



DRAFT BASIC ASSESSMENT REPORT

THE PROPOSED UPGRADE OF NATIONAL ROUTE 11 SECTION 13 BETWEEN MOKOPANE (KM 1.3) AND THE GROOT SANDSLOOT RIVER (KM 24.0)

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

April 2023



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MOKOPANE (KM 1.3) AND THE GROOT SANDSLOOT RIVER (KM 24.0)**

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a. The qualifications of the EAP

Mr Paul Bothma obtained a Master's Degree in Environmental Management. Please find a CV of the EAP and proof of qualifications included in Appendix A. Mr Bothma is registered as an EAP with the Environmental Assessment Practitioner Association of SA. (EAPASA) Registration Number – 2021/4201

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. Mr Bothma has:

- Experience in environmental studies for linear projects ie. roads, mining right and permit applications ie. borrow pits and quarries, waste license applications, Section 24G applications etc.
- 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.

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

Mr Bothma has:

- » Seventeen years' experience in the environmental field;
- » Seventeen years' experience in Project Management;
- » Project management of large environmental assessment and environmental management projects.

Nature of Comments Required

- Any inaccurate observations

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ACRONYMS

BID	Background Information Document
CPD	Community Development Project
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
LEDET	Limpopo Province Department of Economic Development, Environment and Tourism
NEMA	National Environmental Management Act
NEM:AQA	National Environmental Management: Air Quality Act
NFEPA	National Freshwater Ecosystem Priority Area
PLO	Project Liaison Officer
PPP	Public Participation Process
SANRAL	South African National Roads Agency Soc Limited

1. DETAILS OF EAP AND EXPERTISE

This report was prepared Paul Bothma from Chameleon Environmental.

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Mr Bothma has:

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- » Seventeen years' experience in Project Management;
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2. LOCATION OF THE ACTIVITY

The project is located on National Route N11 Section 13 between Mokopane (km 1.3) and the Groot Sandsloot River (km 24.1), Limpopo Province.

The coordinates for the project are the following:

Table 1: Site coordinates

Position	Coordinates
Start: N11 Section 13 at Km 1.3 in Mokopane	S 24° 10' 37.86" E 29° 00' 05.92"
End: N11 Section 13 at Km 24.1 – Groot Sandsloot River	S 23° 59' 36.10" E 28° 57' 35.4"
All listed activities triggered by the proposed project will occur within the road reserve between the start and the end coordinates as indicated above.	
Existing bridges to be demolished and replaced by new bridges	
Dorps River Bridge	S 24° 10' 21.08" E 28° 59' 11.88"
Roosloot River Bridge	S 24° 09' 33.46" E 28° 58' 51.14"
Dithokeng River Bridge	S 24° 08' 11.71" E 28° 57' 49.65"

This project consists of a total length of approximately 22.8 km and is situated in the province of Limpopo within the Mogalakwena Local Municipality and the Waterberg District Municipality. A locality plan is included as Appendix B.

The major part of the project will fall within the boundaries of the existing road reserve but the expansion of the road reserve and construction of new intersections will affect the following properties

Table 2: Affected properties

N11/13 - PROPERTY INFORMATION						
No	Property	Portion	LPI Code	Owner	Type	Title Deed
1	Armoede No 823 - LR	Rem	TOLR00000000082300000	RUSTENBURG PLATINUM MINES LTD	Company	T65590/2004
2	Armoede No 823 - LR	Ptn 3 (Unregistered)			Communal/Tribal	
3	Gillimberg No 861 - LR		TOLR00000000086100000	REPUBLIC OF SOUTH AFRICA	RSA/Communal/Tribal	T34563/2016
4	Gillimberg No 861 - LR	Ptn 10 (Unregistered)			Communal/Tribal	
5	Gillimberg No 861 - LR	Ptn 9 (Unregistered)			Communal/Tribal	
6	Rietfontein No 2 - KS	Rem	TOKS00000000002000000	REPUBLIC OF SOUTH AFRICA	RSA/Communal/Tribal	T8608/1937
7	Tweefontein No 238 - KR	Ptn 3 (ptn of Ptn 2)	TOKR00000000023800003	REPUBLIC OF SOUTH AFRICA	RSA/Communal/Tribal	T8608/1937
8	Tweefontein No 238 - KR	Rem Ptn 2	TOKR00000000023800002	REPUBLIC OF SOUTH AFRICA	RSA/Communal/Tribal	T2995/1938
9	Rietfontein No 240 - KR		TOKR00000000024000000	REPUBLIC OF SOUTH AFRICA	RSA/Communal/Tribal	T2286/1894

10	Tweefontein No 238 - KR	Ptn 1	TOKR0000000002380000 1	REPUBLIC OF SOUTH AFRICA	RSA/Communal/Tribal	T554/1894
11	Turfspruit No 241 - KR		TOKR0000000002410000 0	REPUBLIC OF SOUTH AFRICA	RSA/Communal/Tribal	T23920/2000
12	Macalacaskop No 243 - KR		TOKR0000000002430000 0	REPUBLIC OF SOUTH AFRICA	RSA/Communal/Tribal	T23991/1998

3. DESCRIPTION OF THE SCOPE OF THE PROPOSED ACTIVITY

The project was originally designed as the rehabilitation and upgrading of National Route N11 Section 13 from Mokopane (km 1,310) to the Groot Sandsloot River (km 24,0), but it was decided to split the original project into two contracts.

Km 1 – 8 (Contract 2)

This contract (also referred to as Contract 2) entails the rehabilitation and upgrading of the first part of the original project, stretching from Mokopane (km 1,310) to the R518 Intersection (km 8,345). The original road reserve width of 30m will be increased to 40m minimum over the total length of this contract.

The existing road is a single carriageway surfaced road with varying width stretching through areas that can be classified as predominantly urban. From km 1,3 to km 8,0 the existing road is to be upgraded to a divided dual carriageway road with a 2m wide raised median and 1,8m paved sidewalks on both sides of the road. A short transition section follows, where after the existing single carriageway road is to be widened to a 12,4m minimum surfaced width up to the end of the contract at km 8,345. Paved sidewalks of 1,8m wide are specified over some sections of the single carriageway road.

The core strategies of the project are the following:

- Implementing measures to improve the safety of pedestrians and the general public:
Upgrading of intersections to provide bus/taxi bays and pedestrian crossings.
Construction of paved sidewalks through built-up areas.
Erection of welded steel mesh high security fence along road in built-up areas.
Installation of street lighting along main road through built-up areas.
- Improving the general geometry of the road to increase capacity and safety:
New vertical alignment to raise existing road levels for improved drainage and to fit in with the pavement strengthening strategy.
Upgrading and widening of surfaced width of the single carriageway road. Upgrading of all intersections and junctions.
- Formalising access to adjacent properties by means of local access roads, replacing direct access onto main road. These access roads will be constructed under a specific Community Development Project (CDP) forming part of Contract 1 (km 8,345 - km 24,0). The CDP includes construction of all the local access roads from km 1,310 at Mokopane to km 24,0 at the Groot Sandsloot River, i.e. also including the local access roads situated on this Contract 2 from Mokopane (km 1,310) to the R518 intersection (km 8,345).

- Constructing a new road pavement and strengthening the existing pavement structure for a 20-year life cycle by adding new pavement layers (450mm to 750mm).
- Improving the surface- and cross-drainage of the road by a raised vertical alignment (higher road levels) and upgrading/replacing all drainage culverts.
- Replacing two existing bridge structures (Dorps River and Rooisloot River bridges) due to hydraulic inadequacies.

Km 8 – 24 (Contract 1)

This contract entails the rehabilitation and upgrading of the second part of the original project, stretching from the R518 Intersection (km 8,345) to the Groot Sandsloot River (km 24,0) over a distance of approximately 15,7 km. A portion of the road between km 19,171 and km 20,204 is omitted from the N11-13 Rehabilitation Contract as it will form part of the proposed new Mokopane Bypass project. Short-term rehabilitation measures for this section of the road are however included in this project to serve as a holding action until the Bypass is constructed. The original road reserve width of 30m will be increased to 40m minimum over the total length of this contract.

The existing road is a single carriageway surfaced road with varying width stretching through areas that can be classified as urban, semi-urban and rural. The area from km 14,160 to km 15,820 (Tshamahansi) can at this stage already be classified as semi-urban to urban, while the remaining areas up to km 16,540 are developing fast into semi-urban areas. Only the area from km 16,540 onwards can still be regarded as predominantly rural. From km 8,345 up to the existing mine access road at km 23,360, the existing single carriageway road is to be widened to a 12,4m minimum surfaced width. Between km 13, 0 and km 15, 2 the road center-line was moved to the right-hand side of the travelled way to avoid affecting several existing properties and improvements situated on the RHS of the road. Paved sidewalks of 1,8m wide are specified over some sections of the road between km 8,345 and km 16,620. The existing road width is retained from km 23,360 up to the end of construction at km 24, 0.

The core strategies of the project are the following:

- Implementing measures to improve the safety of pedestrians and the general public:
Upgrading of intersections to provide bus/taxi bays and pedestrian crossings.
Construction of paved sidewalks through built-up areas.
Erection of a welded steel mesh high security fence along road in built-up areas.
Installation of street lighting along main road through built-up areas.
- Improving the general geometry of the road to increase capacity and safety:
New vertical alignment to raise existing road levels for improved drainage and to fit in with the pavement strengthening strategy.
Upgrading and widening of surfaced width of the single carriageway road. Upgrading of all intersections and junctions.
- Formalising access to adjacent properties by means of local access roads, replacing direct access onto main road. These access roads will be constructed under a specific Community Development Project (CDP) forming part of this Contract 1 (km 8,345 - km 24,0). The CDP includes construction of all the local access roads from km 1,310 at Mokopane to km 24,0 at the Groot Sandsloot River, i.e. also including the local access roads situated on the future Contract 2 from Mokopane (km 1,310) to the R518 intersection (km 8,345).

- Constructing a new road pavement and strengthening the existing pavement structure for a 20 year life cycle by adding new pavement layers (450mm to 750mm).
- Improving the surface- and cross-drainage of the road by a raised vertical alignment (higher road levels) and upgrading/replacing all drainage culverts.
- Replacing one existing bridge structure (Dithokeng River Bridge) due to hydraulic inadequacies.

3.1 Technical Details

General roadworks on both Contract 1 (Km 8.0 to Km 24.1)) and Contract 2 (Km 1.3 to Km 8.0)

(a) General Roadworks

The general roadworks on the project consists of the following main elements:

- Clearing and grubbing of the site.
- Accommodation of traffic.
- Construction of temporary deviations where required.
- Relocation and/or protection of services.
- Installation of drainage culverts.
- Installation of subsoil surface drains.
- Construction of banks and dykes.
- Construction of mass earthworks.
- Construction of new pavement layers, asphalt surfacing and a Cape Seal surfacing.
- Installation of guardrails.
- Erosion protection such as gabions and stone pitching.
- Construction of paved sidewalks.
- Erection of road signs and application of road marking (including remarking at end of Defects Liability Period) and the installation of road studs.
- Erection of fencing, including new high security proprietary fencing in residential areas.
- Landscaping and grassing.
- Finishing off the road and road reserve, including borrow pits, hard rock quarry and spoil areas.
- The installation of street lighting in built-up areas.

The typical cross-sections of the roads to be constructed under this contract are described below:

N11-13: km 1,310 - km 8,000 - Urban dual carriageway with raised median and sidewalks

- Lanes: 4 x 3,7m surfaced
- Median island: 2,0m paved
- Median kerbs: 2 x 0,3m barrier kerb-channel combination
- Inner shoulder: 2 x 0,1m surfaced
- Outer shoulder: 2 x 0,3m surfaced
- Sidewalk kerbs: 2 x 0,45m barrier kerb-channel combination
- Sidewalks: 2 x 1,8m paved
- Rounding: 2 x 0,5m gravel
- Roadway: 22,70m

N11-13: km 8,000 - km 8,345 - Urban single carriageway with raised sidewalk both sides / one side only

- Lanes: 2 x 3,7m surfaced
- Shoulders: 2 x 2,5m surfaced
- Sidewalk kerb: 1 x 0,45m barrier kerb-channel combination
- Sidewalk: 1 x 1,8m paved
- Rounding: 2 x 0,5m gravel
- Roadway: 14,65m

Provincial and Municipal connecting roads

- Lanes: 2 x 3,7m surfaced
- Shoulders: 2 x 2,5m surfaced
- Rounding: 2 x 0,5m gravel
- Roadway: 12,40m

N11-13: km 8,345 - km 10,000, km 13,160 - km 14,100 and km 15,820 - km 16,620: Urban single carriageway with raised sidewalk one side only

- Lanes: 2 x 3,7m surfaced
- Shoulders: 2 x 2,5m surfaced
- Sidewalk kerb: 1 x 0,45m barrier kerb-channel combination
- Sidewalk: 1 x 1,8m paved
- Rounding: 2 x 0,5m gravel
- Roadway: 14,65m

N11-13: km 14,100 - km 15,820: Urban single carriageway with raised sidewalks both sides

- Lanes: 2 x 3,7m surfaced
- Shoulders: 2 x 2,5m surfaced

- Sidewalk kerb: 2 x 0,45m barrier kerb-channel combination
- Sidewalks: 2 x 1,8m paved
- Rounding: 2 x 0,5m gravel
- Roadway: 16,90m

N11-13: km 10,000 - km 13,160 and km16, 620 - km 23,360: Rural single carriageway

- Lanes: 2 x 3,7m surfaced
- Shoulders: 2 x 2,5m surfaced
- Rounding: 2 x 0,5m gravel
- Roadway: 12,40m

N11-13: km 23,360 - km 24, 0: Rural single carriageway

- Lanes: 2 x 3,7m surfaced
- Shoulders: 2 x 1,3m surfaced + 2 x 1,2m gravel
- Rounding: 2 x 0,5m gravel
- Roadway: 12,40m

Provincial and Municipal connecting roads

- Lanes: 2 x 3,7m surfaced
- Shoulders: 2 x 2,5m surfaced
- Rounding: 2 x 0,5m gravel
- Roadway: 12,40m

New and existing intersections required

Table 3: New intersections

ROAD	NEW km DISTANCE	SIDE	EXISTING TYPE	DESTINATION	REMARKS/ UPGRADES
N11-13	1.495	LHS	T-junction	Taylor Street	Upgrade to minor 4-legged intersection; new access to School Parking Area on RHS
N11-13	1.870	LHS	T-junction; Access Rd. to school on RHS	Ficuss Street (LHS); School (RHS)	Upgrade to 4-legged intersection, provide bus stops
N11-13	2.590	LHS	T-junction	Sekgagape ng (LHS); Isolated enclave (RHS) situated below 1:50 year floodline	Upgrade to 3-legged roundabout, close access to RHS, provide bus stops
N11-13	3.160	RHS	T-junction	Phola Park	Upgrade to Left-in / Left-out
N11-13	3.475	RHS	T-junction	Phola Park (RHS);	Upgrade to 4-legged roundabout, provide bus stops

				Sekgagapeng (LHS)	
N11-13	3.985	RHS	T-junction	Phola Park	Upgrade to Left-in / Left-out
N11-13	4.280	LHS	T-junction	Moshate (Lekalakala)	Upgrade to Left-in / Left-out
N11-13	4.630	LHS	Access Filling Station	Filling Station & Businesses	Upgrade to Left-in only, Exit onto local street
N11-13	4.780	RHS	T-junction	Moshate (LHS); Mahwelereng A (RHS)	Upgrade to 4-legged roundabout, provide bus stops
N11-13	5.657	LHS	T-junction	Moshate (LHS); Mahwelereng A (RHS)	Upgrade to 4-legged roundabout, provide bus stops
N11-13	6.245	RHS	None	To Dudu Madisha Dr.	New T-junction with turning lanes and bus stops
N11-13	6.950	RHS / LHS	4-way intersection	Lekalakala (LHS), Dudu Madisha (RHS)	Upgrade to 4-legged roundabout, provide bus stops
N11-13	8.010	LHS	Staggered intersection	P19-1 Marken (LHS); Madiba Township (RHS)	Upgrade to 4-legged roundabout, provide bus stops

The following existing structures will either be demolished and replaced or upgraded on the project:

EXISTING BRIDGES ON THE N11 SECTION 13

Table 4: Bridge locations

KM Bridge No.	Bridge No.	Name	Action
2,92	1582	Dorps River	Demolish and replace
7,75	1241	Roosloot River	Demolish and replace
15,61	1170	Dithokeng River	Demolish and replace
24,27	1115	Groot Sandsloot River	Retain. No action required

NEW INSITO CONCRETE CULVERTS ON THE N11 SECTION 13

Table 5: Culvert locations

Culvert No.	Km distance	Size and Skew	Purpose
3/3	3,652	2 x (2400 x 900)@90°	Drainage
4/1	4,067	1 x (2400 x 1200)90°	Drainage
4/2	4,175	2 x (2400X1200) @90	Drainage

4/3	4,237	2 x (3000X1200@ 92°	Drainage
4/4	4.359	2 x (3000X1500)@ 90°	Drainage
4/6	4.513	3 x (3000x 1500) @ 90°	Drainage
5/3	5.683	1 x (2400X1200)@ 270°	Drainage
9/2	9.662	1 x (2400 x 900) @ 90°	Drainage
9/3	9.844	1 x (2400 x 1200) @ 90	Drainage
10/3	10.518	2 x (2400 x 1500) @90°	Drainage
12/1	12,160	3 x (3000 x 900) @ 90°	Drainage
12/2	12,217	2 x (3000 x 1200) @90°	Drainage
13/4	13,715	1 x (2400 x 900) @ 60°	Drainage
14/3	14,574	1 x (2400 x 1200) @90°	Drainage
20/3	20,551	2 x (2400 x 1200) @90°	Drainage
20/4	20,740	1 x (2400 x 1200) @90°	Drainage

CONCRETE-LINED DRAINAGE CANAL

A trapezium-shaped concrete lined drainage canal is constructed within the road reserve, parallel to Road N11-13, over the following sections:

- km 1,510 to km 2,900 (Dorps River) – LHS
- km 6,970 to km 7,540 (Rooisloot River) - LHS

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

Table 6: 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

REFERENCE	FACILITIES
Pre-cast yard	Batching plant
	Cement Silos
	Settlement ponds
	Concrete washing facilities
	Curing areas
	Workshops

Table 7: 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
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

The rock quarries and borrow pits was identified and the EMP's authorised by the DMRE in 2012.

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 Ermelo.

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 will be established by the Contractor once on site. Electricity will be supplied via 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.

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

It is envisaged that asphalt will be obtained from commercial sources in the region as and when required. Should high quantities of asphalt be required, provision for the establishment of a temporary asphalt plant will be made. 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.

Potential water sources:

- Mogalakwena Municipality
 - Anglo Platinum Mogalakwena Mine
 - Landowners
 - Groot Sandsloot River
 - Gert Combrink Dam just outside Mokopane

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.

During the construction stage, sewage will be treated using portable chemical treatment units on the construction site and at the site camps. The portable 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 8: Listed activities

Activity No(s):	Provide the relevant Basic Assessment Activity(ies) as set out in Listing Notice 1 of the EIA Regulations, 2014 as amended	Describe the portion of the proposed project to which the applicable listed activity relates.																				
12	GN R. 983, as amended in GN R. 327: Item 12 The development of infrastructure or structures with a physical footprint of 100 square metres or more where such	<p>EXISTING BRIDGES ON THE N11 SECTION 13</p> <table border="1" data-bbox="603 1738 1385 1973"> <thead> <tr> <th>KM Bridge No.</th> <th>Bridge No.</th> <th>Name</th> <th>Action</th> </tr> </thead> <tbody> <tr> <td>2,92</td> <td>1582</td> <td>Dorps River</td> <td>Demolish and replace</td> </tr> <tr> <td>7,75</td> <td>1241</td> <td>Roosisloot River</td> <td>Demolish and replace</td> </tr> <tr> <td>15,61</td> <td>1170</td> <td>Dithokeng River</td> <td>Demolish and replace</td> </tr> <tr> <td>24,27</td> <td>1115</td> <td>Groot Sandsloot River</td> <td>Retain. No action required</td> </tr> </tbody> </table>	KM Bridge No.	Bridge No.	Name	Action	2,92	1582	Dorps River	Demolish and replace	7,75	1241	Roosisloot River	Demolish and replace	15,61	1170	Dithokeng River	Demolish and replace	24,27	1115	Groot Sandsloot River	Retain. No action required
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	development occurs within a watercourse	<p align="center">NEW INSITO CONCRETE CULVERTS ON THE N11 SECTION 13</p> <table border="1"> <thead> <tr> <th>Culvert No.</th> <th>Km distance</th> <th>Size and Skew</th> <th>Purpose</th> </tr> </thead> <tbody> <tr> <td>3/3</td> <td>3,652</td> <td>2 x (2400 x 900)@90°</td> <td>Drainage</td> </tr> <tr> <td>4/1</td> <td>4,067</td> <td>1 x (2400 x 1200)90°</td> <td>Drainage</td> </tr> <tr> <td>4/2</td> <td>4,175</td> <td>2 x (2400X1200) @90</td> <td>Drainage</td> </tr> <tr> <td>4/3</td> <td>4,237</td> <td>2 x (3000X1200@ 92°</td> <td>Drainage</td> </tr> <tr> <td>4/4</td> <td>4.359</td> <td>2 x (3000X1500)@ 90°</td> <td>Drainage</td> </tr> <tr> <td>4/6</td> <td>4.513</td> <td>3 x (3000x 1500) @ 90°</td> <td>Drainage</td> </tr> <tr> <td>5/3</td> <td>5.683</td> <td>1 x (2400X1200)@ 270°</td> <td>Drainage</td> </tr> <tr> <td>9/2</td> <td>9.662</td> <td>1 x (2400 x 900) @ 90°</td> <td>Drainage</td> </tr> <tr> <td>9/3</td> <td>9.844</td> <td>1 x (2400 x 1200) @ 90</td> <td>Drainage</td> </tr> <tr> <td>10/3</td> <td>10.518</td> <td>2 x (2400 x 1500) @90°</td> <td>Drainage</td> </tr> <tr> <td>12/1</td> <td>12,160</td> <td>3 x (3000 x 900) @ 90°</td> <td>Drainage</td> </tr> <tr> <td>12/2</td> <td>12,217</td> <td>2 x (3000 x 1200) @90°</td> <td>Drainage</td> </tr> <tr> <td>13/4</td> <td>13,715</td> <td>1 x (2400 x 900) @ 60°</td> <td>Drainage</td> </tr> <tr> <td>14/3</td> <td>14,574</td> <td>1 x (2400 x 1200) @90°</td> <td>Drainage</td> </tr> <tr> <td>20/3</td> <td>20,551</td> <td>2 x (2400 x 1200) @90°</td> <td>Drainage</td> </tr> <tr> <td>20/4</td> <td>20,740</td> <td>1 x (2400 x 1200) @90°</td> <td>Drainage</td> </tr> </tbody> </table>	Culvert No.	Km distance	Size and Skew	Purpose	3/3	3,652	2 x (2400 x 900)@90°	Drainage	4/1	4,067	1 x (2400 x 1200)90°	Drainage	4/2	4,175	2 x (2400X1200) @90	Drainage	4/3	4,237	2 x (3000X1200@ 92°	Drainage	4/4	4.359	2 x (3000X1500)@ 90°	Drainage	4/6	4.513	3 x (3000x 1500) @ 90°	Drainage	5/3	5.683	1 x (2400X1200)@ 270°	Drainage	9/2	9.662	1 x (2400 x 900) @ 90°	Drainage	9/3	9.844	1 x (2400 x 1200) @ 90	Drainage	10/3	10.518	2 x (2400 x 1500) @90°	Drainage	12/1	12,160	3 x (3000 x 900) @ 90°	Drainage	12/2	12,217	2 x (3000 x 1200) @90°	Drainage	13/4	13,715	1 x (2400 x 900) @ 60°	Drainage	14/3	14,574	1 x (2400 x 1200) @90°	Drainage	20/3	20,551	2 x (2400 x 1200) @90°	Drainage	20/4	20,740	1 x (2400 x 1200) @90°	Drainage
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19	“The infilling or depositing of any material of more than 10m³ into or dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10m³ from a watercourse.”	The material that will be required for infilling or depositing will be more than 10 m ² for the project.																																																																				
24	GN R. 983, as amended in GN R. 327: Item 24 The development of a road (ii) with a reserve wider than 13.5 m or where no reserve exists where the road is wider than 8 m	The road reserve will increased from 30m to 40m.																																																																				
27	GN R. 983, as amended in GN R. 327: Item 27 (as amended) The clearance of an area of 1 hectares or more, but less than 20 hectares of	Temporary spoil areas along the route																																																																				

	indigenous vegetation, except where such clearance of indigenous vegetation is required for- The undertaking of a linear activity; or maintenance purposes in accordance with a maintenance management plan.																					
31	GN R. 983, as amended in GN R. 327: Item 31 (as amended) The closure of existing facilities, structures or infrastructure for any development and related operation activity or activities listed in this Notice	<p>EXISTING BRIDGES ON THE N11 SECTION 13</p> <table border="1"> <thead> <tr> <th>KM Bridge No.</th> <th>Bridge No.</th> <th>Name</th> <th>Action</th> </tr> </thead> <tbody> <tr> <td>2,92</td> <td>1582</td> <td>Dorps River</td> <td>Demolish and replace</td> </tr> <tr> <td>7,75</td> <td>1241</td> <td>Roosloot River</td> <td>Demolish and replace</td> </tr> <tr> <td>15,61</td> <td>1170</td> <td>Dithokeng River</td> <td>Demolish and replace</td> </tr> <tr> <td>24,27</td> <td>1115</td> <td>Groot Sandsloot River</td> <td>Retain. No action required</td> </tr> </tbody> </table>	KM Bridge No.	Bridge No.	Name	Action	2,92	1582	Dorps River	Demolish and replace	7,75	1241	Roosloot River	Demolish and replace	15,61	1170	Dithokeng River	Demolish and replace	24,27	1115	Groot Sandsloot River	Retain. No action required
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32	The continuation of any development where the environmental authorisation has lapsed and where the continuation of the development, after the date the environmental authorisation has lapsed, will meet the threshold of any activity or activities listed in this Notice, Listing Notice 2 of 2014 or Listing Notice 3 of 2014.	Environmental authorisation for the proposed project was first issued in 2013 and extended in 2016 and 2019 and lapsed in 2021. Authorisation register number – 12/12/20/2375.																				
48	GN R. 983, as amended in GN R. 327: Item 48 (as amended) The expansion of infrastructure or structures where the physical footprint is	<p>Bridges or culverts to be expanded by more than 100sq m</p> <p>EXISTING BRIDGES ON THE N11 SECTION 13</p> <table border="1"> <thead> <tr> <th>KM Bridge No.</th> <th>Bridge No.</th> <th>Name</th> <th>Action</th> </tr> </thead> <tbody> <tr> <td>2,92</td> <td>1582</td> <td>Dorps River</td> <td>Increase bridge width by 133%</td> </tr> <tr> <td>7,75</td> <td>1241</td> <td>Roosloot River</td> <td>Increase bridge width by 115%</td> </tr> </tbody> </table>	KM Bridge No.	Bridge No.	Name	Action	2,92	1582	Dorps River	Increase bridge width by 133%	7,75	1241	Roosloot River	Increase bridge width by 115%								
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	expanded by 100 sq m or more inside a watercourse	15,61	1170	Dithokeng River	Increase bridge with by 225%
		24,27	1115	Groot Sandsloot River	Retain. No action required
56	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	The road will be widened by more than 6 m and the reserve is wider than 13.5m			
Activity No(s):	Provide the relevant Scoping and EIA Activity(ies) as set out in Listing Notice 2 of the EIA Regulations, 2014 as amended	Describe the portion of the proposed project to which the applicable listed activity relates.			
	N/A				
Activity No(s):	Provide the relevant Basic Assessment Activity(ies) as set out in Listing Notice 3 of the EIA Regulations, 2014 as amended	Describe the portion of the proposed project to which the applicable listed activity relates.			
	N/A				

5. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

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

Table 9: Legislation, policies and/or guidelines are applicable to the application

Title of legislation, policy or guideline	Applicability to the project	Administering authority	Date
EIA Regulations 2014 as amended GN R. 983 as amended in GN R. 327 Activities 12, 19, 24 and 56	Listed activities triggered in terms of the EIA Regulations, 2014 as amended	Department of Environmental Affairs	4 December 2014

Title of legislation, policy or guideline	Applicability to the project	Administering authority	Date
<p>Department of Environmental Affairs Departmental Guidelines under www.environment.gov.za</p>	<p>Guidance with regard to the execution of the Environmental Impact Assessment process</p>	<p>Department of Environmental Affairs</p>	<p>2010</p>
<p>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.</p>	<p>General objectives of Integrated Environmental Management as set out in section 23 of NEMA taken into account</p>	<p>The National Department of Environmental Affairs</p>	<p>1998</p>
<p>National Environmental Management: Biodiversity Act (Act No. 10 of 2004) Red data and protected species listed.</p>	<p>Ecological study Red data and protected species listed in the Act will need to be assessed</p>	<p>Department of Agriculture, Forestry and Fisheries (permit application, if necessary)</p>	<p>2004</p>
<p>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.</p>	<p>Aquatic Study Stream crossings and application of a general authorization or WUL at the Department of Water and Sanitation</p>	<p>Department of Water and Sanitation</p>	<p>2016</p>

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

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 <input checked="" type="checkbox"/>	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 N11 Section 13 as a national road under section 40(1) of the Act creates the land use right within the declared road reserve.			
2. Will the activity be in line with the following?			
(a) Provincial Spatial Development Framework (PSDF)	YES <input checked="" type="checkbox"/>	NO	Please explain
The SANRAL is given the power to perform all strategic planning, as well as the planning, design, construction, operation, management, control, maintenance and rehabilitation of all national roads in South Africa in terms of the South African National Roads Agency Limited and National Roads Act, 1998. The N11 Section 13 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 N11 Section 13 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 N11 Section 13 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 N11 Section 13 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
<p>The SANRAL is given the power to perform all strategic planning, as well as the planning, design, construction, operation, management, control, maintenance and rehabilitation of all national roads in South Africa in terms of the South African National Roads Agency Limited and National Roads Act, 1998. The N11 Section 13 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.</p>			
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
<p>The area is in dire need of this project and it is a societal priority as numerous accidents occur on the N2 in this area every year with associated loss of lives.</p>			
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
<p>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.</p>			
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
<p>The SANRAL is given the power to perform all strategic planning, as well as the planning, design, construction, operation, management, control, maintenance and rehabilitation of all national roads in South Africa in terms of the South African National Roads Agency Limited and National Roads Act, 1998. The N11 Section 13 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.</p>			
7. Is this project part of a national programme to address an issue of national concern or importance?	YES	NO x	Please explain
<p>The upgrade of the N2 became important as a result of the deterioration of the road and the numerous accidents that occur in this area every year with associated loss of lives.</p>			

8. Do location factors favour this land use (associated with the activity applied for) at this place? (This relates to the contextualisation of the proposed land use on this site within its broader context.)	YES <input checked="" type="checkbox"/>	NO	Please explain
The N2 is an existing national road and will be widened in terms of SANRAL's mandate in terms of the South African National Roads Agency Limited and National Roads Act, 1998.			
9. Is the development the best practicable environmental option for this land/site?	YES <input checked="" type="checkbox"/>	NO	Please explain
The upgrade of the N11 Section 13 be conducted within the N11 Section 13 road reserve. The potential impacts related to the activity were assessed together with specialist engineering and environmental input and the best practicable environmental option and mitigation measures recommended in the report.			
10. Will the benefits of the proposed land use/development outweigh the negative impacts of it?	YES <input checked="" type="checkbox"/>	NO	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 N11 Section 13 is not upgraded with associated loss of lives. The N11 Section 13 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 <input checked="" type="checkbox"/>	Please explain
The SANRAL is given the power to perform all strategic planning, as well as the planning, design, construction, operation, management, control, maintenance and rehabilitation of all national roads in South Africa in terms of the South African National Roads Agency Limited and National Roads Act, 1998. The N11 Section 13 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 <input checked="" type="checkbox"/>	Please explain
It is not foreseen that any person's rights will be negatively affected by the proposed activity as no community displacement will take place. A public participation process was followed and the comments and concerns taken into account during the environmental process.			
13. Will the proposed activity/ies compromise the "urban edge" as defined by the local municipality?	YES	NO <input checked="" type="checkbox"/>	Please explain
The SANRAL is given the power to perform all strategic planning, as well as the planning, design, construction, operation, management, control, maintenance and rehabilitation of all national roads in South Africa in terms of the South African National Roads Agency Limited and National Roads Act, 1998. The N11 Section 13 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 <input checked="" type="checkbox"/>	Please explain
This project is not included in any of the SIP projects.			

15. What will the benefits be to society in general and to the local communities?	Please explain
<p>The upgrade of the N11 Section 13 offer several benefits to society in general, including:</p> <ul style="list-style-type: none"> • Decrease accidents due to decreasing possibility of head-on collisions; • Safer driving conditions for the road users as the one-way will provide opportunities to pass heavy vehicles. • With the upgrade of the road, less maintenance on vehicles are anticipated; • Improved traffic flow, particularly during peak periods; • Reduced congestion; • Improved drainage and other services. 	
16. Any other need and desirability considerations related to the proposed activity?	Please explain
<ul style="list-style-type: none"> • Employment opportunities for the local residents during construction. • Less accidents and associated loss of lives. • Improved drainage and other services. • Drainage channels will be improved. 	
17. How does the project fit into the National Development Plan for 2030?	Please explain
<p>The SANRAL is given the power to perform all strategic planning, as well as the planning, design, construction, operation, management, control, maintenance and rehabilitation of all national roads in South Africa. The N11 Section 13 is a national road and falls within the jurisdiction of the SANRAL in terms of the South African National Roads Agency Limited and National Roads Act, 1998.</p>	
18. Description of how the general objectives of Integrated Environmental Management as set out in section 23 of NEMA have been taken into account.	
<p>The following general objectives of integrated environmental management have been taken into account:</p> <ol style="list-style-type: none"> a) Identified, predicted and evaluated the actual and potential impact on the environment as a result of the upgrade of the N11 Section 13 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 N11 Section 13; d) Ensured that the effects of activities on the environment received adequate consideration before actions are taken in connection with them; e) Ensured adequate and appropriate opportunity for public participation in decisions that may affect the environment; f) Ensured the consideration of environmental attributes in management and decision-making which may have a significant effect on the environment; and g) Identified and employed the modes of environmental management best suited to ensuring that a particular activity is pursued in accordance with the principles of environmental management set out in section 2 of the NEMA. 	

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

The following have been taken into account:

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

7. DETAILS OF PUBLIC PARTICIPATION PROCESS FOLLOWED

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

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

Interested and affected parties (I&APs) were consulted and afforded the opportunity to participate. The I&AP's 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. As sections of the proposed project intercede in close proximity to high and medium density populated areas, the Applicant in collaboration with the Department of Rural Development and Land Reform and PropSol (SANRAL service provider) conducted a public participation process by conducting public meetings in all the identified affected communities. Respective traditional leaders and ward councillors representing the communities and community members partook in the meetings. The PPP for the environmental authorisation is a separate process although details of both PPP's are included in 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 Mokopane Express of 17 – 25 January 2023. A copy of the advertisement is included in Appendix D.

An earlier public notice was advertised in the Mokopane Express of 12 – 14 October 2023 whereby residents of affected communities were invited to public participation meetings at various venues along the route. A copy of this advertisement is included in Appendix D.

c. Site Notice

Site notifications in English in A2 format requesting comments or objections were placed on site at the start (Km 1.1), centre (Km 12) and the end of the project (Km 24) as well as at the Mokalakwena and Mahwelereng public libraries respectively on 3 November 2022. 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, Local authorities and government departments that would be relevant to this project and 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

A meeting was held with management of the Mokalakwena Local Municipality and identified Ward Councillors of the affected areas on 13 December 2022. Each attendee were issued with a BID and locality plan and were invited to issue any comments and/or issues in writing. The Mokalakwena Local Municipality undertook to communicate with the traditional leaders from the affected areas. The meeting presentation list as well as letters of notification sent 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 10: Summary of Issues raised by I&APs

Interested and Affected Parties	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section and Paragraph Reference in this report where the issues and or Responses were incorporated.
<u>AFFECTED PARTIES</u>				
Landowner/s				
The South African National Roads Agency Soc Limited	No comments received	No issues raised	No response necessary	None required
Landowners or lawful occupiers on adjacent properties	<p>SANRAL, the Applicant, in collaboration with the Limpopo Province Department of Rural Development and Land Reform, Proplsol – a SANRAL Service Provider, and identified Ward Councillors and Traditional Leaders conducted a public participation process to take a resolution regarding the proposed project through arranging meetings and inviting the public to attend and raise probable issues or comments. A public notice was displayed in the Mokopane Express of 12 – 14 October 2022. The meetings were held in venues throughout the affected communities from 7 November to 23 November 2022.</p> <p>The public participation pertaining to the Application for Environmental Authorisation was initiated after the PPP mentioned above and communication with the communities were restricted to communication with the respective Ward Councillors. The Mogalakwena Local Municipality undertook the responsibility to ensure communication with the Traditional Leaders.</p> <p>A meeting was arranged with the Mogalakwena Local Municipal Management and identified Ward Councillors and took place on 13 December 2023. Comments and/or issues arising from the meeting will be discussed below. See minutes of meeting included in Appendix D</p>			

Ward Councillors of identified affected communities within the Mogalakwena Local Municipality				
Ward 18 Cllr KA Sebele	No comments received	None	No response necessary	See copy of Notice in Appendix D
Ward 19 Cllr ET Setsiba	No comments received	None	No response necessary	See copy of Notice in Appendix D
Ward 20 Cllr KA Setsiba	No comments received	None	No response necessary	See copy of Notice in Appendix D
Ward 21 Cllr HP Makhubele	No comments received	None	No response necessary	See copy of Notice in Appendix D
Ward 23 Cllr MR Kekana	27 January 2023.	Cllr Kekana verbally notified us that she did not receive the	The notice was sent to the new/correct e-mail address on 27 January 2023.	See copy of Notice in Appendix D
Ward 24 Cllr RG Selemela	No comments received	None	No response necessary	See copy of Notice in Appendix D
Ward 25 Cllr MG Monama	No comments received	None	No response necessary	See copy of Notice in Appendix D
Ward 26 Cllr LS Marakalala	No comments received	None	No response necessary	See copy of Notice in Appendix D
Ward 29 Cllr MBM Ngwenya	Cllr Ngwenya acknowledged receipt of the Notice on 26 January 2023	None	No response necessary	See copy of Notice in Appendix D
Municipality				
Mogalakwena Local Municipality representatives				

1. Mr LD Seko: Divisional Head- PDP				
2. Ms Mporiseni Nelushi – Environmental Officer	No comments	None	No response necessary	See copy of Notice in Appendix D
3. Ms Charity Radipabe – Manager PDS	No comments		No response necessary	See copy of Notice in Appendix D
4. Ms Nakedi Mabula- Communicatio ns Officer	13 December 2022	Please forward the newspaper advertisement for placement on the municipality portal	A copy of the advertisement that appeared in the Mokopane Express was forwarded to Me Mabula on 18 January 2022	See copy of e- mail in APPENDIX D
5. VL Skosana - Technical	No comments	No issues raised	No response necessary	See copy of Notice in Appendix D
6. SS Mafoko- Technical	No comments	No issues raised	No response necessary	See copy of Notice in Appendix D
7. Ms Lerato Thoka- ADH Town Planning	No comments	No issues raised	No response necessary	See copy of Notice in Appendix D
8. Mr Lionel Mashishi-DM Planning and Development	No comments	No issues raised	No response necessary	See copy of Notice in Appendix D
9. Waterberg District Municipality Me Tebogo Tsabalala	No comments	The initial communication was with a Mr Rabutsoa (MM) and his PA – Me E Kelly. No communication from the DM side. On follow up with the DM we communicated with Mr Mosia the head of communications. He referred us to Me Tebogo Tsabalala. Me Tsabalala requested that we communicate with her in future. The notice was forwarded to Me Tsabalala.	The notice and supporting documentation was forwarded to Me Tsabalala.	See copy of Notice in Appendix D
Organs of State				

The Limpopo Heritage Resources Authority (LIHRA) Mr R Ramugumo	No comments received	No issues raised	No response necessary	See copy of email in Appendix D
SAHRA	No comments	No issues raised	No response necessary	See proof of submission in Appendix D
Limpopo Province Dept of Economic Development, Environment and Tourism Mr Vusi Maluleke/Mr William Mothapo	No comments received	No issues raised	No response necessary	See copy of Notice in Appendix D
Mr/ Me M Nethengwe DWS/Mogalakwena River Catchment Management Agency	No comments received	No issues raised	No response necessary	See copy of email in Appendix D
Communities				
The communities are represented by the various municipal ward councillors The respective ward councillors were notified of the proposed project.				
Tngenas Zion Christian Church Mokopane Mr David Ngwepe Branch Church Secretary	27 January 2023	As the branch secretary of the St Engenas Zion Christian Church in Mokopane corner Hospital street and N11 route, I feel the need to write this Email to you to complain about the on clarification on the affected Erf. The last time we were engaged was when Mr Mthembu and the crew were in charge. Further more we have expressed our views ,opinions and requests	The comments were referred to the project engineers who in collaboration with the Applicant, SANRAL, contacted the I&AP and resolved the issue. We explained to Mr Ngepe that his issue is not an environmental issue but a land acquisition issue.	See copy of email communication in Appendix D

		<p>but we never received any correspondence from the team.</p> <p>It shall be with a great pleasure if you take into consideration this email and do the honours by responding.</p> <p>I will also be glad to enlighten the agreement if necessary</p>		
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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 study area is open flat to undulating low hills with shallow, valleys in which small seasonal and semi-perennial streams are typically found. The topography of the site and surroundings has been modified to an extent typical of the construction of roads and urban areas. The average height above sea level across the study site is 1 132m, with a maximum and minimum elevation of approximately 1 221m and 1 078m, respectively. The average gradient (slope) is low at about 1,4%, with maximum slopes of 5,1% - 4,0%.

(Flori Scientific Services, 2023).

b. Geology and Soils

The geology and soils of the study site and surrounding areas vary quite a bit over the length of the route. In general the area is underlain by the gneisses and migmatites of the Hout River Gneiss (Randian Erathem) and the potassium-deficient gneisses of the Goudplaats Gneiss (Swazian Erathem). Sandstones and mudstones of the Matlabas Subgroup (Mokolian Waterberg Group) are also found. Soils include deep, greyish sands, eutrophic plinthic catenas, red-yellow apedal freely drained soils with high base status, clayey in bottomlands. Land types mainly Bd, Bc, Ae and Ia (Mucina & Rutherford, 2010). (Flori Scientific Services, 2023)

Short descriptions of the prominent landtypes of the study area are shown below (Table 11).

Table 11: Description of land types found in the region

Land Type	Description
Ae	Red-yellow apedal, freely drained soils (Red, high base status soils, > 300 mm deep, without dunes). Moderately deep (average 500-1200 mm) red, freely drained, apedal (= structureless) soils. Soils occur in areas associated with low to moderate rainfall (300-700 mm per annum) in the interior of South Africa and have a high fertility status. A wide range of texture occurs (usually sandy loam to sandy clay loam).
Bc & Bd	Plinthic catena: Upland duplex and marginal soils rare (Eutrophic; red and/or yellow soils). Mainly red (Bc) or yellow (Bd), apedal (= structureless) soils, which are eutrophic (= high base status). They have a moderate to high fertility status and a wide textural range, mostly sandy loam to sandy clay loam. Soils contain a greyish subsoil layer (plinthic) where iron and manganese accumulate in the form of mottles, due to a seasonally fluctuating water table. With time these mottles may harden (or even cement) to form concretions. These plinthic layers will cause restricted water infiltration and root penetration. In drier areas, however, they may help to hold water in the soil that plants can use.

1a	Miscellaneous land classes (Undifferentiated deep deposits). Usually deep pedologically youthful soils, which occur mostly along river courses, valley bottoms and in lower lying areas. Soils are usually weakly structured, with a great variety of colour (often mottled) and often, several layers have been deposited (usually by water) with different soil textures.
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c. Climate

The study site is situated within the medium rainfall zone of 401mm – 600mm per annum and in the Temperate Interior Climatic Zone of South Africa.

The study site is within a summer rainfall region of South Africa, with very dry winters. The site is situated within and nearby to the Town of Mokopane (Potgietersrus).

Mokopane has an average annual rainfall of around 495mm, with most of the precipitation in the summer months of December to February (en.climate-data.org). The summers are warm to hot, while the winters are moderate to cold, but seldom very cold or with severe frost. The cool winter mornings usually become warm and pleasant later during the day.

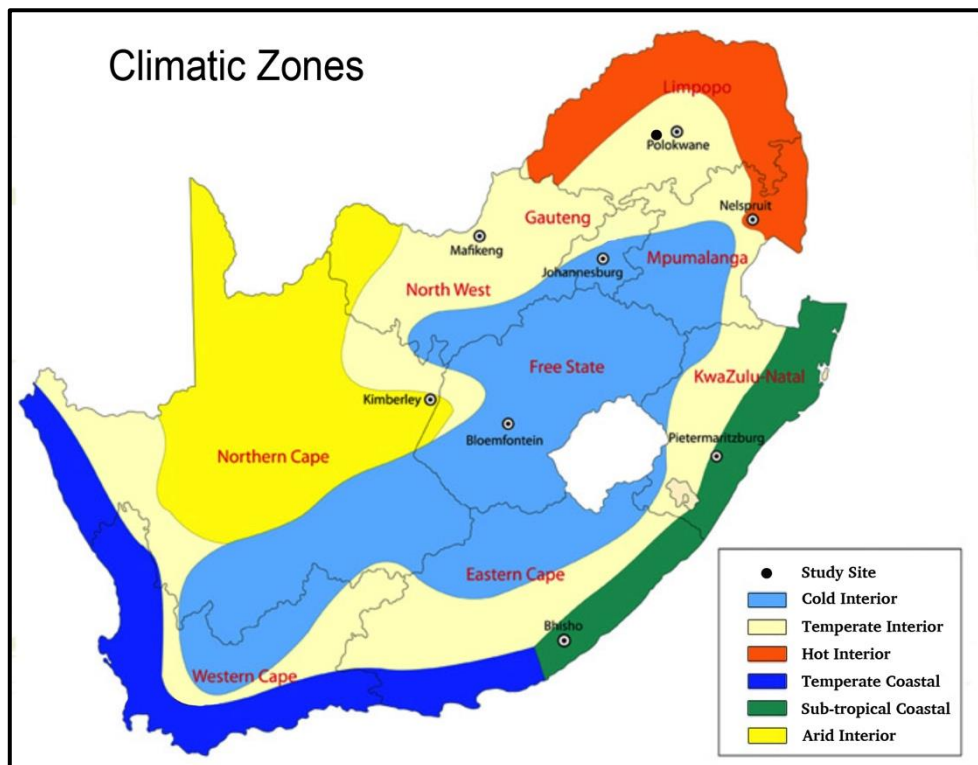


Figure 1: The study area is situated within the Temperate Interior Climatic Zone of South Africa. (Flori Scientific Services, 2023)

d. Land cover

The landcover of the study site is that of the existing single carriageway surfaced road and road reserve. The first +/-15km of the road (N11) runs through urban, built-up areas. The last 8-9km is more open, rural area. (Flori Scientific Services, 2023).

e. Vegetation

South Africa is divided up into nine major biomes. The study area is situated within the Savanna Biome. Savanna (bushveld) vegetation types (veldtypes) tend to have a mix of a lower grassy layer, middle shrub layer, and an upper woody layer (trees). The mix and ratio of the three layers varies from veldtype to veldtype within the Savanna Biome.

The study site is within the veldtype commonly known as **Makhado Sweet Bushveld**. The veldtype / ecosystem is not threatened and has a status of 'Least Concern' (Skowno, 2019).

Table 12: Vegetation classification of the study site

Category Description	Classification
Biome	Savanna
Bioregion	Central Bushveld
Vegetation Types	Eastern Highveld Grassland
Status	Least Concern – Not threatened

f. Vegetation of the study area

The vegetation and natural environment of the study site is altered and degraded. This is to be expected for an environment along an existing road, which predominantly runs through an urban environment. The road reserve is also regularly cut / mowed and oftentimes burnt, which degrades and alters the natural vegetation mix, resulting in very few trees, and shrubs. The herbaceous layer of grasses and herbs is degraded and consists mostly of a few common grass species. There are a number of marula trees scattered along the length of the study site in the road reserve. Some of these trees are close to the road and will probably need to be removed during the construction / upgrade phase of the project.

During site investigations no red data listed (RDL) or orange data listed (ODL) plant species were observed. The only priority species observed is the marula, which is a national protected tree. (Flori Scientific Services, 2023)

g. Priority Floral Species

During field investigations no red data listed (RDL) (Critically endangered, endangered or vulnerable) species were observed within the proposed project area. No orange data listed (ODL) plant species were observed either.

The only priority species in the study area that would be impacted is the marula (*Sclerocarya birrea*). There are approximately 41 trees within the study area, of which some will need to

be removed and others will not need to be impacted on at all. (Flori Scientific Services, 2023).

h. Conservation Status

The conservation status of the veldtype in which the study site is situated is not threatened and has a status of 'Least Concern' (bgis.sanbi.org.za, NEMBA (G 34809, Government Notice 1002), 2011. Skowno, 2019) (Table 13).

Table 13: Veldtype status

Veldtype	Status	Info
Makhado Sweet Bushveld	Least Concern (LC)	About 1% statutorily conserved, mainly in the Bellevue Nature Reserve. Some 27% transformed, mainly by cultivation, with some urban and built-up areas. The southwestern half of the unit has densely populated rural communities (Mucina & Rutherford, 2010).

The Biodiversity Act (Act 10 of 2004) provides for listing of threatened or protected ecosystems, in one of four categories: Critically Endangered (CR), Endangered (EN), Vulnerable (VU) or protected. The main purpose for the listing of threatened ecosystems is an attempt to reduce the rate of ecosystem and species destruction and habitat loss, leading to extinction. This includes preventing further degradation and loss of structure, function and composition of threatened ecosystems (SANBI). (Flori Scientific Services, 2021)

i. Watercourses in the study area

The main watercourses in the region of the study site are four rivers / streams that the existing N11 road crosses over. From Mokopane going north these watercourses (rivers / streams) are: Dorps; Roosloot; Dithokeng; and Groot Sandsloot (Figure 8)



Figure 2: Map of the main watercourses in the region

Main Watercourse crossings

Table 14: Main water crossings

Map ID Number	Coordinates	Type of Watercourse
R1 – Dorps River	24°10'20.93"S; 28°59'11.89"E	River / Stream
R2 – Rooisloot River	24° 8'11.98"S; 28°57'49.81"E	River / Stream
R3 – Dithokeng River	24° 3'54.26"S; 28°58'22.96"E	River / Stream
R4 – Groot Sandsloot River	23°59'35.02"S; 28°57'35.06"E	River / Stream (not to be affected)



Picture 1: Dorps River showing the small highly polluted narrow main channel and high levels of alien plant infestation. Most of the vegetation in picture is alien. During the time of the site visit the water was grey and smelly due to very high levels of raw sewage contamination.



Picture 2: Rooisloot River is a narrow stream with a fairly wide floodplain. The riparian vegetation is badly degraded through the removal of natural resources by locals and infestation by alien invasive plants. The water source is degraded and polluted but did not contain visible raw sewage as in the case of the Dorps River.



Picture 3: Dithokeng River upstream of the N11. Stream levels were low in contrast with expectations after a lengthy period of above average rainfall. The stream has no distinctive riparian zone and moderately levels of alien plant infestation, compared to the Dorps and Rooisloot Rivers. The flow of the Dithokeng River immediately downstream of the N11 was stagnant with small areas of ponding. The dominant small trees / shrubs in and along the river were indigenous, local thorn trees

The Groot Sandsloot River will not be affected by the project as the project ends before the the water crossing.

Wetlands

Figure 3 depicts the latest National Wetland Map (Map 5, 2018), which shows the extent of the wetlands in the area. The Rooisloot and Groot Sandsloot Rivers are shown in Map 5 as 'Valley Bottom Wetlands'. However, these are actually better defined as small rivers or streams that have associated wetlands elements.

There are no true wetlands along the length of the study site. There are a number of storm water culverts under the road which are common, to allow for the free flow of surface storm water of a downpour. These are not watercourses that have therefore not been delineated.

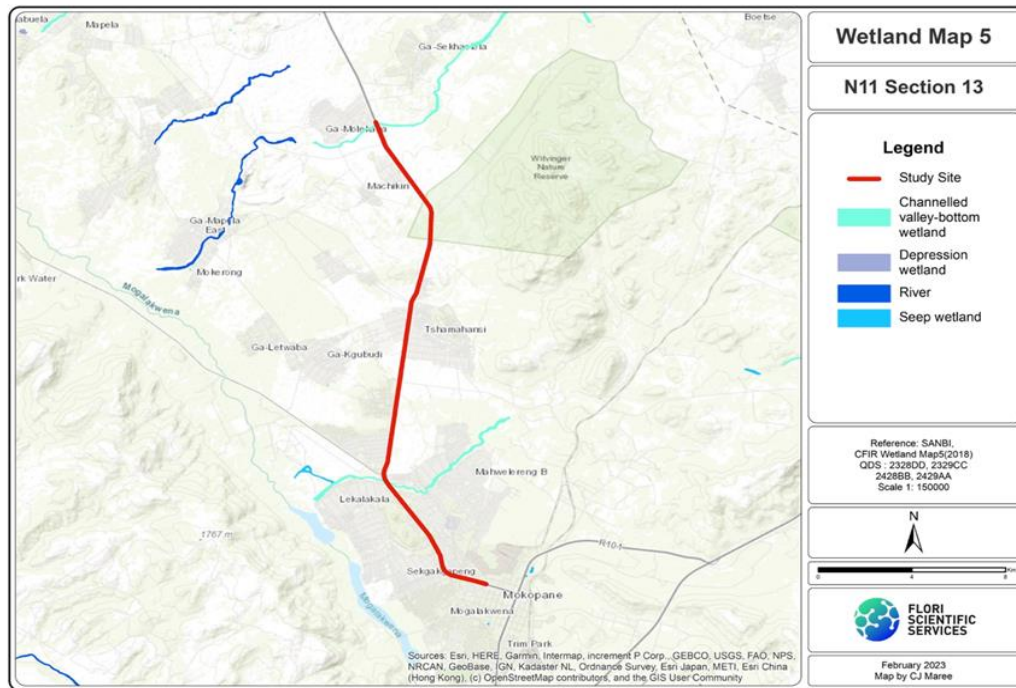


Figure 3: National Wetland Map (Map 5, 2018)

There is a large, very flat open plain near Mozombane Village. The area is between the Rooisloot and Dithokeng Streams. The area has heavier soils than surrounding areas and therefore surface storm water remains longer in the area, creating ideal conditions for heavier plant growth. The area has historically been heavily and continually ploughed and cultivated because of these properties. Presently there are still numerous cultivated lands as well as large-scale development of houses and other structures in this area. This may lead to flooding during periods of high rainfall. There are numerous storm water culverts under the N11 road to facilitate the free movement of surface storm water and to prevent ponding. The area is not seen as a watercourse and was therefore not delineated

Drainage Regions

South Africa is geographically divided up into a number of naturally occurring Primary Drainage Areas (PDAs) and Quaternary Drainage Areas (QDAs). The different areas are demarcated into Water Management Areas (WMAs) and Catchment Management Agencies (CMAs). Previously there were 19 WMAs and 9 CMAs, but as of September 2016, these were revised and there are now officially only nine WMAs, which correspond directly in demarcation to the nine new CMAs (Government Gazette, 16 September 2016. No.1056, pg. 169-172). The study area is situated within the Primary Drainage Area (PDA) of **A** and the Quaternary Drainage Areas (QDAs) of **A61F & A61G**.

Summary of the catchment and drainage area information for the study site.

Table 15: Summary of Catchment Area information

Level	Category
Primary Drainage Area (PDA)	A
Quaternary Drainage Area (QDA)	A61F & A61G
Water Management Area (WMA) – Previous / Old	Limpopo
Water Management Area (WMA) – New (as of Sept. 2016)	Limpopo (WMA 1)
Sub-Water Management Area	Mogalakwena
Catchment Management Agency (CMA)	Limpopo (CMA 1)
Wetland Vegetation Ecoregion (WetVeg)	Central Bushveld (Group 4)
RAMSAR Site	No
River FEPA	No
Wetland FEPA	No
Fish FEPA	No
Fish FSA	No
Fish Corridor	No
Fish Migratory	No
National Strategic Water Source Area (SWSA)	No
Provincial important Water Source Area (WSA)	No

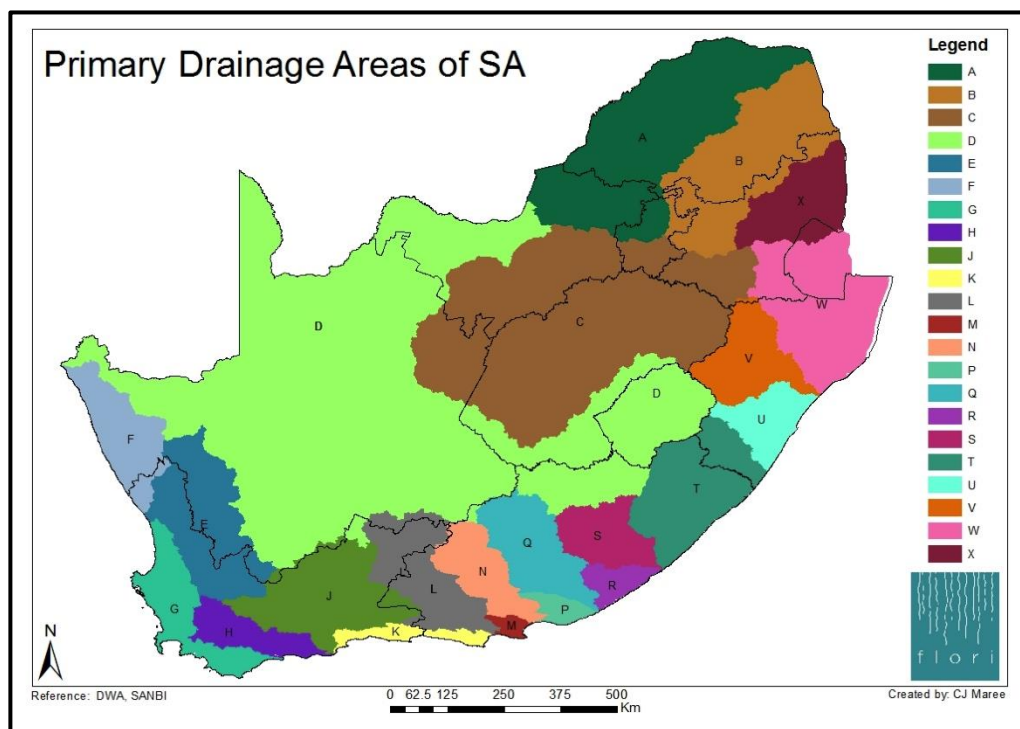


Figure 4: Primary drainage areas.

Strategic Water Source Areas of South Africa

The southern tip of the study site is within the Nyl & Dorps River Valley Strategic Water Source Area. This is a national SWSA in terms of groundwater.

However, it is clear that in this area the proposed project will have absolutely no impact on groundwater.

A Water Source Area (WSA) is a water catchment or aquifer system that either supplies a relatively large volume of water for its size, or is the primary source of water for a town, city or industrial activity. Strategic Water Source Areas (SWSAs) are defined as areas of land that either: (a) supply a disproportionate (i.e. relatively large) volume of mean annual surface water runoff (i.e. water in streams, rivers and wetlands) in relation to their size and so are considered nationally important; or (b) have relatively high groundwater recharge and groundwater forms a nationally important resource (has high levels of use or settlements depend on it); or (c) areas that meet both criteria (a) and (b). A SWSA^(L)_(SEP) is one where the water that is supplied is considered to be of national importance for water security, but there are others, which are considered to be sub-nationally important (WRC, 2019).

According to SANBI, a Strategic Water Source Areas of South Africa (SWSA) are those areas that supply a disproportionate amount of mean annual runoff in relation to the size of the geographical region. These areas are important because they have the potential to contribute significantly to overall water quality and supply, supporting growth and development needs that are often a far distance away. These areas make up 8% of the land area across South Africa, Lesotho and Swaziland, but provide 50% of the water in these countries (SANBI).

Present Ecological State of Watercourses

All watercourses identified within the study area were assessed to determine their Present Ecological State (PES) (Table 16). The assessment criteria and structure are based on the modified Habitat Integrity approach of Kleynhans (1996, 1999). The PES is calculated by looking at the hydrology, geomorphology, water quality and biota of each watercourse. Of importance is the overall PES of the system (Table 16).

The first two watercourses (Dorp and Rooisloot) are in very bad condition (Seriously Modified – Category E). The PES qualities of the watercourses improve as one moves north and more into the rural areas where there are less direct negative anthropogenic impacts on them. The Dithokeng River is therefore less affected.

Table 16: PES of Watercourses in the study area

Criteria	Identified Watercourses			
	Dorps River	Roosisloot	Dithokeng	Groot Sandsloot
HYDROLOGY				
Flow modification	1	1	3	3
Permanent inundation	2	2	3	3
WATER QUALITY				
Water Quality Modification	1	2	3	3
Sediment Load Modification	2	2	2	2
GEOMORPHOLOGY				
Canalisation	2	2	3	3
Topographic Alteration	2	2	2	2
BIOTA				
Terrestrial Encroachment	1	1	2	3
Indigenous Vegetation Removal	1	1	2	3
Invasive Plant Encroachment	1	2	3	3
Alien Fauna	3	3	3	3
Over utilisation of Biota	2	2	3	3
Total:	18	20	29	31
Average:	1,6	1,8	2,6	2,8
Category:	E	E	C	C
Description	Seriously Modified	Seriously Modified	Moderately Modified	Moderately Modified
Description summary	The losses of natural habitats and basic ecosystem functions are extensive.	The losses of natural habitats and basic ecosystem functions are extensive.	The losses of natural habitats and basic ecosystem functions are extensive.	The losses of natural habitats and basic ecosystem functions are extensive.
Recommended EMC	C	C	C	C

Ecological Importance & Sensitivity of Watercourses in the Study Area

The Ecological Importance and Sensitivity (EIS) ratings of the watercourses were determined as shown in the table below (Table 17)

Table 17: EIS of watercourses in the study area

Determinants	Dorps	Roosloot, Dithokeng	Groot Sandsloot	Confidence
PRIMARY DETERMINANTS				
1. Rare & Endangered Species	2	1	1	4
2. Populations of Unique Species	2	1	1	4
3. Species/taxon Richness	2	2	2	4
4. Diversity of Habitat Types or Features	2	1	1	4
5. Migration route/breeding and feeding site for wetland species	2	1	1	3
6. Sensitivity to Changes in the Natural Hydrological Regime	3	1	1	3
7. Sensitivity to Water Quality Changes	3	1	1	3
8. Flood Storage, Energy Dissipation & Particulate / Element Removal	3	1	1	3
MODIFYING DETERMINANTS				
9. Protected Status	0	0	0	4
10. Ecological Integrity	2	1	1	4
TOTAL	20	10	10	-
AVERAGE	2,0	1,0	1,0	-
EIS Category	B	C	C	-
Description	High	Moderate	Moderate	-
	Ecologically important and sensitive. The biodiversity of these watercourses may	Ecologically important and sensitive on a provincial or local scale. The biodiversity of these	Ecologically important and sensitive on a provincial or local scale. The biodiversity of these wetlands is not usually	

	be sensitive to flow and habitat modifications. They play a role in moderating the quantity and quality of water of major rivers.	wetlands is not usually sensitive to flow and habitat modifications. They play a small role in moderating the quantity and quality of water of major rivers.	sensitive to flow and habitat modifications. They play a small role in moderating the quantity and quality of water of major rivers.	
--	---	--	--	--

The Dorps River is ecologically important and has an overall EIS rating of High (Category B). The level of EIS of a watercourse is not directly linked to its PES.

j. Fauna

1. Mammals

No large- or medium-sized mammals were observed during field investigations. There are potentially a number of common species of wild animals, including mammals, present in the greater area, but most are small species with rodents been the dominant group present. The area with the largest potential presence of mammals (and other fauna) is the nearby Witvinger Nature Reserve.

2. Avifauna

The study area is not situated within an Important Bird Area (IBA). The closest IBA is the Waterberg System that includes the Waterberg Mountains and Nylsvley. The Waterberg IBA is located at varying distances of between 10km and 17km west of the study site. A number of birds common to the region were seen during field investigations included: laughing dove (*Streptopelia senegalensis*), cape turtle dove (*Streptopelia capicola*), hadeda ibis (*Bostrychia hagedash*), dark-capped bulbul (*Pycnonotus tricolor*), Cattle egret (*Bubulcus ibis*), Levaillant's cisticola (*Cisticola tinniens*), rattling cisticola (*Cisticola chiniana*), etc.

During field investigations two avifaunal species of conservation concern (SCC) were observed in the general area, namely, black-shouldered kite (*Elanus caeruleus*) and amur falcon (*Falco amurensis*). Both species are not threatened and the project will have no measurable impact on them.

No waterbirds were observed at the watercourses along or near to the study site (N11 road) during site investigations.

3. Reptiles and amphibians

A few common frog species are likely to occur in the rivers in the north of the study site. Frogs are very susceptible to polluted water and riparian zones. The Dorps and Rooisloot Rivers have high levels of polluted water and degraded environments, which greatly reduces the presence of abundant species and numbers. Typically the endangered species are the most susceptible to loss of ideal habitat and the presence of good quality water. It is unlikely that any red data listed (RDL) amphibian species will be present in the study area.

No snakes or lizards were observed along the road and road reserve during field investigations. However, it is more than likely that some common snake and lizard species will be present in the study area. Lizards tend to prefer rocky habitats such as rocky hills (koppies), rocky ridges and rock sheets. However, there are very few such rocky habitats present in the study area. The most ideal habitat and likelihood for numerous lizards and even snakes is the isolated mountain (inselberg) just west of the N11 in the area of Mosate. The project will have no impact on this mountain and habitat.

4. Invertebrates

Invertebrates such as spiders, scorpions and butterflies are important faunal groups, but are very difficult to properly assess in a short time period. During field investigations specific attention was given to priority species such as Mygalomorphae arachnids (Trapdoor and Baboon spiders) and red data butterflies. The nature and scope of the project is such that it will have low to negligible negative impact on these species should they occur. No priority species were observed.

Field observations were limited to a few days, which always limits the observation and identification of fauna in the field. Due to the transformed nature of the study area the species richness will be low. Ideal habitats for most large or priority faunal species are rare to non-existent, with the exception of the pans, wetlands and streams. However, even these are under pressure with lack of adequate bufferzones and corridors and none are in a pristine condition. No large- or medium-sized mammals were observed during field investigations. (Flori Scientific Services, 2023)

k. Air Quality

The bigger part of the project falls within the Mogalakwena township and outlying areas. High density residential activity is evident in close proximity to the existing N11 national route. The N11 is an extremely congested road and air quality is therefore adversely affected. Air quality is also affected during the winter period as wood and coal fires are commonly used.

l. Noise

The proposed upgrade of Section 13 of the N11 (km1.310 to km24.0) road will have an impact on the residential areas E, G and H during the construction phase of the project. The noise increase at the remainder of the noise receptors during the construction phase will be below 7.6dBA and the activities at the construction camp will be insignificant.

The impact on the environment and the noise receptors can however be controlled or minimized by means of the type of road surface to be used. The distance between the proposed road and the noise receptors and the wind direction will play an important role in noise propagation and how the continuous noise from the traffic will be perceived at the farmhouses and communities along the existing road. The management of the activities during the construction phase and the operational phase of the project will ensure how

successful the project will be in terms of the increase of the prevailing ambient noise levels and how the residents will perceive the increase in the noise level. There will be a noise increase in the vicinity of any road as it is a linear noise source depending on the distances the noise receptors are situated from the road. The receptors close to the road (< 100m) will experience a noise intrusion whereas the noise receptors ($\geq 100\text{m}$) will show an increase but not exceeding the threshold value of 7.0dBA.



Figure 5: Noise receptors in the vicinity of the N11 Section 13.

Communities in close proximity to receptors E;G and H will be affected during the construction phase of the activity but noise levels will not exceed the threshold of 7.0 dBA

m. Visual

The bigger part of the project lies in close proximity to high density residential areas. The existing road is currently in a very poor condition and the upgrading of the road will have a positive impact on the general aesthetics

n. Sites of Archaeological and Cultural Interests

1. Archaeological and Cultural

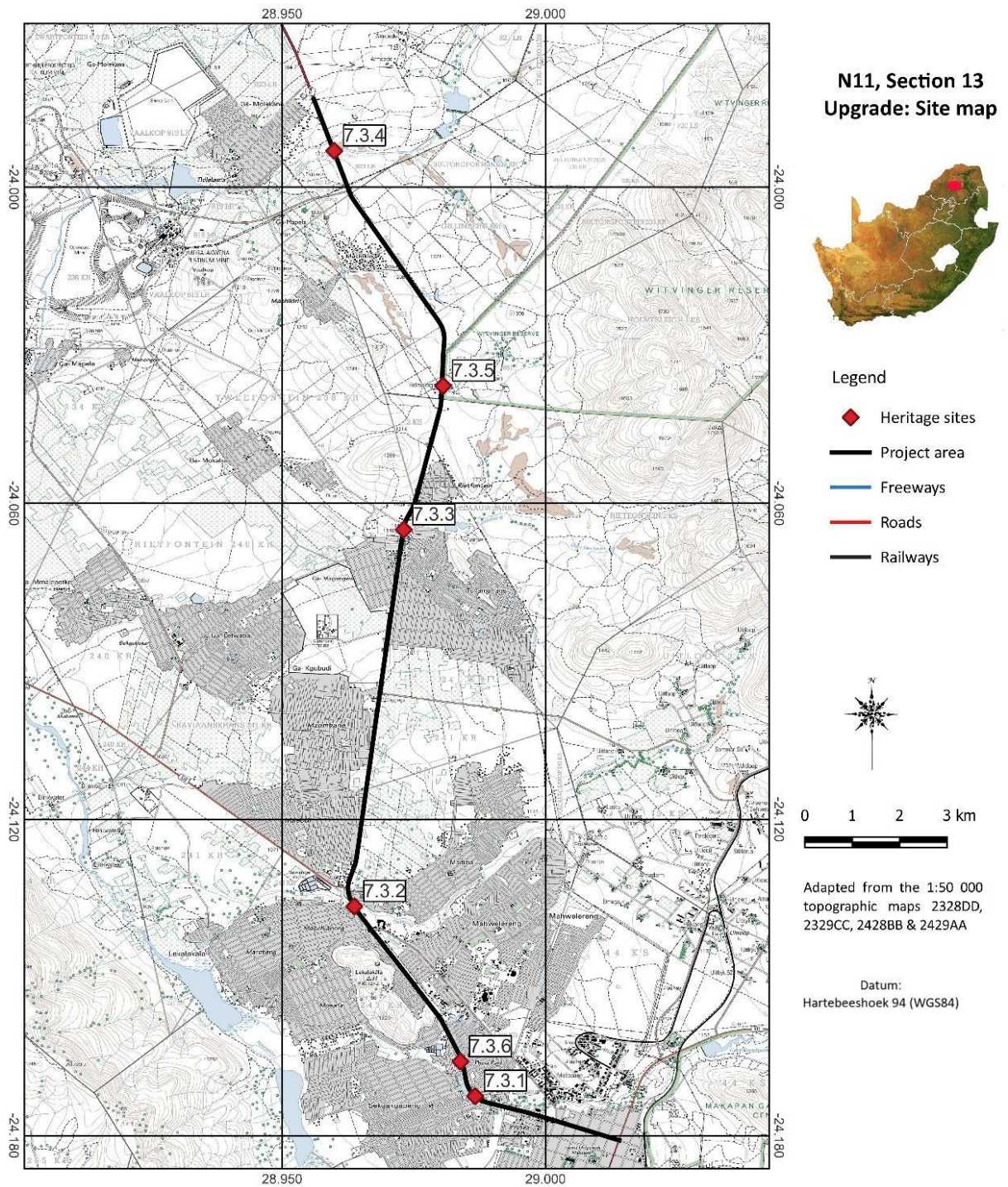


Figure 6: Location map indicating heritage sites in the project area

During the survey the following sites, features and objects of cultural significance were identified.

7.3.1 – 7.3.3 three cast concrete road bridges. According to available information on the bridges they date to the middle of the 1950s. The bridges crossing the Dorps River, Roosloot River and the Dithokeng River will be demolished and replaced by higher capacity

bridges.



Picture 4: Dorps River bridge (7.3.1)



Picture 5: Rooisloot River bridge (7.3.2)



Picture 6: Dithokeng River bridge (7.3.3)

Table 18: Impact assessment of bridges

7.3.1 – 7.3.3 Type: Bridges		
Impact assessment		
These sites are part of the proposed upgrading and therefore they will be impacted on by the roadworks activities.		
	Without mitigation	With mitigation
Extent	Site (1)	Site (1)
Duration	Permanent (5)	Permanent (5)
Intensity (Magnitude)	Moderate (6)	Minor (2)
Probability	Definite (5)	Improbable (2)
Significance	Medium (60)	Low (16)
Status (positive or negative)	Negative	Neutral
Reversibility	Non-reversible	Non-reversible
Irreplaceable loss of resources?	Yes	No
Can impacts be mitigated	Yes	
Cumulative impact: Loss of a limited number of similar features in the larger landscape.		

7.3.4 The Old Gada Roller Mill



Picture 7: The old Gada Roller Mill

The old Gada Roller Mill. It was closed down when local communities were relocated and is now defunct. The old mill will be protected (fenced off) and will not be affected by the project.

Table 19: Assessment of historic mill

7.3.4 Type: Historic mill		
Impact assessment		
This site is located right on the boundary of the road reserve and therefore there is a slight possibility that it might be impacted on by the roadworks activities.		
	Without mitigation	With mitigation
Extent	Site (1)	Site (1)
Duration	Permanent (5)	Permanent (5)
Intensity (Magnitude)	Moderate (6)	Minor (2)
Probability	Probable (3)	Improbable (2)
Significance	Medium (36)	Low (16)
Status (positive or negative)	Negative	Neutral
Reversibility	Non-reversible	Non-reversible
Irreplaceable loss of resources?	Yes	No
Can impacts be mitigated	Yes	
Cumulative impact: Loss of a limited number of similar features in the larger landscape.		

7.3.5: An informal cemetery with a very large number of graves (Approx. 300.)



Picture 8: The informal cemetery (burial site 7.3.5)

Table 20: Assessment of informal burial site

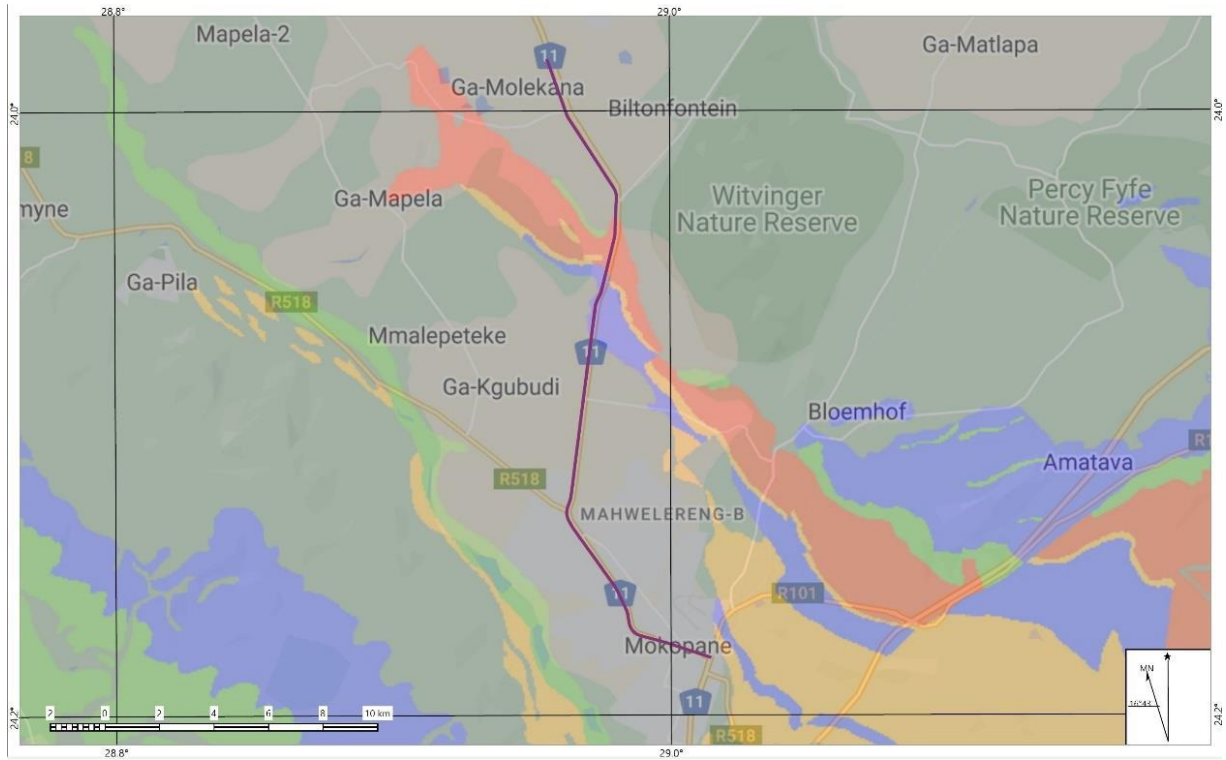
7.3.5 Type: Burial site		
Impact assessment		
This site is located right on the boundary of the road reserve and therefore there is a slight possibility that it might be impacted on by the roadworks activities.		
	Without mitigation	With mitigation
Extent	Site (1)	Site (1)
Duration	Permanent (5)	Permanent (5)
Intensity (Magnitude)	Moderate (6)	Minor (2)
Probability	Probable (3)	Improbable (2)
Significance	Medium (36)	Low (16)
Status (positive or negative)	Negative	Neutral
Reversibility	Non-reversible	Non-reversible
Irreplaceable loss of resources?	Yes	No
Can impacts be mitigated	Yes	
Cumulative impact: Loss of a limited number of similar features in the larger landscape.		

- Makapan World Heritage Site

Plotting the project area in relation to the Makapan WHS, it can be seen that it is too far away to have any physical impact. By using Google Earth's elevation profile function, it can be seen that the project area would not have a visual impact on the WHS.

It is therefore our viewpoint that no project-related mitigation measures are required as the upgrade of Section 13 of the N11 will not have any impact on the Makapan WHS.

2. Palaeontological



Colour	Sensitivity	Required Action
RED	VERY HIGH	field assessment and protocol for finds is required
ORANGE/YELLOW	HIGH	desktop study is required and based on the outcome of the desktop study, a field assessment is likely
GREEN	MODERATE	desktop study is required
BLUE	LOW	no palaeontological studies are required however a protocol for finds is required
GREY	INSIGNIFICANT/ZERO	no palaeontological studies are required
WHITE/CLEAR	UNKNOWN	these areas will require a minimum of a desktop study. As more information comes to light, SAHRA will continue to populate the map.

Figure 7: The Palaeontological sensitivity map of the project area

Field Observation: The area is not large. Vegetation next to the road on the shoulder is lush, mostly grassland, trees and bushes; buildings are present in the townships. All areas were accessible, but very few outcrops are present on the shoulder of the road, mostly isolated rocks of granite and dolomite. The topography is undulating. Fossils were not located.

Background to Palaeontology of the area

Summary: When rock units of moderate to very high palaeontological sensitivity are present within the development footprint, a desk top and or field scoping (survey) study by a professional palaeontologist is usually warranted. The main purpose of a field scoping (survey) study would be to identify any areas within the development footprint where specialist palaeontological mitigation during the construction phase may be required (SG 2.2 SAHRA AMPHOB, 2012).

Both the Bushveld Complex and Turfloop Granite are devoid of fossils.



Picture 9: Shallow dolomite outcrop on shoulder of road.

All Karoo Supergroup geological formations are ranked as **LOW** to **VERY HIGH**, and here the impact is potentially **HIGH** for the Chuniespoort Group.

Criteria used (Fossil Heritage Layer Browser/SAHRA) **(1cB)**:

Table 21: Assessment of palaeontological sensitivities

Rock Unit	Significance/vulnerability	Recommended Action
Bushveld	Very Low	No action required
Chuniespoort Group	High	Desktop and Field Assessment likely

There are significant fossil resources that may be impacted by the development (mudstone, shale) and if destroyed are no longer available for scientific research or other public good (Almond, *et al.* 2009).

Details of the location and distribution of all significant fossil sites or key fossiliferous rock units are often difficult to be determined due to thick topsoil, subsoil, overburden and alluvium. Depth of the overburden may vary a lot.

There is no objection to the development as found through conducting Phase 1 Palaeontological Impact Assessment: Field Study to determine whether the development will affect fossiliferous outcrops as the palaeontological sensitivity of the area is **HIGH**.

A Phase 2 Palaeontological Mitigation is only required if the Phase 1 Palaeontological

Assessment identified a fossiliferous formation and fossils or if fossils are found during construction.

All the land involved in the development was assessed and none of the property is unsuitable for development

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

The study area route crosses over the Dorps, Rooisloot and Dithokeng Rivers. All three rivers will be temporarily affected during construction as the existing infrastructure will be demolished on new, higher capacity bridges constructed. The new bridges will be a huge improvement allowing better drainage especially during high rainfall periods.

Wetlands and wetland areas along the N11 Section 13 will not be affected by the project. 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. Important Transportation Link and Improved Accessibility:

The N11 Section 13 serves as a development spine and the link between Botswana (Martin's Drift border post) and Limpopo Province. 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 along the route, especially from the Groot Sandsloot River into Mokopane, as a result of heavy vehicles doing cross border deliveries and collections. High density residential activity on certain sections of the N11 Section 13 also impacts on the

congestion of the road and slows down traffic flow due to unregulated access onto the N11. The new alignment and proposed new access points 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 22: 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	Managed, 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: $SP = (M) + (D) + (S) \times (P)$. The maximum value is 100 significance points (SP). Environmental impacts will be rated as either of High, Moderate or Low significance on the following basis:

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

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

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 23: Positive and Negative Impacts and Assessment

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

POTENTIAL ENVIRONMENTAL IMPACT	ACTIVITY	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION						RECOMMENDED MITIGATION MEASURES/ REMARKS	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION						
		M	D	S	P	TOTAL	SP		M	D	S	P	TOTAL	S P	
								<p>good working condition and will be serviced regularly.</p> <ul style="list-style-type: none"> Should a vehicle have a break down, it will be serviced immediately. 							
SOIL EROSION															
Possible soil erosion	<p>Construction Phase: Vegetation, stripping, stripping and stockpiling of topsoil, subsoil, overburden and spoil</p> <p>Operational Phase: Excavations, Stockpiling and Transporting of gravel material</p> <p>Decommissioning Phase: Sloping and Landscaping during rehabilitation, Replacing the topsoil and revegetating the disturbed area</p>	6	2	1	4	36	M	<ul style="list-style-type: none"> Topsoil will be removed over the section to be widened and stored in a perimeter berm. The height of the topsoil berm will not exceed 3m. The topsoil berm will be inspected for erosion daily. Minimal amounts of topsoil shall be lost due to erosion, either by wind or water. This can be facilitated through the grassing of topsoil stockpiles. Condition of soil in walk or drive areas should be checked daily for erosion. Access road condition will be checked daily. If erosion is noted at walk and drive areas, access road or topsoil berms, the erosion channel will be fixed by placing cut vegetation, sandbags or rocks within the erosion channel and the cause of the erosion will be 	4	2	1	3	21	L	

POTENTIAL ENVIRONMENTAL IMPACT	ACTIVITY	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION						RECOMMENDED MITIGATION MEASURES/ REMARKS	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION						
		M	D	S	P	TOTAL	SP		M	D	S	P	TOTAL	S P	
								mitigated through the creation of runoff channels.							
NOISE															
Possible Noise Impact	<p>Construction Phase: Vegetation, stripping, stripping and stockpiling of topsoil, subsoil, overburden and spoil</p> <p>Operational Phase: Excavations, Stockpiling and Transporting of gravel material</p> <p>Decommissioning Phase: Sloping and Landscaping during rehabilitation, Replacing the topsoil and revegetating the disturbed area</p>	6	2	2	5	50	M	<ul style="list-style-type: none"> The working hours shall be limited to between 07:00 hrs and 18:00 hrs on weekdays, and 07:00 hrs and 16:00 hrs on Saturdays, or as per contract documentation. Vehicles must be driven at a moderate speed (50 kph) on private roads. Noise generated from heavy vehicles shall only be carried out during normal working hours. Extended working hours will be in accordance with contract documentation. SANRAL shall be obligated to maintain vehicles used at the site in a good condition; SANRAL will be obliged to ensure that all personnel on site apply occupational health and safety requirements with respect to hearing protection. 	4	2	2	5	40	L	

POTENTIAL ENVIRONMENTAL IMPACT	ACTIVITY	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION						RECOMMENDED MITIGATION MEASURES/ REMARKS	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION					
		M	D	S	P	TOTAL	SP		M	D	S	P	TOTAL	S P
VISUAL														
Possible visual impacts	<p>Construction Phase: Vegetation, stripping, stripping and stockpiling of topsoil, subsoil, overburden and spoil</p> <p>Operational Phase: Excavations, Stockpiling and Transporting of gravel material</p> <p>Decommissioning Phase: Sloping and Landscaping during rehabilitation, Replacing the topsoil and revegetating the disturbed area</p>	6	5	1	4	48	M	<ul style="list-style-type: none"> Where areas are going to be disturbed through the destruction of vegetation, use appropriate indigenous and endemic plants to replace screening vegetation lost. If practically possible, locate construction camps in areas that are already disturbed or where it isn't necessary to remove established vegetation. Keep the construction sites and camps neat, clean and organised (i.e. no littering) in order to portray a tidy appearance. In visually sensitive areas screen the construction camp and lay-down yards by enclosing the entire area with a dark green or black shade cloth of no less than 2 m height. Maintain natural vegetation where possible. Rehabilitate disturbed areas as soon as practically possible after construction. This should be done to restrict extended periods of exposed soil. 	4	4	1	4	36	M

POTENTIAL ENVIRONMENTAL IMPACT	ACTIVITY	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION						RECOMMENDED MITIGATION MEASURES/ REMARKS	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION					
		M	D	S	P	TOTAL	SP		M	D	S	P	TOTAL	SP
								<ul style="list-style-type: none"> Utilise existing screening features such as dense vegetation stands or topographical features to place the construction camps and lay-down yards out of the view of sensitive visual receptors. Where vegetation clearance must be done for safety reasons, this should be kept to a minimum. Hydro-seeding must be undertaken as soon as possible after rehabilitation has commenced. The success of hydro-seeding must be monitored over a period of 1 year and be repeated in areas of low success. 						
AQUATIC AND TERRESTRIAL ECOLOGY														
Possible impacts on terrestrial ecology	<p>Construction Phase: Vegetation, stripping, stripping and stockpiling of topsoil, subsoil, overburden and spoil</p> <p>Operational Phase: Excavations, Stockpiling and Transporting of gravel material</p>	6	5	1	4	48	M	<ul style="list-style-type: none"> Some protected trees will be removed or destroyed. The footprint of the project is small in relation to the area and mostly within an already disturbed and altered environment. Three main rivers will be crossed along with a few small semi-perennial streams and drainage lines. The long- 	4	2	1	4	28	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							<p>term impact of the upgrade of the actual watercourse crossings is a positive impact, because it will improve water flow, remove blockages, stabilise stream banks, reduce existing erosion of stream banks and riparian areas.</p> <ul style="list-style-type: none"> Minimal riparian vegetation will be lost (need to be removed) as the project involves the upgrade and not totally new crossings. The upgrade will also not include little to no need to remove trees and other riparian vegetation. Any temporary storage, lay-down areas or accommodation facilities to be setup in existing built-up areas or disturbed areas. No temporary storage areas, laydown areas or site offices are allowed within a 100m of the edge of any river, stream or distinctive drainage line. No temporary storage areas, laydown areas or site offices are allowed within a 100m of the edge of any river, stream or distinctive drainage line. That is, a 100m buffer zone (no-go zone) for these sites are required along all watercourses. 						

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

POTENTIAL ENVIRONMENTAL IMPACT	ACTIVITY	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION						RECOMMENDED MITIGATION MEASURES/ REMARKS	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION					
		M	D	S	P	TOTAL	SP		M	D	S	P	TOTAL	S P
								<p>100m buffer zones around watercourses in which no temporary laydown areas, site offices or campsites may be set up.</p> <ul style="list-style-type: none"> An independent ECO is recommended to monitor operations and ensure that recommended mitigating measures, including buffer zones, are implemented and adhered to. 						
HYDROCARBON SPILLAGES														
Hydrocarbon spillage	<p>Construction Phase: Vegetation, stripping, stripping and stockpiling of topsoil, subsoil, overburden and spoil</p> <p>Operational Phase: Excavations, Stockpiling and Transporting of gravel material</p> <p>Decommissioning Phase: Sloping and Landscaping during rehabilitation, Replacing the topsoil and revegetating the disturbed area</p>	6	3	2	3	27	L	<ul style="list-style-type: none"> All heavy vehicles, excavators and generators used for the project will be in good working condition. A drip tray will be available to place underneath heavy vehicles while the vehicles are parked at night. Should a vehicle have a break down, it will be serviced immediately. If soil contamination with diesel and oils occurred, the spill will be cleared up promptly. If the spill is small, it will be cleaned with a spill kit. if the spill is large, a spill clean-up company will be used to clean-up the spill; Proper functioning of heavy vehicles will be ensured. 	4	2	1	2	14	L

POTENTIAL ENVIRONMENTAL IMPACT	ACTIVITY	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION						RECOMMENDED MITIGATION MEASURES/ REMARKS	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION						
		M	D	S	P	TOTAL	SP		M	D	S	P	TOTAL	SP	
ALIEN VEGETATION															
Possible alien vegetation infestation	<p>Construction Phase: Vegetation, stripping, stripping and stockpiling of topsoil, subsoil, overburden and spoil</p> <p>Operational Phase: Excavations, Stockpiling and Transporting of gravel material</p> <p>Decommissioning Phase: Sloping and Landscaping during rehabilitation, Replacing the topsoil and revegetating the disturbed area</p>	6	2	1	4	36	M	<ul style="list-style-type: none"> • Every 3 months casual labour will be employed to circumnavigate the site to hand pull out known alien vegetation that may have established in the disturbed area. • Casual labour will be provided with photographs of the alien vegetation that could establish. 	4	2	1	2	14	L	

POTENTIAL ENVIRONMENTAL IMPACT	ACTIVITY	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION						RECOMMENDED MITIGATION MEASURES/ REMARKS	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION					
		M	D	S	P	TOTAL	SP		M	D	S	P	TOTAL	S P
SANITATION FACILITIES														
Provision and management of sanitation facilities	All phases	8	2	1	5	55	M	<ul style="list-style-type: none"> Chemical toilet facilities shall preferably be used on site. The toilets shall be services every second week by a service provider. 	4	2	1	4	28	L
HERITAGE, ARCHAEOLOGICAL AND PALEONTOLOGICAL ISSUES														
Archaeological sites and graves to be affected	<p>Construction phase</p> <p>The Dorps, Rooisloot and Dithokeng River bridges are to be demolished and new bridges be constructed.</p> <p>Graves in an informal cemetery adjacent to the N11 Section 13 are close to the road servitude.</p>	6	5	1	5	60	H	<p>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.</p> <p>A number of burial sites have been identified alongside the road, but all are more than 70m from the fence demarcating the road reserve. The possibility that the proposed road works would have an impact on them is therefore viewed to be very low.</p>	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
								<p>The existing bridges to be demolished and replaced shows no interesting or unique technological or engineering features and no significant event or person could be linked to it. However, as it is 60 years old, it enjoys general protection status under the Heritage Act. It is therefore recommended that it is documented (mapped and photographed) by a heritage specialist</p> <ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Appropriate safety clothing will be worn at all times i.e. head gear, shoes, ear plugs. 	6	5	1	2	24	L

10. ALTERNATIVES CONSIDERED

Motivation for preferred site: The N11 Section 13 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

The preferred alternative is a design alternative incorporating the three river crossings on the project.

Three existing bridges are to be decommissioned, demolished and replaced by new bridges. The three bridges are the Dorps River, Rooisloot River and the Dithokeng River bridges. The existing bridges are aged, low capacity structures in a relatively poor condition and will require major upgrades to be in line with the rest of N11 Section 13 upgrading initiative.

Dorps River Bridge:

According to the hydraulic performance of the bridge structure it was found that the bridge capacity is inadequate to accommodate the required design flood frequencies in accordance with the Drainage Manual (SANRAL, 2006) for Classes 2, 3 and 4 road categories.

It is proposed that the existing bridge be demolished and replaced with a structure with additional bridge together with river training and raising the vertical alignment of the road to achieve the hydraulic capacity complying with the requirements for a Class 2 road.

The properties adjacent to the river are below the 1:50 year floodline and separate investigations to safe guarding these properties are suggested, for example the determination of floodlines and in depth discussions with the local authorities and the Department of Water Affairs (DWA). SANRAL should notify the Local Authorities of the existing risk in terms of flooding.

As an additional measure a berm with top level 1083.75 has to be provided directly upstream of the bridge to prevent water from overflowing the river bank in a north westerly direction along the road reserve.

Rooisloot River Bridge

According to the hydraulic performance of the bridge structure it was found that the bridge capacity is inadequate to accommodate the required design flood frequencies in accordance with the Drainage Manual (SANRAL, 2006) for Classes 2, 3 and 4 road categories.

It is proposed that the existing bridge be demolished and replaced with a structure with additional or wider spans together with raising the vertical alignment of the road in accordance with the requirements for a Class 2 road category as contained in the SANRAL Drainage Manual.

Dithokeng River Bridge

It was found that the bridge capacity is inadequate to accommodate the required design flood frequencies in accordance with the Drainage Manual (SANRAL, 2006) for a Class 2, road category it is proposed that the existing bridge be demolished and replaced with a new structure In order to comply with the requirements for a Class 2 road category and to accommodate the newly proposed road cross section.

b) Design Alternative 1

- Upgrading of the existing bridge by raising the deck soffit.

This alternative, although less costly than the preferred alternative, did not address increased traffic capacity and improvement of natural stream flow as to curb flooding of culverts and adjacent properties.

c) Design alternative 2

- Upgrading the existing bridge by raising the deck soffit and add more spans.

This alternative, although less costly than the preferred alternative, did not address increased traffic capacity and improvement of natural stream flow as to curb flooding of culverts and adjacent properties.

d) No-go Alternative

Should the project not proceed the traffic on the N11 Section 13 could experience increasingly unsafe driving conditions neglecting traffic capacity, natural stream flow causing flooding of areas in close proximity to the bridges.

The proposed project will accommodate the predicted increase in traffic volume and avoid high driver frustration. Maintenance frequency and cost, road user frustration and safety levels and further deterioration of the stream flow and increased flooding would impact adversely on the Applicant's objective to provide road users with a high quality, safe national road infrastructure.

The current high volumes of heavy vehicle traffic on the N11 Section 13 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 24: Site Selection Matrix

Criteria	Preferred Alternative	Design	Design Alternative 1
Cost	Demolishing of existing bridges and construction of new, high capacity bridges 40.7 (Rm)		It is estimated that the cost of upgrading the bridges could be up to 75% less but none of the alternatives complied with the SANRAL

		specifications for national road infrastructure
Design Cost Increase	+75%	-75%
Accommodation of increased traffic capacity	Can accommodate increased capacity of the new road as per SANRAL specifications..	The upgrading of the bridges could increase the traffic capacity but did not meet the SANRAL specifications for national road infrastructure..
Drainage in high rainfall area	The drainage capacity will be exponentially improved preventing flooding of the area.	No improvement of the existing very poor drainage conditions with recurrent flooding of the area.

10.2 Advantages and Disadvantages of Alternatives Considered

a. Preferred design alternative

In this option the existing river crossings over the Dorps; Rooisloot and Dithokeng Rivers will be replaced by new, high capacity bridges. The existing bridges does not comply with the SANRAL specifications for national road infrastructure and will therefore be demolished and replaced with bridge infrastructure in compliance with SANRAL standards

Advantages

The advantages of the preferred alternative are the following:

- This option will provide safe and controlled access to and on the water crossings.
- The new bridges will comply with SANRAL specifications for national road infrastructure.
- The new bridge infrastructures will be in compliance with the N11 Section 13 road upgrades.
- The new bridge decks will be raised allowing improved drainage capacity.
- Increased drainage capacity will reduce the possibility of flooding of areas in close proximity to the bridges.
- Training of the river banks in close proximity of the bridges will improve natural stream flow and remove barriers influencing natural flow.
- The safety to the traveling public will be significantly improved as the traffic will be flowing optimally.
- This option accommodates future capacity upgrades if required.
- It is anticipated that the traffic accidents that occur on this road will be reduced with this option.
- It is anticipated that the replacement of the existing low capacity bridges with new high capacity bridges 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 and bridges, 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 new bridges will allow for safe pedestrian passage across the waterway.
- The environmental impact will be increased during the construction phase but will be exponentially decrease once construction is completed.

Disadvantages

The disadvantages of this alternative are the following:

- This is a costly alternative.
- Traffic flow will be disturbed over a longer period.

b. Design Alternative 1

The upgrading of the bridges will entail the marginal expansion of the bridge deck and increase traffic capacity within safe standards. The upgrade will however not comply with SANRAL specifications for a Class 2 national route.

Advantages

The advantages of this alternative are the following:

- The upgrading of the bridges is the most cost effective alternative.
- Traffic capacity will be increased but not in compliance with SANRAL specifications
- 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 option cannot accommodate current and future traffic capacity expansion.
- It is not considered a safe option as there are no safe pedestrian passage available.
- The existing drainage capacity cannot prevent flooding in areas in close proximity to the bridges.
- The N11 Section 13 will be upgraded to SANRAL specifications but the existing bridges cannot be expanded to comply with SANRAL specifications for national route infrastructure.
- Although the environmental impact by upgrading the bridges will be low the impact of insufficient drainage capacity on the river flow and riverbanks will remain unchanged.

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.
- The new bridges will improve traffic capacity and water flow capacity.

10.4 Socio-Economic Parameters

The upgrading of the N11 Section 13, including the replacement of the existing bridges with new, high capacity road infrastructure will contribute to economic growth in the area. 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% is 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 25: Summary of Specialist Reports

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE BAR REPORT (Mark with an X Where applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED.
<p>Terrestrial and Aquatic Ecological Assessments for the Proposed Upgrade and Rehabilitation of the National Route N11 Section 13 from Mokopane (km 1,3) to the Groot Sandsloot River (km 24,0) in the Mogalakwena Local Municipality of the Waterberg District Municipality, Limpopo Province</p> <p>by Flori Scientific Services, 2023</p>	<p>The recommendations of the study are as follows:</p> <ul style="list-style-type: none"> • All recommended mitigating measures as proposed in this study and report should be implemented if the findings of this report are to remain pertinent. All of the recommended mitigating measures must form part of the conditions of the EMP. • Some of the recommended mitigating measures are: <ul style="list-style-type: none"> ○ Any temporary storage, lay-down areas or accommodation facilities to be setup in existing built-up areas or disturbed areas. No temporary storage areas, laydown areas or site offices are allowed within a 100m of the edge of any river, 	<p>x</p>	<p>EMPr</p>

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE BAR REPORT (Mark with an X Where applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED.
	<p>stream or distinctive drainage line.</p> <ul style="list-style-type: none"> ○ No temporary storage areas, laydown areas or site offices are allowed within a 100m of the edge of any river, stream or distinctive drainage line. That is, a 100m buffer zone (no-go zone) for these sites are required along all watercourses. ○ Ensure small footprint during construction phase ○ An Erosion Plan to be implemented and monitored during the construction phase, especially in the area of riverbanks. The erosion potential is moderate to low. This also to further reduce the potential of siltation of the rivers. The plan need only be basic, but needs to be monitored. ○ All hazardous materials must be stored appropriately to prevent these contaminants from entering the water environment; 		

<p style="text-align: center;">LIST OF STUDIES UNDERTAKEN</p>	<p style="text-align: center;">RECOMMENDATIONS OF SPECIALIST REPORTS</p>	<p style="text-align: center;">SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE BAR REPORT (Mark with an X Where applicable)</p>	<p style="text-align: center;">REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED.</p>
	<ul style="list-style-type: none"> ○ All excess materials brought onto site for construction to be removed after construction and their removal seen as part of the construction phase. ○ No open trenches or mounds of soils to be left. All disturbed areas, including temporary laydown areas to be reshaped / re-contoured to blend in with the surrounding topography. ○ Rehabilitation plan for disturbed areas to be compiled and implemented as part of the construction phase. ○ No construction vehicles may drive through any streams or simply create new crossings outside of the proposed plans and EMP conditions, which might include WUL or GA conditions. Existing roads to be used as much as possible, but these roads to be maintained during all phases of the project. 		

<p style="text-align: center;">LIST OF STUDIES UNDERTAKEN</p>	<p style="text-align: center;">RECOMMENDATIONS OF SPECIALIST REPORTS</p>	<p style="text-align: center;">SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE BAR REPORT (Mark with an X Where applicable)</p>	<p style="text-align: center;">REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED.</p>
	<ul style="list-style-type: none"> ○ No concrete or mounds of building sand and other materials may be stored temporary during the construction phase within 32m of any watercourses, because a heavy rainstorm can wash these materials into the watercourse. ○ Temporary access roads (if any) and temporary laydown sites, site office areas, etc. need to be monitored, maintained and rehabilitated at the end of the construction phase as part of the rehabilitation process. ○ There are a few scattered marula trees in the study area. The marula is a national protected tree. Some are going to need to be removed and this will require a prior permit application process. ○ A General Authorisation (GA) is going to be required for the project. 		

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE BAR REPORT (Mark with an X Where applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED.
Phase 1 Cultural Heritage Impact Assessment: The proposed upgrade of Section 13 of the N11, Limpopo Province by Dr J van Schalkwyk, 2023	<p>It is proposed that three existing bridges along the route, the Dorps River, Rooisloot River and Dithokeng River bridges are to be demolished and replaced by new, higher capacity bridges.</p> <p><u>Dorps River bridge:</u> This bridge shows no interesting or unique technological or engineering features and no significant event or person could be linked to it. Management Measures: As the bridge is 60 years old, it enjoys general protection status under the Heritage Act. It is therefore recommended that it is documented (mapped and photographed) by a heritage specialist before it is upgraded. As the bridge will be demolished and replaced by a new bridge, a permit for mitigation and/or destruction must be obtained from SAHRA/LIHRA prior to any work being carried out.</p> <p><u>Rooisloot River bridge:</u></p>	X (all were included)	EMPr

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE BAR REPORT (Mark with an X Where applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED.
	<p>This bridge shows no interesting or unique technological or engineering features and no significant event or person could be linked to it.</p> <p>Management Measures: As the bridge is 60 years old, it enjoys general protection status under the Heritage Act. It is therefore recommended that it is documented (mapped and photographed) by a heritage specialist before it is upgraded.</p> <p>As the bridge will be demolished and replaced by a new bridge, a permit for mitigation and/or destruction must be obtained from SAHRA/LIHRA prior to any work being carried out.</p> <p><u>Dithokeng River bridge:</u></p> <p>This bridge shows no interesting or unique technological or engineering features and no significant event or person could be linked to it.</p> <p>Management Measures:</p>		

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE BAR REPORT (Mark with an X Where applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED.
	<p>As the bridge is 60 years old, it enjoys general protection status under the Heritage Act. It is therefore recommended that it is documented (mapped and photographed) by a heritage specialist before it is upgraded.</p> <p>As the bridge will be demolished and replaced by a new bridge, a permit for mitigation and/or destruction must be obtained from SAHRA/LIHRA prior to any work being carried out.</p> <p><u>The old Gada Roller Mill.</u> The structure is older than 60 years and therefore protected with medium significance.</p> <p>Management measures:</p> <p>This site should be fenced off permanently by means of a wire fence, which, in this particular case, would be the road reserve boundary fence. This fence can be made more visible by the application of danger tape for the duration of construction activities</p>	EMPr	

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE BAR REPORT (Mark with an X Where applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED.
	<p><u>The informal burial site/cemetery</u> The site is located adjacent to the route and entrenches on the road reserve illegally.</p> <p>Management measures: The burial site should be fenced off permanently by means of a wire fence, which, in this particular case, would be the road reserve boundary fence. This fence can be made more visible by the application of danger tape for the duration of construction activities.</p> <p>A specialist archaeologist specialising in affected burial sites should be appointed to apply and obtain a permit for mitigation and/or destruction from SAHRA/LIHRA prior to any work being carried out.</p> <p>Control measures:</p> <p>A person or entity, e.g. the Environmental Control Officer, should be tasked to take responsibility for the</p>	EMPr	

<p style="text-align: center;">LIST OF STUDIES UNDERTAKEN</p>	<p style="text-align: center;">RECOMMENDATIONS OF SPECIALIST REPORTS</p>	<p style="text-align: center;">SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE BAR REPORT (Mark with an X Where applicable)</p>	<p style="text-align: center;">REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED.</p>
	<p>heritage sites and should be held accountable for any damage.</p> <p>Known sites should be located and isolated, e.g. by fencing them off. All construction workers should be informed that these are no-go areas, unless accompanied by the individual or persons representing the Environmental Control Officer as identified above</p> <p>.</p> <p>In areas where the vegetation is threatening the heritage sites, e.g. growing trees pushing walls over, it should be removed, but only after permission for the methods proposed has been granted by SAHRA. A heritage official should be part of the team executing these measures.</p>		

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE BAR REPORT (Mark with an X Where applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED.
<p>The Upgrade of the N11 Section 13 National Route between Mokopane (Km 1.3) and the Grootssandsloot River (Km 24.0)</p> <p>Palaeontological Impact Assessment: Phase 1 Field Study Fourie, H. Dr</p>	<p>Fossils in South Africa mainly occur in rocks of sedimentary nature and not in rocks from igneous or metamorphic nature. Therefore, if there is the presence of Karoo Supergroup strata the palaeontological sensitivity can generally be LOW to VERY HIGH, and here locally in the development area VERY LOW for the Bushveld Complex and HIGH for the Chuniespoort Group. All areas were accessible, but very few outcrops are present on the shoulder of the road, mostly isolated rocks of granite and dolomite. The topography is undulating. Fossils were not located. The Project includes one locality Option present on the Chuniespoort Group and Bushveld Complex</p> <p>The recommendations are:</p> <ol style="list-style-type: none"> 1. Mitigation will be needed if fossils are found during the development. 2. No consultation with parties was necessary. The Environmental Control Officer must familiarise him- or herself with the formations 	<p>X All included</p>	<p>EMPr</p>

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE BAR REPORT (Mark with an X Where applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED.
	<p>present and its fossils and follow protocol.</p> <ol style="list-style-type: none"> 3. The development may go ahead with caution due to the possible presence of dolomites. 4. The ECO must survey for fossils before and or after clearing, digging, drilling or excavating. 5. The EMPr already covers the conservation of heritage and palaeontological material that may be exposed during construction activities. For a chance fossil find, the protocol is to immediately cease all construction activities, construct a 30 m no-go barrier, and contact SAHRA for further investigation. 6. Care must be taken during the dolomite risk assessment as stromatolites may be present (according SANS 1936-1 (2012)) not to destroy any stromatolites 7. . 		
Rehabilitation and Upgrade of the N11 Section 13 Mokopane	The proposed upgrade of Section 13 of the N11 (km1 310 to km24.0) road will have an	X All recommendations included	EMPr

<p style="text-align: center;">LIST OF STUDIES UNDERTAKEN</p>	<p style="text-align: center;">RECOMMENDATIONS OF SPECIALIST REPORTS</p>	<p style="text-align: center;">SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE BAR REPORT (Mark with an X Where applicable)</p>	<p style="text-align: center;">REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED.</p>
<p>(km1.310 and Groot Sandsloot River (km 24.0) Mokopane Noise Impact Assessment. BJB van der Merwe of dBAcoustics</p>	<p>impact on residential areas in close proximity to the site during the construction phase of the project. The noise increase at the remainder of the noise receptors during the construction phase will be below 7.6dBA and the activities at the construction camp will be insignificant. The impact on the environment and the noise receptors can however be controlled or minimized by means of the type of road surface to be used. The distance between the proposed road and the noise receptors and the wind direction will play an important role in noise propagation and how the continuous noise from the traffic will be perceived by communities along the route. The management of the activities during the construction phase and the operational phase of the project will ensure how successful the project will be in terms of the increase of the prevailing ambient noise levels and how the residents will perceive the increase in the noise level. There will be a noise increase in the vicinity of any road as it is a linear noise source depending on the distances the</p>		

<p style="text-align: center;">LIST OF STUDIES UNDERTAKEN</p>	<p style="text-align: center;">RECOMMENDATIONS OF SPECIALIST REPORTS</p>	<p style="text-align: center;">SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE BAR REPORT (Mark with an X Where applicable)</p>	<p style="text-align: center;">REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED.</p>
	<p>noise receptors are situated from the road. The receptors close to the road (< 100m) will experience a noise intrusion whereas the noise receptors (≥ 100m) will show an increase but not exceeding the threshold value of 7.0dBA. The potential noise intrusion from the road can however be controlled by means of approved acoustic screening measures, state of the art equipment, proper noise management principles and compliance to the Noise Regulations, 1994 and the International Finance Corporation’s Environmental Health and Safety Guidelines. The proposed noise management plan must be in place during the construction and operational phases to identify any noise increase on a pro-active basis and to address the problem accordingly. The proposed N11-Section 13 upgrade project will be in line with the environmental noise standards and guidelines provided that all the noise mitigatory measures are in place and that the Noise Impact Management Plan (NIMP) for the project is adhered to.</p>		

12. ENVIRONMENTAL IMPACT STATEMENT

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

Almost the entire study area is transformed or highly degraded and the environmental impact is deemed to be low. There are no areas of pristine grassland or habitats in the study site. No Red Data Listed (RDL) or Orange Data Listed (ODL) plants were observed in the study site. None are expected to occur.

There are no 'high' sensitive habitats present on site, with the exception of the watercourse crossings. Some marula trees (*Sclerocarya birrea*) were identified within the proposed expanded road reserve. The majority of the trees will not be affected by construction. The few affected trees can only be disturbed/removed/replanted once a permit for such actions is issued. 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. The study area route crosses over the Dorps; Rooisloot and Dithokeng Rivers. No wetlands (besides the river areas) will be affected by the project. Mitigation measures are included in the EMP to minimise the impact.

The three affected bridges across the Dorps; Rooisloot and Dithokeng Rivers will be demolished and replaced with new, higher capacity structures. The bridges are older than 60 years and a permit needs to be obtained from SAHRA.

The informal burial site with approximately 300 graves is located adjacent to the existing road reserve. Some more recent graves might illegally encroach into the road reserve. These graves might be affected by the construction activities and will have to be relocated. A permit from SAHRA will have to be applied for before any such action could commence.

The old mill structure, adjacent to the current road reserve will not be affected by the construction and should be protected by fencing off the area.

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

The preferred alternative (widening of the road surface and splitting the lanes via a median, replacement of the Dorps; Rooisloot and Dithokeng River bridges with new structures and introducing new intersections as controlled access points onto the N11)) is favoured for the following reasons:

- 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.

- Replacing the existing bridges over the Dorps; Rooisloot and Dithokeng Rivers with higher capacity bridges will not only improve traffic flow but will also substantially improve drainage and stream flow preventing flooding of the areas
- This option accommodates future capacity upgrades if required.
- 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.

12.1 Final Site Map

Please see the final site maps included in Appendix C.

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

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

- a. Dust Pollution
- b. Soil Erosion
- c. Noise Impact
- d. Visual impact
- e. Impact on terrestrial ecology;
- f. Impact on uncovered heritage aspects
- g. Contamination of site due to hydrocarbon spillage
- h. Emissions from heavy vehicles
- i. Water pollution

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

The positive impacts associated with the project are the following:

- The safety to the traveling public will be improved.
- Improved traffic flow, particularly during peak periods;
- Reduced congestion is anticipated;
- Replacing the existing bridges over the Dorps; Rooisloot and Dithokeng Rivers with higher capacity bridges will not only improve traffic flow but will also substantially improve drainage and stream flow preventing flooding of the areas

- 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 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

- The footprint of the project is small in relation to the area and mostly within an already disturbed and altered environment.
- The Dorps; Rooisloot and Dithokeng Rivers will be crossed and the existing, aged, low capacity bridges be replaced by new technology, high capacity structures. The long-term impact of the upgrade of the actual watercourse crossings is a positive impact, because it will improve water flow, remove blockages, stabilise stream banks, reduce existing erosion of stream banks and riparian areas.
- Minimal riparian vegetation will be lost although training of the river banks is required to improve the stream flow. The upgrade will also not include the need to remove trees and other riparian vegetation.
- Any temporary storage, lay-down areas or accommodation facilities to be setup in existing built-up areas or disturbed areas. No temporary storage areas, laydown areas or site offices are allowed within a 100m of the edge of any river, stream or distinctive drainage line.
- No temporary storage areas, laydown areas or site offices are allowed within a 100m of the edge of any river, stream or distinctive drainage line. That is, a 100m buffer zone (no-go zone) for these sites are required along all watercourses.
- Ensure small footprint during construction phase
- An Erosion Plan to be implemented and monitored during the construction phase, especially in the area of watercourses and steep gradients along escarpment edges. The erosion potential is moderate to low. The plan need only be basic, but needs to be monitored.

- All hazardous materials must be stored appropriately to prevent these contaminants from entering the water environment;
- All excess materials brought onto site for construction to be removed after construction and their removal seen as part of the construction phase.
- No open trenches or mounds of soils to be left.
- Rehabilitation plan for disturbed areas to be compiled and implemented as part of the construction phase.
- No construction vehicles may drive through any streams or simply create new crossings outside of the proposed plans and EMP conditions, which might include WUL or GA conditions. Existing roads to be used as much as possible, but these roads to be maintained during all phases of the project.
- No concrete or mounds of building sand and other materials may be stored temporary during the construction phase within 32m of any watercourses, because a heavy rainstorm can wash these materials into the watercourse.
- Temporary access roads (if any) and temporary laydown sites, site office areas, etc. need to be monitored, maintained and rehabilitated at the end of the construction phase as part of the rehabilitation process.
- An independent ECO is required for the duration of the construction phase.
- Some protected trees were identified within the proposed project area. Only a few of these trees will be affected by construction. All the protected trees should be properly marked and fenced off (danger tape). The few affected trees can only be disturbed once a permit for the action has been obtained.
- A General Authorisation (GA) is going to be required for the project.

Operational Phase

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

Rehabilitation of Temporary Laydown areas

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

f. Possible Impact on Uncovered Cultural or Archaeological site

- It is recommended that the identified burial sites are retained, and it should be fenced off for the duration of the road improvement activities, leaving a buffer zone of at least 20 metres from the outer edge of the graves. If the graves cannot be retained, it should be relocated, but only on condition of following the correct procedures.
- 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.
- 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 physically remove identified 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 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.
- d. It is recommended that the identified burial sites are retained, and be fenced off for the duration of the road improvement activities, leaving a buffer zone of at least 20 metres from the outer edge of the graves. If the graves cannot be retained, it should be relocated, but only on condition of following the correct procedures

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;
- b. All activities must take place in accordance with the approved EMPr;
- c. It is recommended that the identified burial sites are retained, and be fenced off for the duration of the road improvement activities, leaving a buffer zone of at least 20 metres from the outer edge of the graves. If the graves cannot be retained, it should be relocated, but only on condition of following the correct procedures.
- d. Should other 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.

17. PERIOD FOR WHICH THE ENVIRONMENTAL AUTHORISATION IS REQUIRED

The period for which the environmental authorisation is required is 10 years. The date on which the activity will be concluded is unclear at this stage.

18. UNDERTAKING

I, Paul 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