BASIC ASSESSMENT REPORT

DRAFT

THE PROPOSED UPGRADE OF NATIONAL ROAD R574 (DISTRICT ROAD D1547) SECTION 1 FROM R33 AT GROBLERSDAL (KM 0.0) TO THE R579 AT MORWANENG (KM 38.9)

Prepared for the South African National Roads Agency Soc Limited

18 March 2022

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THE PROPOSED UPGRADE OF NATIONAL ROAD R574 (DISTRICT ROAD D1547) SECTION 1 FROM R33 AT GROBLERSDAL (KM 0.0) TO THE R579 AT MORWANENG (KM 38.9)

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Document Status

Title	**THE PROPOSED UPGRADE OF NATIONAL ROAD R574 (DISTRICT ROAD D1547) SECTION 1 FROM R33 AT GROBLERSDAL (KM 0.0) TO THE R579 AT MORWANENG (KM 38.9)**
Author	**Dr Jenine Bothma**
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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 Road R574 (District Road D1547) Section 1 from the R33 at Groblersdal (Km 0.0) at the intersection of R579/R33 to the intersection of the R574/R579 at Morwaneng (Km 38.9). This project consists of a total length of approximately 38.9 km and is situated in the province of Limpopo within the Elias Motsoaledi Local Municipality and the Sekhukhune District 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 (km 0.0)	25°	08'48.71"	29°	26'15.11"
• Middle point of the activity (km 19.5)	25°	00'56.25"	29°	33'05.93"
• End point of the activity (km 87.4)	25°	00'33.28"	29°	44'38.64"

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 Road R574 (District Road D1547) Section 1 from the R33 at Groblersdal (Km 0.0) to the R579 at Morwaneng (Km 38.9)) in the Limpopo Province. The scope of works will include the following:

- Widening of the existing road cross section to a new single and dual carriageway cross-section,
- Vertical and horizontal geometric improvements,
- Vertical and horizontal realignments,
- Improvements of minor and major intersections.
- Widening of river bridges and major and minor culverts,
- Clearing of vegetation outside road reserve for stockpile areas.

The traffic accommodation will be implemented in phases as follows:

Phase 1: Widen the outer edge on the Southbound portion of the carriageway with final earthworks and temporary layer works while accommodating traffic on the existing carriageway.
Phase 2: Divert and accommodate traffic on the Southbound portion of the carriageway. Rehabilitate the existing carriageway and construct the new widenings on the Northbound portion of the carriageway.
Phase 3: Divert and accommodate traffic on the completed Northbound carriageway. Rehabilitate the existing carriageway and construct the new widenings on the southbound portion of the carriageway.
Phase 4: Open both carriageways to traffic.

3.1 Technical Details

The R574 is currently a single carriageway which consists of one lane in each direction from km0.0 to km38.8. The road generally consists of two 3.7m lanes and 2 x 2.5m gravel shoulders. There is also some sections which have a paved shoulder varying from 0.3m to 0.5m. There is an existing climbing lane northbound between km6.9 to km10.1. The width of the lane is ± 3.7m. The road has a camber and is generally 2 %.

The road generally consists of three typical cross-sections:

Cross-section 1 (km 0 to km 6.9)
• 2 x 3,7m lanes,
• 2 x 2.5m gravel shoulders, (varying from 2m to 2,5m),
• Camber 2%.

Cross-section 2 (km 6.9 to km 10.1)
• 2 x 3,5m lanes (climbing),
• 1 x 3,5m lane
• 1 x 0.5m paved edge, (varying from 0.3m to 0.5m)
• Rock wall protection works 0.7m high
• Camber 2%,
• Earth lined box drain in cut condition ±2m.

Cross-section 3 (km 10.1 to km 38.8)
• 2 x 3,7m lanes,
• 2 x 2m gravel shoulder, (varying from 1.5m to 2m),
• 2 x 0.5m paved edge, (varying from 0.3m to 0.5m)
• Camber 2%.

There are a number of gravel and paved intersections along the route. There are 17 major intersections which consists of 2 x 3,5m lanes, and mountable/semi mountable kerb and channel combinations. Painted refuge islands are located at km6.2, km10.2 and km15.6. Limited Taxi lay-byes and pedestrian crossings have been observed at intersections. All intersections are stop controlled. A new gravel intersection has been constructed by Roads Agency Limpopo at km24.0 (D4311-D4310).

It is proposed to upgrade the road to the following:

- km 0.0 – km 1.0: Dual carriageway with 2 x 3.5m lane per direction, a 2.8m median and shoulders, and walkways where required.
  km 1.0 – km 6.9: Dual carriageway with 2 x 3.5m lanes per direction, a 2.8m median and a 2.5 m walkway where required and an unsurfaced shoulder on the opposite side.
- km 6.9 – km 10.1: Dual carriageway with 2 x 3.5m lanes per direction, a 2.8m median and a 2.5 m walkway where required.

- km 10.1 – km 18.2: Dual carriageway with 2 x 3.5m lanes per direction, a 2.0m median and a 2.5 m walkway on either side where required.
- km 18.2 – km 21.9: Dual carriageway with 2 x 3.5m lanes (lane + climbing lane) and a 2.5m walkway on either side where required, a 2.0 median and a 3.7 m lane and a 1.5 m surfaced shoulder on the opposite carriageway.
- km 21.9 – km 33.4: Dual carriageway with 1 x 3.7m lane per direction, 1.5m surfaced outer shoulders either side, a 2.0m median and 2.5m walkway either side.
- km 33.4 – km 34.2: Dual carriageway on one side with 2 x 3.5m lane in one direction and a 2.5 m walkway, a 2.0 m median, a 1 x 3.7m lane and 1.5 m shoulder on the opposite carriageway.
- km 34.2 – km 34.4: Dual carriageway with 2 x 3.5m lanes per direction, a 2.0m median and 2.5m walkway on either side.
- km 34.4 – km 37.85: Dual carriageway with 2 x 3.5m lanes (lane + climbing lane) and a 2.5m walkway where required, a 2.0 median and a 3.7 m lane with a 1.5 m surfaced shoulder on the opposite carriageway.
- km 37.85 – km 38.80: Dual carriageway with 1 x 3.7m lane per direction, a 2.0m median and 1.5 outer shoulders and 2.5 m walkways on both sides.

No new bridge or culvert structures will be required on the project. The project road currently has two bridges and four major culverts and several smaller culverts. Based on the upgrading proposals, two bridges, eight major culverts, eighteen lesser culverts, and forty-eight nominal culverts were to be engineered. The following existing structures will either be demolished and replaced or upgraded on the project:

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	Area outside road reserve m^2
B3187	Bloed River Bridge	Retained and Widened	0.99	39.9
C9561	Rulokwane River Culvert	Retained and Widened	6.075	55.73
C9061	Rulokwane River Culvert	Retained and Widened	12.42	232.11
C9062	Rulokwane River culvert	Retained, widened and rehabilitated	12.45	513.3
C9563	Puleng River Culvert	Retained and widened	17.2	55.00
C9063	Ramogwerane River culvert	Retained and the end structures raised	20.20	404.47

Existing Bridge / Major Culvert Nr	Bridge / Culvert Name	Action Required at Existing Structure	Section and km Distance	Area outside road reserve m^2
B261	Gamakatle River bridge	Retained, widened, provided with new end structures and rehabilitated	26.26	3.5
B262	Gemsbokspruit Tributary culvert	Replaced by a new Major Culvert	31.78	50
C9064	Gemsbokspruit River culvert	Retained, widened, the end structures raised and rehabilitated	34.2	2267.01

The following table provides a list of the intersections that will be required on the project:

Table 2: Intersections required

Intersection Nr.	Type	KM
1	Leeuwfontein	2.60
2	Motetema	6.20
3	Unknow	6.5
4	Tafelkop	10.2
5	Entrance	13.0
6	Access	15.6
7	Access	19.7
8	Access	21.00
9	Access	23.6
10	High School	23.8
11	Legolaneng	24.00
12	Caltex	24.4
13	Access	25.6
14	Access	27.3
15	Access	28.08
16	Ga-Phadi	31.00
17	Access	36.9

The water uses (crossing streams/rivers or within 500m of a wetland) will be applied for at the Department of Water and Sanitation in accordance with the National Water Act, (Act No. 36 of 1998).

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 3: 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 4: 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
10	Locate spoil disposal sites

No	CONSTRUCTION ACTIVITIES
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 5: Listed activities applicable to project

<table>
<tr><th>Listed activity triggered</th><th>Reason</th></tr>
<tr><td>GN R. 983, Item 12 (as amended):

The development of
ii). infrastructure of structures with a physical footprint of 100 square metres or more;</td><td>The following structures extend beyond the current road reserve:
<table>
<tr><th>Km Distance</th><th>Structure Nr.</th><th>Latitude</th><th>Longitude</th><th>Area beyond existing road reserve (m²)</th></tr>
<tr><td>0.99</td><td>B3187</td><td>25°08'18.49"S</td><td>29°26'15.95"E</td><td>39.9</td></tr>
<tr><td>6.075</td><td>C9561</td><td>25°3'29.81"S</td><td>29°30'20.35"E</td><td>55.73</td></tr>
<tr><td>12.42</td><td>C9061</td><td>25°08'30.27"S</td><td>29°30'19.11"E</td><td>232.1</td></tr>
<tr><td>12.45</td><td>C9062</td><td>25°08'30.27"S</td><td>29°30'19.11"E</td><td>513.3</td></tr>
<tr><td>17.2</td><td>C9563</td><td>25°0'44.63"S</td><td>29°33'38.96"E</td><td>55.0</td></tr>
<tr><td>20.20</td><td>C9063</td><td>25°00'44.43"S</td><td>29°33'27.95"E</td><td>404.47</td></tr>
<tr><td>26.26</td><td>B261</td><td>25°00'41.43"S</td><td>29°37'14.01"E</td><td>3.50</td></tr>
<tr><td>31.86</td><td>B262</td><td>25°00'31.86"S</td><td>29°40'30.96"E</td><td>50.0</td></tr>
<tr><td>34.20</td><td>C9064</td><td>25°00'19.04"S</td><td>29°41'58.72"E</td><td>2267.0</td></tr>
</table></td></tr>
<tr><td>GN R. 983, Item 19 (as amended):

The infilling or depositing of any material of more than 10 cubic</td><td>The material that will be required for infilling or depositing will be more than 10 m^2 for the project.</td></tr>
</table>

<table>
<tr><td>metres into, or removal or moving of soil from a watercourse.</td><td></td></tr>
<tr><td>GN R. 983, as amended in GN R. 327: Item 24 (as amended)

The development of a road
(ii) with a reserve wider that 13.5 m or where no reserve exists where the road is wider than 8 m</td><td>The road reserve varies between 40m to 84m and the road will be widened by 21.8m.</td></tr>
<tr><td>GN R. 983, as amended in GN R. 327: Item 31 (as amended)

The decommissioning of existing facilities, structures or infrastructure for
(i) Any development and related operation activity or activities listed in this Notice</td><td>The following structures will be demolished and replaced:
<table>
<tr><th>Structure Nr</th><th>Name</th><th>Action</th><th>km</th></tr>
<tr><td>NC1</td><td>Unknown</td><td>Structure to be demolished and replaced</td><td>60.535</td></tr>
<tr><td>B2490</td><td>Tributary to Sandspruit 1 Bridge</td><td>Structure to be demolished and replaced</td><td>61.520</td></tr>
<tr><td>B2489</td><td>Sandspruit Tributary Bridge</td><td>Structure to be demolished and replaced</td><td>61.820</td></tr>
<tr><td>B1421</td><td>River Bridge</td><td>Structure upgraded</td><td>62.970</td></tr>
<tr><td>B2488</td><td>Sand River Bridge</td><td>Structure to be demolished and replaced</td><td>64.390</td></tr>
<tr><td>C03</td><td>Tributary Sandspruit 3 Culvert</td><td>Structure to be extended to accommodate new road cross section</td><td>66.503</td></tr>
<tr><td>B2479</td><td>Vaal River Bridge</td><td>Structure to be demolished and replaced</td><td>78.840</td></tr>
</table></td></tr>
</table>

<table>
<tr><td></td><td>
<table>
<tr><td>B2478</td><td>Witpunt River Bridge</td><td>Structure to be demolished and replaced</td><td>87.240</td></tr>
</table>
</td></tr>
<tr><td>GN R. 983, as amended in GN R. 327: Item 48 (as amended)

The expansion of infrastructure or structures where the physical footprint is expanded by 100 sq m or more
(a) Inside a watercourse</td><td>The following structures will be expanded by more than 100sq m:
<table>
<tr><th>Km Distance</th><th>Structure Nr.</th><th>Latitude</th><th>Longitude</th><th>Area beyond existing road reserve (m²)</th></tr>
<tr><td>58.41</td><td>C04</td><td>26°43'57.35"S</td><td>30°18'0.71"E</td><td>TBC*</td></tr>
<tr><td>60.50</td><td>NC01</td><td>26°43'53.26"S</td><td>30°16'53.23"E</td><td>138.109</td></tr>
<tr><td>61.57</td><td>B2490</td><td>26°43'52.66"S</td><td>30°16'13.32"E</td><td>350.897</td></tr>
<tr><td>61.73</td><td>B2489</td><td>26°43'52.52"S</td><td>30°16'2.74"E</td><td>523.344</td></tr>
<tr><td>62.96</td><td>B1421</td><td>26°43'51.89"S</td><td>30°15'20.79"E</td><td>875.427</td></tr>
<tr><td>64.36</td><td>B2488</td><td>26°44'0.90"S</td><td>30°14'31.29"E</td><td>538.458</td></tr>
<tr><td>66.49</td><td>C03</td><td>26°43'52.93"S</td><td>30°13'15.59"E</td><td>111.382</td></tr>
<tr><td>78.82</td><td>B2479</td><td>26°38'53.71"S</td><td>30° 9'4.32"E</td><td>1033.593</td></tr>
<tr><td>83.94</td><td>CC01</td><td>26°36'40.37"S</td><td>30° 7'22.72"E</td><td>42.460</td></tr>
</table>
</td></tr>
<tr><td>GN R. 983, Item 56 (as amended):

The widening of a road by more than 6 m where the existing reserve is wider than 13.5 m</td><td>The road reserve varies between 40m to 84m and the road will be widened by 21.8m.</td></tr>
</table>

5. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

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

Table 6: 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 Environment al Affairs	4 December 2014
Department of Environmental Affairs Departmental Guidelines	Guidance with regard to the execution of the Environmental Impact	Department of Environmental Affairs	2010

Title of legislation, policy or guideline	Applicability to the project	Administering authority	Date
under www.environment.gov.za	Assessment process		
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	1998
National Environmental Management: Biodiversity Act (Act No. 10 of 2004) Red data and protected species listed.	Ecological study Red data and protected species listed in the Act will need to be assessed	Department of Agriculture, Forestry and Fisheries (permit application, if necessary)	2004
The National Water Act (Act No. 36 of 1998) for water uses as defined in section 21 (c) and section 21 (i). The application for a General Authorisation or Water Use License (WUL) in terms of the National Water Act, 1998.	Aquatic Study Stream crossings and application of a general authorization or WUL at the Department of Water and Sanitation	Department of Water and Sanitation	2016

Title of legislation, policy or guideline	Applicability to the project	Administering authority	Date
National Heritage Resource Act 1999 (Act No. 25 of 1999) and **KwaZulu-Natal Heritage Act (Act 4 of 2008) Standards and Regulations** **South African Heritage Resources Agency (SAHRA) Minimum Standards;** **Association of Southern African Professional Archaeologists (ASAPA) Constitution and Code of Ethics;** **Anthropological Association of Southern Africa Constitution and Code of Ethics.** **International Best Practise and Guidelines** **ICOMOS Standards (Guidance on Heritage Impact Assessments for Cultural World Heritage Properties); and** **The UNESCO Convention** In terms of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) comment will be obtained from SAHRA. Permits will be obtained if necessary. Concerning the Protection of the World Cultural and Natural Heritage (1972).	Construction of road, or other linear form of development or barrier exceeding 300m in length Construction of bridge or similar structure exceeding 50m in length Development exceeding 5000 sq m required approval from SAHRA. Heritage and Palaeontological study	South African Heritage Resources Agency (SAHRA)	1999

Title of legislation, policy or guideline	Applicability to the project	Administering authority	Date
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
The Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983).	Land capability and Agricultural Potential Study	Department of Agriculture	1983
Disaster Management Act, 2002 (Act 57 of 2002)	Directions issued for PPP	DAFF	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 R574 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 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 R574 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 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 R574 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 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 R574 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 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 R574 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 x	Please explain
The approval of this application will not compromise the integrity of the existing environmental management priorities for the area and it can it 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 R574 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 R574 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 R574 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 x	NO	Please explain
The upgrade of the R574/34 is part of the wider R574 corridor upgrades between the KZN border and Camden which in turn forms part of the strategic route upgrades between Gauteng and Richards Bay and Durban harbours.			

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 x	NO	Please explain
The R574 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 x	NO	Please explain
The upgrade of the R574 will be conducted within the R574 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 x	NO	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 R574 is not upgraded with associated loss of lives. The R574 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	NO x	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 R574 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	NO x	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	NO x	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 R574 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	NO x	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

The upgrade of the R574 offer several benefits to society in general, including:

- Decrease accidents due to decreasing possibility of head-on collisions;
- Safer driving conditions for the road users as the road 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.

The following community involvement goals will form part of the construction works:

- Minimum of 30% of the Final Contract Value by the end of the contract to Targeted Enterprises in the form of subcontracting works;
- Minimum of 8% of the Final Contract Value by the end of the contract to Targeted Labour; and
- An amount still to be determined will also be allocated for a Community Development (CD) type project within the main contract. The CD component to be executed by CIDB 1 to 4 Targeted Enterprise contractors, utilising labour enhanced construction methods.

16. Any other need and desirability considerations related to the proposed activity?	Please explain

- 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

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 R574 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.

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 R574 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 R574;

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 and the Directions regarding measures to address, prevent and combat the spread of COVID-19 relating to National Environmental Management Permits and Licenses dated 05 June 2020.

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 Sekhukhune Times of 17 June 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 and at the Groblersdal public Library on 11 June 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 Elias Motsoaledi Local Municipality and the Sekhukhune 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 7: 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.
AFFECTED PARTIES				
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 R574 road reserve	No comments received	No issues raised	No response necessary	None required
Landowners or Lawful Occupiers on Adjacent Properties				
Mr Sam Moloko Bakone Batubatse Tribal Authority	23 August 2021	Any projects and developments that is taking place to our constituency is as the legal entity, we are obliged to provide our inputs for the good running of that process. Doing this, we are admonished by the Constitution of our country Government plan action include	Thank you for the comments submitted on 23 August 2021. Chameleon Environmental was appointed to undertake the environmental studies for the project only. A Basic Assessment is undertaken for the project that will be submitted to the National Department of Forestry, Fisheries	None required.

		the integrated development plan. The provision permits society to participate in food faith and be given a platform by those stakeholders in charge to provide those services as stipulated by the Business Act of our country. Our inputs are driven by the following exercise inside: • We got full people that are registered with the Department of Trade and Industry; • The company and civil constitution are run by well experienced business minded people. • All the company workers are skilled workers, qualified qualified officials and with qualifications to some positions. • Some of the company have their own employed consultants. • The company has a good record in the field of civil and construction. • In terms of grades we are a good company that have level 4,6,7,8 and 9 at this post in terms of our data system. • Our proposal sustainability is driven by the State facts and aspects. We are also prepared to meet with you	and the Environment (DFFE) for authorisation. The project will be put out to tender once the authorisation is received from DFFE. You need to consult the SANRAL website (www.nra.co.za) for the tender and tender process. Any enquiries regarding the tender or employment opportunities should be directed to the applicant (SANRAL).	

		for more discussion. • The proposal is mainly for the road from Groblersdal to Nebo.		
Municipal Councillors				
Cllr Mokwane Magdeline Kubane Ward 27	No comments received	No issues raised	No response necessary	None required.
Cllr Mokganyetji Thomas Mareme Ward 24	No comments received	No issues raised	No response necessary	None required.
Cllr Malatji Meriam Nape Ward 29	No comments received	No issues raised	No response necessary	None required.
Cllr Msiza Mothibe Rhodes Ward 29	No comments received	No issues raised	No response necessary	None required.
Municipality				
Mr Meshack Kgwale Municipal Manager Elias Motsoaledi Local Municipality	No comments received	No issues raised	No response necessary	None required
Ms Maureen Ntshudisane Municipal Manager Sekhukhune District Municipality	No comments received	No issues raised	No response necessary	None required
Organs of State				
Mr Vusi Maluleke Department of Economic Development, Environment and Tourism	No comments received	No issues raised	No response necessary	None required
Ms Ramatsimele Jacqueline Maisela Head of Department Limpopo Department of Agriculture	No comments	No issues raised	No response necessary	None required

	received			
Mr Dawid Nethengwe (Water Licenses) Department of Water and Sanitation	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
Services				
Mr Fana Hlathi Manager Head Planner for JHB Liquid Telekoms	09 February 2022	Liquid Services are not affected by this project.	Thanks for letting us know.	None required.
Communities				
Mr Sam Moloko Bakone Batubatse Tribal Authority	23 August 2021	Any projects and developments that is taking place to our constituency is as the legal entity, we are obliged to provide our inputs for the good running of that process. Doing this, we are admonished by the Constitution of our country Government plan action include the integrated development plan. The provision permits society to participate in food faith and be given a platform by those stakeholders in charge to provide those services as stipulated by the Business Act of our country. Our inputs are driven by the following exercise inside: • We got full people that are	Thank you for the comments submitted on 23 August 2021. Chameleon Environmental was appointed to undertake the environmental studies for the project only. A Basic Assessment is undertaken for the project that will be submitted to the National Department of Forestry, Fisheries and the Environment (DFFE) for authorisation. The project will be put out to tender once the authorisation is received from DFFE. You need to consult the SANRAL website (www.nra.co.za) for the tender and tender process. Any enquiries regarding the tender or employment opportunities should	None required.

		registered with the Department of Trade and Industry; • The company and civil constitution are run by well experienced business minded people. • All the company workers are skilled workers, qualified qualified officials and with qualifications to some positions. • Some of the company have their own employed consultants. • The company has a good record in the field of civil and construction. • In terms of grades we are a good company that have level 4,6,7,8 and 9 at this post in terms of our data system. • Our proposal sustainability is driven by the State facts and aspects. We are also prepared to meet with you for more discussion. • The proposal is mainly for the road from Groblersdal to Nebo.	be directed to the applicant (SANRAL).	

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 that of undulating plains and hills. The lowest point along the R574 is at Bloed River, near the start of the study site, at an elevation above average sea level of 915m. From the start of the route at KM 0,0 the road continues to climb ever higher, while undulating up and down small hills and eventually onto a large plateau. The highest point is at Morwaneng, at the end of the route, where the elevation is about 1 632m. The average slope across the study site is approximately 3,4% (Flori Scientific Services, 2022).

b. Climate

The study site is situated within the summer rainfall region of South Africa and within the medium rainfall region of 401 mm to 600 mm per annum. The average annual rainfall for the nearby Town of Groblersdal is approximately 497 mm (en.climate-data.org). The average annual rainfall across the Sekhukhune District Municipality is typically below 600 mm. Sekhukhune district is characterised by relatively poor and unreliable rainfall, frequent droughts and periodic flooding (www.researchgate.net).

The climate is warm to hot during the summer months, with some days becoming very hot, while temperatures are typically moderate to cold, but seldom very cold, in winter. The warm summers are long, while the winters are usually short, dry and with mostly clear skies. There are always winter days of colder temperatures with light frost in the early morning hours, especially in the low lying areas around streams and between mountains. The study site is situated within the Temperate Interior Climatic Zone of South Africa, but close to the outer edge of the Cold Interior (Flori Scientific Services, 2022).

c. Land cover

The landuse or landcover of the study site is that of an existing hard surface asphalt road (R574), along with the road reserve. The landcover of the greater area in which the study site is situated is that of open bushveld, commercial farmlands, small plots of subsistence farming and scattered rural villages / townships. The biggest landuse or landcover across the area is that of large and medium sized villages / townships that have tended to extend and merge into each other (Flori Scientific Services, 2022).

d. Vegetation

South Africa is divided up into nine major Biomes. The study site and the surrounding area are within the Savanna Biome and the Grassland Biome. The Savanna (Bushveld) Biome is

typically characterised by a lower layer of grasses, middle layer of shrubs and an upper layer of trees, while the Grassland Biome is characterised by the mostly absent upper layer of trees and scattered middle layer of shrubs, except in rocky areas or rocky outcrops (koppies).

Mucina & Rutherford (2010) divided the Savanna Biome (Bushveld Biome) into six bioregions, namely: Central Bushveld, Mopane, Lowveld, Sub-Escarpment Savanna, Eastern Kalahari Bushveld; and Kalahari Duneveld. The Grassland Biome is divided into four bioregions, namely: Drakensberg Grassland, Dry Highveld Grassland, Mesic Highveld Grassland, and Sub-Escarpment Grassland.

The eastern and middle sections of the study site (about 2/3) are within the Central Bushveld Bioregion of the Savanna Biome and the eastern section (about 1/3) is in the Mesic Highveld Grassalnd Bioregion of the Grassland Biome. Within these bioregoins the study site (R574) is within the original extent of the veldtypes of Central Sandy Bushveld, Loskop Thornveld and Rand Highveld Grassland (Flori Scientific Services, 2022).

Table 8: Vegetation classification of the study site (Flori Scientific Services, 2022)

Category Description	Classification
Biome	Savanna & Grassland
Bioregion	Central Bushveld & Mesic Highveld Grassland
Veldtype	Central Sandy Bushveld, Loskop Thornveld & Rand Highveld Grassland
Status	Central Sandy Bushveld – Least Concern / Least Threatened Loskop Thornveld – Least Concern / Least Threatened Rand Highveld Grassland - Vulnerable

Central Sandy Bushveld is characterised by low undulating areas, sometimes between mountains, and sandy plains and catenas supporting tall, deciduous *Terminalia sericea* and *Burkea africana* woodland on deep sandy soils (with the former often dominant on the lower slopes of sandy catenas) and low, broad-leaved *Combretum* woodland on shallow rocky or gravelly soils. Species of Vachellia (*Acacia*), *Ziziphus* and *Euclea* are found on flats and lower slopes on eutrophic sands and some less sandy soils. *Vachellia* (*Acacia*) *tortilis* may dominate some areas along valleys. Grass-dominated herbaceous layer with relatively low basal cover is found on dystrophic sands (Mucina & Rutherford, 2010).

Loskop Thornveld is characterised by valleys and plains of parts of the upper Olifants River catchment. The veldtype tends to be open, deciduous to semi-deciduous, tall, thorny woodland, usually dominated by thorn trees (Vachellia / *Acacia*) species (Mucina & Rutherford, 2010).

Rand Highveld Grassland is characterised by highly variable landscape with extensive sloping plains and a series of ridges slightly elevated over undulating surrounding plains. The vegetation is species-rich, wiry, sour grassland alternating with low, sour shrubland on rocky outcrops and steeper slopes. Most common grasses on the plains belong to the genera *Themeda*, *Eragrostis*, *Heteropogon* and *Elionurus*. High diversity of herbs, many of

which belong to the Asteraceae, is also a typical feature. Rocky hills and ridges carry sparse (savannoid) woodlands with *Protea caffra* subsp. *caffra*, *Protea welwitschii*, *Vachellia* (=*Acacia*) *caffra* and *Celtis africana*, accompanied by a rich suite of shrubs among which the genus *Searsia* (especially *Searsia (=Rhus*) *magalismonata*) is most prominent (Flori Scientific Services, 2022).

e. Vegetation of the study area

The vegetation of the study site is mostly transformed and highly degraded. The vegetation present in the study site is within the road reserve and consists mainly of grasses and a few forbs. The road reserve is routinely cut and burnt thereby altering and degrading the natural vegetation. Most of the study site runs through villages and townships where the natural environment has been totally transformed and highly degraded.
There are no areas of pristine vegetation present within the study site itself. The areas of good vegetation are confined to patches and are typically not within the study site itself, but in nearby fields, or on nearby hills (Flori Scientific Services, 2022).

g. Priority Floral Species

No Red Data Listed (RDL) species (endangered, threatened or vulnerable) were observed during field investigations in the study area (Flori Scientific Services, 2022).

h. Protected Species

Only one protected tree, namely the Marula (*Sclerocarya birrea*), was found to be present within the study site. There are a few scattered trees along the road in the road reserve (Flori Scientific Services, 2022).

i. Fauna

No large- or medium-sized mammals were observed during field investigations. A few small burrows were found occasional within the road reserve, which appear to be used by small field mice and other rodents such as rock mouse (*Aethomys namaquensis*), striped mouse (*Rhabdomys pumilio*), multimate mouse (*Mastomus natalensis*) and bushveld gerbil (*Tatera leucogaster*). In open, less populated areas outside of the study area some evidence was found of scrub hare (*Lepus sacatilis*) and possibly yellow mongoose (*Cynictis penicillata*). There are many common species of wild animals and mammals present in the area of the greater Sekhukhune District, and many more with a historical distribution in the area, but these are more and more restricted to less accessible areas such as mountains, rocky ravines, etc. The study site is within a mostly densely populated area with numerous settlements and villages where the presence of large and medium sized mammals are scarce (Flori Scientific Services, 2022).

j. Watercourses

There are eight main watercourses (rivers or streams) that the study site (R574) crosses over. Starting from KM 0,0, near Groblersdal these are: Bloed, Rulokwane, Puleng, Puleng

tributary, Ga-Makatle, Gemsbokspruit tributary, Gemsbokspruit and Malekani. In general the watercourses in the study area (those that are crossed) are all small, mostly semi-perennial / intermittent streams and seasonal drainage lines. The crossings are also small and narrow with only two actual bridges crossings over the Bloed River and Ga-Makatle River. The streams have no distinctive riparian zones or vegetation, except for the Bloed River, which only has a narrow zone of a few metres wide.

The only wetlands present in the study site are valley bottom or floodplain wetlands associated with the eight small rivers and streams already mentioned. There are no large or distinctive 'stand alone' wetlands in the study area such as pans, valley bottom wetlands without mainstream channels, etc. The national wetland map only shows one valley bottom wetland associated with the Gemsbokspruit (Flori Scientific Services, 2022).

k. Air Quality

The project occurs in rural areas and the air quality is considered good apart from the air pollution that emanates from the R574.

l. Noise

The current noise levels are high due to the presence of heavy traffic on the R574.

m. Visual

The countryside through which the R574 road passes is largely one of rural agriculture on an undulating landscape. The widening of the road will have little visual effect as the existing road will be widened.

n. Sites of Archaeological and Cultural Interests

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

o. 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.

p. Sensitive Landscapes

There are eight main watercourses (rivers or streams) that the study site (R574) crosses over. Starting from KM 0,0, near Groblersdal these are: Bloed river, Rulokwane, Puleng, Puleng tributary, Ga-Makatle, Gemsbokspruit tributary, Gemsbokspruit and Malekani
Please find a sensitivity plan included in Appendix B.

q. 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.

8. Possible Project Benefits

8.1 Economic Benefits

a. Short term Employment Creation

New employment opportunities will be created during the construction of the road. This includes much needed employment for existing industry, i.e. contractors (especially local Small, Medium and Micro Enterprises from the previously disadvantaged communities), consultants and suppliers.

The construction of the road could take place over several years, requiring a potentially large workforce and possible employment opportunities could be created in the project area. The benefits to the local community from employment could be dependent on the extent of local recruitment.

During the operational phase, the roads project could improve the well-being of populations in the area, and potentially improve the economy as a result of improved transport infrastructure.

b. Long Term Employment Creation

Sustainable employment opportunities will be created for industry (contractors, consultants) during operation and maintenance of the road. Periodic upgrading, maintenance and rehabilitation of the road will be conducted over the next 20 years.

c. Enhance Tourism

The road could enhance tourism through improved accessibility and a continuous route offering an improved, safer road for all road-users.

8.2 Social Benefits

a. Employment

The road could provide long and short term employment opportunities, especially employment for industry. The development could provide employment to unskilled labour in both road and associated developments especially local Small, Medium and Micro Enterprises from the previously disadvantaged communities.

b. Improve Safety

The possibility of head-on collisions will be lowered with the upgrade of the road which will be much safer for all road users, especially heavy vehicles.

c. Skills Development

With the construction of the road, skills development could occur with practical training in management and technical skills. This could also include unskilled labour training and the use of small and medium enterprises.

8.3 Transport Benefits

a. Improved Accessibility:

Improved road networks could encourage business, industry and investment for South Africa and assist in alleviating the high unemployment in the region as a whole.

b. Relieve Traffic Congestion

Traffic congestion occurs in the pass as a result of queueing of heavy vehicles. The upgrade would alleviate these issues.

9. Possible 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 9: 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 trees	Yes	No	Mitigated
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

9.1 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 = (magnitude (M) + duration (D) + scale(S)) x probability (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 ≤ 30 indicates low environmental significance.

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

9.2 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 10: 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	**Construction Phase**: Vegetation, stripping, stripping and stockpiling of topsoil, subsoil, overburden and spoil **Operational Phase:** Excavations, Stockpiling and Transporting of gravel material **Decommissioning Phase:** Sloping and Landscaping during rehabilitation, Replacing the topsoil and revegetating the disturbed area	6	2	2	4	40	M	• 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.	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	SP
								• Should a vehicle have a break down, it will be serviced immediately.						
SOIL EROSION														
Possible soil erosion	**Construction Phase**: Vegetation, stripping, stripping and stockpiling of topsoil, subsoil, overburden and spoil **Operational Phase:** Excavations, Stockpiling and Transporting of gravel material **Decommissioning Phase:** Sloping and Landscaping during rehabilitation, Replacing the topsoil and revegetating the disturbed area	4	2	2	2	16	L	• 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	SP
								mitigated through the creation of runoff channels.						
NOISE														
Possible Noise Impact	**Construction Phase**: Vegetation, stripping, stripping and stockpiling of topsoil, subsoil, overburden and spoil **Operational Phase:** Excavations, Stockpiling and Transporting of gravel material **Decommissioning Phase:** Sloping and Landscaping during rehabilitation, Replacing the topsoil and revegetating the disturbed area	6	2	2	5	50	M	• 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	SP
VISUAL														
Possible visual impacts	**Construction Phase**: Vegetation, stripping, stripping and stockpiling of topsoil, subsoil, overburden and spoil **Operational Phase:** Excavations, Stockpiling and Transporting of gravel material **Decommissioning Phase:** Sloping and Landscaping during rehabilitation, Replacing the topsoil and revegetating the disturbed area	2	2	2	3	18	L	• 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
								• 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 watercourses and terrestrial ecology	**Construction Phase**: Vegetation, stripping, stripping and stockpiling of topsoil, subsoil, overburden and spoil **Operational Phase:** Excavations, Stockpiling and Transporting of gravel material **Decommissioning Phase:** Sloping	6	2	2	4	40	M	• No watercourses (streams, drainage lines, rivers) may be impeded or impounded during the construction phase or at any stage of the project. • Work at watercourse crossings and on stormwater culverts should preferably be carried out during the dry, winter season when water flow is at its lowest or non-existent. • The main flow of watercourses at	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							crossings must not be altered or rerouted during the construction phase. • Preferably any major upgrades and construction of water crossings, and stormwater culverts should be done during the dry, winter period when water flow is at its' lowest. • Erosion and potential siltation of watercourses must be monitored at all times during the construction phase of the project. • Any temporary storage, lay-down areas or accommodation facilities to be setup in existing disturbed areas only. • Ensure small footprint during construction phase. • 32m Buffer zones, from the edge of the banks of all watercourses need to be implemented. These are 'No-Go' zones in terms movement of vehicles and contractors. The only areas of exception are the work areas and footprints at the road crossings of watercourses. • No temporary site offices or lay-down areas are allowed within 50m of the						

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
								edge of any watercourses. • No temporary site offices or lay-down areas are allowed on top of any rocky hills or along any steep hill slopes. All laydown areas must be on flat, plains / surfaces and must be within disturbed areas as far as possible. No areas of trees may be specifically cleared for a laydown area or temporary office site. • All hazardous materials must be stored appropriately to prevent these contaminants from entering the water environment; • All excess materials brought onto site for construction must be removed after construction. • No open trenches or mounds of soils to be left. • A rehabilitation plan for disturbed areas to be compiled and implemented as part of the construction phase of the project. This includes access roads and temporary laydown / site office areas. • There are a few marula trees within the road reserve. These are protected trees and a permit will be required if any need to be removed. However, it						

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
								seems unlikely that any will need to be removed. • A General Authorisation (GA) process will be required for work on the stream crossings. • There are a few protected trees (Marulas) within the study area. All efforts must be made to avoid these trees, along with other any other large, well-established trees. • The study site is within a transformed and degraded environment and therefore impact on natural vegetation will be low. • Any priority species encountered must be identified and rescue prior to any excavation or construction activities. However, it is unlikely that any are present within the study site or the road and road reserve. • A weed control programme should be implemented. This can form part of the routine maintenance programme for the road. • Care must be taken not to interact directly with any wild life encountered. • Any bird nests encountered in the grass, trees or on the ceilings of						

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
								culverts must not be interfered with. If encountered must first be discussed with specialist as how best to proceed. This also applies to any active animal burrows encountered. • Care must be taken with heavy machinery used on the project. All access roads used during construction must be monitored for erosion and maintained. • Soils and stones excavated may be used on site as backfill, fixing of roads, filling of dongas, etc. • Excavated soils and rocks may not be simply dumped in any open veld or even on site. • All temporary access roads, laydown areas, temporary camps, site offices, etc. must be fully rehabilitated by the contractors prior to final signing off of the construction phase of the project. Maintenance phase (to be implemented in defect liability period for 1 year) • Mechanical control of alien plants around disturbed areas to be implemented within three months of completion of construction. Thereafter						

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
								every six months. Mechanical control to be of such a nature as to allow local, indigenous grasses and other pioneers to colonise the previously disturbed areas, thereby keeping out alien invasives. • No chemical control (herbicides) of alien plants to be used within 100m of any watercourses. • Areas around foundations, culverts, gabions, etc. need to be check before and after the summer rainy season for signs of soil erosion due to stormwater run-off. Such sites need to be modified and rehabilitated to prevent ongoing erosion. These sites need to be monitored more closely than other sites which show no or minimal signs of erosion. • Inspection of road shoulders in areas of steep topography to be inspected after the summer rainy season for signs of erosion and rehabilitated and rectified as required.						
HYDROCARBON SPILLAGES														

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
Hydrocarbon spillage	**Construction Phase**: Vegetation, stripping, stripping and stockpiling of topsoil, subsoil, overburden and spoil **Operational Phase:** Excavations, Stockpiling and Transporting of gravel material **Decommissioning Phase:** Sloping and Landscaping during rehabilitation, Replacing the topsoil and revegetating the disturbed area	6	3	2	3	27	L	• 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
ALIEN VEGETATION														
Possible alien vegetation infestation	**Construction Phase**: Vegetation, stripping, stripping and stockpiling of topsoil, subsoil, overburden and spoil **Operational Phase:** Excavations, Stockpiling and Transporting of gravel material	6	2	2	4	40	M	• 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

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
	Decommissioning Phase: Sloping and Landscaping during rehabilitation, Replacing the topsoil and revegetating the disturbed area													
SANITATION FACILITIES														
Provision and management of sanitation facilities	All phases	8	2	2	4	48	M	• 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	• 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	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
								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.						
SAFETY														
Safety of sloped areas and safety of employees	All phases – employees Decommissioning phase – sloped areas	6	5	1	5	60	H	• Appropriate safety clothing will be worn at all times i.e. head gear, shoes, ear plugs.	6	5	1	2	24	L

10. ALTERNATIVES CONSIDERED

Motivation for preferred site: The R574 is an existing road that will be upgraded and site alternatives are therefore, not relevant.

The alternatives that were investigated are different design alternatives for the proposed road.

a) Preferred design alternative

From km 0.0 – km 1.0: Dual carriageway with 2 x 3.5m lane per direction.

b) Design Alternative 1

From km 0.0 – km 1.0: Single carriageway with 1 x 3.7m lane per direction.

c) No-go Alternative

Should the project not proceed the traffic on the R574 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 R574 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.

10.1 Site Selection Matrix

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

Table 11: Site Selection Matrix

Criteria	**Preferred Design Alternative**	**Design Alternative 1**
Cost	R690 585 000	R694 924 000
Level of Service (LOS)	Dueling km0 – km1 improve the Level of Service (LOS) from LOS E to LOS A	No duelling of section and the LOS will remain at E.
Choking of traffic	Prevent choking of traffic between R33 and Bloed river bridge at km 1	Choking of traffic will continue
Internal Rate of Return (IRR)	21.6	21.5

10.2 Advantages and Disadvantages of Alternatives Considered

a. Preferred design alternative

From km 0.0 – km 1.0: Dual carriageway with 2 x 3.5m lane per direction.

Advantages

The advantages of the preferred alternative are the following:

- This is the most cost effective option.
- Duelling km0 – km1 improve the Level of Service (LOS) from LOS E to LOS A.
- Prevent choking of traffic between R33 and the Bloed river Bridge km1.
- No additional tapers required at the R33/R574 intersection.
- Future cost saving by constructing the portion of dual carriageway and Bloed river Bridge.
- The Internal Rate of Return for this option is 21,6.
- The safety to the traveling public will be significantly improved as the traffic will be flowing optimally.
- The road could be upgraded to acceptable horizontal and vertical geometric requirements.
- This option drastically lowers the possibilities of head-on collisions.
- It is anticipated that the traffic accidents that occur on this road will be reduced with this option.
- It is anticipated that the road 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 upgrade of the road will, therefore, ensure safer driving conditions for the traveling public by enabling vehicles to travel more efficiently and smoothly with less congestion.
- Improved traffic flow, particularly during peak periods.
- Reduced congestion is anticipated.
- The environmental impact of the upgrade of the road is deemed to be low.

Disadvantages

The disadvantages of this alternative are the following:

- Additional material will be required for this option, considering the implied pavement and fill widening. The existing sources currently being acquired will however be sufficient in size to address the additional material requirements. In some cases, borrow pit depth of excavation will be amended slightly.

b. Design Alternative 1

From km 0.0 – km 1.0: Single carriageway with 1 x 3.7m lane per direction.
Advantages

The advantages of this alternative are the following:

- Improved traffic flow, particularly during peak periods.
- Reduced congestion is anticipated.
- The environmental impact of the upgrade of the road is deemed to be low.

Disadvantages

The disadvantages of this alternative are the following:

- This is the most expensive option.
- The Level of Service (LOS) from will remain at a LOS E.
- The Internal Rate of Return for this option is 21,5 which is lower than the preferred alternative.
- No choking of traffic is prevented between R33 and the Bloed river Bridge km1.
- Additional tapers are required at the R33/R574 intersection,
- No future cost saving is anticipated with this option.
- The Internal Rate of Return for this option is 21,6.

10.3 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.

10.4 Socio-Economic Parameters

The value of the project is approximately R690 585 000 million. Employment opportunities that will accrue to previously disadvantaged individuals are the following:

a. A minimum of 30% of the Final Contract Value by the end of the contract will accrue to Targeted Enterprises;
b. A minimum of 8% of the Final Contract Value by the end of the contract will accrue to Targeted Labour; and
c. An amount still to be determined will also be allocated for a Community Development type project within the main contract. The Community Development component to be executed by CIDB 1 to 4 Targeted Enterprise contractors, utilising labour enhanced construction methods. A sub-target of 36% are to be black women owned sub-contractors and 36% are to be black youth owned sub-contractors (Note that a particular sub-contractor ownership may contribute to both the women and the youth

criteria. Hence, 36% black women – and 36% black youth ownership does not imply only 29% non-woman/non-youth ownership).

11. SUMMARY OF SPECIALIST REPORTS

Table 12: 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.
Terrestrial Ecological Assessment and Aquatic (Wetland) Assessment for the Improvement of National Route R574 km 0 to km 38 by Flori Scientific Services, 2022	The following are recommended: • The only biodiversity areas of 'high' sensitivity encountered within the study site are the larger watercourse crossings and a section near Motetema where the road goes up a slight rise and onto higher lying ground / plateau. This is in the area where the 'cutting' for widening of the road will need to take place. The area of the Gemsbokspruit (stream) and Mahtrombi Nature Reserve are shown as having animal and plant sensitivities of 'Medium'. This was verified as such during site investigations (ground-truthing). • There are no 'no-go zones' along the study site that might trigger a 'fatal flaw' in terms of the project brief and scope. • There are no 'high' sensitive habitats present on site. • No red data listed (RDL) fauna species were found to be present and / or	x	EMPr

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.
	breeding with the study area boundaries., but it is likely that a few might occasional move through the area. • Site investigations were conducted during the summer (wet) season of the region and the findings and availability of field data is sufficient to reached acceptable findings and outcomes from the assessment. • There are no obvious fatal flaws in terms of the natural environment. • Taking all findings and recommendations into account it is the reasonable opinion of the author / specialist that the activity may be authorised. The project and related activities may proceed to the next phase. **Recommendations** • Recommended mitigating measures as proposed in this study and report should be implemented if the findings of this report are to remain pertinent. • The only bufferzones required for the		

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.
	project are along the watercourses. Obviously work on crossings has to take place and this acceptable. However, a 32m buffer zone, from the edge of the stream banks should be implemented along all watercourses (upstream and downstream). No buffer zones are necessary in areas of normal stormwater culverts and pipes that are simply installed to prevent impeding and impounding general surface flow of rainfall. • A final walkdown is recommended in the area of the cutting to determine how many protected trees will be impacted. Thereafter a tree permit / plant permit application will be required to obtain permission.		
Phase 1 Cultural Heritage Impact Assessment: The Improvement of National Route R574 by Dr J van Schalkwyk, 2021	• 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	X (all were included)	EMPr

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.
	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.		

12. ENVIRONMENTAL IMPACT STATEMENT

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

The study site is an existing transformed and highly degraded environment. Most of the study site (R574) also runs through built up villages and townships with high levels of transformed, altered and degraded natural environments. In reality there are no sensitive areas within the study site itself. The only sensitive areas along the study site route, which can be negatively impacted on during the construction phase are the watercourse crossings and the 'cutting' area.

Most of the watercourses are small and badly degraded but are all, by default, viewed and approached as 'sensitive'. There are no 'high' sensitive habitats present on site, with the exception of the watercourse crossings. 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. There are eight main watercourses (rivers or streams) that the study site (R574) crosses over. Starting from KM 0,0, near Groblersdal these are: Bloed, Rulokwane, Puleng, Puleng tributary, Ga-Makatle, Gemsbokspruit tributary, Gemsbokspruit and Malekani. There are no significant or independent wetlands in the study site. Mitigation measures are included in the EMPr to minimise the impact.

The vegetation of the study site is mostly transformed, altered and highly degraded. The vegetation present in the study site is within the road reserve and consists mainly of grasses and a few herbaceous plants. The road reserve is routinely cut and burnt thereby altering and degrading the natural vegetation. Most of the study site runs through villages and townships where the natural environment has been totally transformed and highly degraded. Only one protected tree, namely the Marula (*Sclerocarya birrea*), was found to be present within the study site. There are a few scattered trees along the road in the road reserve.

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.

Option 1 is recommended due to the following:

- Duelling km0 – km1 improve the Level of Service (LOS) from LOS E to LOS A,
- Prevent choking of traffic between R33 and the Bloed river Bridge km1,
- No additional tapers required at the R33/R574 intersection,
- The difference in width between the single and dual carriageway is marginal and there is a limited cost difference,
- Future cost saving by constructing the portion of dual carriageway and Bloed river bridge,
- Internal Rate of return of 21,6.
- This is the most cost effective option.
- The safety to the traveling public will be significantly improved as the traffic will be flowing optimally.

- The road could be upgraded to acceptable horizontal and vertical geometric requirements.
- This option drastically lowers the possibilities of head-on collisions.
- It is anticipated that the traffic accidents that occur on this road will be reduced with this option.
- It is anticipated that the road 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 upgrade of the road will, therefore, ensure safer driving conditions for the traveling public by enabling vehicles to travel more efficiently and smoothly with less congestion.
- Improved traffic flow, particularly during peak periods.
- Reduced congestion is anticipated.
- The environmental impact of the upgrade of the road is deemed to be low.

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 environmental 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.

13. 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 watercourses (streams, drainage lines, rivers) may be impeded or impounded during the construction phase or at any stage of the project.
- Work at watercourse crossings and on stormwater culverts should preferably be carried out during the dry, winter season when water flow is at its lowest or non-existent.
- The main flow of watercourses at crossings must not be altered or rerouted during the construction phase.
- Preferably any major upgrades and construction of water crossings, and stormwater culverts should be done during the dry, winter period when water flow is at its' lowest.
- Erosion and potential siltation of watercourses must be monitored at all times during the construction phase of the project.
- Any temporary storage, lay-down areas or accommodation facilities to be setup in existing disturbed areas only.
- Ensure small footprint during construction phase.
- 32m Buffer zones, from the edge of the banks of all watercourses need to be implemented. These are 'No-Go' zones in terms movement of vehicles and contractors. The only areas of exception are the work areas and footprints at the road crossings of watercourses.
- No temporary site offices or lay-down areas are allowed within 50m of the edge of any watercourses.
- No temporary site offices or lay-down areas are allowed on top of any rocky hills or along any steep hill slopes. All laydown areas must be on flat, plains / surfaces and must be within disturbed areas as far as possible. No areas of trees may be specifically cleared for a laydown area or temporary office site.
- All hazardous materials must be stored appropriately to prevent these contaminants from entering the water environment;
- All excess materials brought onto site for construction must be removed after construction.

- No open trenches or mounds of soils to be left.
- A rehabilitation plan for disturbed areas to be compiled and implemented as part of the construction phase of the project. This includes access roads and temporary laydown / site office areas.
- There are a few marula trees within the road reserve. These are protected trees and a permit will be required if any need to be removed. However, it seems unlikely that any will need to be removed.
- A General Authorisation (GA) process will be required for work on the stream crossings.
- There are a few protected trees (Marulas) within the study area. All efforts must be made to avoid these trees, along with other any other large, well-established trees.
- The study site is within a transformed and degraded environment and therefore impact on natural vegetation will be low.
- Any priority species encountered must be identified and rescue prior to any excavation or construction activities. However, it is unlikely that any are present within the study site or the road and road reserve.
- A weed control programme should be implemented. This can form part of the routine maintenance programme for the road.
- Care must be taken not to interact directly with any wild life encountered.
- Any bird nests encountered in the grass, trees or on the ceilings of culverts must not be interfered with. If encountered must first be discussed with specialist as how best to proceed. This also applies to any active animal burrows encountered.
- Care must be taken with heavy machinery used on the project. All access roads used during construction must be monitored for erosion and maintained.
- Soils and stones excavated may be used on site as backfill, fixing of roads, filling of dongas, etc.
- Excavated soils and rocks may not be simply dumped in any open veld or even on site.
- All temporary access roads, laydown areas, temporary camps, site offices, etc. must be fully rehabilitated by the contractors prior to final signing off of the construction phase of the project.

Maintenance phase (to be implemented in defect liability period for 1 year)

- Mechanical control of alien plants around disturbed areas to be implemented within three months of completion of construction. Thereafter every six months. Mechanical control to be of such a nature as to allow local, indigenous grasses and other pioneers to colonise the previously disturbed areas, thereby keeping out alien invasives.
- No chemical control (herbicides) of alien plants to be used within 100m of any watercourses.
- Areas around foundations, culverts, gabions, etc. need to be check before and after the summer rainy season for signs of soil erosion due to stormwater run-off. Such sites need to be modified and rehabilitated to prevent ongoing erosion. These sites need to be monitored more closely than other sites which show no or minimal signs of erosion.
- Inspection of road shoulders in areas of steep topography to be inspected after the summer rainy season for signs of erosion and rehabilitated and rectified as required.

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.

14. 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 archaeological sites or graves be exposed during construction work, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made. 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. 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

16. 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.

17. 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.

18. 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