DRAFT BASIC ASSESSMENT REPORT

THE PROPOSED REHABILITATION OF NATIONAL ROUTE 2, SECTION 20, BETWEEN MOUNT FRERE AND THE NGCWELENI RIVER BRIDGE, ALFRED NZO DISTRICT MUNICIPALITY, EASTERN CAPE PROVINCE

DEA REF: 14/12/16/3/3/1/1616

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File Reference Number:	
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Date Received:	

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

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, 2014 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. This report format is current as of **08 December 2014**. It is the responsibility of the applicant to ascertain whether subsequent versions of the form have been published or produced by the competent authority
3. 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.
4. Where applicable **tick** the boxes that are applicable in the report.
5. An incomplete report may be returned to the applicant for revision.
6. 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.
7. This report must be handed in at offices of the relevant competent authority as determined by each authority.
8. No faxed or e-mailed reports will be accepted.
9. The signature of the EAP on the report must be an original signature.
10. The report must be compiled by an independent environmental assessment practitioner.
11. 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.
12. A competent authority may require that for specified types of activities in defined situations only parts of this report need to be completed.
13. Should a specialist report or report on a specialised process be submitted at any stage for any part of this application, the terms of reference for such report must also be submitted.

14. Two (2) colour hard copies and one (1) electronic copy of the report must be submitted to the competent authority.
15. Shape files (.shp) for maps must be included in the electronic copy of the report submitted to the competent authority.

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SECTION A: ACTIVITY INFORMATION

Has a specialist been consulted to assist with the completion of this section? **YES**

If YES, please complete the form entitled "Details of specialist and declaration of interest" for the specialist appointed and attach in Appendix I.

1. PROJECT DESCRIPTION

a) Describe the project associated with the listed activities applied for

1. INTRODUCTION

The proposed rehabilitation of National Route 2, Section 20, from Mount Frere to the Ngcweleni River, Alfred Nzo District Municipality, Eastern Cape Province.

The proposed rehabilitation work is proposed to be undertaken as a preservation measure of the existing road, as well as to implement certain safety improvements.

The proposed scope of work for the upgrade and rehabilitation includes:

- The strengthening of the existing pavement;
- General widening of the existing road cross section
- Installation of new passing / climbing lanes;
- Vertical geometric improvements;
- Upgrade or extension of culverts and drainage infrastructure; and
- Upgrade of major structure, including bridges and culverts.

In addition to upgrade and rehabilitation of the road, SANRAL will also engage in Community Development Projects along the route. Existing roads will be used as frontage roads to connect the new intersections to provide a formal route to the N2 section 20. Where the frontage roads do not exist new gravel roads will be constructed linking the villages to the formalised intersections.

The typical width of the community roads to be constructed under this contract is 6.6m (gravel roads). The approximate total length of the gravel roads is 6.5 km. The community development projects will include:

- The construction of bus bays shelters,
- Construction of 1.8m wide walkways (8 km)
- Construction of frontage roads with associated drainage (approximately 6.5km) and
- Construction of five (5) cattle crossing areas as underpass by introducing a 5m x 3m box

culvert.

2. EXISTING ROAD CONDITION

Section 20 of the existing National Route 2 (N2 Freeway) comprise a single carriageway with 2 x 3.6 m wide surfaced lanes and gravel shoulders, measuring between 1.5 and 2.8 m in width.

2.1 Passing / Climbing Lanes

Limited passing lanes exist along this stretch of the road, being limited to the following areas:

- From km 13.28 to km 13.44;
- From km 14.93 to km 15.12; and
- From km 33.48 to km 33.689.

It has been found that these limited passing areas are insufficient for this section of the road, presenting both an inconvenience and a safety risk to road users.

2.2 Pavement Condition

A visual survey of Sections 19 and 20 reveals that the condition of the existing road pavement of poor, with numerous cracks. These cracks are not confined to the wheel paths and were found to be most prominent in the following sections:

- From km 14.2 to km 16.2;
- From km 18.2 to km 20.2;
- From km 22.5 to km 24.1; and
- From km 32.5 to km 36.1.

These cracks indicate that the base and surfacing of the existing road are distressed, caused by a lack of support from the sib base layer.

2.3 Moisture Content of Road Materials

Assessment of the moisture content of road materials revealed that short sections of the road have unusual moisture levels. These occur at:

- Km 2.06;
- Km 20.22;
- Km 23.9;
- Km 30.48;
- Km 34.9;

- Km 37.32; and
- Km 38.2.

These sections of the road occur in cutting areas, indicating that there is moisture intrusion from the bottom of the pavement.

2.4 Road Surface

An analysis of the road surface, along the entire length of section 20, indicates that the current road surface is incapable of accommodating the design traffic loading calculated for the next 25 years.

2.5 Design Speeds

The existing road has a design speed, for most of its length, of 100 km/hr. Certain sections of the road, however, do not comply with this, and vary between 80 and 110 km/hr.

The entire length of the road needs to meet the design speed of 100 km/hr, necessitating vertical alignment improvements in a number of locations along the road route.

2.6 Drainage Infrastructure

Drainage culverts associated with the existing road measure less than 900 mm in diameter and are therefore deemed to be sub-standard. Inspection of side drains along the road route reveal that many of these area silted. There are 177 culverts located along Sections 19 and 20. Details of these culverts are attached in Appendix J1.

2.7 Major Structures

Major structures occurring along the road route include three bridges and five major culverts / underpasses. Details of the major culverts are attached in Appendix J2.

3. PROPOSED UPGRADE / REHABILITATION WORK

In order to address these shortcoming and risks, it is proposed to undertake the following road upgrade and rehabilitation activities within section 20:

- General widening of the existing road cross-section to create 2 x 3.7 m lanes, with a 2.5 m surfaced shoulder (with 0.5 m rounding). These proposed road widths are consistent with the lane widths on adjacent, recently upgraded sections of the N2, located to the east of this project's limit;
- A highway traffic model was run in order to determine the level of service and passing opportunities along sections 19 and 20, using the current design alignments, traffic data and existing design speeds. The results of this model indicated that it is necessary to introduce six additional passing / climbing lanes at the following locations:

- Eastbound direction:
  - From km 9.84 to km 16.32; and
  - From km 17.2 to km 19.4;
- Westbound direction:
  - From km 2.64 to km 8.76;
  - From km 17.7 to km 19.1;
  - From km 30.82 to km 34.18; and
  - From km 34.78 to km 38.42.

In these areas of passing / climbing lane installation, the road cross-section will be widened to accommodate 2 x 3.7 m wide lanes, 1 x 3.5 m wide passing / climbing lane and a 2.5 m wide surface shoulder, with 0.5 m rounding.

- The base and sub-base layers will have to be strengthened in the distressed areas identified above.
- Areas identified as having high moisture content will require rehabilitation through the improvement of subsurface and side drainage. This will require the installation of new sub-surface drains.
- Strengthening of the road surface will be required along the entire project length, in order to accommodate the calculated traffic loading for the next 25 years.
- Major vertical alignment improvements are proposed at the following locations to improve their design speed and to comply with the Geometric Design for Rural Roads Standard:
  - km 2.7;
  - km 4.1;
  - km 6.8,
  - km 7.0;
  - km 7.4;
  - km 8.2;
  - km 8.8;
  - km 9.2;
  - km 10.5;
  - km 16.1;
  - km 18.0;
  - km 18.7;
  - km 19.8;
  - km 25.3;
  - km 27.8;
  - km 30.15; and
  - km 31.1
- The design speed for the section of road between km 0 and km 4 will be designed for 80 km/hr as this section of the road traverses a built-up urban area.
- The design speed for the section of road between km 17 and km 21.3 will be designed for 60 km/hr to ensure the safety of road users through this uneven section of the road.
- The widening of the road, combined with the proposed vertical improvements will necessitate the replacement of existing drainage culverts with pipes of 900 mm in diameter.

New headwalls will also need to be constructed. In order to accommodate the increased cross-section of the road, as well as to minimise siltation of side drains, it is proposed to install new, lined side drains. Appropriate erosion protection measures are also proposed for installation at the various culvert and drain in- and out-lets.

- All bridges and major culverts / underpasses occurring along the road route will require widening in order to accommodate the increased road width. More specifically, the following major structures will be upgraded or replaced to improve their hydraulic capacity:
    - Bridge B031;
    - Bridge B032;
    - Major culvert C260;
    - Major culvert C261;
    - Major culvert C263; and
    - Major culvert C264.
- Bridge B029 has been identified as having sufficient hydraulic capacity, however there is concern over lateral movement of the river bed upstream of this bridge, which is causing erosion of the approach fills. It is therefore proposed to implement erosion protection through the installation of gabions and scour protection along the foundations of this bridge.
- Additional details of these bridges and culverts are included in the tables below:

BRIDGES			
LOCATION	**BRIDGE NO.**	**RIVER NAME**	**STRUCTURE TYPE**
km 1.8	B029	Thwathwa River	2 x 3.7 m spans; 4.5 m high
km 27.25	B031	Mcetyana River	7.7 m single spans; 3.7 m high
km 38.35	B032	Ngcweleni River	3 x 5.2 m spans; 2.3 m high
CULVERTS			
LOCATION	**CULVERT NO.**	**STRUCTURE SIZE**	
km 0.2	C260	2.19 m x 1.8 m box culvert	
km 6.1	C261	1.8 m x 1.8 m box culvert	
km 8.2	C261	5.5 m x 3.8 m box culvert	
km 25.3	C263	3.0 m x 4.5 m box culvert	
km 34.2	C264	3.9 m x 3.5 m box culvert	

b) Provide a detailed description of the listed activities associated with the project as applied for

Listed activity as described in GN 983, 984 and 985	Description of project activity
GN R 983 **Activity 19(i):** *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 meters from a watercourse.*	The proposed development will involve the upgrade, expansion or widening of bridges B031 and B032, as well as culverts C206, C261, C263 and C264, all of which occur in watercourses, as defined in the Regulations. In addition, it is proposed to install erosion protection infrastructure in a watercourse, in order to protect Bridge B029. These activities will require both the excavation and deposition of material, exceeding 5 m^3 in volume, into watercourses.
GN R 985 **Activity 12(a)(i) & (ii):** *The clearance of an area of 300 square meters or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan, in the Eastern Cape, 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 Biodiversity Assessment, 2004; or within critical biodiversity areas identified in bioregional plans.*	The proposed road widening will require the clearance of in excess of 300 m^2 of indigenous vegetation along the length of the road route, to allow for road widening and upgrade. The vegetation proposed for clearing comprises indigenous vegetation of the following types: • Midlands Mistbelt Grassland; • Drakensberg Foothill Moist Grassland; • East Griqualand Grassland; and • Eastern Valley Bushveld. Midlands Mistbelt Grassland is listed as an Endangered ecosystem in terms of section 52 of the NEMBA. Furthermore, the road proposed for upgrade passes through numerous CBA's as identified in the Eastern Cape Biodiversity Conservation Plan, 2007.
GN R 985 **Activity 18(b)(ii)(ee) & (ii):** *The widening of a road by more than 4 meters, or the lengthening of a road by more than 1*	The proposed development will entail the widening of the N2 Freeway by 5.7 m. This activity will occur outside the urban edge of the two nearest urban areas, namely Mount Frere

kilometre, in the Eastern Cape, outside urban areas, in critical biodiversity areas as identified in systematic biodiversity plans adopted by the Competent Authority or in bioregional plans; or areas on the watercourse side of the development setback line or within 100 meters from the edge of a watercourse where no such setback line has been determined.	and Mount Ayliff. The road proposed for upgrade passes through numerous CBA's as identified in the Eastern Cape Biodiversity Conservation Plan, 2007. The road proposed for upgrade also crosses numerous watercourses and thus the road widening activity will occur within 100 m of the edge of these watercourses.
GN R 985 **Activity 23(iii) & (xii) (a) & (c) (b)(ii)(ee)** *The expansion of bridges, where the bridge is expanded by 10 square meters or more in size, & infrastructure or structures where the physical footprint is expanded by 10 square meters or more; where such development occurs in a watercourse; or if no development setback line has been adopted, within 32 meters of a watercourse, measured from the edge of the watercourse; excluding the expansion of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour; in the Eastern Cape; outside urban areas in; critical biodiversity areas as identified in systematic biodiversity plans adopted by the Competent Authority or in bioregional plans.*	The proposed development will require the expansion of bridges and culverts by more than 10 m^2, both within watercourses and within 32 m of watercourses. These activities will occur outside the urban edge of the two nearest urban areas, namely Mount Frere and Mount Ayliff. The bridges and culverts proposed for upgrade occur within CBA's as identified in the Eastern Cape Biodiversity Conservation Plan, 2007.

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 as required by Appendix 1 (3)(h), Regulation 2014. Alternatives should include a consideration of all possible means by which the purpose and need of the proposed activity (NOT PROJECT) 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.

The identification of alternatives should be in line with the Integrated Environmental Assessment Guideline Series 11, published by the DEA in 2004. Should the alternatives include different locations and lay-outs, the co-ordinates of the different alternatives must be provided. The co-ordinates should be in degrees, minutes and seconds. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection.

a) Site alternatives

No alternate properties have been considered for the proposed development, as the road proposed for upgrade and rehabilitation is existing and is located within a registered servitude.

It would be nether feasible nor reasonable therefore to consider development on an alternate property or at an alternate location.

Alternative 1 (preferred alternative)		
Description	Lat (DDMMSS)	Long (DDMMSS)
Alternative 2		
Description	Lat (DDMMSS)	Long (DDMMSS)
Alternative 3		
Description	Lat (DDMMSS)	Long (DDMMSS)

In the case of linear activities:

Alternative:	**Latitude (S):**	**Longitude (E):**
Alternative S1 (preferred)		
• Starting point of the activity	30° 53’ 24.58” S	28° 59’ 48.17” E
• Middle/Additional point of the activity	30° 49’ 44.61” S	29° 08’ 14.74” E

• End point of the activity	30° 48' 32.22" S	29° 19' 15.41" E
Alternative S2 (if any)		
• Starting point of the activity	None	
• Middle/Additional point of the activity		
• End point of the activity		
Alternative S3 (if any)		
• Starting point of the activity	None	
• 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.

See Appendix J.

In the case of an area being under application, please provide the co-ordinates of the corners of the site as indicated on the lay-out map provided in Appendix A of this form.

b) Activity type alternatives

The activity proposed is the upgrade and rehabilitation of an existing national road for the purpose of enhancing its utilisation by and the safety of road users. The development is also proposed in order to accommodate the predicted traffic volumes making use of the road for the next 25 years.

Any alternate activity type would not enable the achievement of these objectives (i.e. the purpose and need for the development), thus no feasible or reasonable activity type alternatives have been considered.

c) Lay-out / Design alternatives

Three options have been identified and considered by the road engineers for the design of the pavement. Each of these alternatives is discussed in turn, below.

Alternative 1 (preferred alternative)		
Description	Lat (DDMMSS)	Long (DDMMSS)
OPTION 2 (as per Engineering Report) Imported 150mm G1 and 150mm G2 on 300mm in situ recycled existing base and subbase. Surfacing options will be S2 (19/9mm) modified binder double seal and 45mm AC with rolled in chippings.		

The existing pavement section can be rehabilitated by using the existing road base and sub base and deep in situ recycle as a 300mm C3 sub grade. The existing base needs to be reconstructed and made a sub grade to achieve the desired structural life. This pavement will ensure that this pavement structure can reach more than the required lifespan over the structural design period of 25 years with ease.

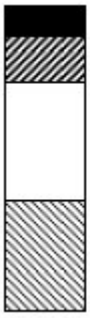
Alternative 2

Description	Lat (DDMMSS)	Long (DDMMSS)

OPTION 3 (as per Engineering Report)

Imported 150mm G1 and 150mm G2 on 300mm in situ recycled existing base and subbase. Surfacing options will be S2 (19/9mm) modified binder double seal and 45mm AC with rolled in chippings.

The existing pavement section can be rehabilitated by using the existing road base and sub base and deep in situ recycle as a 300mm BSM sub grade. The existing base needs to be reconstructed and made a sub grade to achieve the desired structural life. This pavement will ensure that this pavement structure can reach more than the required lifespan over the structural design period of 25 years with ease.

Structural analysis with SA Mechanistic Design Method Me Pads Toolbox shows that this alternative will be able to accommodate reach the desired life irrespective of the surfacing option.		
Alternative 3		
Description	Lat (DDMMSS)	Long (DDMMSS)
OPTION 1 (as per Engineering Report) Imported 150mm G1 on 300mm recycled C3 (150mm imported G5 and 150mm existing base). Surfacing options will be S2 (19/9mm) modified binder double seal and 45mm AC with rolled in chippings.  S2 (19/9mm) or 45mm AC with 13mm rolled in chips 150mm G1 base (new) 300mm C3 recycled existing base and sub base A structural analysis utilizing the SA Mechanistic Design Method Me Pads Toolbox shows that this alternative will not be able to accommodate the 25 year design horizon. This option therefore does not meet the design life requirement for all the uniform sections of N2 Section 20.		

The costs of Option 2 (preferred) and Option 3 (Alternate 1) were calculated and compared:

Life Cycle costs R61 Section 6 (S2(19/9mm) modified binder Double Seal Surfacing Option)

OPTION 2	S2(19/9mm) ,150mm G1,150mm G2 & 300mm C3		OPTION 3	S2(19/9mm) ,150mm G1,150mm G2 & 300mm BSM	
Cost or Road Construction = 301 million			Cost of Road Construction = 313 million		
Description	Cost (R/m2)	Discount cost @ 3.5% PA	Description	Cost (R/m2)	Discount cost @ 3.5% PA
Rehabilitation	R 501.00	R 501.00	Rehabilitation	R 521.00	R 521.00
Fog Spray	R 15.50	R 14.00	Fog Spray	R 15.50	R 14.00
30mmAC & patch	R 72.00	R 55.00	30mmAC & patch	R 72.00	R 55.00
Patch & seal	R 65.00	R 39.00	Patch & seal	R 65.00	R 39.00
Rehabilitation	R 653.50	R 609.00		R 673.50	R 629.00

From the above it can be seen that Option 2 has the lowest life cycle costs. This Option would therefore represent the most reasonable and feasible alternative and has been pursued as the preferred alternative in this application.

c) Technology alternatives

No technologies will be utilised in the operation of the proposed rehabilitated road. Thus, no alternatives in this regard exist.

Alternative 1 (preferred alternative)
None
Alternative 2
Alternative 3

d) Alternate operational aspects of the activity

The operation of the road is intended to provide a safe and efficient movement route for road users. No alternate operational activity would allow this service (the purpose and need of the proposed development) to be provided, thus no alternatives exist.

e) Other alternatives (e.g. scheduling, demand, input, scale and design alternatives)

Alternative 1 (preferred alternative)		
None		
Alternative 2		
Alternative 3		

e) No-go alternative

The no-go alternative would retain the status quo, with no improvement of road use efficiency and the safety of road users. Furthermore, increased capacity of the road, to accommodate calculated future traffic volumes, would not be achieved, with further negative implications for road use efficiency and the safety of road users.

If the no go alternative were pursued, the socio-economic opportunities associated with the project would be lost. The result would be the loss of a potential opportunity for economic upliftment and an improvement in the quality of life for local construction workers and associated industries.

The no go option would, on the other hand result in zero detrimental impacts to the environment. The impacts prevented are, however, manageable and able to be controlled and minimised through

appropriate interventions and mitigation.

3. PHYSICAL SIZE OF THE ACTIVITY

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

Alternative:	Size of the activity:
Alternative A1[1] (preferred activity alternative)	
Alternative A2 (if any)	
Alternative A3 (if any)	

or, for linear activities:

Alternative:	**Length of the activity:**
Alternative A1 (preferred activity alternative)	39 400 m
Alternative A2 (if any)	
Alternative A3 (if any)	

b) 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) 50 m wide and 39 400 m long	1 970 000 m²
Alternative A2 (if any)	
Alternative A3 (if any)	

4. 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	N/A

Describe the type of access road planned:

N/A

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.

5. LOCALITY MAP

See Map 1 in Appendix A.

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

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

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 accurate indication of the project site position as well as the positions of the alternative sites, if any;
- indication of all the alternatives identified;
- closest town(s;)
- 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).

6. LAYOUT/ROUTE PLAN

See Map 2 in Appendix A.

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:

- the property boundaries and numbers of all the properties within 50 metres of the site;
- the current land use as well as the land use zoning of the site;
- the current land use as well as the land use zoning each of the properties adjoining the site or sites;
- the exact position of each listed activity applied for (including alternatives);
- servitude(s) indicating the purpose of the servitude;
- a legend; and
- a north arrow.

7. SENSITIVITY MAP

The required information has been presented in a series of four maps, to avoid congestion of information.

- **Sensitivity Map 1** (Map 3 in Appendix A) shows:
  - Indigenous vegetation; and
  - Main rivers.

- **Sensitivity Map 2** (Map 4 in Appendix A) shows:
  - Main rivers; and
  - Non-perennial drainage lines.

- **Sensitivity Map 3** (Map 5 in Appendix A) shows:
  - CBAs

- **Sensitivity Map 4** (Map 6 in Appendix A) shows:
  - Contours

The layout/route plan as indicated above must be overlain with a sensitivity map that indicates all the sensitive areas associated with the site, including, but not limited to:

- watercourses;
- the 1:100 year flood line (where available or where it is required by DWS);
- ridges;
- cultural and historical features;
- areas with indigenous vegetation (even if it is degraded or infested with alien species); and
- critical biodiversity areas.

The sensitivity map must also cover areas within 100m of the site and must be attached in Appendix A.

8. 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.

See Appendix B.

9. FACILITY ILLUSTRATION

A detailed illustration of the activity must be provided at a scale of at least 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.

See Appendix C.

10. ACTIVITY MOTIVATION

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

1. Is the activity permitted in terms of the property's existing land use rights?	**YES**		Please explain
The proposed development is located within a registered road reserve. This servitude / reserve was registered with the sole purpose of proving land on which a national route could be constructed.			

2. Will the activity be in line with the following?			
(a) Provincial Spatial Development Framework (PSDF)	YES		Please explain

The Eastern Cape (EC) Provincial Spatial development Framework (PSDF) is intended to guide and inform provincial government in the exercise of any discretion or decision-making in terms of the Spatial Planning and Land Use Management Act, 2013 (Act 16 of 2013) (SPLUMA), or any other law relating to land use and development of land.

This document is intended to contribute to and express provincial development policy as well as to integrate and spatially express policies and plans emanating from the various sectors of the provincial and national spheres of government, as they apply at the geographic scale of the province.

This plan outlined specific arrangements for prioritising, mobilising, sequencing and implementing public and private infrastructural and land development investment in the priority spatial structuring areas identified in the document. These include:

- Social protection and basic service delivery, comprising:
    - Income security;
    - Municipal services;
    - Housing;
    - Comprehensive healthcare;
    - Expanded EPWP towards sustainability;
    - Community safety;
    - Gender based violence; and
    - Nutrition;
- Agrarian transformation and rural development, comprising:
    - Land reform (redistribution, redress, tenure, land use);
    - Area based planning;
    - Food security;
    - Agricultural infrastructure;
    - Agro processing; and
    - Institution building;
- Human resource development and education, comprising:
    - HRD plan;

  - ECD;
  - Improve access, throughput and quality of GET education band;
  - Improve quality and status of FET;
  - ABET and literacy; and
  - Public service (provincial and local) skills and training;
- Infrastructure, comprising:
  - Integrated infrastructure plan;
  - Establish a project preparation fund;
  - Infrastructure finance strategy;
  - Strengthen state capacity; and
  - Technical support centre;
- Diversification of manufacturing, comprising:
  - Industrial development;
  - Development finance;
  - Tourism development;
  - Local economic development;
  - Cooperative development;
  - Innovation and research and development; and
  - Institutional building and reconfiguration.

While the proposed development may not fit neatly within any of the above-identified development priorities, it has the potential to facilitate development and improvement within certain of the development priorities, through improved access. These would include, but not be limited to industrial development, tourism development and local economic development.

The most significant way in which the proposed development will facilitate the achievement of priorities and outcomes set out in the PSDF is through the provision of a reliable and high quality transport corridor, which can support development and around which future development can be clustered, through the creation of nodes.

Certain transportation strategies are set out in the PSDF. The proposed development will contribute to certain of these, including:

- **Strategy 3:** Corridor development through urban-rural linkages;

- **Strategy 4:** Optimisation of settlement development through integrated land use and transport planning.

The section of road proposed for upgrade falls within an identified rural development corridor which has been identified as requiring development to enhance the rural linkage between the Alfred Nzo District and Mthatha. This corridor has been specifically identified due to the food production and forestry areas occurring in these rural areas.

(b) Urban edge / Edge of Built environment for the area		**NO**	Please explain

The section of road proposed for rehabilitation and upgrade falls outside the urban edge and the edge of the built environment.

It is intended that this development will improve rural-urban linkages in the region, thereby contributing to enhanced development within the industrial, manufacturing, agricultural, forestry and tourism sectors of the local economy. Each of these has been identified as development priorities within the provincial and municipal SDF for the area.

(c) Integrated Development Plan (IDP) and Spatial Development Framework (SDF) of the Local Municipality (e.g. would the approval of this application compromise the integrity of the existing approved and credible municipal IDP and SDF?).	**YES**		Please explain

The road proposed for upgrade and rehabilitation is a national road, falling under the jurisdiction of SANRAL, as opposed to a municipal road falling under the IDP of the Umzimvubu Local Municipality. As such, the upgrade and rehabilitation of the road, while falling within the jurisdictional area of the Local Municipality, is not necessarily provided for in the municipal plans and policies. Rather, the upgrade and rehabilitation of this road is catered for in the national-level planning policies of SANRAL.

Despite the above explanation, the relevant documents have been considered to determine conformance of the proposed national-level development with the vision of the local authority.

INTEGRATED DEVELOPMENT PLAN FOR UMZIMVUBU

Key performance areas and desired outcomes outlined in the IDP for the 2015/2016 financial year include the following which are enhanced / facilitated by the proposed development:

KPA	INTENDED OUTCOMES
Local economic development	• An efficient, competitive and responsive economic infrastructure network; • Vibrant, equitable, sustainable rural communities contributing towards food security for all; • Agricultural development; • Increased manufacturing activities; • Enhanced tourism; • Forestry development.

Infrastructure development and service delivery	• Roads; • Water and sanitation; • Telecommunications; • Electricity; • Waste management; • Enhanced quality of life in rural areas.

The IDP notes that roads serve as a gateway into the Umzimvubu interior, allow for enhanced access to natural resources and facilitate the transportation of goods out of sites (in the rural areas) of economic activity, to their intended markets (located in the urban areas).

An assessment of the impact of roads, such as the section of the N2 Freeway proposed for rehabilitation and upgrade, reveals that the N2, together with the R405 serves as a spine along which settlement arises. In addition, the two urban centres of Mt Frere and Mt Ayliff are fully accessible utilising this route. It can be deduced that the N2 freeway running through the Umzimvubu Municipality has a strong bearing on the spatial spread of economic activity.

The continued and enhanced use of this road in the medium to long term (25 years) as proposed by this development, is an important factor for the stimulation of economic activity in the region. This would allow:

- Tourists to explore the region;
- Villagers to transport agricultural produce to market areas;
- Forestry stakeholders to access land in which additional plantations might be established;
- Cheap and efficient carriage and delivery of essential retail goods to villages spread throughout the region;
- Increased willingness and decreased costs for entrepreneurs to conduct business in the area;
- Reduced fleet maintenance costs;
- Decreased delivery times; and
- Removal of physical barriers to market access.

All of these would enhance the view of Umzimvubu as an investment destination. For these reasons, it is the opinion of the project team that this proposed development is in alignment with the Umzimvubu IDP.

SPATIAL DEVELOPMENT FRAMEWORK FOR UMZIMVUBU

The current SDF for the Umzimvubu Local Municipality (dated 2011) identifies the major opportunities and constraints which influence spatial development within the region. It then goes further to highlight various development strategies, objectives and land use management

guidelines, for implementation by the municipality, aimed at achieving integrated and sustainable spatial development in the medium to long term.

In terms of roads and transportation, the SDF notes that the access routes in the region act as investment lines. A hierarchy of investment lines can be distinguished consisting of primary, secondary and tertiary routes relating to the importance of a specific road in terms of national, regional or local accessibility. The N2 Freeway is identified as the primary route, providing strong linkage between the economic centres that are found around the province of the Eastern Cape and those of KwaZulu-Natal.

The presence of the N2 Freeway is therefore identified as an opportunity in the SDF. More specifically, the municipality has a high development potential through the offering of stop and go services to the traffic passing by.

The two urban centres which the N2 passes through are highlighted as higher intensity development areas for high-density residential, institutional, social, industrial, warehouse, business, sports and recreation development and facilities. The two towns therefore act as service centres that serve all communities surrounding them. It is anticipated that investment opportunities and the service of surrounding rural areas will be enhanced by the proposed upgrade and rehabilitation activities.

The SDF notes, as a constraint, that the passage of the N2 Freeway through the town of Mt Frere gives rise to problematic traffic congestion, as slow-moving vehicles pass through the CBD.

As a solution, the SDF proposes an alternative by-pass. The proposed rehabilitation and upgrade of Section 19 of the N2 Freeway (located within Mt Frere), which will result in an increase in the capacity of the section, is intended as an interim measure until the proposed by-pass can be planned and implemented.

A further constraint highlighted in the SDF relating to roads is that road construction is often the source of gully erosion due to creation of concentrated run-off from improperly designed road drainage systems. Road cuts are often left bare resulting in extensive rill erosion, which builds up to gully erosion as the volume of run-off water increases.

The proposed development has the potential to enhance and facilitate the utilisation of opportunities associated with the N2 Freeway. An opportunity also exists, through appropriate environmental management during the construction phase to minimise the constraints identified as associated with road construction activities.

(d) Approved Structure Plan of the Municipality

A local authority is required, in terms of the Land Use Planning Ordinance (No. 15 of 1985) to

prepare a Structure Plan for review and approval by the Administrator. The general purpose of this plan is to lay down guidelines for the future spatial development of the area to which it relates (including urban renewal, urban design or the preparation of development plans) in such a way as will most effectively promote the order of the area as well as the general welfare of the community concerned.

No Structure Plan appears to exist for either the Umzimvubu Local Municipality or the Alfred Nzo District Municipality.

(e) An Environmental Management Framework (EMF) adopted by the Department (e.g. Would the approval of this application compromise the integrity of the existing environmental management priorities for the area and if so, can it be justified in terms of sustainability considerations?)			

No EMF appears to exist for either the Umzimvubu Local Municipality or the Alfred Nzo District Municipality.

(f) Any other Plans (e.g. Guide Plan)			

No other plans were discovered.

3. Is the land use (associated with the activity being applied for) considered within the timeframe intended by the existing approved SDF agreed to by the relevant environmental authority (i.e. is the proposed development in line with the projects and programmes identified as priorities within the credible IDP)?		**NO**	Please explain

The road proposed for upgrade and rehabilitation is a national road, falling under the jurisdiction of SANRAL, as opposed to a municipal road falling under the IDP of the Umzimvubu Local Municipality. As such, the upgrade and rehabilitation of the road, while falling within the jurisdictional area of the Local Municipality, is not necessarily provided for in the municipal plans and policies. Rather, the upgrade and rehabilitation of this road is catered for in the national-level planning policies of SANRAL.

Despite this, the following was noted with respect to the timeframes provided in the Municipal planning documents:

- In terms of Section 26(e) of the Municipal Systems Act (Act 32 of 2000), each municipality is required to prepare an Integrated Development Plan (IDP) which must include a Spatial Development Framework (SDF). IDP documents are required to be reviewed on an annual basis. The implication of this is that SDF documents should also be reviewed annually.
- The only Final SDF document (i.e. agreed to by the relevant authorities) for the Umzimvubu Local Municipality is dated 2011. A draft SDF, dated 2015, is available on the municipal website, however this document cannot be considered as it has not been adopted by the

municipal council.

- Based on the requirement to update annually, and the fact that the Final SDF is dated 2011, it cannot be confirmed whether or not the proposed development is considered within the timeframe intended by an approved SDF.
- The proposed development is however in line with the current and up-to-date IDP for the municipality (for the period 2015 – 2016).

4. Does the community/area need the activity and the associated land use concerned (is it a societal priority)? (This refers to the strategic as well as local level (e.g. development is a national priority, but within a specific local context it could be inappropriate.)	**YES**		Please explain

The proposed upgrade and rehabilitation of the N2 Freeway will have benefits on the national, provincial and local level.

5. Are the necessary services with adequate capacity currently available (at the time of application), or must additional capacity be created to cater for the development? (Confirmation by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as Appendix I.)	**YES**		Please explain

The proposed development will not place significant additional pressure or demand on municipal services in the operational phase.

Minor demand will be placed during the construction phase, for the accommodation of construction personnel, the provision of water (for drinking and construction purposes) and the disposal of wastes (solid and effluent wastes). Due to the minor and temporary nature of these demands, it is not necessary to obtain confirmation of the municipality for the provision of these services.

6. Is this development provided for in the infrastructure planning of the municipality, and if not what will the implication be on the infrastructure planning of the municipality (priority and placement of services and opportunity costs)? (Comment by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as Appendix I.)		**NO**	Please explain

The road proposed for upgrade and rehabilitation is a national road, falling under the jurisdiction of SANRAL, as opposed to a municipal road falling under the IDP of the Umzimvubu Local Municipality. As such, the upgrade and rehabilitation of the road, while falling within the jurisdictional area of the Local Municipality, is not necessarily provided for in the municipal plans and policies. Rather, the upgrade and rehabilitation of this road is catered for in the national-level planning policies of SANRAL.

As the road will remain within its registered servitude, it is not anticipated that there will be any

negative implications for municipal services.			
7. Is this project part of a national programme to address an issue of national concern or importance?	**YES**		Please explain
The South African National Road Agency SOC Limited (SANRAL) is mandated to strategically plan, design, construct, operate, rehabilitate and maintain South Africa's National Road Network. SANRAL employs a Pavement Management System (PMS) which comprises systematic information collection and decision making to facilitate the optimisation of resources for the maintenance, rehabilitation and the construction of new pavements across the country, by generating a programme of works and corresponding budget which match a defined level of service. The proposed rehabilitation and upgrade works have been identified as required in order to meet with current demands by road users, to enhance safety of road users and to maintain the efficient functioning of the N2 Freeway for the next 20 years. In addition, these activities will facilitate SANRAL in meeting its stated mandate.			
8. Do location factors favour this land use (associated with the activity applied for) at this place? (This relates to the contextualisation of the proposed land use on this site within its broader context.)	**YES**		Please explain
The existing road is located within a registered road reserve area. The proposed upgrade and rehabilitation activities will occur entirely within this road reserve area.			
9. Is the development the best practicable environmental option for this land/site?	**YES**		Please explain
The Best Practicable Environmental Option (BPEO) is defined in the NEMA as "*the option that provides the most benefit or causes the least damage to the environment as a whole, at a cost acceptable to society, in the long term as well as in the short term*". The reference to the "whole environment" made above implies that the natural, social, economic and cultural factors must be taken into consideration. The two alternatives available for this project are: 1. The establishment of a new section of national road, along a new alignment, to replace the existing N2 Section 20; or 2. The no go alternative, whereby no rehabilitation or upgrade of the road is undertaken. The first alternative described above would have significantly greater environmental impacts and economic implications than the preferred alternative or the no-go alternative, and for this reason, cannot be deemed to be the best practicable environmental option. The no-go alternative, while having the least environmental impact, would result in a road which is unusable, which would have associated economic and social implications and could not, therefore be deemed to be the best practicable environmental option.			

The preferred alternative, which comprises the upgrade and rehabilitation of the existing road along its current alignment, would have fewer environmental impacts and a lower economic cost than the first alternative described above, and would have fewer negative social and economic implications than the no-go alternative. As the preferred alternative is the one with the most benefits, and can be undertaken at an acceptable level of environmental cost (provided the recommended mitigation measures are implemented and adhered to), the preferred alternative is deemed to be the best practicable environmental option.

10. Will the benefits of the proposed land use/development outweigh the negative impacts of it?	**YES**		Please explain

The investigations and assessments undertaken for the preferred development alternative have identified a number of social, economic and environmental impacts. These need to be considered and balanced against one another to determine if they constitute a sustainable development.

The assessment of impacts undertaken in this Basic Assessment found that, in general, socio-economic impacts associated with the proposed development will be positive and of low to medium significance, enhancing livelihoods and quality of life for the foreseeable future. Environmental impacts, on the other hand, are generally negative, comprising the clearance of indigenous vegetation, the potential contamination of soils and groundwater, noise, and traffic. The significance of these negative environmental impacts are low, in general and can, in the opinion of the EAP, be effectively reduced by the implementation of the recommended mitigation measures.

On the balance therefore, provided that all recommended controls are put in place and implemented, it would appear that the proposed social and economic developments could be undertaken without significant detrimental impact on the environment.

11. Will the proposed land use/development set a precedent for similar activities in the area (local municipality)?		**NO**	Please explain

The proposed activity comprises the upgrade and rehabilitation of an existing road. As the road is already in existence, no new development precedent can be set.

12. Will any person's rights be negatively affected by the proposed activity/ies?		**NO**	Please explain

The proposed development will be located entirely within the boundaries of a registered road servitude, which has been reserved specifically for the N2 Freeway and is owned / managed by SANRAL.

It was noted, during the site visit, that some homes or other structures have been established within the road reserve area. SANRAL will need to undertake negotiations with these individuals in order to protect these structures or relocate them to an area outside of the road reserve, to ensure the safety of these structures and their inhabitants.

13. Will the proposed activity/ies compromise the "urban edge" as defined by the local municipality?		**NO**	Please explain
The proposed development is located outside the urban edge of the Mount Frere area. However, the nature of the development, being the upgrade and rehabilitation of existing road infrastructure, is of the type that will not result in urban sprawl. There will therefore be no compromise of the existing urban edge.			
14. Will the proposed activity/ies contribute to any of the 17 Strategic Integrated Projects (SIPS)?		**NO**	Please explain
The proposed development does not fall within any of the 18 SIPs identified in the National Infrastructure Plan.			
15. What will the benefits be to society in general and to the local communities?			Please explain
The proposed upgrade would provide benefits to both the local and regional community and traffic passing through the area by: • Increased road capacity (through the addition of climbing / overtaking lanes) that would improve traffic flow and reduce travel time and traffic congestion; • Improved safety for all road users, including pedestrians and cyclists; • Improved storm water runoff and drainage; • Improved level of services in the Eastern Cape and linking with KwaZulu-Natal; • Improved living standards for road users; • Improved access leading to higher levels of development; • Enhanced access to public transport; • Upliftment of individual and community spirit; • Improved access for emergency vehicles; • Broader economic benefits in the form of increased competitiveness; • Contribution to the National GDP; • Contribution to the GGP. In addition to these operational phase benefits, there are benefits associated with the construction phase. These include the creation of new job opportunities for skilled and semi-skilled workers, as well as opportunities for skills development.			
16. Any other need and desirability considerations related to the proposed activity?			Please explain
The aim of the proposed road upgrade and rehabilitation is to improve the quality of the road section in order to extend its structural lifespan as well as to enhance its quality of service. These improvements will have additional beneficial effects such as relieving traffic congestion, improving road safety and improving overtaking opportunities, etc.			

17. How does the project fit into the National Development Plan for 2030?	Please explain
The National Development Plan (NDP) offers a long-term perspective, defining a desired destination and identifying the role different sectors of society need to play in reaching that goal. The NDP aims to eliminate poverty and reduce inequality by 2030. According to the plan, South Africa can realise these goals by drawing on the energies of its people, growing an inclusive economy, building capabilities, enhancing the capacity of the state, and promoting leadership and partnerships throughout society. The Implementation Plan developed to facilitate the achievement of these aims specifically identifies the need to improve the quality of public services. This is listed as being critical to achieving transformation. Transportation and the provision of efficient and safe access is a public service. The proposed activities will facilitate improved road safety and quality of service of national routes.	

18. Please describe how the general objectives of Integrated Environmental Management as set out in section 23 of NEMA have been taken into account.	
The following provides an analysis of how the objectives of integrated environmental management (IEM) have been considered in the current SANRAL N11 road upgrade. The general objective of IEM is to:	
(a) Promote the integration of the principles of environmental management set out in section 2 into the making of all decisions which may have a significant effect on the environment;	Alignment with NEMA principles described below (see Section 19 assessment below).
(b) Identify, predict and evaluate the actual and potential impact on the environment, socioeconomic conditions and cultural heritage, the risks and consequences and alternatives and options for mitigation of activities, with a view to minimizing negative impacts, maximizing benefits and promoting compliance with the principles of environmental management set out in section 2;	Implicit in the current BA process.
(c) Ensure that the effects of activities on the environment receive adequate consideration before actions are taken in connection with them;	Implicit in the current BA process.

(d) Ensure adequate and appropriate opportunity for public participation in decisions that may affect the environment;	The current BA process has included a comprehensive PP process, including: • Erection of notice boards at various locations along the route proposed for upgrade; • Publication of advertisements in the local press; • Identification of key local stakeholders and organs of state / authorities; and • Engagement with the above-mentioned key stakeholders and authorities through the circulation of a Background Information Document. In addition, a copy of this Draft Report will be made available to all registered Interested and Affected Parties, for review and comment, for a minimum of 30 days.
(e) Ensure the consideration of environmental attributes in management and decision-making which may have a significant effect on the environment; and	A comprehensive assessment of the significance of impacts has been conducted as part of the BAR.
(f) Identify and employ the modes of environmental management best suited to ensuring that a particular activity is pursued in accordance with the principles of environmental management set out in section 23.	These modes of management (mitigation measures) have been identified and included into the EMPr for implementation during construction.

19. Please describe how the principles of environmental management as set out in section 2 of NEMA have been taken into account.

2. (1) The principles set out in this section apply throughout the Republic to the actions of all organs of state that may significantly affect the environment and;

(a) Shall apply alongside all other appropriate and relevant considerations, including the State's responsibility to respect, protect, promote and fulfil the social and economic rights in Chapter 2 of the Constitution and in	The onus is on the proponent to demonstrate to the authorizing agency (DEA) that the State will not be abrogating its responsibility by authorizing the proposed development.	Complies. The BA process has been undertaken in order to provide the relevant decision-makers with the required information. The BA Report should provide sufficient information for the relevant authority to make a

particular the basic needs of categories of persons disadvantaged by unfair discrimination;		defendable and informed decision.
(b) Serve as the general framework within which environmental management and implementation plans must be formulated;	The onus is on the proponent to demonstrate to DEA that the NEMA principles will not compromised.	Complies. The proposed project does not conflict with NEMA principles in such a manner that it places undue risks on the natural or socio-economic environment. Mitigation measures must be effectively implemented.
(c) Serve as guidelines by reference to which any organ of state must exercise any function when taking any decision in terms of this Act or any statutory provision concerning the protection of the environment;	The onus is on the proponent to demonstrate to the authorizing agency (DEA) that in providing environmental authorisation the principles of NEMA are duly addressed.	Complies. The BA process has been undertaken in order to provide the relevant decision-makers with the required information. The BA Report should provide sufficient information for the relevant authority to make a defendable and informed decision.
(d) Serve as principles by reference to which a conciliator appointed under this Act must make recommendations; and	Not Applicable	Not Applicable
(e) Guide the interpretation, administration and implementation of this Act, and any other law concerned with the protection or management of the environment.	Not Applicable	Not Applicable
(2) Environmental management must place people and their needs at the forefront of its concern, and serve their	The BA process must demonstrate that the needs of local people will be adequately addressed and that the development will serve the	Complies. The proposed project will not result in any undue or unacceptable impacts on the local socio-economic

	physical, psychological, developmental, cultural and social interests equitably.	interests of the public equitably	environment. Nor will any impacts be unfairly distributed. Recommendations made in the BAR must be adopted.
	(3) Development must be socially, environmentally and economically sustainable.	The BA process must demonstrate that the development is socially, environmentally and economically sustainable.	Complies. There is no indication that the proposed project would result in undue or environmental, social and economic impacts that would place the sustainability of local natural systems or the project at risk. Recommendations made in the BAR must be adopted
	(4) (a) Sustainable development requires the consideration of all relevant factors including the following:		
i.	that the disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimised and remedied;	The development should not result in a significant loss of biodiversity. Should any loss occur then the project should seek to minimise or remedy the impact or provide suitable offsets.	Complies. Disturbance of local ecosystems must be avoided or impacts must be mitigated. An EMPr and rehabilitation plan will assist in reducing the impact and providing benefits in terms of the re-establishment of natural vegetation. The recommendations made in the Vegetation Assessment must be adopted.
ii.	that pollution and degradation of the environment are avoided, or, where they cannot be altogether avoided, are minimised and remedied;	Certain activities associated with the project carry risks in terms of pollution and environmental degradation. This includes storm water run-off from the new road surfaces.	Complies. The BAR notes that impacts with regard to pollution and degradation of the environment can be managed and will not result in an unacceptable impact on the local environment. The recommendations made in the BAR must be adopted.

		Particular focus must be given to the Environmental Management Programme with regard to the monitoring of stormwater.
iii. that the disturbance of landscapes and sites that constitute the nation's cultural heritage is avoided, or where it cannot be altogether avoided, is minimised and remedied;	The proponent would need to demonstrate that it would not impact on sites of valuable cultural and historical heritage	Complies. A Heritage Impact Assessment has been conducted, and found that there will be no impact on heritage resources arising from the proposed development. Recommendations made in the Heritage Impact Assessment must be adopted
iv. that waste is avoided, or where it cannot be altogether avoided, minimised and re-used or recycled where possible and otherwise disposed of in a responsible manner;	Certain activities associated with the project carry risks in terms of pollution and environmental degradation.	Complies. The BAR notes that impacts with regard to pollution and degradation of the environment can be managed and will not result in unacceptable impact on the local environment. The recommendations made in the BAR must be adopted. Particular focus must be given to the Environmental Management Programme.
v. that the use and exploitation of non-renewable natural resources is responsible and equitable, and takes into account the consequences of the depletion of the resource.	Not Applicable - the project does not involve the exploitation of non-renewable resources	Not Applicable
vi. that the development, use and exploitation of renewable resources and the ecosystems of which	The project should not involve the unsustainable use or renewable resources and ecosystems, nor should any	Complies. The proponent does not intend to and neither will they support the over-use renewable

they are part do not exceed the level beyond which their integrity is jeopardised.	related secondary impacts result in increased resource use.	resources.

11. 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	Applicability to the project	Administering authority	Date
National Environmental Management Act, 1998 (Act 107 of 1998)	**Section 2:** National Environmental Management Principles **Section 23:** General objectives of integrated environmental management **Section 24:** Environmental authorisations **Section 24N:** Environmental management programme **Section 28:** Duty of care and remediation of environmental damage	National Department of Environmental Affairs	1998
Environmental Impact Assessment Regulations, 2014	**GN R 982** **Chapter 4:** Application for environmental authorisation **Chapter 6:** Public participation **Appendix 1:** Basic Assessment Report **Appendix 4:** Environmental Management Programme **Appendix 6:** Specialist Reports **GN R 983** Activity 19(i) **GN R 985** Activity 12(a)(i) & (ii) Activity 18(b)(ii)(ee) & (ii) Activity 23(iii) & (xii)(a) & (c) (b)(ii)(ee)	National Department of Environmental Affairs	2014
National Water Act, 1998	**Section 2:** Purpose of the	Department of Water and	1998

(Act 36 of 1998)	Act **Section 21:** Water Use **Section 39:** General authorisations to water use **Section 40:** Application for license **Section 41:** Procedure for license applications.	Sanitation	
General Authorisations in terms of Section 39 of the National Water Act	**GN 399** **Schedule 1:** Taking water from a water resource **GN 1199** **Schedule:** Impeding or diverting the flow of water in a watercourse and altering the bed, banks or characteristics of a watercourse	Department of Water and Sanitation	26/03/2004 01/01/2010
National Environmental Management Biodiversity Act (Act No. 10 of 2004)	**Section 52:** Ecosystems that are threatened or in need of protection.	National Department of Environmental Affairs	2004
	GN 1002 of 9 December 2011: National List of Ecosystems that are threatened and in need of protection		2011
National Heritage Resources Act, 1999 (Act No. 25 of 1999)	**Section 38(1)(a):** ...any person who intends to undertake a development categorised as the construction of a road...exceeding 300 meters in length must, at the very earliest stage of initiating such development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development	Eastern Cape Provincial Heritage Resources Authority	1999
Guideline 5: Companion to the NEMA EIA Regulations	Entire document	National Department of Environmental Affairs	2010
Guideline 7: Public Participation in the EIA Process	Entire document	National Department of Environmental Affairs	2010
Guideline 9: Need and Desirability	Entire document	National Department of Environmental Affaires	2014

12. WASTE, EFFLUENT, EMISSION AND NOISE MANAGEMENT

a) Solid waste management

Will the activity produce solid construction waste during the construction/initiation phase?	**YES**
If YES, what estimated quantity will be produced per month?	Approximately 10 m^3

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

Construction phase waste is expected to be limited to packaging materials (shrink wrap, cardboard, used cement bags) and litter generated by the construction staff. It is recommended that wastes be recycled as far as possible.

General Solid Waste:

General solid waste will be placed in bins fitted with plastic bags and a lid by the construction worker responsible for its generation. Wastes will be collected from these bins at the end of each work day and transferred to a designated waste storage area located within the Contractors Camp.

The waste storage area will be underlain by an impermeable surface, will be fenced, sign posted and protected from wind and rain. On at least a monthly basis, the Contractor will be responsible for arranging for the waste to be securely transported to the nearest licensed landfill site.

Hazardous Solid Waste:

Hazardous or contaminated solid wastes will be stored in a designated hazardous waste storage area located within the Contractors Camp. This storage area will be underlain by an impermeable surface, provided with a bund with a capacity capable of holding 110% of the waste storage capacity, and will be protected from wind and rain. This storage area will be access controlled and signposted.

Hazardous wastes will be collected at least on a monthly basis by an appropriate service provider and will be removed to a licensed hazardous waste landfill site for disposal.

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

General solid waste will be disposed of at the nearest licensed landfill site.
Hazardous solid waste will be disposed of at the nearest licensed hazardous waste landfill site.

Will the activity produce solid waste during its operational phase?	**NO**
If YES, what estimated quantity will be produced per month?	

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

N/A

If the solid waste will be disposed of into a municipal waste stream, indicate which registered landfill site will be used.

N/A

Where will the solid waste be disposed of 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 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 NEM:WA?		**NO**

If YES, inform the competent authority and request a change to an application for scoping and EIA. An application for a waste permit in terms of the NEM:WA must also be submitted with this application.

Is the activity that is being applied for a solid waste handling or treatment facility?		**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. An application for a waste permit in terms of the NEM:WA must also be submitted with this application.

b) Liquid effluent

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

If YES, provide the particulars of the facility:

Facility name:	Mount Frere Wastewater Treatment Works		
Contact person:	Manager: Infrastructure & Planning – Mr S.P. Ntonga		
Postal address:	Private Bag X9020 Mount Frere		
Postal code:	5090		
Telephone:	039 255 8500	**Cell:**	
E-mail:		**Fax:**	039 255 0167

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

The proposed development will not use significant volumes of water during construction and will use no water during the operational phase. There is no need therefore to implement measures for reuse and recycling of water on this project.

c) Emissions into the atmosphere

Will the activity release emissions into the atmosphere other that exhaust emissions and dust associated with construction phase activities?		NO
If YES, is it controlled by any legislation of any sphere of government?		

If YES, the applicant must 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:

During the construction phase, emissions will comprise of dust and exhaust fumes generated by the plant operating on the site. These emissions will be temporary in nature.

d) Waste permit

Will any aspect of the activity produce waste that will require a waste permit in terms of the NEM:WA?		NO

If YES, please submit evidence that an application for a waste permit has been submitted to the competent authority

e) Generation of noise

Will the activity generate noise?	YES	

Noise will be generated during the construction phase by the use of construction plant and machinery on the site, as well as by the construction workers themselves. This impact will be limited to the duration of the construction phase.

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

Noise generation and its effect on health is regulated by the Noise Induced Hearing Loss Regulations published in GN R 307 of 7 March 2003, in terms of the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993). The noise generated by the proposed development is not, however anticipated to exceed the Noise Rating Limits.

Describe the noise in terms of type and level:

Noise will be generated during the construction phase by plant and machinery in use, as well as by construction workers. It is not anticipated that any blasting will be required on this project, thus there will be no blasting-related noise impacts arising.

13. 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:	5 000 litres
Does the activity require a water use authorisation (general authorisation or water use license) from the Department of Water Affairs?	**YES**

If YES, please provide proof that the application has been submitted to the Department of Water Affairs.

This application process has not yet commenced.

14. ENERGY EFFICIENCY

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

The construction and operational phases of the development will not make use of electricity. There is no need therefore to incorporate energy efficiency measures into the design of the road.

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

The construction and operational phases of the development will not make use of electricity. No alternate energy sources are therefore required.

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 B and indicate the area, which is covered by each copy No. on the Site Plan.

Section B Copy No. (e.g. A): **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**

3.1 Aquatic Ecological Assessment (June 2015) conducted by Scherman Colloty and Associates

3.2 Terrestrial Ecological Assessment (June 2015) conducted by Scherman Colloty and Associates

3.3 Heritage Impact Assessment (August 2015) conducted by Active Heritage

If YES, please complete the form entitled "Details of specialist and declaration of interest" for each specialist thus appointed and attach it in Appendix I. All specialist reports must be contained in Appendix D.

Property description/physical address:

Province	Eastern Cape
District Municipality	Alfred Nzo District Municipality
Local Municipality	Umzimvubu Local Municipality
Ward Number(s)	8, 9, 11, 17, 18 and 27
Farm name and number	These are not applicable as the road proposed for upgrade and rehabilitation is routed entirely within a registered servitude area.
Portion number	
SG Code	

Where a large number of properties are involved (e.g. linear activities), please attach a full list to this application including the same information as indicated above.

Current land-use zoning as per local municipality IDP/records:

No zoning information is available for the Umzimkulu Local Municipality. The road is however located within a registered national road servitude and is currently utilised for the N2 Freeway.

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? **NO**

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

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	**X**	2.4 Closed valley		2.7 Undulating plain / low hills	
2.2 Plateau		2.5 Open valley		2.8 Dune	
2.3 Side slope of hill/mountain		2.6 Plain		2.9 Seafront	
2.10 At sea					

The N2 Freeway has been routed predominantly along the watershed between two quaternary catchments, namely T33G and T33H, both of which occur within the Umzimvubu River Catchment area. As such, the road is predominantly located along a ridgeline.

3. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

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

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

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**

The existing road extent comprises a paved surface. The shoulder areas on either side of the road are currently bare soil. The road is routed through undeveloped natural areas which, as a result of over-grazing and poorly managed burning, are degraded and contain scattered alien vegetation (predominantly wattle (*Acacia mearnsii*) and Peanut butter cassia (*Senna didymobotrya*). Some cultivation also occurs in the areas adjacent to the road, predominantly maize and pine plantations. Some buildings (residential dwellings, schools and shops) occur along the route.

Plate 1: Photos indicating the natural and alien vegetation occurring along the road route proposed for upgrade and rehabilitation.

Plate 2: Photos indicating the types of cultivation occurring along the road route proposed for upgrade and rehabilitation.

Plate 3: Photos indicating the types of structures occurring along the road route proposed for upgrade and rehabilitation.

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. SURFACE WATER

Indicate the surface water present on and or adjacent to the site and alternative sites

Perennial River	**YES**		
Non-Perennial River	**YES**		
Permanent Wetland		**NO**	
Seasonal Wetland		**NO**	
Artificial Wetland	**YES**		
Estuarine / Lagoonal wetland		**NO**	

If any of the boxes marked YES or UNSURE is ticked, please provide a description of the relevant watercourse.

PERENNIAL RIVERS

Major rivers occurring in the study area and crossed by the N2 Freeway include:

- The Mzimvubu River - crossing point: 30° 51' 00.50" S and 29° 04' 10.23" E;
- The Mnceba River – crossing point: 30° 49' 10.39" S and 29° 12' 38.16" E; and
- The Mzintlava River – located at the end of Section 20 at 30° 48' 31.47" S and 29° 19' 17.59" E.

All three of these rivers have been categorised as having a Present Ecological State (PES) = C, meaning they are moderately modified, with some loss of natural habitats having occurred.

The Ecological Importance (EI) and Ecological Sensitivity (ES) for the Mzimvubu and Mnceba Rivers has been determined to be MODERATE. The EI and ES of the Mzintlava River are HIGH, however, it must be noted that the road proposed for upgrade and rehabilitation terminates at the Mzintlava River, without crossing this river.

Various smaller drainage lines of these major rivers are also crossed by the N2 Freeway. Of particular interest in this project, are the following, which are crossed by major structures (bridges) requiring upgrade / replacement:

- The Thwathwa River – a non-perennial river, draining to the Mzimvubu River, crossed by Bridge B029 at km 1.8;
- The Mcetyana River – a perennial river, draining to the Mnceba River, crossed by Bridge B031 at km 27.25; and
- The Ngcweleni River - a perennial river, draining to the Mzintlava River, crossed by Bridge B032 at km 38.35.

The National Freshwater Ecosystem Priority Assessment for the study site indicates that the road section does traverse important Freshwater Ecosystems Priority Areas (FEPA's), fish corridors and important upstream catchments. These have been identified due to the fact that the three above-mentioned rivers retain some largely intact areas of riparian and instream habitat.

The results of the National Freshwater Ecosystem Priority Assessment for the study area are indicated in Figure 1 below.

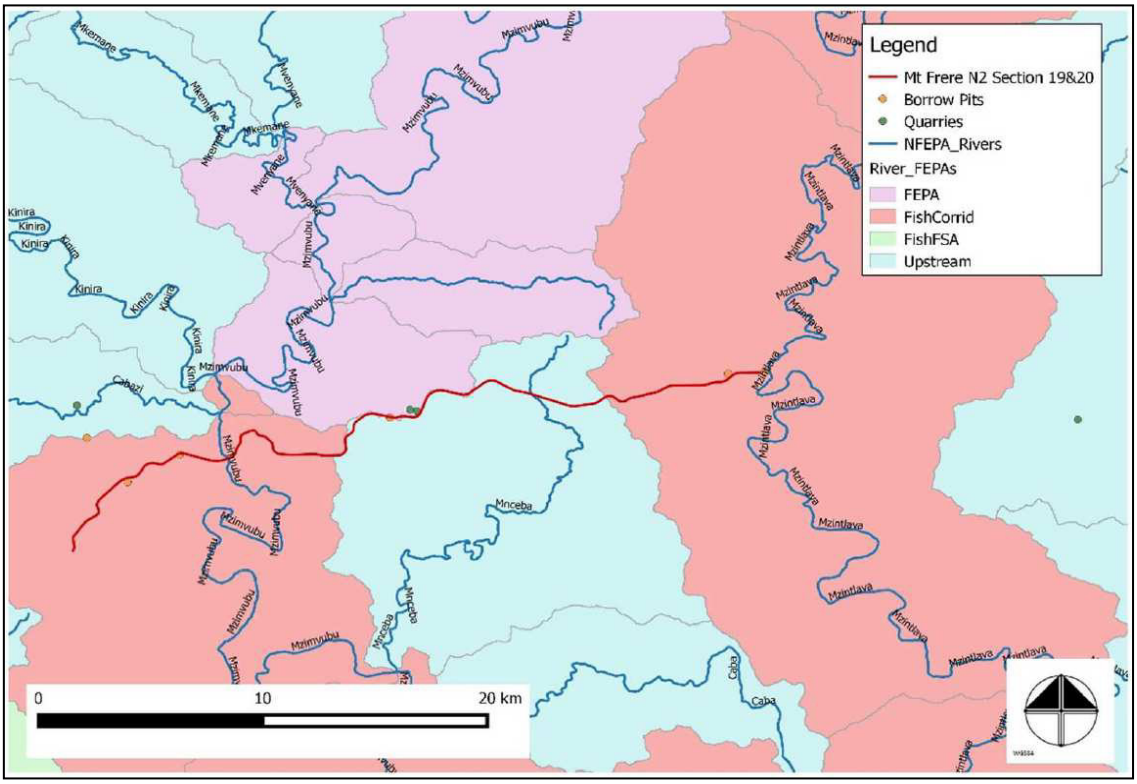


Figure 1: Results of the National Freshwater Ecosystem Priority Assessment for the sections of the N2 Freeway proposed for upgrade and rehabilitation.

NON-PERENNIAL RIVERS

Numerous non-perennial rivers and drainage lines are traversed by the road section proposed for upgrade and rehabilitation, as indicated in Figure 2.

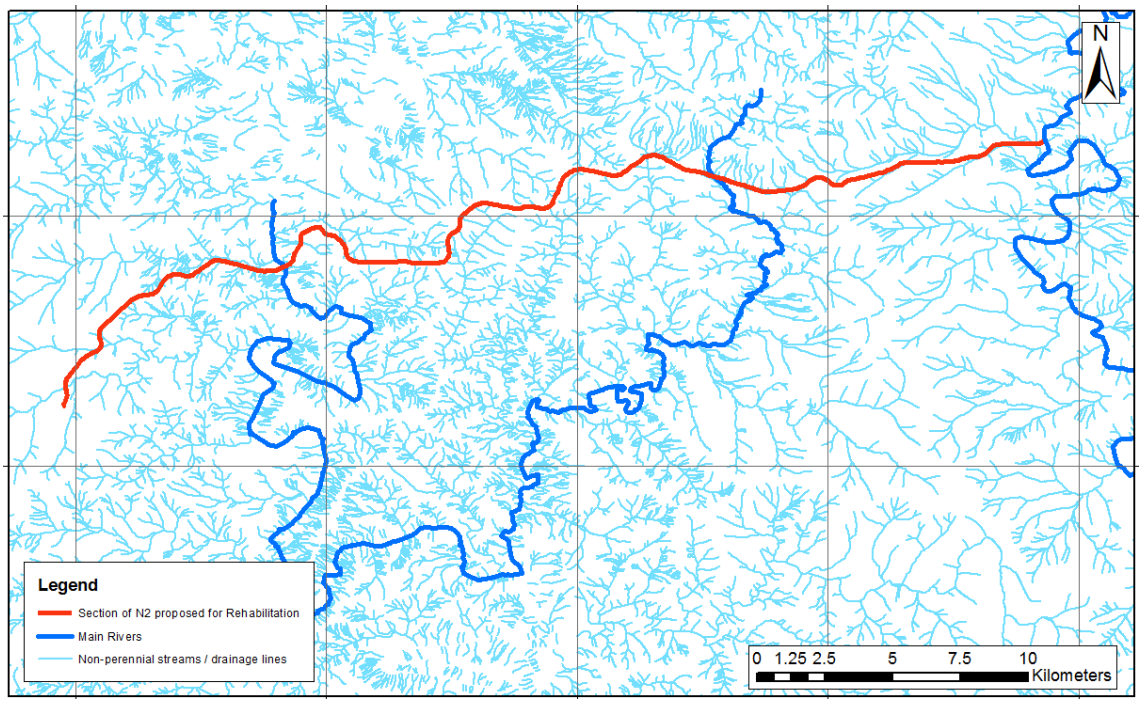


Figure 2: Map indicating the numerous non-perennial rivers and drainage lines are traversed by the road section proposed for upgrade and rehabilitation.

The non-perennial rivers and drainage lines are mostly associated with the upper Mzimbubu, Mnceba and Mzintlava Rivers.

The co-ordinates of each of these crossing points is listed in the table below. Maps showing these crossing points are attached in Appendix A.

CROSSING POINT	SOUTH CO-ORDINATE	EAST CO-ORDINATE
1	30 53' 24.949" S	28 59' 48.336" E
2	30 52' 38.882" S	29 00' 28.387" E
3	30 52' 23.654" S	29 00' 28.615" E
4	30 51' 26.555" S	29 01' 39.728" E
5	30 51' 24.538" S	29 01' 41.067" E
6	30 51' 23.877" S	29 01' 41.53" E
7	30 51' 21.266" S	29 01' 43.248" E
8	30 51' 18.721" S	29 01' 44.819" E
9	30 51' 10.164" S	29 01' 56.428" E
10	30 51' 11.8" S	29 02' 14.749" E
11	30 51' 02.751" S	29 02' 31.087" E
12	30 50' 52.958" S	29 02' 53.624" E
13	30 51' 00.693" S	29 03' 22.928" E
14	30 51' 00.182" S	29 04' 11.121" E
15	30 50' 31.351" S	29 04' 29.291" E
16	30 50' 45.194" S	29 05' 24.168" E

17	30 48' 48.396" S	29 11' 24.302" E
18	30 49' 10.422" S	29 12' 38.07" E
19	30 49' 15.885" S	29 12' 55.426" E
20	30 49' 22.49" S	29 13' 16.531" E
21	30 49' 24.476" S	29 13' 22.689" E
22	30 49' 28.474" S	29 14' 12.87" E
23	30 49' 24.004" S	29 14' 30.797" E
24	30 48' 55.847" S	29 16' 32.985" E
25	30 48' 40.453" S	29 18' 13.049" E
26	30 48' 33.426" S	29 19' 04.397" E
27	30 48' 31.464" S	29 19' 17.507" E

It was noted during the site visit that a large proportion of the non-perennial streams / drainage lines are eroded and deeply incised, due, in part, to the dispersive nature of the soils in the region, combined with poor management of the vegetation (arising from over-grazing, over-burning and previous cultivation).

Drainage channels associated with existing pipe culverts of the N2 Freeway were noted to have little or no erosion / energy dissipation structures, further contributing to the erosion of these features. This source of erosion will be mitigated and minimised by the proposed upgrade of theses culverts and the installation of erosion protection structures.

The incised and eroded non-perennial streams and drainage lines occurring in the study area were noted to support no riparian or instream habitat, reducing the ecological sensitivity and importance of these features.

Erosion, grazing, agriculture, the large number of dams and afforestation, have impacted on the non-perennial streams and drainage lines, reducing their overall EI and ES to a rating of LOW.

WETLANDS

The National Wetland Inventory (SANBI), which is contained in the National Freshwater Ecosystem Priority Areas (NFEPA) spatial database, indicated that the study area contains several wetlands (Figure 3).

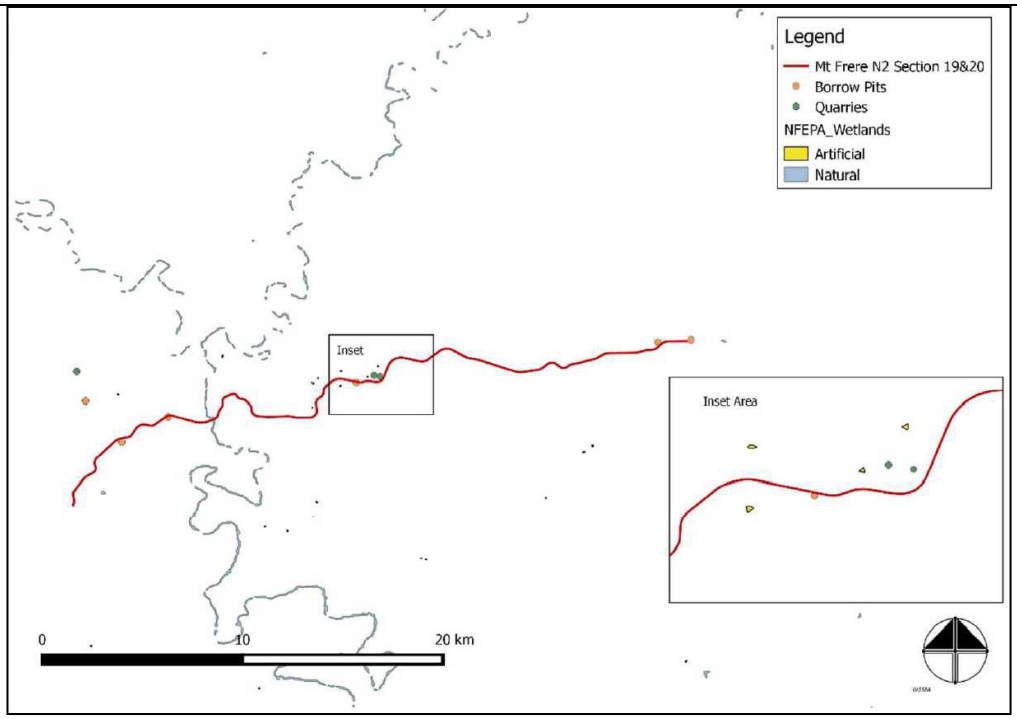


Figure 3: Wetland types and distribution within the study area.

These wetlands were confirmed, during the site visit by the specialist, to be artificial impoundments, mostly farm dams. None of these had any extensive wetland habitat that support larger numbers of species. The only biota included a few weavers using the reeds that had grown due to the sedimentation, or amphibians. None of the plant or animal species are of conservation concern. These systems appear to be seasonal in nature, drying out during the dry season.

With regard the Present Ecological State scores, the man-made farm dams were not rated as the proposed upgrade and rehabilitation of the N2 Freeway will not impact on these artificial systems. Similarly the wetlands created by the road itself, through the pooling of stormwater runoff, were not rated as these will disappear once the road is upgraded. This is however seen as a positive impact as it is more important to reinstate the natural hydrology of the riverine systems and protect these from erosion, sedimentation and additional impoundments.

6. LAND USE CHARACTER OF SURROUNDING AREA

Indicate land uses and/or prominent features that 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:

Natural area	Dam or reservoir	Polo fields
Low density residential	Hospital/medical centre	Filling station [H]
Medium density residential	School	Landfill or waste treatment site
High density residential	Tertiary education facility	Plantation
Informal residential [A]	Church	Agriculture

Retail commercial & warehousing	Old age home	River, stream or wetland
Light industrial	Sewage treatment plant[A]	Nature conservation area
Medium industrial [AN]	Train station or shunting yard [N]	Mountain, koppie or ridge
Heavy industrial [AN]	Railway line [N]	Museum
Power station	Major road (4 lanes or more) [N]	Historical building
Office/consulting room	Airport [N]	Protected Area
Military or police base/station/compound	Harbour	Graveyard
Spoil heap or slimes dam[A]	Sport facilities	Archaeological site
Quarry, sand or borrow pit	Golf course	Other land uses (describe)

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

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

Informal Residential

Eleven small rural villages, comprised of informal housing (rondavel huts with mud walls and thatch roofs, or informal brick structures), with limited municipal service provision, occur within 500 meters of the road route proposed for upgrade and rehabilitation. The location of these villages are indicated in Figure 4.

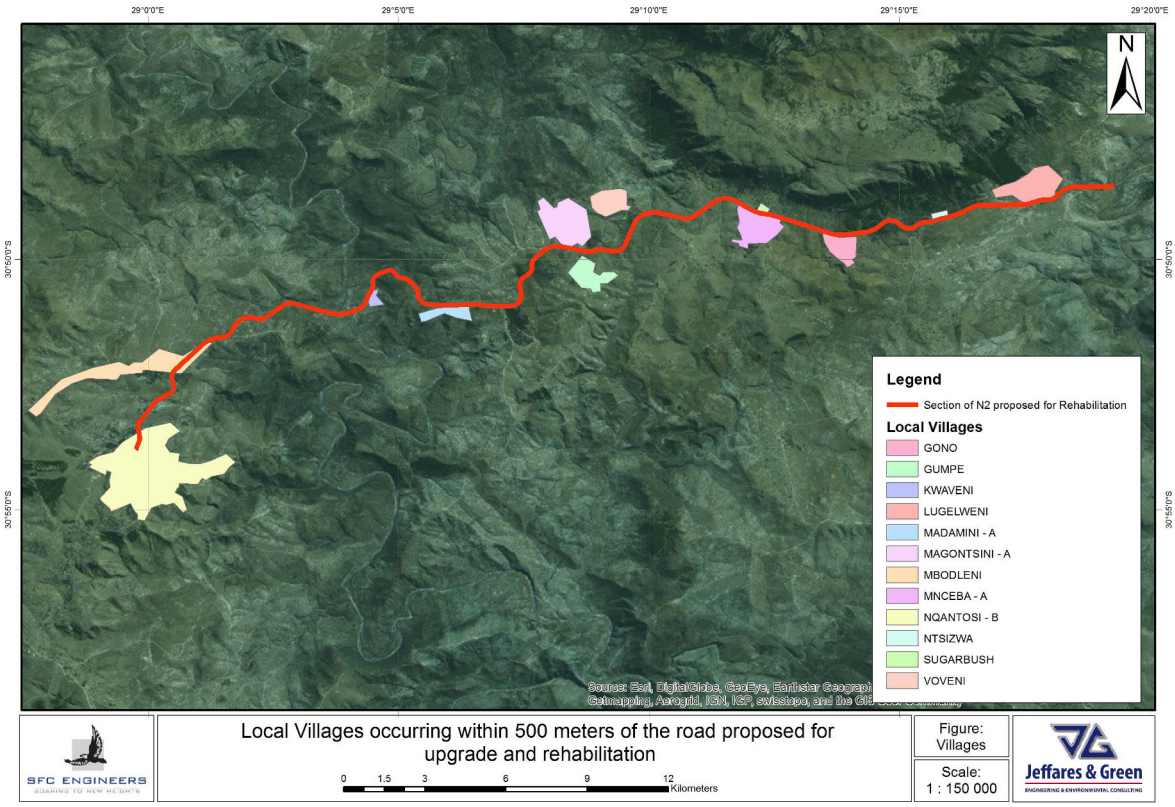


Figure 4: Map indicating the villages occurring in proximity to the road proposed for upgrade and rehabilitation.

The table below provides some information about each of the villages identified.

VILLAGE NAME	TOTAL POPULATION	NO. OF HOUSES
Mbodleni	2459	595
KwaVeni	207	43
Madamini	504	104
Magontsini	1768	428
Gumpe	993	206
Voveni	812	196
Mnceba	1301	315
Sugarbush	47	11
Gono	904	219
Ntsizwa	Unknown	Unknown
Lungelweni	1417	343

These residential areas could potentially be impacted upon during the construction phase of the proposed development, in a number of ways, both positive and negative. These have been summarised in the table below.

Table 1: Potential impacts associated with the construction phase on the nearby settlements

POTENTIAL POSITIVE IMPACTS	POTENTIAL NEGATIVE IMPACTS
Job creation	Noise disturbance
Skills development and enhanced desirability and appeal to future potential employers	Dust disturbance
Additional income	Traffic disturbances (road closures)
Enhanced quality of life through improved affordability of food / medical care, etc.	Disturbance / damage to infrastructure (e.g. fences / walls / buildings / buried services)
Improved access to urban centres of Mt Frere and Mt Ayliff.	Possible disturbance of graves located within the road reserve.

The possibility exists, similarly, that the proximity of the rural communities will impact, both positively and negatively on the proposed activity. These impacts are summarised in the table below.

Table 2: Potential impacts of the nearby settlements on the proposed activities

POTENTIAL POSITIVE IMPACTS	POTENTIAL NEGATIVE IMPACTS
Labour force located in close proximity to the construction activities	Crime / theft from the construction site
	Unrest over perceived insufficient / unfair job creation / allocation
	Complaints regarding noise / dust / traffic and the need arising to implement (often expensive) additional mitigation measures.

If any of the boxes marked with an "H" are ticked, how will this impact / be impacted upon by the proposed activity? Specify and explain:

Natural Area

Vegetation Type

Much of the area through which the road proposed for upgrade and rehabilitation is routed is undeveloped and comprises of natural vegetation. Three vegetation types intersected by the road route proposed for upgrade and rehabilitation:

i. East Griqualand Grassland: hilly country with slopes covered by grassland in places, with patches of bush clumps of *Leucosidea sericea* (Old wood), *Diospyros lycoides* (Star apple), *Acacia karroo* (Sweet thorn) and *Ziziphus mucronata* (Buffalo thorn). This vegetation type is listed (in terms of the National Biodiversity Assessment) as **Vulnerable**. The target for conservation of this vegetation type is 23%, however, at present, only 0.2% of this vegetation type is statutorily conserved in nature reserves. Risks to this vegetation type include cultivation, plantations, urban-sprawl and invasion by woody *Acacia* species.

ii. Eastern Valley Bushveld: semi-deciduous savannah woodlands in a mosaic with thickets, often succulent and dominated by species of *Euphorbia* and *Aloe*. This vegetation type is classified as **Least Threatened** and has a conservation target of 25%. At present 0.8% of this vegetation type is formally protected in nature reserves. It is estimated that approximately 15% of this vegetation type has been transformed by cultivation and invasion by alien vegetation.

iii. Drakensberg Foothill Moist Grassland: moderately rolling and mountainous, much incised by river gorges of drier vegetation types and by forest, and covered in forb-rich grasslands dominated by short grasses including *Themeda triandra* (Red grass) and *Tristachya leucothrix* (Hairy trident grass). This vegetation type is classified as **Least Threatened** and has a conservation target of 23%. Only 2-3% is statutorily conserved at present. It is estimated that 20% of this vegetation type has already been lost or transformed by cultivations, plantations and urban sprawl. Alien woody species such as *Rubus* (Bramble), *Acacia dealbata* (Silver wattle) and *Solanum mauritianum* (Bugweed) also present a risk to this vegetation type.

The National Environmental Management Biodiversity Act (Act No. 10 of 2004) (NEMBA) lists 225 threatened ecosystems, based on vegetation type. If an ecosystem / vegetation type is listed, then certain actions, in terms of the NEMBA are triggered. None of the vegetation types affected by the proposed development are listed.

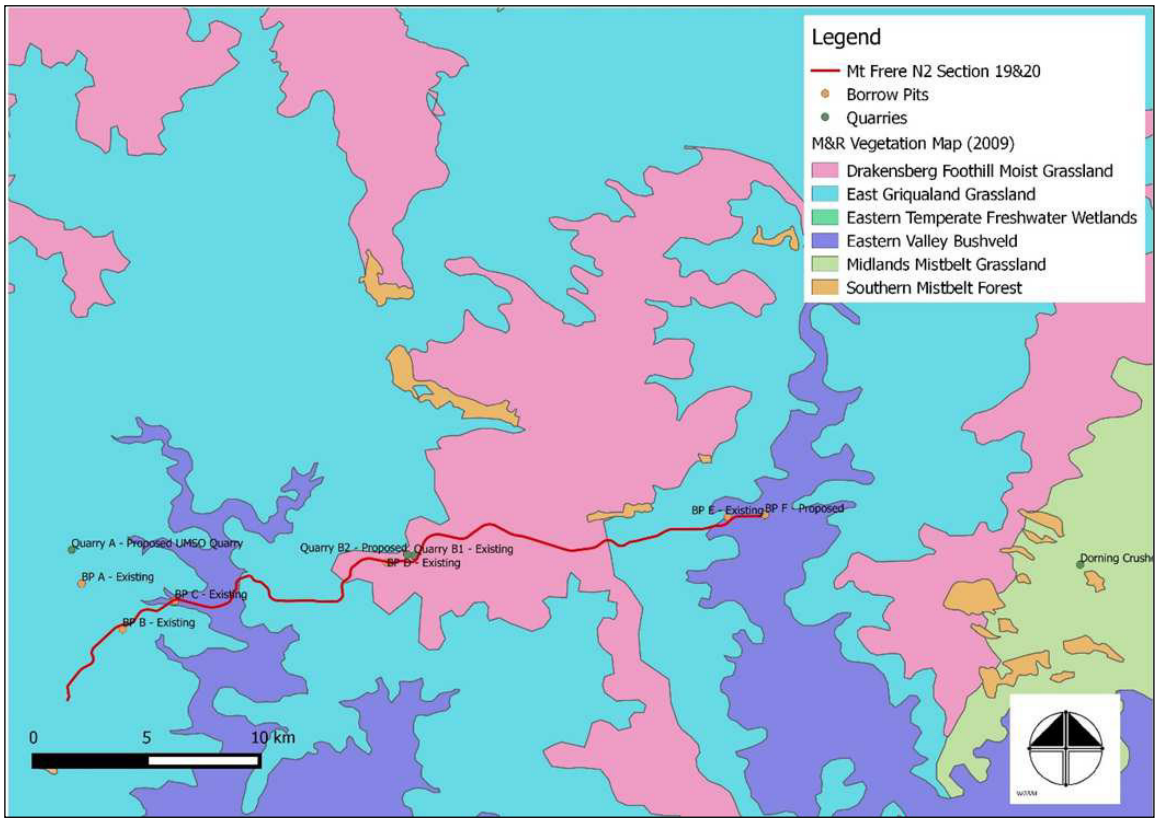


Figure 5: The vegetation units through which the road section under investigation is routed (Mucina and Rutherford, 2006).

Species of Special Concern

The Terrestrial Ecologist identified two species of special concern occurring in the study area and potentially affected by the proposed development. These are:

- *Aloe striata* (Coral Aloe) – a stemless aloe with blue-green leaves which lack spines along their margins. This plant has coral red flowers, borne during the winter months on tall, flat-topped inflorescences. This species is endemic to the Eastern Cape and is widespread throughout the province.

  Isolated specimens of this species were identified in the thicket vegetation, generally associated with rocky areas along watercourses.

- *Crassula sp.* – a large, well-branched, compact, rounded and evergreen shrub with glossy dark grey-green, oval succulent leaves and rounded heads of pink flowers, occurring in winter – spring. This species is limited to the Eastern and Western Cape regions, as well as KwaZulu-Natal.

  Isolated specimens were identified, typically associated with rocky cliffs in the road cuttings.

Should the need arise, during the construction phase, to remove or translocate any specimens of these species, appropriate permits will need to be applied for from the relevant provincial department. It should be noted, in this regard, that both of these species can be easily translocated and would be suitable for use in post-construction rehabilitation activities.

Critical Biodiversity Areas

The road section proposed for upgrade and rehabilitation traverses several Critical Biodiversity Areas (CBAs) as identified in the Eastern Cape Biodiversity Conservation Plan (2007).

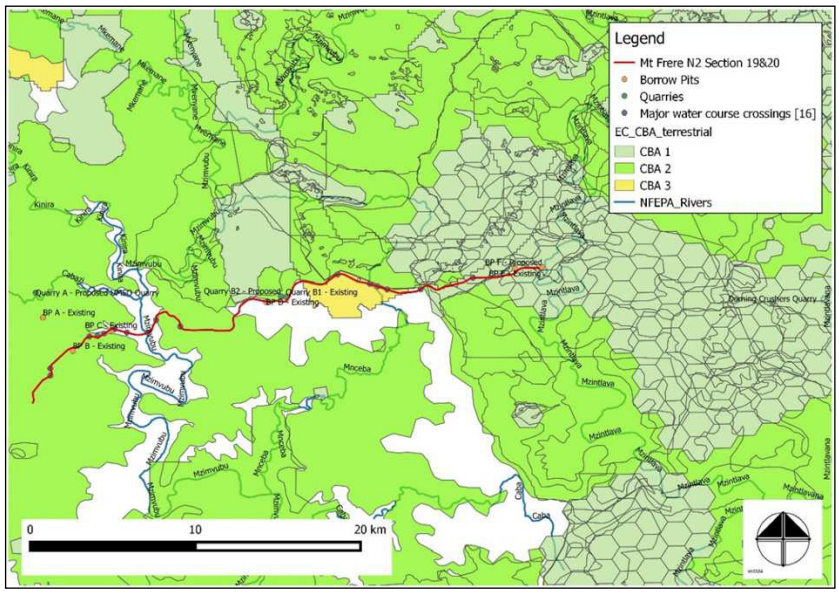


Figure 6: Map illustrating the various CBAs described in the Eastern Cape Biodiversity Conservation Plan (2007)

According to the ECBCP the following CBAs are affected:

CBA CATEGORY	TYPE	EXPLANATION
CBA 1	T1 – SA Vegetation	National critically endangered vegetation types / ecosystems
	T2 – Expert	Known important sites for biodiversity
CBA 2	T2 – SA Vegetation	Endangered SA vegetation types
	T2 Expert	Known important sites for biodiversity
CBA 3	T3 mdtpvg	Vegetation identified as sensitive in the Maloti-Drakensberg Transfrontier Project Vegetation Map

Impacts

Impacts on these natural areas, arising from the undertaking of the proposed activities, include:

- Loss of vegetation and associated habitat;
- Potential loss of plant species of special conservation concern
- Spread of alien invasive species;
- Habitat destruction and associated disturbance or loss of fauna; and
- Habitat fragmentation and disturbance of Critical Diversity Area Corridors.

Previous cultivation, over-grazing, improper burn remiges and the invasion of alien vegetation (predominantly wattle, occurring in drainage lines) have transformed the existing natural areas from their natural state (as described above) into one which has low species and habitat diversity. The conservation value of these natural areas is therefore limited.

In addition, consideration must be given that the road is already constructed within these areas, and would not have a direct impact, or cause the loss of any of the identified sensitive habitats.

Due to the scale of disturbance in the long-term on the surrounding vegetation when compared to its current state (low species abundance but with isolated areas with sensitive habitat and or protected plant species, the clearance of natural vegetation for the purposes of the proposed road upgrade and rehabilitation, is deemed to not be a significant detrimental impact, provided the mitigation measures identified by the Terrestrial Ecologist are implemented.

Quarry / Sand / Borrow Pit

Five borrow pits occur within a 500 m radius of the route proposed for upgrade and rehabilitation. The co-ordinates of the borrow pits are set out in the table below:

Borrow Pit Number	South Co-ordinate	East Co-ordinate
BP 1	30° 51' 39.316" S	29° 01' 20.834" E
BP 2	30° 50' 53.059" S	29° 02' 21.291" E
BP 3	30° 49' 39.254" S	29° 09' 29.099" E
BP 4	30° 49' 01.426" S	29° 09' 57.264" E
BP 5	30° 49' 09.239" S	29° 12' 46.667" E

It is unlikely that these borrow pits will detrimentally impact on or be impacted by the proposed road upgrade and rehabilitation. On the contrary, the possibility exists that these borrow pits (if licensed and permission is granted by the relevant license holder) may provide a convenient source of material required for the proposed activity. Furthermore, should any of these borrow pits be noted to be generating erosion which has the potential to affect the road, the relevant license holder will be engaged to undertake the rehabilitation of these.

Dam or Reservoir

Five small dams have been identified as occurring within 500 meters of the road route. All five dams are man-made storage dams, located along non-perennial streams / drainage lined, established for the purposes (most likely) of stock watering.

Details regarding these dams are summarised in Table 3.

Table 3: details of the dams noted to occur within 500 m of the proposed activity

DAM NO.	ON-STREAM / OFF-STREAM	SOUTH CO-ORDINATE	EAST CO-ORDINATE	AREA
Dam 1	On-stream	30° 50' 37.619" S	29° 07' 18.130" E	2 864.37 m^2
Dam 2	On-stream	30° 49' 57.144" S	29° 08' 11.346" E	4 401.85 m^2
Dam 3	Off-stream	30° 49' 29.090" S	29° 08' 12.417" E	385.28 m^2
Dam 4	On-stream	30° 49' 40.119" S	29° 09' 03.064" E	2 934.89 m^2
Dam 5	On-stream	30° 49' 19.882" S	29° 09' 22.337" E	3 445.88 m^2

Schools and sports facilities

Five schools, with associated sports fields occur within 500 meters of the road section proposed for upgrade and rehabilitation. Details of these schools are set out in Table 4 below.

Table 4: Details of schools occurring within 500 m of the proposed road upgrade

NAME	SOUTH CO-ORDINATE	EAST CO-ORDINATE
Zwelakhe Senior Primary School	30° 50' 38.328" S	29° 04' 31.155" E
Zwelakhe Senior School	30° 50' 58.704" S	29° 06' 55.595" E
Mjilas Ridge Junior School	30° 51' 00.527" S	29° 07' 03.052" E
Rode Junior and Senior School	30° 49' 38.94" S	29° 08' 22.359" E
Voveni Junior School	30° 49' 11.152" S	29° 09' 30.094" E

It is not anticipated that the presence of these schools will have any impact on the proposed development.

However, it is likely that the proposed upgrade and rehabilitation activities will impact detrimentally on the operation of these schools. These impacts could include noise and dust disturbances, as well as the increased safety risks posed to school children walking along the road, to and from school, by the presence of plant and machinery.

Noise and dust impacts can be minimised by ensuring that all plant and machinery is maintained properly and through implementing dust minimisation measures on the site. Safety risks can be minimised by limiting access by non-construction personnel to the construction site, and by ensuring that all construction-related traffic comply with a speed limit of 40 km / hour.

Plantation

An area of plantations occurs to the north of the N2 Freeway, in the section immediately before the Ngcweleni Bridge (at the end of Section 20). The location of these plantations are indicated in Figure 7 below. Photos of the plantations are indicated in Plate 4.

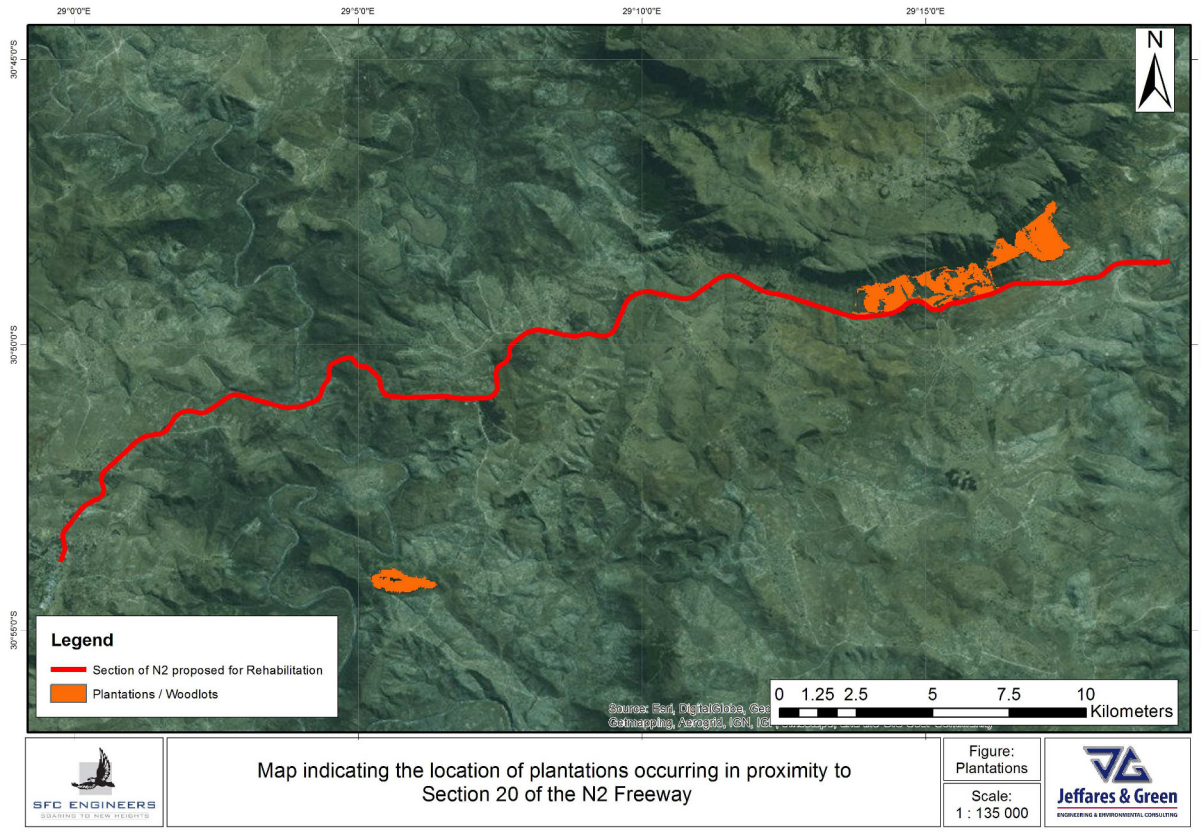


Figure 7: Map indicating the plantation areas occurring in proximity to the road section proposed for upgrade and rehabilitation.

Plate 4: Photos of the plantations occurring in proximity to the road proposed for upgrade.

It is not anticipated that the presence of these plantation areas will have any impact on the proposed development. However, it is possible that the proposed upgrade and rehabilitation activities will impact detrimentally, during the construction phase, on the operation of these commercial plantations through the closure of certain sections of the road, and associated traffic delays. These impacts, will however be temporary in nature and will be resolved upon completion of construction activities.

Agriculture

Agricultural activities occurring in the area include the communal grazing of livestock (cattle, sheep and goats) as well as the cultivation of crops, predominantly maize, on both a subsistence and a commercial level.

It is not anticipated that the undertaking of these agricultural activities will have any impact on the proposed development. However, it is possible that the proposed upgrade and rehabilitation activities will impact detrimentally, during the construction phase, on the operation of these agricultural activities. These could arise through the closure of certain sections of the road, and associated traffic delays; increased traffic volumes on the road and associated increased risks for unrestrained grazing livestock, dust and noise. These impacts, will however be temporary in nature and will be resolved upon completion of construction activities.

River Stream or Wetland

As discussed in Section 5 above, three perennial rivers occur in the study area and are crossed by the N2 Freeway. These are the Mzimvubu River, the Mnceba River and the Mzintlava River. In addition, numerous non-perennial rivers and drainage lines are traversed by the road section proposed for upgrade and rehabilitation. Wetland areas occur in the area, all of which were found, by the aquatic specialist, to be artificial in nature.

It is not anticipated that the presence of these surface water features will have any impact significant on the proposed development, as their presence has been accommodated in the design of the proposed development.
There are, however risks to the surface water features which arise from the proposed development, both during the construction and operational phases. These include:

- Aquatic habitat disturbance
- Increased potential for erosion and sedimentation;
- Changes to the hydrological regime;
- Increased velocity of surface water flows arising from an increase in impermeable surfaces; and
- Diminished water quality.

Measures for the control and mitigation of these impacts have been identified by the Aquatic Specialist. These measures have been incorporated into the EMPr so as to ensure their implementation. Should this implementation be undertaken, it is likely that the significance of the above-mentioned impacts will be drastically reduced or removed altogether.

Certain benefits for the surface water features may also arise from the proposed development. it was noted during the site visits that drainage channels associated with existing pipe culverts of the N2 Freeway have little or no erosion / energy dissipation structures. The stormwater flows from these culverts therefore likely contribute to erosion of local drainage lines. This source of erosion will be mitigated and minimised by the proposed upgrade of theses culverts and the installation of erosion protection structures.

Similarly, the wetlands which the specialist noted were created by the road itself, through the pooling of stormwater runoff, will disappear once the road is upgraded. This is seen as a positive impact as it is more important to reinstate the natural hydrology of the riverine systems and protect these from erosion, sedimentation and additional impoundments.

Mountain, Koppie or Ridge

The N2 Freeway has been routed predominantly along the watershed between two quaternary catchments, namely T33G and T33H, both of which occur within the Umzimvubu River Catchment area. As such, the road is predominantly located along a ridgeline.

It is not anticipated that the proposed development or the ridgeline will have an effect on one another, given that the road is existing and the proposed upgrade and rehabilitation have been designed based on the fact that the road is routed along a ridge.

Graveyard

Whilst no formal graveyards occur in proximity to the road, the Heritage Specialist did note a number of graves located along the road route. It is the opinion of the specialist that, as these graves are located in excess of 30 meters from the edge of the road proposed for upgrade, that there will be no impact thereon. However, the possibility of "invisible graves" is acknowledged, together with the recommendation that should any graves be identified / disturbed by the proposed development, that all activities should cease immediately and a heritage consultant or ECPHRA be contacted. Should the developer decide to proceed in those areas where graves have been exposed then a second phase heritage impact Assessment will be called for. This second phase heritage impact assessment will be time consuming and may implicate the removal and exhumation of graves of by Grave Exhumation Expert.

Does the proposed site (including any alternative sites) fall within any of the following:

Critical Biodiversity Area (as per provincial conservation plan)	**YES**	
Core area of a protected area?		**NO**
Buffer area of a protected area?		**NO**
Planned expansion area of an existing protected area?		**NO**
Existing offset area associated with a previous Environmental Authorisation?		**NO**
Buffer area of the SKA?		**NO**

If the answer to any of these questions was YES, a map indicating the affected area must be included in Appendix A.

A Map indicating the CBA's is included as Map 5 in Appendix A.

7. CULTURAL/HISTORICAL FEATURES

Are there any signs of culturally or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including Archaeological or paleontological sites, on or close (within 20m) to the site? If YES, explain:		**NO**
A specialist Heritage Impact Assessment was conducted. The specialist discovered three heritage sites along the section of road under investigation (as set out in Table 5 below). All of these sites are located in excess of 30 meters from the edge of the road and will not therefore be impacted upon. The specialist is of the opinion that there is no need for mitigation measures in this regard.		

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

The specialist discovered three heritage sites along the section of road under investigation. These

are summarised below.

Table 5: Summary of heritage sites identified

No.	Heritage Site	Estimated Age	Significance	Requires Mitigation?	Co-ordinates
1	Thaba Ntsizwe (battlefield and living heritage site)	Approximately 1820 for historic battle between Zulu and Bhaca people	High significance locally	No, but maintain 20m buffer around site	30° 48' 36.74" S 29° 13' 05.27" E
2	Iron Age site	Between 200 and 800 years ago	High to medium significance locally		30° 51' 22.62" S 29° 04' 00.24" E
3	Old trading store	Approximately 100 years old	High to medium significance locally		30° 50' 58.33" S 29° 03' 58.57" E

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

If YES, please provide proof that this permit application has been submitted to SAHRA or the relevant provincial authority.

8. SOCIO-ECONOMIC CHARACTER

a) Local Municipality

Please provide details on the socio-economic character of the local municipality in which the proposed site(s) are situated.

Level of unemployment:

The proposed development will occur within the Umzimvubu Local Municipality. According to the Integrated Development plan (IDP) for the 2015-2016 period, the population of the area (as measured in 2009) was 223 330 people. 90% of these people reside in rural areas, and the remainder lives in the two urban centres if Mount Frere and Mount Ayliff.

From the age profile of the municipality, it can be seen that only 51% of the population is eligible to be economically active, with 42% of the population being too young (below 14 years of age) and the remaining 7% being of retirement age (65 years and above).

In addition to the age profile, the education levels of the region have an impact on the employment levels (discussed below). The IDP categorises employment status as either "Employed", "Unemployed" or "Not economically active".

Umzimvubu has a working age population of 118 122 individuals. However, given the low levels of functional literacy in the area, the quality of the Umzimvubu labour force is compromised, giving rise to a small base of employable individuals in the area.

Employment levels have accordingly been measured to be low, with only 1 in 3 adult residents engaged in gainful employment of a formal or informal nature. It is estimated that almost 25% of all employment in the area is informal in nature. These factors combine to result in a low labour force participation rate of only 38%.

From the high percentage of individuals classified as "not economically active" it can be inferred that there is a high level of worker discouragement, indicated by the high number of individuals who have given up attempts to gain employment as a result of perceived futility in the action.

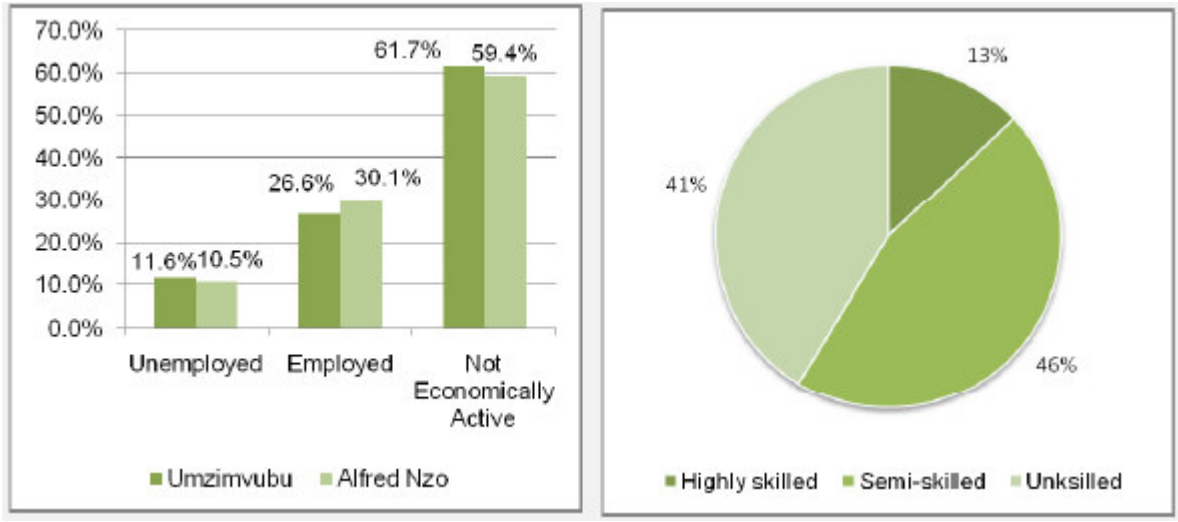


Figure 8: Unemployment levels in Umzimvubu Municipality.

The nature of employment in the area, as presented above shows that most employment opportunities arise in the semi-skilled category. The implication is that there are limited opportunities for highly skilled labour to be employed, which may perpetuate the low levels of education.

Additional barriers to employment have been identified and include geographic barriers to the job market and low wages as compared to other urban centres, such as Kokstad.

Economic profile of local municipality:

The economic profile of the area is a function of the employment sectors active in the region. The sector categorised currently active in the region are indicated in Figure 9 below.

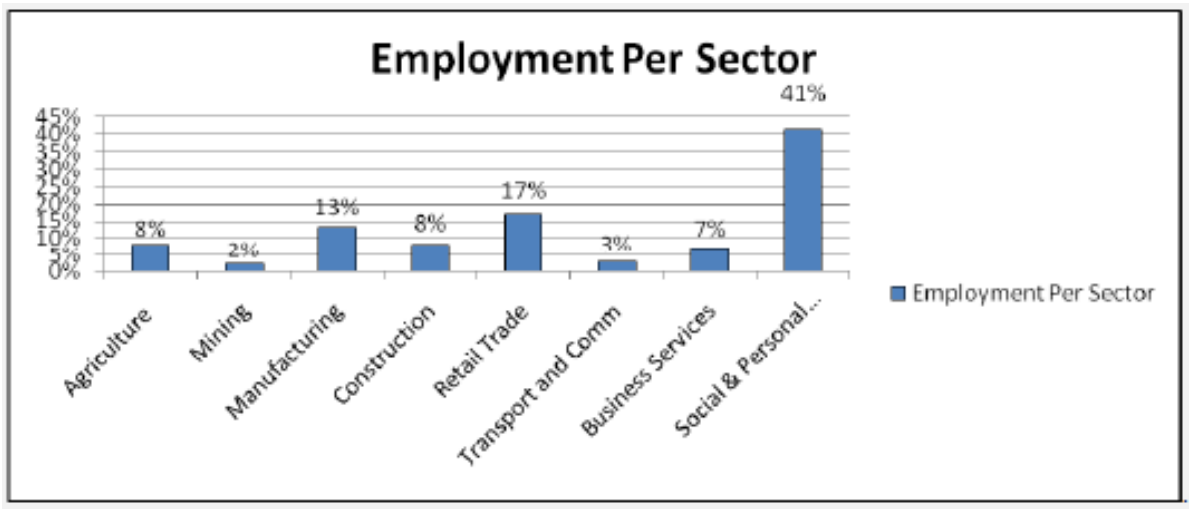


Figure 9: Sectors and levels of employment active in the Umzimvubu area.

Employment in the area is dominated by elementary occupations and occupations requiring low skill levels. Elementary occupations make up 34.3% of the employment sector. Craft and related workers, service shop market and sales workers, and clerks jointly constitute a further 22.5% of the employment sector. Professionals, technicians and associate professionals and legislators / senior managers jointly constitute 36.8%. This number is relatively high as compared to neighbouring municipal areas and is attributed to the high number of government services in the area.

The dominance of elementary and other low level occupations is testimony to the low skills base of the area. This is aggravated by the absence of tertiary educational institutions, which contributes to the low number of graduates in the area. Consequently, there is an acute shortage of skilled artisans, engineers, project managers, business management skills and technical skills, particularly in the agricultural, tourism, forestry and environmental management sectors.

Level of education:

The education levels achieved by a group of individuals is generally indicative of the level of human development within a population group. It furthermore serves as a measure of the potential of the population to generate an income, thereby increasing the capital circulating within the micro-economy.

The average educational attainment levels of residents in the Umzimvubu area are set out in the figure below.

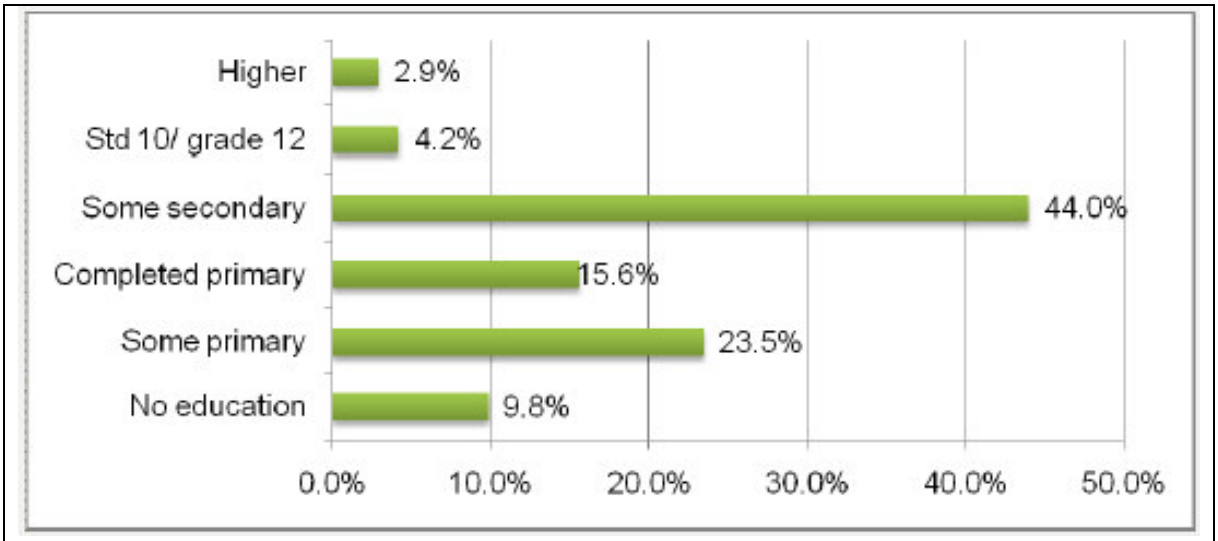


Figure 10: Education levels in the Umzimvubu Local Municipality.

From this figure it can be seen that the area has low levels of educational achievement, with only 7.1% of the population having completed Matric or higher. This figure compares poorly against the remainder of the Eastern Cape, being less than half the provincial average of 16.5%.

These facts have implications for the worker profile, as individuals who have not attained a certain minimum level of education are often faced with barriers to entry into the formal employment market.

In addition, there is further bearing on the nature of investment activity that is feasible and sustainable in the area. It has been identified that without the provision of adequate education and training, a skills deficit will arise and constrain future development within the municipal area.

b) Socio-economic value of the activity

What is the expected capital value of the activity on completion?	R 480 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 and construction phase of the activity/ies?	± 270
What is the expected value of the employment opportunities during the development and construction phase?	R 20 million
What percentage of this will accrue to previously disadvantaged individuals?	55 %
How many permanent new employment opportunities will be created during the operational phase of the activity?	135
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

9. BIODIVERSITY

Please note: The Department may request specialist input/studies depending on the nature of the biodiversity occurring on the site and potential impact(s) of the proposed activity/ies. To assist with the identification of the biodiversity occurring on site and the ecosystem status consult http://bgis.sanbi.org or BGIShelp@sanbi.org. Information is also available on compact disc (cd) from the Biodiversity-GIS Unit, Ph (021) 799 8698. This information may be updated from time to time and it is the applicant/ EAP's responsibility to ensure that the latest version is used. A map of the relevant biodiversity information (including an indication of the habitat conditions as per (b) below) and must be provided as an overlay map to the property/site plan as Appendix D to this report.

a) Indicate the applicable biodiversity planning categories of all areas on site and indicate the reason(s) provided in the biodiversity plan for the selection of the specific area as part of the specific category)

<table>
<tr><th colspan="4">Systematic Biodiversity Planning Category</th><th>If CBA or ESA, indicate the reason(s) for its selection in biodiversity plan</th></tr>
<tr><td rowspan="2">Critical Biodiversity Area (CBA) in terms of ECBCP (2007)</td><td rowspan="2">Ecological Support Area (ESA)</td><td rowspan="2">Other Natural Area (ONA)</td><td rowspan="2">No Natural Area Remaining (NNR)</td><td>CBA 1:
T1 – High Irreplaceability – areas according to the ECBCP definitely required to meet representation targets for biodiversity features.
T2 – Expert Mapped – Expert mapped areas from various other studies.
T2 – SA Veg Type Status – National vegetation types / ecosystems threat status = endangered.
T1 – MSTP Veg Map – Maloti-Drakensberg Transfrontier Project Vegetation threat status = critically endangered.
C1 – Mapped Corridor – ecological corridor identified by the ECBCP using an integrated corridor design for the entire province.
C2 – Existing Corridor – existing ecological corridor and/or unnamed macro-ecological corridor from existing studies.</td></tr>
<tr><td>CBA 2:
T2 – Expert Mapped – Expert mapped areas from various other studies.
T3 – MSTP Veg Map – Maloti-Drakensberg Transfrontier Project Vegetation threat status = vulnerable.</td></tr>
</table>

				• **C1 – Mapped Corridor** – ecological corridor identified by the ECBCP using an integrated corridor design for the entire province. • **C2 – Existing Corridor** – existing ecological corridor and/or unnamed macro-ecological corridor from existing studies.
				CBA 3: • **T3 – MSTP Veg Map** – Maloti-Drakensberg Transfrontier Project Vegetation threat status = vulnerable.

See Map 5 in Appendix A.

b) Indicate and describe the habitat condition on site

Habitat Condition	Percentage of habitat condition class (adding up to 100%)	Description and additional Comments and Observations (including additional insight into condition, e.g. poor land management practises, presence of quarries, grazing, harvesting regimes etc).
Natural	**0 %**	All land occurring in proximity to the road proposed for upgrade and rehabilitation has been modified in some way, as a result of grazing, burning, cultivation or development. No completely natural and unmodified areas remain.
Near Natural (includes areas with low to moderate level of alien invasive plants)	**50 %**	Most of the study area comprises slightly modified natural vegetation, with a relatively low level of alien infestation. Modification of the natural vegetation has arisen primarily as a result of poor grassland management practices (including over-grazing and over-burning), past cultivation, and erosion / gully formation.
Degraded (includes areas heavily invaded by alien plants)	**30 %**	Some parts of the study area have become heavily invaded by alien species. This predominantly comprises wattle trees and bracken fern occurring in drainage lines.
Transformed (includes cultivation, dams, urban, plantation, roads, etc)	**20 %**	Parts of the study area have been completely transformed by the N2 Freeway, various settlements (both urban and rural), cultivation and plantations.

c) Complete the table to indicate:

(i) the type of vegetation, including its ecosystem status, present on the site; and

(ii) whether an aquatic ecosystem is present on site.

<table>
<tr><th colspan="2">Terrestrial Ecosystems</th><th colspan="6">Aquatic Ecosystems</th></tr>
<tr><td rowspan="3">Ecosystem threat status as per the National Environmental Management: Biodiversity Act (Act No. 10 of 2004)</td><td>Critical</td><td rowspan="2" colspan="2">Wetland (including rivers, depressions, channelled and unchanneled wetlands, flats, seeps pans, and artificial wetlands)</td><td rowspan="2">Estuary</td><td rowspan="2" colspan="2">Coastline</td></tr>
<tr><td>Endangered</td></tr>
<tr><td>East Griqualand Grassland: Vulnerable
Drakensberg Foothill Moist Grassland & Eastern Valley Bushveld: Least Threatened</td><td>YES</td><td></td><td></td><td></td><td>NO</td><td></td><td>NO</td></tr>
</table>

See Map 7 in Appendix A

d) Please provide a description of the vegetation type and/or aquatic ecosystem present on site, including any important biodiversity features/information identified on site (e.g. threatened species and special habitats)

Vegetation types occurring on site include:

- Drakensberg Foothill Moist Grassland – listed as **Least Threatened** in terms of the National Biodiversity Assessment (2004) and **not listed** as a threatened ecosystem in terms of Section 52 of the NEMBA;
- East Griqualand Grasslands – listed as **Vulnerable** in terms of the NBA and **not listed** as a threatened ecosystem in terms of NEMBA; and
- Eastern Valley Bushveld – listed as **Least Threatened** in terms of the NBA and **not listed** as a threatened ecosystem in terms of the NEMBA.

Species of Special Concern identified on the site include:

- *Aloe striata*; and
- *Crassula* sp.

Aquatic ecosystems identified include:

- Three perennial rivers:
  - Mzimvubu River,
  - Mnceba River, and

- Mzintlava River.

- Numerous non-perennial rivers and drainage lines; and
- Wetland areas, all of which were found, by the aquatic specialist, to be artificial in nature.

See Map 8 in Appendix A.

SECTION C: PUBLIC PARTICIPATION

1. ADVERTISEMENT AND NOTICE

Publication name	Daily Dispatch	
Date published	03/11/2014	
Site notice position	**Latitude**	**Longitude**
POSTER 1	30° 53' 47.35" S	28° 59' 44.50" E
POSTER 2	30° 51' 03.47" S	29° 04' 00.38" E
POSTER 3	30° 49' 47.42" S	29° 08' 33.72" E
POSTER 4	30° 48' 32.88" S	29° 19' 07.86" E
Date placed	04/08/2014	

Include proof of the placement of the relevant advertisements and notices in Appendix E1.

A copy of the advertisement and the site poster, together with photos of the site photos have been provided.

2. DETERMINATION OF APPROPRIATE MEASURES

Provide details of the measures taken to include all potential I&APs as required by Regulation 41(2)(e) and 41(6) of GN 733.

Key stakeholders (other than organs of state) identified in terms of Regulation 41(2)(b) of GN 733

Title, Name and Surname	**Affiliation/ key stakeholder status**	**Contact details (tel number or e-mail address)**
Mr Tobela Nota	Municipal Manager – Umzimvubu Local Municipality	tobela.nota@yahoo.com
Mr S.P. Ntonga	Manager: Infrastructure and Planning – Umzimvubu Local Municipality	sntonga@gmail.com
Cllr M. Jojo	Ward 8	813 Main Street Mount Frere PO Box 53, Umzimvubu, 3297 Tel: +27 (0)39 255 8500 /166 Fax: +27 (0) 39 255 0167
Cllr Z.J. Mendu	Ward 9	
Cllr N. Gogela	Ward 11	
Cllr S.Mankanku	Ward 17	
Cllr N.L. Xezu	Ward 18	
Cllr S. Nogcantsi	Ward 27	
Mr S. Tantsi	Municipal Manager - Ntabankulu Local Municipality	stantsi@ntabankulu.gov.za
Ms Qotoyi	Director: Infrastructure Planning	qotoyi@ntabankulu.gov.za
Unknown	Ward 11 councillor	Erf 85 Main Street,

Unknown	Ward 12 councillor	PO Box 234, Ntabankulu 5730 Tel: +27 (0) 39 258 0056 Fax: +27 (0) 39 258 0173
Mr Mzubasi Silinga	Municipal Manager - Alfred Nzo District Municipality	gxashini@andm.gov.za

Include proof that the key stakeholder received written notification of the proposed activities as Appendix E2. This proof may include any of the following:

- e-mail delivery reports;
- registered mail receipts;
- courier waybills;
- signed acknowledgements of receipt; and/or
- or any other proof as agreed upon by the competent authority.

Proof of provision of written notification is attached in Appendix E2. This comprises:

- Copy of email sent
- Delivery receipts
- Read receipts
- Cover letter and transmittal slips for posted notifications.

3. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

Summary of main issues raised by I&APs	Summary of response from EAP
No comments received to date	

4. COMMENTS AND RESPONSE REPORT

The practitioner must record all comments received from I&APs and respond to each comment before the Draft BAR 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 the Final BAR as Appendix E3.

To date, no comments have been received.

5. AUTHORITY PARTICIPATION

Authorities and organs of state identified as key stakeholders:

Authority/Organ of State	Contact person (Title, Name and Surname)	Tel No	Fax No	e-mail	Postal address
Department of Water and Sanitation (DWS)	Wilna Moolman	012 336 7557	012 323 0321	moolmanw@dws.gov.za	Private Bag X313,

	Jack Landile Lizna Fourie Charon Russel			JackL@dws.gov.za FourieL4@dws.gov.za russelc@dws.gov.za	Pretoria, 0001
Eastern Cape Department of Economic Development Environmental Affairs and Tourism (DEDEAT): Alfred Nzo Region	Siyabulela Mtonjeni	039 256 0282		Siyabulela.mtonjeni@deaet.ecape.gov.za	
Eastern Cape Provincial Heritage Resources Authority (ECPHRA)	Sello Mokhanya	043 642 2811	043 642 2812	smokhanya@ecphra.org.za	PO Box 16208, Amathole Valley, 5616
National Department of Agriculture, Forestry and Fisheries: Indigenous Forests	Tozi Mjali	012 309 5716	012 309 5837	ToziM@daff.gov.za	
Eastern Cape Department of Agriculture and Rural Development	Raynald Dinga	041 501 0733		Mziwethembad@daff.gov.za	Private Bag X0040, Bhisho, 5605

Include proof that the Authorities and Organs of State received written notification of the proposed activities as appendix E4.

Proof of provision of written notification is attached in Appendix E2. This comprises:

- Copy of email sent
- Delivery receipts
- Read receipts
- Cover letter and transmittal slips for posted notifications.

In the case of renewable energy projects, Eskom and the SKA Project Office must be included in the list of Organs of State.

N/A

6. CONSULTATION WITH OTHER STAKEHOLDERS

Note that, for any activities (linear or other) where deviation from the public participation requirements may be appropriate, the person conducting the public participation process may deviate from the requirements of that sub-regulation 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. Application for any deviation from the regulations relating to the public participation process must be submitted prior to the commencement of the public participation process.

A list of registered I&APs must be included as appendix E5.

Copies of any correspondence and minutes of any meetings held must be included in Appendix E6.

SECTION D: IMPACT ASSESSMENT

The assessment of impacts must adhere to the minimum requirements in the EIA Regulations, 2014 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. 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

Provide a summary and anticipated significance of the potential direct, indirect and cumulative impacts 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. This impact assessment must be applied to all the identified alternatives to the activities identified in Section A(2) of this report.

1.1 IMPACT IDENTIFICATION, DESCRIPTION AND ASSESSMENT

Likely impacts associated with the proposed development have been identified through the undertaking of site visits, consultation of published information and independent assessment by the Environmental Project Team. Impacts have also been identified by the specialist assessments undertaken.

(i) Methodology

Impacts identified were assessed according to the criteria outlined below. Each impact was ranked according to extent, duration, magnitude and probability. These criteria are based on the Department of Environmental Affairs and Tourism (DEAT) (now the Department of Environmental Affairs) Guideline Document to the EIA Regulations (1998). A significance rating was calculated as per the methodology outlined below. Where possible, mitigatory measures were recommended for the impacts identified.

(a) Status of the Impact

The impacts were assessed as having either a:

- Negative effect (i.e. at a cost to the environment);
- Positive effect (i.e. a benefit to the environment); or
- Neutral effect on the environment.

(b) Extent of the Impact

The extent of each impact was rated as being one of the following:

- (1) Site - within the boundaries of the development site;
- (2) Local - the area within 5 km of the site;
- (3) Municipal - the Local Municipality;
- (4) Regional - The Eastern Cape Province;
- (5) National – South Africa; or
- (6) International – Southern Africa.

(c) Duration of the Impact

The duration of each impact was rated as being one of the following:

- (1) Immediate - > 1 year;
- (2) Short term – 1 – 5 years;
- (3) Medium term – 6 – 15 years;
- (4) Long Term – the impact will cease when the operation stops; and
- (5) Permanent – no mitigation measure will reduce the impact after construction.

(d) Magnitude of the Impact

The intensity or severity of each impact was rated as being one of the following:

- (0) None – where the aspect will have no impact on the environment'
- (2) Minor – where the impact affects the environment in such a way that natural, cultural and social functions / processes are not affected;
- (4) Low – where the impact affects the environment in such a way that the natural, cultural and social functions / processes are slightly affected;
- (6) Moderate – where the affected environment is altered but natural, cultural and social functions / processes continue, albeit in a modified way;
- (8) High – natural, cultural or social functions / processes are altered to the extent that they will temporarily cease; or
- (10) Very high / unknown – natural, cultural or social functions / processes are altered to the extent that they will permanently cease.

(e) Probability of Occurrence

The likelihood of the impact actually occurring is indicated as either:

- (0) None – the impact will not occur;

- (1) Improbable – the possibility of the impact materialising is very low as a result of design, historic experience or implementation of adequate corrective actions;
- (2) Low – there is a probability that the impact will occur;
- (3) Medium – the impact may occur;
- (4) High – it is most likely that the impact will occur; or
- (5) Definite / unknown – the impact will occur regardless of the implementation of any prevention or corrective actions, or it is not known what the probability will be, based on a lack of published information.

(f) Significance of the Impact

Based on the information contained in the points above, the potential impacts have been assigned a significance weighting (**S**). This weighting is formulated by adding the sum of the numbers assigned to extent (**E**), duration (**D**) and magnitude (M) and multiplying this sum by the probability (**P**) of the impact.

S = (E+D+M)*P

The significance weightings are:

- (< 30) **Low** – the impact would not have a direct influence on the decision to develop in the area;
- (30 – 60) **Medium** – the impact could influence the decision to develop in the area unless it is effectively managed / mitigated; and
- (> 60) **High** - the impact must have an influence on the decision-making process for development in the area.

The alternatives assessed are summarised below:

ALTERNATIVE TYPE	ALTERNATIVES
SITE ALTERNATIVES	**NONE** No alternate properties have been considered for the proposed development, as the road proposed for upgrade and rehabilitation is existing and is located within a registered servitude. It would be neither feasible nor reasonable therefore to consider development on an alternate property or at an alternate location.
ACTIVITY TYPE ALTERNATIVES	**NONE**

	The activity proposed is the upgrade and rehabilitation of an existing national road for the purpose of enhancing its utilisation by and the safety of road users. The development is also proposed in order to accommodate the predicted traffic volumes making use of the road for the next 25 years. Any alternate activity type would not enable the achievement of these objectives (i.e. the purpose and need for the development), thus no feasible or reasonable activity type alternatives have been considered.
DESIGN ALTERNATIVES	**ALTERNATIVE 1 (PREFERRED ALTERNATIVE)** Imported 150mm G1 and 150mm G2 on 300mm in situ recycled existing base and subbase. Surfacing options will be S2 (19/9mm) modified binder double seal and 45mm AC with rolled in chippings.
	ALTERNATIVE 2 Imported 150mm G1 and 150mm G2 on 300mm in situ recycled existing base and subbase. Surfacing options will be S2 (19/9mm) modified binder double seal and 45mm AC with rolled in chippings.
	ALTERNATIVE 3 Imported 150mm G1 on 300mm recycled C3 (150mm imported G5 and 150mm existing base). Surfacing options will be S2 (19/9mm) modified binder double seal and 45mm AC with rolled in chippings.
TECHNOLOGY ALTERNATIVES	**NONE** No technologies will be utilised in the operation of the proposed rehabilitated road. Thus, no alternatives in this regard exist.
ALTERNATE OPERATIONAL ASPECTS OF THE ACTIVITY	**NONE** The operation of the road is intended to provide a safe and efficient movement route for road users. No alternate operational activity would allow this service (the purpose and need of the proposed development) to be provided, thus no alternatives exist.
OTHER ALTERNATIVES	**NONE**.
NO GO ALTERNATIVE	The no-go alternative would retain the status quo, with no improvement of road use efficiency and the safety of road users. Furthermore, increased capacity of the road, to accommodate calculated future traffic volumes, would not be achieved, with further negative implications for road use efficiency and the safety of road users.

1.2 CONSTRUCTION PHASE IMPACTS

Activity	Impact summary	Significance		Proposed mitigation
Alternative 1 - PREFERRED ALTERNATIVE – Upgrade along existing route and layout, making use of Design Alternative 1 for surfacing				
General construction impacts	***Direct impacts:*** • Movements of trucks delivering construction material, and other construction activities will constitute the main impacts during the construction phase. • Clearance of vegetation and the movement of construction vehicles will result in aesthetic/visual impacts and air quality impacts (dust and emissions). • The demolition of old structures requiring replacement will result in dust, and waste generation. • Most of the cement which will be utilised during construction will be delivered to the site, pre-mixed, by a supplier. There may, however, be a need to mix small amounts of concrete on the site. This presents a contamination risk to soils and water resources.	Nature Extent Duration: Magnitude Probability **Significance**	- 2 1 4 4 **28** **LOW**	• Dust suppression measures need to be implemented on site when necessary to reduce the dust impacts. • Wastes must be managed appropriately and collected regularly to prevent accumulation on site. • Oil spillages must be minimised on site and should there be accidental spillage it need to be disposed of accordingly. • Chemical sanitary facilities need to be provided to workers and serviced weekly. • Where possible noise needs to be minimised by conducting construction activities between 07H00-17H00. • The construction site should be barricaded all the time to prevent unauthorised access by the public. • Vegetation should be cleared in a phased manner to prevent exposure of soil which may result in erosion and siltation of nearby streams. • It is also recommended that wastes arising from demolition of structures be recycled where possible and if not be disposed in a registered landfill site. • The mixing of concrete on the site must be minimised by making use of pre-mixed concrete. • Any on site mixing which occurs must be undertaken under controlled conditions so as to minimise potential environmental contamination. • Any concrete waste must be appropriately disposed

Activity	Impact summary	Significance		Proposed mitigation
				of. Under no circumstances should waste concrete be dumped in the surrounding environment.
	Indirect impacts: • Liquid waste, including sewage, will be generated during the construction phase. Chemical portable toilets will be provided by the Contractor for use by Construction workers. This presents a potential source of soil and groundwater contamination. • Solid wastes generated during the construction phase will include both general and hazardous wastes, which if incorrectly stored, handled, treated or disposed of, could present a contamination risk to the environment. • Machinery and human activity on the site will increase the risk of veld fires. As the surrounding areas comprise vegetation, there is a risk that any fire started on the site could spread to the surrounding areas. • The construction phase will result in additional traffic on the local roads. This traffic will be large and slow moving, in general. This may result in deterioration of the road surfaces.	Nature Extent Duration: Magnitude Probability **Significance**	- 2 2 2 3 **18** **LOW**	• Chemical toilets utilised during the construction phase must be emptied and maintained by an appropriate service provider in order to minimise contamination risks to the environment. • All solid wastes generated during the construction phase must be stored and handled appropriately so as to minimise environmental contamination and must be removed from the site regularly for disposal at an appropriate, licensed waste disposal site. • No cooking fires are permitted on the site. • Fire-fighting equipment must be readily and easily accessible. • A Fire Officer must be appointed and must be responsible for providing training to construction workers on the appropriate responses to a fire situation, as well as for ensuring that all fire-fighting equipment is maintained in good working order. • A detailed Traffic Management Plan should be compiled by the Contractor to ensure that traffic on the local roads is disrupted as little as possible. • This plan should include measures for the optimization of the amount of travel on the local roads, thereby reducing impact. • The delivery of construction equipment and material should be limited to hours outside peak traffic times (including weekends). • Where obvious damage to the road infrastructure has occurred as a result of the project, repairs should be undertaken in accordance with the Local

Activity	Impact summary	Significance		Proposed mitigation
				Municipality's specifications and requirements.
	Cumulative impacts: • The disposal of wastes generated by the construction phase will place additional pressure on local waste disposal services (wastewater treatment works and landfills). • Ambient noise and dust levels will be raised by the contribution of construction to baseline conditions. This impact will be temporary in nature, being limited to the construction phase.	Nature Extent Duration: Magnitude Probability **Significance**	- 3 2 2 3 **21** **LOW**	• Waste generation must be minimised as far as possible. • Recycling of wastes must be employed as far as possible. • Only licensed waste disposal facilities may be utilised for the disposal of wastes.
Soils	***Direct impacts:*** • Potential disturbances on the soil include compaction, physical removal and potential pollution by hydrocarbons. • Furthermore, if standard stormwater control measures are not implemented during the construction phase, soil erosion and subsequent degradation of vegetation may occur.	Nature Extent Duration: Magnitude Probability **Significance**	- 1 2 2 3 **15** **LOW**	• Heavy construction vehicles must be restricted to the development footprint and reserve area. No vehicles should be permitted to drive through or in proximity to wetlands and drainage lines. • An erosion or stormwater control plan must be implemented across the entire development site to prevent and control erosion impacts. • All potential soil contaminants (including oil, fuel and cement) must be stored and handled in such a way so as to minimise the potential for spillage or leakage and contamination.
Hydrology	***Direct impacts:*** • Loss of wetland and riparian habitat through vegetation clearance for the upgrade of culverts and drainage structures. • Disturbance and modification of the bed / bank of drainage lines by construction activities (including compaction). • Construction activities within rivers and drainage lines, as well as on the banks thereof will loosen material resulting in an increase in	Nature Extent Duration: Magnitude Probability **Significance**	- 2 2 6 4 **40** **MED**	• The construction footprint must not extend further than is necessary, preferably not more than 20 m up and downstream of the positioning of the bridge / culvert structure. • The use of heavy machinery and equipment within river courses should be limited. Only the equipment that is absolutely necessary should be allowed in the river courses. • Strict controls and environmental education should be employed for all the construction workers that are

Activity	Impact summary	Significance		Proposed mitigation
	sediment load in these systems. • There is a risk that pollution of the water in the river could occur through spillages from the plant and equipment that will be used during the construction phase			working within water courses. • Construction should preferably take place during the dry season. • Clearance of vegetation within drainage lines must be minimised as far as possible.
	Indirect impacts: • Water quality impairment through sedimentation and construction related effluent • The various aspects listed above impact directly on the aquatic biota present in the rivers and drainage lines. • Disturbance of the vegetation on the river banks may pose a potential erosion risk to the river banks.	Nature Extent Duration: Magnitude Probability **Significance**	- 2 2 4 3 **24** **LOW**	• Runoff should be prevented from directly entering wetlands and associated water features. • Strict use and management of all hazardous materials must be implemented on site. • Appropriate measures (such as the use of plastic trays or liners) to prevent the spillage of cement or other hazardous substances such as oil or diesel near water sources. • No refuelling of plant or equipment will be allowed on the construction site. All refuelling will be done in the site camp or another designated area off site. • Where possible Ready Mix cement should be used for the casting of in-situ structures. No large scale mixing will therefore take place on site. • No vehicles or plant should be parked within river courses or on the banks thereof when not actively working on the construction. • Limit the construction footprint to an area that is no larger than what is required to complete the construction. • The construction area must be rehabilitated once the construction process has been completed.
	Cumulative impacts: • Loss of terrestrial and wetland biodiversity. • Altered hydrological regime as a result of	Nature Extent	- 2	• Clearance of vegetation within drainage lines must be minimised as far as possible. • All alien vegetation should be cleared within the

Activity	Impact summary	Significance		Proposed mitigation
	artificial hardening of the soil surface, cut and fill activities and compaction of soils on the site. • Increase in erosion, as a result of the clearing of vegetation.	Duration: Magnitude Probability **Significance** **LOW**	2 2 3 **18**	construction servitude. • No vehicles should be permitted to drive through or in proximity to wetlands and drainage lines.
Vegetation	***Direct impacts:*** • Loss of terrestrial vegetation and associated habitat. Impacts on vegetation species are minimised due to the proposed project being situated within current reserve, which has been previously disturbed by previous road construction and operation activities. • Two protected plant species were noted to occur in the area, namely *Aloe striata* and *Crassula sp*. should the need arise, during the construction phase, to remove or translocate any specimens of these species, appropriate permits will need to be applied for from the relevant provincial department. • The clearance of the vegetation on the site will also result in the clearance of exotic plant species, including those listed as Category 1 invaders in the Conservation of Agricultural Resources Act, 1993 (Act No. 43 of 1993) (CARA), or as Category 1a or 1b Listed Invasive Species in terms of the Alien and Invasive Species Regulations published in GN R 598 of 1 August 2014, in terms of the National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA).	Nature Extent Duration: Magnitude Probability **Significance** **LOW** Nature Extent Duration: Magnitude Probability **Significance** **LOW**	- 1 2 2 4 **20** + 1 2 4 3 **21**	• Large aloes, geophytes and bulbous plants in the affected areas should be removed and replanted in suitable habitat. • No trees shall be felled for fuel purposes and disturbed outside the road reserve during the construction period. • Both protected species identified as occurring in the area can be easily translocated and would be suitable for use in post-construction rehabilitation activities. • The extent of the development footprint must be limited as much as possible. This extent must be demarcated prior to the commencement of site clearing activities. • Limit vegetation removal to the construction footprint only. Retain natural vegetation as much as possible. • Vegetation clearance should be minimised during construction to mitigate against habitat loss, erosion, dust and unnecessary destruction of species. • Re-vegetate disturbed areas as soon as construction activities have been completed. • Alien plants must be removed by the Contractor, where these plants establish in the construction footprint during the construction period.

Activity	Impact summary	Significance		Proposed mitigation
	Indirect impacts: • Spread of alien invasive plant species as a result of the disturbance of vegetation and soils on the site by construction activities.	Nature Extent Duration: Magnitude Probability **Significance**	- 1 2 4 3 **21** **LOW**	• Alien vegetation must be controlled on site by the contractor, for the duration of the construction phase.
	Cumulative impacts: • According to Mucina and Rutherford, 2006, the three affected vegetation types are East Griqualand Grassland, Drakensberg Foothill Moist Grassland and Eastern Valley Bushveld. The target for conservation of these vegetation types is listed as 23%, 23% and 25% respectively. At present, only 0.2% of East Griqualand Grassland is statutorily protected, only 2-3% of Drakensberg Foothill Moist Grassland is formally protected and only 0.8% of Eastern Valley Bushveld is protected in declared protected areas. It is estimated that 20% of Drakensberg Foothill Moist Grassland and 15% of Eastern Valley Bushveld has already been lost to transformation through cultivation, plantations, urban sprawl or alien infestation. • Loss of portions of these vegetation types to the proposed development may hamper the ability of the biodiversity authorities to meet the defined conservation targets. As such, the loss of vegetation to development may contribute to the vulnerability and threat to these ecosystems.	Nature Extent Duration: Magnitude Probability **Significance**	- 2 3 2 3 **21** **LOW**	• The significance of these impacts is reduced by the fact that the vegetation which requires clearance occurs in a road reserve area, and as such is not available for conservation purposes, having been reserved for road use. • In addition, due to the previous construction of a road, the vegetation occurring within the road reserve has been previously disturbed, and invaded by alien vegetation, with the result that it does not closely resemble the three natural vegetation types predicted to occur. This has reduced the value of this vegetation for conservation purposes. Its loss to development is therefore of lower significance. • The proposed road upgrade and rehabilitation will not contribute significantly to increased habitat fragmentation as the road is already in existence. • Habitat disturbance will occur, but can be mitigated by ensuring that construction staff do not harm animals on the site, and the relocation of animals, by an appropriate person, to an alternate and appropriate habitat.

Activity	Impact summary	Significance		Proposed mitigation
	• Increased fragmentation of habitat and disturbance of ecological process areas.			
Fauna	***Direct impacts:*** • The clearance of vegetation on the proposed development site will result in the destruction and loss of habitat, with an associated effect on faunal biodiversity. The conversion of grassland (previously disturbed / transformed) will impact on the smaller sedentary species (insects, arachnids, reptiles, amphibians and mammals) adapted to their terrestrial habitats.	Nature Extent Duration: Magnitude Probability **Significance**	- 1 2 2 3 **15** **LOW**	• Any animals, particularly reptiles which are disturbed or displaced by construction activities, should be relocated to a safe area and not harmed in any way.
	Indirect impacts: • The proposed development site is located within a corridor area identified in terms of the ECBCP, however, due to the small size of the area to be transformed, it is not anticipated that the functioning of the corridor will be significantly altered.	Nature Extent Duration: Magnitude Probability **Significance**	- 2 2 2 3 **18** **LOW**	• None required.
	Cumulative impacts: • None.			• None required.
Heritage	***Direct impacts:*** • Three heritage sites have been identified in proximity to the road section proposed for upgrade. These are the Thaba Ntsizwe battlefield and living heritage site, a later Iron Age site and an old trading store. Each of these is located more than 50 m from the road • A number of graves occur in proximity to the	Nature Extent Duration: Magnitude Probability **Significance**	- 1 2 2 2 **10**	• A minimum 20 m buffer must be applied to all heritage resources and graves.

Activity	Impact summary	Significance		Proposed mitigation
	road, but all more than 30 m from its edge.		LOW	
	Indirect impacts: • There is a risk of sub-surface archaeological and/or paleontological resources being impacted upon and damaged during excavation activities associated with construction activities.	Nature Extent Duration: Magnitude Probability **Significance**	- 1 2 2 2 **10** LOW	• Should sub-surface archaeological resources or artefacts be uncovered during construction, activity must be halted and the relevant Heritage Authority informed.
	Cumulative impacts: • None.			• None required.
Social	***Direct impacts:*** • The section of road proposed for upgrade is located between residential, commercial and agricultural land uses. The proposed development activities may impact on these land uses as they have, in some places, encroached on the SANRAL servitude.	Nature Extent Duration: Magnitude Probability **Significance**	- 1 4 6 4 **44** MED	• It is recommended that SANRAL and the appointed contractor liaise with the Chief and affected parties to resolve the encroachment issue.
	• Construction will result in the creation of skilled, semi-skilled and unskilled jobs. The use of local labour is recommended as this would have a positive impact on the local economy.	Nature Extent Duration: Magnitude Probability **Significance**	+ 3 2 4 4 **36** MED	

Activity	Impact summary	Significance		Proposed mitigation
	Indirect impacts: • Skills transfer will be promoted. • The influx of workers to the site will result in increased expenditure, for food, accommodation and entertainment, within the local economy, generating economic growth in the region. • Suppliers of construction materials to the site will also experience the benefits of economic growth and increased income as a result of the construction phase.	Nature Extent Duration: Magnitude Probability **Significance**	+ 3 2 4 4 **36** **MED**	• None required.
	Cumulative impacts: • Loss of agricultural land to cultivation use. The significance of this impact is however lessened by the fact that the proposed development site gas been classified as non-arable and only suited to grazing use.	Nature Extent Duration: Magnitude Probability **Significance**	- 1 4 2 3 **21** **LOW**	• None possible.
Economic	***Direct impacts:*** • Economic empowerment of the construction workers.	Nature Extent Duration: Magnitude Probability **Significance**	+ 2 2 4 4 **32** **MED**	• None required.
	Indirect impacts: • Economic benefits for local building material	Nature	+	• None required.

Activity	Impact summary	Significance		Proposed mitigation
	suppliers and the building of the local supplier industry though the local manufacture of components. • Economic stimulation of the region by the influx of construction workers, contractors and engineers for the construction phase which is anticipated to run for a number of years.	Extent Duration: Magnitude Probability **Significance**	3 2 4 4 **36** **MED**	
	Cumulative impacts: • Job creation may lead to an improvement in the livelihoods of the local people resulting from income generation and skills transfer. This would enable them to better provide for themselves and enable them to take advantage of opportunities for work which may arise in the future.	Nature Extent Duration: Magnitude Probability **Significance**	+ 3 2 4 4 **36** **MED**	• None required.
Alternative 2 - Upgrade along existing route and layout, making use of Design Alternative 2 for surfacing				
• Impacts on the natural, social and economic environment arising from Alternative 2 are the same as those described for the preferred alternative. Additional impacts are described below.				
Economic	***Direct impacts:*** • The cost for SANRAL of constructing alternative 2 is approximately R 10 million more than the cost of constructing the preferred alternative	Nature Extent Duration: Magnitude Probability **Significance**	- 5 2 6 4 **52** **MED**	• Construct the preferred alternative.
	Indirect impacts:			• None required.

Activity	Impact summary	Significance		Proposed mitigation
	• None.			
	Cumulative impacts: • None.			• None required.
Alternative 3 - Upgrade along existing route and layout, making use of Design Alternative 3 for surfacing				
• Impacts on the natural, social and economic environment arising from Alternative 3 are the same as those described for the preferred alternative. Additional impacts are described below.				
Economic	***Direct impacts:*** • Surfacing alternative 3 will not enable SANRAL to meet its stated objective of achieving a 25 year design horizon.	Nature Extent Duration: Magnitude Probability **Significance**	- 4 5 8 4 **68** **HIGH**	• Construct the preferred alternative.
	Indirect impacts: • None.			• None required.
	Cumulative impacts: • None.			• None required.
No-go option				
General construction impacts	***Direct impacts:*** • No movements of trucks delivering construction material, and other construction activities. • No requirement for clearance of vegetation or the movement of construction vehicles thus no aesthetic/visual impacts or air quality impacts (dust and emissions). • The demolition of old structures requiring	Neutral		• None required.

Activity	Impact summary	Significance	Proposed mitigation
	replacement will result in dust, and waste generation. • No need to mix cement on the site and therefore no contamination risk to soils and water resources.		
	Indirect impacts: • No generation of liquid waste, and therefore, no potential source of soil and groundwater contamination. • No generation of solid wastes and therefore no contamination risk to the environment. • No increase in the risk of veld fires. • No additional traffic on local roads.	Neutral	• None required.
	Cumulative impacts: • No need to dispose of wastes and therefore no additional pressure on local waste disposal services (wastewater treatment works and landfills). • No increase in ambient noise and dust levels.	Neutral	• None required.
Soils	***Direct impacts:*** • No disturbances on the soil from compaction, physical removal and potential pollution by hydrocarbons. • No risk of soil erosion and subsequent degradation of vegetation.	Neutral	• None required.
	Indirect impacts: • None.		• None required.
	Cumulative impacts:		• None required.

Activity	Impact summary	Significance		Proposed mitigation
	• None.			
Hydrology	***Direct impacts:*** • No loss of wetland and riparian habitat as a result of vegetation clearance for the upgrade of culverts and drainage structures. • No disturbance or modification of the bed / bank of drainage lines by construction activities (including compaction).	Neutral		• None required.
	Indirect impacts: • No potential impairment of water quality impairment through sedimentation and construction related effluent	Neutral		• None required.
	Cumulative impacts: • No loss of terrestrial and wetland biodiversity. • No alteration of the hydrological regime as a result of artificial hardening of the soil surface, cut and fill activities and compaction of soils on the site. • No increase in erosion, as a result of the clearing of vegetation.	Neutral		• None required.
Vegetation	***Direct impacts:*** • No loss of terrestrial vegetation and associated habitat. • No disturbance of the two protected plant species were noted to occur in the area, namely *Aloe striata* and *Crassula sp*. • No clearance of exotic plant species, including those listed as Category 1 invaders in the Conservation of Agricultural Resources Act, 1993 (Act No. 43 of 1993) (CARA), or as	Neutral Nature Extent Duration:	 - 1	• None required.

Activity	Impact summary	Significance		Proposed mitigation
	Category 1a or 1b Listed Invasive Species in terms of the Alien and Invasive Species Regulations published in GN R 598 of 1 August 2014, in terms of the National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA).	Magnitude Probability **Significance**	2 2 3 **15** **LOW**	
	Indirect impacts: • No increase in the spread of alien invasive plant species.	Neutral		• None required.
	Cumulative impacts: • No loss vegetation and therefore no effect on the ability of the biodiversity authorities to meet the defined conservation targets. • No contribution to the vulnerability and threat to ecosystems. • No increase in the fragmentation of habitat and disturbance of ecological process areas.	Neutral		• None required.
Fauna	***Direct impacts:*** • No destruction or loss of habitat.	Neutral		• None required.
	Indirect impacts: • No development within a corridor area identified in terms of the ECBCP.	Neutral		• None required.
	Cumulative impacts: • None.			• None required.
Heritage	***Direct impacts:*** • No impacts on the three heritage sites identified in proximity to the road section proposed for upgrade.	Neutral		• None required.

Activity	Impact summary	Significance		Proposed mitigation
	• No impacts on the graves occur in proximity to the road.			
	Indirect impacts: • No risk of sub-surface archaeological and/or paleontological resources being impacted upon and damaged during excavation activities associated with construction activities.	Neutral		• None required.
	Cumulative impacts: • None.			• None required.
Social	***Direct impacts:*** • No encroachment on the residential, commercial and agricultural land uses occurring within the road servitude • No creation of skilled, semi-skilled and unskilled jobs.	Neutral Nature Extent Duration: Magnitude Probability **Significance**	 - 2 2 4 3 **24** **LOW**	• Construct the preferred alternative.
	Indirect impacts: • No potential for skills transfer. • No potential for increased expenditure within the local economy, with no economic growth in the region. • No benefits of economic growth and increased	Nature Extent Duration: Magnitude Probability **Significance**	- 3 2 4 3	• Construct the preferred alternative.

Activity	Impact summary	Significance		Proposed mitigation
	income as a result of the construction phase.		**27** **LOW**	
	Cumulative impacts: • No loss of agricultural land to cultivation use.	Neutral		• None required.
Economic	***Direct impacts:*** • The no go alternative will not enable SANRAL to meet its stated objective of achieving a 25 year design horizon. • No economic empowerment of the construction workers.	Nature Extent Duration: Magnitude Probability **Significance**	- 4 4 6 4 **56** **MED**	• Construct the preferred alternative.
	Indirect impacts: • No economic benefits for local building material suppliers. • No economic stimulation of the region by the influx of construction workers, contractors and engineers for the construction phase.	Nature Extent Duration: Magnitude Probability **Significance**	- 3 2 4 3 **27** **LOW**	• Construct the preferred alternative.
	Cumulative impacts: • No job creation and therefore no potential improvement in the livelihoods of the local people resulting from income generation and skills transfer.	Nature Extent Duration: Magnitude Probability **Significance**	- 3 2 4 3 **27**	• Construct the preferred alternative.

Activity	Impact summary	Significance		Proposed mitigation
			LOW	

2. 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)

All environmental legislation in South Africa is derived from Section 24 of the Constitution, which contains the Environmental Right. This right imposes an obligation on the State to promote justifiable economic and social development, whilst at the same time recognising and balancing this development against a need to protect the environment.

The purpose of the environmental impact assessment process is to identify the various social and economic elements of a development, as well as its environmental impacts, and to assess the significance of these with respect to the objective of protecting the environment, minimising pollution and preventing ecological degradation. This is done to facilitate decision-making by the State and the achievement of sustainable development.

Achieving sustainable development requires that development integrate environmental, social and economic considerations, address social and economic inequalities, promote sustainable and equitable use of natural and cultural resources and cater for the interests of future generations.

With reference to this specific development, the preferred alternative is to upgrade and rehabilitate a section of the N2 National Route, with the purpose of making it safer for road users, as well as ensuring its continued efficient operation over the next 25 years.

The investigations and assessments undertaken for this preferred development alternative have identified a number of social, economic and environmental impacts. These need to be considered and balanced against one another to determine if they constitute a sustainable development.

The assessment of impacts undertaken in this Basic Assessment found that, in general, socio-economic impacts associated with the proposed development will be positive and of low to medium significance, enhancing livelihoods and quality of life for the foreseeable future. Environmental impacts, on the other hand, are generally negative, comprising the clearance of indigenous vegetation, the potential contamination of soils and groundwater, noise, and traffic. The significance of these negative environmental impacts are low, in general and can, in the opinion of the EAP, be effectively reduced by the implementation of the recommended mitigation measures.

On the balance therefore, provided that all recommended controls are put in place and

implemented, it would appear that the proposed social and economic developments could be undertaken without significant detrimental impact on the environment.

Alternative 2

The investigations and assessments undertaken for Alternative 2 indicate that, in general, social impacts associated with the proposed development will be positive and of low to medium significance, enhancing livelihoods and quality of life for the foreseeable future.

Environmental impacts, on the other hand, are generally negative, comprising the clearance of indigenous vegetation, the potential contamination of soils and groundwater, noise, and traffic. The significance of these negative environmental impacts are low, in general and can, in the opinion of the EAP, be effectively reduced by the implementation of the recommended mitigation measures.

Economic impacts are both positive and negative, however, the financial cost associated with construction of Alternative 2 makes this alternative less desirable than the preferred alternative.

Alternative 3

The investigations and assessments undertaken for Alternative 3 indicate that, in general, social impacts associated with the proposed development will be positive and of low to medium significance, enhancing livelihoods and quality of life for the foreseeable future.

Environmental impacts, on the other hand, are generally negative, comprising the clearance of indigenous vegetation, the potential contamination of soils and groundwater, noise, and traffic. The significance of these negative environmental impacts are low, in general and can, in the opinion of the EAP, be effectively reduced by the implementation of the recommended mitigation measures.

The fact that this proposed alternative will not allow for the achievement of the necessary road lifespan, makes this alternative unreasonable and unfeasible and therefore less desirable than the preferred alternative.

No-go alternative (compulsory)

The no-go option would retain the status quo: the N2 Section 20 between Mount Frere and the Ngcweleni River Bridge would not have its safety levels improved, nor its capacity. In addition, the road surface and substructure would continue to deteriorate, further decreasing the safety of road users and the utility of the route.

If the no go alternative were pursued, the socio-economic opportunities associated with the project would be lost. The result would be the loss of a potential opportunity for economic upliftment and an improvement in the quality of life for local construction workers and associated industries.

The no go option would, on the other hand result in zero detrimental impacts to the environment. The impacts prevented are, however, manageable and able to be controlled and minimised through appropriate interventions and mitigation.

The no go option is therefore **not recommended for authorisation** as it would result in insignificant environmental benefits and significant social and economic impacts (loss of significant benefits).

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	

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.

GENERAL

- The construction site should be barricaded all the time to prevent unauthorised access by the public.
- The mixing of concrete on the site must be minimised by making use of pre-mixed concrete.
- Any on site mixing which occurs must be undertaken under controlled conditions so as to minimise potential environmental contamination.
- Any concrete waste must be appropriately disposed of. Under no circumstances should waste concrete be dumped in the surrounding environment.
- No cooking fires are permitted on the site.
- Fire-fighting equipment must be readily and easily accessible.
- A Fire Officer must be appointed and must be responsible for providing training to construction workers on the appropriate responses to a fire situation, as well as for ensuring that all fire-fighting equipment is maintained in good working order.

NUISANCE CONTROL

- Dust suppression measures need to be implemented on site when necessary to reduce the dust impacts.
- Where possible noise needs to be minimised by conducting construction activities between 07H00-17H00. Work must be limited to weekdays only.

WASTE MANAGEMENT

- Wastes must be managed appropriately and collected regularly to prevent accumulation on site.
- All solid wastes generated during the construction phase must be stored and handled appropriately so as to minimise environmental contamination and must be removed from the site regularly for disposal at an appropriate, licensed waste disposal site.
- Oil spillages must be minimised on site and should there be accidental spillage it needs to be controlled, cleaned up and disposed of appropriately.
- Chemical sanitary facilities need to be provided to workers and serviced weekly.
- Chemical toilets utilised during the construction phase must be emptied and maintained by an appropriate service provider in order to minimise contamination risks to the environment.
- Waste generation must be minimised as far as possible.
- Recycling of wastes must be employed as far as possible.
- Only licensed waste disposal facilities may be utilised for the disposal of wastes.

VEGETATION

- Vegetation should be cleared in a phased manner to prevent exposure of soil which may result in erosion and siltation of nearby streams.
- Large aloes, geophytes and bulbous plants in the affected areas should be removed and replanted in suitable habitat.
- No trees shall be felled for fuel purposes and disturbed outside the road reserve during the construction period.
- Both protected species identified as occurring in the area can be easily translocated and would be suitable for use in post-construction rehabilitation activities.
- The extent of the development footprint must be limited as much as possible. This extent must be demarcated prior to the commencement of site clearing activities.
- Limit vegetation removal to the construction footprint only. Retain natural vegetation as much as possible.
- Vegetation clearance should be minimised during construction to mitigate against habitat loss, erosion, dust and unnecessary destruction of species.
- Re-vegetate disturbed areas as soon as construction activities have been completed.
- Alien plants currently occurring on the site must be removed by the Contractor, where these plants establish in the construction footprint during the construction period.
- Alien vegetation must be controlled on site by the contractor, for the duration of the construction phase.

FAUNA

- Any animals, particularly reptiles which are disturbed or displaced by construction activities, should be relocated to a safe area and not harmed in any way.

SOILS AND WATER

- The construction footprint must not extend further than is necessary, preferably not more than 20 m up and downstream of the positioning of the bridge / culvert structure.
- The use of heavy machinery and equipment within river courses should be limited. Only the equipment that is absolutely necessary should be allowed in the river courses.
- Strict controls and environmental education should be employed for all the construction workers that are working within water courses.
- Construction should preferably take place during the dry season.
- Clearance of vegetation within drainage lines must be minimised as far as possible.
- Runoff should be prevented from directly entering wetlands and associated water features.
- Strict use and management of all hazardous materials must be implemented on site.
- Appropriate measures (such as the use of plastic trays or liners) to prevent the spillage of cement or other hazardous substances such as oil or diesel near water sources.
- No refuelling of plant or equipment will be allowed on the construction site. All refuelling will be done in the site camp or another designated area off site.
- Where possible Ready Mix cement should be used for the casting of in-situ structures. No large scale mixing will therefore take place on site.
- No vehicles or plant should be parked within river courses or on the banks thereof when not actively working on the construction.
- Limit the construction footprint to an area that is no larger than what is required to complete the construction.

- The construction area must be rehabilitated once the construction process has been completed.
- Clearance of vegetation within drainage lines must be minimised as far as possible.
- All alien vegetation should be cleared within the construction servitude.
- No vehicles should be permitted to drive through or in proximity to wetlands and drainage lines.

TRAFFIC

- A detailed Traffic Management Plan should be compiled by the Contractor to ensure that traffic on the local roads is disrupted as little as possible.
- This plan should include measures for the optimization of the amount of travel on the local roads, thereby reducing impact.
- The delivery of construction equipment and material should be limited to hours outside peak traffic times (including weekends).
- 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's specifications and requirements.

HERITAGE

- A minimum 20 m buffer must be applied to all heritage resources and graves.
- Should sub-surface archaeological resources or artefacts be uncovered during construction, activity must be halted and the relevant Heritage Authority informed.

SOCIAL

- SANRAL and the appointed contractor must liaise with the Chief and affected parties to resolve the issues of encroachment into the road reserve area.

Is an EMPr attached?	**YES**	

The EMPr must be attached as Appendix G.

The details of the EAP who compiled the BAR and the expertise of the EAP to perform the Basic Assessment process must be included as Appendix H.

If any specialist reports were used during the compilation of this BAR, please attach the declaration of interest for each specialist in Appendix I.

Any other information relevant to this application and not previously included must be attached in Appendix J.

_____

NAME OF EAP

_____ _____

SIGNATURE OF EAP DATE

SECTION F: APPENDIXES

The following appendixes must be attached:

Appendix A: Maps

Appendix B: Photographs

Appendix C: Facility illustration(s)

Appendix D: Specialist reports (including terms of reference)

Appendix E: Public Participation

Appendix F: Impact Assessment

Appendix G: Environmental Management Programme (EMPr)

Appendix H: Details of EAP and expertise

Appendix I: Specialist's declaration of interest

Appendix J: Additional Information