DRAFT

BASIC ASSESSMENT REPORT

THE PROPOSED CONSTRUCTION OF THE MNGAZI RIVER BRIDGE AND ACCESS ROAD NEAR PORT ST JOHNS

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DOCUMENT CONTROL

DRAFT BASIC ASSESSMENT REPORT

The Proposed Construction of the Mngazi River Bridge and Access Road near Port St Johns

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Hatch Goba Consulting Engineers	1
Department of Water Affairs	1
Mr Sanqela	1

REVISION AND AMENDMENTS

DATE	NO.	DESCRIPTION OF REVISION OR AMENDMENT
2013/07/18	0	The Proposed Construction of the Mngazi River Bridge and Access Road Basic Assessment

SUMMARY DATA

Project:	**The Proposed Construction of the Mngazi Bridge and Access Road near Port St Johns**
Location:	**Port St Johns, Eastern Cape**
Client:	**South African National Road Agency Limited**
Consultant:	**Environmental Impact Management Services (Pty) Ltd (EIMS).**
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environmental affairs
Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

(For official use only)

File Reference Number:	
Application Number:	
Date Received:	

Basic assessment report in terms of the Environmental Impact Assessment Regulations, 2010, promulgated in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended.

Kindly note that:

1. This **basic assessment report** is a standard report that may be required by a competent authority in terms of the EIA Regulations, 2010 and is meant to streamline applications. Please make sure that it is the report used by the particular competent authority for the activity that is being applied for.

2. The report must be typed within the spaces provided in the form. The size of the spaces provided is not necessarily 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 typing.

3. Where applicable **tick** the boxes that are applicable in the report.

4. An incomplete report may 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 may result in the rejection of the application as provided for in the regulations.

6. This report must be handed in at offices of the relevant competent authority as determined by each authority.

7. No faxed or e-mailed reports will be accepted.

8. The report must be compiled by an independent environmental assessment practitioner.

9. 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.

10. A competent authority may require that for specified types of activities in defined situations only parts of this report need to be completed.

SECTION A: ACTIVITY INFORMATION

Has a specialist been consulted to assist with the completion of this section?	YES	NO
	X	

If YES, please complete the form entitled "Details of specialist and declaration of interest" for appointment of a specialist for each specialist thus appointed:
Any specialist reports must be contained in Appendix D.

1. ACTIVITY DESCRIPTION

Describe the activity, which is being applied for, in detail[1]:

This project will involve the construction of an access road and bridge across the Mngazi River (situated 71 km from Mthatha on the R61), which falls under the jurisdiction of the Port St Johns Local Municipality in the Eastern Cape. The existing access to the village is located approximately 270 m in an Easterly direction (towards Port St Johns) from the proposed bridge and access road site. It is proposed that the existing gravel access road will be closed off from the R61 by guard rails.

The existing access road is concealed by existing R61 dimensions and as such creates a dangerous turning area off the R61. The proposed bridge and access road will therefore provide a safer and more formalised access to the local communities and thereby ensure pedestrian and vehicular safety. Please refer to Appendix A showing the proposed access road and bridge.

The road will be approximately 5.5 metres wide and 380 metres long and will join the existing gravel road going into the village. The bridge structure will carry a single 4 m wide land together with a 1.5 m pedestrian walkway (5.5 m). The bridge structure will have a total length of 60 m.

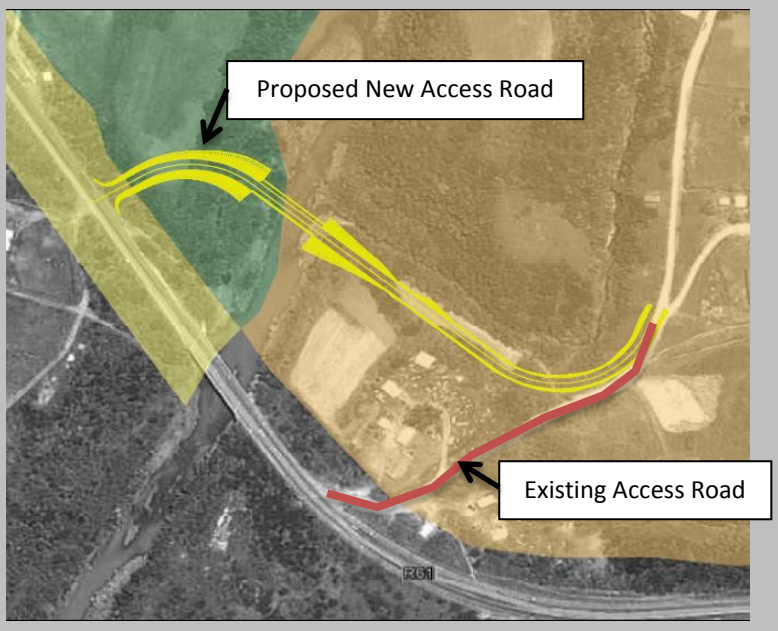

Figure 1: Proposed New Access Road and bridge across the Mngazi River

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

2. FEASIBLE AND REASONABLE ALTERNATIVES

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

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

Describe alternatives that are considered in this application. 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.

Paragraphs 3 – 13 below should be completed for each alternative.

Preferred alternative: The proposed Bridge and Access Road across the Mngazi River

At present, the local residents use an access gravel road that is also used by vehicles into the Swazin A village. Furthermore, the gravel road connection is easily concealed by the road dimensions and, as such, poses an accident risk due to visibility. With the access road being located directly on the R61 there have been a number of accidents.

Location Alternatives:

Selection criteria included, *inter alia*: determination of the feasible and financially viable development site, landowner negotiations and communications with local village authorities. A feasible and financially viable development zone with a footprint of 1252 m^2 was identified. During the BA process specialist Aquatic Ecology and Heritage studies were undertaken in order to allow the development footprint to avoid any sensitive features (please refer to Appendix D for specialist reports). The current development zone is the preferred alternatives for the following reasons:

- It will provide safe access for both vehicles and pedestrians,
- It has minimal impact on the river and tributaries that are in close proximity to development,
- It has a very low impact on properties and landowners, and
- It is the most feasible and financially viable option.

Other alternatives considered included:

Alternative: Upgrading the existing Access Road

As mentioning above, there is an existing gravel road (connecting to the R61) into Swazin A village that is utilised by pedestrians and vehicles. This alternative was not feasible due to the fact that access to the village would still be situated on a dangerous curve that had recorded a number of accidents over time.

Bridge Design Alternatives:

Hatch Goba (2013) reported that three alternatives were considered that satisfied the hydraulic requirements and other site constraints:

Option A:

A low-level structure (**Error! Reference source not found.**) able to accommodate a 1:10 year flood was considered (design flood for R4 route). This structure has five 12 m spans and a total length of 60 m. The deck would be solid slab with tapered edges (span/d ration of 18.5). The piers would comprise of solid walls on spread footings. River diversions and drainage of excavations would be necessary for the construction of the foundations. The abutments would comprise of solid walls with splayed wingwalls. The deck would be made monolithic with the substructure to eliminate bearings and joints. Bollards and collapsible handrails would be provided at the deck edges.

The 1:10 year flood level is 34.3 m, allowing a required freeboard of 0.8 m meaning that the soffit needs to be at 35.1m (assuming a structural depth of 0.6 m gives a top deck level of 35.7 m). This is 0.15 m above the 1:20 year flood level and 1.3 m below the 1:50 year flood level.

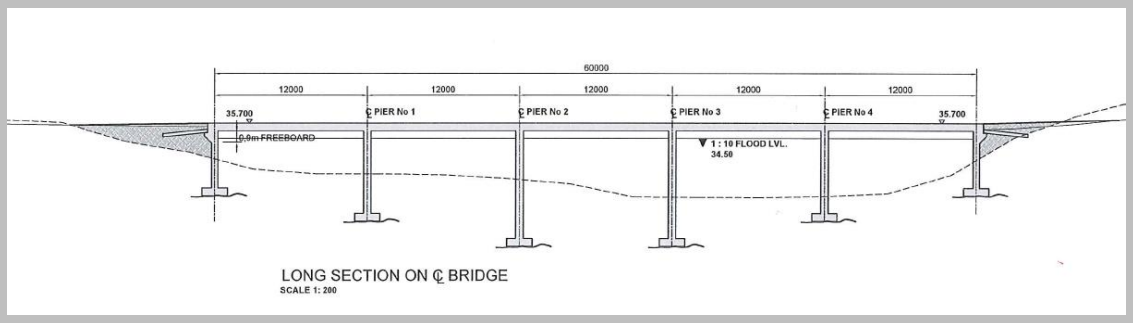

Figure 2: Low-level structure (34.50 m) able to accommodate a 1:10 year flood level

Option B (preferred option):

Option B would be a low-level structure able to accommodate a 1:10 year flood level. The structure will have three 20 m spans and a total length of 60 m. The deck would comprise of arched beams with a slab deck (span/d ratio varies from 25 at midpoint to 15 at the piers and abutments). The piers would consist of solid walls with rounded ends supported on spread footings. The abutments would consist of solid walls and splayed wingwalls. The deck would be made monolithic with the substructure to eliminate bearings and joints. Bollards and collapsible handrails would be provided at the deck edges.

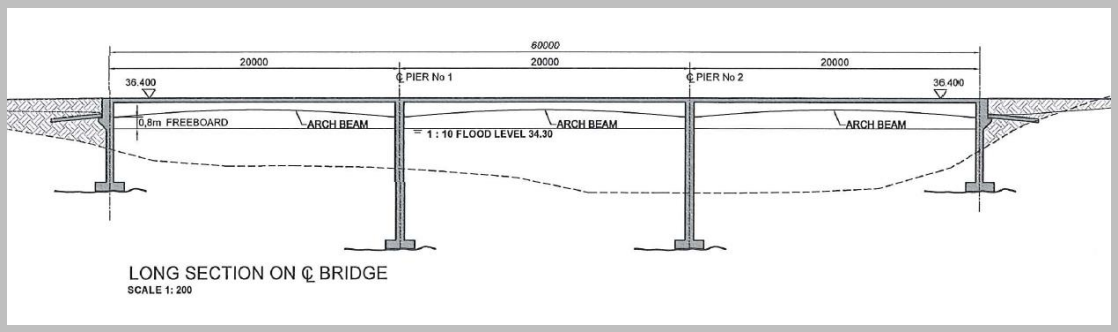

Figure 3: Low-level structure (34.40 m) able to accommodate a 1:10 year flood level

Option C:

The high-level structure (see Figure 4) with the same opening width was then investigated to accommodate a 1:50 year flood, with a level of 37 m (allowing for a freeboard of 1.1 m means the soffit needs to be 38.1 m). This structure would have three 20 m spans with a deck comprising of precast M beams with a cast in-situ slab. The beams would be supported on elastomeric bearings on wall type piers and abutments. The deck has a span/d ratio of 16.3. The deck top surface would be at 39.3 m, which is above the 1:100 year flood level of 38.2 m. This structure is 8 m above river level.

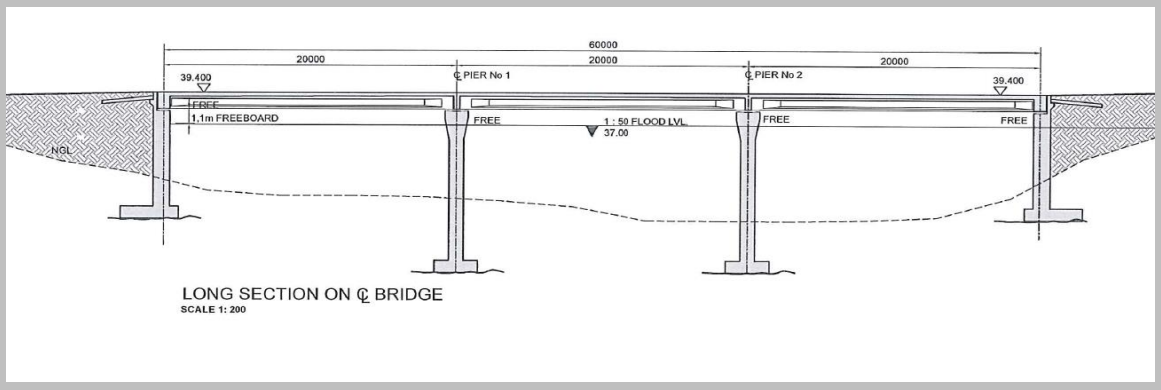

Figure 4: High-level structure (37 m) able to accommodate a 1:50 year flood level

Hatch Goba (2013) reported that neither of the options investigated influenced the freeboard of the existing R61 Bridge which meets the class R2 criteria.

It was concluded that Option C was not feasible as 1) it fits poorly with the topography, 2) would require a high fill on both approaches and 3) it also has the poorest aesthetic and is substantially more expensive to construct than the other options.

Option A was reported to fit well with the topography and would require minor approach fills only, however it was not considered feasible due to the high costs associated with access and drainage of the four piers together with a structurally inefficient deck.

Option B was considered favourable as it fits well with the topography and has the most efficient structural system. This structure is arguably the most aesthetically pleasing and is the most cost effective to construct. Therefore Hatch Goba (2013) recommended that Option B be adopted for construction.

In addition to the conclusions reached by Hatch Goba (2013), Option B would have a smaller impact on the physical attributes of the river and river biota as it will be the less intrusive during construction and operation in comparison to Option A. This is due to Option B having three 20 m spans in comparison to Option A (five 12 m spans). Therefore, due to the reasons above, Option B will be assessed further.

The No-Go Alternative

The current access into the Swazin A village is less than desirable for both pedestrians and vehicles. There is a need for safer infrastructure connecting to the R61 for both pedestrians and vehicles. If the project does not proceed, the current unavailability of safe infrastructure and concerns over the accident rate will continue and there will be no opportunities for economic development taking place. The area is semi-rural and would benefit from the economic boost and infrastructure that increases vehicle and pedestrian safety.

3. 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 and decimal minutes. The minutes should have at least three decimals to ensure adequate accuracy. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection.

List alternative sites, if applicable.

Alternative:	**Latitude (S):**		**Longitude (E):**	
Alternative S1[2] (preferred or only site alternative)	31°	36.578'	29	24.248'
Alternative S2 (if any)	°	'	°	'
Alternative S3 (if any)	°	'	°	'

In the case of linear activities:

Alternative:	**Latitude (S):**		**Longitude (E):**	
Alternative S1 (preferred or only route alternative)				
• Starting point of the activity	31°	36.578'	29°	24.248'
• Middle/Additional point of the activity	31°	36.578'	29°	24.309'
• End point of the activity	31°	36.618'	29°	24.433'
Alternative S2 (if any)				
• Starting point of the activity	°	'	°	'
• Middle/Additional point of the activity	°	'	°	'
• End point of the activity	°	'	°	'
Alternative S3 (if any)				
• Starting point of the activity	°	'	°	'
• Middle/Additional 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 250 meters along the route for each alternative alignment.

4. PHYSICAL SIZE OF THE ACTIVITY

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

Alternative:	**Size of the activity:**
Alternative A1[3] (preferred activity alternative)	m^2
Alternative A2 (if any)	m^2
Alternative A3 (if any)	m^2

or, for linear activities:

Length of the activity: _____

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

Alternative:	
Alternative A1 (preferred activity alternative)	1253 m^2
Alternative A2 (if any)	m
Alternative A3 (if any)	m

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

Alternative:	**Size of the site/servitude:**
Alternative A1 (preferred activity alternative)	m^2
Alternative A2 (if any)	m^2
Alternative A3 (if any)	m^2

5. SITE ACCESS

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

Describe the type of access road planned:

Access to development site already exists.

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.

6. 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 document.

The site or route plans must indicate the following:

6.1 the scale of the plan which must be at least a scale of 1:500;
6.2 the property boundaries and numbers of all the properties within 50 metres of the site;
6.3 the current land use as well as the land use zoning of each of the properties adjoining the site or sites;
6.4 the exact position of each element of the application as well as any other structures on the site;
6.5 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;
6.6 all trees and shrubs taller than 1.8 metres;
6.7 walls and fencing including details of the height and construction material;
6.8 servitudes indicating the purpose of the servitude;
6.9 sensitive environmental elements within 100 metres of the site or sites including (but not limited thereto):
- rivers;
- the 1:100 year flood line (where available or where it is required by DWA);
- ridges;
- cultural and historical features;
- areas with indigenous vegetation (even if it is degraded or invested with alien species);

6.10 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
6.11 the positions from where photographs of the site were taken.

7. 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 form. It must be supplemented with additional photographs of relevant features on the site, if applicable.

8. FACILITY ILLUSTRATION

A detailed illustration of the activity must be provided at a scale of 1:200 as Appendix C for activities that include structures. The illustrations must be to scale and must represent a realistic image of the planned activity. The illustration must give a representative view of the activity.

9 ACTIVITY MOTIVATION

9(a) Socio-economic value of the activity

What is the expected capital value of the activity on completion?	R 8 000 000	
What is the expected yearly income that will be generated by or as a result of the activity?	R 0.00	
Will the activity contribute to service infrastructure?	YES X	NO
Is the activity a public amenity?	YES X	NO
How many new employment opportunities will be created in the development phase of the activity?	20	
What is the expected value of the employment opportunities during the development phase?	R 180 000.00	
What percentage of this will accrue to previously disadvantaged individuals?	100%	
How many permanent new employment opportunities will be created during the operational phase of the activity?	None	
What is the expected current value of the employment opportunities during the first 10 years?	R 180 000.00	
What percentage of this will accrue to previously disadvantaged individuals?	100%	

9(b) Need and desirability of the activity

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

NEED:			
1.	Was the relevant provincial planning department involved in the application?	YES X	NO
2.	Does the proposed land use fall within the relevant provincial planning framework?	YES X	NO

3.	If the answer to questions 1 and / or 2 was NO, please provide further motivation / explanation:

DESIRABILITY:			
1.	Does the proposed land use / development fit the surrounding area?	YES	NO
2.	Does the proposed land use / development conform to the relevant structure plans, SDF and planning visions for the area?	YES	NO
3.	Will the benefits of the proposed land use / development outweigh the negative impacts of it?	YES	NO
4.	If the answer to any of the questions 1-3 was NO, please provide further motivation / explanation:		
5.	Will the proposed land use / development impact on the sense of place?	YES	NO
6.	Will the proposed land use / development set a precedent?	YES	NO
7.	Will any person's rights be affected by the proposed land use / development?	YES	NO
8.	Will the proposed land use / development compromise the "urban edge"?	YES	NO
9.	If the answer to any of the question 5-8 was YES, please provide further motivation / explanation.		

BENEFITS:			
1.	Will the land use / development have any benefits for society in general?	YES	NO
2.	**Explain**: The development will provide safe access to and from the communities located in close proximity to the development site. Additionally, there will be employment opportunities created for local residents.		
3.	Will the land use / development have any benefits for the local communities where it will be located?	YES	NO
4.	**Explain**: Local residents will be provided with adequate road infrastructure for vehicles and safer access to the adjacent communities.		

10 APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

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

Title of legislation, policy or guideline:	Administering authority:	Date:
National Environmental Management Act (Act No. 107 of 1998)	Department of Environmental	1998

Title of legislation, policy or guideline:		Administering authority:	Date:
		Affairs	
GNR 544, Listing Notice 1 Activity 11	*"The construction of: (i) canals; (ii) channels; (iii) bridges; (iv) dams; (v) weirs; (vi) bulk storm water outlet structures; (vii) marinas; (viii) jetties exceeding 50 square metres in size; (ix) slipways exceeding 50 square metres in size; (x) buildings exceeding 50 square metres in size; or (xi) infrastructure or structures covering 50 square metres or more where such construction occurs within a watercourse or within 32 metres or a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line."*	Department of Environmental Affairs	18 June 2010
GNR 544, Listing Notice 1 Activity 18	*"The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil sand shells shell grit, pebbles or rock from (i) a watercourse; (ii) the sea; (iii) the seashore; (iv) the littoral active zone, an estuary or a distance of 100 metres inland of the high water mark of the sea or an estuary, whichever distance is the greater but excluding where such infilling, depositing, dredging, excavation, removal or moving (i) is for maintenance purposes undertaken in accordance with a management plan agreed to by the relevant environmental authority; or (ii) occurs behind the development setback line."*	Department of Environmental Affairs	18 June 2010
GNR 544, Listing Notice 1 Activity 22	*"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, or* *(iii) for which an environmental authorisation was obtained for the route determination in terms of the activity 5 in Government Notice 387 of 2006 or activity 18 in Notice 545 of 2012."*	Department of Environmental Affairs	18 June 2010
GNR 546, Listing Notice 3 Activity 12	"*The clearance of an area of 300 square meters or more of vegetation where 75% or more of the vegetation cover constitutes indigenous vegetation.* *(a) Within a critically endangered or*	Department of Environmental Affairs	18 June 2010

Title of legislation, policy or guideline:		Administering authority:	Date:
	endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004; *(b) Within critical biodiversity areas identified in bioregional plans;* *(c) Within the littoral active zone or 100 meters inland from high water make of the sea or an estuary, whichever distance is greater, excluding where such removal will occur behind the development setback line on erven in urban areas."*		
GNR 546, Listing Notice 3 Activity 16	"*The construction of:* *(i) Jetties exceeding 10 square metres in size;* *(ii) Slipways exceeding 10 square metres in size;* *(iii) buildings with a footprint exceeding 10 square meters in size; or* *(iv) infrastructure exceeding 10 square meters 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 expansion will occur behind the development setback line* *(a) In Eastern Cape (ii) Outside urban areas, in:* *(aa) A protected area identified in terms of the NEMPAA, excluding conservancies;* *(bb) National Protected Area Expansion Strategy Focus areas;* *(cc) World Heritage Sites;* *(dd) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;* *(ee) Sites or areas identified in terms of an International Convention;* *(ff) Critical biodiversity areas or*	Department of Environmental Affairs	18 June 2010

Title of legislation, policy or guideline:		Administering authority:	Date:
	ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; *(gg) Core areas in biosphere reserves;* *(hh) Areas within 10 kilometres from national parks or World heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve;* *(ii) Areas seawards of the development setback line or within 1 kilometre from the high water mark of the sea if no such development setback line is determined."*		

11. WASTE, EFFLUENT, EMISSION AND NOISE MANAGEMENT

11(a) Solid waste management

Will the activity produce solid construction waste during the construction/initiation phase?	YES ☒ NO ☐
If yes, what estimated quantity will be produced per month?	± 20 m^3

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

The solid waste produced during the construction phase will be kept to a minimum. This waste will be disposed of at a suitably registered waste disposal site. It is important to note that construction solid waste will be composed of standard building rubble.

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

Construction solid waste will be disposed of at a registered waste disposal site

Will the activity produce solid waste during its operational phase?	YES ☐ NO ☒
If yes, what estimated quantity will be produced per month?	m^3

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

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

If the solid waste (construction or operational phases) will not be disposed of in a registered landfill site or be taken up in a municipal waste stream, then the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

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

If yes, inform the competent authority and request a change to an application for scoping and EIA.

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

If yes, then the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

11(b) Liquid effluent

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

If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

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

If yes, provide the particulars of the facility:

Facility name:			
Contact person:			
Postal address:			
Postal code:			
Telephone:		Cell:	
E-mail:		Fax:	

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

Waste water will be reused where possible when washing construction equipment or during mixing of mortar.

11(c) Emissions into the atmosphere

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

If yes, 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 emissions in terms of type and concentration:

Emissions will result from dust during the construction phase. However, due to the relatively small size and short duration of the construction (± 6 months) it is anticipated that there will be minimal dust generated, should dust suppression measures be implemented successfully. The rate of emission shall comply with the national air quality standard of PM_{10} promulgated under the National Environmental Management: Air Quality Act (Act 39 of 2004).

11(d) Generation of noise

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

If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

If no, describe the noise in terms of type and level:

Noise will result from construction activities on site during the construction phase. During the operational phase, noise will be generated by vehicles utilising the road. However, the existing access road, which is located almost 225m towards a south easterly direction from the proposed new access road site, will be closed to traffic. Furthermore, the proposed access road provides access to a relatively busy road (R61) and therefore, it is anticipated that there will not be a significant change in noise levels during the operational phase.

12. WATER USE

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

municipal	water board	groundwater	river, stream, dam or lake	other	the activity will not use water

If water is to be extracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate

the volume that will be extracted per month: litres

Does the activity require a water use permit from the Department of Water Affairs? YES NO

If yes, please submit the necessary application to the Department of Water Affairs and attach proof thereof to this application if it has been submitted.

Please refer to attachment in Appendix H for Water Use License Application proof of submission

13. ENERGY EFFICIENCY

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

The activity will not make use of energy from the national grid and energy requirements will be limited to the use of fuel for construction activities and equipment. Efficient use of fuel would be ensured by minimizing the amount of trips undertaken by construction vehicles and by ensuring that the construction vehicles are properly serviced.

The activity will not require any energy during the operational phase.

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

No alternative energy sources will be utilised during the construction or operational phases

SECTION B: SITE/AREA/PROPERTY DESCRIPTION

Important notes:

1. 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 B Copy No.: **1**

2. Paragraphs 1 - 6 below must be completed for each alternative.

3. Has a specialist been consulted to assist with the completion of this section? YES NO

If YES, please complete the form entitled "Details of specialist and declaration of interest"

for each specialist thus appointed:

All specialist reports must be contained in Appendix D.

Property description/physical address:	Mzimvubu Erf 48, Remainder of Mzimvubu Farm 37 and Remainder of Mzimvubu Erf 11111111.

(Farm name, portion etc.) Where a large number of properties are involved (e.g. linear activities), please attach a full list to this application.

In instances where there is more than one town or district involved, please attach a list of towns or districts to this application.

Current land-use zoning:	Remainder of Farm 37 is zoned as an Agricultural zone, while the remainder of the un-alienated state land (Erf 11111111) is zoned as an open space

In instances where there is more than one current land-use zoning, please attach a list of current land use zonings that also indicate which portions each use pertains to , to this application.

Is a change of land-use or a consent use application required?	YES	~~NO~~
Must a building plan be submitted to the local authority?	YES	~~NO~~

Locality map:

An A3 locality map must be attached to the back of this document, as Appendix A. The scale of the locality map must be relevant to the size of the development (at least 1:50 000. For linear activities of more than 25 kilometres, a smaller scale e.g. 1:250 000 can be used. The scale must be indicated on the map.) The map must indicate the following:

- an indication of the project site position as well as the positions of the alternative sites, if any;
- road access from all major roads in the area;
- road names or numbers of all major roads as well as the roads that provide access to the site(s);
- all roads within a 1km radius of the site or alternative sites; and
- a north arrow;
- a legend; and
- locality GPS co-ordinates (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 and decimal minutes. The minutes should have at least three decimals to ensure adequate accuracy. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection)

1. GRADIENT OF THE SITE

Indicate the general gradient of the site.

Alternative S1:

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

Alternative S2 (if any):

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

Alternative S3 (if any):

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

2. LOCATION IN LANDSCAPE

Indicate the landform(s) that best describes the site:

2.1 Ridgeline
2.2 Plateau
2.3 Side slope of hill/mountain
2.4 Closed valley
2.5 Open valley
2.6 Plain
2.7 Undulating plain / low hills
2.8 Dune
2.9 Seafront

3. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

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

	Alternative S1:		**Alternative S2 (if any):**		**Alternative S3 (if any):**	
Shallow water table (less than 1.5m deep)	X					
Dolomite, sinkhole or doline areas		X				
Seasonally wet soils (often close to water bodies)	X					
Unstable rocky slopes or steep slopes with loose soil	X					
Dispersive soils (soils that dissolve in water)		X				
Soils with high clay content (clay fraction more than 40%)		X				

Any other unstable soil or geological feature	YES	NO		YES	NO		YES	NO
An area sensitive to erosion	YES	NO		YES	NO		YES	NO

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

4. GROUNDCOVER

Indicate the types of groundcover present on the site:

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

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

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

5. LAND USE CHARACTER OF SURROUNDING AREA

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

5.1 Natural area
5.2 Low density residential
5.3 Medium density residential
5.4 High density residential
5.5 Informal residential[A]
5.6 Retail commercial & warehousing
5.7 Light industrial
5.8 Medium industrial [AN]
5.9 Heavy industrial [AN]
5.10 Power station
5.11 Office/consulting room
5.12 Military or police base/station/compound
5.13 Spoil heap or slimes dam[A]
5.14 Quarry, sand or borrow pit
5.15 Dam or reservoir

5.16 Hospital/medical centre
5.17 School
5.18 Tertiary education facility
5.19 Church
5.20 Old age home
5.21 Sewage treatment plant[A]
5.22 Train station or shunting yard [N]
5.23 Railway line [N]
5.24 Major road (4 lanes or more) [N]
5.25 Airport [N]
5.26 Harbour
5.27 Sport facilities
5.28 Golf course
5.29 Polo fields
5.30 Filling station [H]
5.31 Landfill or waste treatment site
5.32 Plantation
5.33 Agriculture
5.34 River, stream or wetland
5.35 Nature conservation area
5.36 Mountain, koppie or ridge
5.37 Museum
5.38 Historical building
5.39 Protected Area
5.40 Graveyard
5.41 Archaeological site
5.42 Other land uses (describe)

If any of the boxes marked with an "[N] "are ticked, how will this impact / be impacted upon by the proposed activity?

If any of the boxes marked with an "[An]" are ticked, how will this impact / be impacted upon by the proposed activity?

If YES, specify and explain:	
If YES, specify:	

If any of the boxes marked with an "[H]" are ticked, how will this impact / be impacted upon by the proposed activity.

If YES, specify and explain:	

If YES, specify:

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 close (within 20m) to the site?	YES	NO X
	Uncertain	

If YES, explain:

If uncertain, conduct a specialist investigation by a recognised specialist in the field to establish whether there is such a feature(s) present on or close to the site.

Briefly explain the findings of the specialist:

As far as can be gauged no culturally sensitive pre-18th century artefacts have been found in the zone although oral history (not required in this study) might show that different groups (such as Early, Middle and Stone Age man, San, Khoekhoen and Black Xhosa speaking peoples) once lived in this area. No graveyards or informal graves were found in the preliminary survey. If further findings e.g. burial sites are discovered in the course of excavation or construction it is imperative that SAHRA, ECPHRA and/or the senior historian be informed immediately of the situation so that any relevant material may be investigated or collected before it is destroyed.

Please refer to the HIA report attached in Appendix D for further details.

Will any building or structure older than 60 years be affected in any way?	YES	NO X
Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?	YES	NO X

If yes, please submit or, make sure that the applicant or a specialist submits the necessary application to SAHRA or the relevant provincial heritage agency and attach proof thereof to this application if such application has been made.

The heritage authorities (SAHRA and Eastern Cape Province Heritage Resource Agency) were informed of the activity and requested to comment and/or provide their input where necessary.

SECTION C: 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;

(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 municipality which has jurisdiction in the area;
  (vi) any organ of state having jurisdiction in respect of any aspect of the activity; and
  (vii) any other party as required by the competent authority;

(c) placing an advertisement in—
  (i) one local newspaper; or
  (ii) any official *Gazette* that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations;

(d) placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or may have an impact that extends beyond the boundaries of the metropolitan or local 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 the application has been submitted to the competent authority in terms of these Regulations, as the case may be;
  (ii) whether basic assessment or scoping procedures are being applied to the application, in the case of an application for environmental authorisation;
  (iii) the nature and location of the activity to which the application relates;
  (iv) where further information on the application or activity can be obtained; and
  (iv) the manner in which and the person to whom representations in respect of the application may be made.

3. PLACEMENT OF ADVERTISEMENTS AND NOTICES

Where the proposed activity may have impacts that extend beyond the municipal area where it is located, a notice must be placed in at least one provincial newspaper or national newspaper, indicating that an application will be submitted to the competent authority in terms of these regulations, the nature

and location of the activity, where further information on the proposed activity can be obtained and the manner in which representations in respect of the application can be made, unless a notice has been placed in any Gazette that is published specifically for the purpose of providing notice to the public of applications made in terms of the EIA regulations.

Advertisements and notices must make provision for all alternatives.

4. DETERMINATION OF APPROPRIATE MEASURES

The practitioner must ensure that the public participation is adequate and must determine whether a public meeting or any other additional measure is appropriate or not based on the particular nature of each case. 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 the application is submitted. The comments and responses must be captured in a comments and response report as prescribed in the EIA regulations and be attached to this application. The comments and response report must be attached under Appendix E.

6. AUTHORITY PARTICIPATION

Please note that a complete list of all organs of state and or any other applicable authority with their contact details must be appended to the basic assessment report or scoping report, whichever is applicable.

Authorities are 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.

List of authorities informed:

Eastern Cape Department of Economic Development, Environmental Affairs and Tourism
Department of Water Affairs
South African Heritage Resource Agency
Eastern Cape Province Heritage Resource Agency
Department of Rural Development and Land Reform.
Department of Roads and Transport

List of authorities from whom comments have been received:

The Department of Water Affairs made comments with regards to water use authorisations for the development. Please refer to minutes attached in Appendix H for details

7. CONSULTATION WITH OTHER STAKEHOLDERS

Note that, for linear activities, or where deviation from the public participation requirements may be appropriate, the person conducting the public participation process may deviate from the requirements of that subregulation to the extent and in the manner as may be agreed to by the competent authority.

Proof of any such agreement must be provided, where applicable.

Has any comment been received from stakeholders?	YES	NO

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

SECTION D: IMPACT ASSESSMENT

The assessment of impacts must adhere to the minimum 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 requests have been made of yet from the I&APs.

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 to this report as Annexure E):

No requests have been made of yet from the I&APs.

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

List the potential direct, indirect and cumulative property/activity/design/technology/operational alternative related impacts (as appropriate) that are likely to occur as a result of the planning and design phase, construction phase, operational phase, decommissioning and closure phase, including impacts relating to the choice of site/activity/technology alternatives as well as the mitigation measures that may eliminate or reduce the potential impacts listed.

Alternative (preferred alternative)

Please note that a detailed description of the impact rating methodology and a detailed account of the impacts and mitigation measures have been attached as Appendix G. The summary provided in the table below reflects the impacts identified for each of the phases of the proposed development.

Table 1 Summary of the impact assessment results for the Mngazi River crossing

Impact	Nature	Environmental Risk	Nature	Environmental Risk	Public Response	Cumulative Impacts	Irreplaceable loss of resources	Prioritisation Factor	Final Significance Score
Planning and Design Phase									
1. Job Creation	Positive	10	Positive	10	None	Low	Low	1	10
Construction Phase									
2. Job Creation	Positive	13.7	Positive	13.7	None	Low	Low	1	13.7
3. Changes to water quality	Negative	-13	Negative	-4	None	Medium	Medium	1.3	-5.3
4. Soil erosion and sedimentation	Negative	-9	Negative	-2.5	None	Low	Low	1	-2.5
5. Disturbance of in-stream habitat and biota	Negative	-15	Negative	-12.5	None	Medium	Medium	1.3	-16.7
6. Disturbance of river bank structure	Negative	-9	Negative	-4.5	None	Low	Low	1	-4.5
7. Destruction of riparian vegetation and habitat	Negative	-11	Negative	-7	None	Low	Medium	1.2	-8.2
8. Traffic	Negative	-10	Negative	-7	None	Low	Low	1	-7
9. Discovery of sub-surface archaeological finds	Negative	-9.75	Negative	-6	None	Low	Low	1	-6
10. Discovery of unknown sub-surface human remains	Negative	-9.75	Negative	-6	None	Low	Low	1	-6
11. Increased noise and light pollution	Negative	-13	Negative	-13	None	Low	Low	1	-13
Operational Phase									

Impact	Nature	Environmental Risk	Nature	Environmental Risk	Public Response	Cumulative Impacts	Irreplaceable loss of resources	Prioritisation Factor	Final Significance Score
12. Changes to the hydrological regime and increased potential for erosion/ sedimentation	Negative	-16	Negative	-14	None	Medium	Low	1.2	-16.33
13. Changes in channel structure, ecosystems and dynamics	Negative	-16	Negative	-9.75	None	Low	Low	1	-9.75
14. Invasion by weeds and IAPs	Negative	-11	Negative	-5.25	None	Medium	Medium	1.3	-7
15. Chemical pollution	Negative	-10.5	Negative	-6	None	Medium	Medium	1.3	-8
16. Increased fire risk	Negative	-10.5	Negative	-6.5	None	Medium	Medium	1.3	-8.7
17. Increased noise and light pollution	Negative	-13	Negative	-13	None	Low	Low	1	-13
18. Increased solid waste dumping/littering	Negative	-8.25	Negative	-6	None	Low	Low		-6
19. Traffic	Positive	7.5	Positive	7.5	None	Low	Low	1	7.5

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 A (preferred alternative)

The proposed development has the identified alternative (see Appendix C) as the preferred and only financially viable alternative for the reasons detailed below:

It is anticipated that the development will be completed over a relatively short period. The proposed/preferred alternative will result in minimal losses of riparian and other types of vegetation. Upon assessment of the site, there were no major compelling environmental concerns that would hinder the proposed development.

The negative impacts resulting from the proposed development will occur during the planning, construction, operation and decommissioning phase. The majority of the impacts would have a limited extent after successful implementation of mitigation measures.

The potential impacts associated with the proposed development are related to changes and/or disturbances in the following: water quality, soil erosion and sedimentation, in-stream habitats and biota, channel banks, riparian vegetation and habitat, hydrological regimes, channel structure, ecosystem dynamics, alien invasion, chemical pollution, noise and dust pollution, fire risks and littering, as well as employment creation. The entire development will be associated with positive socio-economic impacts including, amongst others, creation of jobs and availability of suitable infrastructure. The impacts identified for this development are anticipated to be of short or medium duration with high or medium confidence levels that they will occur. Numerous mitigation measures have been identified that would reduce the identified impacts. The mitigation measures are presented in Section E below.

Overall, it can be said that the negative impacts of the construction phase, although negative, can be reduced to have a low or a low-medium significance. The negative impacts of the operational phase will, after implementation of mitigation or corrective actions, have a low or a low-medium negative effect on the environment.

No-go alternative (compulsory)

If the proposed activity is not to take place, none of the identified impacts will occur. However implementation of mitigation measures would reduce the significance and where possible prevent the occurrence of impacts associated with the construction as well as the operation phases. The proposed access road and bridge will provide safer and all weather access across the river and thereby ensures pedestrian and vehicular safety.

SECTION E. RECOMMENDATION OF PRACTITIONER

Is the information contained in this report and the documentation attached hereto sufficient to make a decision in respect of the activity applied for (in the view of the environmental assessment practitioner)?

YES	NO
X	

If "NO", indicate the aspects that should be assessed further as part of a Scoping and EIA process before a decision can be made (list the aspects that require further assessment):

If "YES", please 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:

Construction Phase

- The proper storage and handling of hazardous substances (hydrocarbons and chemicals) needs to be administered. Storage containers must be regularly inspected so as to prevent leaks.
- Construction materials liable to spillage are to be stored in appropriate structures (bunded areas) with impermeable flooring (e.g. cement).
- Washing and cleaning of equipment should also be done in berms or bunded areas.
- Storage of potentially hazardous materials (e.g. Fuel, oil, cement, bitumen, paint, etc.) should be outside of the 1:100 year flood line, or within a horizontal distance of 100m from a watercourse, or as specified by the Environmental Control Officer.
- Surface water draining off contaminated areas containing oil and petrol would need to be channelled towards a sump to separate these chemicals and oils. Alternatively, other appropriate contamination prevention measures should be put in place.
- Operation and storage of machinery and construction-related equipment must be done outside of the riparian zone where possible.
- Spillages should be cleaned up immediately and contaminants properly drained and disposed of using proper solid/hazardous waste facilities (not to be disposed of within the natural environment). Any contaminated soil from the construction site must be removed and rehabilitated timeously and appropriately.
- Any cement batching activities should occur outside of the delineated riparian zone. Cement batching boards should be used. Cement products/wash not to be disposed of into the natural environment.
- Ensure that suitable overnight facilities are provided for vehicles, away from any areas of channelled flow.
- Provide drip-trays beneath standing machinery/plant.
- Routinely check machinery/plant for oil or fuel leaks before construction begins.
- Sanitation – portable toilets (1 toilet per 15 to 30 users is the norm) to be provided where construction is occurring. Workers need to be encouraged to use these facilities and not the natural environment. Toilets should not be located within the 1:100 year flood line of a watercourse or closer than 100m or from any natural water bodies including rivers, streams and wetlands. Waste from chemical toilets should be disposed of regularly and in a responsible manner by a registered waste contractor.
- Provide waste bins and encourage workers not to litter or dispose of solid waste in the natural environment but to use available facilities for waste disposal.
- Clear and completely remove from site all general waste, constructional plant, equipment, surplus rock and other foreign materials once construction has been

completed.

- All stockpiles must be protected from erosion, stored on flat areas where run-off will be minimised, and be surrounded by berms.
- No stockpiling should take place within a water course, including the riparian area.
- Mechanical plant and bowsers must not be refuelled or serviced within or directly adjacent to any river channel.
- It is suggested that all construction camps, lay down areas, batching plants and any stores should be located outside of the recommended minimum buffer widths as defined in the Eastern Cape Biodiversity Conservation Plan: Technical Report (Hayes *et al.*, 2007).

  - For crossing: *Mngazi River* this would be a distance of 50 m from the edge of the delineated riparian zone.

  - For crossing: *Mngazi River tributaries* this would be a distance of 32 m from the edge of the delineated riparian zone.

- Excavated material/sediments/spoil from the construction zone (including any foreign materials) should not be placed or stockpiled within the channel or riparian zone in order to reduce the possibility of material being washed downstream.
- For activities taking place within the channel it is suggested that coffer dams are built around the works area to trap any possible pollutants or sediments.
- Measures must be implemented to distribute storm water as evenly as possible to avoid point sources of erosion.
- Any erosion points created during construction should be filled and stabilized immediately.
- Install sediment barriers (e.g. silt fences, sandbags hay bales, filter berms, retaining walls and check dams) immediately downstream of any disturbed areas (e.g. where vegetation stripping is taking place) to trap any sediment generated during construction.
- Sediment traps should be regularly maintained and cleared so as to ensure effective drainage.
- Erosion control measures should be employed where required.
- Construction should proceed mainly during the dry, winter months in order to minimize soil erosion linked to high runoff rates.
- All disturbed construction areas should be suitably top-soiled and vegetated as soon as practically possible after construction, so as to stabilize erosion-prone areas.
- Access routes should be designed to limit their potential impact on the environment, bearing in mind steep banks and areas that are already showing reduced groundcover and erosion.
- Weather forecasts from the South African Weather Bureau should be monitored to avoid exposing soil or building works or materials during a storm event and appropriate action must be taken in advance to protect construction works should a storm event be forecasted.
- Water quality should be monitored for level of suspended solids at a point upstream and immediately downstream of the construction area, during construction and for a period after
- Limit activities wherever possible from taking place within the river channel, or for as short a time as possible where such activities are necessary.
- During construction, flows should be diverted around active in-channel work areas to

ensure flow continues within the channel and to allow for continued ecological functioning of the downstream areas during construction. Under no circumstance should consideration be given to the excavation of an alternative channel or the damming of the stream in such a manner as to totally restrict the flow.

- Any abstraction of water for construction purposes must be approved by the Department of Water Affairs (DWA).
- For activities taking place within the channel it is suggested that coffer dams are built around the works area to trap any possible pollutants or sediments
- Water diversion needs to be temporary. Re-directed flow must not be channelled towards stream banks which could cause erosion.
- Undertake work during low flow season to reduce the risk of high flow/flood-related impacts.
- Excavated material/sediments/spoil from the construction zone (including any foreign materials) should not be placed or stockpiled within the channel.
- Restrict unnecessary disturbance to in-channel areas and manage the removal of sediments/natural debris from channels.
- River sediments should not be permanently removed from the system.
- Construction should occur during the winter months when flows are low to limit the potential for erosion inked to high runoff rates.
- Necessary erosion protection works for unstable channel banks (e.g.: coarse rock pack, gabions) need to be constructed both at the abstraction site and along pipeline routes up the channel banks.
- No physical damage should be done to any aspects of the river channel and banks other than those necessary to complete the works as specified. Ensure that construction activities are carefully monitored to limit unnecessary impacts to the riparian zone.
- Re-instate indigenous vegetation (grasses and indigenous trees) disturbed as soon as practically possible once construction ceases so as to stabilise channel banks. Monitor re-vegetation to ensure channel banks are well covered and protected from erosion.
- Bank erosion should be monitored at regular intervals (e.g. at the onset of the rainy period) in order to assess whether further river bank
- Access routes should be designed to limit potential impact on the environment, bearing in mind steep banks and areas that are already showing reduced groundcover and erosion. A single access route along the channel bank should be considered to access the site – preferably utilising existing footpaths and tracks where areas have already been disturbed.
- Where necessary, structures should be installed to stabilise locally steepened channel banks/hill slopes.
- Soil required for construction purposes must not be derived from the river channel or banks.
- Any soil removed from the river banks/channel should be stockpiled and used in rehabilitation.
- Soils on the river floodplain above the banks that have been compacted must be loosened to an appropriate depth to allow seed germination to occur.
- Install protective works (e.g. gabions, reno-mattresses) to stabilise and protect unstable banks immediately upstream and downstream of site where bedrock ceases to protect the channel margins.
- It is advised that an ECO with a good understanding of the local flora be appoint during the construction phase.

- The construction zone should be clearly demarcated prior to the commencement of construction activities to ensure that construction vehicles do not unduly disturb riparian areas.
- Keep the clearing of vegetation in riparian areas to a minimum and attempt to ensure that clearing occurs in parallel with the construction progress where practically possible.
- Vegetation clearing should ideally be scheduled for the dry season.
- Road-bridge crossings must be designed to limit the physical area of riparian habitat impacted and should be aligned with degraded sections of the riparian zone where possible.
- Attempts must be made to restrict activities within the riparian zone by only accessing the channel using existing access roads.
- Site supervisors must ensure that impacts are confined to the construction zone. Prevent vehicular and personnel access into undisturbed areas. Where possible, cut vegetation to ground-level rather than removing it completely, leaving root systems intact to ensure rapid re-colonization.
- No birds or any other animals may be trapped, hunted or handled in any way.
- Exotic trees and plants encountered should be removed from the site and properly disposed of.
- Rehabilitate disturbed areas as soon as practically possible with indigenous vegetation. A suitable replanting and re-vegetation programme is needed to rehabilitate the riparian zone post-construction. This should comprise a mix of rapidly germinating indigenous annual grass seeds to stabilise the surface layers with a mix of naturally occurring indigenous tree species for longer term stabilisation. These tree species should be those suited to the eco region and adapted to stabilising the banks and riparian margins.
- Where any works (e.g. erosion & storm water control measures) near a river is required, specific attention should be paid to the immediate re-vegetation of cleared areas to limit the potential for erosion and sedimentation.
- Where possible, local labour should be used for construction activities.
- Training programmes could be instated to facilitate skill transfer to local contractors and labourers.
- Vegetation clearing should ideally be scheduled for the dry season.
- Road-bridge crossings must be designed to limit the physical area of riparian habitat impacted and should be aligned with degraded sections of the riparian zone where possible.
- Attempts must be made to restrict activities within the riparian zone by only accessing the channel using existing access roads.
- Site supervisors must ensure that impacts are confined to the construction zone. Prevent vehicular and personnel access into undisturbed areas. Where possible, cut vegetation to ground-level rather than removing it completely, leaving root systems intact to ensure rapid re-colonization.
- No birds or any other animals may be trapped, hunted or handled in any way.
- Exotic trees and plants encountered should be removed from the site and properly disposed of.
- A detailed Traffic Management Plan should be compiled by a suitably qualified professional to ensure that traffic on the roads in the area is disrupted as little as possible.
- The traffic management plan should include measures for the optimisation of the

amount of travel on the local roads, thereby reducing the impact on the local road infrastructure.
- The delivery of construction material and equipment should be limited to hours outside peak traffic times (including weekends) prevailing on the surrounding roads.
- Where obvious damage to the road infrastructure has occurred as a result of the project, repairs should be undertaken in accordance with the local municipality specifications and requirements.
- If during construction any possible finds are made, the operations must be stopped and a qualified archaeologist be contacted for an assessment of the find.
- Any substantial fossil remains (e.g. vertebrates, petrified wood) encountered during excavation should be reported to SAHRA for possible mitigation by a professional palaeontologist.
- Increased vehicular activity and associated noise/light pollution will be extremely difficult to control.
- Ensure that any rest stops and associated structures are not situated adjacent to riverine habitats
- Mitigation of discovered sites will require a fence around the cemetery with a buffer of at least 10 meters and demarcation as a no-go area.
- Where graves and cemeteries are to be directly impacted by construction activities, it is recommended that the graves be relocated after a full grave relocation process that includes comprehensive social consultation.
- A suitably qualified grave relocation specialist should be appointed to facilitate the grave relocation process

Operation Phase
- The bridge crossings should not trap any run-off, thereby creating inundated areas, but allow for the free-flow movement of water.
- Storm water and any runoff generated by the hard surfaces should be discharged into energy dissipation structures prior to being discharged back into the natural water courses (such as retention ponds or areas with rock rip-rap grassed with indigenous vegetation to encourage the trapping of silt and attenuation of flows).
- Limit the physical footprint of the road and verges that would require clearing to a minimum.
- Bridge piers and associated works, should be designed in such a way so that they don't alter the extent of the natural flood lines for the watercourse.
- Construct any necessary erosion protection works where the bridge infrastructure intersects the channel banks of the river in order to prevent scouring or outer-bank erosion. Protection works to be considered include gabions, reno mattresses or other stabilising structures to armour them.
- The channel embankments must be rehabilitated to ensure both longitudinal and cross sectional stability against summer floods. Depending on the circumstances, this may necessitate stabilizing structures such as gabions or reno mattresses as well as careful attention to vegetation rehabilitation.
- The design of the bridge infrastructure needs to accommodate 1:100 year floods. Infrastructure located within the 1:100 year flood line will need to be designed and appropriately protected to be robust enough to withstand a 1:100 year flood.
- Pillars, columns or bridge buttresses should not be placed in in-stream or in riparian zones, if at all possible. If this is necessary, the number and width of pillars, vertical columns and buttresses placed within the river channel and floodplain should be

minimised and all precautions should be taken to avoid excessive disturbance of the channel banks and reduce the risk erosion/increased sedimentation.

- Bridges must span the entire width of the channel and river floodplain so as to avoid disturbance to the riparian zones of rivers.
- Ensure that construction methods are according to the best-practice recommendations provided under the Impact above: *Disturbance of in-stream habitat and biota.*and impact on Invasion by weeds
- All areas disturbed by construction activities must be rehabilitated to their former state once construction activities have ceased and should be monitored afterwards to prevent disturbed areas from being colonised by exotic species and weeds.
- Re-vegetation of disturbed areas must use indigenous plants including locally-common indigenous grasses and trees/shrubs.
- Stockpiles containing mostly exotic or weed species should be covered for extended periods to inhibit seedling germination of these species.
- Implement an integrated alien weed control programme to ensure that alien plants are actively managed and eradicated from the site, with adequate follow-up measures to ensure the area remains weed-free. Remove and effectively treat any alien plants in the construction zone during the construction and operational phase. The dominant invasive species common to the river sites have been documented in this report. These particular species need to be targeted for control and removal.
- Restrict and control the use of herbicides and other chemicals in the road reserve during maintenance.
- Runoff from the road surface should be dissipated before entering the watercourses and diffuse flow encouraged. Discharge through a vegetated buffer should be promoted where possible to trap contaminants.
- Ensure that any rest stops and associated structures are not situated adjacent to riverine habitats
- Ensure that vegetation in the road reserve is kept low (vertical height) by means of regular maintenance.
- Ensure that any rest stops and associated structures are not situated adjacent to riverine habitats.
- Provide waste bins in the vicinity of sensitive aquatic ecosystems to promote waste management. Regular clearing/maintenance of bins would be required.
- Ensure that any rest stops and associated structures are not situated adjacent to riverine habitats

Is an EMPr attached?	YES	NO

The EMPr must be attached as Appendix F.

SECTION F: APPENDICES

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: Impact Assessment Methodology

Appendix H: Water Use License Application proof