



## **FINAL BASIC ASSESSMENT REPORT**

**FOR THE PROPOSED REPLACEMENT OF THE  
NSELENI RIVER BRIDGE NO.261 ON P425 WITH  
PROPOSED RE-ALIGNMENT BETWEEN EMPANGENI  
AND NSELENI; UMHLATHUZE AND MFOLOZI  
MUNICIPALITIES, UTHUNGULU DISTRICT, KZN**



**REFERENCE NUMBER:**

**DC28/0013/2013**

**DATE: 26 JULY 2013**

## Basic Assessment Report



## agriculture, environmental affairs & rural development

Department:  
Agriculture, Environmental Affairs  
& Rural Development  
**PROVINCE OF KWAZULU-NATAL**

(For official use only)

EIA File Reference Number:  
NEAS Reference Number:  
Waste Management Licence Number:  
(if applicable)  
Date Received:

DC28/0013/2013
KZN/EIA/0001150/2013
Not Applicable

## 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 1 or 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 Agriculture, Environmental Affairs and Rural Development. 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 Agriculture, Environmental Affairs and Rural Development may require that for specified types of activities in defined situations only parts of this report need to be completed.

Department of Agriculture, Environmental Affairs & Rural Development, KwaZulu-Natal	Basic Assessment Report 2010 Version 3: April 2011	Page 2 of 51
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## Basic Assessment Report

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 Agriculture, Environmental Affairs and Rural Development 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):	DC28/0013/2013
File reference number (Waste Management Licence):	Not Applicable

## 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:	<b>Triplo4 Sustainable Solutions</b>		
Physical address:	<b>Suite 5, The Circle, Douglas Crowe Avenue, Ballito, 4420</b>		
Postal address:	<b>PO Box 6595, Zimbali</b>		
Postal code:	<b>4418</b>	Cell:	<b>083 308 8003</b>
Telephone:	<b>032 946 3213</b>	Fax:	<b>032 946 0826</b>
E-mail:	<b><a href="mailto:hantie@triplo4.com">hantie@triplo4.com</a></b>		

## 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 (yrs)
<b>Hantie Plomp</b>	<b>Masters Environmental Management</b>	<b>IAIAsa; SACNASP</b>	<b>&gt;15 years</b>
<b>Felicity Swanepoel</b>	<b>BSc Honours Wildlife Management</b>		<b>&gt;2 years</b>
<b>Chen Read</b>	<b>Post Graduate Environmental Management</b>		<b>&gt;3 years</b>
<b>Arlene Singh</b>	<b>BSc Environmental Sciences</b>		<b>&lt;1 year</b>

## 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
<b>Clayton Cook</b>	<b>MSc Zoology BSc Botany &amp; Zoology</b>	<b>Faunal Consultant; Wetland and Riparian Delineations; Zoology</b>	<b>Section C 1-5, as well as Appendix D and Appendix F</b>	<b>PRELIMINARY ECOLOGICAL HABITAT ASSESSMENT FOR THE PROPOSED REPLACEMENT OF</b>

Department of Agriculture, Environmental Affairs & Rural Development, KwaZulu-Natal	Basic Assessment Report 2010 Version 3: April 2011	Page 4 of 51
---	---	--------------

Basic Assessment Report

				THE NSELENI RIVER BRIDGE, KWAZULU-NATAL
Soilkraft cc. IJ Breytenbach and FJ Breytenbach	(Pr. Sci. Nat.) (Pr. Eng.)	Geotechnical Profiling	Appendix D	DRILLING INVESTIGATION FOR THE PROPOSED CONSTRUCTION OF A NEW BRIDGE OVER THE NSELENI RIVER IN KWAZULU-NATAL

## SECTION B: ACTIVITY INFORMATION

### 1. PROJECT TITLE

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

Proposed replacement of the Nseleni River Bridge No 261 on the P425 with alternative re-alignment, situated between Empangeni and Nseleni, Kwa-Zulu Natal.

### 2. PROJECT DESCRIPTION

Provide a detailed description of the project:

The project proposes the replacement of the damaged Nseleni River Bridge on the P425. The existing single lane river bridge is a steel truss that can no longer be deemed structurally adequate for the road class and loading it now carries.

The recommendation is to build a replacement structure adjacent to the old steel truss that uses a slightly revised road alignment. The new road alignment is approximately 13m wide and has a road reserve of 30 m. It is anticipated that the new bridge will be a 3-span post-tensioned box-girder concrete deck (approximately a length of 66m in total) with pier columns either side of the Nseleni River, which has been determined to be the most suitable bridge design when considering its advantages in terms of:

- better hydraulic performance in high floods due to the longer central span;
- less environmental impacts with piers at greater distances from the active river channel and
- aesthetic preference due to the slenderness and span arrangement.

The bridge is designed for two 3,5m wide lanes with 1,5m shoulders and a 1,5m barrier-protected pedestrian walkway. This complies with lane width requirements for the abovementioned Road Class 3 design speed. The Nseleni River valley, at the position where it is crossed by the new P425 alignment, is 12m deep with 30m to 40m between the river banks.

A number of design options were investigated by RHDHV with the three most suitable options given detailed consideration. The three detailed options include three bridge span configurations and two bridge deck types. The road alignment on either side of the bridge approaches were carried out to conform to the design speed whilst minimising the necessary road works.

Due to the existence of the P425, and the desire not to have to realign a large section of the road, it was proposed that a new bridge should be constructed close to the existing structure, and considered two road alignment alternatives for design speeds of 80 km/h and 100 km/h.

The 80 km/h design speed option crossed the river downstream of the existing structure and the 100 km/h option upstream of the existing structure.

Based on the critical role of the P425 between Empangeni and Nseleni, as an emergency alternative route to the N2, and considering possible upgrading of the P425, the 100 km/h upstream option has been adopted for use in all bridge design options included in this bridge report.

## Basic Assessment Report

The new alignment at the bridge approaches caters for a future upgrade of the P425 with a Road Class 3 compliance of 100 km/h design speed.

The bridge was designed so as to avoid placement of piers within the regular flow of the Nseleni River.

### 3. ACTIVITY DESCRIPTION

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

GNR 544: Listing Notice 1, 2010	<b>Activity 11</b>	<p>The construction of canals; channels, bridges, dams, bulk storm water outlet structures and /or 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.</p> <p><b>The construction of a new bridge, road re-alignment and construction platform will take place at / within the river.</b></p>
GNR 544: Listing Notice 1, 2010	<b>Activity 18</b>	<p>The infilling or depositing of any material of more than 5 cubic meters into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5 cubic metres from a watercourse.</p> <p><b>During road and bridge construction materials will be brought in, the platform will be built, erosion protection measures will be implemented and excavations and moving of soil, sand or rock will take place at the river for the pier columns.</b></p>
GNR 544: Listing Notice 1, 2010	<b>Activity 22</b>	<p>The construction of a road, outside urban areas, (i) with a reserve wider than 13,5 meters or, (ii) where no reserve exists where the road is wider than 8 metres.</p> <p><b>The bridge is designed for two 3,5m wide lanes with 1,5m shoulders and a 1,5m barrier-protected pedestrian walkway, therefore making it 13m wide. The new road alignment is approximately 13m wide and has a road reserve of 30 m.</b></p>
GNR 544: Listing Notice 1, 2010	<b>Activity 47</b>	<p>The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre -</p> <p>(i) where the existing reserve is wider than 13,5 meters; or</p> <p>(ii) where no reserve exists, where the existing road</p>

## Basic Assessment Report

		<p>is wider than 8 metres – excluding widening or lengthening occurring inside urban areas.</p> <p><b>The area is not urban. The road will not be lengthened by more than a kilometre, although the alignment between the existing and new re-aligned sections may comprise small areas that will be widened by more than 6m.</b></p>
GN544: Listing Notice 3, 2010	<p><b>Activity 12:</b> The clearance of an area of 300 square metres or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation</p>	<p>(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;</p> <p><b>The proposed new Nseleni Bridge alignment will occur within the riparian zone (high sensitivity) and will require clearing of vegetation. This zone has been highly transformed and degraded by cultivation. This activity was confirmed with EKZN Wildlife.</b></p>

#### 4. FEASIBLE AND REASONABLE ALTERNATIVES

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.

**“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;**

Due to the Nseleni Bridge being built shortly after 1931, it has deteriorated significantly over time. The Nseleni Bridge is well used by the local communities, as they provide access to various social facilities, such as schools (e.g. Mpemvu Primary School and Owen Sithole College of Agriculture). The KZN Department of Transport recognised the need for replacement of Nseleni Bridge as well as the re-alignment of the P425 which will allow for future upgrade of the P425 with a Road Class 3 compliance of 100km/h design speed. This will thereby increase vehicular mobility and improved the commuters’ safety aspects.



Two site alternatives were considered for the replacement bridge:

- 1) Upstream of the current Nseleni Bridge (Preferred alternative)
- 2) Downstream of the current Nseleni Bridge

The preferred position upstream from the current bridge has a smaller environmental footprint. The option of constructing the bridge downstream from the current bridge would result in excessive clearance of vegetation as the density of vegetation increases downstream of the bridge.

No other site alternatives are deemed relevant for this project.

**(b) the type of activity to be undertaken;**

The proposed activities of replacement of the Nseleni Bridge, as well as the re-alignment of a section of P425 are associated with the upgrading project along the P425. Thus, no other activities for any other purposes will be undertaken.

**(c) the design or layout of the activity;**

Multiple design options have been provided for consideration for the replacement of the bridge. The factors affecting the design options proposed were: economy; constructability; safety; structural maintenance; aesthetics; environment and social sustainability. The exact locality of the bridge may also differ between which side of the current bridge it occurs and that will depend on the geometry of the sides, and the side which will have the least impact on the surrounding area.

A total of three different bridge options have been considered in detail for this report namely a:

- 3 Span Continuous Box Girder Deck (20m-26m-20m)
- 2 Span Continuous Box Girder Deck (33m-33m)
- 3 Span Pre-Cast Beam and In situ Deck Slab (22m-22m-22m)

All 3 bridge designs are for two 3,5m wide lanes with 1,5m shoulders and a 1,5m barrier-protected pedestrian walkway.

All bridge designs considered for this report are 66m in total length to suit the Nseleni River waterway. Design alternatives are based on two different construction methodologies (in situ versus pre-cast) and minimising foundations within the river valley (two span versus three span).

**Alternative A1 – 3 Span Continuous Box Girder Deck (Option A – Preferred Alternative)**

The 3 Span Continuous Box Girder deck option is 66m long (20m, 26m, 20m), on a 465 m radius horizontal curve. The proposed deck depth is equal to 1.30 m for a span to depth ratio equal to 20.

## Basic Assessment Report

The pier cross sections are rectangular in shape with rounded edges to accommodate river flow around the pier. Both piers are approximately 14 metres high.

The deck is designed to be integral with the piers with bearings located only at abutments. This arrangement minimizes the difficulty in replacing bearings in piers at a considerable height.

The 3 span continuous box girder bridge design alternative is the most slender and aesthetically pleasing option proposed, and therefore is the preferred alternative.

### **Alternative A2 – 2 Span Continuous Box Girder Deck (Option B)**

The 2 Span Continuous Box Girder option includes 2 equal spans measuring 33 m in length. The deck depth is equal to 1.85 m for a span to depth ratio equal to 18.

The pier cross section is the same as for Option A, with the pier integral with the deck and again the only bearings being at the abutments. The maintenance advantages are the same as for Option A.

This 2 span option reduces costs due to the elimination of one of the pier columns, along with the associated earthworks. These cost savings however result in additional costs due to increased deck depth and post-tensioning.

Considering the economical impact, as well as from an engineering aspect, this alternative is not supported.

### **Alternative A3 – 3 Span Pre-Cast Beam and In Situ Deck Slab (Option C)**

The 3 span pre-cast beam deck arrangement consists of three equal spans of 22 m with I-beams measuring 1.6 m in depth, and a 180 mm thick deck slab. A total of 8 pre-cast beams per span are anticipated.

The pier shape is different from Options A and B, with a wider pier wall and a beam bearing seat cap on the top to accommodate the bearings.

In terms of hydraulic efficiency, the piers will be closer to the centre of the flow for flood conditions when compared to Option A. One of the piers lies closer to the low flow river stream and therefore a higher degree of river diversion would be required than for the other Options.

Whilst this design option minimises the challenges of scaffolding within the Nseleni River valley, it significantly increases constructability drawbacks such as access for the crane and excavations very close to the existing river (possibly warranting and retraining of the river), and therefore, giving the environmental impacts, this option is not supported.

Due to the existence of the P425, and the desire not to have to realign a large section of the road, it was proposed that a new bridge should be constructed close to the existing structure, and considered two road alignment alternatives for design speeds of 80 km/h and 100 km/h.

The 80 km/h design speed option crossed the river downstream of the existing structure and the 100 km/h option upstream of the existing structure.

Department of Agriculture, Environmental Affairs & Rural Development, KwaZulu-Natal	Basic Assessment Report 2010 Version 3: April 2011	Page 10 of 51
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## Basic Assessment Report

Based on the critical role of the P425 between Empangeni and Nseleni, as an emergency alternative route to the N2, and considering possible upgrading of the P425, the 100 km/h upstream option has been adopted for use in all bridge design options included in this bridge report.

The upstream alignment at the bridge approaches caters for a future upgrade of the P425 with a Road Class 3 compliance of 100 km/h design speed. All three bridge options proposed in this report follow the same upstream road alignment and therefore share the same Catchment Area.

No other specific alternatives in terms of layout or design were considered.

### **(d) the technology to be used in the activity;**

The following technology methods will be used:

- A new two lane (3,5m wide with 1,5m shoulders), three span ( 20m-26m-20m) continuous in-situ box girder concrete deck (total length of 66m) upstream and immediately adjacent to the old steel truss.
- Pier cross sections, rectangular in shape with rounded edges to accommodate river flow around the pier. Both piers are approximately 14 metres high.
- Ancillary components forming part of the proposed structures:
  - In situ vehicle barriers on the deck edge and before the sidewalk, matching KZN DoT's (and SANRAL's) existing standards and design procedure (revised 2012).
  - 1,5m barrier-protected pedestrian sidewalk on one side of the bridge.
  - Bearings and expansion joints.

No other specific alternatives in terms of technology were considered.

### **(e) the operational aspects of the activity; and**

The operational aspects relate to the usage of the new improved design, constructed and maintained new bridge and road alignment which in turn will improve mobility, environmental and health conditions and accessibility to social facilities for the local communities. No alternatives exist.

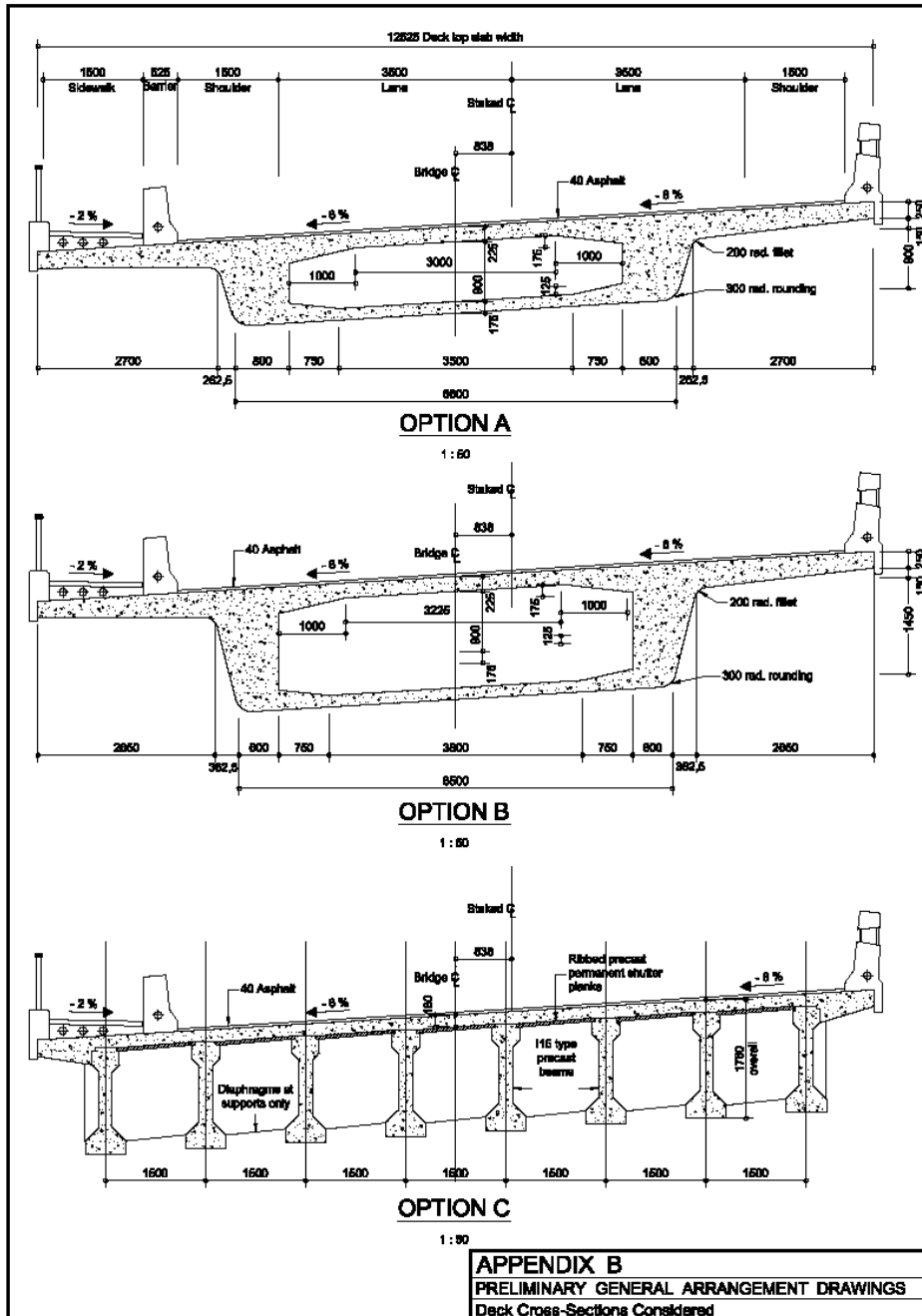
### **(f) the option of not implementing the activity.**

The no-go option will entail the maintaining of the status quo namely a poor and inadequate bridge structure and road class, lack of adequate mobility and accessibility. The bridge structure is deteriorating at an alarming speed as the local community is dismantling the steel structures such as railings. Crossing the bridge on foot is highly dangerous as the pedestrian is left with a choice of walking in the one lane road or on the narrow bridge walkway without any railings. There is no alternative pedestrian crossing in the vicinity.

## Basic Assessment Report

Overall, not replacing the Nseleni River Bridge and accompanied re-alignment will not comply with DoT standards, and the social, environmental and economic benefits for the local communities and businesses will not be realised, as the degraded quality of the local community life style and the natural environment will remain unchanged.

Given the afore-mentioned, the “No-Go” alternative have very real and significant negative environmental, social and economic impacts and the significant positive environmental, social and economic impacts that will result from the upgrades will not be realised. Thus the no-go option is not supported.



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.

**The activity is to take place 11,3km north east of Empangeni and links the said town to the villages of Lubana and Mabuyeni.**

Alternative:	Latitude (S):			Longitude (E):		
	28°	39'	20.39"	31°	56'	48.97"
Alternative S1 <sup>1</sup> (preferred or only site alternative)						
Alternative S2 (if any)						
Alternative S3 (if any)						

**In the case of linear activities: This is not a linear activity**

Alternative:	Latitude (S):	Longitude (E):
Alternative S1 (preferred or only route alternative)		
• Starting point of the activity		
• Middle point of the activity		
• End point of the activity		
Alternative S2 (if any)		
• Starting point of the activity		
• Middle point of the activity		
• End point of the activity		
Alternative S3 (if any)		
• Starting point of the activity		
• Middle point of the activity		
• End point of the activity		

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.

## 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 <sup>2</sup> (preferred activity alternative)	5825m <sup>2</sup>
Alternative A2 (if any)	
Alternative A3 (if any)	

<sup>1</sup> "Alternative S.." refer to site alternatives.

<sup>2</sup> "Alternative A.." refer to activity, process, technology or other alternatives.

or, for linear activities:

**Alternative:**

Alternative A1 (preferred activity alternative)  
 Alternative A2 (if any)  
 Alternative A3 (if any)

**Length of the activity:**



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

**Alternative:**

Alternative A1 (preferred activity alternative)

**Size of the site/servitude:**

Being part of the P425 road upgrade, all structures and alignments will have a similar servitude as the road, namely 30 m

Alternative A2 (if any)  
 Alternative A3 (if any)

**7. SITE ACCESS**

Does ready access to the site exist?

YES

If NO, what is the distance over which a new access road will be built

Describe the type of access road planned:

Access already occurs to both sides of the bridge in the form of the P425; however realignment leading up to the bridge on both sides will be required.  
 Due to dense vegetation and the steepness where the bridge is to be built conditions of difficult to very difficult access applies.  
 A working platform, vegetation clearing and earthworks will be required to allow access to construction activities. No objections were received from the landowners in terms of access to the river construction site immediately adjacent to the P425.

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;

## Basic Assessment Report

- 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;
- 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): (Andrew Mather Report has a map)
  - 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?
- What is the expected yearly income that will be generated by or as a result of the activity?
- Will the activity contribute to service infrastructure?
- Is the activity a public amenity?
- How many new employment opportunities will be created in the development phase of the activity?

What is the expected capital value of the activity on completion?	R25 million
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
Is the activity a public amenity?	YES
How many new employment opportunities will be created in the development phase of the activity?	Approx. 30 labours, including 6 Nat. Youth Service Progr. learners

## Basic Assessment Report

What is the expected value of the employment opportunities during the development phase?	Approx. R880,000
What percentage of this will accrue to previously disadvantaged individuals?	95%
How many permanent new employment opportunities will be created during the operational phase of the activity?	N/A
What is the expected current value of the employment opportunities during the first 10 years?	N/A
What percentage of this will accrue to previously disadvantaged individuals?	N/A

**Please note:**

It is envisaged that this project is a suitable scale and budget for implementing the National Youth Services Programme for 6 young learners in an 8 to 12 month programme. Included in this Bridge Report is a cost estimate for National Youth Service implementation that includes the following:

Description	Rate Estimate	Total
Employment of NYS youth workers	R110 / day	R150,000
COIDA payments	R10,000	
Liaising with NYS programme manager and training service provider	R300 / hour	R35,000
Tools for NYS workers	R10,000	R10,000
EPWP & NYS signboard	R3,500	R3,500
Costs of programme manager and training service provider	R22,500 / month	R225,000
Handling costs	10%	R 19,925
<b>(10 months) SUM TOTAL</b>	<b>R453 ,425</b>	

### 11.2. Need and desirability of the activity

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

The existing single lane river bridge is a steel truss built shortly after 1931, that has deteriorated over time and become structurally inadequate and unsafe. The bridge is currently being used by the local community on a daily basis as it serves as a link to various social amenities such as schools and other towns such as Empangeni and Nseleni.

The new bridge will not only offer a safer crossing but will also be adequate for the upgrade planned for the P425. The P425 serves as an alternate emergency route to the N2, the re-alignment of the road will thereby increase the design speed to 100km/h.

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

Benefits of the bridge for society will include a far safer and more efficient means of traversing the Nseleni River. It will further serve to demonstrate to the local communities that structures are in place and plans are being implemented aimed at benefitting and assisting them. It will also demonstrate that government and local leaders are trying to improve living standards and quality of life for all South Africans. Where suitable, labour-intensive construction practices will be implemented.



## Basic Assessment Report

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

The bridge will not only provide the local communities with a safer crossing but it will also provide contract workers with added employment opportunities during the construction phase of the activity. The improved connectivity will give the local community members greater access to important road networks within the region, allowing them to get to jobs, employment opportunities and school facilities in a timely and easier manner. Also by implementation of the National Youth Services Programme, 6 young learners from the area will be provided with an income as well as training during the project, which they can then use to acquire future working opportunities.

### 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 No. 107 of 1998	National & Provincial	1998
EIA Regulations, 2010	National & Provincial	02 Aug 2010
Constitution of the Republic of South Africa	National, Provincial and Local Government	1996
National Environmental Management: Waste Act (No 59 of 2008)	National & Provincial and Tourism	2008
National Water Act (No 36 of 1998) and regulations	Department of Water Affairs	1998
National Road Traffic Act	Provincial – Department of Transport	93 of 1996
The Development Planning Act (No 6 of 2008)	National, Provincial and Local Government	2008
Occupational Health and Safety Act (No. 85 of 1993)	Department of Labour	1993
Hazardous Substances Act (15 of 1973)	Department of Health	1973
Provincial, District and Local Municipal Guidelines and Standards	National, Provincial and Local Government	As Implemented
Conservation of Agriculture Resources	National	1983
National Environmental Management: Biodiversity Act	National	2004
National Water Act	National	1998
National Water Resources Strategy	National	2004
National Forest Act	Nation	1998
National Environmental Management: Air Quality Act	National and Provincial	2008

### 13. WASTE, EFFLUENT, EMISSION AND NOISE MANAGEMENT

The construction of the bridge is based on a standard construction method. On completion of the bridge, there will be no generation of waste, effluent or noise during operation.

#### 13.1. Solid waste management

Will the activity produce solid construction waste during the construction/initiation phase?	YES	<input checked="" type="checkbox"/>
If yes, what estimated quantity will be produced per month?	Approx 6m <sup>3</sup>	

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

The solid waste, of which building rubble is expected to be the largest percentage, will be generated during the construction phase. The waste will be recycled or reused whenever possible and the rest disposed to the registered waste disposal site so as to avoid the pollution of surrounding areas. Small amounts of hazardous waste such as discarded oil or grease may be generated on site. Hazardous waste will be disposed of at an appropriately licensed and registered hazardous waste disposal facility. Waste management will be dealt with more extensively within the EMPr for the different phases of the project.

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

The general waste produced will be disposed and the relevant registered Municipal waste facility. In the unlikely event that hazardous wastes are produced these will be collected by a competent waste handling contractor and disposed of at the uThungulu Regional Landfill Site which is the closest to the site.

Will the activity produce solid waste during its operational phase?	<input checked="" type="checkbox"/>	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)

N/A

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

N/A

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?	<input checked="" type="checkbox"/>	NO
--	-------------------------------------	----

**If yes, contact the KZN Department of Agriculture, Environmental Affairs and Rural Development 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?	<input checked="" type="checkbox"/>	NO
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**If yes, contact the KZN Department of Agriculture, Environmental Affairs and Rural Development 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?	<input checked="" type="checkbox"/>	NO
If yes, what estimated quantity will be produced per month?	N/A m <sup>3</sup>	
Will the activity produce any effluent that will be treated and/or disposed of on site?	<input checked="" type="checkbox"/>	NO

**If yes, contact the KZN Department of Agriculture, Environmental Affairs and Rural Development 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?	<input checked="" type="checkbox"/>	NO
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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:

The proposed bridge upgrades will NOT produce any liquid effluent. Toilet facilities will be provided by the contractor in the way of chemical toilets. Disposal of sewage from the chemical toilet will be done by the sub-contractor who provides these facilities.

**13.3. Emissions into the atmosphere**

Will the activity release emissions into the atmosphere?	YES	<input checked="" type="checkbox"/>
If yes, is it controlled by any legislation of any sphere of government?	<input checked="" type="checkbox"/>	NO

**If yes, contact the KZN Department of Agriculture, Environmental Affairs and Rural Development to obtain clarity regarding the process requirements for your application.**

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

Limited dust liberation and emissions during construction phase due to the off-loading of construction materials, such as sand and cement, movement of construction vehicles and clearing and construction activities associated with the establishment of the bridge and related surrounding infrastructure and road re-alignment.

Emissions generated will be in the form of dust, carbon dioxide and other vehicle emissions generated by diesel powered machinery and trucks during the construction process i.e. tip trucks, TLB's, excavators and dust from the movement of the construction vehicles. These emissions will be composed primarily of CO<sup>2</sup> and will be of a low concentration.

Dust generation can be mitigated by either water spraying and / or dust suppressants. The speed of construction vehicles and other vehicles should be strictly controlled to avoid excessive dust generation.

**13.4. Generation of noise**

Will the activity generate noise?

YES	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	NO

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

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:

- During the construction phase noise associated with normal construction activities i.e. vehicles, generators and plant equipment will be used on the site.
- Noise levels are to be kept within the legislated limits for the area, in accordance with the requirements of the relevant national and local noise control statutes (i.e. SANS 10103 which specifies the required noise levels in rural residential areas and sensitive noise receptors such as schools).
- The noise generated will be limited to daylight hours during workdays for the duration of the construction phase and is not anticipated to cause long term negative impacts.
- Other noise disruptions could potentially be experienced during the construction phase through activities such as drilling or jack-hammering. This will be a temporary disturbance and it the ambient noise generated is expected to be well below 85dBA (Occupational Health and Safety Act, 1993; Environmental Regulations for Workplaces, 1987, Noise and Hearing Conservation from SABS 083-1983) at potential receptor sites.
- Measures to minimise noise generation during construction are contained in the EMP.

**14. WATER USE**

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

municipal	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
-----------	-------------------------------------	-------------------------------------	-------------------------------------	-------------------------------------	-------------------------------------

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:

N/A Litres	
YES	<input checked="" type="checkbox"/>

Does the activity require a water use permit from the Department of Water Affairs?

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

Water used on site will be mainly for dust suppression. It is not likely that more than one water cart will be used per day during construction (i.e.10 000L).

Following an enquiry, The Department of Water Affairs confirmed that no water use licence is required, as general authorisation is sufficient, under section 21 c & i.

**15. ENERGY EFFICIENCY**

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

Preservation of the existing bridge is a low energy, cost-effective and environmentally low-impact option. Additionally, this is favoured as it adds a contrasting aesthetic component to the new structure and maintain historical features associated with the area.

In terms of energy efficiency, the proposed replacement of the bridge should be undertaken during normal working hours to reduce the use of artificial lighting. Additionally, The contractor will be advised to transport all construction materials on site at the same time where possible and the collection of waste material conducted simultaneous with other activities to reduce the amount fuel usage for such transportation.

Waste management methods (i.e. recycling and reusing), as well as water and biodiversity conservation measures and sourcing local materials are recommended and are included in the EMPr.

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

Lower resource consumption as a result of the choice of bridge design also equate to lower energy consumption. Once the construction has been completed no further energy will be required for the operation of the bridge.

## 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):

- 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						Steeper than 1:5
------	--	--	--	--	--	------------------

#### Alternative S2 (if any):

Flat						Steeper than 1:5
------	--	--	--	--	--	------------------

#### Alternative S3 (if any):

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The topography of the area is varied from flat ground (road re-alignment) to very steep slopes toward the river bottom.

## Basic Assessment Report

### 2. LOCATION IN LANDSCAPE

Indicate the landform(s) that best describes the site (Please cross the appropriate box).

**Alternative S1 (preferred site):**

<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Open valley	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
-------------------------------------	-------------------------------------	-------------------------------------	-------------------------------------	-------------------------------------	-------------	-------------------------------------	-------------------------------------	-------------------------------------	-------------------------------------

**Alternative S2 (if any):**

<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Open valley	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
-------------------------------------	-------------------------------------	-------------------------------------	-------------------------------------	-------------------------------------	-------------	-------------------------------------	-------------------------------------	-------------------------------------	-------------------------------------

**Alternative S3 (if any):**

<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
-------------------------------------	-------------------------------------	-------------------------------------	-------------------------------------	-------------------------------------	--	-------------------------------------	-------------------------------------	-------------------------------------	-------------------------------------

### 3. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

Has a specialist been consulted for the completion of this section?

YES	<input checked="" type="checkbox"/>
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If YES, please complete the following:

Name of the specialist:	IJ Breytenbach and FJ Breytenbach		
Qualification(s) of the specialist:	(Pr. Sci. Nat.) and (Pr. Eng.)		
Postal address:	PO Box 73478 Lynnwood Ridge		
Postal code:	0040		
Telephone:	012-9910426	Cell:	
E-mail:	soilkraft02@iburst.co.za	Fax:	012-9912555

Are there any rare or endangered flora or fauna species (including red data species) present on any of the alternative sites?

<input checked="" type="checkbox"/>	NO
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If YES, specify and explain:

--	--

Are there any special or sensitive habitats or other natural features present on any of the alternative sites?

<input checked="" type="checkbox"/>	YES
-------------------------------------	-----

If YES, specify and explain:

The site is very densely vegetated and is characterised by a steep gradient. Groundwater is expected to be present and may occur as ingress water from the valley sidewalls. Founding conditions are likely to be below groundwater level. The bridge site is situated on basaltic bedrock. Please refer to more information below, as well as the full specialists report, Appendix D.	
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Are any further specialist studies recommended by the specialist?

<input checked="" type="checkbox"/>	NO
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If YES, specify:

--	--

If YES, is such a report(s) attached in Appendix D?

<input checked="" type="checkbox"/>	
-------------------------------------	--

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	<input checked="" type="checkbox"/>	YES	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Dolomite, sinkhole or doline areas	<input checked="" type="checkbox"/>	NO	<input checked="" type="checkbox"/>	NO	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Seasonally wet soils (often close to water bodies)	YES	<input checked="" type="checkbox"/>	YES	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Unstable rocky slopes or steep slopes with loose soil	YES	<input checked="" type="checkbox"/>	YES	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Dispersive soils (soils that dissolve in water)	<input checked="" type="checkbox"/>	NO	<input checked="" type="checkbox"/>	NO	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Soils with high clay content (clay fraction more than 40%)	<input checked="" type="checkbox"/>	NO	<input checked="" type="checkbox"/>	NO	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

## Basic Assessment Report

Any other unstable soil or geological feature	<input type="checkbox"/>	NO	<input type="checkbox"/>	NO	<input type="checkbox"/>	<input type="checkbox"/>
An area sensitive to erosion	YES	<input type="checkbox"/>	YES	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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).

A geotechnical investigation was carried out by Enviro Geotech Drilling Services, with Soilkraft responsible for compiling the geotechnical report in January 2013 for the proposed Nseleni Bridge. The geotechnical Investigation found that the site is geotechnically suitable for the construction of the bridge provided that the recommendations given in the report are adhered to. These recommendations specifically highlighted various aspects of the construction process whereby certain methodologies and precautions must be employed. These recommendations specifically referred to the earthworks, Excavatability, proposed cuts & fills, foundations / founding, slope stability, stormwater, and erosion potential. The recommendations have been summarised below and the full recommendations can be found in the geotechnical report in appendix C.

- Results from the fieldwork tests indicated that the site is characterised by slightly weathered basalt bedrock located at the base of boreholes. This is deemed the best option for founding, other horizons were discounted from contention for quality of safety reasons.
- The geotechnical report suggests the use of “rota piles”, and consultation with drilling experts to best determine an economical solution.
- After consultation with an experienced drilling expert, it is believed that continuous flight auger CFA piling should be adequate to penetrate the highly basaltic layers.
- The geotechnical report recommends socketing into the basalt layer and it is believed that anchoring into the basalt bedrock layer via dowels can achieve the required effect.

### 4. GROUND COVER

Has a specialist been consulted for the completion of this section? YES

If YES, please complete the following:

Name of the specialist:	Clayton Cook		
Qualification(s) of the specialist:	MSc Zoology (UP) Pr.Sci.Nat 400084/08		
Postal address:	PO Box 39357; Uvongo		
Postal code:	4270		

Telephone:		Cell:	
E-mail:	giant.bullfrog@gmail.com	Fax:	

Are there any rare or endangered flora or fauna species (including red data species) present on any of the alternative sites?  NO

If YES, specify and explain:

Are there any special or sensitive habitats or other natural features present on any of the alternative sites? YES

If YES, specify and explain:

The river and associated Subtropical Alluvial riparian zone are considered to be of conservation importance. The Nseleni River and associated riparian zone is protected under the National Water Act 36 of 1998. However, high levels of habitat degradation occur around the area with wood harvesting, rock removal, sand harvesting, alien invasive plant vegetation as well as extensive overgrazing and soil erosion.





Are any further specialist studies recommended by the specialist?  NO

## Basic Assessment Report

If YES, specify:   
 If YES, is such a report(s) attached in Appendix D?

Signature of specialist:  Date: 30 March 2013













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

	Natural veld with scattered aliens <sup>E</sup>			
	Cultivated land			

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.

### 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		The river and associated Subtropical Alluvial riparian zone are considered to be of conservation importance. The Nseleni River and associated riparian zone is protected under the National Water Act 36 of 1998. High levels of habitat degradation do however occur around the area with wood harvesting, rock removal, sand harvesting, alien invasive plant vegetation as well as extensive overgrazing and soil erosion.
Low density residential	YES		There are a number (<10) of small rural households within a 500m radius of the site.
Medium density residential		NO	
High density residential		NO	
Informal residential		NO	
Retail commercial & warehousing		NO	
Light industrial		NO	
Medium industrial		NO	
Heavy industrial		NO	
Power station		NO	
Office/consulting room		NO	
Military or police base/station/compound		NO	
Department of Agriculture, Environmental Affairs & Rural Development, KwaZulu-Natal	Basic Assessment Report 2010 Version 3: April 2011		Page 24 of 51



## Basic Assessment Report

Land use character			Description
Spoil heap or slimes dam	■	NO	
Quarry, sand or borrow pit	■	NO	
Dam or reservoir	YES	■	Crystal Dam, situated in a distance, behind the sugar-cane plantations
Hospital/medical centre	■	NO	
School/ creche	YES	■	Mpemvu Primary School
Tertiary education facility	YES	■	Owen Sithole College of Agriculture
Church	■	NO	
Old age home	■	NO	
Sewage treatment plant	■	NO	
Train station or shunting yard	■	NO	
Railway line	■	NO	
Major road (4 lanes or more)	■	NO	
Airport	■	NO	
Harbour	■	NO	
Sport facilities	■	NO	
Golf course	■	NO	
Polo fields	■	NO	
Filling station	■	NO	
Landfill or waste treatment site	■	NO	
Plantation	YES	■	The adjacent areas are dominated by extensive sugar-cane plantations
Agriculture	YES	■	
River, stream or wetland	YES	■	The activity takes place over the Nseleni River.
Nature conservation area	■	NO	
Mountain, hill or ridge	■	NO	
Museum	■	NO	
Historical building	■	NO	
Protected Area	■	NO	
Graveyard	■	NO	
Archaeological site	YES	■	<p>The original Nseleni Bridge is older than 60 years old.</p> <p>Based on the structure's original design drawings, the existing steel truss bridge appears to have been designed or constructed in the 1930s to 1940s. If the structure is in fact older than 60 years, the structure should be considered a protected structure as per the South African Heritage Resources Agency.</p> <p>To this end, it is proposed that the existing steel truss bridge not be demolished. Preserving the structure adjacent to the new bridge provides both aesthetic and historical value.</p> <p>It is recommended that upon completion of the new bridge, the existing bridge be closed to vehicle and pedestrian traffic whilst adding educational signboard info with historical information about the site as applicable.</p>

## Basic Assessment Report

Land use character			Description
Other land uses (describe)	[REDACTED]	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	[REDACTED]
-----	------------

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:

The Background Information Document and the Draft BAR has been submitted to Amafa. Amafa has requested a Heritage Impact Assessment Report by an appointed Amafa accredited Heritage Practitioner.
--

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

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

[REDACTED]	NO
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If YES, please submit the necessary application to AMAFA and attach proof thereof to this report.

Based on the structure's original design drawings, the existing steel truss bridge appears to have been designed or constructed in the 1930s to 1940s. If the structure is in fact older than 60 years, the structure should be considered a protected structure as per the South African Heritage Resources Agency.

To this end, it is proposed that the existing steel truss bridge not be demolished. Preserving the structure adjacent to the new bridge provides both aesthetic and historical value.

It is recommended that upon completion of the new bridge, the existing bridge be closed to vehicle and pedestrian traffic whilst adding educational signboard info with historical information about the site as applicable.

## SECTION D: PUBLIC PARTICIPATION

### 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;

**Site notices was placed in Zulu and English at The Nseleni River Bridge (both sides), the entrance to the Owen Sithole College of Agriculture and the Empangeni Library. Refer to photographic proof - Appendix E.**

- (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;

**Refer to Appendix E – I&AP List and proof of compliance and Appendix G – Landowner Notice as well as minutes of the meeting held with Tongaat Hulett’s Farm Manager.**

- (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;

**Advert was placed in Zululand Fever on 17 May 2013. Refer to appendix E for proof.**

- (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 Agriculture, Environmental Affairs and Rural Development in terms of the EIA Regulations, 2010;(ii)

Department of Agriculture, Environmental Affairs & Rural Development, KwaZulu-Natal	Basic Assessment Report 2010 Version 3: April 2011	Page 27 of 51
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- (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.

**Refer to advert and notices.**

### 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 Agriculture, Environmental Affairs and Rural Development 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.

**Refer to Appendix E**

### 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

## Basic Assessment Report

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):

No comment received to date. The draft BAR has been submitted as will the Final Basic Assessment Report.

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):

Comments of Background Information Document:

**UMhlathuze Municipality** - I have no objection with this construction works as the steel structure is not in a good condition and on its last legs, it will improve the road safety, pedestrian safety and riding quality. Refer to issues trail.

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):

Ingonyama Trust signed the landowners notice. The BID was submitted, but no further comment was received.

## 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):

Gerry Barry (Farm Manager of Crystal Holdings, the landowners) had requested an on-site meeting with Triplo4 Sustainable Solutions and Royal HaskoningDHV, to gain more insight into how the proposed new bridge replacement could potentially affect the operations of Tongaat Hulett.

Mr Barry indicated that Crystal Holdings has no objections to the project as it was in the best interests of the public / community. Mr Barry indicated that compensation regarding land lost should be paid out to The AFGRI Group and Tongaat Hulett per hectare of land lost. Off-set was discussed and included compensation of land or replacement of lost land with land gained by the rehabilitation of the existing road.

Royal HaskoningDHV are to survey the area of agricultural land that will affected/lost by the project and provide the relevant information to Mr Barry to enable Crystal Holdings to quantify the compensation.

Please refer to Appendix G: Other Information- Minutes of Meeting with Crystal Holdings

## 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 principle objection by Tongaat Hulett. Compensation sought for loss of plantation footprint.

Department of Agriculture, Environmental Affairs & Rural Development, KwaZulu-Natal	Basic Assessment Report 2010 Version 3: April 2011	Page 29 of 51
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## Basic Assessment Report

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):

Support noted. Compensation being negotiated.

### 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

#### THE SIGNIFICANCE OF IMPACTS WILL BE RATED FROM LOW TO HIGH WHERE:

**LOW** = Little influence on the receiving environment

**MEDIUM** = Will have an influence on the receiving environment unless mitigated

**HIGH** = Will have an influence on the receiving environment regardless of mitigation

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

##### a. Site alternatives

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

##### Alternative S1 (Upstream of current Nseleni Bridge - preferred alternative):

###### Direct impacts:

Aspect / Impact	Significance
Logistic arrangement - inappropriate resource planning and infrastructure design	Medium
Potential for environmental impacts (degradation, resource consumption, pollution, etc)	Medium
Risk of incorrect site layout	Medium-High
Increased ecological disturbance to fauna and flora	Medium
Labour intensive procedures may not be fully considered	Medium- High
Removal of invader plants through proper identification and recommendations.	Medium (Pos)

###### Indirect impacts:

Aspect / Impact	Significance
Creation of employment opportunities for local community (Temporary)	Medium (Pos)
Provision of adequate bridge structure, to improve the road safety, pedestrian safety and riding quality	Med (Pos)

###### Cumulative impacts:

Aspect / Impact	Significance
Environmental impact on sensitive areas	Medium
Uplifting of local communities conditions	Medium-High ( Pos)

##### Alternative S2 Downstream of current Nseleni Bridge:

###### Direct impacts:

Aspect / Impact	Significance
Logistic arrangement - inappropriate resource planning and infrastructure design	Medium
Potential for environmental impacts (degradation, resource consumption, pollution, etc)	Medium-High

## Basic Assessment Report

Risk of incorrect site layout	Medium-High
Increased ecological disturbance to fauna and flora	Medium-High
Labour intensive procedures may not be fully considered	Medium- High
<b>Indirect impacts:</b>	
<b>Aspect / Impact</b>	<b>Significance</b>
Creation of employment opportunities for local community (Temporary)	Medium (Pos)
Provision of adequate bridge structure, to improve the road safety, pedestrian safety and riding quality	Med (Pos)
<b>Cumulative impacts:</b>	
<b>Aspect / Impact</b>	<b>Significance</b>
Additional infrastructure requirements and increased footprint	Medium-High
Increases environmental impact on sensitive areas	Medium-High
Destabilisation of riparian vegetation during bridge construction	Medium- High
Uplifting of local communities conditions	Medium-High ( Pos)

### No-go alternative (compulsory)

<b>Direct impacts:</b>	
<b>Aspect / Impact</b>	<b>Significance</b>
Safety of travelling on the unsafe bridge remains unchanged	Medium-High
Loss of social and economic benefits associated with the upgrade of the bridge	Medium
Risk of damage to persons and vehicles travelling on or around the current bridge	Medium- High
Bridge will not meet upgraded Road Class 3 upgrade specifications	High
<b>Indirect impacts:</b>	
<b>Aspect / Impact</b>	<b>Significance</b>
A number of potential temporary employment opportunities will not be realised	Medium- High
Traffic congestion if used as emergency alternative route	Medium-High
<b>Cumulative impacts:</b>	
<b>Aspect / Impact</b>	<b>Significance</b>
Loss of social and economic benefits associated with the investment in the area	Medium

Indicate mitigation measures to manage the potential impacts listed above:

Aspect / Impact	Mitigation	Significance after mitigation
Logistic arrangement	<ul style="list-style-type: none"> <li>▪ Use existing P425 as far as possible</li> </ul>	Low-Medium
Potential - environmental impacts (sensitive areas)	<ul style="list-style-type: none"> <li>▪ Conduct Specialists studies and BA process / provide technical input</li> <li>▪ Ensure liaison with authorities and stakeholders</li> <li>▪ Conduct assessment and identify alternatives and mitigation measures</li> <li>▪ Select appropriate bridge design and locality;</li> <li>▪ Ensure development and implementation of EMPr and compliance to conditions of environmental requirements, licenses and authorisations</li> <li>▪ Prior to construction, temporally fences should be erected in such a manner to prevent access and damage to any sensitive areas identified</li> </ul>	Medium
Employment	<ul style="list-style-type: none"> <li>▪ Source employment from local community</li> </ul>	Medium-High

## Basic Assessment Report

Traffic congestion and safety	<ul style="list-style-type: none"> <li>▪ Design 2 lane bridge with appropriate alignment and safety features</li> </ul>	
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### b. Process, technology, layout or other alternatives

List the impacts associated with any process, technology, layout or other alternatives that are likely to occur during the planning and design phase (please list impacts associated with each alternative separately):

#### Alternative A1: 3 Span Continuous Box Girder Deck - preferred alternative

<b>Direct impacts:</b>	
Aspect / Impact	Significance
Decreased ecological footprint	Medium(Pos)
Cost of establishment	Medium- High
Greater hydraulic performance	Medium(Pos)
Increased storm water runoff due to temporary increase in cleared slopes and an increase in hardened surfaces	Medium- High
Destabilisation of riparian vegetation during bridge construction	Medium-High
<b>Indirect impacts:</b>	
Aspect / Impact	Significance
Health and Safety risks to the public and employees during the construction phase	Low-Medium
Removal of invader plants through proper identification and recommendations.	Medium (Pos)
<b>Cumulative impacts:</b>	
Aspect / Impact	Significance
Aesthetically appealing	Medium-High (Pos)
Risk of flooding	Medium-High

#### Alternative A2: 2 Span Continuous Box Girder Deck

<b>Direct impacts:</b>	
Aspect / Impact	Significance
Loss of infrastructure due to erosion and storm events	Medium- High
Cost of establishment	Medium- High
Increased storm water runoff due to an increase in bare surfaces	Medium- High
Destabilisation of riparian vegetation during bridge construction	Medium-High
<b>Indirect impacts:</b>	
Aspect / Impact	Significance
Health and Safety risks to the public and employees during the construction phase	Low-Medium
Removal of invader plants through proper identification and recommendations.	Medium (Pos)
<b>Cumulative impacts:</b>	
Aspect / Impact	Significance
Undesirable aesthetic appearance	Medium-High
Risk of flooding	Medium-High

#### Alternative A3 (if any) 3 Span Pre-Cast Beam and In Situ Deck Slab

<b>Direct impacts:</b>	
Aspect / Impact	Significance
Increased diversion of the Nseleni River	Medium- High
Cost of establishment	Medium- High



## Basic Assessment Report

Increased storm water runoff due to an increase in bare surfaces	Medium- High
Destabilisation of riparian vegetation during bridge construction	Medium-High
<b>Indirect impacts:</b>	
<b>Aspect / Impact</b>	<b>Significance</b>
Health and Safety risks to the public and employees during the construction phase	Low-Medium
Removal of invader plants through proper identification and recommendations.	Medium (Pos)
<b>Cumulative impacts:</b>	
<b>Aspect / Impact</b>	<b>Significance</b>
Risk of flooding	Medium- High

### No-go alternative (compulsory)

<b>Direct impacts:</b>	
<b>Aspect / Impact</b>	<b>Significance</b>
Safety of travelling on the unsafe bridge remains unchanged	Medium-High
Loss of social and economic benefits associated with the upgrade of the bridge	Medium
Risk of damage to persons travelling on or around the current bridge	Medium- High
Bridge will not meet upgraded Road Class 3 upgrade specifications	High
<b>Indirect impacts:</b>	
<b>Aspect / Impact</b>	<b>Significance</b>
A number of potential temporary employment opportunities will not be realised	Medium
Traffic congestion if used as emergency alternative route	Medium-High
<b>Cumulative impacts:</b>	
<b>Aspect / Impact</b>	<b>Significance</b>
Loss of social and economic benefits in the community due to the upgraded road and bridge	Medium

Indicate mitigation measures to manage the potential impacts listed above:

### Alternative A1: 3 Span Continuous Box Girder Deck - preferred alternative

<b>Direct impacts:</b>		
<b>Aspect / Impact</b>	<b>Mitigation</b>	<b>Significance after Mitigation</b>
Loss of infrastructure due to erosion or storm events	<ul style="list-style-type: none"> <li>▪ Ensure appropriate design and construction by reputable companies</li> <li>▪ Ensure proper planning of storm water systems on site.</li> <li>▪ Possible use of a geotextile over bare surfaces during construction and until stabilization of the banks has taken place.</li> <li>▪ Proper placement of stockpiles, away from the steep slopes.</li> </ul>	Low-Medium
Cost of establishment	<ul style="list-style-type: none"> <li>▪ Ensure appropriate funding and selection of cost effective option.</li> </ul>	Low
Potential for environmental impacts	<ul style="list-style-type: none"> <li>▪ Consider environmental impacts (water requirements, energy usage, etc) and select process with acceptable impact / risk and mitigation measures</li> <li>▪ Follow the EMPr commitments</li> </ul>	Low-Medium
Increased storm water runoff due to an increase in hardened surfaces	<ul style="list-style-type: none"> <li>▪ Design and ensure adequate drainage to the storm water system</li> </ul>	Low
<b>Indirect impacts:</b>		

## Basic Assessment Report

Aspect / Impact	Mitigation	Significance after Mitigation
Health and Safety risks to the public and employees during the construction phase	<ul style="list-style-type: none"> <li>▪ Appoint H&amp;S Officer</li> <li>▪ Make sure that the excavated areas are properly demarcated, and public access is prevented</li> </ul>	Low
<b>Cumulative impacts:</b>		
Aspect / Impact	Mitigation	Significance after Mitigation
Flooding	<ul style="list-style-type: none"> <li>▪ Conduct hydraulic assessment and determine freeboard requirements;</li> <li>▪ Design requirement: maximum flood level not to exceed shoulder break point (SBP) level.</li> </ul>	Low

### Alternative A2 : 2 Span Continuous Box Girder Deck

<b>Direct impacts:</b>		
Aspect / Impact	Mitigation	Significance after Mitigation
Loss of infrastructure due to erosion or storm events	<ul style="list-style-type: none"> <li>▪ Ensure appropriate design and construction by reputable companies</li> <li>▪ Ensure proper planning of storm water systems on site.</li> <li>▪ Possible use of a geotextile over bare surfaces during construction and until stabilization of the banks has taken place.</li> <li>▪ Proper placement of stockpiles, away from the steep slopes.</li> </ul>	Low-Medium
Cost of establishment	<ul style="list-style-type: none"> <li>▪ Ensure appropriate funding and design selection.</li> </ul>	Low
Potential for environmental impacts	<ul style="list-style-type: none"> <li>▪ Consider environmental impacts (water requirements, energy usage, etc) and select process with acceptable impact / risk and mitigation measures</li> <li>▪ Follow the EMPr commitments</li> </ul>	Low-Medium
Increased storm water runoff due to an increase in hardened surfaces	<ul style="list-style-type: none"> <li>▪ Design and ensure adequate drainage to the storm water system</li> </ul>	Low
<b>Indirect impacts:</b>		
Aspect / Impact	Mitigation	Significance after Mitigation
Health and Safety risks to the public and employees during the construction phase	<ul style="list-style-type: none"> <li>▪ Appoint H&amp;S Officer</li> <li>▪ Make sure that the excavated areas are properly demarcated, and public access is prevented</li> </ul>	Low
<b>Cumulative impacts:</b>		
Aspect / Impact	Mitigation	Significance after Mitigation
Flooding	<ul style="list-style-type: none"> <li>▪ Conduct hydraulic assessment and determine freeboard requirements;</li> <li>▪ Design requirement: maximum flood level not to exceed shoulder break point (SBP) level.</li> </ul>	Low

### Alternative A3 (if any) 3 Span Pre-Cast Beam and In Situ Deck Slab:

<b>Direct impacts:</b>		
Aspect / Impact	Mitigation	Significance after Mitigation
Loss of infrastructure due to erosion or storm events	<ul style="list-style-type: none"> <li>▪ Ensure appropriate design and construction by reputable companies</li> <li>▪ Ensure proper planning of storm water systems on site.</li> <li>▪ Possible use of a geotextile over bare surfaces during construction and until stabilization of the banks has taken</li> </ul>	Low-Medium

## Basic Assessment Report

	<ul style="list-style-type: none"> <li>place.</li> <li>▪ Proper placement of stockpiles, away from the steep slopes.</li> </ul>	
Cost of establishment	<ul style="list-style-type: none"> <li>▪ Ensure appropriate funding.</li> </ul>	Low
Potential for environmental impacts	<ul style="list-style-type: none"> <li>▪ Consider environmental impacts (water requirements, energy usage, etc) and select process with acceptable impact / risk and mitigation measures</li> </ul>	Low-Medium
Increased storm water runoff due to an increase in hardened surfaces	<ul style="list-style-type: none"> <li>▪ Design and ensure adequate drainage to the storm water system</li> </ul>	Low
<b>Indirect impacts:</b>		
<b>Aspect / Impact</b>	<b>Mitigation</b>	<b>Significance after Mitigation</b>
Health and Safety risks to the public and employees during the construction phase	<ul style="list-style-type: none"> <li>▪ Appoint H&amp;S Officer</li> <li>▪ Make sure that the excavated areas are properly demarcated public access is prevented</li> </ul>	Low
<b>Cumulative impacts:</b>		
<b>Aspect / Impact</b>	<b>Mitigation</b>	<b>Significance after Mitigation</b>
Risk of flooding	<ul style="list-style-type: none"> <li>▪ Implement flooding mitigation measures</li> <li>▪ Consider an alternative design</li> </ul>	Low

## 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:

#### Alternative S1 (Upstream of current Nseleni Bridge - preferred alternative):

<b>Direct impacts:</b>		
<b>Aspect / Impact</b>		<b>Significance</b>
Disturbance, damage or destruction to indigenous and sensitive vegetation		Low - Medium
Removal of invader plants through proper identification and recommendations.		Medium (Pos)
Erosion of stockpiled material (stone, sand and gravel).		Low - Medium
Increased potential for erosion along stream banks resulting in the sedimentation of the stream.		Medium- High
Poor stormwater management during construction can lead to erosion and loss of soil.		Low- Medium
Air pollution caused by construction activities, such as dust generation during the excavation and exhaust emissions of heavy construction vehicles		Low -Medium
Noise and visual disturbance during construction activities. Noise generated by construction workers, machinery and construction vehicles disturbing surrounding residents.		Low -Medium
Generation of waste during construction of new facilities		Medium
Pollution of surface and groundwater due to spillage of hazardous materials, such as oil and fuels		Medium -High
Increased storm water runoff from the site due to increased sealed surfaces		Medium
Resource consumption (fuel, energy, water, material)		Medium
Construction material: The movement of trucks for the delivery of construction material, disposal of construction waste will release dusts emissions and potential oil spills.		Medium- low
Surface water: during this period there may be an increase in run-off and erosion caused as a result of construction processes		Medium-low
Degradation and Contamination of the Nseleni River and surrounding environment by cement and other hazardous materials.		Medium- High
Damage to river banks during excavation, causing sedimentation of the watercourse and		High
Department of Agriculture, Environmental Affairs & Rural Development, KwaZulu-Natal	Basic Assessment Report 2010 Version 3: April 2011	Page 35 of 51

## Basic Assessment Report

affecting water quality.	
Modification of the river flow and riverine dynamics of the area.	Medium
Littering on or around the site	Low- Medium
Improper disposal of rubble i.e.: burying or neglecting building rubble resulting in direct mechanical damage to surrounding vegetation and untidiness of the site.	Medium- High
Lack of toilet facilities resulting in unsanitary conditions.	Medium- High
Improper disposal of toilet waste from chemical toilets resulting in contamination of the surrounding environment and the Nseleni River.	Medium- High

### **Indirect impacts:**

<b>Aspect / Impact</b>	<b>Significance</b>
Risk to human health and safety due to open excavations and moving construction machinery.	Medium-High
Temporary employment and skills opportunities will be created	Medium (Pos)
Increased traffic and heavy vehicles and machinery on roads	Low-Medium
Possible spillage of hazardous material onto surfaces during usage and storage of hydrocarbons and chemicals	Medium-High
Maintenance of construction equipment and vehicles resulting in hydrocarbon waste generation and spillage to surrounding areas.	Medium-High
Risk of alien invasive encroachment into disturbed areas	Low- Medium
Hunting/ Fishing by construction workers	Medium
Damage and removal of existing vegetation.	Medium
Risk of spills from construction equipment (oils, fuels, cement etc) contaminating soil and watercourse	High
Sourcing of raw materials i.e.: (gravel, stone, sand, cement and water) from unsustainable sources resulting in illegal sand mining and mining operations causing significant environmental damage.	High
Provision of adequate bridge structure, to improve the road safety, pedestrian safety and riding quality	High (Pos)

### **Cumulative impacts:**

<b>Aspect / Impact</b>	<b>Significance</b>
Decreased potential of landfill air space due to disposal of building rubble and waste	Medium
Impacts on air quality due to emissions and dust	Low -Medium
Traffic along the roadside	Low -Medium
Uplifting of local communities conditions	Medium-High ( Pos)

### **Alternative S2 Downstream of current Nseleni Bridge:**

#### **Direct Impacts:**

<b>Aspect / Impact</b>	<b>Significance</b>
This alternative was not pursued past the planning phase as the environmental, social and economic impacts would be significantly more negative than the preferred option S1	

#### **Indirect Impacts:**

<b>Aspect / Impact</b>	<b>Significance</b>

#### **Cumulative impacts:**

<b>Aspect / Impact</b>	<b>Significance</b>

### **No-go alternative (compulsory)**

#### **Direct impacts:**

<b>Aspect / Impact</b>	<b>Significance</b>
Safety of travelling on the unsafe bridge remains unchanged	Medium-High
Loss of social and economic benefits associated with the upgrade of the bridge	Medium
Risk of damage to persons travelling on or around the current bridge	Medium- High

## Basic Assessment Report

Bridge will not meet upgraded Road Class 3 upgrade specifications	High
<b>Indirect impacts:</b>	
<b>Aspect / Impact</b>	<b>Significance</b>
A number of potential temporary employment opportunities will not be realised	Medium
<b>Cumulative impacts:</b>	
<b>Aspect / Impact</b>	<b>Significance</b>
Loss of social and economic benefits in the community due to the upgraded road and bridge	Medium

Indicate mitigation measures to manage the potential impacts listed above:

**Alternative S1 (Upstream of current Nseleni Bridge - preferred alternative):**

**Direct impacts:**

Aspect / Impact	Mitigation	Significance after Mitigation
Construction material - potential dust emission and oil spill	<ul style="list-style-type: none"> <li>▪ It is recommended that dust suppression measures be implemented ensure that vegetation is not affected and siltation of the river does not occur due to dust from the new roads as well as from construction vehicles. Oil spillages and rubble waste should be removed and disposed of appropriately. After the construction has been completed the compacted soils must be ripped &amp; loosened to allow the growth of vegetation.</li> <li>▪ Site workers will be trained in avoiding impacts in areas of potential concern (e.g. steep stream banks).</li> <li>▪ Designated concrete mixing areas and storage areas for any hazardous materials will be assigned; this will be strictly controlled through the site specific EMPr.</li> </ul>	Low
Waste Production and Sanitation on site	<ul style="list-style-type: none"> <li>▪ 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 the skips / bins.</li> <li>▪ Littering will not be permitted on the site and general housekeeping will be enforced. General waste bins must be readily available for litter disposal and general housekeeping.</li> <li>▪ All excess material and rubble must be removed from the site so not to restrict the rehabilitation process.</li> <li>▪ All excess material and rubble must go to an approved, designated landfill and a safe disposal certificate must be obtained.</li> <li>▪ Site workers will be trained in avoiding such impacts.</li> <li>▪ Adequate toilet facilities must be provided for all staff members as standard construction practice.</li> <li>▪ The chemical toilets to be provided must be from a registered company and all sewage must be disposed of at an appropriate facility.</li> <li>▪ Safe disposal certificates must be kept on record.</li> </ul>	Medium

## Basic Assessment Report

	<ul style="list-style-type: none"> <li>▪ All activities will be managed by an EMPr.</li> </ul>	
Surface water	<ul style="list-style-type: none"> <li>▪ Excavated soil should be properly stockpiled to avoid wash away during rainstorms. All material used for construction purposes should be stored in such a manner that it would not contaminate the surface water which drains from the site.</li> <li>▪ Should water in the river channel need to be pumped around the construction site and discharged back into the river, it must be done with care to ensure that water is discharged in a manner that does not cause siltation or erosion into the downstream watercourse and storm water management needs to be implemented.</li> <li>▪ Stormwater control must be instituted during construction; however this is a temporary impact of the proposal. A drainage system must be established for the construction camp.</li> <li>▪ The drainage system must be regularly checked to ensure the unobstructed flow of water.</li> <li>▪ All activities will be managed by an EMPr.</li> </ul>	Low
River Morphology	<ul style="list-style-type: none"> <li>▪ The natural downstream flow of the river is to be maintained during construction by directing the flow to one side by means of flume pipes or a channel rather than damming the river that may affect the downstream flow. However, if the water flow is low, damming may be used provided that this does not cause any flooding. The flume pipes or dams will be removed and the banks of the watercourse will be reinstated using previously excavated material and topsoil upon completion of construction activities.</li> <li>▪ Any activities conducted within or near watercourses must be strictly monitored by an ECO and the best construction practices, as outlined in the EMPr.</li> <li>▪ Liaise and obtain the necessary permits from the Department of Water Affairs.</li> <li>▪ During rehabilitation, the channel plan form and the in-stream morphology should be maintained – i.e. do not disturb the existing riverbed other than necessary for rehabilitation.</li> <li>• Monitor changes to sediment patterns (deposition and erosion) up- and downstream of repaired structures to assess recovery and reinstatement of the general slope of the watercourse.</li> </ul>	Medium
Soil erosion of disturbed and unconsolidated soil in construction footprints and stockpiles	<ul style="list-style-type: none"> <li>• Removal of vegetation to take place only within demarcated construction site</li> <li>• Implement soil conservation measures, i.e. covering stockpiles and construction of berms or other barriers to prevent water run-off</li> <li>• Material must be stocked in such a way that it cannot fall or cause injury or damage to properties or the natural environment.</li> <li>• Stockpiles must not exceed 2m in height and must be covered to prevent erosion caused by exposure to heavy</li> </ul>	Low – Medium
Department of Agriculture, Environmental Affairs & Rural Development, KwaZulu-Natal	Basic Assessment Report 2010 Version 3: April 2011	Page 38 of 51

## Basic Assessment Report

	<ul style="list-style-type: none"> <li>wind or rain.</li> <li>• Alternatively, low walls or berms must be constructed around the stockpiles.</li> <li>• The necessary precautions will be taken to prevent erosion which will include the construction of headwalls and gabion protection as well as temporary bank retainers.</li> <li>• A site specific Environmental Management Programme (EMPr) has been designed to manage construction activities and is attached under Appendix F.</li> </ul>	
Air pollution caused by construction activities, such as dust generation during the excavation and exhaust emissions of heavy construction vehicles.	<ul style="list-style-type: none"> <li>• Dust suppression strategies should be implemented;</li> <li>• All vehicles to be in a good condition, with acceptable smoke emissions.</li> <li>• Unnecessary clearing of vegetation to be avoided</li> </ul>	Low
Noise and visual disturbance during construction activities	<ul style="list-style-type: none"> <li>• Designated working hours according to the local municipality;</li> <li>• Excessive noise must be controlled on site.</li> <li>• Workers will be trained regarding noise on site and construction hours will be kept to working hours</li> <li>• The construction will need to 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.</li> <li>• If excessive noise is expected during certain stages of the construction, nearby residents must be notified prior to the event.</li> <li>• General EMPr commitments</li> </ul>	Low
Pollution of surface and groundwater due to spillage of materials	<ul style="list-style-type: none"> <li>• Appropriate handling, storage and disposal measures</li> <li>• Implement training and awareness</li> <li>• General EMPr commitments</li> </ul>	Low
Increased stormwater runoff from the site due to increased sealed surfaces	<ul style="list-style-type: none"> <li>▪ Construct and implement stormwater plan as per design</li> <li>▪ Permeable materials should be use where applicable</li> <li>▪ General EMPr commitment</li> </ul>	Low-Medium
Impact to sensitive areas and related plant and animal species	<ul style="list-style-type: none"> <li>▪ Prevent spillage and disposal of waste to sensitive areas</li> <li>▪ Implement EMPr recommendations</li> <li>▪ Barriers that run parallel to roads may be constructed to prevent fauna and other wildlife from crossing roads, thus reducing animal mortality and road hazards.</li> <li>▪ Speed limits should be adhered to all the time including the trucks travelling on the P425 road.</li> </ul>	Low-Medium

### Indirect impacts:

Aspect / Impact	Mitigation	Significance after Mitigation
Risk to human health and safety due to open excavations and moving construction machinery.	<ul style="list-style-type: none"> <li>• Construction site to be demarcated and access controlled.</li> <li>• Implementing guidelines and regulations of the Occupational Health and Safety Act, regulation for construction.</li> <li>• General EMPr commitments.</li> </ul>	Low
Possible spillage of hazardous material onto surfaces during usage and storage of hydrocarbons and chemicals	<ul style="list-style-type: none"> <li>• Ensure the use of drip trays during storage of hydrocarbon containers and during servicing of machinery</li> <li>• Implement training and awareness and</li> </ul>	Low- Medium

## Basic Assessment Report

	<p>EMPr requirements</p> <ul style="list-style-type: none"> <li>Any hazardous or dangerous goods utilized 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 utilizing hazardous or dangerous materials to ensure the repaid containment of the spill.</li> <li>Spill kits must be regularly checked and maintained. The</li> <li>Follow EMPr commitments</li> </ul>	
Maintenance of construction equipment and vehicles resulting in hydrocarbon waste generation and spillage to surrounding areas.	<ul style="list-style-type: none"> <li>Maintenance of vehicles may not occur on site</li> <li>Emergency maintenance must be conducted in a responsible manner i.e. use of drip trays with collection of oil and grease and clean-up of any spillages</li> </ul>	Low- Medium
Resource use and conservation	<ul style="list-style-type: none"> <li>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.</li> </ul>	Low- Medium
Fauna and Flora	<ul style="list-style-type: none"> <li>The establishment or spread of alien plant species on site must be monitored and the correct removal and disposal of alien plant species must be followed.</li> <li>Rehabilitation of disturbed areas must commence as soon as construction activities are completed in those areas.</li> <li>Workers will be educated on minimizing damage to vegetation during construction.</li> <li>Rehabilitation of disturbed areas will be undertaken on completion of the project.</li> <li>Hunting or poaching will be prohibited. During construction, guidelines set out by the ECO will be followed to ensure no potential impacts occur.</li> <li>All activities will be managed by an EMPr.</li> <li>Ensure that road reserve and actual road width is clearly marked and pegged before vegetation clearing, to prevent additional vegetation from being removed.</li> </ul>	Medium

### Cumulative impacts:

Aspect / Impact	Mitigation	Significance after Mitigation
Decreased potential of landfill air space due to disposal of building rubble and waste	<ul style="list-style-type: none"> <li>Implement reuse and recycling where feasible, waste streams will be separated and recycled where possible to limit waste added to the landfill site.</li> <li>Prevent spillage and wastage</li> <li>All solid waste must be disposed of at the nearest licensed landfill and safe disposal certificates obtained.</li> <li>Separate skips/ bins for the different waste streams must be available on site.</li> <li>The waste containers must be appropriate to the waste type contained therein and where necessary should be lined and covered.</li> <li>This will be managed through the site</li> </ul>	Low-Medium



## Basic Assessment Report

	specific EMPr and monitored by the ECO.	
Impacts on air quality due to emissions and dust	<ul style="list-style-type: none"> <li>General EMPr commitments</li> </ul>	Low
Waste materials at site and within landfill	<ul style="list-style-type: none"> <li>Adequate waste collection facilities and disposal of non-recyclable or recyclable waste disposal site</li> </ul>	Low- Medium

### Alternative S2 Downstream of current Nseleni Bridge:

#### Direct impacts:

This alternative was not pursued past the planning phase as the environmental, social and economic impacts would be significantly more negative than the preferred option S1

#### Indirect impacts:

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#### Cumulative impacts:

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## b. Process, technology, layout or other alternatives

List the impacts associated with process, technology, layout or other alternatives that are likely to occur during the construction phase (please list impacts associated with each alternative separately):

### Alternative A1: 3 Span Continuous Box Girder Deck - preferred alternative

#### Direct impacts:

Aspect / Impact	Significance
Disturbance, damage or destruction to indigenous vegetation and protected plant species	Medium
Removal of invader plants through proper identification and recommendations.	Medium (Pos)
Soil erosion of disturbed and unconsolidated soil in construction footprints and stockpiles	Low - Medium
Air pollution caused by construction activities, such as dust generation during the excavation and exhaust emissions of heavy construction vehicles	Low -Medium
Noise and visual disturbance during construction activities	Low -Medium
Generation of waste during demolition of existing infrastructure and construction of new facilities	Medium
Pollution of surface and groundwater due to spillage of hazardous materials, such as oil and fuels	Medium -High
Increased storm water runoff from the site due to increased sealed surfaces	Medium
Resource consumption (fuel, energy, water, material)	Medium
Impact to sensitive areas (Riparian vegetation)	Medium-High

#### Indirect impacts:

Aspect / Impact	Significance
Risk to human health and safety due to open excavations and moving construction machinery.	Medium-High
Temporary employment and skills opportunities will be created	Medium (Pos)
Increased traffic and heavy vehicles and machinery on roads	Low-Medium
Possible spillage of hazardous material onto surfaces during usage and storage of hydrocarbons and chemicals	Medium-High
Maintenance of construction equipment and vehicles resulting in hydrocarbon waste generation and spillage to surrounding areas.	Medium-High
Provision of adequate bridge structure, to improve the road safety, pedestrian safety and riding quality	High (Pos)

## Basic Assessment Report

<b>Cumulative impacts:</b>	
<b>Aspect / Impact</b>	<b>Significance</b>
Decreased potential of landfill air space due to disposal of building rubble and waste	Medium
Impacts on air quality due to emissions and dust	Low -Medium
Traffic along the roadside	Low -Medium
Waste materials at site and within landfill	Medium- High
Uplifting of local communities conditions	Medium-High ( Pos)

### Alternative A2 & A3: 2 Span Continuous Box Girder Deck / 3 Span Pre-Cast Beam and In Situ Deck Slab

<b>Direct impacts:</b>	
<b>Aspect / Impact</b>	<b>Significance</b>
These alternatives were not pursued past the planning phase as the environmental, social, economic and structural impacts would be significantly more negative than the preferred option A1.	
<b>Indirect impacts:</b>	
<b>Aspect / Impact</b>	<b>Significance</b>
<b>Cumulative impacts:</b>	
<b>Aspect / Impact</b>	<b>Significance</b>

### No-go alternative (compulsory)

<b>Direct impacts:</b>	
<b>Aspect / Impact</b>	<b>Significance</b>
Safety of travelling on the unsafe bridge remains unchanged	Medium-High
Loss of social and economic benefits associated with the upgrade of the bridge	Medium
Risk of damage to persons travelling on or around the current bridge	Medium- High
Bridge will not meet upgraded Road Class 3 upgrade specifications	High
<b>Indirect impacts:</b>	
<b>Aspect / Impact</b>	<b>Significance</b>
A number of potential temporary employment opportunities will not be realised	Medium
<b>Cumulative impacts:</b>	
<b>Aspect / Impact</b>	<b>Significance</b>
Loss of social and economic benefits in the community due to the upgraded road and bridge	Medium

Indicate mitigation measures to manage the potential impacts listed above:

### Alternative A1: 3 Span Continuous Box Girder Deck - preferred alternative

<b>Aspect / Impact</b>	<b>Mitigation</b>	<b>Significance after Mitigation</b>
Disturbance, damage or destruction to indigenous vegetation and protected plant species	<ul style="list-style-type: none"> <li>▪ Non-essential removal of indigenous vegetation to be avoided</li> <li>▪ Mark and screen protected species on site to prevent accidental damage</li> </ul>	Low
Soil erosion of disturbed and unconsolidated soil in construction footprints and stockpiles	<ul style="list-style-type: none"> <li>• Removal of vegetation to take place only within demarcated construction site</li> <li>• Implement soil conservation measures, i.e. covering stockpiles and construction of berms or other barriers to prevent water run-off</li> </ul>	Low - Medium
Air pollution caused by construction activities, such as dust generation during the excavation and exhaust emissions of heavy construction	<ul style="list-style-type: none"> <li>• Dust suppression strategies should be implemented;</li> <li>• All vehicles to be in a good condition,</li> </ul>	Low
Department of Agriculture, Environmental Affairs & Rural Development, KwaZulu-Natal	Basic Assessment Report 2010 Version 3: April 2011	Page 42 of 51

## Basic Assessment Report

vehicles.	<ul style="list-style-type: none"> <li>with acceptable smoke emissions.</li> <li>Unnecessary clearing of vegetation to be avoided</li> </ul>	
Noise and visual disturbance during construction activities	<ul style="list-style-type: none"> <li>Designated working hours according to the local municipality;</li> <li>General EMPr commitments</li> </ul>	Low
Generation of waste during demolition of existing infrastructure and construction of new facilities	<ul style="list-style-type: none"> <li>Implement reuse and recycling where feasible</li> <li>Prevent spillage and wastage</li> <li>Waste to be collected regularly and deposited at permitted landfill site</li> <li>General EMPr commitments</li> </ul>	Low-Medium
Pollution of surface and groundwater due to spillage of materials	<ul style="list-style-type: none"> <li>Appropriate handling, storage and disposal measures</li> <li>Implement training and awareness</li> <li>General EMPr commitments</li> </ul>	Low
Increased stormwater runoff from the site due to increased sealed surfaces	<ul style="list-style-type: none"> <li>Construct and implement stormwater plan as per design</li> <li>Permeable materials should be use where applicable</li> <li>General EMPr commitment</li> </ul>	Low-Medium
Impact to sensitive areas	<ul style="list-style-type: none"> <li>Prevent spillage and disposal of waste to sensitive areas</li> <li>Implement EMPr recommendations</li> </ul>	Low-Medium

### Indirect impacts:

Aspect / Impact	Mitigation	Significance after Mitigation
Risk to human health and safety due to open excavations and moving construction machinery.	<ul style="list-style-type: none"> <li>Construction site to be demarcated and access controlled</li> <li>Implementing guidelines and regulations of the Occupational Health and Safety Act, regulation for construction and general EMPr commitments</li> </ul>	Low
Possible spillage of hazardous material onto surfaces during usage and storage of hydrocarbons and chemicals	<ul style="list-style-type: none"> <li>Ensure the use of drip trays during storage of hydrocarbon containers and during servicing of machinery.</li> <li>Implement training and awareness and EMPr requirements</li> </ul>	Low- Medium
Maintenance of construction equipment and vehicles resulting in hydrocarbon waste generation and spillage to surrounding areas.	<ul style="list-style-type: none"> <li>Maintenance of vehicles may not occur on site.</li> <li>Emergency maintenance must be conducted in a responsible manner i.e. use of drip trays with collection of oil and grease and clean-up of any spillages</li> </ul>	Low- Medium

### Cumulative impacts:

Aspect / Impact	Mitigation	Significance after Mitigation
Decreased potential of landfill air space due to disposal of building rubble and waste	<ul style="list-style-type: none"> <li>Implement reuse and recycling where feasible</li> <li>Prevent spillage and wastage</li> </ul>	Low-Medium
Impacts on air quality due to emissions and dust	<ul style="list-style-type: none"> <li>General EMPr commitments</li> </ul>	Low
Waste materials at site and within landfill	<ul style="list-style-type: none"> <li>Adequate waste collection facilities and disposal of non-recyclable or recyclable waste disposal site</li> </ul>	Low- Medium

## Basic Assessment Report

### 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:

**There are no significant environmental impacts anticipated during the operational phase of the project. The proposed design will ensure for adequate hydrological functioning and traffic safety.**

#### Alternative S1 (Upstream of current Nseleni Bridge - preferred alternative):

<b>Direct impacts:</b>	
<b>Aspect / Impact</b>	<b>Significance</b>
Increased storm water runoff from the site due to increased sealed surfaces	Low
Impact on aesthetics and a change in the character of the area.	Medium-High (Pos)
Establishment / re-establishment of invader weeds and plant species.	Medium
Vegetation overgrowth of infrastructure and littering	Medium
Soil erosion	Low- Medium
Damage / Loss of infrastructure due to erosion and storm events	Medium
<b>Indirect impacts:</b>	
<b>Aspect / Impact</b>	<b>Significance</b>
Provision of adequate bridge structure, to improve the road safety, pedestrian safety and riding quality	High (Pos)
Slight increase of traffic flow in the area due to a larger bridge.	Medium (Positive)
<b>Cumulative impacts:</b>	
<b>Aspect / Impact</b>	<b>Significance</b>
Uplifting of local communities conditions	Medium-High ( Pos)

#### Alternative S2 Downstream of current Nseleni Bridge:

<b>Direct impacts:</b>	
<b>Aspect / Impact</b>	<b>Significance</b>
This alternative was not pursued past the planning phase as the environmental, social and economic impacts would be significantly more negative than the preferred option S1.	
<b>Indirect impacts:</b>	
<b>Aspect / Impact</b>	<b>Significance</b>
<b>Cumulative impacts:</b>	
<b>Aspect / Impact</b>	<b>Significance</b>

#### No-go alternative (compulsory)

<b>Direct impacts:</b>	
<b>Aspect / Impact</b>	<b>Significance</b>
Safety of travelling on the unsafe bridge remains unchanged	Medium-High
Loss of social and economic benefits associated with the upgrade of the bridge	Medium
Risk of damage to persons travelling on or around the current bridge	Medium- High
<b>Indirect impacts:</b>	
<b>Aspect / Impact</b>	<b>Significance</b>

## Basic Assessment Report

A number of potential temporary employment opportunities will not be realised	Medium
<b>Cumulative impacts:</b>	
<b>Aspect / Impact</b>	<b>Significance</b>
Loss of social and economic benefits in the community due to the upgraded road and bridge	Medium

Indicate mitigation measures to manage the potential impacts listed above:

### Alternative S1 (Upstream of current Nseleni Bridge - preferred alternative):

#### Direct impacts:

Aspect / Impact	Mitigation	Significance after Mitigation
Functionality	<ul style="list-style-type: none"> <li>• Care should be taken at all times to prevent accidents on the road, and the bridge should be monitored at least once a year to monitor the operating condition.</li> <li>• Underpasses should be accessible to maintenance staff and should be cleared of accumulated material at least at the start of each rainy season.</li> </ul>	Low
Establishment / re-establishment of invader weeds and plant species.	<ul style="list-style-type: none"> <li>▪ Weeds and alien vegetation should be removed and prevented from spreading, as stipulated in the EMPr</li> <li>▪ All excavations must be rehabilitated for the operational phase</li> </ul>	Low
Vegetation overgrowth of infrastructure and littering	<ul style="list-style-type: none"> <li>▪ Regular maintenance required, as stipulated in the EMPr</li> </ul>	Low
Increased storm water runoff from the site due to increased sealed surfaces	<ul style="list-style-type: none"> <li>▪ Adequately manage storm water in accordance with the management plan</li> <li>▪ Keep storm water management structures free of litter and debris</li> <li>▪ Maintain vegetation on site</li> </ul>	Low
Soil erosion	<ul style="list-style-type: none"> <li>• Implement soil conservation measures, such as keeping the area vegetated where possible</li> <li>• Ensure appropriate storm water control measures</li> <li>• Use of a geotextile to protect exposed surfaces</li> </ul>	Low
Damage / Loss of infrastructure due to erosion and storm events	<ul style="list-style-type: none"> <li>• Ongoing monitoring stability and address infrastructure and structural issues</li> <li>• Maintain the old bridge in working order, however traffic should not be allowed to use it</li> </ul>	Low

### b. Process, technology, layout or other alternatives

List the impacts associated with process, technology, layout or other alternatives that are likely to occur during the operational phase (please list impacts associated with each alternative separately):

#### Alternative A1: 3 Span Continuous Box Girder Deck - preferred alternative

<b>Direct impacts:</b>	
Aspect / Impact	Significance
Increased storm water runoff from the site due to increased sealed surfaces	Low
Impact on aesthetics and a change in the character of the area.	Medium-High (Pos)
Establishment / re-establishment of invader weeds and plant species.	Medium
Vegetation overgrowth of infrastructure and littering	Medium
Soil erosion	Low- Medium
Long term structural integrity of the bridge being compromised during a large flood event.	Low- Medium
Deterioration of pedestrian walkways and handrails over time	Low-Medium
Improved access important road networks	Medium-High(Pos)

## Basic Assessment Report

<b>Indirect impacts:</b>	
<b>Aspect / Impact</b>	<b>Significance</b>
Excess siltation downstream of the Nseleni River due to erosion	Low-Medium
Pedestrian accidents caused by worn out walkways and handrails	Low-Medium
Provision of adequate bridge structure, to improve the road safety, pedestrian safety and riding quality	High (Pos)
<b>Cumulative impacts:</b>	
<b>Aspect / Impact</b>	<b>Significance</b>
Uplifting of local communities conditions	Medium-High ( Pos)

### **Alternative A2 & A3: 2 Span Continuous Box Girder Deck / 3 Span Pre-Cast Beam and In Situ Deck Slab**

#### **Direct impacts: / Indirect impacts: / Cumulative impacts:**

These alternatives were not pursued past the planning phase as the environmental, social and economic impacts would be significantly more negative than the preferred option A1.

Indicate mitigation measures to manage the potential impacts listed above:

### **Alternative A1: 3 Span Continuous Box Girder Deck - preferred alternative**

#### **Direct impacts:**

<b>Aspect / Impact</b>	<b>Mitigation</b>	<b>Significance after Mitigation</b>
Increased storm water runoff from the site due to increased sealed surfaces	<ul style="list-style-type: none"> <li>▪ Adequately manage storm water in accordance with the management plan</li> <li>▪ Keep storm water management structures free of litter and debris</li> <li>▪ Maintain vegetation on site</li> </ul>	Low
Accidental or negligent spills of hazardous substances by vehicles using the bridge	<ul style="list-style-type: none"> <li>▪ EMPr commitments regarding clean up procedures</li> </ul>	Low-Medium
Establishment / re-establishment of invader weeds and plant species.	<ul style="list-style-type: none"> <li>▪ Weeds and alien vegetation should be removed and prevented from spreading, as stipulated in the EMPr</li> <li>▪ All excavations must be rehabilitated for the operational phase</li> </ul>	Low
Vegetation overgrowth of infrastructure and littering	<ul style="list-style-type: none"> <li>▪ Regular maintenance required, as stipulated in the EMPr</li> </ul>	Low
Long term structural integrity of the bridge being compromised during a large flood event.	<ul style="list-style-type: none"> <li>▪ The engineering design will take into account the potential flow rates coming from each catchment area and design river crossings accordingly, to ensure the integrity of the bridge during flood events. The bridge will be designed to withstand 1:50 year flood events thereby ensuring the integrity of the bridge for many years to come.</li> <li>• Regular maintenance of the bridge would be required to ensure the structural integrity of the bridge is maintained any potential damage.</li> </ul>	Low-Medium
Deterioration of pedestrian walkways and handrails over time	<ul style="list-style-type: none"> <li>▪ Regular maintenance of pedestrian walkways over time, as they will be used on a regular basis.</li> </ul>	Low

## **2.4. IMPACTS THAT MAY RESULT FROM THE DECOMMISSIONING OR CLOSURE PHASE**

### **a. Site alternatives**

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

Department of Agriculture, Environmental Affairs & Rural Development, KwaZulu-Natal	Basic Assessment Report 2010 Version 3: April 2011	Page 46 of 51
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## Basic Assessment Report

It is not anticipated that the new bridge and related bridge infrastructures will be decommissioned in the foreseeable future. Should decommissioning take place, the legislation applicable at that time should be complied with, and relevant environmental practices implemented. Therefore, an assessment of impacts for this phase is not applicable. It is recommended that a separate Basic Assessment be undertaken accordingly, in order to address the impacts associated with the decommissioning phase should it become applicable.

**Alternative S1 (Upstream of current Nseleni Bridge - preferred alternative):**

*Direct impacts: / Indirect impacts: / Cumulative impacts:*

**Alternative S2 (if any): Downstream of current Nseleni Bridge:**

*Direct impacts: / Indirect impacts: / Cumulative impacts:*

**No-go alternative (compulsory)**

*Direct impacts: / Indirect impacts: / Cumulative impacts:*

Indicate mitigation measures to manage the potential impacts listed above:

**Alternative S1**

**Alternative S2**

Not Applicable – decommissioning not anticipated for the bridge project

Not Applicable

### b. Process, technology, layout or other alternatives

List the impacts associated with process, technology, layout or other alternatives that are likely to occur during the decommissioning or closure phase (please list impacts associated with each alternative separately):

It is not anticipated that the bridge and related bridge approaches will be decommissioned in the foreseeable future. Should decommissioning take place, the legislation applicable at that time should be complied with, and relevant environmental practices implemented. Therefore, an assessment of impacts for this phase is not applicable. It is recommended that a separate Basic Assessment be undertaken accordingly, in order to address the impacts associated with the decommissioning phase should it become applicable.

**Alternative A1: 3 Span Continuous Box Girder Deck - preferred alternative**

*Direct impacts: / Indirect impacts: / Cumulative impacts:*

**Alternative A2 : 2 Span Continuous Box Girder Deck**

*Direct impacts: / Indirect impacts: / Cumulative impacts:*

**Alternative A3: 3 Span Pre-Cast Beam and In Situ Deck Slab**

*Direct impacts: / Indirect impacts: / Cumulative impacts:*

**No-go alternative (compulsory)**

*Direct impacts: / Indirect impacts: / Cumulative impacts:*

### 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 S1 (preferred site)**

An Environmental Site Officer (ESO) will be appointed during the construction phase of the project to monitor and record compliance and non-compliances at the site on daily basis. An Environmental Control Officer (ECO) will also monitor the site twice a month and compile a monthly report documenting the environmental aspects of the site.

**Alternative A1 (preferred alternative) 3 Span Continuous Box Girder Deck**

An Environmental Site Officer (ESO) will be appointed during the construction phase of the project to monitor and record compliance and non-compliances at the site on daily basis. An Environmental Control Officer (ECO) will also

monitor the site twice a month and compile a monthly report documenting the environmental aspects of the site.

Monitoring and maintenance is essential for the operational phase in terms of the Environmental Authorisation. It is recommended that all maintenance activities during operation must comply with the construction measures detailed in the construction phase of the EMPr

### 3. ENVIRONMENTAL IMPACT STATEMENT

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.

**Alternative S1 & A1 (Upstream of current Nseleni Bridge & 3 Span Continuous Box Girder Deck - preferred alternative):**

#### Construction phase – Short term duration

- The probable impacts on the biophysical environment (e.g. removal or destruction of Riparian plants species and soil erosion) can all be mitigated to *Low to Low-Medium Negative*, while the removal of invader plants in the construction footprints is considered a *Medium to High Positive impact*.
- The probable impacts of the dust, noise, waste, pollution and modification to the Nseleni River flow, as well as stormwater management impacts are *Low-Medium to Medium-High Negative impacts*, but can all be mitigated to *Low to Low-Medium Negative*.
- The probable negative socio-economic impacts (i.e. pedestrian and commuters' health and safety issues, traffic disturbance) can be mitigated to *Low*, while the opportunity for temporary employment, as well as the provision of an adequate bridge structure is considered *Medium to High Positive impact*.

#### Operational Phase – Long-term duration

- The definitive impacts associated with improved social, environmental and economical opportunities through provision of adequate bridge and road conditions and its infrastructures are all considered *Medium-High Positive Impacts*.
- The probable negative impacts associated with potential increased stormwater runoff, increase noise can be mitigated to *Low Negative impacts*.

The position upstream from the existing bridge is supported as this will result in a reduced new footprint associated with the new route alignment with less compensation requirements as well as less vegetation clearance for the bridge access and temporary platform required for construction purposes. This new route alignment will also support the Class 3 design with a 100km/h speed limit that is preferable in terms of the emergency alternative to the N2.

The 3 span continuous box girder deck is supported as the preferred option as it:

- considers and makes provision for unimpeded river flow (pier cross sections are rectangular in shape with rounded edges to accommodate river flow around the pier);
- allows for safer and easier bridge maintenance (deck is designed to be integral with the piers with bearings located only at abutments. This arrangement minimizes the difficulty in replacing bearings in piers at a considerable height);
- requires reduced material / resources for construction (is the most slender); and



## Basic Assessment Report

- is the most aesthetically pleasing option proposed, and therefore is the preferred alternative.

### **Alternative S2 Downstream of current Nseleni Bridge:**

Alternative S2 is not supported due to greater ecological and economic impacts. Please refer to section 4 of this report for further alternatives' assessment.

### **Alternative A2: 2 Span Continuous Box Girder Deck**

Alternative A2 is not supported due to greater economical and hydrological impacts. Please refer to section 4 of this report for further alternatives' assessment.

### **Alternative A3: 3 Span Pre-Cast Beam and In Situ Deck Slab**

Alternative A3 is not supported due to greater ecological and hydrological impacts. Please refer to section 4 of this report for further alternatives' assessment.

### **No-go alternative (compulsory)**

- The definitive non-realization of potential temporary employment during the construction phase is considered *Medium Negative short-term impacts*, which will persist at the site in the No-Go alternative.
- The probable slow and unsafe travelling over the severely damaged Nseleni Bridge, which potentially causes road traffic and pedestrian accidents, is considered *Medium-High Negative long-term impacts*, which will persist at the site in the No-Go alternative.
- Overall, the social, environmental and economic benefits for the local communities and businesses will not be realised, and the degraded quality of the local community life style and the natural environment will remain unchanged, which considered *Medium-High to High Negative long-term impacts*, which will persist at the site in the No-Go alternative.

The current bridge is in disrepair and cannot be feasibly repaired or upgraded to comply with more modern day requirements. This is due to it being built in the 1930's with steel, comprising of a single lane. Replacement is paramount to ensure commuter (pedestrian and vehicular) safety and mobility.

Royal HaskoningDHV (RHDHV) has only guaranteed the structural safety of the bridge for a 2 year period after which a follow up investigation is required.

The no-go option is not supported.

## 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 and Rural Development regarding the further requirements for your report.

YES	<input checked="" type="checkbox"/>

If "YES", please attach the 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:

The following may be considered for inclusion in the environmental authorisation:

## Basic Assessment Report

- The EMPr (see appendix F) and conditions thereto should be adhered to.
- An ECO must be appointed and all contractor staff to be trained on the EMPr and Environmental Authorisation requirements prior to commencement of activities.
- Environmental monitoring and auditing shall be undertaken by the ECO on a fortnightly basis during the construction phase and re-vegetated areas should be monitored every 3 months for the first 12 months.
- Maintenance of the new bridge and road must be undertaken on a regular basis to ensure the safety of road users.
- Ensure adequate preservation of the existing steel bridge and added security measures for the safety of the public.

## 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: Environmental Management Programme (EMPr)

Appendix G: Other information