edtea
Department :
Economic Development, Tourism and Environmental Affairs
PROVINCE OF KWAZULU-NATAL

	(For official use only)
EIA File Reference Number:	DC/
NEAS Reference Number:	KZN/EIA/
Waste Management Licence Number: (if applicable)	
Date Received:	

BASIC ASSESSMENT REPORT

Submitted in terms of the Environmental Impact Assessment Regulations, 2010 promulgated in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998)

This template may be used for the following applications:

- Environmental Authorization subject to basic assessment for an activity that is listed in Listing Notices 1or 3, 2010 (Government Notices No. R 544 or No. R 546 dated 18 June 2010); or
- Waste Management Licence for an activity that is listed in terms of section 20(b) of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) for which a basic assessment process as stipulated in the EIA Regulations must be conducted as part of the application (refer to the schedule of waste management activities in Category A of Government Notice No. 718 dated 03 July 2009).

Kindly note that:

1. This basic assessment report meets the requirements of the EIA Regulations, 2010 and is meant to streamline applications. This report is the format prescribed by the KZN Department of Economic Development, Tourism & Environmental Affairs. Please make sure that this is the latest version.
2. The report must be typed within the spaces provided in the form. The size of the spaces provided is not indicative of the amount of information to be provided. The report is in the form of a table that can extend itself as each space is filled with text.
3. Where required, place a cross in the box you select.
4. An incomplete report will be returned to the applicant for revision.
5. The use of "not applicable" in the report must be done with circumspection because if it is used in respect of material information that is required by the competent authority for assessing the application, it will result in the rejection of the application as provided for in the regulations.
6. No faxed or e-mailed reports will be accepted.
7. The report must be compiled by an independent environmental assessment practitioner ("EAP").
8. Unless protected by law, all information in the report will become public information on receipt by the competent authority. Any interested and affected party should be provided with the information contained in this report on request, during any stage of the application process.
9. The KZN Department of Economic Development, Tourism & Environmental Affairs may require that for specified types of activities in defined situations only parts of this report need to be completed.
10. The EAP must submit this basic assessment report for comment to all relevant State departments that administer a law relating to a matter affecting the environment. This provision is in accordance with Section 24 O (2) of the National Environmental Management Act 1998 (Act 107 of 1998) and such comments must be submitted within 40 days of such a request.
11. Please note that this report must be handed in or posted to the District Office of the KZN Department of Economic Development, Tourism & Environmental Affairs to which the application has been allocated (please refer to the details provided in the letter of acknowledgement for this application).

DEPARTMENTAL REFERENCE NUMBER(S)

File reference number (EIA):	DC29/0031/2014
File reference number (Waste Management Licence):	

SECTION A: DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER AND SPECIALISTS

1. NAME AND CONTACT DETAILS OF ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)

Name and contact details of the EAP who prepared this report:

Business name of EAP:	Kerry Seppings Environmental Management Specialists cc (KSEMS)		
Physical address:	4 Woodville Lane, Off Hawkstone Avenue, Summerveld, Assagay		
Postal address:	P. O. Box 396, Gillitts		
Postal code:	3603	Cell:	079 520 1583
Telephone:	031 769 1578	Fax:	086 535 5281
E-mail:	KSEMS@ksems.co.za		

2. NAMES AND EXPERTISE OF REPRESENTATIVES OF THE EAP

Names and details of the expertise of each representative of the EAP involved in the preparation of this report:

Name of representative of the EAP	Education qualifications	Professional affiliations	Experience at environmental assessments (years)
Kerry Stanton	MSc Cum laude BSc (Hons) MSc	- EAPSA Certified, - Certified Professional Natural Scientist (400167/12), - Certified GCX Carbon Footprint Analyst (Level 1)	18
Colin Holmes	MSc Cum laude BSc (Hons)	- Certified Professional Natural Scientist (400384/14), - SETA Accredited Carbon Footprint Analyst - IAIAsa	2
Patricia Nathaniel	BSc Honours (Environmental Management)	-	3

3. NAMES AND EXPERTISE OF SPECIALISTS

Names and details of the expertise of each specialist that has contributed to this report:

Name of specialist	Education qualifications	Field of expertise	Section/ s contributed to in this basic assessment report	Title of specialist report/ s as attached in Appendix D

Frans Prins	Detailed CV available on request	Cultural and Heritage	Section 6	First phase heritage impact assessment of the proposed Umdloti River Bridge and realignment of Main Road P713, Ndwedwe Local Municipality
Gavin Macdonald	Detailed CV available on request	Vegetation	Section 4	Proposed construction of the uMdloti River Bridge and realignment of Main Road P713: Specialist Botanical Report
Eco-Pulse	Detailed CV available on request	Wetland/Water course Assessment	Section 3	Proposed P713 realignment and bridge upgrade within the eThekwini Municipalities, KZN: Wetland and Riparian Impact Assessment Report

SECTION B: ACTIVITY INFORMATION

1. PROJECT TITLE

Describe the project title as provided on the application form for environmental authorization:

The proposed construction of the Umdloti River Bridge and realignment of Main Road, P713, Ndwedwe Local Municipality

2. PROJECT DESCRIPTION

Provide a detailed description of the project:

The KwaZulu-Natal Department of Transport (KZNDoT) proposes to construct a new bridge to replace the existing low-level structure along Main Road P713 in the Ndwedwe Local Municipality (which forms part of the Ilembe District municipality) and the eThekwini Metropolitan Municipality. The existing structure is a vented causeway comprising of fifteen (15), 600mm diameter concrete stormwater pipes overlaid by a concrete slab. Due to the low-level structure, any appreciable rainfall event causes water to flow over. As a result this causes inconvenience to the many school children, general pedestrians and vehicles who use the bridge as a link to many services on the other side of the Umdloti River.

Figure 1: Umdloti River flowing over the existing low-level causeway during a rainfall event

The new bridge structure will be approximately 100 metres in length, 12.5 metres wide and approximately 25 metres away (in a Westerly Direction) from the existing low-level structure along Main Road P713. The 100m length of the bridge will be supported by four (4) piers (5x20m openings) and the soffit (underside) of the bridge will be nine (9) metres above the river bed during normal flow conditions (approximately 5m above the surface flow of the river).

The development also entails the realignment of approximately 450 metres of Main Road P713 and the upgrade of the road surface to Asphalt. The road carriageway (2x3.25m lanes) will be separated from the pedestrian sidewalk by a reinforced concrete New Jersey Barrier (NJB), the sidewalk will be accompanied by a polycrete handrail which will ensure safety of pedestrians. The new bridge structure will be constructed adjacent to the existing low-level structure and will only be demolished once the new bridge is complete, this arrangement allows for pedestrians and scholars to have access to the other side of the Umdloti River during the construction phase.

The new bridge structure and road upgrade will substantially increase the level of service and benefits to the nearby communities and will provide all year access to the education and health facilities in the area.

3. ACTIVITY DESCRIPTION

Describe each listed activity in Listing Notice 1 (GNR 544, 18 June2010), Listing Notice 3 (GNR 546, 18June 2010) or Category A of GN 718, 3 July 2009 (Waste Management Activities) which is being applied for as per the project description:

Indicate the number and date of the relevant notice:	Activity No (s) (in terms of the relevant or notice) :	Describe each listed activity as per the project description (and not as per wording of the relevant Government Notice)[1]:
Government Notice No. 544 of 18th June 2010	Activity 11 of Listing Notice 1: The construction of: (i) canals; (ii) channels; (iii) bridges; (iv) dams; (v) weirs; (vi) bulk storm water outlet structures; (vii) marinas; (viii) jetties exceeding 50 square metres in size; (ix) slipways exceeding 50 square metres in size; (x) buildings exceeding 50 square metres in size; or	The new bridge will trigger Activity 11 of Listing Notice 1 as the bridge will be constructed across the Umloti River.

[1] Please note that this description should not be a repetition of the listed activity as contained in the relevant Government Notice, but should be a brief description of activities to be undertaken as per the project description, i.e. describe the components of the desired development

	(xi) infrastructure or structures covering 50 square metres or more where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.	
Government Notice No. 544 of 18th June 2010	Activity 18 of Listing Notice 1: The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock from: (i) a watercourse; (ii) the sea; (iii) the seashore; (iv) the littoral active zone, an estuary or a distance of 100 metres inland of the high-water mark of the sea or an estuary, whichever distance is the greater but excluding where such infilling, depositing, dredging, excavation, removal or moving: (i) is for maintenance purposes undertaken in accordance with a management plan agreed to by the relevant environmental authority; or (ii)Occurs behind the development setback line.	It is possible that there will be potential infilling of more than 5m^3 in the Umdloti River during the construction of the new bridge structure and the road re-alignment (bridge abutments and Stormwater pipes).
Government Notice No. 546 of 18th June 2010	Activity 12 of Listing Notice 3: The clearance of an area of 300 square metres or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation. (a) Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004; (b) Within critical biodiversity areas identified in bioregional plans; (c) Within the littoral active zone or 100 metres inland from high water mark of the sea or an estuary, whichever distance is the greater, excluding where such removal will occur behind the	The re-alignment of Main Road P713 will require the removal of 300 square metres or more of vegetation from the KZN Moist Coast Hinterland Vegetation ('Endangered') and the KZN Southern Mesic Coastal Lowlands Forests ('Critically Endangered'). However, these areas are dominated by alien invasive species and not indigenous vegetation, in addition a vegetation specialist will be commissioned to assess the state of the vegetation on site.

	development setback line on erven in urban areas.	

4. FEASIBLE AND REASONABLE ALTERNATIVES

"alternatives", in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to—

(a) the property on which or location where it is proposed to undertake the activity;
(b) the type of activity to be undertaken;
(c) the design or layout of the activity;
(d) the technology to be used in the activity;
(e) the operational aspects of the activity; and
(f) the option of not implementing the activity.

Describe alternatives that are considered in this report. Alternatives should include a consideration of all possible means by which the purpose and need of the proposed activity could be accomplished in the specific instance taking account of the interest of the applicant in the activity. The no-go alternative must in all cases be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed. The determination of whether site or activity (including different processes etc.) or both is appropriate needs to be informed by the specific circumstances of the activity and its environment. After receipt of this report the competent authority may also request the applicant to assess additional alternatives that could possibly accomplish the purpose and need of the proposed activity if it is clear that realistic alternatives have not been considered to a reasonable extent.

Preferred Alternative (S1): Criteria for Site Selection

The proposed development is the outcome of a feasibility study which investigated the upgrading of the existing low-level vented causeway to provide an improved level of service to the communities in the area surrounding the site. Due to the current design of the existing structure, any appreciable rainfall events causes water to flow over the causeway having enormous implications for those who use the bridge to reach facilities, schools and places of work on the other side of the river. Therefore the proposed development was prioritised by the KZNDoT to ensure that the existing crossing is replaced with a permanent and efficient crossing over the Umdloti River as it is the only crossing in the area and local residents and scholars will have to travel a distance to the next crossing.

Due to the immediate need for a permanent crossing over the Umdloti River and the location of the existing bridge structure, alternate sites for the bridge were not considered.

Preferred Alternative (A1): Design and Specifications

A key factor in determining the design of the new bridge structure was to replace the low-level structure with a simple and convenient but efficient structure which will accommodate for both pedestrians and vehicles alike. The new bridge structure will be approximately 100 metres in length, 12.5 metres wide and approximately 25 metres away (in a Westerly Direction) from the existing low-level structure along Main Road P713. The 100m length of the bridge will be supported by four (4) piers (5x20m openings) and the soffit (underside) of the bridge will be nine (9) metres above the river bed during normal flow conditions (approximately 5m above the surface flow of the river).

These dimensions of the new bridge structure will be adequate to accommodate higher flow conditions (1:50 year floodline) whereby all (excluding catastrophic rain occurrences) would flow under the bridge and not onto the causeway.

During the initial feasibility study conducted, it was identified that with raising the level of the bridge to accommodate the 1:50 year floodline, the approaching Main Road P713 approximately 450 metres in total, 200m on the eThekwini side (left side) and 250m on the Ndwedwe side (right) would require raising and re-alignment and resurfacing to Asphalt (refer to Appendix C for the bridge design and layout and re-alignment of P713).

Alternative S2: Design and Specifications

An alternative to the preferred site would be the construction of the bridge within the existing footprint i.e. Constructing the bridge at its existing location and not re-aligning the Main Road P713. This alternative is not feasible as it would require the existing low-level causeway to be demolished before construction of the new structure resulting in local community members and scholars having no access to either side of the Umdloti River during the time of construction. In addition, the re-alignment of Main Road P713 is required due to safety requirements of the KZNDoT,

No-Go Alternative:

The no go alternative i.e. not constructing the high-level Umdloti River Bridge would result in scholars at the Ogunjini and Thumbela Schools and the local communities continued use of the low-level bridge structure. During periods of high water levels and floods, the community would continue to be at risk while attempting to traverse the river. The local community would continue to have limited access to important road networks continuing the difficulties of accessing jobs, schools, medical facilities and work opportunities on the other side of the Umdloti River.

Sections B 5 – 15 below should be completed for each alternative.

5. ACTIVITY POSITION

Indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The co-ordinates should be in degrees, minutes and seconds. List alternative sites were applicable.

Alternative:	Latitude (S):			Longitude (E):		
Alternative S1[2] (preferred or only site alternative)	0	‘	“	0	‘	“
Alternative S2 (if any)	0	‘	“	0	‘	“
Alternative S3 (if any)	0	‘	“	0	‘	“

In the case of linear activities:

Alternative:	Latitude (S):			Longitude (E):		
Alternative S1 (preferred or only route alternative)						
• Starting point of the road realignment	29^0	35’	21.6”	30^0	58’	47.2”
• Middle point of the bridge	29^0	35’	29”	30^0	58’	54.9”
• End point of the road re-alignment	29^0	35’	34.5”	30^0	58’	48.7”

For route alternatives that are longer than 500m, please provide an addendum with co-ordinates taken every 500m along the route for each alternative alignment.

[2] “Alternative S..” refer to site alternatives.

6. PHYSICAL SIZE OF THE ACTIVITY

Indicate the physical size of the preferred activity/technology as well as alternative activities/technologies (footprints):

Alternative:	Size of the activity:
Alternative A1[3] (preferred activity alternative)	m²
Alternative A2 (if any)	m²
Alternative A3 (if any)	m²

or, for linear activities:

Alternative:	Length of the bridge and road re-alignment:
Alternative A1 (preferred activity alternative)	550m (100m bridge and 450m road re-alignment

Indicate the size of the alternative sites or servitudes (within which the above footprints will occur):

Alternative:	Size of the site/servitude:
Alternative A1 (preferred activity alternative)	6875m²
Alternative A2 (if any)	m²
Alternative A3 (if any)	m²

7. SITE ACCESS

Does ready access to the site exist?	YES	NO
If NO, what is the distance over which a new access road will be built		m

Describe the type of access road planned:

The proposed site is situated along existing Main Road P713.

Include the position of the access road on the site plan and required map, as well as an indication of the road in relation to the site.

8. SITE OR ROUTE PLAN

A detailed site or route plan(s) must be prepared for each alternative site or alternative activity. It must be attached as Appendix A to this report.

The site or route plans must indicate the following:

8.1. the scale of the plan which must be at least a scale of 1:500;
8.2. the property boundaries and numbers/ erf/ farm numbers of all adjoining properties of the site;
8.3. the current land use as well as the land use zoning of each of the properties adjoining the site or sites;
8.4. the exact position of each element of the application as well as any other structures on the site;
8.5. the position of services, including electricity supply cables (indicate above or underground), water supply pipelines, boreholes, street lights, sewage pipelines, storm water infrastructure and telecommunication infrastructure;
8.6. walls and fencing including details of the height and construction material;

[3] "Alternative A.." refer to activity, process, technology or other alternatives.

8.7. servitudes indicating the purpose of the servitude;
8.8. sensitive environmental elements within 100 metres of the site or sites including (but not limited thereto):
- rivers, streams, drainage lines or wetlands;
- the 1:100 year flood line (where available or where it is required by DWA);
- ridges;
- cultural and historical features;
- areas with indigenous vegetation including protected plant species (even if it is degraded or infested with alien species);

8.9. for gentle slopes the 1 metre contour intervals must be indicated on the plan and whenever the slope of the site exceeds 1:10, the 500mm contours must be indicated on the plan; and
8.10. the positions from where photographs of the site were taken.

9. SITE PHOTOGRAPHS

Colour photographs from the centre of the site must be taken in at least the eight major compass directions with a description of each photograph. Photographs must be attached under Appendix B to this report. It must be supplemented with additional photographs of relevant features on the site, if applicable.

10. FACILITY ILLUSTRATION

A detailed illustration of the facility must be provided at a scale of 1:200 and attached to this report as Appendix C. The illustrations must be to scale and must represent a realistic image of the planned activity/ies.

11. ACTIVITY MOTIVATION

11.1. Socio-economic value of the activity

What is the expected capital value of the activity on completion?	R35 000 000	
What is the expected yearly income that will be generated by or as a result of the activity?	N/A	
Will the activity contribute to service infrastructure?	~~YES~~	NO
Is the activity a public amenity?	~~YES~~	NO
How many new employment opportunities will be created in the development phase of the activity?	5	
What is the expected value of the employment opportunities during the development phase?	R60 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?	0	

11.2. Need and desirability of the activity

Motivate and explain the need and desirability of the activity (including demand for the activity):

The Umdloti River is one of the main river systems flowing into the Durban area, however the river also serves as a barrier between the Ndwedwe and eThekwini municipalities therefore a low-level vented causeway was constructed. As a result, the residents of Ogunjini and neighbouring towns can gain access to the services and facilities on the other side of the Umdloti River.

The Osindisweni Hospital is approximately 1.8kms South of the crossing and for ambulances servicing the area from the Hospital North towards Ndwedwe town centre, it provides the only serviceable crossing to Ndwedwe. Alternative routes to Ndwedwe when the crossing is flooded require major detours along Main Road P100 to the West or Main Road P521 to the East. In addition, Ogunijin and Thumbela Primary Schools

are located nearby and draws some pupils from the area who depend on the bridge on a daily basis. Often general pedestrians, medical vehicles and scholars reach their destinations later than anticipated or not at all.

Therefore the KZNDoT has prioritised the construction of a new high-level bridge structure to replace the existing low-level causeway in an effort to provide a serviceable, permanent, reliable and safe crossing for the residents of the neighbouring communities.

Indicate any benefits that the activity will have for society in general:

The proposed development will have the following benefits for society in general:

- The new bridge structure will provide a permanent, safe link over the Umdloti River.
- Hospitals, schools and places of work can be easily accessed from Ogunjini and neighbouring towns within the Ndwedwe Municipality.
- There will be no flooding of the bridge structure during the rainy season and therefore can be used without the inconvenience of alternative routes.
- The road carriageway will be separated from the pedestrian walkway allowing for both vehicles and pedestrians to use the bridge simultaneously and ensuring the safety of all (especially scholars).
- The development will improve service delivery to the rural communities of the Ndwedwe Municipality.

Indicate any benefits that the activity will have for the local communities where the activity will be located:

As above.

12. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

List all legislation, policies and/or guidelines of any sphere of government that are relevant to the application as contemplated in the EIA regulations, if applicable:

Title of legislation, policy or guideline:	Administering authority:	Date:
National Environmental Management Act	All organs of State.	1998
Environment Conservation Act	DEA / EDTEA	1989
National Water Act	DWA	1998
National Water Resources Strategy	DWA	2004
Occupational Health and Safety Act	DOL	1993
Hazardous Chemical Substance regulations	DOL	1995
Environmental Regulations for Workplaces	Department of Labour	1987
General Administrative Regulations	Department of Labour	2003
Construction Regulations	DOL	2003
eThekwini Municipality by-laws (General By-laws)	eThekwini Municipality	2008
National Environmental Management: Air Quality Act	DEA / EDTEA	2004
National Environmental Management: Waste Act	DEA / EDTEA	2008
National Standards (SANS)	SABS	2003

13. WASTE, EFFLUENT, EMISSION AND NOISE MANAGEMENT

13.1. Solid waste management

Will the activity produce solid construction waste during the construction/initiation phase?	YES (X)	NO
If yes, what estimated quantity will be produced per month?	+ 3m^3	

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

Waste will be temporarily stored on site in designated waste skips / bins and then removed by an appropriate waste contractor to an approved landfill site. This will be managed through the EMPr.

Where will the construction solid waste be disposed of? (provide details of landfill site)

Solid waste will be removed when appropriate levels of waste have accumulated at the on-site waste storage facility within the construction site camp. This waste will be disposed of at the nearest registered landfill. The nearest municipal landfill site is in Iqadi (Buffelsdraai Landfill Site), approximately 4.5km away from the proposed site.

Will the activity produce solid waste during its operational phase?	YES	~~NO~~
If yes, what estimated quantity will be produced per month?	N/A	

How will the solid waste be disposed of? (provide details of landfill site)

Where will the solid waste be disposed if it does not feed into a municipal waste stream (describe)?

If the solid waste (construction or operational phases) will not be disposed of in a registered landfill site or be taken up in a municipal waste stream, then the applicant should consult with the competent authority to determine the further requirements of the application.

Can any part of the solid waste be classified as hazardous in terms of the relevant legislation?	YES	~~NO~~

If yes, contact the KZN Department of Economic Development, Tourism & Environmental Affairs to obtain clarity regarding the process requirements for your application.

Is the activity that is being applied for a solid waste handling or treatment facility?	YES	~~NO~~

If yes, contact the KZN Department of Economic Development, Tourism & Environmental Affairs to obtain clarity regarding the process requirements for your application.

13.2. Liquid effluent

Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system?	YES	~~NO~~
If yes, what estimated quantity will be produced per month?		m^3
Will the activity produce any effluent that will be treated and/or disposed of on site?	Yes	~~NO~~

If yes, contact the KZN Department of Economic Development, Tourism & Environmental Affairs to obtain clarity regarding the process requirements for your application.

Will the activity produce effluent that will be treated and/or disposed of at another facility?	YES	~~NO~~

If yes, provide the particulars of the facility:			
Facility name:			
Contact person:			
Postal address:			
Postal code:			
Telephone:		Cell:	
E-mail:		Fax:	

Describe the measures that will be taken to ensure the optimal reuse or recycling of waste water, if any:

No wastewater is expected to be produced from the construction phase and no wastewater will be produced during the operational phase.

13.3. Emissions into the atmosphere

Will the activity release emissions into the atmosphere?	~~YES~~	NO
If yes, is it controlled by any legislation of any sphere of government?	YES	~~NO~~

If yes, contact the KZN Department of Economic Development, Tourism & Environmental Affairs to obtain clarity regarding the process requirements for your application.

If no, describe the emissions in terms of type and concentration:

Dust will be produced during the construction phase as well as emissions from construction vehicles accessing the site. These emissions will be comprised primarily of CO2 and will be of a low concentration. Dust abatement measures if required will be implemented throughout construction activities and this will be controlled by an EMPr.

13.4. Generation of noise

Will the activity generate noise?	~~YES~~	NO
If yes, is it controlled by any legislation of any sphere of government?	YES	~~NO~~

If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.
If no, describe the noise in terms of type and level:

The proposed activity will generate noise during the construction phase from construction vehicles and equipment. It is not expected that noise levels during construction will exceed 85dBa. Noise suppressors should be used on machinery on site. Workers will be trained regarding noise on site and construction hours will be kept to working hours (07h00 to 17h00). Work should not continue on weekends, after hours or public holidays.

14. 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	the activity will not use water

If water is to be extracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate the volume that will be extracted per month:'		litres
Does the activity require a water use permit from the Department of Water Affairs?	~~YES~~	NO

If YES, please submit the necessary application to the Department of Water Affairs and attach proof thereof to this report.

This proposed activity may require a Water Use License Application (WULA) as deemed necessary by the Department of Water Affairs as it is a bridge located across a watercourse (Umdloti River). The piers and abutments may be considered as structures that will impede or divert the flow of water within the Umdloti River.

15. ENERGY EFFICIENCY

Describe the design measures, if any, that have been taken to ensure that the activity is energy efficient:

There are no measures being undertaken other than ensuring the energy consumption of equipment (through proper maintenance) is as efficient as possible in order to lower operating costs.

Describe how alternative energy sources have been taken into account or been built into the design of the activity, if any:

The activity involves the construction of a bridge and upgrading of an existing road. Machinery and vehicles that will be used during the construction will utilize diesel and petrol. There are no feasible alternative energy sources other than these two fuel types to run these machines and vehicles. The bridge and associated road are passive structures which does not utilize any energy during the operational phase.

SECTION C: SITE/ AREA/ PROPERTY DESCRIPTION

Important notes:

- For linear activities (pipelines, etc) as well as activities that cover very large sites, it may be necessary to complete this section for each part of the site that has a significantly different environment. In such

cases please complete copies of Section C and indicate the area, which is covered by each copy No. on the Site Plan.

Section C Copy No. (e.g. A):	1

- Subsections 1 - 6 below must be completed for each alternative.

1. GRADIENT OF THE SITE

Indicate the general gradient of the site.
Alternative S1:

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					

2. LOCATION IN LANDSCAPE

Indicate the landform(s) that best describes the site (Please cross the appropriate box).
Alternative S1 (preferred site):

Ridgeline	Plateau	Side slope of hill/mountain	Closed valley	Open valley	Plain	Undulating plain/low hills	Dune	Sea-front
						X		

3. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

Has a specialist been consulted for the completion of this section?			YES X	NO
If YES, please complete the following:				
Name of the specialist:	Brian Mafela and Ryan Edwards			
Qualification(s) of the specialist:	Brian Mafela: BSc Honours in Forest Resources and Wildlife Management Ryan Edwards:MSc in Environmental Science (Wetland Hydro-geomorphology)			
Postal address:	1 Mallory Road, Hilton			
Postal code:	3245			
Telephone:	033 343 3651	Cell:	-	
E-mail:	dmacfarlane@eco-pulse.co.za	Fax:	-	
Are there any rare or endangered flora or fauna species (including red data species) present on any of the alternative sites?			YES	NO X
If YES, specify and explain:	According to the Wetland Specialist Report, there were no rare and endangered biota on site at the time of the study (page 25 of the Wetland Specialist Report).			
Are their any special or sensitive habitats or other natural features present on any of the alternative sites?			YES X	NO
If YES, specify and explain:	The proposed development activity is planned to cross reach number U9 of the uMdloti River and impact negatively on the riverine system (in-stream and riparian habitat) associated with the uMdloti river. The associated road infrastructure will also run parallel to a wetland system which is a tributary of the uMdloti River (Page 7 of the Wetland Report)			
Are any further specialist studies recommended by the specialist?			YES	NO X
If YES, specify:				
If YES, is such a report(s) attached in Appendix D?			YES	NO X

Signature of specialist: _____ Date: _____

Is the site(s) located on any of the following (cross the appropriate boxes)?

	Alternative S1:		Alternative S2 (if any):			Alternative S3 (if any):	
Shallow water table (less than 1.5m deep)	YES	NO	YES	NO		YES	NO
Dolomite, sinkhole or doline areas	YES	NO	YES	NO		YES	NO
Seasonally wet soils (often close to water bodies)	YES	NO	YES	NO		YES	NO
Unstable rocky slopes or steep slopes with loose soil	YES	NO	YES	NO		YES	NO
Dispersive soils (soils that dissolve in water)	YES	NO	YES	NO		YES	NO
Soils with high clay content (clay fraction more than 40%)	YES	NO	YES	NO		YES	NO
Any other unstable soil or geological feature	YES	NO	YES	NO		YES	NO
An area sensitive to erosion	YES	NO	YES	NO		YES	NO

If you are unsure about any of the above or if you are concerned that any of the above aspects may be an issue of concern in the application, an appropriate specialist should be appointed to assist in the completion of this section. (Information in respect of the above will often be available as part of the project information or at the planning sections of local authorities. Where it exists, the 1:50 000 scale Regional Geotechnical Maps prepared by the Council for Geo Science may also be consulted).

Wetland/Riparian/Watercourse Impact Assessment Summary

Summary of Onsite Impacts

uMdloti River Unit: The riverine systems (in-stream, riparian and wetland habitat) has been, and continues to be, subjected to a number of direct and indirect impacts that have modified ecosystem/habitat condition and processes within the vicinity of the proposed activity. These impacts include: direct physical modification impacts in the form of riparian and in-stream habitat clearing and re-shaping for the establishment of the P713 causeway and the establishment of the Ogunjini in-stream infrastructure, the ongoing physical impacts of sand mining upstream and downstream, trampling of riparian habitat for cattle ingress and egress, and recent clearing and modification of the riparian areas along the existing P713 causeway. Indirect impacts include increased erosion and sedimentation, and alien invasive plant invasion/proliferation, as a result of the above-listed physical impacts, indirect habitat sedimentation impacts due to upstream sand mining, and impacts associated with the flow changes (base and peak flows) that have altered in-stream habitat.

Seep Unit: The seep unit has been subject to three main direct impacts, namely infilling and excavation related to road infrastructure, vegetation clearing and soil disturbance due to cultivation, and excavation of shallow drains/furrows in an attempt to drain the soils. Other indirect impacts recorded include IAP invasion/proliferation and the transformation of the plant species composition, ultimately contributing to general habitat deterioration.

Riverine Present Ecological State (PES) and Ecological Importance and Sensitivity (EIS)

For the purposes of this assessment, the riverine unit was divided into two sub-units upstream and downstream of the P713 causeway. This was done to factor in the distinct differences in the severity of impacts within these two areas. The upstream portion was assessed as being moderately modified, falling within PES Class C.

The impact score was largely influenced by large bed, bank and riparian impacts (summary table on pages 19-20 of the Wetland Report).

The uMdloti River unit was assessed as being of moderate ecological importance and sensitivity (EIS Class D). This was largely due to the conservation importance of the perennial river in terms of national, provincial and municipal conservation planning and the moderate importance of the riverine systems in terms of aquatic habitats and refuge value (summary table on pages 25 of the Wetland Report)..

Wetland PES and EIS

The seep was assessed as being moderately modified, falling within PES Class C. Despite wholesale clearing for cultivation, the hydrology and geomorphology of the unit is intact and as such the overall impact score was Moderate (summary table on pages 21 of the Wetland Report).

The seep unit was assessed as being of low ecological importance and sensitivity (EIS Class D). This was largely due to the current largely modified condition of the habitat and the lack of noteworthy biodiversity maintenance features (summary table on pages 26 of the Wetland Report).

Baseline Water Quality Assessment

The results of the analysis of physio-chemical and biological (E. coli) parameters indicate slightly elevated ammonia and phosphate levels likely as a result of agricultural fertilisers and possibly runoff/effluent containing human or animal wastes entering the river system upstream. Ammonia is oxidised through bacterial activity into nitrite and later nitrate which become an available nutrient for uptake by aquatic plants. Nitrate/nitrite concentration are however relatively low which may indicate that nitrogenous matter has not been converted from ammonia to available nitrate. Remaining water availability variables are reasonably low with no key trends emerging. Overall the water quality of the river at the time of the sampling can be considered to be fair.

Summary of the Construction Phase Impacts

1. Destruction, loss and physical modification of habitat impacts-Riverine Area

The layout plan indicates that some outer portions of the riparian zone will be infilled for the bridge abutments and that areas of the in-stream, wetland and marginal riparian habitat will be physically modified where the two piers are proposed. In addition to the areas to be infilled and modified within the bridge footprint over the long-term, the riparian and in-stream habitat within the entire corridor of the road will be modified by heavy machinery gaining access to the bridge pier sites and constructing the abutments. The small long-term/permanent loss of habitat will likely not have too much of an effect on the current level of ecosystem services provided. However, the abutment will likely increase the level of flood waters directly upstream with limited effects on the current condition of the delineated riparian zone.

Other associated impacts include faunal fatalities during the construction phase and the reduction in the population size of non-threatened biota. Sedentary and slow moving fauna like millipedes, molluscs, crustaceans and frogs living and/or using the habitat during the construction phase will likely be killed during the clearing, re-shaping and infilling. At this stage, no threatened fauna have been flagged for the development site and as such the impact on local threatened fauna populations is expected to be low.

Overall the physical disturbance impacts will contribute to the overall degradation of the in-stream and riparian habitat within the vicinity of the activity if rehabilitation is not undertaken appropriately. However, with effective and reasonable rehabilitation, the overall impacts of the direct disturbance impacts on the local freshwater ecosystems should be low in the long-term.

2. Destruction, loss and physical modification of habitat impacts-Wetland Unit

A small portion of the edge of the seep wetland unit is likely to be infilled during the re-alignment of the road. However, the exact extent of infill could not be calculated. This will result in the loss of a very small disturbed wetland area. The loss of flora and fauna is anticipated to be negligible and the reduction in wetland condition is also expected to be low considering the already degraded state of the wetland, as long as appropriate mitigation is applied.

3. Catchment transformation and flow modification impacts

Erosion and sedimentation impacts are likely to arise as a result of two catchment transformation and flow modification activities/impacts during construction:

- Clearing and exposure of bare soils within and upslope of the freshwater habitats and the destabilisation of bed and banks.
- Flow diversion during the establishment of the bridge piers.

4. Pollution

In the context of this impact assessment, water quality refers to its fitness for maintaining the health aquatic ecosystems. Construction phase contaminants include:

- Hydrocarbons – leakages from petrol/diesel stores and machinery/vehicles, spillages from poor dispensing practices.
- Oils and grease - leakages from oil/grease stores and machinery/vehicles, spillages from poor handling and disposal practices.
- Cement - spillages from poor mixing and disposal practices.
- Bitumen - spillages from poor application, handling and disposal practices.
- Sewage – leakages from and/or poor servicing of chemical toilets and/or informal use of surrounding bush by workers.

These contaminants have the capacity to negatively affect the in-stream aquatic habitat within the vicinity of the construction corridor and downstream, particularly aquatic flora and fauna sensitive to changes in nutrient levels, chemical oxygen demand and certain toxicants.

5. Combined and cumulative impacts

Although impacts to the areas to be directly impacted will be high, the combined impact of the abovementioned direct and indirect impacts on the local freshwater ecosystems is likely to be moderate under if mitigation measures are poorly implemented and/or construction activities are poorly controlled and undertaken.

Summary of the Operational Phase Impacts

1. Catchment transformation and flow modification impacts

Dirt and tarred roads are known to generate high velocity surface runoff that needs to be rapidly removed from the road surface for road safety purposes. As a result, concentrated stormwater discharged from roads often results in rill and gully erosion, especially where the receiving environment is sensitive to surface flows (e.g. highly erodible soils) and where no effort is made to minimise the velocity and energy of discharged runoff.

2. Pollution

Road run-off is now acknowledged as a significant source of diffuse pollution contaminating receiving waters. Well used major roads are known to generate runoff contaminated with substantial loads of deicers, nutrients, heavy metals, polycyclic aromatic hydrocarbons (PAHs), Volatile Organic Compounds (VOCs) such as benzene, toluene, ethylbenzene, xylene, and methyl tert-butyl ether (MTBE). In this case, the road is not a major highway or freeway so the quantities of contaminates are expected to be lower than that of major roads.

3. Combined and cumulative impacts

The noteworthy potential cumulative impacts of the operation of the proposed activity would be the habitat degradation associated with the worst case scenarios for erosion and pollution. However, the combined impact of the abovementioned direct and indirect impacts on the local freshwater ecosystems is likely to be moderate at worst if mitigation measures are poorly implemented and/or construction activities are poorly controlled and undertaken.

Impact Mitigation and Management

1. Planning Recommendations

A. Bridge Design Recommendations:

- If possible, the bridge piers must not be locate within the active channel of the uMdloti River and the active channel should be spanned.
- As far as possible, the bridge crossing should be aligned as close as possible to the existing causeway to confine the direct disturbance impacts to the smallest area as possible, and because the habitat immediately upstream of the existing causeway are the most disturbed.
- Appropriate erosion protection must be installed on the bridge piers and abutments where applicable.

B. Road Stormwater Design Recommendations:

- More frequent drains should be installed on the approach to the river to ensure that the least amount of water is discharged directly into the river as possible.
- Water should be discharged at regular intervals along the road by means of mitre drains.
- The mitre drains and/or other drains should not discharge directly into the river, but rather into the buffer and riparian zones to allow for the trapping of sediment and contaminants prior to them entering the in-stream habitat.
- All outlets must be armoured with erosion control and energy dissipater measures like reno-mattresses and rip-rap.

2. Construction Mitigation Measures

- A WULA is required.
- A permit will be required to damage/disturb or relocate Millettia grandis (Umzimbeet) a tree species listed as protected trees under the National Forests Act (No. 84 of 1998).
- It is recommended that construction within the uMdloti River system take place in the winter/dry months to reduce erosion and sedimentation risks during the construction phase.
- A detailed method statement for working within the wetland/aquatic habitats must be compiled in line with the mitigation measures proposed below and in conjunction with the appointed contractor to confirm all methods of wetland encroachment and the most practical and effective steps to minimise the impacts to the aquatic wetland habitat.
- A construction corridor roughly the width of the road footprint must be demarcated by a surveyor using stakes and orange plastic bonnox fencing. All areas outside of the demarcated area must be considered no-go areas for the duration of the construction phase.
- Prior to the stripping, infilling, excavation and re-shaping of the wetland/aquatic habitat within the development footprint/corridor, indigenous emergent vegetation within the development footprint should be relocated to a temporary holding area for use in the rehabilitation. Such vegetation should be removed in-situ (with sods).
- If it is necessary for the piers to be constructed within the in-stream areas, the pier construction sites will need to be dewatered by constructing a coffer dam around the pier site and possibly dewatering the pier site.

- Stormwater and erosion control measures must be implemented during the construction phase to ensure that erosion and sedimentation impacts to the wetland, riparian and in-stream habitats are minimised and avoided.
- All alien invasive vegetation that has colonised the construction site must be removed, preferably by uprooting. The contactor should consult the ECO regarding the method of removal.
- Pollution control measures must be as per the EMPr.
- Rehabilitation measures to be conducted includes removal of all construction materials from the riparian zone, compacted soils must be loosened, river banks must be protected with biodegradable geofabric eg biojute, re-vegetation of disturbed areas etc (further rehabilitation measures is found on pages 38-39 of the Wetland Report).
- The contractor must be adequately inducted and educated on the sensitivity of the area.
- Regular monitoring of construction activities must be conducted.

3. Decommissioning Mitigation Measures

- Before any work commences in the river channel, sediment control/silt capture measures (e.g. bidim/silt curtains) must be installed downstream of the working areas within the river.
- The causeway must be removed in a systematic manner working from the centre moving outwards.
- Excavation below the current elevation of the river bed must be avoided.
- All foreign material removed must be stored outside of the riparian areas and later disposed of appropriately at a registered landfill.
- The bed and banks should be re-shaped to reflect the morphology of the bed and banks upstream and downstream of the existing causeway.
- Where applicable the construction rehabilitation measures must be implemented during decommissioning.

4. Operational Phase Mitigation Measures

- All stormwater infrastructure and associated outlet protection must be maintained by the applicant in perpetuity.
- Erosion that occurs below the outlets must be rehabilitated during maintenance visits.
- Educational signs must be established on, or adjacent to, the bridge entrances to educate the local residents on the uMdloti River and prohibitions with regards to solid waste and other hazardous substances.

4. GROUNDCOVER

Has a specialist been consulted for the completion of this section?		YES (X)	NO
If YES, please complete the following:			
Name of the specialist:	GJ McDonald		
Qualification(s) of the specialist:	Pr. Sci. Nat.		
Postal address:	P.O Box 152, Ifafa Beach		
Postal code:	4185		
Telephone:	039 977 8011	Cell:	082 200 9549
E-mail:	gavinmc1@telkomsa.net	Fax:	
Are there any rare or endangered flora or fauna species (including red data species) present on any of the alternative sites?		YES (X)	NO

If YES, specify and explain:	The proposed development is sited in an area which has been largely transformed by human settlement and small-scale/subsistence farming efforts. Such vegetation as is found is highly disturbed with few indigenous species, numerous 'weeds' and ruderals and extensive alien invasion. Plant species that are protected nationally include Sclerocarya caffra and provincially include Scadoxus puniceus. The Red-Listed species Hypoxis hemerocallidea (declining) was found in the general area of the study and may be encountered during the walk through for the final alignment.		
Are there any special or sensitive habitats or other natural features present on any of the alternative sites?		YES X	NO
If YES, specify and explain:	The proposed development occurs along the Umdloti River, there are also wetlands in close proximity to the proposed site.		
Are any further specialist studies recommended by the specialist?		YES	NO X
If YES, specify:	N/A		
If YES, is such a report(s) attached in Appendix D?		YES	NO

Signature of specialist: _____ Date: _____

The location of all identified rare or endangered species or other elements should be accurately indicated on the site plan(s).

Natural veld - good condition[E]	Natural veld with scattered aliens[E]	Natural veld with heavy alien infestation[E] X	Veld dominated by alien species[E]	Gardens
Sport field	Cultivated land	Paved surface X	Building or other structure X	Bare soil

If any of the boxes marked with an "[E] "is ticked, please consult an appropriate specialist to assist in the completion of this section if the environmental assessment practitioner doesn't have the necessary expertise.

Vegetation Impact Assessment Summary

Classification of Vegetation

The vegetation of the area can be classified as Moist Coast Hinterland Grassland (Gs 20):

Moist Coast Hinterland Grassland (Gs 20 = KZN 21)
Distribution: KwaZulu-Natal and Eastern Cape Provinces: From near Melmoth in the north to near Libode in the south (including Eshowe, New Hanover, Thornville, Richmond, Harding, Lusikisiki) generally occurring below Gs 9 (Midlands Mistbelt Grassland). Altitude ranges from 450 - 900m.
Vegetation and Landscape Features: Rolling and hilly landscape. Dense tall sour grassland dominated by unpalatable Ngongoni grass (Aristida junciformis) with this mono-dominance associated with low species diversity; when in good condition dominated by Themeda triandra and Tristachya leucothrix.

Vegetation at and surrounding the proposed site

Vegetation along the route consists primarily of alien and invasive species with a number of 'weedy' or ruderal indigenous species. Woody vegetation is largely confined to a handful of species, notably Millettia grandis and Sclerocroton integerrimum. Alien species grow abundantly along the road edges in response to the disturbance and/or regular clearing.

Rare/Endangered species at the proposed site

The lack of suitable habitat for Red Listed species of plants or species of conservation significance means that the chance of disturbing or displacing these species is minimal and it would seem reasonable to discount the area as 'sensitive' from a biodiversity perspective. A single plant of the Specially Protected species Scadoxus puniceus and a single plant of the Specially Protected Tree Sclerocarya caffra were encountered along the proposed road route. Their presence indicates the potential that they might be encountered at other locations along the route. Permits for the removal or translocation of the Listed and Specially Protected species will have to be sought from the competent authority.

Impacts and Mitigation Measures

The results of this survey indicate that the impact of the proposed development will be minimal. The area is already substantially transformed by human habitation, subsistence and small-scale farming, and the regular burning and clearing of the existing road verges. Therefore, biodiversity has already been affected by habitat loss and alteration and is unlikely to be further impacted. The proposed new river crossing is already impacted by alien species invasion and habitat alteration.

The potential impacts on the remaining habitat from the proposed upgrade are likely to be felt only during the construction phase when additional disturbance and potential problems such as hydrocarbon spills from earth-moving/construction vehicles, compaction of soils from human and vehicular traffic and potential dumping of building materials and tarmac might occur. During earth-moving activities, care should be taken to prevent soil being carried into the watercourse and from being eroded from the site.

Since the proposed development consists of upgrading the roads from gravel to tar, the major impacts have already been exerted and the additional impacts will be likely to occur only during the construction phase. The current dust load on the verge vegetation will be reduced by tarring the roads and this will be a positive impact from a vegetation perspective. Having sealed surfaces will increase the runoff after rainfall and care will need to be taken to prevent erosion. Special care will need to be taken when working within sensitive habitats such as the river crossing and wetlands associated with the route.

The vegetation specialist has stated that there should be no reason to oppose the proposed development on botanical grounds.

5. LAND USE CHARACTER OF SURROUNDING AREA

Cross the land uses and/or prominent features that currently occur within a 500m radius of the site and give a description of how this influences the application or may be impacted upon by the application:

Land use character			Description
Natural area	YES	NO	The existing bridge is situated across the Umdloti River and is located within an 'Endangered' and 'Critically Endangered' Ecosystem (SANBI GIS, 2014). However, following a site investigation, it is evident that the site is dominated by alien invasive species, some of which will be removed as a result of the road-realignment.
Low density residential	YES	NO	
Medium density residential	YES	NO	
High density residential	YES	NO	
Informal residential	YES	NO	The site is located on the boundary of the eThekwini and Ndwedwe municipalities respectively. There are scattered informal dwellings and formal houses on either side of the Umdloti River. The new bridge and associated

	X		road re-alignment will have a positive impact on the neighbouring communities as there will be a permanent link across the river providing access to health and educational facilities.
Retail commercial & warehousing	YES	NO	
Light industrial	YES	NO	
Medium industrial	YES	NO	
Heavy industrial	YES	NO	
Power station	YES	NO	
Office/consulting room	YES	NO	
Military or police base/station/compound	YES	NO	
Spoil heap or slimes dam	YES	NO	
Quarry, sand or borrow pit	YES	NO	
Dam or reservoir	YES	NO	
Hospital/medical centre	YES	NO	
School/ creche	YES	NO	
Tertiary education facility	YES	NO	
Church	YES	NO	
Old age home	YES	NO	
Sewage treatment plant	YES	NO	The Ogunjini Waterworks is located approximately 50m away from the proposed site for the bridge and within 20m away from the Main Road P713. The proposed development is not likely to have any impact on the waterworks, however the management of the waterworks will be consulted to ensure awareness of the development as well as to confirm that the development will have no impact on the processes of the waterworks.
Train station or shunting yard	YES	NO	
Railway line	YES	NO	
Major road (4 lanes or more)	YES	NO	
Airport	YES	NO	
Harbour	YES	NO	
Sport facilities	YES	NO	A sports field is located approximately 150m away from the site. The proposed development will have no impact on the sports field.
Golf course	YES	NO	
Polo fields	YES	NO	
Filling station	YES	NO	
Landfill or waste treatment site	YES	NO	
Plantation	YES	NO	
Agriculture	YES	NO	
River, stream or wetland	YES	NO	The new bridge structure will be a replacement for the existing low-level vented causeway over the Umdloti River. The proposed development is will have no significant impacts on the river. Impacts resulting from construction will be mitigated against an EMPr.
Nature conservation area	YES	NO	

Mountain, hill or ridge	YES	NO	The site is surrounded by undulating low hills which will not be impacted upon by the proposed development.
Museum	YES	NO	
Historical building	YES	NO	
Protected Area	YES	NO	
Graveyard	YES	NO	
Archaeological site	YES	NO	
Other land uses (describe)	YES	NO	

6. 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 palaeontological sites, on or within 20m of the site?	YES	NO

If YES, contact a specialist recommended by AMAFA to conduct a heritage impact assessment. The heritage impact assessment must be attached as an appendix to this report.

Briefly explain the recommendations of the specialist:	Since no heritage sites were identified the only recommendation by the specialist is that operations that expose archaeological or historical remains should cease immediately, pending evaluation by the provincial heritage agency.

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

If YES, please submit the necessary application to AMAFA and attach proof thereof to this report.

Heritage Impact Assessment Summary

A first phase heritage survey of the proposed Umdloti River Bridge and realignment of main Road P713, Ndwedwe Local Municipality identified no heritage sites or features on the footprint. There is no archaeological reason why the development may not proceed on the project area as planned. Attention is drawn to the South African Heritage Resources Act, 1999 (Act No. 25 of 1999) and the KwaZulu-Natal Heritage Act (Act no 4 of 2008) which, requires that operations that expose archaeological or historical remains should cease immediately, pending evaluation by the provincial heritage agency.

No heritage sites were identified during the ground survey. The footprint is also not part of any known cultural landscape. Although the consultant saw modern grave sites none of them occur closer than 100m from the proposed development.

SECTION D: PUBLIC PARTICIPATION

Summary of the Public Participation Process for the proposed Umdloti River Bridge and upgrade of Main Road P713

The application has been advertised in the Northern Star (local) and Isolezwe (regional) Newspapers on the 25th of November 2014 and the 14th of November 2014 respectively. Signboards have been placed along in close proximity to the site and along Main Road P713 and notices have been distributed to the local community. A meeting was held with registered interested and affected parties (I&APs) including ward councillors and traditional leaders on the 21st of November 2014. The following authorities and interest groups have also been notified on the 21st of November 2014: Department of Water Affairs (DWA), Ezemvelo KZN Wildlife, Department of Agriculture, Forestry and Fisheries, Ugu eThekwini Municipality.

1. ADVERTISEMENT

The person conducting a public participation process must take into account any guidelines applicable to public participation as contemplated in section 24J of the Act and must give notice to all potential interested and affected parties of the application which is subjected to public participation by—

(a) fixing a notice board (of a size at least 60cm by 42cm; and must display the required information in lettering and in a format as may be determined by the competent authority) at a place conspicuous to the public at the boundary or on the fence of—
  (i) the site where the activity to which the application relates is or is to be undertaken; and
  (ii) any alternative site mentioned in the application;
(b) giving written notice to—
  (i) the owner or person in control of that land if the applicant is not the owner or person in control of the land;
  (ii) the occupiers of the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
  (iii) owners and occupiers of land adjacent to the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
  (iv) the municipal councillor of the ward in which the site or alternative site is situated and any organisation of ratepayers that represent the community in the area;
  (v) the local and district municipality which has jurisdiction in the area;
  (vi) any organ of state having jurisdiction in respect of any aspect of the activity (as identified in the application form for the environmental authorization of this project); and
  (vii) any other party as required by the competent authority;
(c) placing an advertisement in—
  (i) one local newspaper; or
  (ii) any official Gazette that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations;
(d) placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or may have an impact that extends beyond the boundaries of the metropolitan or district municipality in which it is or will be undertaken: Provided that this paragraph need not be complied with if an advertisement has been placed in an official Gazette referred to in subregulation 54(c)(ii); and
(e) using reasonable alternative methods, as agreed to by the competent authority, in those instances where a person is desiring of but unable to participate in the process due to—
  (i) illiteracy;
  (ii) disability; or
  (iii) any other disadvantage.

2. CONTENT OF ADVERTISEMENTS AND NOTICES

A notice board, advertisement or notices must:
(a) indicate the details of the application which is subjected to public participation; and
(b) state—
  (i) that an application for environmental authorization has been submitted to the KZN Department of Economic Development, Tourism & Environmental Affairs in terms of the EIA Regulations, 2010;(ii)
  (iii) a brief project description that includes the nature and location of the activity to which the application relates;
  (iv) where further information on the application can be obtained; and
  (iv) the manner in which and the person to whom representations in respect of the application may be made.

3. PLACEMENT OF ADVERTISEMENTS AND NOTICES

Where the proposed activity may have impacts that extend beyond the municipal area where it is located, a notice must be placed in at least one provincial newspaper or national newspaper, indicating that an application will be submitted to the competent authority in terms of these regulations, the nature and location of the activity, where further information on the proposed activity can be obtained and the manner in which representations in respect of the application can be made, unless a notice has been placed in any Gazette that is published specifically for the purpose of providing notice to the public of applications made in terms of the EIA regulations.

Advertisements and notices must make provision for all alternatives.

4. DETERMINATION OF APPROPRIATE PROCESS

The EAP must ensure that the public participation process is according to that prescribed in regulation 54 of the EIA Regulations, 2010, but may deviate from the requirements of subregulation 54(2) in the manner agreed by the KZN Department of Economic Development, Tourism & Environmental Affairs as appropriate for this application. Special attention should be given to the involvement of local community structures such as Ward Committees, ratepayers associations and traditional authorities where appropriate.

Please note that public concerns that emerge at a later stage that should have been addressed may cause the competent authority to withdraw any authorisation it may have issued if it becomes apparent that the public participation process was inadequate.

5. COMMENTS AND RESPONSE REPORT

The practitioner must record all comments and respond to each comment of the public before this application is submitted. The comments and responses must be captured in a comments and response report as prescribed in the EIA regulations (regulation 57 in the EIA Regulations, 2010) and be attached as Appendix E to this report.

6. PARTICIPATION BY DISTRICT, LOCAL AND TRADITIONAL AUTHORITIES

District, local and traditional authorities (where applicable) are all key interested and affected parties in each application and no decision on any application will be made before the relevant local authority is provided with the opportunity to give input. The planning and the environmental sections of the local authority must be informed of this application and provided with an opportunity to comment.

Has any comment been received from the district municipality?	YES	NO
If "YES", briefly describe the feedback below (also attach any correspondence to and from this authority with regard to this application):		

Has any comment been received from the local municipality?	YES	NO
If "YES", briefly describe the feedback below (also attach any correspondence to and from this authority with regard to this application):		

Has any comment been received from a traditional authority?	YES	NO

If "YES", briefly describe the feedback below (also attach any correspondence to and from this authority with regard to this application):

7. CONSULTATION WITH OTHER STAKEHOLDERS

Any stakeholder that has a direct interest in the site or property, such as servitude holders and service providers, should be informed of the application and be provided with the opportunity to comment.

Has any comment been received from stakeholders? YES ~~NO~~

If "YES", briefly describe the feedback below (also attach copies of any correspondence to and from the stakeholders to this application):

SECTION E: IMPACT ASSESSMENT

The assessment of impacts must adhere to the requirements in the EIA Regulations, 2010, and should take applicable official guidelines into account. The issues raised by interested and affected parties should also be addressed in the assessment of impacts.

1. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

List the main issues raised by interested and affected parties.

No comments have been received from I&APs. Any comments received on the Draft BAR will be included in Appendix E of the Final BAR.

Response from the practitioner to the issues raised by the interested and affected parties (A full response must be given in the Comments and Response Report that must be attached as Appendix E to this report):

No comments have been received from I&APs. Any comments received on the Draft BAR will be included in Appendix E of the Final BAR.

2. IMPACTS THAT MAY RESULT FROM THE PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL, DECOMMISSIONING AND CLOSURE PHASES AS WELL AS PROPOSED MANAGEMENT OF IDENTIFIED IMPACTS AND PROPOSED MITIGATION MEASURES

2.1. IMPACTS THAT MAY RESULT FROM THE PLANNING AND DESIGN PHASE

Non-compliance with Legislative Requirements

During the planning and design phase of the proposed development, compliance with environmental requirements is carefully considered and integrated into the design and location of the proposed bridge and road upgrade to avoid non-compliance and delays in the Basic Assessment Process. Foreseen issues are planned for and dealt with at this phase and contingency plans are developed for unforeseen impacts and delays.

Notification of the Proposed Development to all I&AP

At this phase all I&APs must be identified and must be informed of all changes and phases throughout the Basic Assessment process. Impacts to timelines may be experienced if this procedure isn't carried out efficiently and thoroughly. In general, processes such as the Basic Assessment process are

delayed due to insufficient notification of the development and the inadequate information presented in public information documents. Notification is imperative to carry out a Basic Assessment process successfully.

Impacts that may arise from the Bridge Design and associated Road Upgrade

The existing low-level bridge structure is the only formal point at which the local communities can traverse the Umdloti River. Therefore the new bridge design and construction plan must proceed in a manner that accommodates the existing structure as it can only be demolished once the new bridge is completed.

Involvement of Specialists

The need for specialist studies must be identified during the planning phase of the development as the environmental authorisation must include these studies in order for the competent authority to make an informed decision. If a study is not included then the Basic Assessment process is delayed until such time that all necessary studies are completed.

2.2. IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION PHASE

a. Site alternatives

List the potential impacts associated with site alternatives that are likely to occur during the construction phase:

Nature of Impact (potential)	Direct, Indirect or cumulative	Extent of Impact	Duration of Impact	Can impact be prevented/reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
SOIL										
Destabilisation and erosion of stockpiled materials	Direct	Local	Construction phase (short-term)	Yes – can be managed.	No	Medium	High	Due to construction activities, soil in and around the proposed site can become eroded, degraded, compacted and destabilised. As a general principle, contractors must limit vegetation clearing to the workable corridor/site. The contractor must stabilise cleared areas to prevent and control erosion and/or sedimentation of the watercourses. Only vegetation that needs to be removed to accommodate the proposed bridge and road upgrade must be removed	Low	Low

Nature of Impact (potential)	Direct, Indirect or cumulative	Extent of Impact	Duration of Impact	Can impact be prevented/reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
								in a phased and controlled manner. A site specific EMPr has been designed to manage construction activities and is attached under Appendix F.		
The onsite erosion of exposed soil before rehabilitation is completed.	Direct	Local	Construction phase (short-term)	Yes – can be managed	No	Medium	High	The duration of exposed soil must be kept to a minimum and rehabilitation must be initiated as soon as construction is completed. The contractor must stabilise cleared areas to prevent and control erosion and / or sedimentation of the river. Only vegetation that needs to be removed for the construction of the bridge and road upgrade, should be removed in a phased and controlled manner. The wetland specialist made the following recommendations:	Low	Low

Nature of Impact (potential)	Direct, Indirect or cumulative	Extent of Impact	Duration of Impact	Can impact be prevented/reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
								All bare slopes and surfaces to be exposed to the elements during clearing and earthworks must be protected against erosion using rows of silt fences and sandbags or, alternatively, the exposed slopes must drain into a temporary stormwater and silt trap/pond/dam. Many smaller silt traps/dams should be favoured over few large.		
Increased potential for erosion along the Umdloti river banks resulting in the sedimentation of the river.	Indirect	Local	Construction phase (short-term)	Yes – can be managed	No	Medium	High	Erosion and sedimentation impacts are likely to arise as a result of two catchment transformation and flow modification activities/impacts during construction: 1. Clearing and exposure of bare soils within and upslope of the freshwater habitats and the destabilisation of bed and banks. 2. Flow diversion during the establishment of the bridge piers.	Low	Low

Nature of Impact (potential)	Direct, Indirect or cumulative	Extent of Impact	Duration of Impact	Can impact be prevented/reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
								The necessary precautions will need to be taken to prevent erosion which should include the implementation of sandbags / silt fencing as a temporary measure until rehabilitation can occur. During construction, guidelines set out by the ECO will be followed to ensure no potential impacts occur. This must be controlled by the EMPr. The wetland specialist has made the following recommendations: Appropriate erosion protection must be installed on the bridge piers and abutments where applicable. It is recommended that construction within the uMdloti River system take		

Nature of Impact (potential)	Direct, Indirect or cumulative	Extent of Impact	Duration of Impact	Can impact be prevented/reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
								place in the winter/dry months to reduce erosion and sedimentation risks during the construction phase. Stormwater and erosion control measures must be implemented during the construction phase to ensure that erosion and sedimentation impacts to the wetland, riparian and in-stream habitats are minimised and avoided.		
Soil Contamination	Direct	Local	Construction phase (short-term)	Yes-prevented and managed	No	Medium	High	Soil contamination during the construction phase occurs as a result of accidental spills or leaks and mixing of cement on permeable surfaces, resulting in product seeping into the ground and potentially moving into the soil and groundwater. Mixing of cement will be done on an impervious surface and away from areas where run-off can	Low	Low

Nature of Impact (potential)	Direct, Indirect or cumulative	Extent of Impact	Duration of Impact	Can impact be prevented/reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
								enter into stormwater drainage lines or streams to prevent contamination. In addition construction vehicles and machinery must be well maintained at all times to prevent seepage of oil and fuel into the soil. Drip tray must be used where necessary. Construction must be monitored by an independent ECO who must monitor compliance with the construction EMPr. The wetland specialist has made the following recommendations: The proper storage and handling of hazardous substances (e.g. Fuel, oil, cement, bitumen, paint, etc.) needs to be administered. Storage containers must be		

Nature of Impact (potential)	Direct, Indirect or cumulative	Extent of Impact	Duration of Impact	Can impact be prevented/reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
								regularly inspected so as to prevent leaks and all hazardous storage must take place in a bunded area or within drip trays to prevent soil/water contamination. Further recommendations can be found on Page 37 of the Wetland Report (Appendix D).		
STORMWATER										
Poor storm water management during construction	Indirect	Local	Construction phase (short term)	Yes	No	Medium	High	Stormwater control must be implemented during construction; however this is a temporary impact of the proposal. A drainage system must be established for the construction camp. Contaminated storm water must not be allowed to enter the Umdloti river. This will be controlled by the EMPr. The wetland specialist has made the following recommendations:	Low	Low

Nature of Impact (potential)	Direct, Indirect or cumulative	Extent of Impact	Duration of Impact	Can impact be prevented/reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
								Clearing activities must only be undertaken during agreed working times and permitted weather conditions. If heavy rains are expected, clearing activities should be put on hold. In this regard, the contractor must be aware of weather forecasts. Sediment barriers (e.g. silt fences, sandbags, hay bales, earthen filter berms, retaining walls and check dams) must be established along the entire length of the sensitive zone (e.g. buffer zone edge or watercourse edge where no buffers) to capture sediment before entering the freshwater habitat buffer zones. Sediment barriers should be regularly maintained and cleared so as to ensure effective drainage. Further recommendations are found on Pages 36-37		

Nature of Impact (potential)	Direct, Indirect or cumulative	Extent of Impact	Duration of Impact	Can impact be prevented/reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
								of the Wetland Report (Appendix D).		
FLORA										
Risk of alien invasive encroachment into disturbed areas.	Direct	Local	Construction phase (short-term)	Yes	No	Medium	High	The re-alignment of Main Road P713 will require the removal of vegetation from a 'critically endangered' ecosystem, however the site has a high level of alien invasive infestation which will be removed prior to construction. Despite the high level of alien vegetation at the proposed site, the spread of alien plant species on site must be inhibited by monitoring. In addition the correct removal and disposal of alien plant species must be followed. Rehabilitation of disturbed areas must commence as soon as construction activities are completed in those areas. All activities will be managed by an EMPr.	Low	Low

Nature of Impact (potential)	Direct, Indirect or cumulative	Extent of Impact	Duration of Impact	Can impact be prevented/reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
								The wetland specialist has made the following recommendations: All alien invasive vegetation that has colonised the construction site must be removed, preferably by uprooting. The contactor should consult the ECO regarding the method of removal. All bare surfaces across the construction site must be checked for alien invasive plants at the end of every month and alien pants removed by hand pulling/uprooting and adequately disposed. Herbicides should be utilised where hand pulling/uprooting is not possible. Only herbicides which have been certified safe for use in wetlands		

Nature of Impact (potential)	Direct, Indirect or cumulative	Extent of Impact	Duration of Impact	Can impact be prevented/reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
								by independent testing authority to be used.		
Damage and removal of existing vegetation.	Direct	Local	Construction phase (short-term)	Yes	No	Low	High	Workers must be educated / trained on minimizing damage to vegetation during construction. Only vegetation that must be removed for the construction of the bridge should be removed and the footprint must be kept to a minimum. Rehabilitation of disturbed areas must be undertaken with locally indigenous species upon completion of construction activities. This must be controlled through the EMPr. The wetland specialist has made the following recommendations: Prior to the stripping, infilling, excavation and re-shaping of the wetland/aquatic habitat within the development footprint/corridor, indigenous emergent	Low	Low

Nature of Impact (potential)	Direct, Indirect or cumulative	Extent of Impact	Duration of Impact	Can impact be prevented/reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
								vegetation within the development footprint should be relocated to a temporary holding area for use in the rehabilitation. Such vegetation should be removed in-situ (with sods-locally common grass species are recommended for rehabilitation purposes). If re-vegetation of exposed surfaces cannot be established immediately due to phasing issues, rows of silt fences and sandbags of vegetation must be established along the contours at regular intervals to slow runoff and capture eroded soil. Immediately after the topsoil is reinstated and the wetland areas stabilised, the disturbed wetland and marginal riparian areas must be re-		

Nature of Impact (potential)	Direct, Indirect or cumulative	Extent of Impact	Duration of Impact	Can impact be prevented/reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
								vegetated using the emergent vegetation rescued from the development footprint. The plants should be re-planted by a qualified professional landscaper. Further recommendations are found on pages 38-39 of the Wetland Report (Appendix D).		
FAUNA										
Hunting / Fishing by construction workers.	Direct	Local	Construction phase (short-term)	Yes	No	Low	High	Impacts of working within and in the vicinity of the freshwater habitats are the increased occurrence of the hunting and killing of fauna disturbed and flushed during the construction activities. Hunting, poaching or fishing is prohibited during construction. Guidelines set out by the ECO must be followed to ensure no potential impacts occur and workers will be instructed that hunting and fishing is a non-	Low	Low

Nature of Impact (potential)	Direct, Indirect or cumulative	Extent of Impact	Duration of Impact	Can impact be prevented/reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
								compliance of the authorized activity. This must be controlled through the EMPr. The wetland specialist made the following recommendations: All fauna encountered during hand clearing must be rescued and relocated to suitable intact wetland habitat.		
SENSITIVE ENVIRONMENTAL AREAS										
Umdloti Riverine Area										
Degradation and contamination of the Umdloti River and surrounding environment by cement and other hazardous materials.	Direct	Local	Construction phase (short-term)	Yes	No	High	High	Site workers will be trained in avoiding impacts in areas of potential concern (e.g. steep river banks, floodplains). Designated concrete mixing areas and storage areas for any hazardous materials must be assigned; cement mixing is not permitted in any area where runoff can enter the Umdloti River. This must be strictly	Low	Low

Nature of Impact (potential)	Direct, Indirect or cumulative	Extent of Impact	Duration of Impact	Can impact be prevented/reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
								controlled through the site specific EMPr. The wetland specialist made the following recommendations: The proper storage and handling of hazardous substances (e.g. Fuel, oil, cement, bitumen, paint, etc.) needs to be administered. Storage containers must be regularly inspected so as to prevent leaks and all hazardous storage must take place in a bunded area or within drip trays to prevent soil/water contamination. No refueling, servicing nor chemical storage should occur within 50m of the delineated wetland /aquatic habitat or within the 100-year flood line, whichever is applicable. Further recommendations are found on page 37 of		

Nature of Impact (potential)	Direct, Indirect or cumulative	Extent of Impact	Duration of Impact	Can impact be prevented/reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
								the Wetland Report (Appendix D).		
Damage to river banks during excavation.	Direct	Local	Construction phase (short-term)	Yes	No	High	High	The necessary precautions will need to be taken to prevent erosion which should include the implementation of sandbags / silt fencing as a temporary measure until rehabilitation occurs. During construction, guidelines set out by the ECO must be followed to ensure no potential impacts occur. This must be strictly controlled by the EMPr. The wetland specialist has made the following recommendations: Topsoil must be redistributed across the banks/wetland in parallel to implementation of bank stabilisation and erosion protection.	Low	Low

Nature of Impact (potential)	Direct, Indirect or cumulative	Extent of Impact	Duration of Impact	Can impact be prevented/reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
								Care shall be taken not to mix the topsoil with the subsoil during re-shaping operations. All river banks must be protected with a biodegradable geofabric such as Biojute® or other products produced by Kaytech and Maccaferri. Temporary measures to prevent soil loss on the banks must be implemented and may include rows of sand bags/silt fences and silt fences at the water's edge. The bed and banks should be re-shaped to reflect the morphology of the bed and banks upstream and downstream of the existing causeway.		
Modification of the river flow and riverine	Indirect	Local (potential to become regional if it	Construction phase (short-term)	Yes	No	High	High	Erosion and sedimentation impacts are likely to arise as a result of two catchment	Low	Low

Nature of Impact (potential)	Direct, Indirect or cumulative	Extent of Impact	Duration of Impact	Can impact be prevented/reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
dynamics of the area.		affects stream flow dynamics further down the watercourse)						transformation and flow modification activities/impacts during construction: 1. Clearing and exposure of bare soils within and upslope of the freshwater habitats and the destabilisation of bed and banks. 2. Flow diversion during the establishment of the bridge piers. The wetland specialist made the following recommendations: If the piers are to be located within the in-stream areas, flow will need to be diverted around the pier construction zones through the establishment of temporary coffer dams/bunds. Such flow diversion could result in bed and bank erosion as flow is concentrated through certain portions of the main channel. If		

Nature of Impact (potential)	Direct, Indirect or cumulative	Extent of Impact	Duration of Impact	Can impact be prevented/reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
								erosion does take place, eroded sediment is also likely to be deposited in lower energy environments downstream and contribute to further in-stream habitat smothering and burial, and impacts to aquatic fauna.		
Endangered Ecosystem Vegetation										
The removal of 'endangered' and/or 'critically endangered' species.	Direct	Local	Construction phase (short-term)	Yes	No	High	High	The results of the vegetation survey indicate that the impact of the proposed development will be minimal. The area is already substantially transformed by human habitation, subsistence and small-scale farming, and the regular burning and clearing of the existing road verges. Therefore, biodiversity has already been affected by habitat loss and alteration and is unlikely to be further impacted. The proposed new river crossing is already	Low	Low

Nature of Impact (potential)	Direct, Indirect or cumulative	Extent of Impact	Duration of Impact	Can impact be prevented/reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
								impacted by alien species invasion and habitat alteration. A single plant of the Specially Protected species Scadoxus puniceus and a single plant of the Specially Protected Tree Sclerocarya caffra were encountered along the proposed road route. Their presence indicates the potential that they might be encountered at other locations along the route. Permits for the removal or translocation of the Listed and Specially Protected species will have to be sought from the competent authority. According to the wetland specialist a permit will be required to damage/disturb or relocate Millettia grandis (Umzimbeet) a tree species listed as protected trees under the		

Nature of Impact (potential)	Direct, Indirect or cumulative	Extent of Impact	Duration of Impact	Can impact be prevented/reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
								National Forests Act (No. 84 of 1998). In this regard, the protected trees falling within the development footprint will need to be marked and an application for their removal submitted to the Department of Agriculture, Forestry and Fisheries (DAFF). All impacted indigenous riparian trees (protected and non-protected) must be replaced at a ratio of 1:3 (3 being replacement specimens).		
Cultural and Heritage Sites										
Potential disturbance or unearthing of the graves on the northern side of the river and disturbance to other heritage resources during the	Direct	Local	Construction phase	Yes	No	Medium	High	A first phase heritage survey of the proposed Umdloti River Bridge and realignment of main Road P713, Ndwedwe Local Municipality identified no heritage sites or features on the footprint. Upon identification of a heritage resource, operations that expose archaeological or historical remains should	Low	Low

Nature of Impact (potential)	Direct, Indirect or cumulative	Extent of Impact	Duration of Impact	Can impact be prevented/reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
construction phase.								cease immediately, pending evaluation by the provincial heritage agency.		
WASTE										
Improper storage and disposal of solid waste.	Direct	Local (within construction site)	Construction phase (short-term)	Yes impact can be managed	No	Medium	High	Due to the nature of the activity, waste is anticipated to be minimal. All solid waste generated during the construction process must be placed in a designated waste collection area within the construction camp and must not be allowed to blow around the site, be accessible by animals, or be placed in piles adjacent to the skips / bins. All solid waste must then be disposed of at the nearest licensed landfill and safe disposal certificates must be obtained and kept on site at all times during construction. Separate skips/ bins for the different waste streams must be available on site. The waste containers must be	Low	Low

Nature of Impact (potential)	Direct, Indirect or cumulative	Extent of Impact	Duration of Impact	Can impact be prevented/reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
								appropriate to the waste type contained therein and where necessary should be lined and covered. This must be managed through the site specific EMPr and monitored by the ECO.		
Littering around the site.	Direct	Local (within construction site)	Construction phase (short-term)	Yes impact can be managed	No	Medium	High	Littering is not permitted on the site and general housekeeping must be enforced. General waste bins must be readily available for litter disposal and general housekeeping. The EMPr must be followed during construction.	Low	Low
Improper disposal of rubble i.e.: burying or neglecting building rubble resulting in direct mechanical damage to surrounding vegetation and	Direct	Local (within construction site)	Construction phase (short-term)	Yes impact can be managed	No	Medium	High	All excess material and rubble must be removed from the site so not to restrict the rehabilitation process. All excess material and rubble must go to an approved designated landfill and a safe disposal certificate must be obtained. All activities must be managed by an EMPr. Site workers will be	Low	Low

Nature of Impact (potential)	Direct, Indirect or cumulative	Extent of Impact	Duration of Impact	Can impact be prevented/reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
untidiness of the site.								trained in avoiding such impacts during induction training and regular toolbox talks.		
Lack of toilet facilities resulting in unsanitary conditions.	Direct	Local (within construction site)	Construction phase (short-term)	Yes impact can be managed	No	Medium	High	Adequate chemical toilet facilities must be provided for all staff members as standard construction practice. These toilets must be regularly cleaned by a reputable company and maintained in a clean state. This must be monitored in an EMPr.	Low	Low
Improper disposal of toilet waste from chemical toilets resulting in contamination of the surrounding environment and the Umdloti River.	Direct	Local (within construction site)	Construction phase (short-term)	Yes impact can be managed	No	Medium	High	Chemical toilets must be placed within the construction camp and not in close proximity to the river. The chemical toilets must be provided by a registered company and all effluent must be regularly disposed of at a licenses facility. Safe disposal certificates must be kept on record.	Low	Low
Increase waste to landfill site.	Cumulative	Local (potential to become regional)	Construction phase (short-term)	Yes impact can be managed	No	Medium	High	Due to the nature of the activity, waste is anticipated to be minimal. Where possible, waste	Low	Low

Nature of Impact (potential)	Direct, Indirect or cumulative	Extent of Impact	Duration of Impact	Can impact be prevented/reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
								streams will be separated and recycled to limit the amount of waste being added to the landfill site.		
HAZARDOUS CHEMICALS / FUELS										
Risk of spills from construction equipment (oils, fuels, cement etc) contaminating soil and the watercourse.	Direct	Local (within construction site)	Construction phase (short-term)	Yes impact can be managed	No	Medium	High	Any hazardous or dangerous goods utilised during the construction phase must be stored on an impermeable surface that is bunded, fenced, locked and covered. A spill kit must be clearly marked and visible when utilising hazardous or dangerous materials to ensure that all spills are immediately cleaned. Spill kits must be regularly checked and maintained. The EMPr must be followed during construction.	Low	Low
NOISE										
Noise generated by construction workers, machinery and construction	Direct	Local (within construction site)	Construction phase (short-term)	Yes impact can be managed	No	Medium	High	Excessive noise must be controlled on site. Workers will be trained regarding noise generation on site and construction hours will be	Low	Low

Nature of Impact (potential)	Direct, Indirect or cumulative	Extent of Impact	Duration of Impact	Can impact be prevented/reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
vehicles disturbing surrounding residents.								kept to working hours (07h00 to 17h00). The construction activities will be monitored by an ECO who will ensure compliance with the construction EMPr. All precautions must be taken to ensure that noise generation is kept to a minimum. If excessive noise is expected during certain stages of the construction, nearby residents must be notified prior to the event.		
Potential impact on the Ogunjini Waterworks	Direct	Local (within construction site)	Construction phase (short-term)	Yes impact can be managed	No	Low	Low	The impact of the construction of the bridge and road re-alignment on the waterworks is expected to be minimal. However, management of the waterworks will be consulted prior to consultation to ensure a full understanding of the project and to discuss the implications for the waterworks (if any).	Low	Low
AIR QUALITY										

Nature of Impact (potential)	Direct, Indirect or cumulative	Extent of Impact	Duration of Impact	Can impact be prevented/reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
Emissions generated from construction vehicles	Direct	Local	Construction phase (short-term)	Yes impact can be managed	No	Medium	High	The only emissions that will be generated will be from construction vehicles which will be minimal and is not expected to significantly affect the surrounding communities or the environment.	Low	Low
Dust generated from construction vehicles and other onsite activity	Direct	Local	Construction phase (short-term)	Yes impact can be managed	No	Medium	High	Dust control measures (the use of a water cart / truck) must be used to wet exposed soil and thereby ensure that excessive dust levels are not experienced on site. The dust levels must be kept below the required SANBS standard to ensure minimal impact on the surrounding community and the environment.	High	Low
RESOURCE USE & CONSERVATION										
Sourcing of raw materials i.e.: (gravel, stone, sand, cement and water) from unsustainable	Direct	Local (potential to become regional)	Construction phase (short-term)	Yes impact can be managed	No	Medium	High	All materials must be obtained from a registered and sustainable source and all delivery notes and slips must be made available to the ECO e.g.	Low	Low

Nature of Impact (potential)	Direct, Indirect or cumulative	Extent of Impact	Duration of Impact	Can impact be prevented/reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
sources resulting in illegal sand mining and mining operations causing significant environmental damage.								mined material such as stone must only be obtained from permitted quarries.		
TRAFFIC										
Speeding vehicles resulting in safety issues for surrounding communities (particularly scholars).	Direct	Local	Construction phase (short-term)	Yes	No	Medium	High	Speeding will be prohibited. Flagmen and other traffic control measures should be implemented if the need arises during the construction phase. An EMPr has been designed to manage construction activities and is attached as Appendix F.	Low	Low
SOCIO-ECONOMIC										
Damage to surrounding neighbours' properties i.e.: houses, fence lines, crops,	Direct	Local	Construction phase (short-term)	Yes	No	Low	High	Surrounding neighbours must be consulted prior to construction to discuss the construction process and potential impacts on nearby properties, as well	Low	Low

Nature of Impact (potential)	Direct, Indirect or cumulative	Extent of Impact	Duration of Impact	Can impact be prevented/reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
gardens and accesses.								as opportunities regarding employment. Properties are not expected to be severely impacted on as they are not in close proximity to the site, however, should unplanned impacts occur, the contractor will be responsible for the necessary repairs.		
Positive impact - Potential temporary employment during the construction phase.	Direct	Local	Construction phase (short-term)	Positive impact no mitigation required.	No	Positive impact no mitigation required.	Positive impact no mitigation required.	Positive impact no mitigation required – skilled local community members may be granted employment during the construction phase.	Positive impact no mitigation required.	Positive impact no mitigation required.
Positive impact – scholars will no longer have to swim across the river to get to school at great risk to their own safety.	Direct	Local	Construction phase (short-term)	Positive impact no mitigation required.	No	Positive impact no mitigation required.	Positive impact no mitigation required.	Positive impact no mitigation required – the bridge will allow all scholars to safely traverse the Umdloti River.	Positive impact no mitigation required.	Positive impact no mitigation required.
Positive impact – community members will no	Direct	Local	Construction phase (short-term)	Positive impact no	No	Positive impact no	Positive impact no	Positive impact no mitigation required – the bridge will allow all	Positive impact no	Positive impact no mitigation required.

Nature of Impact (potential)	Direct, Indirect or cumulative	Extent of Impact	Duration of Impact	Can impact be prevented/reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
longer have to swim across the river or use longer and more expensive alternative routes to get to important road networks and services on the other side of the Umdloti River.				mitigation required.		mitigation required.	mitigation required.	community members to quickly and safely traverse the Umdloti River.	mitigation required.	
Positive Impact –P713 Road Upgrade will allow for safe vehicle passage as well as pedestrian movement simultaneously.	Direct	Local	Long Term	Positive impact no mitigation required.	No	Positive impact no mitigation required.	Positive impact no mitigation required.	Positive impact no mitigation required – the design of the bridge and road upgrade and re-alignment will allow for pedestrians and vehicles to make use of the road simultaneously without the delay of waiting for either pedestrians or vehicles to pass first.	Positive impact no mitigation required.	Positive impact no mitigation required.

No-Go Alternative:

Nature of Impact (potential)	Direct, Indirect or cumulative	Extent of Impact	Duration of Impact	Can impact be prevented/reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
IMPACTS OF THE NO-GO OPTION										
Scholars continued swimming across the Umdloti River to attend school.	Direct	Local	Long term	Yes	No	High	Low	Cannot be mitigated. Scholars would continue to be forced to swim across the Umdloti River during heavy rains (when the existing low-level bridge is submerged) to attend school at great risk to their own health and safety, particularly during periods of high water levels.	High	High
Continued lack of access to important road networks and services on the other side of the Umdloti River	Direct	Local	Long term	Yes	No	Medium	Low	Cannot be mitigated. Community members would continue to risk crossing the river during periods of high water levels (e.g. flooding) and access to important road networks and services would continue to be limited. Alternative ways of getting to important road networks and services would continue to be costly.	High	Medium - High
Continued delays encountered by	Direct	Local	Long term	Yes	No	Medium	Low	Medical vehicles will have to make use of alternate routes during high flow	High	Medium - High

Nature of Impact (potential)	Direct, Indirect or cumulative	Extent of Impact	Duration of Impact	Can impact be prevented/reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
medical vehicles that has to use alternate routes to get to the hospital on the other side of the Umdloti River								periods which causes delays in transporting patients to the hospital timeously.		
Health and safety	Direct	Local	Long Term	Yes	No	Medium	Low	Cannot be mitigated. Community members, especially scholars would continue to swim across the Umdloti River at great risk to their own health and safety, particularly during periods of high water levels.	High	Medium - High

2.3. IMPACTS THAT MAY RESULT FROM THE OPERATIONAL PHASE

a. Site alternatives

List the potential impacts associated with site alternatives that are likely to occur during the operational phase:

Nature of Impact (potential)	Direct or Indirect	Extent of Impact	Duration of Impact	Can impact be prevented/reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
Catchment transformation and flow modification	Direct	Local	Operational phase (long term)	Yes	No	High	High	Impacts on the Umdloti River are expected to be minimal because the bridge will be well above the water level of the watercourse and informal crossing of this river will no longer be required. Community members must ensure no litter or other forms of general waste are thrown from the bridge into the river. The engineering design has taken into account the potential flow rates for the river to ensure the watercourse is not impacted upon and a maintenance team will be employed to ensure river bank stability and the functionality of the bridge in the long term.	Low	Low

Nature of Impact (potential)	Direct or Indirect	Extent of Impact	Duration of Impact	Can impact be prevented/reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
Potential impacts on river bank stability.	Direct	Local	Operational phase (long term)	Yes	No	High	High	The engineering design of the bridge will ensure that the integrity and stability of the river banks are not compromised. Rehabilitation measures will also be implemented upon completion of construction activities which will assist with the riverbank stability.	Low	Low
Storm water runoff resulting in gully erosion	Direct	Local	Operational phase (long term)	Yes	No	High	High	Dirt and tarred roads are known to generate high velocity surface runoff that needs to be rapidly removed from the road surface for road safety purposes. Erosion rills and gullies must be filled-in with appropriate material and silt fences or fascine work must be established along the gulley for additional protection until grass has re-colonised the rehabilitated area.		

Nature of Impact (potential)	Direct or Indirect	Extent of Impact	Duration of Impact	Can impact be prevented/reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
								All Stormwater infrastructure and associated outlet protection must be maintained by the applicant in perpetuity.		
Long term structural integrity of the bridge being compromised during a large flood event.	Direct	Local	Operational phase (long term)	Yes	No	High	High	The engineering design has taken into account the bridge accordingly (to withstand at least 1:50 year flood events) to ensure the integrity of the bridge is maintained during floods or other weather events.	Low	Low
Costs of maintenance to the bridge.	Direct	Local	Operational phase (long term)	Yes	No	Medium	Low	Regular maintenance of the bridge (by the applicant) is required to ensure the structural integrity of the bridge is maintained and any potential damage to the bridge can be mitigated. The cost of maintenance operations must be borne by the applicant.	Medium	Medium

Nature of Impact (potential)	Direct or Indirect	Extent of Impact	Duration of Impact	Can impact be prevented/reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
Erosion of surrounding banks due to stormwater	Indirect	Local	Operational phase (long term)	Yes	No	High	Low	Stormwater control measures will need to be implemented to ensure water running off the bridge and footpath does not cause erosion to the surrounding environment. Stormwater should be directed to the river or surrounding vegetative environment via stormwater channels or pipelines without the possibility of sediment being picked up or structural damage to the river banks occurring.	Low	Low
Pollution during operation	Direct	Local	Operational phase (long term)	Yes	No	Medium	Low	Road run-off is now acknowledged as a significant source of diffuse pollution contaminating receiving waters. Well used major roads are known to generate runoff contaminated with substantial loads of deicers, nutrients, heavy metals, polycyclic aromatic hydrocarbons	Low	Low

Nature of Impact (potential)	Direct or Indirect	Extent of Impact	Duration of Impact	Can impact be prevented/reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
								(PAHs), Volatile Organic Compounds (VOCs) such as benzene, toluene, ethylbenzene, xylene, and methyl tert-butyl ether (MTBE). The Main Road P713 is not a major highway or freeway so the quantities of contaminants are expected to be lower. Educational signs must be established on, or adjacent to, the bridge entrances to educate the local residents on the uMdloti River and prohibitions with regards to solid waste and other hazardous substances.		
Improved access to important road networks and services on the other side of the Umdloti River	Indirect	Local	Operational phase (long term)	Positive impact no mitigation required.	No	Positive impact no mitigation required.	Positive impact no mitigation required.	Positive impact no mitigation required. Residents will now have an easier and more efficient way of traversing the river. The completed bridge will facilitate connectivity and increase rural mobility in the region.	Positive impact no mitigation required.	Positive impact no mitigation required.

Nature of Impact (potential)	Direct or Indirect	Extent of Impact	Duration of Impact	Can impact be prevented/reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
Positive Impact – Health and Safety - community members, particularly scholars, won't have to traverse the river at great risk to their own health and safety.	Direct	Local	Construction phase (short-term)	Positive impact no mitigation required.	No	Positive impact no mitigation required.	Positive impact no mitigation required.	Positive impact no mitigation required.	Positive impact no mitigation required.	Positive impact no mitigation required.

No-Go Alternative:

IMPACTS OF THE NO-GO OPTION										
Nature of Impact (potential)	Direct or Indirect	Extent of Impact	Duration of Impact	Can impact be prevented/reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
Continued informal crossing of the Umdloti River (i.e. traversing across during times of increased flow).	Direct	Local	Long term	No	No	High	Low	Cannot be mitigated. Community members, particularly scholars, would continue to swim across the river in order to attend school or reach important road networks at risk to their health and safety during times of increased flow.	High	Medium - High

Continued lack of access important road networks.	Direct	Local	Long term	No	No	High	Low	Cannot be mitigated. Community members would continue to risk crossing the river and access to important road networks and services would continue to be limited	High	Medium - High
Health and Safety - community members, especially scholars, would continue to swim across the river.	Direct	Local	Long Term	No	No	Medium	Low	Cannot be mitigated. Community members, particularly scholars, would continue to swim across the river, particularly during periods of high water, levels putting their own health and safety at risk and increasing the potential for injuries and deaths.	High	High

2.4. IMPACTS THAT MAY RESULT FROM THE DECOMISSIONING OR CLOSURE PHASE

a. Site alternatives

The proposed construction of the Umdloti Bridge and P713 Road Upgrade will be permanent and as such there will be no decommissioning or closure phase. However, the impacts associated with decommissioning of the bridge are listed below.

List the potential impacts associated with site alternatives that are likely to occur during the decommissioning or closure phase:

Nature of Impact (potential)	Direct or Indirect	Extent of Impact	Duration of Impact	Can impact be prevented/reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
SOIL										
The rubble and steel would need to be removed and disposed of off-site. As a result, there will be a potential increase in the amount of waste sent to the landfill site	Direct	Local	Decommissioning (short-term)	Yes – can be managed.	No	Medium	High	Alternative uses for all waste materials should be sort and recycling should take place where possible. Should no alternative uses for the waste be found, disposal at a licensed landfill must occur.	Low	Low
Potential contamination of the Umdloti River with rubble and waste.	Direct	Local	Decommissioning (short-term)	Yes – can be managed	No	Medium	High	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 stabilise cleared areas to prevent and control erosion and / or	Low	Low

Nature of Impact (potential)	Direct or Indirect	Extent of Impact	Duration of Impact	Can impact be prevented/reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
								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.		
Negative impact on riparian areas.	Indirect	Local	Decommissioning (short-term)	Yes – can be managed	No	Medium	High	Disruption of water flow and drainage at the bridge and downstream of it will be minimal as there will be no modification of the river bed. Erosion on the river banks must be controlled and prevented.	Low	Low
Impacts relating to the removal of the causeway	Direct	Local	Decommissioning (short term)	Yes	No	Low	High	The causeway must be removed in a systematic manner working from the centre moving outwards. Excavation below the current elevation of the river bed must be avoided. All foreign material removed must be stored outside of the riparian areas and later disposed		

Nature of Impact (potential)	Direct or Indirect	Extent of Impact	Duration of Impact	Can impact be prevented/reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
								of appropriately at a registered landfill. The bed and banks should be re-shaped to reflect the morphology of the bed and banks upstream and downstream of the existing causeway. Available rocks should be sourced and laid down over the exposed channel bed to stabilise the river bed and create a rocky bed habitat.		
Decommissioning activities causing erosion and sedimendation especially along the river banks and downstream of the work area	Direct	Local	Decommissioning (short term)	Yes	No	Low	High	Before any work commences in the river channel, sediment control/silt capture measures (e.g. bidim/silt curtains) must be installed downstream of the working areas within the river. Quantities of silt fences/curtains shall be decided on site with the engineer, contractor and ECO. The ECO should be present during	Low	Low

Nature of Impact (potential)	Direct or Indirect	Extent of Impact	Duration of Impact	Can impact be prevented/reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
								the location and installation of the silt curtains. The river banks will need to be rehabilitated and re-vegetated preventing any possible erosion once decommissioning is complete.		
Construction rubble / waste entering the river could lead to increased sedimentation and impact on water quality of the river.	Indirect	Local	Decommissioning (short-term)	Yes	No	Low	High	Control measures must be implemented during decommissioning and care should be taken to prevent any rubble or other waste material entering the river.	Low	Low
Limited / restricted access to important road networks for local community members.	Indirect	Local	Decommissioning (short-term)	Yes	No	Medium	High	Local community members will cross the river at informal crossing points or will be forced to swim across the river again. They will again be at risk when trying to reach access points to get to jobs, schools or work opportunities.	Low	Low

Nature of Impact (potential)	Direct or Indirect	Extent of Impact	Duration of Impact	Can impact be prevented/reversed or managed?	Will irreplaceable resources be lost?	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
Scholars will once again have to traverse the Umdloti River during times of increased flow.	Direct	Local	Decommissioning (short-term)	Yes	No	High	Low	Should decommissioning occur, scholars will again have to traverse the river to attend school at great risks to their own health and safety.	Low	Low
Increase waste to landfill site.	Cumulative	Local (potential to become regional)	Decommissioning (short-term)	Yes impact can be managed	No	Medium	High	Waste streams will be separated and recycled where possible to limit amount of waste added to the landfill site.	Low	Low

2.5. PROPOSED MONITORING AND AUDITING

For each phase of the project and for each alternative, please indicate how identified impacts and mitigation will be monitored and/or audited.

Alternative A1 and S1 (preferred site)
Construction phase: It is recommended that monitoring be done through monthly environmental construction audits ensuring compliance with an Environmental Management Programme (EMPr). An independent ECO must be appointed to undertake this monitoring process. Operation phase: The applicant must ensure inspections and scheduled maintenance of infrastructure. A post construction audit must be undertaken by the ECO to ensure the EMPr requirements have been met.

Assumptions, Uncertainties and Gaps In Knowledge [Regulation 22 (2) (m)]
There are no uncertainties or gaps in the information provided and the EAP is confident that sufficient information has been provided to allow an assessment of the proposal.

3. ENVIRONMENTAL IMPACT STATEMENT

Environmental impact statement with a reasoned opinion as to whether the activity should be authorised or not be authorized; [Regulation 22 (2) (n)]

Taking the assessment of potential impacts into account, please provide an environmental impact statement that summarises the impact that the proposed activity and its alternatives may have on the environment after the management and mitigation of impacts have been taken into account, with specific reference to types of impact, duration of impacts, likelihood of potential impacts actually occurring and the significance of impacts.

It is the opinion of the EAP that the application submitted for the proposed bridge and road realignment (Alternative S1 and A1) be approved. This alternative would result in minor environmental and social impact as minimal vegetation will require removal for the construction of the bridge at this point and this is best location for the bridge in terms of the servicing the scholars and the community as a whole. The bridge will be designed to a height that will withstand at least 1:50 year flood events therefore providing the scholars and community with a more efficient and safer means of traversing the Umdloti River.

Alternative A1 and S1 (preferred site)
The KwaZulu-Natal Department of Transport (KZNDoT) proposes to construct a new bridge to replace the existing low-level structure along Main Road P713 in the Ndwedwe Local Municipality which forms part of the Ilembe District and the eThekwini Metropolitan Municipalities respectively. The existing structure is a vented causeway comprising of fifteen (15), 600mm diameter concrete stormwater pipes overlaid by a concrete slab. Due to the low-level structure, any appreciable rainfall event causes water to flow over. As a result this causes inconvenience to the many school children, general pedestrians and vehicles who use the bridge as a link to many services on the other side of the Umdloti River. The new bridge structure will be approximately 100 metres in length, 12.5 metres wide and approximately 25 metres away (in a Westerly Direction) from the existing low-level structure along Main Road P713. The 100m length of the bridge will be supported by four (4) piers (5x20m openings) and the soffit (underside) of the bridge will be nine (9) metres above the river bed during normal flow conditions (approximately 5m above the surface flow of the river). The development also entails the realignment of approximately 450 metres of Main Road P713 and the upgrade of the road surface to Asphalt. The road carriageway (2x3.25m lanes) will be separated

from the pedestrian sidewalk by a reinforced concrete New Jersey Barrier (NJB), the sidewalk will be accompanied by a polycrete handrail which will ensure safety of pedestrians. The new bridge structure will be constructed adjacent to the existing low-level structure and will only be demolished once the new bridge is complete, this arrangement allows for pedestrians and scholars to have access to the other side of the Umdloti River during the construction phase.

The new bridge structure and road upgrade will substantially increase the level of service and benefits to the nearby communities and will provide all year access to the education and health facilities in the area.

Alternative S2

An alternative to the preferred site would be the construction of the bridge within the existing footprint i.e. Constructing the bridge at its existing location and not re-aligning the Main Road P713. This alternative is not feasible as it would require the existing low-level causeway to be demolished before construction of the new structure resulting in local community members and scholars having no access to either side of the Umdloti River during the time of construction. In addition, the re-alignment of Main Road P713 is a safety requirement of the KZNDoT.

No-go alternative (compulsory)

The 'No-Go' alternative (i.e. not constructing the Umdloti Bridge) will lead to the primary goal of providing the scholars and pedestrians a safer and more efficient means of traversing the river, not being met. The 'No Go' alternative will effectively negate the community's wishes for the construction of a bridge that provides a safe and efficient means of crossing the Umdloti River as they have expressed concern for the amount of community members, especially children, being injured or drowning while attempting to cross the river during floods whilst making use of the low-level existing structure. The significance of this is that local community members, particularly children, will be forced to continue crossing the Umdloti River at informal crossing points or the existing low-level structure which often becomes submerged during flood events which could potentially result in further drowning incidents and will result in the continued restricted access of community members to schools, medical facilities and important road networks. It is also expected that no new employment opportunities will be created for local residents during construction and operation. These impacts are all rated as medium-high.

SECTION F. RECOMMENDATION OF EAP

Is the information contained in this report and the documentation attached hereto in the view of the EAPr sufficient to make a decision in respect of this report? If "NO", please contact the KZN Department of Agriculture & Environmental Affairs regarding the further requirements for your report. N/A	YES X	NO

If "YES", please attach the draft EMPr as Appendix F to this report and list any recommended conditions, including mitigation measures that should be considered for inclusion in any authorisation that may be granted by the competent authority in respect of the application:

1. It is recommended that alternative A1 and S1 (i.e. construction of a bridge across the Umdloti River and associated P713 Road upgrade) be accepted from environmental and social perspective.
2. The applicant must ensure that mitigation measures and controls specified in the EMPr are adhered to. The construction of the bridge must be monitored by an independent ECO who should ensure compliance with the construction EMPr. Please see the EMPr attached as Appendix F for further details on management of the site during construction.
3. It is recommended that environmental construction audits be conducted on a monthly basis. In addition a pre-construction audit and post-construction audit (PCA) must be conducted.
4. The contractor and his staff must attend an environmental awareness training course, presented by the site engineer or a suitably qualified EO from the engineers / contractors, prior to construction commencing. The environmental awareness training course should cover the following key aspects: (a) basic awareness and understanding of key environmental features of the work site and the surrounding environment, (b) understanding the importance of, and reasons why, the environment must be protected, (c) ways to minimize environmental impacts, and (d) requirements of the Environmental Authorisation and EMPr. The EAP must be on hand to aid with any environmentally-based questions.
5. Construction activities must comply with designated working hours and surrounding residents must be informed prior to commencement of construction activities.
6. Emergency contact numbers must be placed at each construction site.
7. Adequate chemical toilet facilities must be provided for all staff members as standard construction practice. The chemical toilets must be from a registered company and all sewage must be disposed of at an appropriate facility. Safe disposal certificates must be kept on record.
8. Existing infrastructure (i.e. electricity lines, water pipelines) must be identified prior to construction.
9. As there are no formal stormwater drainage facilities on site, the contractor must prepare a Stormwater Control Plan / Method Statement to ensure that all construction methods adopted on site do not cause, or precipitate, soil erosion. The designated responsible person on site, as indicated in the Stormwater Control Plan (usually the contractor) should ensure that no construction work takes place before the stormwater control measures are in place. The Stormwater Control Plan must be approved by the ECO prior to implementation.
10. The duration of exposed soil must be kept to a minimum and rehabilitation must be initiated as soon as construction is completed.
11. Materials must be stockpiled in appropriate areas where storm water runoff cannot erode into the stockpile.
12. Dust control must be implemented throughout the construction phase through the use of a water cart / truck.

13. Speeding must be prohibited.
14. Any alien vegetation found within, or surrounding, the construction site must be cleared to ensure that invasion of disturbed areas does not occur.
15. There may not be hunting / fishing of wildlife or poaching of livestock on the site and no setting of snares or traps. No animals are to be harmed or harassed. Hunting or poaching must be prohibited.
16. Cement mixing must take place on a hard surface or on cement mixing trays. Cement mixing will not be permitted to occur where run off can enter the watercourse. In addition cement and fuels must be stored within bunded and hard surfaced areas. If the creation of a permanent bunded area is not feasible, these materials must be stored on drip trays capable of holding at least 110% of the spilled volume.
17. All materials must be obtained from a registered and sustainable source and all delivery notes and slips must be made available to the Environmental Control Officer (e.g. mined material such as stone must only be obtained from permitted quarries).
18. Littering must not be permitted on the site and general housekeeping must be enforced.
19. Waste must be stored in the bins within the waste collection area in the construction camp and must not be allowed to blow around the site, be accessible by animals, or be placed in piles adjacent to the skips / bins and must be disposed of at an appropriate land fill site.
20. Hazardous waste must be stored on a hard surface within a bunded area and must not be allowed to enter watercourses and the surrounding environment.
21. All excess material and rubble must be removed from the site so as not to restrict the rehabilitation process. All excess material and rubble must go to an approved, designated landfill and a safe disposal certificate must be obtained.
22. Recycling should be undertaken where possible to limit waste added to the landfill site
23. The watercourse may not be used as a water source by staff unless water abstraction is approved and permitted by DWA.
24. A spill response procedure must be designed to manage spills during operation. Suitable spill kits must be available and staff must be made aware of the spill response procedure.
25. The Ogunjini Waterworks must not be negatively impacted upon during the construction phase of the proposed development.
26. Continued access to either side of the Umdloti River must be maintained during the construction phase.

Wetland Specialist Recommendations

1. A WULA is required.
2. A permit will be required to damage/disturb or relocate Millettia grandis (Umzimbeet) a tree species listed as protected trees under the National Forests Act (No. 84 of 1998).
3. It is recommended that construction within the uMdloti River system take place in the winter/dry months to reduce erosion and sedimentation risks during the construction phase.
4. A detailed method statement for working within the wetland/aquatic habitats must be compiled in line with the mitigation measures proposed below and in conjunction with the appointed contractor to confirm all methods of wetland encroachment and the most practical and effective steps to minimise the impacts to the aquatic wetland habitat.
5. A construction corridor roughly the width of the road footprint must be demarcated by a surveyor using stakes and orange plastic bonnox fencing. All areas outside of the demarcated area must be considered no-go areas for the duration of the construction phase.

6. Prior to the stripping, infilling, excavation and re-shaping of the wetland/aquatic habitat within the development footprint/corridor, indigenous emergent vegetation within the development footprint should be relocated to a temporary holding area for use in the rehabilitation. Such vegetation should be removed in-situ (with sods).
7. If it is necessary for the piers to be constructed within the in-stream areas, the pier construction sites will need to be dewatered by constructing a coffer dam around the pier site and possibly dewatering the pier site.
8. Stormwater and erosion control measures must be implemented during the construction phase to ensure that erosion and sedimentation impacts to the wetland, riparian and in-stream habitats are minimised and avoided.
9. All alien invasive vegetation that has colonised the construction site must be removed, preferably by uprooting. The contactor should consult the ECO regarding the method of removal.
10. Pollution control measures must be as per the EMPr.
11. Rehabilitation measures to be conducted includes removal of all construction materials from the riparian zone, compacted soils must be loosened, river banks must be protected with biodegradable geofabric eg biojute, re-vegetation of disturbed areas etc (further rehabilitation measures is found on pages 38-39 of the Wetland Report).
12. The contractor must be adequately inducted and educated on the sensitivity of the area.
13. Regular monitoring of construction activities must be conducted.
14. Before any work commences in the river channel, sediment control/silt capture measures (e.g. bidim/silt curtains) must be installed downstream of the working areas within the river.
15. The causeway must be removed in a systematic manner working from the centre moving outwards.
16. Excavation below the current elevation of the river bed must be avoided.
17. All foreign material removed must be stored outside of the riparian areas and later disposed of appropriately at a registered landfill.
18. The bed and banks should be re-shaped to reflect the morphology of the bed and banks upstream and downstream of the existing causeway.
19. Where applicable the construction rehabilitation measures must be implemented during decommissioning.
20. All stormwater infrastructure and associated outlet protection must be maintained by the applicant in perpetuity.
21. Erosion that occurs below the outlets must be rehabilitated during maintenance visits.
22. Educational signs must be established on, or adjacent to, the bridge entrances to educate the local residents on the uMdloti River and prohibitions with regards to solid waste and other hazardous substances.

Vegetation Specialist Recommendations

1. Since the proposed development consists of upgrading the roads from gravel to tar, the major impacts have already been exerted and the additional impacts will occur during construction. Care will need to be taken to prevent erosion and special care when working with sensitive habitats such as river crossings and wetlands.

Heritage Specialist Recommendations

1. There is no archaeological reason why the proposed development may not take place as planned. It should, however, be pointed out that the KwaZulu-Natal Heritage Act requires that operations exposing archaeological and historical residues should cease immediately pending an evaluation by the heritage authorities

SECTION G: APPENDIXES

The following appendixes must be attached as appropriate:

Appendix A: Site plan(s)

Appendix B: Photographs

Appendix C: Facility illustration(s)

Appendix D: Specialist reports

Appendix E: Comments and responses report

Appendix F: Draft Environmental Management Programme (EMPr)

Appendix G: Other information

Appendix A – Locality Map and Site Plan

Appendix B – Site Photos

Appendix C – Facility Illustrations

Appendix D – Specialist Reports

- Heritage Report
- Vegetation Report
- Wetland Report

Appendix E – Comments and Response Table

Appendix F – Environmental Management Programme

Appendix G – Additional Information

Public Participation Process

- Signboards
- Notification of Landowner
- I&AP Notification
- Meeting Register with Ward Councillors and Traditional Leaders
- Distribution of Information signed by ward councillors
- Newspaper adverts
- Registered I&APs
- Notification of release of Draft BAR