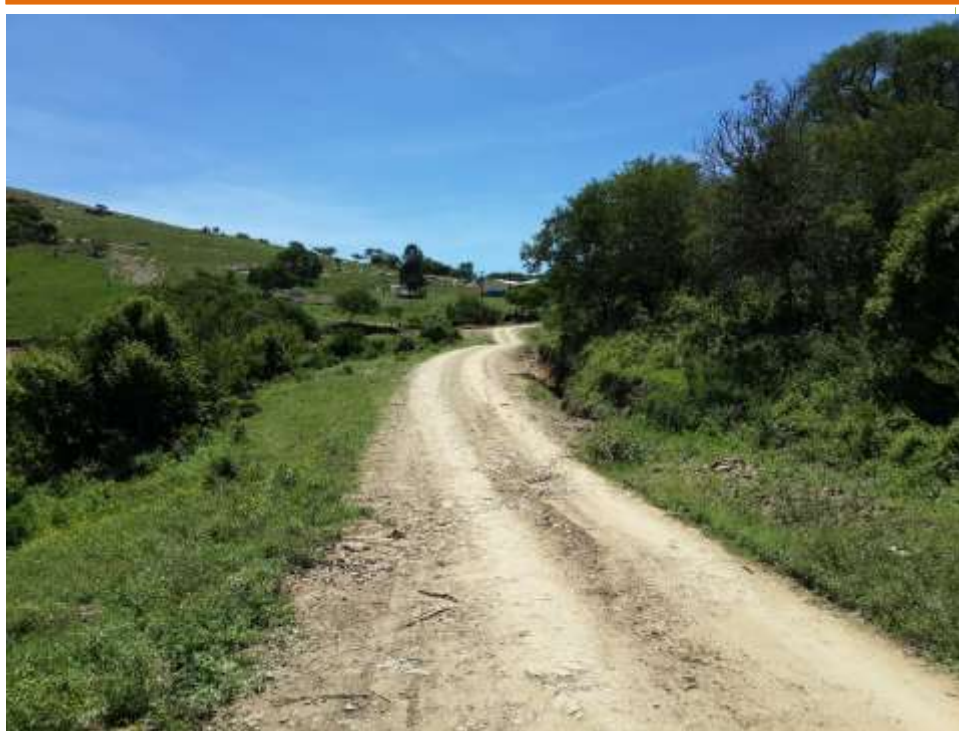




HANSLAB (PTY) Ltd
ENVIRONMENTAL AND GROUND
ENGINEERING SPECIALIST

2017

FINAL BASIC ASSESSMENT REPORT



PROJECT NAME: NTABENZIMA MUD TRACK
AREA/MUNICIPALITY: MVOTI MUNICIPALITY
CLIENT: DEPARTMENT OF TRANSPORT (DOT)
DATE: 09 JUNE 2017

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edtea

Department :
Economic Development, Tourism and
Environmental Affairs

PROVINCE OF KWAZULU-NATAL

(For official use only)

File Reference Number:

Application Number:

Date Received:

Basic assessment report in terms of the Environmental Impact Assessment Regulations, 2014, promulgated in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended.

CONSULTANT DETAILS	
COMPANY	HANSLAB (Pty) Ltd
POSTAL ADDRESS	P.O. Box 2135, Umhlanga Manors, 4021
COMPILED REPORT	Ms M. Shabalala Junior Environmental Practitioner
SIGNED	
DATE	
REVIEWED REPORT	Mr Sheldon Singh Sen. Environmental Specialist
SIGNED	
DATE	
DATE SUBMITTED	

EXECUTIVE SUMMARY:

Hanslab (Pty) Ltd was appointed by KwaZulu-Natal Department of Transport (DOT) to undertake an Environmental Application for the proposed project. The KwaZulu-Natal Department of Transport (the applicant) proposes to upgrade Ntabenzima mud track to a Type 7A Gravel road. The upgrade will be approximately 5.5 km in length, 6 m in width with a road reserve of 20m which conforms to the DOT standards for local road upgrades. The proposed route traverses several drainage lines. The applicant (KZN DOT) proposes to construct pipe culvert structures & a portal causeway structure within the points at which the drainage lines intercepts the proposed route to allow for the natural flow of water. The construction of the proposed structures forms the focus of the application process.

A consultative process (public participation) was undertaken as part of the compilation of the Draft Basic Assessment Report. Comments and recommendations received from the stakeholders have been addressed and included in the FBAR. The purpose of this FBAR is to provide the identified competent authority (Department of Economic Development, Tourism and Environmental Affairs) with all the required and relevant information regarding the proposed project, inclusive of all Interested and Affected Parties (I&APs) and relevant State Departments comments received during the review and commenting phase of the assessment, in order to enable the KZN DEDTEA to make an informed decision.

According to the risk rating matrix, after all significant impacts were taken into consideration & rated individually, the preferred route is said to have a **low environmental significance rating**. Most impacts are short term, local in extent, some site specific, not intense in its effect and may not be likely to occur. Mitigation measures are feasible and are readily instituted as part of a standing design, construction or operating procedures.

DETAILS OF EAP

EAP	Environmental Experience	Contact Details
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SECTION A: ACTIVITY INFORMATION

PROJECT TITLE

The proposed upgrade of a mud track to a Type 7A gravel road & appropriate structures along Ntabenzima mud track within Umvoti Local Municipality.

PROJECT DESCRIPTION

The KwaZulu-Natal Department of Transport (the applicant) proposes to upgrade Ntabenzima mud track to a Type 7A Gravel road. The upgrade will be approximately 5.5 km in length, 6 m in width with a road reserve of 20m which conforms to the DOT standards for local road upgrades. In total, the proposed route transverses several drainage lines. The applicant (KZN DOT) proposes to construct pipe culvert structures & a portal causeway structure within the points at which the drainage lines intercepts the proposed route to allow for the natural flow of water. The construction of the pipe culverts & portal causeway structure within the crossings forms the focus of the basic assessment report, and triggers a listed activities as outlined below.

Two alternative designs for the pipe culvert structures have been outlined below and will be assessed within the BAR:

- **Design Alternative 1:** Precast concrete pipe culvert and associated headwalls;
- **Design Alternative 2:** Concrete piped culvert with stone pitched/ gabion headwalls;

One alternative has been investigated for the proposed portal causeway structure and assessed within the BAR:

- **Alternative 1:** Portal Causeway structure;

The listed activities below are triggered according to the EIA Regulations of 2014

- **Listing Notice 1, Listed Activity 12:**

The development of –

(ii) infrastructure or structures with a physical footprint of 100 square metres or more.

where such development occurs-

(a) within a watercourse.

DESCRIPTION OF THE ACTIVITY TRIGGERING LISTED ACTIVITY 12

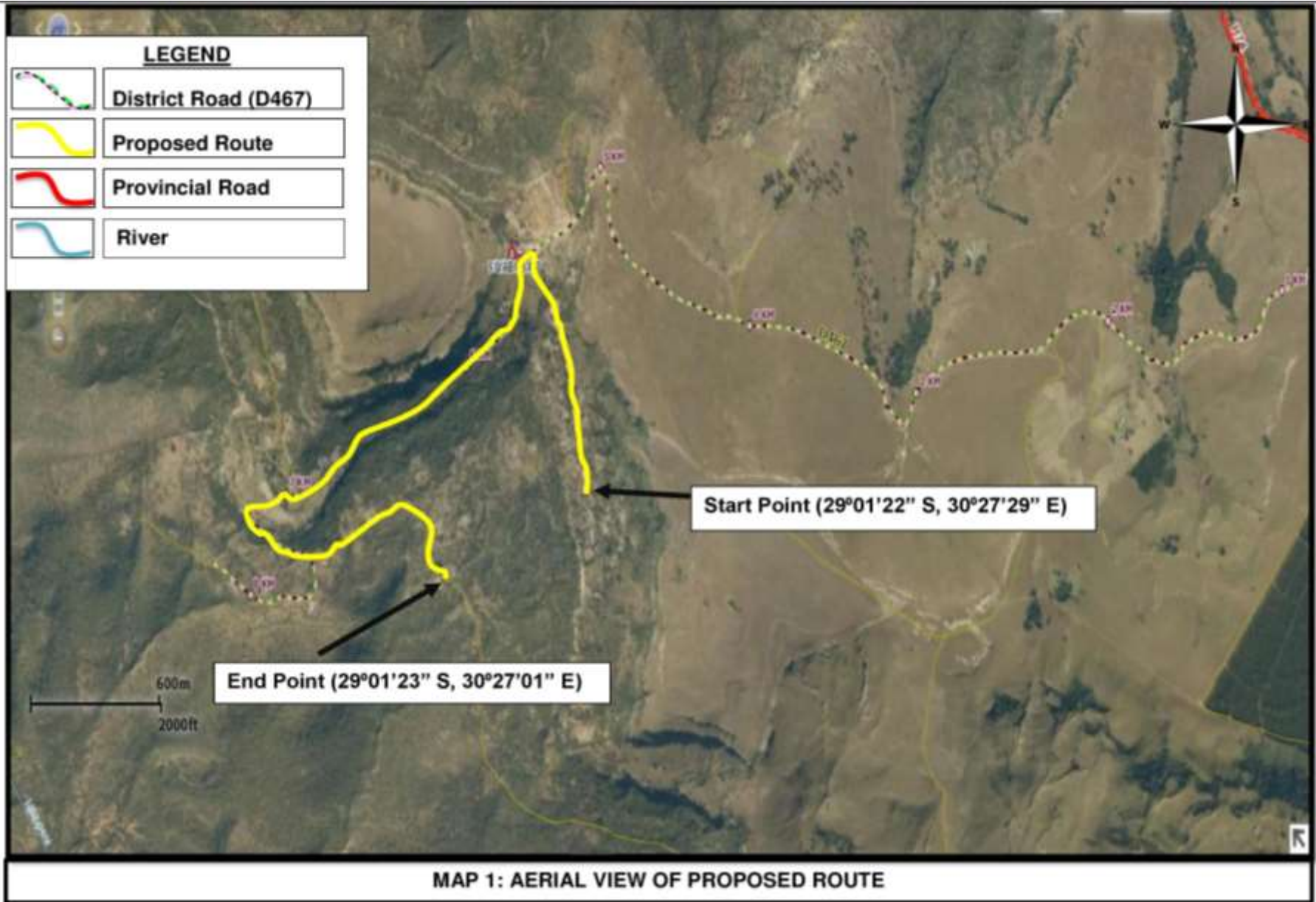
The Department of Transport (DOT) proposes to construct several pipe culverts and a portal culvert causeway structure along the drainage lines & major water crossing point respectively. The physical footprint of the proposed structures will be greater than a 100 square metres and therefore triggers activity 12 of Listing Notice 1 as mentioned.

- **Listing Notice 1 of April 2017, Listed Activity 19:**

The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from - a watercourse;

DESCRIPTION OF THE ACTIVITY TRIGGERING LISTED ACTIVITY 19

The proposed activity will require the temporary removal of soil from the watercourse and drainage lines for the proposed construction of the structures. **Approximately 15 m³** of soil will be removed from the major water crossing to allow for construction of the portal causeway structure. The beds and banks of the stream will also be modified during the construction phase, to allow for the linking/re-alignment of the upgraded local road to the structure.



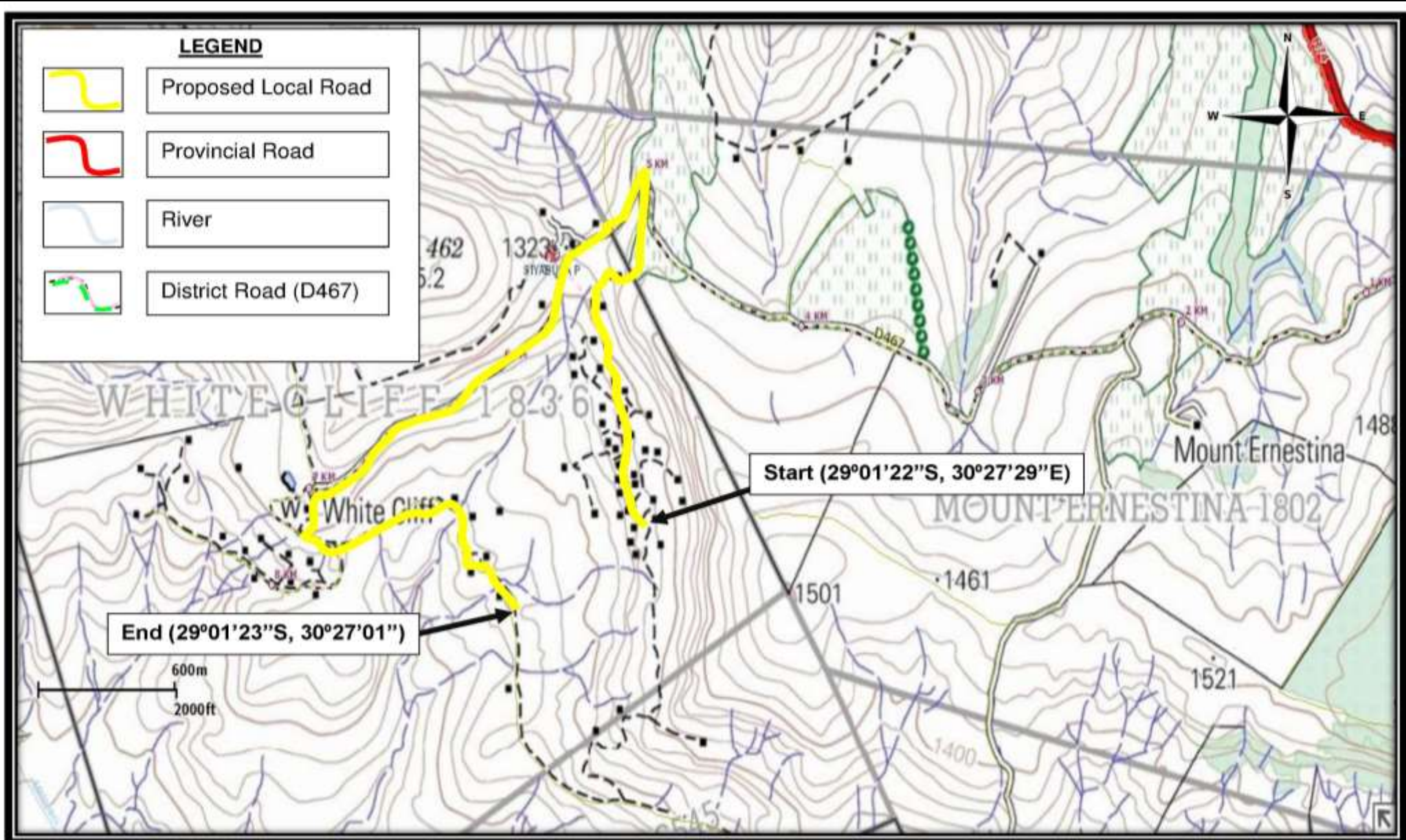
FEASIBLE & REASONABLE ALTERNATIVES

Site Alternative

The proposed construction of the causeway structure & pipe culverts will take place along a point that has already been disturbed. The river banks have become prone to erosion, and inundated during periods of high rainfall. There are no site alternatives with respect to the position/location of the causeway structure & pipe culverts as the existing Ntabenzima mud track traverses the watercourse at this specific crossing point, furthermore the existing crossing point has been utilized by the community members & livestock over many years, which has become prone to soil degradation.

Table 1: Showing the location of the proposed structures:

Location of the pipe culverts, & causeway structure:	Latitude (DDMMSS)	Longitude (DDMMSS)
Drainage Line	29°01'01" S	30°27'24" E
Drainage Line	29° 00' 57" S	30°27'21" E
Drainage Line	29°01'06" S	30°27'05" E
Drainage Line	29°01'26" S	30°26'44" E
Drainage Line	29°01'24" S	30°26'48" E
Drainage Line	29°01'23" S	30°27'00" E



Map 2: Locality Map of Proposed Route

Technology Alternatives

The Department of Transport proposes to construct a portal causeway within the watercourse and pipe culverts within the drainage lines. One design alternative has been investigated for the proposed portal causeway structure. Two design alternatives have been investigated w.r.t. the culvert structure:

- i) Precast pipe culverts with associated precast headwalls;
- ii) Concrete piped culvert with stone pitched/ gabion headwalls.

- **Portal Causeway Structure**

Based on DOT standard details for a portal culvert causeway the approximate width is 8.45 m and length is 7.4 m which varies in relation to the stream width. The physical footprint of the structure is > 100 m². The causeway structure will be supported on pad foundation founded on bedrock. Refer to **Appendix C.1 - facility illustration**.



Photograph 1: showing example of a portal causeway structure.

- **Pipe culvert structure**

Alternative 1 - Precast Concrete Pipe Culvert with precast headwalls:

Photograph 2 below depicts an example of the preferred technology to be implemented within the drainage lines. 600mm Diameter, class 100D pipes of 2.44m lengths spanning, covered by a minimum of 150mm compacted back-fill material will be constructed in the drainage lines. Concrete head-walls will be installed on the inlet and outlet sides of the culverts. **Refer to Appendix C.2.** for facility design. The preferred alternative has been considered as the best practical option by the applicant, as it has a longer life span, and much more cost effective to install and maintain. This option is the best environmental option as it will not require no formwork and no cement mixing on site thereby minimising spillages on site.



Photograph 2: Showing a concrete pipe culvert structure with headwalls.

Alternative 2: Concrete piped culvert with stone pitched/gabion headwalls:

The second option will be to construct concrete pipe culverts with gabion or stone pitched headwalls within the drainage line. Stone pitching as it applies to road and construction is uniform sized stone placed shoulder to shoulder on a prepared surface. The stones used must be sound, tough, durable and clean and are normally sourced from rock quarries. These are placed on cement with the spaces between stones filled with cement. The gabions are recommended in areas where stability is required.

This option will be considered based on specific site conditions and the site engineer will advise accordingly during the site assessment and construction phase (**Refer to Appendix C.3 - Facility Design Drawings/layout**).



Photograph 3: Showing stone pitched pipe culverts with headwalls.

NO-GO ALTERNATIVE

No portal causeway and pipe culvert structures will be constructed, therefore there will be no negative impacts associated with the construction activity. However, there will also be no positive impacts associated with the road construction, for instance, enhanced connectivity and access for the local community. Community members that utilize the road will continue to experience disruptions, with regards to gaining access to the roads in the event of floods occurring. Difficulty will be experienced when access is frequently overtopped by flood water, making access impossible at times of high flow. Erosion along the road is evident in areas as a direct result of poor drainage along the existing mud track.

The banks along the track are highly eroded due to poor drainage and inadequate storm water control structures. According to the ward councilor, members of the community are left stranded throughout periods of intense rainfall as the existing mud track becomes inaccessible. There is no formal crossing structure, therefore no public transport can be accessed by the community members. The proposed route is transformed by existing footpaths and highly degraded to the extent that gully formation has become pronounced in the immediate site area. Most of the natural vegetation is at risk of becoming replaced by invasive alien vegetation.

PHYICAL SIZE OF THE ACTIVITY

Alternative:

Alternative A1¹ (preferred activity alternative)

Alternative A2 (if any)

Alternative A3 (if any)

Size of the activity –

Causeway Structure

	>100 m ²
	N/A m ²
	N/A m ²

Alternative:

Alternative A1² (preferred activity alternative)

Alternative A2 (if any)

Alternative A3 (if any)

Size of the activity –

Pipe Culvert Structures

	<50 m ²
	<50 m ²
	N/A m ²

LAYOUT OR ROUTE PLAN

The site plan has been prepared for the proposed route upgrade and no alternative route has been investigated as the preferred route is being upgraded along the existing mud track as it has already been degraded. **Refer to Appendix A.1**

LOCALITY MAP

A locality map serves as a tool to provide a visual representation of information in a geographical context. **Refer to Appendix A.2**

SITE PHOTOGRAPHS

Refer to Appendix B

FACILITY ILLUSTRATION

A detailed illustration has been provided and attached as **Appendix C.** to the report.

Appendix C.1 - Portal causeway

Appendix C.2 - Precast concrete pipe culvert and headwalls

Appendix C.3 - Stone pitched headwalls for the proposed pipe culvert structure

ACTIVITY MOTIVATION

The proposed upgrade will be located off R74 along Ntabenzima mud track (extended from D467), providing access to the local communities, and school children. The proposed causeway, and pipe culverts will be constructed to ensure safe access to pedestrians and motorists, whilst minimizing soil erosion and siltation of the watercourse due to runoff. The Greytown region is predominately rural and access to basic developmental areas & settlements is limited. Development in this area will create opportunities and unlock new development. Community members are often left stranded during periods of high rainfall; therefore, the upgrading of the mud track and construction of the crossing structures will impact positively to members of the community. During the construction process, local labour will be sourced (required/rooted) by the contractor, thus offering skilled training opportunities to members of the community. As a result of the construction process, employment will increase. It is therefore, a high societal priority for local community members. The proposed construction of the causeway, slab & pipe culvert structures will positively impact the local community by providing access to basic amenities, and minimizing the negative impact of flooding, and soil erosion.

The proposed construction will outweigh the negative impacts in terms of increased socio-economic development for the local community. The site is degraded and banks along the existing water crossing point are highly eroded as a direct result of poor drainage. The natural vegetation of the site is interrupted and removed by human activities. On completion of construction, the site will be rehabilitated. There is an urgent need to ensure safe and reliable means of crossing the water crossings for both vehicles and pedestrians. The construction of the causeway structure, slab and pipe culverts will also make travelling for basic amenities, education and work feasible for local community members. The crossing points are prone to flooding particularly during periods of high rainfall, thus limiting the access to basic amenities. Most of the population has no formal education and is illiterate. Most community members are dependent on governmental social grants, pensions and even informal trading to earn a living. Therefore, the development of this area is of great importance. The proposed action of upgrading the existing mud track can be considered as the first step towards upliftment or development of the local community. Once construction is complete the road will allow for public transport modes to cater for local communities efficiently.

According to the uMzinyathi District Municipality Draft EMF (2016), the objective of the mitigations and environmental practice is to enhance natural resources for sustainable equitable use, to protect and enhance the quality as well as the safety of the environment. Promoting the conservation and sustainable utilization of our resources to enhance economic growth, and protecting and improving the quality and

safety of the environment. Section 2 of NEMA encourages environmental management that places people and their needs at the forefront of it concern, to be able to meet their physical, developmental, cultural and social interests. Taking this into consideration the communities will be able to access basic amenities always because of the proposed development. Economically, the proposed activity will ensure that communities gain access to the school and allow easy access for potential investments. All factors mentioned in Section 2 (4) of NEMA were taken into consideration, assessed and discussed in Section D. Section D of the BAR addresses possible impacts such as land and water pollution, ecological disturbances, noise and socio-economic impacts as required by NEMA as well as possible mitigation measures.

EAP is an independent person, appointed by the applicant to determine all negative and positive impacts that may result from the proposed development. Mitigation measures have been proposed in this report. All the information compiled by the EAP was rated in a scoring matrix, taking environmental, social and ecological issues into account. The Draft BAR was circulated into the public domain for a Public Participation Process as described in NEMA. All comments received during the entire Basic Assessment process have been recorded as part of the "Issues and Responses Report" and addressed accordingly in the BAR. All impacts with regards to the proposed development were identified in and included as Section D of the report. The impacts that have been identified must be managed and mitigated. These measures have been included in the Environmental Management Programme (EMPr) attached as **Appendix F of this report.**

APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

a) NEMA and the Environmental Impact Assessment Regulations, 2014

The EIA Regulations 2014, promulgated under NEMA (1998), focus primarily on creating a framework for co-operative environmental governance. NEMA provides for co-operative environmental governance by establishing principles for decision-making on matters affecting the environment, institutions that will promote co-operative governance and procedures for co-ordinating environmental functions exercised by State Departments and to provide for matters connected therewith.

In terms of the EIA Regulations of 2014, activities listed in GN No. 327 (requiring a Basic Assessment (BA) process), the proposed project includes activities that are triggered within the Regulations. The listed activities are deemed to include activities that could potentially have an impact on the social and biophysical state of an area and as such, the applicant is required to obtain an Environmental Authorisation (EA) by way of a BA process

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

The purpose of the Biodiversity Act is to provide for the management and conservation of South Africa's biodiversity within the framework of the NEMA and the protection of species and ecosystems that warrant national protection. As part of its implementation strategy, the National Spatial Biodiversity Assessment was developed.

This Act is applicable to this application for environmental authorisation, in the sense that it requires the project applicant to consider the protection and management of local biodiversity.

c) National Heritage Resources Act, 1999 (Act No. 25 of 1999)

This Act legislates the necessity for cultural and heritage impact assessment in areas earmarked for development, which exceed 0.5 hectares (ha) and where linear developments (including roads) exceed 300 metres in length. The Act makes provision for the potential destruction to existing sites, pending the archaeologist's recommendations through permitting procedures. Permits are administered by AMAFA KwaZulu-Natal, the Provincial Heritage Resources Authority.

d) Occupational Health and Safety Act, 1993 (Act No. 85 of 1993)

To provide for the health and safety of persons at work and for the health and safety of persons about the use of plant and machinery; the protection of persons other than persons at work against hazards to health and safety arising out of or about the activities of persons at work; to establish an advisory council for occupational health and safety; and to provide for matters connected therewith.

e) Constitution of Republic of South Africa (Act No 108 of 1996)

The project falls within the boundaries of South Africa. The Constitution of the Republic of South Africa has major implications for environmental management. The main effects are the protection of environmental and property rights, the change brought about by the sections dealing with administrative law, such as access to information, just administrative action and broadening of the locus standing of litigants. These aspects provide general and overarching support and are of major assistance in the effective implementation of the environmental management principles and structures of the NEMA. Section 24 in the Bill of Rights of the Constitution specifically states that:

Everyone has the right -

- *To an environment that is not harmful to their health or well-being; and*
- *To have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that -*
- *Prevent pollution and ecological degradation;*
- *Promote conservation; and*
- *Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.*

Waste, effluent, emission and noise management

- Solid waste management

Will the activity produce solid construction waste during the construction/initiation phase?

YES	NO
X	
> 5m ³	

If YES, what estimated quantity will be produced per month?

How will the construction solid waste be disposed of (describe)?

All solid waste accumulated during construction will be kept in designated area and will be disposed at the registered local landfill site weekly. This has been addressed in the EMPr (**Appendix F**).

Where will the construction solid waste be disposed of (describe)?

The construction solid waste will be disposed of at the nearest registered landfill dump site located on Dundee Road (R33) by the contractor. This has been addressed in the EMPr.

Will the activity produce solid waste during its operational phase?

YES	NO
	x
N/A m ³	

If YES, what estimated quantity will be produced per month?

- Liquid effluent

Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system?

YES	NO
	X
N/A m ³	
YES	NO
	X

Will the activity produce any effluent that will be treated and/or disposed of on-site?

- **Emissions into the atmosphere**

Will the activity release emissions into the atmosphere other than exhaust emissions and dust associated with construction phase activities?

YES	NO
	X
YES	NO
	X

If YES, is it controlled by any legislation of any sphere of government?

- **Waste permit**

Will any aspect of the activity produce waste that will require a waste permit in terms of the NEM: WA?

YES	NO
	X

- **Generation of noise**

Will the activity generate noise?

YES	NO
X	
YES	NO
	X

If YES, is it controlled by any legislation of any sphere of government?

Describe the noise in terms of type and level:

Noise will only be generated during the Construction Phase only (machinery, generator etc.) The level of the noise is however low and below 70 decibels threshold limit. No noise will be generated during the operational phase; the impact is short-term and can be minimised with affective monitoring and auditing conducted by ECO.

- Water use

Please indicate the source(s) of water that will be used for the activity by ticking the appropriate box(es):

Municipal	Water board	Groundwater	River, stream, dam or lake	Other Water will be transported to site via water tanks.	The activity will not use water
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Water will be transported to the site via water trucks as to minimise strain placed on the local municipal system, and no water will be abstracted from any watercourse during the construction phase of the project. The applicant must lodge a water use license application for all structures crossing a watercourse, and 500m from any identified wetland.

SECTION B: SITE/AREA/PROPERTY DESCRIPTION

Property Description

Table 2: Property Description

Province	KwaZulu-Natal
District Municipality	UMzinyathi District Municipality
Local Municipality	Umvoti Local Municipality
Ward Number(s)	Ward 11
Farm name and number	Whitecliff 1836
Portion number	3 & 4
SG Code	NOFT01250000183600000
	NOFT01250000183600003
	NOFT01250000183600004

GRADIENT OF THE SITE

Alternative S1:

Existing Track

Flat	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5
			X			

Drainage lines

Flat	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5
		X				

Alternative S2 (if any):

Flat	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5
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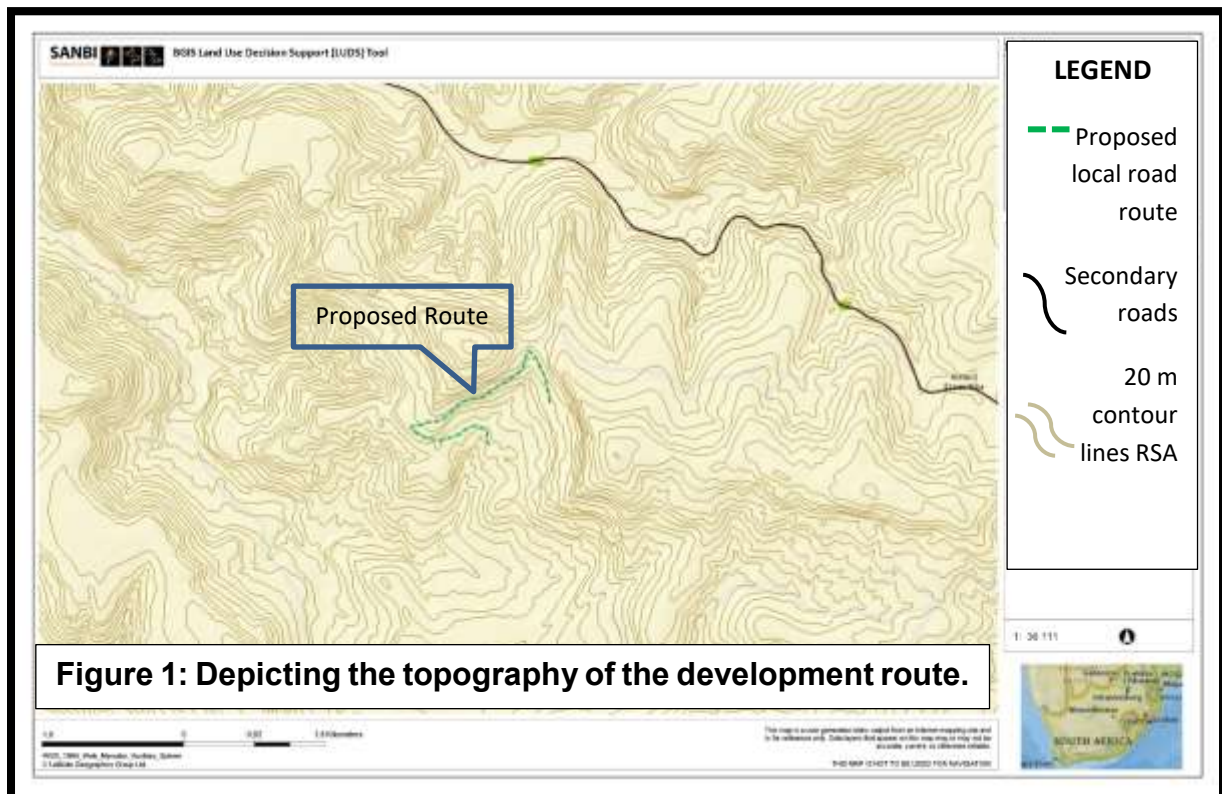
Alternative S3 (if any):

Flat	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5
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Baseline Biophysical Conditions

1. Topography

The topography is undulating, although some areas are steeper than others. Umvoti Local Municipality has the lowest altitude point being 145m above sea level and the highest being 1614m above sea level. UMzinyathi District area is characterised by extensive variation with deep river gorges, rolling grasslands, extensive wetlands, hills and valley bush veld. The District can be divided into three topography areas, the northern plateau with the Biggarsberg and the Buffalo River valley dominating the landscape; the southern landscape defined by the mountains immediately North of Greytown and the Mvoti River valley; and the prominent Thukela River valley, into which the valleys carved by the Buffalo and Mooi Rivers feed into, which is characterised by deep gorges and steep slopes (Umvoti Municipality IDP, 2015- 2016).



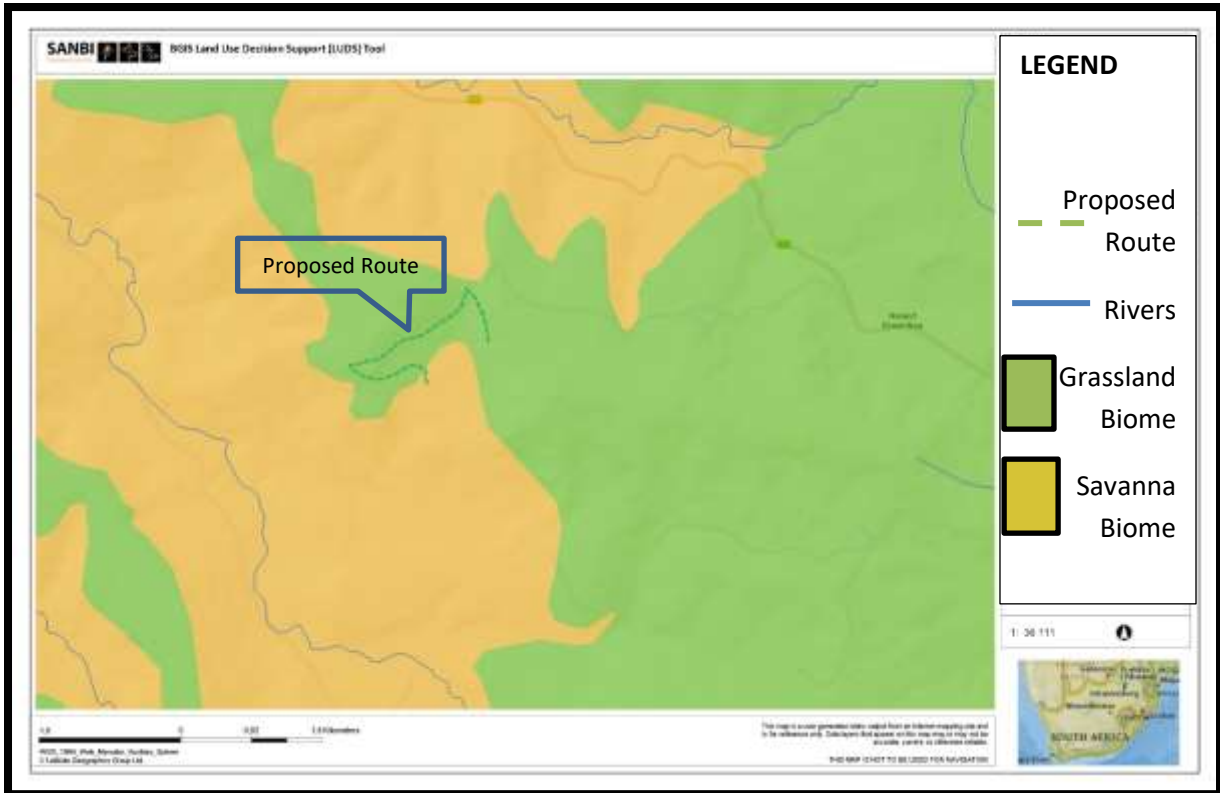


Figure 3: Showing biomes dominating the development route.

3.Geology

The development area is dominated by undifferentiated shallow soils, with Lithosols which are shallow soils on hard or weathering rock. These is a group of shallow **soils** lacking well-defined horizons, especially an entisol consisting of partially weathered rock fragments, usually on steep slopes. These types of soil are closely linked to the dominance of grassland and savanna vegetation. (SANBI LUDS data)

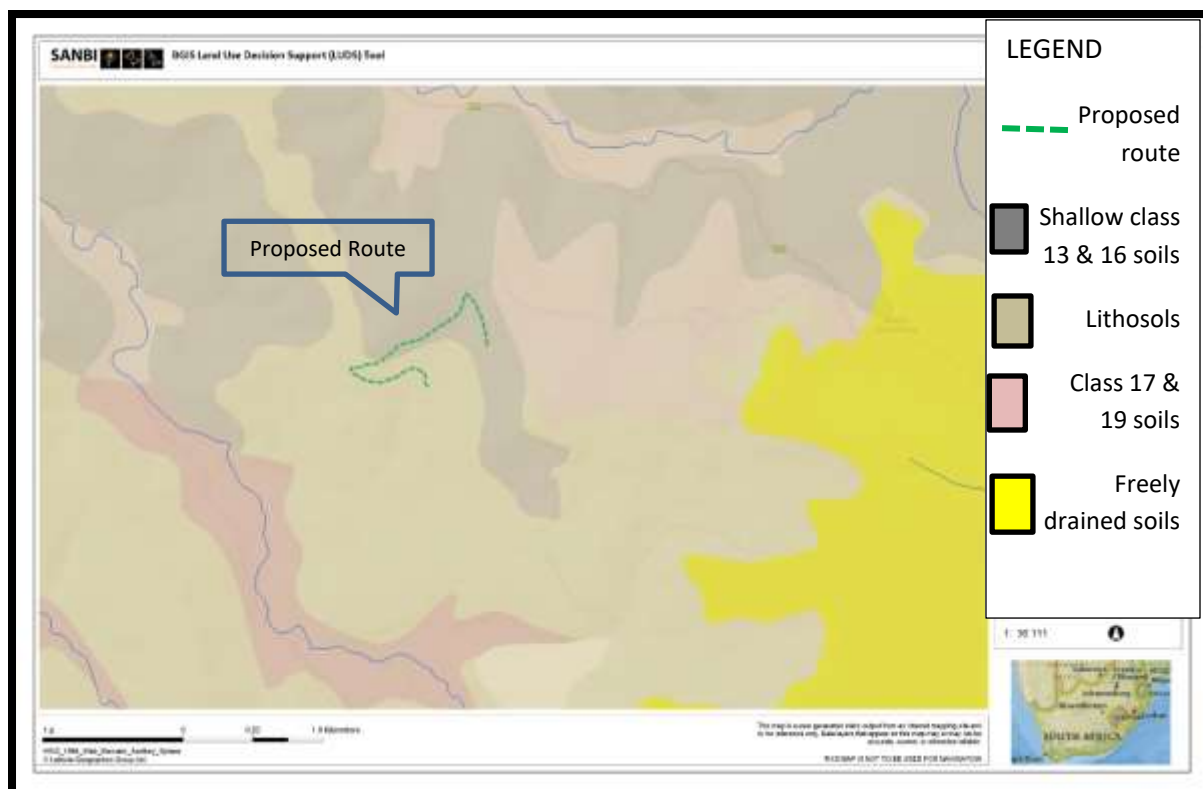


Figure 4: showing soil classes of the development route.

4. Climate

Umvoti has a temperate climate. Temperate climates are those without extremes of temperature and precipitation (rain and snow). The changes between summer and winter are generally invigorating without being frustratingly extreme. Rainfall varies from more than 800mm in Umvoti and Endumeni, to less than 400 mm in parts of Msinga. Precipitation is primarily associated with summer thunderstorms, which can be accompanied by strong winds and hail. Temperature averages range from a minimum of 2°C in winter to a maximum of 23°C in summer, with an average of 14°C (Umvoti Municipality IDP, 2015- 2016).

5. Biodiversity

During the site investigation, existing footpaths and overgrazing were observed and the site has been transformed, therefore the proposed activity will contribute to the rehabilitation of the site which has been outlined in the EMP. According to the SANBI data it can be understood that the proposed causeway & drainage lines for pipe culverts on the site lie within areas where no natural habitat remains, and if any are remaining they are least threatened.

6. Land use character of surrounding area

Natural area	Dam or reservoir	Polo fields
Low density residential	Hospital/medical centre	Filling station ^H
Medium density residential	Schools (Mount Ernestina Combined; Muden Combined; Ophathe Primary)	Landfill or waste treatment site
High density residential	Tertiary education facility	Plantation
Informal residential ^A (Rondavels & Mud huts adjacent to the route)	Church	Agriculture (Commercial & Subsistence farming)
Retail commercial & warehousing	Old age home	River, stream
Light industrial	Sewage treatment plant ^A	Nature conservation area
Medium industrial ^{AN}	Train station or shunting yard ^N	Mountain, ridge
Heavy industrial ^{AN}	Railway line ^N	Museum
Power station	Major road (4 lanes or more) ^N	Historical building
Office/consulting room	Airport ^N	Protected Area
Military or police base/station/compound	Harbour	Graveyard
Spoil heap or slimes dam ^A	Sport facilities	Archaeological site
Quarry, sand or borrow pit	Golf course	Other land uses (describe)

7. CULTURAL/HISTORICAL FEATURES

Are there any signs of culturally or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including Archaeological or paleontological sites, on or close (within 20m) to the site? If YES, explain:

YES

NO

Uncertain

The Draft BAR was uploaded to the AMAFA website for comment. After the assessing officer had taken into consideration all possible heritage, archeological and paleontological impacts the proposed route may have on the receiving environment concluded that the development will not be a threat to the heritage resources. This however does not rule out the possibility of encountering resources in the vicinity of the development footprint. Should any heritage resources such as broken pottery, rock art sites, building foundation, graves etc be noticed in and around the development footprint, Amafa should be consulted for guidance.

The below-mentioned standard conditions must be adhered to:

1. Amafa should be contacted if any heritage objects are identified during earthmoving activities and all development should cease until further notice.
2. No structures older than sixty years or parts thereof are allowed to be demolished altered or extended without a permit from Amafa.
3. No activities are allowed within 50m of a site, which contains rock art.
4. Sources of all natural materials (including topsoil, sands, natural gravels, crushed stone, asphalt, etc.) must be obtained in a sustainable manner and in compliance with the heritage legislation.

Refer to **Appendix E.5– Final AMAFA comments.**

Failure to comply with the requirements of the National Heritage Resources Act and the Kwa-Zulu Natal Heritage Resources Act could lead to legal action being instituted against the applicant.

Will any building or structure older than 60 years be affected in any way?

YES	NO
-----	----

Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?

YES	NO
-----	----

8. SOCIO-ECONOMIC CHARACTER

a) Local Municipality

Umvoti Local Municipality is one of four municipalities in the UMzinyathi District Municipality, KwaZulu-Natal. The municipality is situated along the eastern boarder of UMzinyathi District, about 65 km from Dundee and approximately 70 km from Pietermaritzburg. It covers an area of approximately 2 516 km² and is well served by provincial and regional roads, easily accessible from Pietermaritzburg, the coast, Drakensberg, and the battlefields route. According to Census 2011, 53.5% of individuals in the municipality live in formal dwellings. 94.6% of the 103 093 people in the municipality are Black African, with the White and Coloured populations each contributing 2.2%.

There are 27 282 households in Umvoti Local Municipality, with an average of 3.7 people per household. Nearly 57.6% of households are headed by females, and the proportion of households residing in formal dwellings is 53.5%. In terms of service delivery, 20.2% of households have access to piped water within the dwelling, and 23.4% of households have a flush toilet that is connected to a sewerage system. 58.3% of households have access to electricity for lighting.

Level of unemployment:

According to the SDF (2013), the Umvoti local municipality has experienced a steady decline in unemployment rates since 1996. In 1996 the unemployment rate was recorded at 49.8% this has significantly dropped to 30.4% in 2011. The general prediction trend is translated to a reduction of an average of 1.6% year on year. 30.4% of the 24 047 economically active individuals (i.e. those who are employed or unemployed but looking for work) are unemployed. Of the 13 160 economically active youth (15–34 years) in the municipality, 38.0% are unemployed.

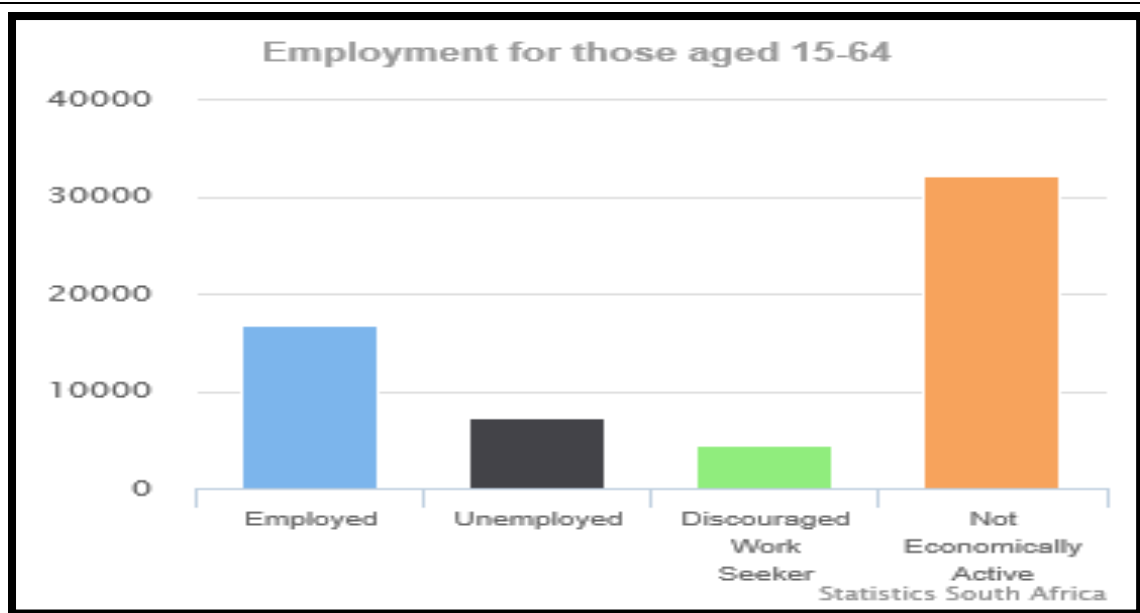


Figure 6: Representing the employment rate in Umvoti by age.

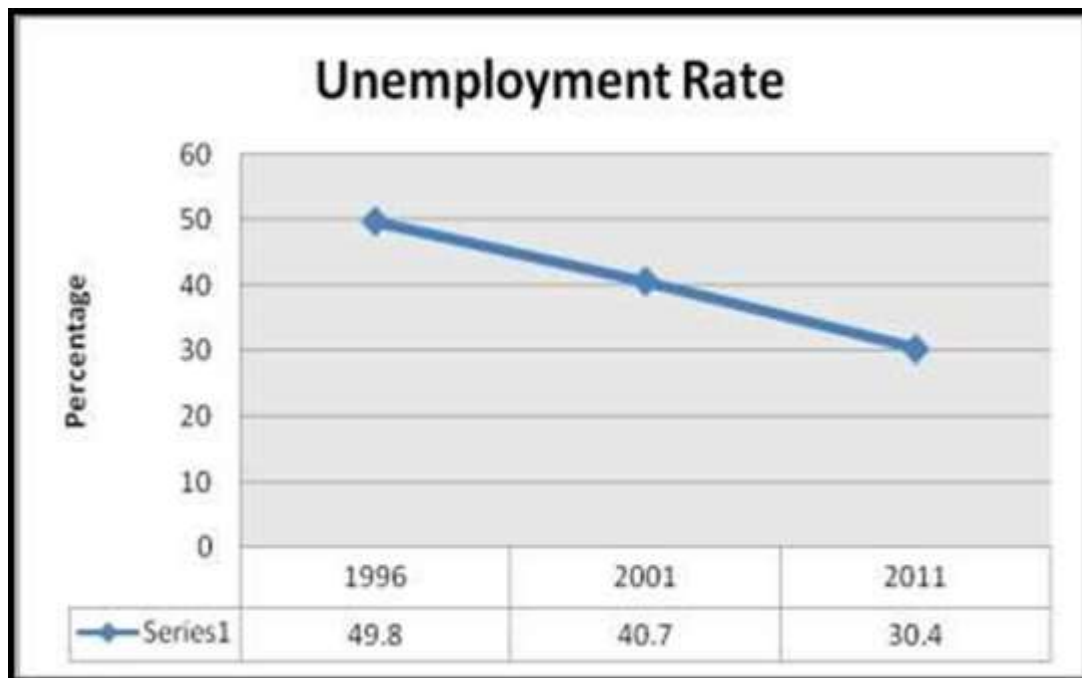


Figure 7: Representing Unemployment Rate in Umvoti SDF, 2013

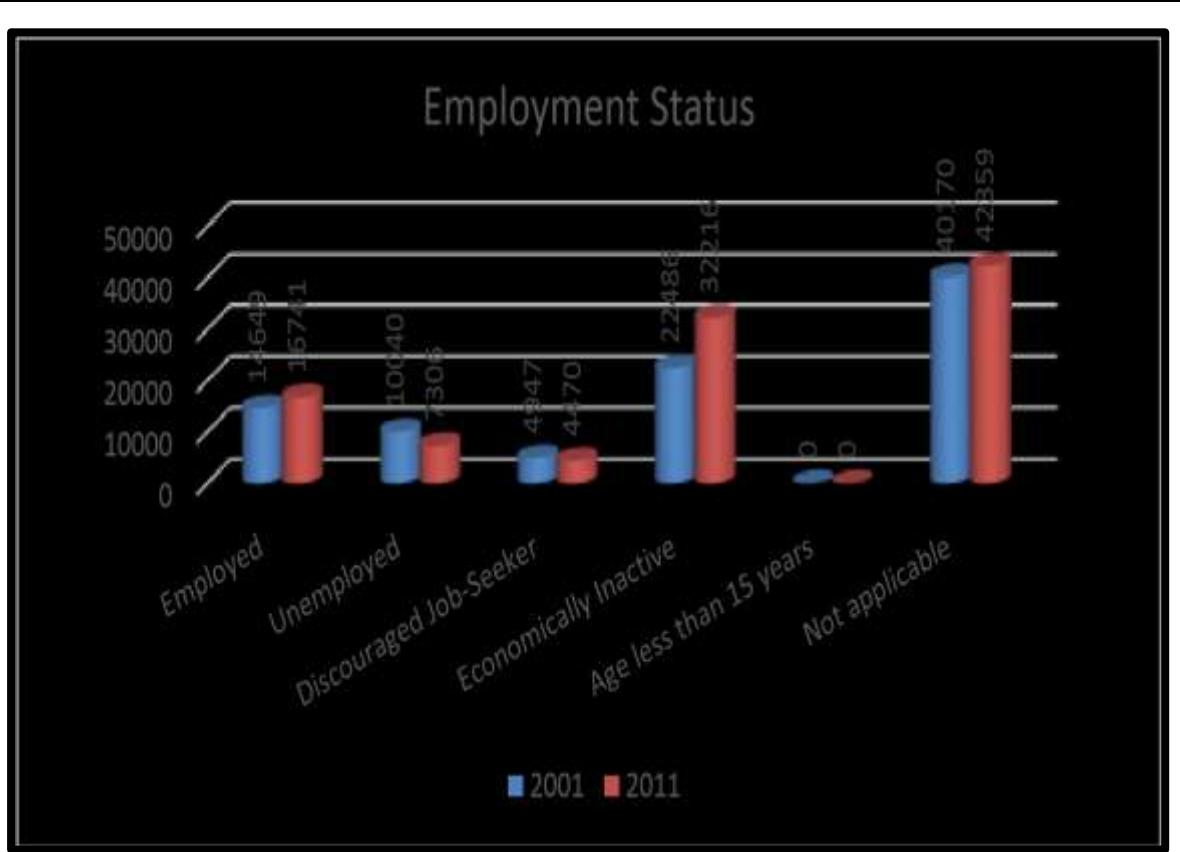


Figure 8: Representing Umvoti Employment Status IDP, 2014

Economic profile of local municipality:

The Umvoti Local Municipality has well known sectors of economic development, which contribute or drive the economic growth of the area. General government services, wholesale and retail trade, manufacturing and agriculture as well as forestry have been major contributors in the economy. Greytown is the main provider of higher income jobs in senior management, professional, technical, clerks as well as skilled personnel. Commercial farms provide most of the skilled jobs and are provided through processing plants. It should be noted that Traditional Authority areas provide few to no jobs at all (IDP, 2014-2015).

Good agricultural potential is found in the Greytown area and along Umvoti River arising from a combination of high rainfalls, moderate temperatures, good soils and moderate slopes. Moderate agricultural potential is concentrated in the area between Greytown and Kranskop, but large patches are scattered throughout the area, where productivity is adversely affected by difficult topography, acidic soils, high hail tendencies and population pressure. The carrying capacity of the veld is high in

summer, but poor during the winter months. Soil erosion & leaching of soils is a recurring problem as a combination of Poor Land-Use Practices, Heavy Overgrazing & Poaching coupled with steep gradients have led to the degradation of wetlands, soil fertility & an overall reduction in the agricultural productivity of the area.

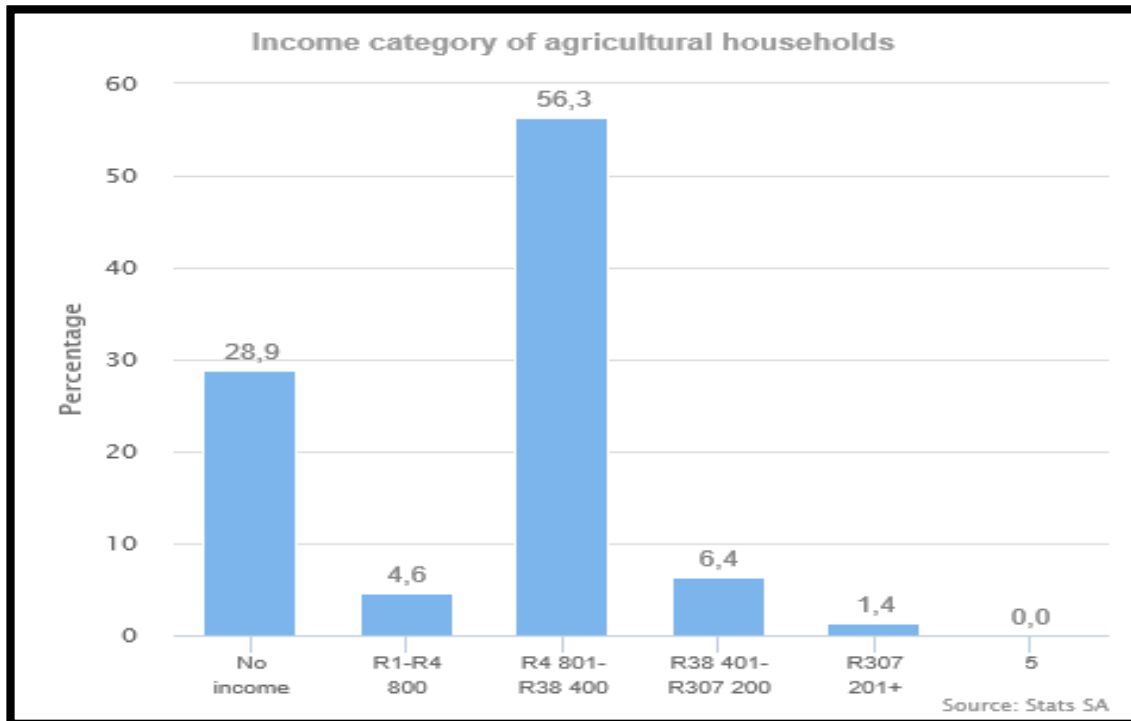


Figure 9: Representing the income generated by each household with their agricultural produce to sustain their families (Stats SA, 2011).

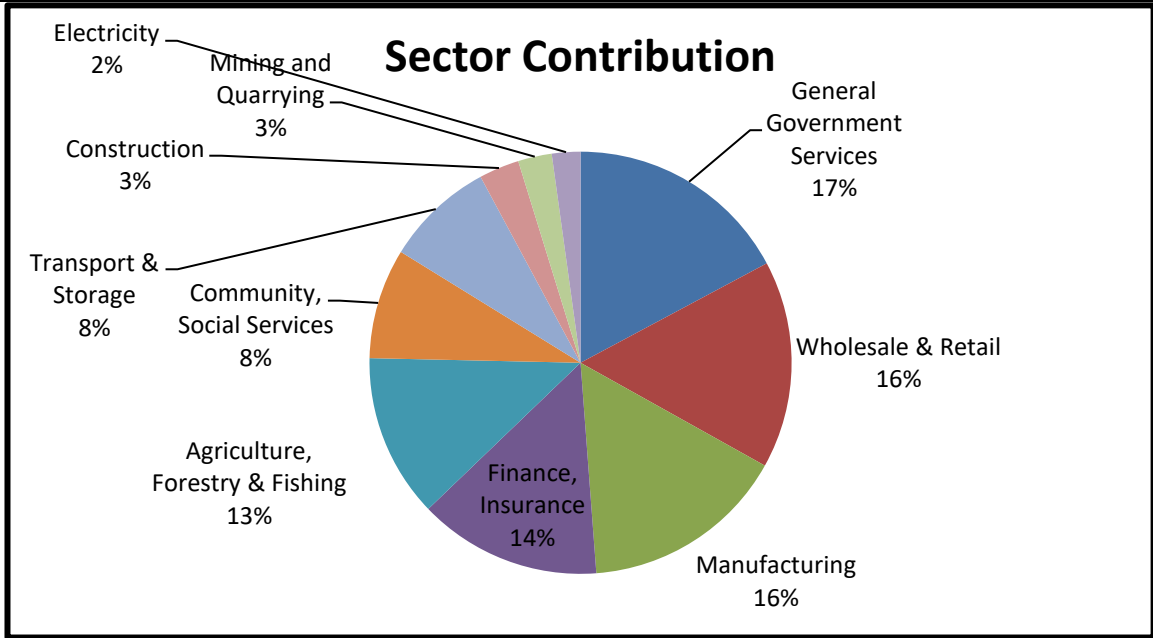


Figure 10: Representing the economic contributors by sector in the Umvoti municipality.

Level of education:

According to the census 2011 only 26.6% of those aged 20 and above have had no schooling, while 1 in 4 individuals (25.3%) in this age group have some secondary education, 22.8% have completed matric, and 4.8% have some form of higher education.

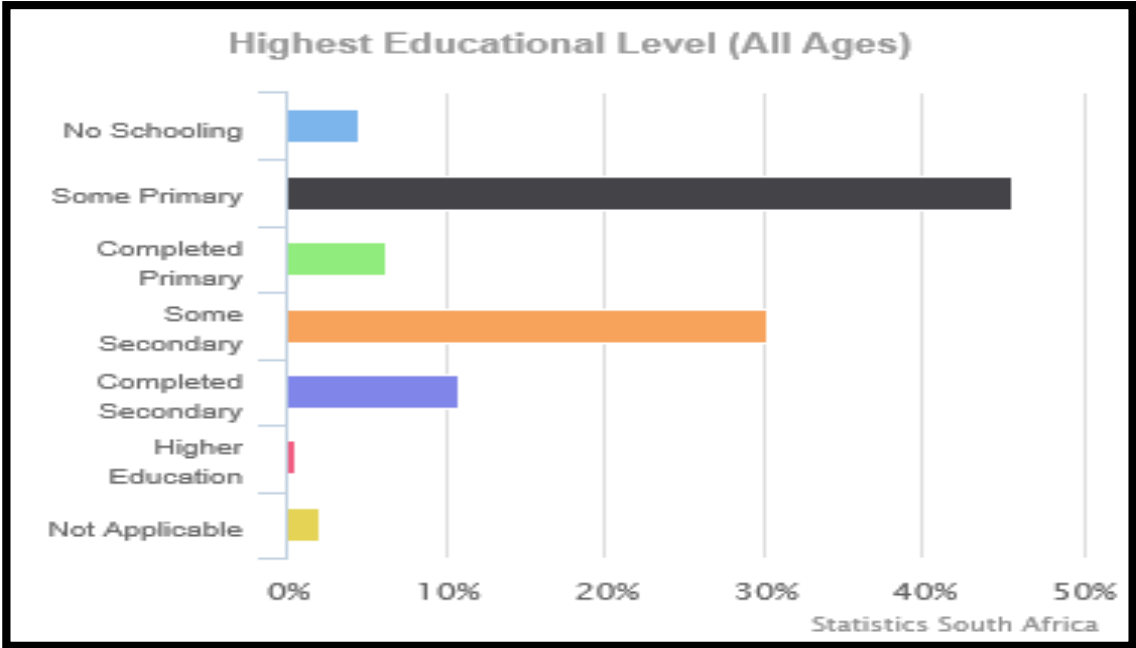


Figure 11: Showing the education levels of Umvoti Municipality (Stats SA, 2011).

b) Socio-economic value of the activity

What is the expected capital value of the activity on completion?	R 3.5 million	
What is the expected yearly income that will be generated by or as a result of the activity?	R N/A	
Will the activity contribute to service infrastructure?	YES X	NO
Is the activity a public amenity?	YES X	NO
How many new employment opportunities will be created in the development and construction phase of the activity/ies?	20	
What is the expected value of the employment opportunities during the development and construction phase?	R 800 000	
What percentage of this will accrue to previously disadvantaged individuals?	100 %	
How many permanent new employment opportunities will be created during the operational phase of the activity?	N/A	
What is the expected current value of the employment opportunities during the first 10 years?	N/A	
What percentage of this will accrue to previously disadvantaged individuals?	100 %	

SECTION C: PUBLIC PARTICIPATION

1. Advertisement and Notice

Table 3: Showing the Newspaper Advertisement to notify Interested & Affected Parties (I&AP's)

Publication name	Greytown Gazette	
Date published	23/11/2016	
Site notice position	Latitude	Longitude
	29°01 '17" S	30°27 '28" E
	29°00 '51" S	30°27 '22" E
Date placed	17/11/2016	

2. Determination of appropriate measures

2.1 Site Notices

On the 17th of November 2016 two site notices were placed at strategic points along the Ntabenzima mud track for public viewing (**Refer to Appendix E.3**). This formed part of the notification period and allowed the public an opportunity to register as Interested and Affected Party (I&AP). See comments & responses summary report attached as **Appendix E.1**.



Photograph 4: Showing proof of site notice place along the proposed route.

2.2 Newspaper Advertisement

A newspaper article was published on the Greytown Gazette on the 23rd of November 2016. The newspaper articles formed part of the Public Participation Process and afforded the public the opportunity to register as Interested & Affected Parties (I&AP's). **To date no comments have been received & no individuals have registered as I&AP's.**

Missing man sought

Eighteen-year-old Kharyshan Nicholas Mamba is missing. He was last seen at Zebra's (Harambee Hotel) on Saturday 5 November. Anyone with any information is asked to call Detective Constable JC Mkhawwe of the HATVMI SAPS at 079 679 2728.



A stroke? Take fast action

WORLD Stroke Week began on 25 October running until 3 November and ER24 is urging people to educate themselves about the condition.

Stroke is a common and serious condition affecting millions of people around the globe. A stroke, which could lead to death or disability, occurs when blood flow to parts of the brain is cut off.

There are two types of stroke. The most common is the ischaemic stroke, which occurs when a blood vessel supplying blood to part of the brain becomes blocked by a blood clot which could either form in an artery in the brain or travel to the brain through a blood vessel from another part of the body.

The second less common, but more likely, fatal type of stroke, is the haemorrhagic stroke, which occurs when a blood vessel in the brain leaks or bursts and/or ruptures causing bleeding.

Recognising the signs of a stroke early and seeking urgent medical assistance are of utmost importance as it increases the person's chances of survival and recovery.

If you suspect you or someone else is having a stroke, conduct the fast test as follows:

• Face - Is one side of the person's face drooping? The person should smile or show their teeth.

• Arm - One side is drooping, they could be hav-

ing a stroke. • Arm - the person should keep their arms raised for a few seconds. If one arm drifts down or is weak, they could be having a stroke.

• Speech - the person should try to speak. If there is slurring or if the person struggles to understand or repeat any sentence, they could be having a stroke.

• Time - If the person experiences any of the above, call emergency services immediately.

Immediate and appropriate care can improve a patient's outcome. Strokes can be reversed if treated before the affected brain tissue dies.

Hypertension, or high blood pressure, is the leading cause of strokes (and heart attack) in South Africa. Hence, it is vital that you get your blood pressure measured regularly.

Risk factors for stroke also include diabetes, high cholesterol, smoking, excessive alcohol intake, heart disease and stress.

It is vital that people live a healthier lifestyle to reduce chances of having a stroke. Quitting smoking, reducing alcohol intake, making the right food choices (such as reducing salt and sugar intake), and including moderate exercise into your daily routine, can make a positive difference.

- ER24.

Xmas cakes with a difference

THIS is world-famous TV star, Mary Berry's recipe. She became famous as one of the stars of the Great British Bake Off.

Make this delectably moist and fruity cake as an alternative to traditional Christmas cake. It serves 12.

- 150g red glacé cherries, rinsed, dried and cut into quarters
 - 225g canned pineapple in pineapple juice, drained, dried and roughly chopped
 - 50g dried apricots, chopped
 - 100g blanched almonds, roughly chopped
 - 2 lemons, finely grated zest only
 - 350g sultanas
 - 250g unsalted butter, softened, plus extra for greasing
 - 250g caster sugar
 - 5 large free-range eggs, lightly beaten
 - 250g self-raising flour
 - 75g ground almonds
- For the topping
- small handful blanched whole almonds
 - small handful walnut halves
 - small handful red glacé cherries, halved
 - 50g white orange peel (available from health food shops), cut into pieces
 - 100g apricot jam

Method:

• Preheat the oven to 160C/320F. Grease a deep, 23cm/9in round cake tin with butter, then line the base and sides with a double layer of baking parchment.

• In a bowl, gently mix together the cherries, pineapple, apricots, almonds, lemon zest and sultanas until well combined. Set aside.

• In a food processor, cream the butter and sugar until light and fluffy. Pour in the beaten eggs a little at a time, adding a spoonful of the flour to prevent the mixture from curdling and pulsing after each addition.

• Carefully fold the remaining flour and ground almonds into the cake mixture using a metal spoon, then gently fold in the fruit and nut mixture until just combined.

• Pour the cake mixture into the prepared tin and smooth the surface using a palette knife.

• For the topping, decorate the cake with the blanched whole almonds, walnut halves, glacé cherry halves and orange peel.

• Bake the cake in the oven for 2-2½ hours, or until golden-brown on top and cooked through. (The cake is cooked through when a skewer inserted into the centre of the cake comes out clean.) Cover the cake loosely with tin foil after one hour to prevent the top from becoming too dark.

• Sit the cake aside in its tin to cool for 30 minutes, then remove from the tin, peel the baking parchment away from the sides and place onto a wire rack to cool completely.

• Meanwhile, heat the apricot jam in a small pan over a low heat, then strain through a fine sieve to remove any pieces of fruit. When the cake has cooled, brush

the top all over with the warm apricot jam. Wrap a ribbon around the cake and tie with a bow, if desired, then serve.

Simmer 'n stir cake

An easy-to-make alternative to traditional Christmas cakes, which requires no braising.

Ingredients

- 175g chopped almonds
- 200g dark muscovado sugar
- 750g luxury mixed dried fruit (one that includes mixed peel and glacé cherries)
- finely grated zest and juice of 1 orange
- finely grated zest of 1 lemon
- 100ml cherry brandy or brandy plus 4 tbsp more
- 45g macadamia nut
- 3 large eggs
- lightly beaten
- 45g ground almond
- 200g plain flour
- ½ tsp baking powder
- 1 tsp ground mixed spice
- 1 tsp ground cinnamon
- ¼ tsp ground allspice

Method

• Put the butter, sugar, fruit, zests, juice and 100ml brandy in a large pan. Bring slowly to the boil, stirring until the butter has melted. Reduce the heat and bubble for 10 minutes, stirring occasionally.

• Remove the pan from the heat and leave to cool for 30 minutes.

• Meanwhile, preheat the oven to 150°C and line a 20cm round cake tin. Toast the nuts in a dry frying pan, tossing them until evenly browned, or in the oven for 8-10 minutes - keep an eye on them as they burn easily. When they are cool, chop roughly.

• Stir the eggs, nuts and ground almonds into the fruit mixture and mix well. Sift the flour, baking powder and spices into the pan. Stir in gently, until there are no traces of flour left.

• Spoon the mixture into the tin and smooth it down evenly - you will find this is easiest with the back of a metal spoon which has been dipped into boiling water.

• Bake for 45 minutes, then turn down the heat to 140°C and cook for a further 1-1½ hours the top of the cake with foil if it starts to darken too much. To check the cake is done, insert a fine skewer into the centre - if it comes out clean, the cake is cooked.

• Make holes all over the warm cake with a fine skewer and spoon the extra 4 tbsp brandy over the holes until it has all soaked in. Leave the cake to cool in the tin.

• When it's cold, remove it from the tin, peel off the lining paper, then wrap first in baking parchment and then in foil.

• The cake will keep in a cupboard for up to three months or you can freeze it for six months.

- Mary Cadogan, BBC.

ISAZISO SOKUBAMBA IQHAZA KOMPHEKATHI NGOKOMQHUBO WOKUGUNYAZWA NGOKWEZEMVELO

Endaweni yazo-Greytown:

Omyanya Wezoka/Thatha Kwa-Zulu Natal uphokamisa ukuthuthakisa:

- Umqanga wendawo Odadeni
- Umqanga wendawo uMhophani
- Umqanga wendawo uMhlaberima

Isaziso sibanikezelwa emphakathini ngokomthetho weNational Environmental Management Act (NEMA), 1998 (Act No. 107 of 1998), njengoba kwakuchibiyelwa Ukugunyazwa ngokwezemvelo kuzoluneka kulezinkomibeki ephakanyiswe. Kusolwa emphakathi ngokuthinteka kokawo kulesicelo sokugunyazwa ngokwezemvelo.

I-Basic Assessment Report (BAR) kanye ne Environmental Management Programme (EMP) kuzothuyelwa kuyoholelwa ukugunyazwa ngabomyanya ngabazemvelo. Lezinkomibeki zithinta i-activity 12 kanye no19 weGovernment Notice GNR963.

Umhlobo wezemvelo ozimela usazokwazi ukuba enze imsebenzi wokufika kakhulu ukugunyazwa ngokwezemvelo. Abantu ukubamba iqhaza kulafeliso bayaminye ukuba babhalese njengabathakaselayo kanye nabathintekayo. Interested and Affected Party (I&AP). Abathakaselayo bangabaleka kumhlobo wezemvelo ozimela zingakapheli idesuku ezingu-14 kuzukuba kukhishwe lezikhangiso.

Ukuthola ulwazi olungezwe ngokufelwa kwigama lakho othwini iwabathakaselayo kanye nabathintekayo, ungathumelela igama lakho, ikheli nalapho utholakala khona sthumele ku:

Mbali Shabalala / Uvishkaar Sumer
Uvishkaar wezemvelo: Harslab Environmental and Ground Engineering Specialist
P.O. Box 2135, Umtsheni, 4021
Ehlobo: 031 963 1570
E-mail: mbali@harslab.co.za / uvishkaar@harslab.co.za

PLEASE NOTE
DEADLINE
FOR GAZETTE
CLASSIFIEDS
IS MONDAY, 10 am
033 413 2735

Figure 12: Showing proof of Ad published in the Greytown Gazette, dated 23 November 2016.

2.3 Meeting with Ward councillor

A formal meeting was held on the 17th of November 2016. Present at the meeting was the ward councillor (Mr Dlamini) of Ward 11. The meeting served to inform parties regarding the construction of the proposed upgrade of the mud track, inclusive of a causeway & pipe culverts at the existing water crossing points. A formal letter was then presented to the ward councilor outlining the nature of the proposed development. Thereafter the ward councilor signed the formal letter confirming that he was made aware of the proposed development. (Refer to **Appendix E.2** for acknowledgement letter). The elected structures that currently exist were chosen to be the most appropriate means of informing community members of the proposed development.

3. Key stakeholders (other than organs of state) identified in terms of Regulation 41(2)(b) of GN 983:

Table 4: Key Stakeholders

Title, Name and Surname	Affiliation/ key stakeholder status	Contact details (tel number or e-mail address)
Mr Dlamini	Ward Councillor	072 621 7577

3.1 Issues raised by Interested and Affected Parties

Summary of main issues raised by I&APs	Summary of response from EAP
No concerns have been raised by the local community, other than the lack of formal access to all amenities. The ward councillor is in favour of the proposed upgrade. The Induna expressed the urgency for the causeway structure as community members cannot cross the watercourse during periods of high rainfall.	Responses have been included in the Appendix E.1 entitled 'Summary of comments & responses'

4. COMMENTS AND RESPONSE REPORT

REFER TO **APPENDIX E.1** FOR SUMMARY OF COMMENTS

5. AUTHORITY PARTICIPATION

Table 5: Authorities and organs of state identified as key stakeholders:

AUTHORITY/ ORGAN OF STATE	CONTACT PERSON (TITLE, NAME AND SURNAME)	TELEPHONE	E-MAIL	POSTAL ADDRESS
Department of Transport	Ms. S. Ndlela	034 299 8600	sibongile.mhlungu@knztransport.gov.za	Private Bag X2002 Dundee 3000
AMAFA	Ms B. Pawandiwa	033 394 6543	bernadep@amafapmb.co.za	P.O. Box 2685 PMB 3201
KZN Wildlife	Mr D Wieners	033 845 1999	Dominic.Wieners@kznwildlife.com	P.O. Box 13053 3202
Department of Water & Sanitation	Mr S. Govender	031 336 2759	GovenderS2@dwa.gov.za	88 Field Street Durban 4001
Department of Economic Development, Tourism & Environmental Affairs (DEDTEA)	Mr G. Willis-Smith	034 299 9679	gerald.willis-smith@kznedtea.gov.za	P.O Box 125, Dundee 3000

SECTION D: IMPACT ASSESSMENT

Impact assessment must consider of the interactions between all aspects and associated activities of the development nature, scale and duration of effects on the environment, whether such effects are positive (beneficial) or negative (detrimental). **The impact identified and assessed below are impact that are associated with the proposed road upgrade, construction and operational phases of the proposed development**

All mitigation measures have been outlined in specific detail in the EMPr (**Appendix F**); therefore, this section must be read in conjunction with the EMPr. The impacts that have been outlined below relate to the construction of a causeway and all relevant structures.

Risk Assessment

Risk Assessment Methodology

The following presents the assessment criteria used to evaluate the impacts resulting from the proposed development.

IMPACT ASSESSMENT METHODOLOGY

The assessment criteria outlined below identifies the environmental impacts associated with the proposed development. The environmental impacts identified will be quantified, and the significance of each impact will be assessed using the scoring matrix methodology

The impacts that may result from the construction phase and operation phase of the project was assessed according to a number of criteria to arrive at an overall significance rating. The criteria used were as follows:

Ranking Scales for Environmental Risk Assessment

Probability Rating (P)

Rating	Probability
5	Definite
4	High Probability
3	Medium Probability
2	Low Probability
1	Improbable
0	None

Duration Rating (D)

Rating	Duration
5	Permanent
4	Long term (ceases with operational life)
3	Medium Term (5-15 years)
2	Short-term (0-5 years)
1	Immediate

Scale Rating (S)

Rating	Scale
5	International
4	National
3	Regional
2	Local
1	Site
0	None

Magnitude Rating (M)

Rating	Magnitude
10	Very High
8	High
6	Moderate
4	Low
2	Minor

After each impact is rated according to the ranking scales above, the **environmental significance** of each impact could be assessed by applying the following formula:

$$\text{SP} = (\text{MAGNITUDE (M)} + \text{DURATION (D)} + \text{SCALE(S)} \times \text{PROBABILITY (P)})$$

Where SP is defined as significance points. The maximum value of significance points (SP) is 100. Environmental effects could therefore be rated as either high (H), moderate (M), or low (L) significance is based on the following:

Rating	SP
>60 Points	High Environmental Significance (HES)
30-60 Points	Moderate Environmental Significance (MES)
<30 Points	Low Environmental Significance (LES)

PLANNING / DESIGN PHASE:

The Engineer must take the following into consideration:

- ▶ All method statements must be submitted to the Engineer for approval.
- ▶ Engineering designs must include all temporary access roads to be created during construction.
- ▶ A site layout plan must include the location of the campsite, the siting of the campsite must be approved by the Engineer/ECO prior to construction.
- ▶ All identified buffers must be taken into consideration when designing the final route.
- ▶ No-go areas must be demarcated by the ECO prior to construction.
- ▶ The construction EMPr must be brought to the attention of the contractor.

IMPACTS ASSOCIATED WITH THE CONSTRUCTION PHASE

BIOPHYSICAL IMPACTS

- Impacts associated with the watercourse
 - Soil erosion and sedimentation of watercourse
 - Pollution of water resources and soil
 - Increase surface run-off and altered flow regime in the watercourse
- Removal of vegetation
 - Encroachment of alien invasive and loss of vegetation
- Impacts associated with faunal life
 - Disruption of access to grazing areas
- Handling of Waste & Hazardous Substances
 - Spillage of hazardous substance
 - Improper storage and disposal of waste
 - Ablution facilities
- Noise pollution
- Excavation and earthworks
 - Dust and smoke emission

SOCIAL IMPACTS:

- Disruption of the social dynamics within the local community
- Impact on health and social well-being

Proposed upgrade of Ntabenzima mud track in Greytown, within the Umvoti District Municipality.

Impacts/Significance associated with the Construction Phase

Potential Impact	Direct, indirect, or cumulative	Significance Rating					
		Scale	Duration	Probability	Magnitude	Significance Points (SP)	
Impacts associated with the watercourse							
Soil Erosion and sedimentation of watercourse Activity: -Excavation and vegetation clearing -Stockpiling of materials -Surface run-off from construction areas. Potential impacts: Erosion is likely to occur because of inappropriate stockpiling methods.	Direct impact						
		Before Mitigation	Local	Immediate	Definite	High	MES
			2	1	5	8	55
		After Mitigation	Local	Immediate	Medium	Low	LES
		2	1	3	4	21	

Mitigation Measures:

- Once an area has been cleared of vegetation, the top layer (nominally 150mm) of soil should be removed and stockpiled in a designated area.
- Effective rehabilitation of disturbed areas as well as the implementation of erosion control measures is imperative to mitigate the above risks.
- Stockpiles must not surpass 2 meters in height unless otherwise permitted by the engineer.
- Vegetation clearing must not be undertaken more than 10 days in advance of construction. The disturbed area must be rehabilitated within 2 weeks of project finalization.
- Topsoil should only be exposed for minimal periods of time and adequately stockpiled to prevent the topsoil loss and run-off.
- Litter traps will be provided strategic locations
- Protection of stormwater during construction to prevent sediment laden stormwater being discharged into the watercourses.
- Routing stormwater to areas where it can settle out, prior to being discharged
- Stockpiles must be covered if exposed to intense weather conditions such as wind and rain, and must not be allowed on or near steep slopes.
- The banks of the water crossing point will be affected with the construction of the causeway structure. This must be re-profiled as per the original soil horizon structure and re-vegetated with indigenous grasses and trees.
- Install sediment barriers across the entire construction right-of-way immediately upslope of the riparian boundary at the water crossing point to prevent sediment flow into the watercourse.
- Erosion protection measures must be installed at the causeway structure or any stormwater drainage pipes' outlets located along the route. This is in addition to velocity control measures.
- Topsoil must be kept separate from overburden and must not be used for building purposes or maintenance or access roads.
- Stockpiles may further be protected by the construction of berms or low brick walls around their bases.
- Stockpiles must be at least 50m away from a watercourse, to prevent erosion.
- A site-specific EMPr has been compiled to manage construction activities and is attached under **Appendix F.**

Impacts/Significance associated with the Construction Phase

Potential Impact	Direct, indirect, or cumulative	Significance Rating					
		Scale	Duration	Probability	Magnitude	Significance Points (SP)	
Impacts associated with the watercourse							
Pollution of water resources <u>Activity (or source of pollution):</u> – Release of sediment from the construction site. – Mismanagement w.r.t handling/disposing of hazardous chemicals and construction waste. – Pollutants found on road surfaces. <u>Potential impacts:</u> – Sediment release from a construction site into the receiving environment is one of the most common forms of waterborne pollution. – Mismanagement of waste and pollutants including hydrocarbons, construction waste and other hazardous chemicals will result in these substances entering and polluting	Indirect impact	Before Mitigation	Site	Short-term	Definite	High	HES
			1	2	5	8	55
		After Mitigation	Site	Immediate	Medium	Low	MES
			1	1	3	6	24

these sensitive environments either directly through surface runoff during rainfall events, or subsurface water movement.

- Road surfaces are recognised as a source of various pollutants which can originate from a wide variety of sources. The pollutant concentration in road runoff can be highly variable and dependant on a wide variety of factors including location, traffic volumes, extent of dry period before a rainfall event, and nature of the road surface

Mitigation Measures:

- All waste generated during construction is to be disposed of as per an Environmental Management Programme (EMPr) and no washing of containers, wheelbarrows, spades, picks or any other equipment adjacent to or in the watercourse is strictly permitted.
- Proper management and disposal of waste must occur during the lifespan of the project.
- No release of any substance i.e. cement, oil, that could be toxic to fauna or faunal habitats within the watercourse system.
- Portable toilets must be placed outside of the 1:100-year flood line from the watercourse or 30m away from the riparian zone, whichever is the greatest
- Do not locate the construction camp or any depot for any substance which causes or is likely to cause pollution within a distance of 100m of the riparian zone.
- Spillages of fuels, oils and other potentially harmful chemicals must be cleaned up immediately and contaminants properly drained and disposed of using correct solid/hazardous waste facilities (not to be disposed of within the natural environment). Any contaminated soil must be removed and the affected area rehabilitated immediately – consult with a wetland/aquatic specialist if spills occur.
- The design and use of SUDS which includes, but is not limited to, swales, filter strips and infiltration trenches that capture runoff, filter out the pollutants and allow for the diffuse release of water into the receiving environment is paramount to limiting the long term effects of an increase in hardened surfaces adjacent to the wetland areas situated along the route.
- The EMPr must be adhered to.

Impacts/Significance associated with the Construction Phase

Potential Impact	Direct, indirect, or cumulative	Significance Rating
-------------------------	--	----------------------------

<p>Increased surface run-off and reduction of flow regime of the watercourse.</p> <p>Activity:</p> <p>-Construction of road and drainage infrastructure</p> <p>Potential impact:</p> <p>-Modification of flow dynamics of the watercourse.</p>	Direct impact		Scale	Duration	Probability	Magnitude	Significance Points (SP)	
		Before Mitigation	Site	Short-term	High	Very High	MES	
			1	2	4	10	52	
		After Mitigation	Site	Short-term	Low	Moderate	LES	
			1	2	2	6	18	

Mitigations

- Edge hardening must be kept to a minimum. Design options should be investigated to minimise the alteration of the adjacent habitats to concrete environments, whilst taking into consideration the type of structure and materials utilised.
- Rehabilitation must ensure that riparian structure and function are reinstated in such a way as to ensure the ongoing functionality of the larger riparian systems.
- Areas adjacent to the water crossing point which are occupied by indigenous vegetation species must be rehabilitated where hardened areas are evident. This must also include areas within the water crossing point that were cleared during construction.
- All imported or repositioned sediment and materials within the watercourse and along the banks must be removed. Once construction activities conclude all disturbed areas must be rehabilitated to its pre-construction condition, or an improved condition.
- Effective rehabilitation of the development footprint as well as the implementation of erosion control measures is imperative to mitigate the risks.
- These have been addressed in the attached EMPr.

Impacts/Significance associated with the Construction Phase

Potential Impact	Direct, indirect, or cumulative	Significance Rating					
		Scale	Duration	Probability	Magnitude	Significance Points (SP)	
Vegetation Removal							
Spread of Alien invasive species Activity: -The removal of vegetation within the proposed site will have a negative impact on the functionality of the vegetation community associated with the riparian zone system. Potential impacts: -Natural area will be more susceptible to encroachment by invasive alien species and erosion. -Loss of indigenous vegetation through land clearing.	Indirect impact						
		Before Mitigation	Local	Immediate	Definite	High	HES
			2	1	5	8	55
		After Mitigation	Site	Immediate	Medium	Low	MES
	1	1	3	4	18		

Mitigation Measures:

- An alien invasive management programme must be incorporated into an Environmental Management Programme.
- The Contractor should be responsible for implementing a programme of weed control (particularly in areas where the soil has been disturbed); and grassing any remaining stockpiles to prevent weed invasion
- Ongoing alien plant control must be undertaken after the construction phase and during the operational phase and particularly in the disturbed areas. Areas which have been disturbed will be quickly colonised by invasive alien species. An ongoing management plan must be implemented for the clearing/eradication of alien species.
- Disturbance to natural vegetation should be minimized as far as possible to limit opportunities for alien invasive plant species to become established
- Footprint areas should be kept as small as possible when removing alien plant species; and no vehicles should be allowed to drive through designated sensitive drainage line and riparian areas during the eradication of alien species.
- All indigenous vegetation must be marked and avoided as far as practically possible.
- Only trees that have NOT been marked beforehand are to be removed.
- Gathering of firewood, fruit, muthi-plants, crops or any other natural material on site or in areas adjacent to the site is prohibited.
- Immediate re-vegetation of stripped areas and removal of aliens by weeding must take place. This significantly reduces the amount of time and money that must be spent on invasive alien plant management during rehabilitation
- Construction staff and vehicles must stick to the road reserve.
- Monitor all sites disturbed by construction activities for colonization by exotics or invasive plants and control these as they emerge. This requirement is in fulfilment of the terms of the National Environmental Management: Biodiversity Act (Act 10 of 2004). Areas which have been disturbed will be quickly colonized by invasive alien plant species.
- Post-construction rehabilitation is essential to mitigate the negative impacts of construction activities and must be implemented as soon as possible.
- A site-specific EMPr has been compiled to manage construction activities and is attached under

Appendix F.

Impacts/Significance associated with the Construction Phase

Potential Impact	Direct, indirect, or cumulative	Significance Rating					
		Scale	Duration	Probability	Magnitude	Significance Points (SP)	
Impacts associated with Faunal life							
Disruption of access to grazing areas and animal safety Activity: -Road upgrade and construction of structures Potential impacts: - Fauna will not be able to gain access to grazing areas that they frequently use. - Removal of indigenous vegetation during the construction phase could result in a disruption of eating patterns, as their food source may be removed for construction purposes.	Direct impact						
		Before Mitigation	Local	Short-term	High	Moderate	MES
			2	2	4	6	40
		After Mitigation	Local	Short-term	Low	Low	LES
		2	2	2	4	16	

Mitigation Measures:

- Workers must be given training on the possible fauna that may be encountered in the area.
- 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.
- The hunting of birds and animals on site and in surrounding areas is strictly prohibited and workers must be instructed that hunting, poaching and fishing is a direct noncompliance of the authorized activity.
- Under no circumstances shall any fauna be handled, removed, killed or interfered with. 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.
- 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). The latter species may require the services of a specialist to catch and relocate dangerous/venomous species.
- Guidelines will be set out by the ECO during the construction phase, which must to be adhered to, to ensure that no possible impacts occur.
- The ECO will monitor such activities for non-compliance.

Impacts/Significance associated with the Construction Phase

Potential Impact	Direct, indirect, or cumulative	Significance Rating					
		Scale	Duration	Probability	Magnitude	Significance Points (SP)	
Impacts associated with hazardous substances and waste handling							
Spillages of hazardous substance Activity: -Excavation, cement pouring, storage of hazardous substances during road upgrade and structure construction Potential impacts: -Construction vehicles may leak oil that may contaminate soil. -Fuels and other chemicals stored on-site will negatively impact groundwater as a result of spillages. Substances entering and polluting sensitive natural environments either directly through surface runoff during rainfall events, or subsurface water movement.	Direct impact	Before Mitigation	Local	Immediate	High	High	MES
			2	1	4	8	44
		After Mitigation	Local	Immediate	Low	Moderate	LES
	2	1	2	6	18		

Mitigation Measures:

- Every effort should be made to ensure that any chemicals or hazardous substances do not contaminate the soil or ground water on site
- All waste generated during construction is to be disposed accordingly and washing of containers, wheelbarrows, spades, picks or any other equipment adjacent to or in the watercourse is strictly prohibited.
- Temporary bunds must be constructed around chemical or fuel storage area that is outside 1:100 floodline of the drainage line. the contractor uses a pre-mix cement to prevent potential spills on bare ground.
- Plastic sheeting should be placed on bare ground when pouring the pre-mix cement.
- No release of any substance i.e. cement, oil, that could be toxic to fauna or faunal habitats within the watercourse systems.
- Do not locate the construction camp or any depot for any substance which causes or is likely to cause pollution within 100m of the riparian zone.
- The bulk diesel bunkers must be stored at least 100m away from any watercourse and must be stored in a roof, bunded area.
- The bunded area should be constructed of a material resistant to/not affected by the chemical stored in the banded. Alternatively, it must be lined with a corrosive resistant material.
- It is the duty of the contractor to ensure the prevention of spillages of chemicals or hazardous substances on-site, to inhibit the contamination of the soil or ground water on present within the proposed project area.
- Cement must be mixed off-site and construction vehicles must be kept at a distance from the watercourse area.
- Spillages of fuels, oils and other potentially harmful chemicals must be cleaned up immediately and contaminants properly drained and disposed of using correct solid/hazardous waste facilities (not to be disposed of within the natural environment). Any contaminated soil must be removed and the affected area rehabilitated immediately – consult with a wetland/aquatic specialist if spills occur.
- Spills in bunded areas must be cleaned up, removed and disposed of safely from the bunded area as soon after detection as possible to minimize pollution risk.
- Any contaminated soil must be removed and the affected area rehabilitated immediately
- A site-specific EMPr has been compiled to manage construction activities.

Impacts/Significance associated with the Construction Phase

Potential Impact	Direct, indirect, or cumulative	Significance Rating					
			Scale	Duration	Probability	Magnitude	Significance Points (S)
Impacts associated with hazardous substances and waste handling							
Improper storage and disposal of solid waste. Activity: Storage and disposal of construction waste. Potential impact: Contamination of the surface and site with general or construction waste. General waste produced on site includes: Office waste; Operational waste and General domestic waste.	Direct impact	Before Mitigation	Site	Short term	High	High	MES
			1	2	4	8	44
		After Mitigation	Site	Short term	Low	Moderate	LES
	1	2	2	6	18		

Mitigation Measures:

- Implement a general construction waste management program. Ensure that the Environmental Management Plan (EMP) is adhered to always during construction.
- Storage of materials must not pose a risk to the surrounding environment and this includes surface and ground water.
- Refuse must be placed in the designated skips / bins which must be regularly emptied. These should remain within demarcated areas and should be designed to prevent refuse from being blown out by wind.
- In addition to the waste facilities within the construction camp, provision must be made for waste receptacles to be placed at intervals along the work front.
- Littering on site is forbidden and the site shall be cleared of litter at the end of each working day.
- Recycling of materials such as glass, paper and plastic is to be encouraged by providing separate receptacles.
- All waste must be removed from the site and transported to a landfill site.
- Waybills proving disposal at each site shall be provided for the Engineer's inspection.
- The contractor must keep the landfill certificates or receipts on site which is to be produced to the Competent Authority upon request
- Regular inspections and tidying will be done on site before workers are dismissed for the day so that the site will be tidy always.
- Construction rubble shall be temporarily stored of in pre-agreed, demarcated spoil dumps that have been approved by the Engineer for temporary storage, thereafter all rubble must be transported to a registered landfill site.
- The contractor will collect a certificate for disposable from the landfill site for record purposes.
- The ECO will ensure that such is adhered to during audits

Impacts/Significance associated with the Construction Phase

Potential Impact	Direct, indirect, or cumulative	Significance Rating					
		Scale	Duration	Probability	Magnitude	Significance Points (SP)	
Impacts associated with hazardous substance and waste handling							
Ablution facilities Activity -The use of chemical ablution on site Potential impact -Lack of appropriate sanitation facilities and improper disposal of toilet waste from chemical toilets resulting in the contamination of the surrounding environment and the watercourse.	Direct impact	Before Mitigation	Site	Short term	High	Moderate	MES
			1	2	4	6	36
		After Mitigation	Site	Short-term	Low	Minor	LES
	1	2	2	2	10		

Mitigation Measures:

- Adequate chemical toilets must be provided for all workers as standard construction practice. The acceptable ratio is 1 chemical toilet per 20 workers.
- The chemical toilets must be provided by a registered company and all effluent must be regularly disposed of at a licensed facility. Service certificates must be kept on record.
- Portable toilets must be placed outside of the 1:100-year flood line from streams or 30m away from the riparian zone, whichever is the greatest.
- Waste from chemical toilets should be disposed of every two weeks and in a responsible manner by a registered waste contractor and proof of service must be kept in the environmental file.
- Care must be taken to avoid contamination of soils and water, pollution and nuisance to adjoining areas.
- A site-specific EMPr has been compiled to manage construction activities and is attached under **Appendix F.**

Impacts/Significance associated with the Construction Phase

Potential Impact	Direct, indirect, or cumulative	Significance Rating					
		Scale	Duration	Probability	Magnitude	Significance Points (SP)	
Noise pollution							
Activity: Use of construction equipment	Direct impact	Before Mitigation	Local	Short term	Definite	Moderate	MES
Potential impact:			2	2	5	6	50
Noise disturbance:							
Residents near the proposed development site will be subjected to increased noise nuisance (noise and vibration caused by construction machinery and equipment) during the construction phase of the project.		After Mitigation	Local	Short term	Medium	Minor	MES
			2	2	3	2	18

Mitigation Measures:

- Construction machinery such as jackhammers, construction vehicles such as sand and water trucks loaded with stone and water tanks will create noise. Such noise will be generated in a discontinuous manner during the day only while the causeway construction is underway.
- Noise will only be generated during the construction phase (from operating machinery, generators etc.) and will only occur during the designated working hours (7:30 to 17:00) week days and closed during weekends, and must comply with the provisions of SABS 0400-1990 with respect to working hours.
- The level of the noise generated will be low and below 70 decibels threshold limit.
- Construction vehicles and machinery should be fitted with the appropriate noise muffling devices and must be appropriately maintained.
- No noise will be generated during the operational phase; therefore, the impact is short-term and can be minimised with affective monitoring and installing silencing equipment on all plant hire/machinery.
- A site-specific EMPr has been compiled to manage construction activities and is attached under **Appendix F.**

Impacts/Significance associated with the Construction Phase

Potential Impact	Direct, indirect, or cumulative	Significance Rating					
			Scale	Duration	Probability	Magnitude	Significance Points (SP)
Impacts associated with excavation and earthworks							
Dust and smoke emission Activity: -Dust emission from construction vehicles, construction equipment and excavation Potential impact: -Dust generated as a result of construction activities and construction vehicles. -Vehicle fumes from unmaintained vehicles	Direct impact	Before Mitigation	Local	Short term	Definite	Moderate	MES
			2	2	5	6	50
		After Mitigation	Local	Immediate	Medium	Low	LES
		2	1	3	4	21	

Mitigation Measures:

- The use of a water truck must be used to wet exposed road surfaces or stockpiled areas.
- The construction vehicles must adhere to a speed limit of 30km/hr to avoid excessive dust emission.
- The application of best management practices for dust suppression will also aid in reducing air pollution. During construction period areas that have been stripped of vegetation must be dampened periodically within each day, depending on the need to avoid excessive dust
- Access and other cleared surfaces must be dampened whenever possible and especially in dry and windy/conditions to avoid excessive dust.
- Loads could be covered to avoid loss of material in transport, especially if material is transported off site.
- The dust levels must be kept below the required SANS standard to ensure minimal impact to the surrounding community and the environment.
- Suspend excavation during periods of high winds
- Vehicles are to be kept in good condition to minimise vehicular fumes.
- Should excessive emissions be observed, the Contractor must remove the vehicle from the site.
- Emissions into the air can be minimised by ensuring regular maintenance of construction vehicles and equipment in order to reduce emission of exhaust fumes.
- A site-specific EMPr has been compiled to manage construction activities and is attached under **Appendix F.**

Social and Economic impacts

Potential Impact		Direct, indirect, or cumulative	Significance Rating				
Disruption of the social dynamics within the local community			Scale	Duration	Probability	Magnitude	Significance Points (SP)
<p>Activity:</p> <ul style="list-style-type: none"> Temporary workers living temporarily within the local community during the construction phase. <p>Nature of the potential impact:</p> <p>-There is a likelihood of job seekers moving into the study area. The potential in-migration of workers is likely to result in other cumulative impacts, such as conflict with existing community members, social inconveniences and/or problems and pressures on existing infrastructure.</p>	Direct impact	Before Mitigation	Local	Short term	High	Moderate	MES
			2	2	4	6	40
		After Mitigation	Local	Short term	Medium	Minor	MES
	2	2	3	2	18		

Mitigation Measures:

- Should these impacts take place, it is only anticipated to most likely occur during the construction phase of the project. It is therefore advised that construction workers who are already housed within the Social Impact Zone of the proposed site, be employed as opposed to establishing temporary housing for workers.
- It is not advised that temporary workers assimilate with the local communities and suitable accommodation in larger centres should be considered.
- In order to mitigate most of these impacts the contractor should consider the establishment of a Community Monitoring Forum (CMF) in order to monitor the construction phase and the implementation of the recommended mitigation measures.
- The CMF should be established before the construction phase commences, and should include key stakeholders, including representatives from local communities, local councillors, affected landowners and the contractor(s).
- The CMF should also be briefed on the potential risks to the local community associated with construction workers.
- A site-specific EMPr has been compiled to manage construction activities and is attached under **Appendix F.**

Social and Economic Impacts

Potential Impact	Direct, indirect, or cumulative	Significance Rating					
		Scale	Duration	Probability	Magnitude	Significance Points (SP)	
Health and social well-being							
<u>Activity:</u> – Upgrade of Ntabenzima Road. <u>Potential impact:</u> Impact on health and social well-being of the community	Direct impact	Before Mitigation	Local	Immediate	Definite	Moderate	MES
			2	1	4	6	36
		After Mitigation	Local	Immediate	Medium	Low	LES
			2	1	2	4	14

Mitigation Measures:

- Construction related public health impacts due to possible air/dust pollution, noise pollution, light pollution and vibration should also be considered. The contractor should strive to abide by the abovementioned Act, in addition to international best practice guidelines
- Furthermore, it is advised that the contractor ensure that everyone working at the construction site is competent at the work they do. They must be properly trained and have the experience and knowledge to work in a safe and responsible manner.
- Areas of the project where there are health or safety hazards need to be marked and treated as danger areas. All people, other than those who have been specifically authorized to enter, must be excluded from such areas, for example by erecting warning signs and barriers. The barriers should clearly identify the boundary of the danger area and make entry impossible without a conscious effort
- A site-specific EMPr has been compiled to manage construction activities and is attached under **Appendix F.**

Impacts/Significance associated with the Construction Phase

Potential Impact	Direct, indirect, or cumulative	Significance Rating						
			Scale	Duration	Probability	Magnitude	Significance Points (SP)	
NO-GO ALTERNATIVE								
<p>If the project does not go ahead as planned this will result in on-going safety risks for pedestrians that use the water crossing point (watercourse) during periods of high rainfall and flooding.</p> <p>Cannot be mitigated. Community members will be forced to cross the watercourse during times of high water levels and floods at risk to their health and safety. Incidents of drowning and injury could potentially occur.</p>	Direct impact							
		Before Mitigation	N/A	N/A	N/A	N/A	N/A	
			N/A	N/A	N/A	N/A	N/A	
		After Mitigation	N/A	N/A	N/A	N/A	N/A	
			N/A	N/A	N/A	N/A	N/A	

IMPACTS ASSOCIATED WITH THE OPERATIONAL PHASE

BIOPHYSICAL IMPACTS:

- Soil erosion
- Surface run-off
- Encroachment of alien invasive species

Proposed upgrade of Ntabenzima mud track in Greytown, within the Umvoti District Municipality.

Impacts/Significance associated with the Operational Phase

Potential Impact	Direct, indirect, or cumulative	Significance Rating					
		Scale	Duration	Probability	Magnitude	Significance Points (SP)	
SOIL EROSION							
Activity:	Indirect impact						
-Road Upgrade		Before Mitigation	Site	Permanent	Definite	Moderate	MES
Potential impacts:			1	5	5	6	60
-The risk and potential impact of soil erosion during the operational phase because of inadequately maintained structures and ineffective stormwater control techniques along the new causeway site.							
-Dilapidation of the causeway structure as well as erosion protection measures will lead to erosion within the receiving environment in the long term.		After Mitigation	Site	Permanent	Medium	Low	MES
			1	5	3	4	30

Mitigation Measures:

- To minimise soil erosion as an existing serious impact, careful consideration is required during the design stage to ensure that water directing techniques are correctly implemented within the construction site. These techniques must be designed and specified in a manner that will effectively mitigate the effects of stormwater runoff.
- Effective rehabilitation of the development footprint as well as the implementation of erosion control measures is imperative to mitigate the above risks.
- The proposed causeway structure and stormwater pipelines designs must be preferably wider than the width of the watercourse.
- On-going maintenance must be implemented by the Applicant.

Mitigation Measures:

- Proper management and disposal of waste must occur during the lifespan of the project, including during the operational phase.
- The duration of exposed soil must be kept to a minimum and rehabilitation must be initiated as soon as decommissioning is completed.
- The contractor must stabilize cleared areas to prevent and control erosion and/or sedimentation.
- Any vegetation that requires removal during the decommissioning phase must be done so in a phased manner that does not damage other vegetation unnecessarily
- The applicant must ensure regular maintenance of all drainage systems within the causeway site as they help in improving site drainage, and reduce pollutants entering surface waters and groundwater.
- Grass filter stripes can also be used as they function by slowing runoff velocities, trapping sediment and other pollutants and providing a modest infiltration
- If the runoff during or after construction will cause erosion in a channel, the channel must be lined or flow control methods must be installed. The first choice of lining is grass as this will reduce runoff velocities and provide water quality benefits through filtration and infiltration. Should the velocity in the channel erode the grass, turf reinforcement mats, riprap, gabions, or Reno-mattresses must be used.
- Watercourse crossings must be regularly checked to ensure they are not being degraded or causing degradation and that, openings (under or at a culvert opening) are kept clear to avoid impeding flows to downstream areas. This minimizes erosion.

Impacts/Significance associated with the Operational Phase

Potential Impact	Direct, indirect, or cumulative	Significance Rating					
			Scale	Duration	Probability	Magnitude	Significance Points (SP)
Encroachment of alien invasive species							
Activity: Road upgrade	Direct Impact	Before Mitigation	Local	Permanent	High	Moderate	MES
Potential impact: invasive plants are easy to encroach in disturbed riparian areas and spread easily due to the consequent erosion			2	5	4	6	52
		After Mitigation	Site	Permanent	Low	Low	LES
			1	5	2	4	20

Mitigation Measures:

- An alien invasive management programme must be incorporated into the Environmental Management Programme. This has been adequately addressed in the attached EMPr.
- Ongoing alien plant control must be undertaken along the route and particularly in the disturbed wetland areas. Areas which have been disturbed will be quickly colonized by invasive alien species.
- An ongoing management plan must be implemented for the clearing/eradication of alien species

Impacts/Significance associated with the Operational Phase

Potential Impact	Direct, indirect, or cumulative	Proposed Mitigation	Significance Rating					
			Scale	Duration	Probability	Magnitude	Significance Points (SP)	
4. NO-GO ALTERNATIVE								
4.1 If the project does not go ahead this will result in continued safety risks for pedestrians crossing the watercourse during periods of heavy rainfall and flooding.	Direct impact	N/A						
			Before Mitigation	-	-	-	-	-
				-	-	-	-	-
			After Mitigation	-	-	-	-	-
				-	-	-	-	-

Table 6: Summary of the impacts: Construction Phase of the proposed development (preferred alternative).

CONSTRUCTION PHASE			
	POTENTIAL IMPACT	SIGNIFICANCE POINTS BEFORE MITIGATION	SIGNIFICANCE POINTS AFTER MITIGATION
1	SOIL EROSION AND SEDIMENTATION OF WATERCOURSE	55	21
2	POLLUTION OF WATER RESOURCES	55	24
3	INCREASE SURFACE RUN-OFF AND REDUCTION OF FLOW REGIME	52	18
4	SPREAD OF ALIEN INVASIVE SPECIES	55	18
5	ACCESS TO GRAZING AREAS	40	16
6	SPILLAGE OF HAZARDOUS SUBSTANCES	44	18
7	IMPROPER STORAGE AND DISPOSAL OF WASTE	44	18
8	ABLUTION FACILITIES	36	10
9	NOISE POLLUTION	50	18
10	DUST AND SMOKE EMISSION	50	21
11	DISRUPTION TO COMMUNITY SOCIAL DYNAMICS	40	18
12	HEALTH AND SOCIAL WELL-BEING	36	14
	AVERAGE	46(MES)	15(LES)

Table 7: Summary of the impacts: Operational Phase of the proposed development (preferred alternative).

OPERATIONAL PHASE			
	POTENTIAL IMPACT	SIGNIFICANCE POINTS BEFORE MITIGATION	SIGNIFICANCE POINTS AFTER MITIGATION
1	WATERCOURSE DEGRADATION	60	30
2	ENCROACHMENT OF ALIEN INVASIVE SPECIES	52	18
3	SURFACE RUN-OFF	52	20
	AVERAGE	55 (MES)	23 (LES)

IMPACT ASSESSMENT SUMMARY

Preferred Alternative

The proposed causeway has been carefully planned to accommodate for the needs and requirements of the community while being mindful of imposing the least negative environmental impact. The preferred site alternative occurs within the existing water crossing point. Vegetation clearance will be restricted to alien invasive vegetation; no indigenous vegetation will be removed as the upgrade follows the existing track indicating disturbance. The proposed causeway does not transverse any homesteads. Additionally, the proposed development will serve as rehabilitation to the environment. According to the risk rating after all significant impacts were taken into consideration, the preferred alternative is said to have a **low environmental significance** after all impacts were rated individually with and without mitigation. It was found that most of the impacts listed and rated have a low environmental significance with the mitigations being implemented. Mitigation measures are feasible and are readily instituted as part of a standing design, construction or operating procedure.

Alternative 2:

No alternative site has been identified. Alternative alignments would require additional disturbance to the environment with very little potential of improvement in terms of environmental performance. The proposed causeway will be constructed on the existing track which has already been upgraded, furthermore DOT has assessed other options and none were as cost effective.

SECTION E

Recommendations of the EAP

- The EMPr must be strictly adhered to and implemented during the construction and operational phases.
- An ECO should be appointed by the applicant to undertake Environmental audits and submit **monthly audit reports** to the Competent Authority.
- It is imperative that surface runoff from the proposed activities is adequately managed by the contractor. The development of sound storm water management practices must be adhered to on-site as to eliminate any potential run-off into the watercourses.
- All buffer zones/no-go areas identified in the report must be strictly adhered to.
- Based on the status quo above & given the indigent nature of the communities affected it is the EAP's recommendation that the preferred route and preferred technology are the best feasible options.
- To effectively inhibit the damage caused by soil erosion, the volume and velocity of water entering the watercourses from the larger catchment needs to be effectively managed.
- Operations exposing archaeological and historical residues should cease immediately pending an evaluation by the heritage authorities, if any are to be encountered.

Declaration by the EAP

Refer to attached EAP Declaration – Appendix G.1

MBALI SHABALALA (JUNIOR EAP)

DATE

SHELDON SINGH
(ENVIRONMENTAL SPECIALIST)

DATE

APPENDIX A.1

SITE LAYOUT

APPENDIX A.2

LOCALITY MAP

APPENDIX B

SITE PHOTOS

APPENDIX C

FACILITY ILLUSTRATION

- **C.1- PLAN OF PORTAL CAUSEWAY**
- **C.2- PLAN OF CONCRETE PIPE CULVERT HEADWALLS**
- **C.3 - PLAN OF STONE PITCHED PIPE CULVERT HEADWALLS**

C.1- PLAN OF PORTAL CAUSEWAY

C.2- PLAN OF CONCRETE PIPE CULVERT HEADWALLS

C.3 - PLAN OF STONE PITCHED PIPE CULVERT HEADWALLS

APPENDIX D

SPECIALIST REPORTS

No specialist studies were undertaken.

APPENDIX E

PUBLIC PARTICIPATION

- **E.1 – SUMMARY OF COMMENTS/RESPONSES FROM I&APS**
- **E.2 – PROOF OF RECIEPTS**
- **E.3 – PROOF OF SITE NOTICES**
- **E.4 – COPY OF NEWSPAPER AD**
- **E.5 – COMMENTS FROM AMAFA**
- **E.6 – COMMENTS FROM KZN WILDLIFE**
- **E.7 – COMMENTS FROM WATER & SANITATION**
- **E.8 – COMMENTS FROM EDTEA**

E.1 – SUMMARY OF COMMENTS/RESPONSES FROM I&AP'S

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E.5- COMMENTS FROM AMAFA

E.6 – COMMENTS FROM KZN WILDLIFE

E.7 – COMMENTS FROM DEPARTMENT OF WATER & SANITATION

**E.8- COMMENTS FROM DEPARTMENT OF ECONOMIC DEVELOPMENT, TOURISM
& ENVIRONMENTAL AFFAIRS**

APPENDIX F

ENVIRONMENTAL MANAGEMENT

PROGRAMME (EMPR)

APPENDIX G

OTHER INFORMATION

G.1-EAP DECLARATION OF INTEREST

G.2 – EAP CV'S

G.1-EAP DECLARATION OF INTEREST

G.2 – EAP CV'S