

DRAFT BASIC ASSESSMENT
REPORT

**THE PROPOSED UPGRADE OF
NATIONAL ROAD R36 SECTION 6
FROM MANCHABENI (KM 4.70)
TO TZANEEN (KM 33.40)**

**Prepared for the South African
National Roads Agency Soc
Limited**

April 2022



THE PROPOSED UPGRADE OF NATIONAL ROAD R36 SECTION 6 FROM
MANCHABENI (KM 4.70) TO TZANEEN (KM 33.40)

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ACRONYMS

BID	Background Information Document
CV	Curriculum Vitae
DFFE	Department of Forestry, Fisheries and the Environment
EAP	Environmental Assessment Practitioner
EAPASA	Environmental Assessment Practitioner Association of SA
EMPr	Environmental Management Programme
I&APs	Interested and Affected Parties
IBA	Important Bird Area(s)
IRR	Internal Rate of Return
PPP	Public Participation Process
NEMA	National Environmental Management Act
NEM:AQA	National Environmental Management: Air Quality Act
NFEPA	National Freshwater Ecosystem Priority Area
PLO	Project Liaison Officer
SANRAL	South African National Roads Agency Soc Limited

1. DETAILS OF EAP AND EXPERTISE

This report was prepared by Dr Josephine Bothma from Chameleon Environmental.

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a. The qualifications of the EAP

Dr Josephine Bothma has a PhD in Environmental Management. Please find a CV of the EAP and proof of qualifications included in Appendix A.

b. Summary of the EAP's past experience

The Environmental Assessment Practitioner (EAP) has the appropriate skills and experience to undertake the required studies for the proposed project. Dr Bothma has:

- Experience in environmental studies for linear project and borrow pits and quarries.
- The EAP is registered as an Environmental Assessment Practitioner with EAPASA with registration number 2019/246.
- Proven ability to timeously produce thorough, readable and informative documents.
- Adequate recording and reporting systems to ensure the preservation of all data gathered.
- A good working knowledge of all relevant and applicable policies, legislation, guidelines, norms and standards.
- The EAP does not have any links to engineering firms, construction companies, or financial institutions, and would be able sign the required declarations of independence to be submitted to the relevant environmental authorities.

Dr Bothma has a PhD in Environmental Management with extensive experience in the environmental field. Dr Bothma is a founder member of Chameleon Environmental since August 2006, a specialist environmental consulting company based in Pretoria, South Africa but operates nationwide. The company provides a broad range of environmental consulting services to the public and private sectors.

She has:

- » Thirty-two (32) years' experience in the environmental field
- » Twenty-two (22) years' experience in Project Management
- » Project management of large environmental assessment and environmental management projects.

2. LOCATION OF THE ACTIVITY

The project is located on National Route 36, section 6. The southern project limit is Manchabeni km4.7 and the northern project limit is at km33.5 in Tzaneen at the intersection of Agatha/Sirkel Drive. The total length of the project is 28.7km. However, the construction of a road within an urban edge is excluded from any listed activity. The section to be assessed in this BAR is therefore, from km 4.7 to km 25.8. The project is located within Limpopo in the Mopani District Municipality and the Greater Tzaneen Local Municipality. A locality plan is included as Appendix B.

The coordinates for the project are the following:

	Latitude (S):		Longitude (E):	
• Starting point of the activity	24°	01' 06.29"	30°	21' 55.17"
• Middle point of the activity	23°	54' 40.78"	30°	15' 41.11"
• End point of the activity	23°	52' 30.26"	30°	11' 39.53"

Please see locality plan of the project attached as Appendix B.

3. DESCRIPTION OF THE SCOPE OF THE PROPOSED ACTIVITY

It is the intention of the South African National Roads Agency (Soc) Ltd (SANRAL) to upgrade the National Route 36, section 6 from Manchabeni at km4.7 to km25.8 just before Tzaneen. The project is located within Limpopo in the Mopani District Municipality and the Greater Tzaneen Local Municipality

The scope of work includes the following items:

- Increasing road reserve width (variable),
- Strengthening the existing pavement,
- Rehabilitation of the pavement within Tzaneen town,
- Widening of the existing road cross section to a new proposed single and dual carriageway cross-section,
- Vertical and horizontal geometric improvements,
- Widening of river bridges and major and minor bridges/culverts,
- Vertical and horizontal realignments,
- Improvements of minor and major intersections,
- Walkways and busbays,
- Access/service roads,
- Temporary deviations to accommodate two-way traffic during construction at major structures.
- Stockpile areas and vegetation clearance outside road reserve in excess of one hectare.

The borrow pits and quarries for the project will be applied for at the Department of Minerals Resources and Energy in the Limpopo Province.

3.1 Technical Details

The R36 is a single carriageway which consist of four typical cross-sections:

- Km4.7 to km18.6 consist of two 3,7m lanes with varying gravel shoulders (2m to 2,5m).
- Km18.6 to km30.6 consists of two 3,7m lanes with 2 x 2m paved shoulders.
- Km30.6 to km31.5 consist of four 3,7m lanes.
- Km 31.5 to km33.4 consist of two 3,7m lanes.

Km30.6 to km33.4 traverses through the town of Tzaneen and the surrounding road is fully developed.

The road has a camber and is generally 2%.

Single carriageway km4.7 to km9.3: 2 x 3,7m lanes

- 2 x 3m paved shoulders,
- 2% Camber,
- 1:2 embankment slopes,
- Kerb and channel combination and guardrails where required,

Dual Carriageway from km9.3 to km22.6

- 2 x 3,5m inner lanes,
- 2 x 3.5m outer lanes,
- 1 x 2m kerbed island,
- 2 x 0.4m inner shoulders,
- 2 x 1,5m outer shoulders,
- 2% Camber,
- 1:2 slopes,
- Kerb and channel combination and guardrails where required,

Dual Carriageway: Rural (km22.6 to km30.7)

- 2 x 3,5m inner lanes,
- 2 x 3.7m outer lanes,
- 2 x 0.4m concrete barrier,
- 2 x 1m inner shoulders,
- 2 x 2,5m outer shoulders,
- 2% Camber,
- 1:2 slopes,
- Kerb and channel combination or Type A side drain and guardrails in high fill conditions,
- 1,5m V-drain in cut conditions and 5m lined drain in shallow cuts.

Dual Carriageway: Rural (km22.6 to km30.7)

- 2 x 3,5m inner lanes,
- 2 x 3.7m outer lanes,
- 2 x 0.4m concrete barrier,
- 2 x 1m inner shoulders,
- 2 x 2,5m outer shoulders,
- 2% Camber,
- 1:2 slopes,
- Kerb and channel combination or Type A side drain and guardrails in high fill conditions,
- 1,5m V-drain in cut conditions and 5m lined drain in shallow cuts.

Single Carriageway: Town (km31.5 to km33.4)

- 2 x 3,7m lanes (existing),
- 2% Camber (existing),
- Kerb and channel combination (existing).

A total of 50 intersections will require upgrading to improve access control along the route. Intersection control proposals consist of priority stop control, roundabouts and traffic signals.

Table 1: Existing major bridge and culvert structures on project

Existing Bridge / Major Culvert Nr	Bridge / Culvert Name	Action Required at Existing Structure	Section and km Distance
Bridge B1867	Thabina River at km 10.20	Retained and Widened	10.20
Culvert	Unnumbered culvert	Culvert replaced with bridge	10.90
Bridge B1415	Letsitele River	Retained and Widened	15.45
Culvert	Letaba River Tributary Bridge	Culvert replaced with bridge	22.88
Culvert	Letaba River Tributary Bridge	Culvert replaced with bridge	25.00
Bridge B1440	Greater Letaba Tributary Bridge	Retained and Widened	29.97

It is estimated that the area outside the existing road reserve that will be affected with the widening of bridges B1867, B1415 and B1440 will be approximately 2500m².

3.2 Facilities and Construction Activities

A list of possible facilities and construction activities associated with the project are summarised in Tables 3 and 4.

Table 2: Construction Facilities

REFERENCE	FACILITIES
Construction site camp	Access Roads
	Offices and site laboratory
	Storage Tanks
	Topsoil stockpiles
	Work shops
	Wash bays
	Laydown areas
	Store rooms
	Fuel storage facilities
	Cement silos
	Batching plants
	Temporary spoil stockpile
	Toilets and sanitation
	Oil traps
	Oil recycling facilities
	Storage of hazardous materials (oil, paint etc)
	Storage of gas
	Refuelling area
	Site security post
Pre-cast yard	Batching plant
	Cement Silos
	Settlement ponds
	Concrete washing facilities
	Curing areas
	Workshops

Table 3: List of Construction Activities

No	CONSTRUCTION ACTIVITIES
1	Earthworks: Excavation
2	Earthworks: Blasting
3	Cleaning and grubbing and bulldozing activities
4	Concrete work
5	Construction and use of temporary access roads
6	Construction employment (appoint labourers)
7	Control of weeds and invasive species
8	Spoil material generation and management
9	Domestic solid waste collection and disposal

No	CONSTRUCTION ACTIVITIES
10	Locate spoil disposal sites
11	Explosive magazines (to be determined)
12	Handling and disposal of contaminated water
13	Handling, storage and disposal of hazardous material
14	Horticultural activities
15	Parking bay for trucks
16	Lighting activities
17	Managing construction site (labourers)
18	Managing spoil dump sites
19	Managing topsoil stockpiles
20	Mixing of concrete
21	Ongoing consultation with affected parties
22	Overhead work and signalling
23	Painting
24	Provision and operation of water washing and toilet facilities
25	Refuelling of construction vehicles and machinery
26	Slope stabilisation and erosion control
27	Construction solid waste collection and disposal
28	Storage and disposal of empty containers
29	Topsoil stripping
30	Transportation of hazardous substances
31	Transportation of spoil material
32	Use of electricity generators
33	Welding

a. Construction Materials

The following construction materials could be required by the Project:

- Gravel material
- Cement
- Structural Steel
- Reinforcement Steel
- Sand
- Bituminous material/asphalt
- Paints and chemicals, mineral products
- Fixtures and fittings

The construction material such as cement, structural steel, reinforcement steel, rock bolts and paints will be procured directly from sources. The fine and coarse aggregate required for the preparation of concrete is planned to be made available from suitable quarry sites located and/or spoil from excavations.

b. Rock Quarries and Borrow Pits

A survey to identify suitable quarry and borrow pit locations was undertaken. The aim of the survey was to identify sites which could potentially provide the quantity and quality of aggregates required at a location as close to the major project components as possible, in order to reduce transportation costs and minimise environmental impacts. A separate environmental study was undertaken for the quarry and borrow pit sites and submitted to the Department of Mineral Resources and Energy for approval.

c. Crushing Plants

A crushing plant is planned at the identified quarry sites, with a spoils area at the quarry.

3.3 Additional Project Infrastructure

a. Site Camps

The final location of the construction camp sites, including offices during the construction phase, will be determined by the Contractor that is appointed for the construction of the road by the applicant (South African National Roads Agency Soc Limited), following the tender process. The appointed contractor usually identifies land that is already disturbed or makes use of an old farm house. However, it is acknowledged that should any listed activity be triggered in terms of the EIA Regulations, 2014, as amended, in the setting up of the construction camp site, the contractor would have to undertake the necessary environmental studies before the camp site can be erected.

The following could potentially be construction camp sites, including offices during the construction phase:

- Disturbed, open land.
- On farmland.

Both options will have to be discussed with the various landowners by the appointed Contractor for the project.

It is envisioned that the staff would stay in Groblersdal.

The options to have the camp sites dismantled after construction work is completed or to sign it over to the respective landowner, will also be negotiated with the Contractor and the respective landowner.

b. Electricity and Diesel Supply

The power demand is expected to be 1000 kW per day, and will be supplied from two 800 kW diesel generators on site. Buried electrical cables will distribute power around the site.

Diesel fuel for generators and construction equipment will be stored in a secure area in suitable above ground steel tanks at the identified camp sites, supplied and maintained by the fuel suppliers. An adequate bund wall (110% volume) will be provided for fuel and diesel areas to accommodate any spillage or overflow of these substances. Approximately 300,000 tonnes of diesel is expected to be supplied over the three years of operation.

c. Concrete Batching and Mixing Plants

At this stage the location and number of concrete batching and mixing plants and stores and workshops for the project is unknown. It is envisaged that there will be construction facilities at various sections along the alignment and that each of these sections will include a concrete batching and mixing plant, main stores and a workshop.

d. Excavators, Motor Graders and Road Rollers

Various excavators and motor graders will also be used for the construction of the road. The graders are used to create an even flat surface to lay the asphalt on. The road roller is basically a compactor which makes use of soil, gravel, and asphalt during the construction of roads. Road rollers are also used for compacting the land before the asphalt can be laid after the graders have done their work. The rollers are used to press the asphalt in place and bind the various layers of the road together.

e. Asphalt Mixing Plants

Asphalt mixing plants are machines that are used to manufacture road stone like asphalt, cement and rock stones to make the top layer of the roads. The operation of a temporary asphalt plant is exempted from applying for an Atmospheric Emission License as per NEM:AQA, 2004 Section 23 Notice 201. The definition of a temporary asphalt plant is the following: "An asphalt plant that is used for the sole purposes of supplying asphalt for a specific road paving contract not exceeding a period of 24 months". New and existing temporary asphalt plants must comply with the standards and limits as noted in Notice 201.

f. Forklift Truck and Wheel Loader

Forklift truck is a powered industrial vehicle that can be used to pick an object on or below the ground level and raised to move the object. Wheel loaders are also known as front-end loaders. It is a machine that is used to move a pile of material from the ground and load it onto a dump truck. It consists of front mounted square wide bucket joined to the end of two arms used to scoop up materials from the ground without spreading it out.

g. Water Supply and Sewage Treatment

The appointed Contractor will be responsible to source water for the project. It is presumed that potable water will initially be supplied by road from Municipal water. Water could also be sourced from existing boreholes, fountains and farm dams in close proximity to the project

site. The necessary permits will be obtained by the appointed Contractor for any new abstractions.

Water for use in construction processes (eg concrete production) and dust control will be sourced from existing boreholes and farm dams.

Firefighting water will be held in tanks to provide a sustained flow rate of 250 000 litres per hour, for up to four hours.

During the construction stage, sewage will be treated using portable chemical treatment units on the construction site and at the site camps. The potable toilets will be serviced regularly by a reputable service provider (at least once a week).

4. LISTED ACTIVITIES

The following listed activities are applicable to this project:

Table 4: Listed activities applicable to project

Listed activity triggered	Reason
<p>GN R. 983, Item 12 (as amended):</p> <p>The development of ii). infrastructure of structures with a physical footprint of 100 square metres or more;</p>	<p>It is estimated that the area outside the existing road reserve that will be affected with the widening of bridges B1867, B1415 and B1440 will be approximately 2500m².</p>
<p>GN R. 983, Item 19 (as amended):</p> <p>The infilling or depositing of any material of more than 10 cubic metres into, or removal or moving of soil from a watercourse.</p>	<p>The material that will be required for infilling or depositing will be approximately 300,000 m³ in total.</p>
<p>GN R. 983, as amended in GN R. 327: Item 24 (as amended)</p> <p>The development of a road (ii) with a reserve wider than 13.5 m or where no reserve exists where the road is wider than 8 m</p>	<p>The road reserve will be wider than 13.5 m (between 53 and 118 m).</p> <p>The road will be approximately 30 m wide.</p>
<p>GN R. 983, as amended in GN R. 327: Item 31 (as amended)</p> <p>The decommissioning of existing facilities, structures or</p>	<p>The following structures will be demolished and replaced:</p>

<p>infrastructure for</p> <p>(i) Any development and related operation activity or activities listed in this Notice</p>	<p>Existing Bridge / Major Culvert Nr</p>	<p>Bridge / Culvert Name</p>	<p>Action Required at Existing Structure</p>	<p>Section and km Distance</p>
	<p>Culvert</p>	<p>Unnumbered culvert</p>	<p>Culvert replaced with bridge</p>	<p>10.90</p>
	<p>Culvert</p>	<p>Letaba River Tributary Bridge</p>	<p>Culvert replaced with bridge</p>	<p>22.88</p>
	<p>Culvert</p>	<p>Letaba River Tributary Bridge</p>	<p>Culvert replaced with bridge</p>	<p>25.00</p>
<p>GN R. 983, as amended in GN R. 327: Item 48 (as amended)</p> <p>The expansion of infrastructure or structures where the physical footprint is expanded by 100 sq m or more</p> <p>(a) Inside a watercourse</p>	<p>It is estimated that the area outside the existing road reserve that will be affected with the widening of bridges B1867, B1415 and B1440 will be approximately 2500m².</p>			
<p>GN R. 983, Item 56 (as amended):</p> <p>The widening of a road by more than 6 m where the existing reserve is wider than 13.5 m</p>	<p>The road reserve will be wider than 13.5 m (between 53 and 118 m).</p> <p>The existing road is between 7.4m to 14.8m wide. The road will be widened by approximately 22 m at the widest cross section.</p>			
<p>GN R. 985, as amended in GN R. 324: Item 24 (as amended)</p> <p>The development and related operation of facilities or infrastructure for the storage or the and handling of a dangerous good with such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic m</p> <p>In Limpopo province All areas.</p>	<p>Diesel could be stored at the campsite by the appointed contractor that could exceed 30 cubic m.</p>			

5. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

The following legislation, policies and/or guidelines are applicable to the application:

Table 5: Legislation, policies and/or guidelines are applicable to the application

Title of legislation, policy or guideline	Applicability to the project	Administering authority	Date
EIA Regulations 2014 as amended GN R. 983 as amended in GN R. 327 Activities 12, 19, 24 and 56	Listed activities triggered in terms of the EIA Regulations, 2014 as amended	Department of Environmental Affairs	4 December 2014
Department of Environmental Affairs Departmental Guidelines under www.environment.gov.za	Guidance with regard to the execution of the Basic Assessment process	Department of Environmental Affairs	2010
National Environmental Management Act, 1998 (Act No. 107 of 1998) The National Environmental Management Act, 1998 (Act No. 107 of 1998): [NEMA] was enacted in November 1998. NEMA provides for cooperative governance by establishing principles for decision-making on matters affected the environment, institutions that will promote co-operative governance and procedures for coordinating environmental functions, public participation and sustainable development.	General objectives of Integrated Environmental Management as set out in section 23 of NEMA taken into account	The National Department of Environmental Affairs	27 November 1998
The National Water Act (Act No. 36 of 1998) for water uses as defined in section 21 (c) and	Stream crossings and application of a general authorisation at the Department of Water and	Department of Water and Sanitation	27 July 2016

section 21 (i). The application for a GA in terms of the National Water Act, 1998.	Sanitation		
National Heritage Resource Act 1999 (Act No. 25 of 1999) In terms of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) comment will be obtained from SAHRA.	Any linear activity that exceeds 300 m in extent requires input from SAHRA.	South African Heritage Resources Agency (SAHRA)	1999
Regulation 15 of the Conservation Act of Agricultural Resources Act, 1983 (Act 43 of 1983)	Ecological study Alien vegetation identification on site	Department of Agriculture	1983
Disaster Management Act, 2002 (Act 57 of 2002)	Covid-19 Directions issued for PPP	Covid-19 Directions issued for PPP taken into account during Public Participation Process	2020

6. NEED AND DESIRABILITY OF PROJECT

The following provide a motivation for the need and desirability of the activity:

1. Is the activity permitted in terms of the property's existing land use rights?	YES x	NO	Please explain
The project is undertaken in terms of the South African National Roads Agency Soc Limited (SANRAL's) mandate in terms of the South African National Roads Agency Limited and National Roads Act, 1998. The declaration of the R36 as a national road under section 40(1) of the Act creates the land use right within the declared road reserve.			

2. Will the activity be in line with the following?			
(a) Provincial Spatial Development Framework (PSDF)	YES <input checked="" type="checkbox"/>	NO	Please explain
The SANRAL is given the power to perform all strategic planning, as well as the planning, design, construction, operation, management, control, maintenance and rehabilitation of all national roads in South Africa in terms of the South African National Roads Agency Limited and National Roads Act, 1998. The R36 is a national road and falls within the jurisdiction of the SANRAL and the development is not bound by the Municipality's PSDF in order to continue.			
(b) Urban edge / Edge of Built environment for the area	YES <input checked="" type="checkbox"/>	NO	Please explain
The SANRAL is given the power to perform all strategic planning, as well as the planning, design, construction, operation, management, control, maintenance and rehabilitation of all national roads in South Africa in terms of the South African National Roads Agency Limited and National Roads Act, 1998. The R36 is a national road and falls within the jurisdiction of the SANRAL and the development is not bound by the Municipality's urban edge in order to continue as it is not a residential development or municipal road development.			
(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 <input checked="" type="checkbox"/>	NO	Please explain
The SANRAL is given the power to perform all strategic planning, as well as the planning, design, construction, operation, management, control, maintenance and rehabilitation of all national roads in South Africa in terms of the South African National Roads Agency Limited and National Roads Act, 1998. The N2 is a national road and falls within the jurisdiction of the SANRAL and the development is not bound by the Municipality's IDP in order to continue as it is not a residential development or municipal roads development.			
(d) Approved Structure Plan of the Municipality	YES <input checked="" type="checkbox"/>	NO	Please explain
The SANRAL is given the power to perform all strategic planning, as well as the planning, design, construction, operation, management, control, maintenance and rehabilitation of all national roads in South Africa in terms of the South African National Roads Agency Limited and National Roads Act, 1998. The R36 is a national road and falls within the jurisdiction of the SANRAL and the development is not bound by the Municipality's approved structure plan in order to continue as it is not a residential development or municipal roads development.			
(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?)	YES	NO <input checked="" type="checkbox"/>	Please explain
The approval of this application will not compromise the integrity of the existing environmental management priorities for the area and it can be justified in terms of sustainability considerations. No significant long term impact is foreseen as a result of the project.			

(f) Any other Plans (e.g. Guide Plan)	YES	NO x	Please explain
No significant long term impact is foreseen as a result of the project.			
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)?	YES x	NO	Please explain
The SANRAL is given the power to perform all strategic planning, as well as the planning, design, construction, operation, management, control, maintenance and rehabilitation of all national roads in South Africa in terms of the South African National Roads Agency Limited and National Roads Act, 1998. The R36 is a national road and falls within the jurisdiction of the SANRAL. The development is not bound by the Municipality's approved SDF in order to continue as it is not a residential development or municipal roads development.			
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 x	NO	Please explain
The area is in dire need of this project and it is a societal priority as numerous accidents occur on the R36 in this area every year with associated loss of lives.			
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?	YES x	NO	Please explain
The contractor, once appointed through the tender process with SANRAL, will decide on the water, sewage and waste disposal services during the time of construction. The relevant contractor will negotiate with the relevant local Municipality for 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)?	YES x	NO	Please explain
The SANRAL is given the power to perform all strategic planning, as well as the planning, design, construction, operation, management, control, maintenance and rehabilitation of all national roads in South Africa in terms of the South African National Roads Agency Limited and National Roads Act, 1998. The R36 is a national road and falls within the jurisdiction of the SANRAL. The development is not bound by the Municipality's infrastructure planning in order to continue.			
7. Is this project part of a national programme to address an issue of national concern or importance?	YES	NO x	Please explain
The upgrade of the R36 became important as a result of the deterioration of the road and the numerous accidents that occur in this area every year with associated loss of lives.			

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 <input checked="" type="checkbox"/>	NO <input type="checkbox"/>	Please explain
The N2 is an existing national road and will be widened in terms of SANRAL's mandate in terms of the South African National Roads Agency Limited and National Roads Act, 1998.			
9. Is the development the best practicable environmental option for this land/site?	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>	Please explain
The upgrade of the R36 will be conducted within the N2 road reserve. The potential impacts related to the activity were assessed together with specialist engineering and environmental input and the best practicable environmental option and mitigation measures recommended in the report.			
10. Will the benefits of the proposed land use/development outweigh the negative impacts of it?	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>	Please explain
The benefits of the proposed development will outweigh the negative impacts as the local communities and road users are in dire need of this project as a result of the severe safety risk if the R36 is not upgraded with associated loss of lives. The R36 will, therefore, be upgraded with a low impact to the environment but a high positive impact to the community and traveling public.			
11. Will the proposed land use/development set a precedent for similar activities in the area (local municipality)?	YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>	Please explain
The SANRAL is given the power to perform all strategic planning, as well as the planning, design, construction, operation, management, control, maintenance and rehabilitation of all national roads in South Africa in terms of the South African National Roads Agency Limited and National Roads Act, 1998. The R36 is a national road and falls within the jurisdiction of the SANRAL. This development will therefore not set a precedent for similar activities as it is not bound by the Municipality's infrastructure planning in order to continue.			
12. Will any person's rights be negatively affected by the proposed activity/ies?	YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>	Please explain
It is not foreseen that any person's rights will be negatively affected by the proposed activity as no community displacement will take place. A public participation process was followed and the comments and concerns taken into account during the environmental process.			
13. Will the proposed activity/ies compromise the "urban edge" as defined by the local municipality?	YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>	Please explain
The SANRAL is given the power to perform all strategic planning, as well as the planning, design, construction, operation, management, control, maintenance and rehabilitation of all national roads in South Africa in terms of the South African National Roads Agency Limited and National Roads Act, 1998. The R36 is a national road and falls within the jurisdiction of the SANRAL and the development is not bound by the Municipality's urban edge in order to continue as it is not a residential development or municipal road development.			
14. Will the proposed activity/ies contribute to any of the 17 Strategic Integrated Projects (SIPs)?	YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>	Please explain
This project is not included in any of the SIP projects.			

15. What will the benefits be to society in general and to the local communities?	Please explain
<p>The upgrade of the R36 offer several benefits to society in general, including:</p> <ul style="list-style-type: none"> • Decrease accidents due to decreasing possibility of head-on collisions; • Safer driving conditions for the road users as the one-way will provide opportunities to pass heavy vehicles. • With the upgrade of the road, less maintenance on vehicles are anticipated; • Improved traffic flow, particularly during peak periods; • Reduced congestion; • Improved drainage and other services. 	
16. Any other need and desirability considerations related to the proposed activity?	Please explain
<ul style="list-style-type: none"> • Employment opportunities for the local residents during construction. • Less accidents and associated loss of lives. • Improved drainage and other services. • Drainage channels will be improved. 	
17. How does the project fit into the National Development Plan for 2030?	Please explain
<p>The SANRAL is given the power to perform all strategic planning, as well as the planning, design, construction, operation, management, control, maintenance and rehabilitation of all national roads in South Africa. The N2 is a national road and falls within the jurisdiction of the SANRAL in terms of the South African National Roads Agency Limited and National Roads Act, 1998.</p>	

18. Description of how the general objectives of Integrated Environmental Management as set out in section 23 of NEMA have been taken into account.

The following general objectives of integrated environmental management have been taken into account:

- a) Identified, predicted and evaluated the actual and potential impact on the environment as a result of the upgrade of the R36 as well as the socio-economic conditions and cultural heritage,
- b) Investigated alternatives and options for mitigation of activities, with a view to minimizing negative impacts.
- c) Maximizing benefits to the environment as a result of the upgrade of the N2;
- d) Ensured that the effects of activities on the environment received adequate consideration before actions are taken in connection with them;
- e) Ensured adequate and appropriate opportunity for public participation in decisions that may affect the environment;
- f) Ensured the consideration of environmental attributes in management and decision-making which may have a significant effect on the environment; and
- g) Identified and employed 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 2 of the NEMA.

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

The following have been taken into account:

- Identified all potential activities and associated environmental risks associated with the proposed project;
- Consideration of all relevant ecological, social and economic factors in development;
- Minimised adverse environmental impacts, pollution or degradation of the environment;
- Avoiding or minimising the disturbance to ecosystems;
- That pollution and degradation of the environment are avoided, or, where they cannot be altogether avoided, are minimised and remedied;
- 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;
- 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;
- 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;
- That the development, use and exploitation of renewable resources and the ecosystems of which they are part do not exceed the level beyond which their integrity is jeopardised;
- That a risk-averse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions;
- That negative impacts on the environment and on people's environmental rights be anticipated and prevented, and where they cannot be altogether prevented, are minimised and remedied.
- Promotion of community participation through an extensive and open public participation process with I&APs;
- Delivery of high quality information to government and other decision-makers in order to enable them to make informed decisions regarding the project and avoid unnecessary project delays.

7. DETAILS OF PUBLIC PARTICIPATION PROCESS FOLLOWED

A public participation process was undertaken in accordance with the EIA Regulations, 2014, as amended.

The public participation and communication process aims to identify issues in order to maximise the social and environmental benefits, and to minimise the social and environmental costs of the proposed project.

Interested and affected parties (I&APs) were consulted and afforded the opportunity to participate. The I&APs were informed and involved in the project from the outset in order to promote participation and transparency.

The aim of this public participation process is to achieve the following broad goals:

- Identification of all key I&APs and stakeholders;
- The active involvement of all I&APs with respect to decision making;
- An exchange of information relevant to the proposed project through Background Information Documents (BID), consultations and newspaper advertisements.
- The development of an understanding with regards to the broader project objectives and goals and knowledge of the project; and
- The identification of issues and concerns with regards to all potential alternatives associated with the proposed development.

The following approach was followed in undertaking the public participation process:

a. Identification of and Consultation with I&APs

The first step in the public participation process was to identify the key I&APs. A list of the registered I&APs is attached as Appendix D.

b. Advertising

In accordance with the EIA Regulations, 2014, as amended an advertisement was placed requesting I&APs to register their interest in the project. An advertisement was placed in the Northern Bulletin of 5 March 2021. A copy of the advertisement is included in Appendix D.

c. Site Notice

Site notifications in English in A2 format requesting comments or objections were placed on site on 12 March 2021. Photographs of the site notices are included in Appendix G.

d. Notification Letter and Background Information Document

Notification letters about the project and a Background Information Document were sent out to the particular Ward Councillors, Government Departments that would be relevant to this project and the affected landowners are included in Appendix D.

e. Comments and Response Report

A comments and response report was drafted that included all the issues raised by the Interested and/or Affected Parties as well as the responses to the issues raised. The Comments and Response report is included in Appendix D.

f. Local Authority Involvement

Letters were forwarded to the Tzaneen Local Municipality and the Mopani District Municipality. The letters are included in Appendix D.

g. Review of Draft Basic Assessment Report

The Draft Basic Assessment Report will be made available to the public for review and comment, within an allocated 30-day period.

7.1 Summary of issues raised by I&APs

Table 6: Summary of Issues raised by I&APs

Interested and Affected Parties	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section and Paragraph Reference in This report Where the Issues and or Responses were incorporated.
<u>AFFECTED PARTIES</u>				
Landowner/s				
The South African National Roads Agency Soc Limited	No comments received	No issues raised	No response necessary	None required
Lawful occupier/s of the land				
There are no lawful occupiers of the N2 road reserve	No comments received	No issues raised	No response necessary	None required
Landowners or lawful occupiers on adjacent properties				
Mr Heinrick Drewes	1 July 2021	I tried to look on the map but it is vague	I will request the engineers who are responsible for the	None required

Landowner		<p>What is the impact of the widening of the road on my property?</p> <p>What do you need from me?</p> <p>What happens to the current access to my property?</p>	<p>design of the road to send you a plan that will show how your property will be affected.</p> <p>Your property will never be closed off. There will be land acquisition consultants that will visit with you to discuss the land acquisition and compensation with you.</p>	
Municipal councillors				
Mr Marthinus Prinsloo Ward Councillor Ward 15	No comments received	<p>We have received a letter regarding the proposed upgrade of the R36 section 6 from Manchabeni to Tzaneen in the Limpopo Province.</p> <p>This letter serves to say that the above-mentioned reference number is noted and there is no objection.</p>	We thank you for the response	None required
Municipality				
Mr BS Matlala Municipal Manager Tzaneen Local Municipality	No comments received	No issues raised	No response necessary	None required
Ms. Maggie Machumele Tzaneen Local Municipality Environmental Section	No comments received	No issues raised	No response necessary	None required

Mr Quiet Kgatla Municipal Manager Mopani District Municipality	No comments received	No issues raised	No response necessary	None required
Organs of state				
Mr Dawid Nethengwe (Water Licenses) Department of Water and Sanitation	No comments received	No issues raised	No response necessary	None required
Mr Vusi Maluleke Department of Economic Development, Environment and Tourism Limpopo Province	No comments received	No issues raised	No response necessary	None required
Mr. Sello Maleka The Chief Executive Officer The Limpopo Tourism Agency	No comments received	No issues raised	No response necessary	None required
Ms Ramatsimele Jacqueline Maisela Head of Department Limpopo Department of Agriculture	No comments received	No issues raised	No response necessary	None required
Communities				
None				

7.2 The Environmental Attributes Associated With Alternatives

The environmental attributes described below include socio-economic, social, heritage, cultural, geographical, physical and biological aspects.

7.2.1 Baseline Environment

a. Topography

The topography of the region is mountainous areas with undulating hills, valleys and flat to undulating plains, sometimes on top of small plateaus. The average height above sea level for the study site is approximately 629m, with maximum and minimum elevations of 767m and 541m, respectively. The highest point is in the Town of Tzaneen, near the end of the Road Section 6, while the lowest point is where the site (Road R36) crosses over the Letsitele River. The study site is situated mostly at the bottom of the escarpment, with Tzaneen situated on the edge or lower foothills of the escarpment (Flori Scientific Services, 2021).

b. Geology and Soils

The geology of the area material sources to rehabilitate and widen the project road are discussed. The figure below shows the underlying geological formations along the route.

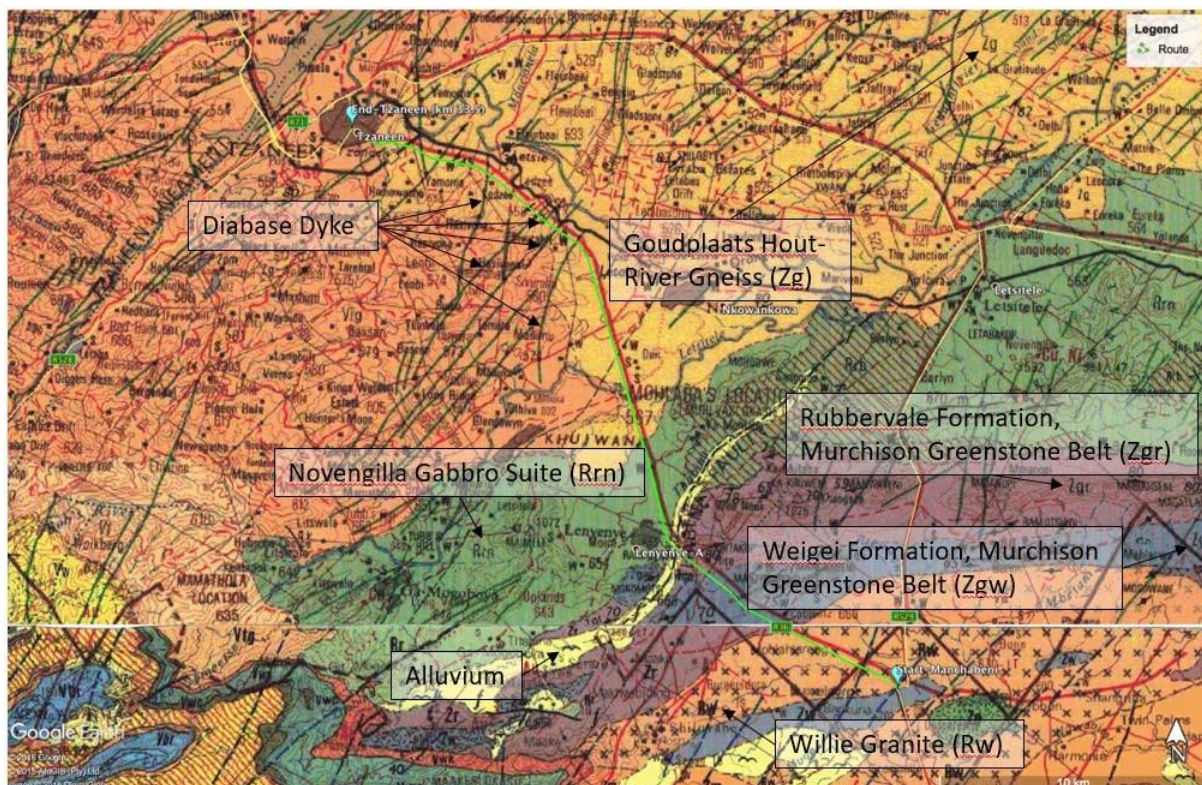


FIGURE: Underlying Geological Formations

The geology primarily consists of granites (Rw), gneisses (Zg) gabbros (Rrn) and greenstone belts (Zgr and Zgw). The Weigei Formation and Rubbervale Formation are greenstone belts and are mostly various types of schists (Nathoo Mbenyane Engineers).

c. Climate

The study site is within a summer rainfall region of the country. The study site is situated along the edges of the two high rainfall regions (601mm – 1 000mm, and >1000mm) on top of and along the escarpment; and within medium rainfall region (401mm – 600mm) on the lower foothills. The site is within the Hot Interior Climatic Zone of South Africa. The summers are hot to very hot and humid (sub-tropical in the area of Tzaneen), while the winter nights and early mornings can be cool to mild. Frost is uncommon. The average annual rainfall for Tzaneen is approximately 881mm. The average temperatures for Tzaneen are maximums in the high twenties / low thirties and minimums in the low teens, Degrees Celsius (Flori Scientific Services, 2021).

d. Land cover

The landuses and/or landcover of the study site are the existing national road (R36) and road reserve. The dominant landcovers of the area are high-density townships in the south, the Town of Tzaneen in the north and some open bushveld in the areas between. Other landuses in the area include forestry, mining and high-intensity commercial farming (mostly crop cultivation and orchards) (Flori Scientific Services, 2021).

e. Vegetation

South Africa is divided up into nine major Biomes. The study site and the surrounding area are within the Savanna Biome. Mucina & Rutherford (2006) divide the Bushveld into six main bioregions, namely, Central Bushveld, Mopane, Lowveld, Sub-Escarpment Savanna, Eastern Kalahari Bushveld and Kalahari Duneveld. The study site is within the Lowveld Bioregion and within the original extent of the veldtypes of Granite Lowveld and Tzaneen Sour Bushveld.

The vegetation hierarchy of the study site is shown below in Table 6.

Table 7: Vegetation hierarchy of the study area

Category Description	Classification
Biome	Savanna (Bushveld)
Bioregion	Lowveld
Veldtype	Granite Lowveld, Tzaneen Sour Bushveld

Granite Lowveld is characterised by tall shrubland with few trees to moderately dense low woodland on the deep sandy uplands with *Terminalia sericea* (Silver Cluster-leaf), *Combretum zeyheri* (Bushwillow) and *Combretum apiculatum* and ground layer including *Pogonarthria squarrosa*, *Tricholaena monachne* and *Eragrostis rigidior*. Dense thicket to open savanna in the bottomlands with *Vachellia* (*Acacia*) *nigrescens*, *Dichrostachys cinerea*, *Grewia bicolor* in the woody layer. The dense herbaceous layer contains the dominant *Digitaria eriantha*, *Panicum maximum* and *Aristida congesta* on fine-textured soils, while

brackish bottomlands support *Sporobolus nitens*, *Urochloa mosambicensis* and *Chloris virgata*. At seep lines, where convex topography changes to concave, a dense fringe of *Terminalia sericea* occurs, with *Eragrostis gummiflua* in the undergrowth.

Tzaneen Sour Bushveld is characterised by deciduous, tall open bushveld (parkland) with a well-developed, tall grass layer, occurring on low to high mountains with undulating plains mainly at the base of, and on the lower to middle slopes of, the northeastern escarpment.

f. Vegetation of the study area

The study site is a highly transformed area of existing hard-surfaced road and transformed and highly degraded road reserve. Added to this is that approximately 21km of the 28,7km is within built-up, urban areas. The remaining 2,7km comprises of 1,5km of farmlands and 1,2km of degraded bushveld. In other words, only around 4% of the immediate adjacent area along the length of the study site (R36, Section 6) can be classified as bushveld or natural vegetation. All of this 4% is within badly degraded Tzaneen Sour Bushveld. The only other resemblances of natural vegetation are in the areas of the small streams and rivers that are crossed. There are no patches or examples of pristine Tzaneen Sour Bushveld or Granite Lowveld present in the study area.

The list of dominant and other plant species observed on site are listed in the Appendices to the specialist study.

No Red Data Listed (RDL) floral species (endangered, threatened or vulnerable) were observed during field investigations. No Orange Data species or species of conservation concern were observed during field investigations either. Due to anthropic (human) activities in the study area the floral species richness is low.

g. Air Quality

Approximately 21km of the 28,7km is within built-up, urban areas that could affect the air quality negatively.

h. Noise

The current noise levels are high due to the presence of heavy traffic on the R36.

i. Visual

The area is highly disturbed that has a negative visual effect. There is movement of people and free-roaming livestock in the area. There are no pristine areas of veld in the area of the proposed bridge.

j. Sites of Archaeological and Cultural Interests

There are no sites of archaeological or cultural interests that were identified in the area.

k. Socio-Economic Aspects

The project could have a positive impact on the regional socio-economic structure through its support of the development industry, profit generation contributing to tax revenue, employment creation and the skills development of its employees. The following will accrue to local labour:

- 8-10% of the project value is allocated to targeted local labour.
- 30% of the project value is part of the CPG and will be awarded to subcontractors through a formal tender process.
- 1.25% of the Contractors tendered value will be set aside for various training related to construction.

l. Sensitive Landscapes

The following are considered sensitive landscapes associated with the project:

- Two main rivers will be crossed (Letsitele & Thabina), along with a few small semi-perennial streams and drainage lines.
- Any area with natural vegetation.

Please find a sensitivity plan included in Appendix B.

m. Cumulative Impacts

The cumulative impacts associated with the upgrade of the road could be the following (based on experience with regard to other major road upgrade projects):

- Additional traffic on the local roads during construction;
- Possible time delays as a result of construction period;
- Possible influx of people searching for employment opportunities in the area during construction.

7.3 Impacts and Risks Identified

The **potential** impacts associated with the project and the degree to which these impacts can be reversed or may cause irreplaceable loss of resource and can be avoided, managed or mitigated are the following:

Table 4: Potential Impacts and Risks Identified

Potential Impact	Reversed Y/N or n/a	Irreplaceable loss	Avoided, Managed, Mitigated
Dust Nuisance	Yes	No	Mitigated
Soil Erosion	Yes	Yes	Avoided, Mitigated
Loss of topsoil	Yes	No	Avoided
Noise Impact	Yes	No	Avoided, Mitigated
Water Pollution	Yes	No	Avoided, Mitigated
Visual Impact	Yes	No	Avoided, Mitigated
Clearing of protected	Yes	No	Mitigated

trees			
Mammals and snakes in road reserve	Yes	No	Managed, Mitigated
Uncovered heritage sites and graves	Yes	No	Managed, Mitigated
Contamination of site due to hydrocarbon spillage	Yes	No	Avoided, Managed
Emissions from heavy vehicles	Yes	No	Avoided, Managed
Infestation of weeds and alien vegetation	Yes	No	Managed, Mitigated
Possible pollution of solid waste	Yes	No	Managed, Mitigated
Possible sewage pollution	Yes	No	Managed, Mitigated
Possible pollution of fuels and gas as a result of inadequate storage	Yes	No	Managed, Mitigated
Possible pollution by cement or concrete	Yes	No	Managed, Mitigated

7.4 Methodology Used in Determining Impacts

Potential environmental impacts on the environment will be determined in terms of the following in order to determine the significance of each impact:

Nature:

A brief description of the environmental aspect being impacted upon by a particular action or activity is presented. Also:

- Probability (how likely is it that the impact will occur?)
- Magnitude (how severe will the impact be?)
- Duration (how long will the impact last?)
- Scale of the impact (what size of the area will be affected?)

Thereafter, mitigation measures will be proposed in order to reduce or eliminate negative impacts and enhance positive impacts. The impact of the proposed activity on the environment will be considered for the pre- construction, construction and operational phases. The necessary mitigation measures will be consolidated in the form of an Environmental Management Programme (EMPr).

Assessment of significance – method:

The significance of every environmental impact identified will be determined using the following approach:

In assessing the potential significance of an impact two aspects will be considered:

- i) Occurrence
- ii) Severity
 - Occurrence will be sub-divided into:
 - Probability of occurrence
 - Duration of occurrence
 - Severity will be sub-divided into:
 - Magnitude (severity) of impact
 - Scale/extent of impact

In order to assess each of these factors for each impact, ranking scales were employed as follows:

Probability:	Duration:
5 - Definite/don't know	5 - Permanent
4 - Highly probable	4 - Long-term*
3 - Medium probability	3 - Medium-term (5-15 years)
2 - Low probability	2 - Short-term (0-5 years)
1 - Improbable	1 - Immediate
0 - None	0 - None
Scale:	Magnitude:
5 - International	10 - Very high/don't know
4 - National	8 - High
3 - Regional	6 - Moderate
2 - Local	4 - Low
1 - Site only	2 - Minor
0 - None	0 - None
*impact ceases after operational life of the activity	

Once the above factors had been ranked for each impact, the overall risk (environmental significance) of each impact will be assessed using the following formula: $SP = (M) + (D) + (S) \times (P)$. The maximum value is 100 significance points (SP). Environmental impacts will be rated as either of High, Moderate or Low significance on the following basis:

- SP greater or the same as 60 indicates high environmental significance;
- SP 31 greater or the same as 59 indicates moderate environmental significance;
- SP \leq 30 indicates low environmental significance.

Risks associated with alternatives: The risks associated with the alternatives are deemed to be low.

7.5 Positive and Negative Impacts and Assessment

The following table provides the positive and negative impacts associated with the project and the impact assessment undertaken. The mitigation measures are also included in the table.

Table 5: Positive and Negative Impacts and Assessment

POTENTIAL ENVIRONMENTAL IMPACT	ACTIVITY	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION						RECOMMENDED MITIGATION MEASURES/ REMARKS	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION							
		M	D	S	P	TOTAL	SP		M	D	S	P	TOTAL	SP		
AIR AND DUST POLLUTION																
Possible air and dust pollution	<p>Construction Phase: Vegetation, stripping, stripping and stockpiling of topsoil, subsoil, overburden and spoil</p> <p>Operational Phase: Excavations, Stockpiling and Transporting of gravel material</p> <p>Decommissioning Phase: Sloping and Landscaping during rehabilitation, Replacing the topsoil and revegetating the disturbed area</p>								<ul style="list-style-type: none"> Dust will be suppressed through a watering management programme, especially during windy conditions. Dust generated will be carefully monitored by the DEO and should be suppressed by means of watering regularly. Access roads will be watered regularly, especially in the dry winter months and in periods of high wind. Vegetation will not be unnecessary stripped. Domestic fires will be prohibited on site. Heavy vehicle will be serviced regularly to ensure emission control. All heavy vehicles, excavators and generators used on site will be in good working condition and will be serviced regularly. 							
		6	2	2	4	40	M		2	2	3	1	8	L		

POTENTIAL ENVIRONMENTAL IMPACT	ACTIVITY	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION						RECOMMENDED MITIGATION MEASURES/ REMARKS	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION						
		M	D	S	P	TOTAL	SP		M	D	S	P	TOTAL	S P	
								<ul style="list-style-type: none"> Should a vehicle have a break down, it will be serviced immediately. 							
SOIL EROSION															
Possible soil erosion	<p>Construction Phase: Vegetation, stripping, stripping and stockpiling of topsoil, subsoil, overburden and spoil</p> <p>Operational Phase: Excavations, Stockpiling and Transporting of gravel material</p> <p>Decommissioning Phase: Sloping and Landscaping during rehabilitation, Replacing the topsoil and revegetating the disturbed area</p>	4	2	2	2	16	L	<ul style="list-style-type: none"> Topsoil will be removed over the section to be widened and stored in a perimeter berm. The height of the topsoil berm will not exceed 3m. The topsoil berm will be inspected for erosion daily. Minimal amounts of topsoil shall be lost due to erosion, either by wind or water. This can be facilitated through the grassing of topsoil stockpiles. Condition of soil in walk or drive areas should be checked daily for erosion. Access road condition will be checked daily. If erosion is noted at walk and drive areas, access road or topsoil berms, the erosion channel will be fixed by placing cut vegetation, sandbags or rocks within the erosion channel and the cause of the erosion will be 	2	2	2	2	12	L	

POTENTIAL ENVIRONMENTAL IMPACT	ACTIVITY	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION						RECOMMENDED MITIGATION MEASURES/ REMARKS	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION						
		M	D	S	P	TOTAL	SP		M	D	S	P	TOTAL	S P	
								mitigated through the creation of runoff channels.							
NOISE															
Possible Noise Impact	<p>Construction Phase: Vegetation, stripping, stripping and stockpiling of topsoil, subsoil, overburden and spoil</p> <p>Operational Phase: Excavations, Stockpiling and Transporting of gravel material</p> <p>Decommissioning Phase: Sloping and Landscaping during rehabilitation, Replacing the topsoil and revegetating the disturbed area</p>	6	2	2	5	50	M	<ul style="list-style-type: none"> The working hours shall be limited to between 07:00 hrs and 18:00 hrs on weekdays, and 07:00 hrs and 16:00 hrs on Saturdays, or as per contract documentation. Vehicles must be driven at a moderate speed (50 kph) on private roads. Noise generated from heavy vehicles shall only be carried out during normal working hours. Extended working hours will be in accordance with contract documentation. SANRAL shall be obligated to maintain vehicles used at the site in a good condition; SANRAL will be obliged to ensure that all personnel on site apply occupational health and safety requirements with respect to hearing protection. 	2	2	2	5	30	L	

POTENTIAL ENVIRONMENTAL IMPACT	ACTIVITY	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION						RECOMMENDED MITIGATION MEASURES/ REMARKS	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION					
		M	D	S	P	TOTAL	SP		M	D	S	P	TOTAL	S P
VISUAL														
Possible visual impacts	<p>Construction Phase: Vegetation, stripping, stripping and stockpiling of topsoil, subsoil, overburden and spoil</p> <p>Operational Phase: Excavations, Stockpiling and Transporting of gravel material</p> <p>Decommissioning Phase: Sloping and Landscaping during rehabilitation, Replacing the topsoil and revegetating the disturbed area</p>	2	2	2	3	18	L	<ul style="list-style-type: none"> Where areas are going to be disturbed through the destruction of vegetation, use appropriate indigenous and endemic plants to replace screening vegetation lost. If practically possible, locate construction camps in areas that are already disturbed or where it isn't necessary to remove established vegetation. Keep the construction sites and camps neat, clean and organised (i.e. no littering) in order to portray a tidy appearance. In visually sensitive areas screen the construction camp and lay-down yards by enclosing the entire area with a dark green or black shade cloth of no less than 2 m height. Maintain natural vegetation where possible. Rehabilitate disturbed areas as soon as practically possible after construction. This should be done to restrict extended periods of exposed soil. 	2	2	2	2	12	L

POTENTIAL ENVIRONMENTAL IMPACT	ACTIVITY	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION						RECOMMENDED MITIGATION MEASURES/ REMARKS	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION					
		M	D	S	P	TOTAL	SP		M	D	S	P	TOTAL	SP
								<ul style="list-style-type: none"> Utilise existing screening features such as dense vegetation stands or topographical features to place the construction camps and lay-down yards out of the view of sensitive visual receptors. Where vegetation clearance must be done for safety reasons, this should be kept to a minimum. Hydro-seeding must be undertaken as soon as possible after rehabilitation has commenced. The success of hydro-seeding must be monitored over a period of 1 year and be repeated in areas of low success. 						
AQUATIC AND TERRESTRIAL ECOLOGY														
Possible impacts on terrestrial ecology	<p>Construction Phase: Vegetation, stripping, stripping and stockpiling of topsoil, subsoil, overburden and spoil</p> <p>Operational Phase: Excavations, Stockpiling and Transporting of gravel material</p> <p>Decommissioning Phase: Sloping</p>	6	2	2	4	40	M	<ul style="list-style-type: none"> No protected trees will be removed or destroyed. The footprint of the project is small in relation to the area and mostly within an already disturbed and altered environment. Two main rivers will be crossed (Letsitele & Thabina), along with a few small semi-perennial streams and 	4	2	2	2	16	L

POTENTIAL ENVIRONMENTAL IMPACT	ACTIVITY	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION						RECOMMENDED MITIGATION MEASURES/ REMARKS	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION					
		M	D	S	P	TOTAL	SP		M	D	S	P	TOTAL	SP
	and Landscaping during rehabilitation, Replacing the topsoil and revegetating the disturbed area							<p>drainage lines. The long-term impact of the upgrade of the actual watercourse crossings is a positive impact, because it will improve water flow, remove blockages, stabilise stream banks, reduce existing erosion of stream banks and riparian areas.</p> <ul style="list-style-type: none"> Minimal riparian vegetation will be lost (need to be removed) as the project involves the upgrade and not totally new crossings. The upgrade will also not include little to no need to remove trees and other riparian vegetation. Any temporary storage, lay-down areas or accommodation facilities to be setup in existing built-up areas or disturbed areas. No temporary storage areas, laydown areas or site offices are allowed within a 100m of the edge of any river, stream or distinctive drainage line. No temporary storage areas, laydown areas or site offices are allowed within a 100m of the edge of any river, stream or distinctive drainage line. That is, a 100m buffer zone (no-go zone) for these sites are required along all watercourses. 						

POTENTIAL ENVIRONMENTAL IMPACT	ACTIVITY	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION						RECOMMENDED MITIGATION MEASURES/ REMARKS	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION						
		M	D	S	P	TOTAL	SP		M	D	S	P	TOTAL	S P	
								<ul style="list-style-type: none"> • Ensure small footprint during construction phase • An Erosion Plan to be implemented and monitored during the construction phase, especially in the area of watercourses and steep gradients along escarpment edges. The erosion potential is moderate to low. This also to further reduce the potential of siltation of small watercourses. The plan need only be basic, but needs to be monitored. • All hazardous materials must be stored appropriately to prevent these contaminants from entering the water environment; • All excess materials brought onto site for construction to be removed after construction and their removal seen as part of the construction phase. • No open trenches or mounds of soils to be left. • Rehabilitation plan for disturbed areas to be compiled and implemented as part of the construction phase. • The most important recommendations arising from the study is the need for 							

POTENTIAL ENVIRONMENTAL IMPACT	ACTIVITY	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION						RECOMMENDED MITIGATION MEASURES/ REMARKS	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION					
		M	D	S	P	TOTAL	SP		M	D	S	P	TOTAL	S P
								<p>100m buffer zones around watercourses in which no temporary laydown areas, site offices or campsites may be set up.</p> <ul style="list-style-type: none"> An independent ECO is recommended to monitor operations and ensure that recommended mitigating measures, including buffer zones, are implemented and adhered to. 						
HYDROCARBON SPILLAGES														
Hydrocarbon spillage	<p>Construction Phase: Vegetation, stripping, stripping and stockpiling of topsoil, subsoil, overburden and spoil</p> <p>Operational Phase: Excavations, Stockpiling and Transporting of gravel material</p> <p>Decommissioning Phase: Sloping and Landscaping during rehabilitation, Replacing the topsoil and revegetating the disturbed area</p>	6	3	2	3	27	L	<ul style="list-style-type: none"> All heavy vehicles, excavators and generators used for the project will be in good working condition. A drip tray will be available to place underneath heavy vehicles while the vehicles are parked at night. Should a vehicle have a break down, it will be serviced immediately. If soil contamination with diesel and oils occurred, the spill will be cleared up promptly. If the spill is small, it will be cleaned with a spill kit. if the spill is large, a spill clean-up company will be used to clean-up the spill; Proper functioning of heavy vehicles will be ensured. 	2	3	2	2	14	L

POTENTIAL ENVIRONMENTAL IMPACT	ACTIVITY	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION						RECOMMENDED MITIGATION MEASURES/ REMARKS	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION							
		M	D	S	P	TOTAL	SP		M	D	S	P	TOTAL	S P		
ALIEN VEGETATION																
Possible alien vegetation infestation	<p>Construction Phase: Vegetation, stripping, stripping and stockpiling of topsoil, subsoil, overburden and spoil</p> <p>Operational Phase: Excavations, Stockpiling and Transporting of gravel material</p> <p>Decommissioning Phase: Sloping and Landscaping during rehabilitation, Replacing the topsoil and revegetating the disturbed area</p>	6	2	2	4	40	M	<ul style="list-style-type: none"> Every 3 months casual labour will be employed to circumnavigate the site to hand pull out known alien vegetation that may have established in the disturbed area. Casual labour will be provided with photographs of the alien vegetation that could establish. 	4	2	2	2	16	L		
SANITATION FACILITIES																

POTENTIAL ENVIRONMENTAL IMPACT	ACTIVITY	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION						RECOMMENDED MITIGATION MEASURES/ REMARKS	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION					
		M	D	S	P	TOTAL	SP		M	D	S	P	TOTAL	S P
Provision and management of sanitation facilities	All phases	8	2	2	4	48	M	<ul style="list-style-type: none"> Chemical toilet facilities shall preferably be used on site. The toilets shall be services every second week by a service provider. 	4	2	2	3	24	L
HERITAGE, ARCHAEOLOGICAL AND PALEONTOLOGICAL ISSUES														
Possible archaeological sites and graves to be affected	Construction phase	6	5	1	5	60	H	<ul style="list-style-type: none"> If an artefact or grave on-site is uncovered, work in the immediate vicinity shall be stopped immediately and it should immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made. The Contractor shall take reasonable precautions to prevent any person from removing or damaging any such article. The South African Heritage Resources Agency (SAHRA) shall be contacted such that an archaeological/heritage resources consultant can be appointed to record the site and excavate if necessary. Work may only resume once clearance is given in 	6	5	1	2	24	L

POTENTIAL ENVIRONMENTAL IMPACT	ACTIVITY	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION						RECOMMENDED MITIGATION MEASURES/ REMARKS	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION						
		M	D	S	P	TOTAL	SP		M	D	S	P	TOTAL	SP	
								writing by the archaeologist/heritage resources consultant.							
SAFETY															
Safety of sloped areas and safety of employees	All phases – employees Decommissioning phase – sloped areas	6	5	1	5	60	H	<ul style="list-style-type: none"> Appropriate safety clothing will be worn at all times i.e. head gear, shoes, ear plugs. 	6	5	1	2	24	L	

8. ALTERNATIVES CONSIDERED

Motivation for preferred site: The R36 from Manchabeni to Tzaneen is an existing road that will be upgraded and site alternatives are therefore, not relevant.

The alternatives that were investigated are different design speeds for the proposed road. The design speeds considered are 80km/h, 90km/h and 100km/h.

a) Preferred design alternative

A design speed of 80 km/h for the project.

b) Design Alternative 1

A design speed of 100 km/h for the project.

c) No-go Alternative

Should the project not proceed the traffic on the R36 could experience increasingly unsafe driving conditions. This project will accommodate the predicted increase in traffic volume and avoid high driver frustration. The cost of maintenance could be very high with this alternative.

The current high volumes of heavy vehicle traffic on the R36 are a major safety and capacity concern. The volume of heavy vehicles is expected to increase significantly over the next 20 years. Traffic volumes and design principals determine that the road needs to be upgraded to ensure the safety of the traveling public. If this is not done, it is anticipated that accidents on this road will increase in future.

Please see facility illustrations in Appendix C.

8.1 Site Selection Matrix

The following table provides a site selection matrix of the alternatives considered:

Table 6: Site Selection Matrix

Criteria	Preferred Alternative	Design	Design Alternative 1
Vertical alignment	Limited realignment		Extensive realignment
Structures	Least affected		Most affected
Earthworks	Minor impact on cut/fills		Major impact on cut/fills
Traffic accommodation	Least complex		Very complex
Improve safety to traveling public	Yes		Yes
Improve traffic flow	Yes		Yes
Reduce congestion	Yes		Yes

8.2 Advantages and Disadvantages of Alternatives Considered

a. Preferred design alternative

In this option, a design speed of 80km/h is proposed for the project.

Advantages

The advantages of the preferred alternative are the following:

- This option will ensure safer driving conditions for the road users.
- Improved traffic flow, particularly during peak periods.
- Reduced congestion is anticipated.
- It is anticipated that the upgrade will cater for future traffic demand and will support economic growth. This will benefit the communities in the area including local residents, motorists, the road freight industry and its customers.
- The environmental impact of the upgrade of the road is deemed to be low.
- Limited realignment of the vertical alignment is necessary following existing vertical alignment.
- The bridge structures will be the least affected by this alternative.
- There will be a minor impact on cut/fills and limited impact on existing access roads.
- The traffic accommodation will be the least complex.
- No land acquisition will be required for temporary deviations.
- The safety to pedestrians will be significantly improved due to the lower vehicle speeds.

Disadvantages

The disadvantages of this alternative are the following:

- Driver frustration could occur due to the low speed that needs to be maintained on the road.

b. Design Alternative 1

In this option, a design speed of 100km/h is proposed for the project.

Advantages

The advantages of this alternative are the following:

- This option will ensure safer driving conditions for the road users.
- Improved traffic flow, particularly during peak periods.
- Reduced congestion is anticipated.

- It is anticipated that the upgrade of the road will cater for future traffic demand and will support economic growth. This will benefit the communities in the area including local residents, motorists, the road freight industry and its customers.
- The environmental impact of the upgrade of the road is deemed to be low.

Disadvantages

The disadvantages of this alternative are the following:

- The realignment of crest and sag curves is necessary in the current position for the vertical alignment.
- The bridge structures will be affected as it will affect the clearance bridges and the realignment of the existing road will be required.
- There will major impact on fills to improve sag curves and will impact on existing access roads.
- The traffic accommodation will be the very complex with possible stop/go's.
- Land acquisition will be required for temporary deviations.
- Less safe option for pedestrians due to higher vehicle speeds.

8.3 Sustainable Development

It will be attempted to implement the following:

- Compact fluorescent lights will be installed in the site offices;
- All solid waste will be separated in different containers to make recycling possible;
- Where new toilets will be installed dual flush device toilets will be installed;
- Storm water will be managed and improved to reduce erosion by installing gabion boxes;
- Where new grassing is done, it will be done by using locally indigenous vegetation;
- Training of staff will be done to implement good housekeeping. This will be done during toolbox talks.
- An ECO will address the staff on good housekeeping actions.

8.4 Socio-Economic Parameters

The value of the project is R850 million. Employment opportunities that will accrue to previously disadvantaged individuals are the following:

- 8-10% of the project value is allocated to targeted local labour.
- 30% of the project value is part of the CPG and will be awarded to subcontractors through a formal tender process.
- 1.25% of the Contractors tendered value will be set aside for various training related to construction.

9. SUMMARY OF SPECIALIST REPORTS

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X Where applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED.
Proposed Upgrade of National Road R36 Section 6, from Manchabeni (Km 4,70) to Tzaneen (Km 33,40), Greater Tzaneen Local Municipality, Mopani District Municipality, Limpopo Province	<p>Construction Phase</p> <ul style="list-style-type: none"> • No protected trees will be removed or destroyed. • The footprint of the project is small in relation to the area and mostly within an already disturbed and altered environment. • Two main rivers will be crossed (Letsitele & Thabina), along with a few small semi-perennial streams and drainage lines. The long-term impact of the upgrade of the actual watercourse crossings is a positive impact, because it will improve water flow, remove blockages, stabilise stream banks, reduce existing erosion of stream banks and riparian areas. • Minimal riparian vegetation will be lost (need to be removed) as the project involves the upgrade and not totally new 	x	EMPr

<p style="text-align: center;">LIST OF STUDIES UNDERTAKEN</p>	<p style="text-align: center;">RECOMMENDATIONS OF SPECIALIST REPORTS</p>	<p style="text-align: center;">SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X Where applicable)</p>	<p style="text-align: center;">REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED.</p>
	<p>crossings. The upgrade will also not include little to no need to remove trees and other riparian vegetation.</p> <ul style="list-style-type: none"> • Any temporary storage, lay-down areas or accommodation facilities to be setup in existing built-up areas or disturbed areas. No temporary storage areas, laydown areas or site offices are allowed within a 100m of the edge of any river, stream or distinctive drainage line. • No temporary storage areas, laydown areas or site offices are allowed within a 100m of the edge of any river, stream or distinctive drainage line. That is, a 100m buffer zone (no-go zone) for these sites are required along all watercourses. • Ensure small footprint during construction phase • An Erosion Plan to be implemented and monitored during the construction phase, especially in the area of 		

<p style="text-align: center;">LIST OF STUDIES UNDERTAKEN</p>	<p style="text-align: center;">RECOMMENDATIONS OF SPECIALIST REPORTS</p>	<p style="text-align: center;">SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X Where applicable)</p>	<p style="text-align: center;">REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED.</p>
	<p>watercourses and steep gradients along escarpment edges. The erosion potential is moderate to low. This also to further reduce the potential of siltation of small watercourses. The plan need only be basic, but needs to be monitored.</p> <ul style="list-style-type: none"> • All hazardous materials must be stored appropriately to prevent these contaminants from entering the water environment; • All excess materials brought onto site for construction to be removed after construction and their removal seen as part of the construction phase. • No open trenches or mounds of soils to be left. • Rehabilitation plan for disturbed areas to be compiled and implemented as part of the construction phase. • No construction vehicles may drive through any streams or simply create new crossings outside of the proposed 		

<p style="text-align: center;">LIST OF STUDIES UNDERTAKEN</p>	<p style="text-align: center;">RECOMMENDATIONS OF SPECIALIST REPORTS</p>	<p style="text-align: center;">SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X Where applicable)</p>	<p style="text-align: center;">REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED.</p>
	<p>plans and EMPr conditions, which might include WUL or GA conditions. Existing roads to be used as much as possible, but these roads to be maintained during all phases of the project.</p> <ul style="list-style-type: none"> • No concrete or mounds of building sand and other materials may be stored temporary during the construction phase within 32m of any watercourses, because a heavy rainstorm can wash these materials into the watercourse. • Temporary access roads (if any) and temporary laydown sites, site office areas, etc. need to be monitored, maintained and rehabilitated at the end of the construction phase as part of the rehabilitation process. • An independent ECO is required for the duration of the construction phase. • There are a few scattered marula trees in the study area. The marula is a national protected tree. It appears that 		

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X Where applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED.
	<p>there should be no need to remove or cut any of these trees during the project. However, should any of these trees need to be removed then a tree permit will need to be required prior to any such operations.</p> <ul style="list-style-type: none"> • A General Authorisation (GA) is going to be required for the project. A Water Use Licence Application (WULA) process should not be required. <p>Operational Phase</p> <ul style="list-style-type: none"> • Monitoring, rehabilitation, general maintenance may form part of the routine maintenance programme for the road. <p>Rehabilitation of Temporary Laydown areas Site-specific rehabilitation plan must be compiled and implemented as part of the construction phase of the project. It may not be left until a later date or fall under the operational phase of the project.</p>		
Phase 1 Cultural Heritage Impact Assessment:	Reasoned opinion as to whether the proposed activity should be authorised:	X (all were included)	EMPr

<p style="text-align: center;">LIST OF STUDIES UNDERTAKEN</p>	<p style="text-align: center;">RECOMMENDATIONS OF SPECIALIST REPORTS</p>	<p style="text-align: center;">SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X Where applicable)</p>	<p style="text-align: center;">REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED.</p>
<p>Phase 1 Heritage Assessment for the proposed Upgrade of National Road R36 Section 6, from Manchabeni (Km 4,70) to Tzaneen (Km 33,40), Greater Tzaneen Local Municipality, Mopani District Municipality, Limpopo Province by Dr J van Schalkwyk, 2021</p>	<p>From a heritage point of view, it is recommended that the proposed development be allowed to continue on acceptance of the conditions proposed below.</p> <p>Conditions for inclusion in the environmental authorisation:</p> <ul style="list-style-type: none"> • Should archaeological sites or graves be exposed in other areas during construction work, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made. 		<p>EMPr</p>

10. ENVIRONMENTAL IMPACT STATEMENT

The following presents a summary of the key findings of the environmental impact assessment:

The area is severely degraded and the environmental impact is deemed to be low. The most important environmental impacts as a result of the upgrade of the road pertain to the possible impacts to the aquatic resources along the route. Mitigation measures are included in the EMP to minimise the impact.

The essence of the Basic Assessment process is aimed at ensuring informed decision-making and environmental accountability, and to assist in achieving environmentally sound and sustainable development. The environmental impacts associated with the upgrade of the road are deemed to be low. No long-term environmental impact should arise.

The preferred alternative is favoured for the following reasons:

- This option will ensure safer driving conditions for the road users.
- Improved traffic flow, particularly during peak periods.
- Reduced congestion is anticipated.
- It is anticipated that the upgrade will cater for future traffic demand and will support economic growth. This will benefit the communities in the area including local residents, motorists, the road freight industry and its customers.
- The environmental impact of the upgrade of the road is deemed to be low.
- Limited realignment of the vertical alignment is necessary following existing vertical alignment.
- The bridge structures will be the least affected by this alternative.
- There will be a minor impact on cut/fills and limited impact on existing access roads.
- The traffic accommodation will be the least complex.
- No land acquisition will be required for temporary deviations.
- The safety to pedestrians will be significantly improved due to the lower vehicle speeds.

10.1 Final Site Map

Please see the final site maps included in Appendix C.

10.2 Summary of the positive and negative impacts and risks of the proposed activity and identified alternatives

The possible negative impacts related to the project are associated with the construction phase i.e.

- a. Dust Pollution
- b. Soil Erosion
- c. Noise Impact
- d. Visual impact

- e. Impact on terrestrial ecology;
- f. Impact on uncovered heritage aspects
- g. Contamination of site due to hydrocarbon spillage
- h. Emissions from heavy vehicles
- i. Water pollution

These negative impacts have a low significance and can be mitigated during the construction period.

The positive impacts associated with the project are the following:

- The safety to the traveling public will be improved.
- Improved traffic flow, particularly during peak periods;
- Reduced congestion is anticipated;
- It is anticipated that the project will cater for future traffic demand and will support economic growth. This will benefit the communities in the area including local residents, motorists, the road freight industry and its customers. The project will, therefore, ensure safer driving conditions for the traveling public by enabling vehicles to travel more efficiently and smoothly with less congestion.

11. PROPOSED IMPACT MANAGEMENT OBJECTIVES AND THE IMPACT MANAGEMENT OUTCOMES FOR INCLUSION IN THE EMPR

The following impact management measures will be implemented by SANRAL to prevent or remedy any possible pollution or degradation of the environment:

a. Possible dust and air pollution

- Dust will be suppressed through a watering management programme, especially during windy conditions.
- Dust generated will be carefully monitored by the DEO and should be suppressed by means of water regularly.
- Any temporary access roads will be watered regularly, especially in the dry winter months and in periods of high wind.
- Vegetation will not be unnecessary stripped.
- Domestic fires will be prohibited on site.
- Heavy vehicle will be serviced regularly to ensure emission control.

b. Soil Erosion

- Minimal amounts of topsoil shall be lost due to erosion, either by wind or water.
- Condition of soil in walk or drive areas should be checked daily for erosion.
- Access road conditions will be checked daily.
- If erosion is noted at walk and drive areas, access road or topsoil berms, the erosion channel will be fixed by placing cut vegetation, sandbags or rocks within the erosion channel and the cause of the erosion will be mitigated through the creation of runoff channels.

c. Possible Noise Pollution

- The working hours shall be limited to between 07:00 hrs and 18:00 hrs on weekdays, and 07:00 hrs and 17:00 hrs on Saturdays, or as per contract documentation.
- Vehicles must be driven at a moderate speed (50 kph) on private roads.
- Noise generated from the heavy vehicles on the project shall only be carried out during normal working hours.
- Extended working hours will be in accordance with contract documentation.
- SANRAL shall be obligated to maintain vehicles used at the project in a good condition;
- SANRAL will be obliged to ensure that all personnel on site apply occupational health and safety requirements with respect to hearing protection.

d. Possible Visual impact

- Where areas are going to be disturbed through the destruction of vegetation, use appropriate indigenous and endemic plants to replace screening vegetation lost.
- If practically possible, locate construction camps in areas that are already disturbed or where it isn't necessary to remove established vegetation.
- Keep the construction sites and camps neat, clean and organised (i.e. no littering) in order to portray a tidy appearance.
- In visually sensitive areas screen the construction camp and lay-down yards by enclosing the entire area with a dark green or black shade cloth of no less than 2 m height.
- Maintain natural vegetation where possible.
- Rehabilitate disturbed areas as soon as practically possible after construction. This should be done to restrict extended periods of exposed soil.
- Utilise existing screening features such as dense vegetation stands or topographical features to place the construction camps and lay-down yards out of the view of sensitive visual receptors.
- Where vegetation clearance must be done for safety reasons, this should be kept to a minimum.
- Hydro-seeding must be undertaken as soon as possible.
- The success of hydro-seeding must be monitored over a period of 1 year and be repeated in areas of low success.

e. Aquatic and Terrestrial Ecology

Construction Phase

- No protected trees will be removed or destroyed.
- The footprint of the project is small in relation to the area and mostly within an already disturbed and altered environment.
- Two main rivers will be crossed (Letsitele & Thabina), along with a few small semi-perennial streams and drainage lines. The long-term impact of the upgrade of the actual watercourse crossings is a positive impact, because it will improve water flow, remove blockages, stabilise stream banks, reduce existing erosion of stream banks and riparian areas.

- Any temporary storage, lay-down areas or accommodation facilities to be setup in existing built-up areas or disturbed areas. No temporary storage areas, laydown areas or site offices are allowed within a 100m of the edge of any river, stream or distinctive drainage line.
- No temporary storage areas, laydown areas or site offices are allowed within a 100m of the edge of any river, stream or distinctive drainage line. That is, a 100m buffer zone (no-go zone) for these sites are required along all watercourses.
- Ensure small footprint during construction phase
- An Erosion Plan to be implemented and monitored during the construction phase, especially in the area of watercourses and steep gradients along escarpment edges. The erosion potential is moderate to low. This also to further reduce the potential of siltation of small watercourses. The plan need only be basic, but needs to be monitored.
- All hazardous materials must be stored appropriately to prevent these contaminants from entering the water environment;
- All excess materials brought onto site for construction to be removed after construction and their removal seen as part of the construction phase.
- No open trenches or mounds of soils to be left.
- Rehabilitation plan for disturbed areas to be compiled and implemented as part of the construction phase.
- No construction vehicles may drive through any streams or simply create new crossings outside of the proposed plans and EMP conditions, which might include WUL or GA conditions. Existing roads to be used as much as possible, but these roads to be maintained during all phases of the project.
- No concrete or mounds of building sand and other materials may be stored temporary during the construction phase within 32m of any watercourses, because a heavy rainstorm can wash these materials into the watercourse.
- Temporary access roads (if any) and temporary laydown sites, site office areas, etc. need to be monitored, maintained and rehabilitated at the end of the construction phase as part of the rehabilitation process.
- An independent ECO is required for the duration of the construction phase.
- There are a few scattered Marula trees in the study area. The Marula is a national protected tree. It appears that there should be no need to remove or cut any of these trees during the project. However, should any of these trees need to be removed then a tree permit will need to be required prior to any such operations.
- A General Authorisation (GA) is going to be required for the project. A Water Use Licence Application (WULA) process should not be required.

Operational Phase

Monitoring, rehabilitation, general maintenance may form part of the routine maintenance programme for the road.

Rehabilitation of Temporary Laydown areas

Site-specific rehabilitation plan must be compiled and implemented as part of the construction phase of the project. It may not be left until a later date or fall under the operational phase of the project.

f. Possible Impact on Uncovered Cultural or Archaeological site

- If an artefact or grave on-site is uncovered, work in the immediate vicinity shall be stopped immediately and it should immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made. The Contractor shall take reasonable precautions to prevent any person from removing or damaging any such article.
- • The South African Heritage Resources Agency (SAHRA) shall be contacted such that an archaeological/heritage resources consultant can be appointed to record the site and excavate if necessary. Work may only resume once clearance is given in writing by the archaeologist/heritage resources consultant.

g. Possible contamination of site due to hydrocarbons spillage

- All heavy vehicles, excavators and generators used during construction will be in good working condition.
- A drip tray will be available to place underneath haul vehicles while the vehicles are parked at night.
- Should a vehicle have a break down, it will be serviced immediately. If soil contamination with diesel and oils occurred, the spill will be cleared up promptly. If the spill is small, it will be cleaned with a spill kit. If the spill is large, a spill clean-up company will be used to clean-up the spill;
- Proper functioning of heavy vehicles will be ensured.

h. Possible establishment and spread of alien vegetation

- Every 3 months casual labour will be employed on site to hand pull out known alien vegetation that may have established in the disturbed area.
- Casual labour will be provided with photographs of the alien vegetation that could establish.

i. Sanitation Facilities

- Chemical toilet facilities shall preferably be used on site. The toilets shall be serviced every second week by a reputable service provider.

j. Emissions from heavy vehicles

- All heavy vehicles, excavators and generators used on site will be in good working condition and will be serviced regularly.
- Should a vehicle have a break down, it will be serviced immediately.

k. Unsafe working conditions for employees

- Appropriate safety clothing will be worn at all times i.e. head gear, shoes, ear plugs.

12. ASPECTS FOR INCLUSION AS CONDITIONS OF AUTHORISATION

- a. A Site Environmental Control Officer must be on site for implementation of the EMPr;
- b. All activities must take place in accordance with the approved EMPr;
- c. Should any archaeological artefact be exposed during construction activities, construction must be stopped. Under no circumstances shall any artefact be destroyed. The area must be fenced off and a heritage practitioner must be must be contacted as soon as possible.

13. DESCRIPTION OF ANY ASSUMPTION, UNCERTAINTIES AND GAPS IN KNOWLEDGE

- a. The following assumptions have been made for the purposes of this report:
 - All information received from sources contributing to this project is correct;
 - That SANRAL will consider the recommendations derived from this study, and
 - The National Department of Forestry, Fisheries and the Environment will be the decision making authority with regard to this application.

b. Limitations

None.

c. Knowledge Gaps

None

14. REASONED OPINION AS TO WHETHER THE PROPOSED ACTIVITY SHOULD OR SHOULD NOT BE AUTHORISED

i) Reasons why the activity should be authorized or not

The activity should be authorised by the Department of Forestry, Fisheries and the Environment as the significance of the environmental impacts identified is low while there are positive impacts that will benefit the community as a whole.

ii) Conditions that must be included in the authorisation

- a. A Site Environmental Control Officer must be on site for implementation of the EMPr;
- c. All activities must take place in accordance with the approved EMPr;
- d. Should any archaeological artefact be exposed during construction activities, construction must be stopped. Under no circumstances shall any artefact be destroyed. The area must be fenced off and a heritage practitioner must be must be contacted as soon as possible.

15. PERIOD FOR WHICH THE ENVIRONMENTAL AUTHORISATION IS REQUIRED

The period for which the environmental authorisation is required is 5 years. The date on which the activity will be concluded is unclear at this stage.

16. UNDERTAKING

I, Josephine Bothma, declare that –

- I act as the independent environmental practitioner in this application.
- The information contained in the report is correct.
- All comments and inputs from stakeholders and I&APs are included in the report.
- The inputs and recommendations from specialist reports are included in the report.
- All information provided to I&APs are included in the report.
- Responses to I&APs to comments or inputs made by I&APs are included in the report.

Signature of the environmental assessment practitioner:

Chameleon Environmental

Name of company:

Date:

Commissioner of Oaths

LIST OF APPENDICES

Appendix A – CV and qualification certificate of EAP

Appendix B – Locality Plan, Sensitivity Plan

Appendix C – Facility Illustrations/site map

Appendix D – Public Participation Process

Appendix E – Specialist studies

Appendix F – Licenses/Permits received

Appendix G – Photographs

Appendix H - EMPr