SOUTH AFRICAN NATIONAL ROADS AGENCY SOC LIMITED (SANRAL)

STRATEGIC INFRASTRUCTURE PROJECT (SIP2)
PROPOSED CAPACITY UPGRADES TO THE N2 & N3

BASIC ASSESSMENT 5

PROPOSED CAPACITY UPGRADES TO THE N3 FROM LYNNFIELD PARK (KM 30.6) TO GLADYS MANZI (FORMERLY MURRAY) ROAD (KM 6.1)

DRAFT BASIC ASSESSMENT REPORT

DEA REF NO: 14/12/16/3/3/1/1966

DRAFT BASIC ASSESSMENT REPORT FOR PUBLIC REVIEW

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DEA REF NO: *TO BE ASSIGNED*

Report prepared for:

SANRAL SOC LIMITED
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Scottsville
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SANRAL
SOUTH AFRICAN NATIONAL ROADS AGENCY SOC LTD
BUILDING SOUTH AFRICA THROUGH BETTER ROADS

Report prepared by:

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acer AFRICA

October 2018

DRAFT BASIC ASSESSMENT REPORT FOR PUBLIC REVIEW

This Draft BAR has been placed at the following public places in the project area. It will be available to members of the public for the comment period of **25 October 2018 – 23 November 2018**.

Area	Venue	Street Address	Telephone Number
Camperdown	Camperdown Public Library	18 Old Main Road, Camperdown, 3720	031 785 9337
Ashburton	Ashburton Public Library	1 Wally Hayward Drive Ashburton Pietermaritzburg	033 326 1844
Msunduzi/ PMB	Bessie Head Library Msunduzi Public Library	260 Church Street, Pietermaritzburg, 3201	033 392 2634

YOUR COMMENTS PLEASE

Please submit your comments by no later than 23 November 2018 to:

Mareike Straueli ► P O Box 503, Mtunzini, 3867
► Tel: 035 340 2715 ► Fax: 035 340 2232 ► E-mail: N3batch1@acerafrica.co.za

Please note that, in line with the EIA Regulations, all registered interested and affected parties are required to disclose any direct business, financial, personal or other interest which that party may have in the approval or refusal of the application.

EXECUTIVE SUMMARY

INTRODUCTION AND LEGAL REQUIREMENTS

The South African National Roads Agency SOC Limited (SANRAL) intends to widen the N2 and N3 national roads between the Port of Durban and Pietermaritzburg, KwaZulu-Natal. The proposed project requires environmental authorisation from the national Department of Environmental Affairs. **This report is a Basic Assessment Report (BAR) for a section of the N3 capacity improvements between Lynnfield Park and Gladys Manzi (formerly Murray) Road.** The BAR has been prepared on behalf of SANRAL by ACER (Africa) Environmental Consultants (ACER), in terms of the requirements of the Environmental Impact Assessment (EIA) Regulations of 2014 (as amended), published under the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA). The Basic Assessment process has included technical investigations and public participation in accordance with GN R. 326. This Draft BAR has been made available for public review and comment during the period **25 October to 23 November 2018.**

Further to the requirement for environmental authorisation, several other environmental laws, policies and guidelines are applicable to this project and are listed in Table 7 of this report.

PROJECT NEED AND DESIRABILITY

The N2 and N3 carry large volumes of traffic, with a high percentage of heavy vehicles carrying freight to and from the Port of Durban, forming the backbone of South Africa's freight network. Sections of these national roads are operating at full or near full capacity. Traffic studies commissioned by SANRAL have projected traffic growth figures, which indicate the need to provide additional lanes to alleviate current traffic congestion and to accommodate future growth and improve road safety and efficiency. SANRAL (Eastern Region), therefore, proposes to provide additional lanes along a section of the N2 near the Port of Durban and a section of the N3 from the N2/N3 (E.B Cloete) interchange (I/C) on to Pietermaritzburg. The proposed capacity improvements, which are divided into sections and covered ultimately by several engineering work packages, will be implemented at different stages according to timing priorities and factors related to funding availability (albeit the reality is that there will be overlapping construction periods between the different work packages). The proposed capacity improvements will improve safety and accommodate traffic growth to 2047.

Importantly, the upgrades are planned in line with South Africa's Strategic Infrastructure Projects (SIPs) as described in the National Development Plan, 2011. Specifically, the proposed capacity improvements form the backbone of SIP2, which focuses on strengthening the Durban-Free State-Gauteng logistics and industrial corridor. In line with SIP2 goals, the capacity improvements will improve access to Durban's export and import facilities. National roads are essential infrastructure supporting the economy of the country and, therefore, of benefit to all citizens of South Africa either directly or indirectly. As such, this project has been taken into account by, and is compatible with, national, provincial and municipal development and planning frameworks.

PROJECT LOCATION AND MAIN COMPONENTS

The section of national road dealt with in this Basic Assessment falls between Lynnfield Park and Gladys Manzi Road (see locality figure overleaf). It is located primarily within the uMsunduzi Local Municipality and to a small extent, the Mkhambathini Local Municipality, both of which fall under the uMgungundlovu District Municipality, KwaZulu-Natal.

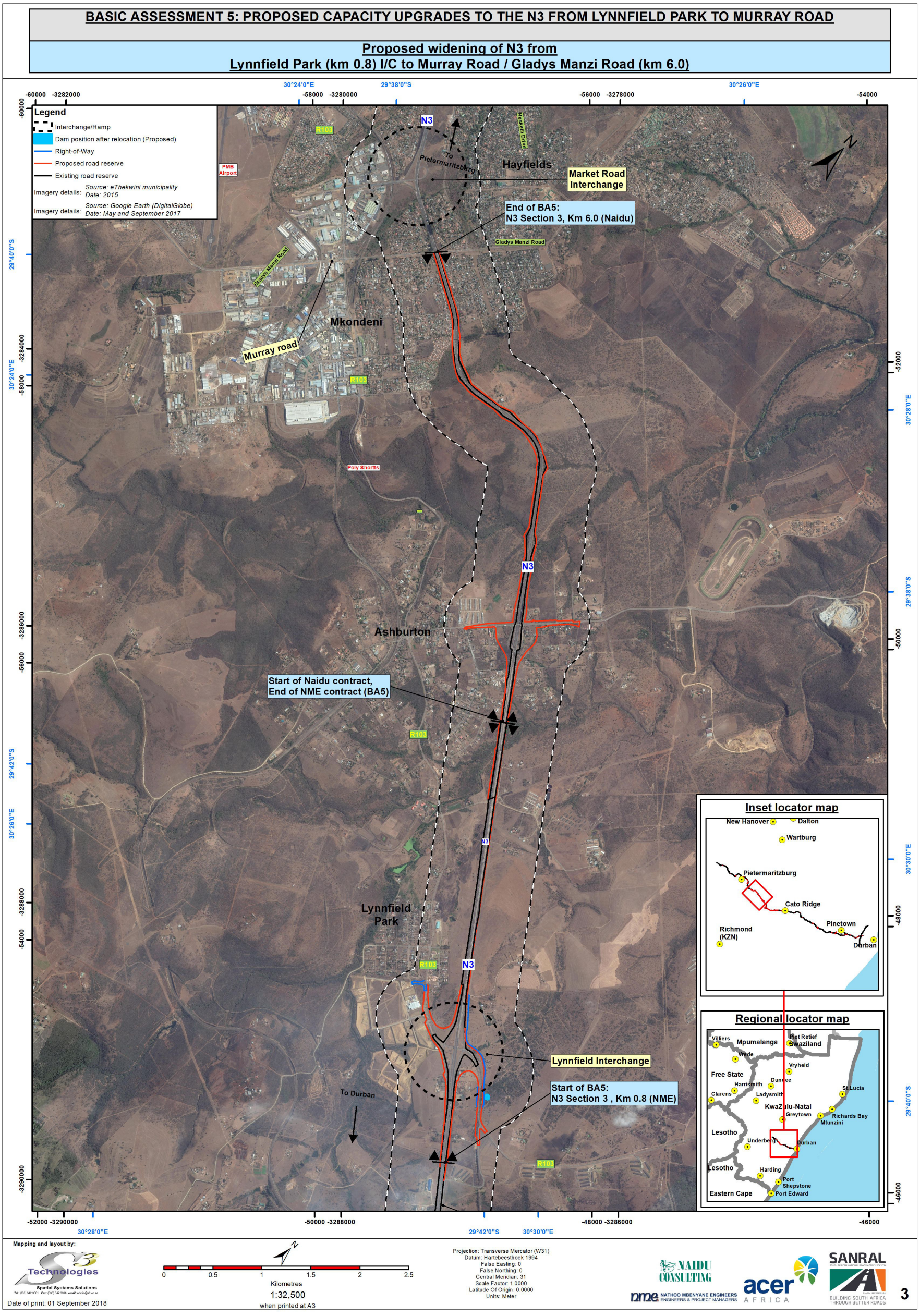


Figure 1 Location of proposed capacity upgrades to the N3 from Lynnfield Park to Gladys Manzi Road

Road sections to undergo construction are:

- N3 from the south of Lynnfield Park I/C to south of the Ashburton I/C.
- N3 from the Ashburton I/C to Gladys Manzi Road.

Within these sections, the major interchanges to be upgraded are:

- Lynnfield Park (N3/Wally Hayward Drive).
- Ashburton (N3/Pope Ellis Drive).

Associated works include realignment of a short portion of the R103 and realignment or relocation of existing intersections and farm access roads near the Lynnfield Park I/C. Work on the two road contracts covered by this Basic Assessment (BA) are anticipated to commence during the first half of 2020, with the relocation of various services out of the road reserve commencing beforehand, under a separate contract.

PROJECT ALTERNATIVES

In line with the EIA Regulations, several alternatives have been considered for the proposed project. Given that this project entails the upgrade of an existing national road, alternatives investigated by SANRAL have revolved mostly around technical engineering issues (road design, materials, etc.). However, it must be understood that the final project proposal for which environmental authorisation is requested presents only **one feasible overall design alternative** which has been selected based on detailed modelling to best meet traffic demands and road safety standards.

The No-Development alternative (not preferred) provides the baseline against which alternatives are assessed and also demonstrates the consequences of not authorising the development proposal.

THE RECEIVING ENVIRONMENT

The N3 section under consideration is part of a major transport and economic corridor. In this area, it passes through a mix of urban and agricultural land. Road widening will be restricted mainly to the median and the existing road reserves. However, sections of private and state-owned land will need to be acquired by SANRAL where widening cannot be accommodated within SANRAL's own properties. The project affects natural habitat, requiring vegetation clearance from narrow areas adjacent to the N3 both in and next to the road reserve. The N3 passes through Critical Biodiversity Areas in terms of the KZN Systematic Conservation Assessment. Approximately eight watercourses will be affected where road widening requires lengthening/upgrading of existing drainage structures. The Bellevue farmstead has been identified as a potentially affected cultural heritage resource.

PUBLIC PARTICIPATION PROCESS

The public participation process was designed and implemented to comply with the requirements of the EIA Regulations and NEMA. A detailed description is provided in Chapter 6 of this report.

ASSESSMENT METHODOLOGY

Issues and potential impacts of the project on the environment (and *vice versa*) were identified by way of field investigations, desktop studies and interaction with Interested and Affected Parties (I&APs). Key issues and impacts requiring further investigation were addressed by specialist studies and/or further detailed input from the environmental and technical team. Input from ACER's in-house specialists underwent independent review. Mitigation measures were identified with inputs from I&APs, the specialists, the design engineers and the Environmental Assessment Practitioner (EAP) team. Information was collated, evaluated and integrated, taking into account the specialist findings and recommended mitigation measures. Thereafter, each impact was assessed using the assessment conventions outlined in Table 14 of this report.

SUMMARY OF KEY ISSUES AND POTENTIAL IMPACTS ASSOCIATED WITH THE N2 AND N3 CAPACITY IMPROVEMENTS AND ASSESSMENT OF THE SIGNIFICANCE OF THE IDENTIFIED IMPACTS

The key issues identified and assessed during this Basic Assessment were formulated as eight questions. Associated potential impacts were identified and their significance assessed both before and after mitigation.

What economic and socio-economic benefits will result from the proposed widening/capacity improvements to the N2 and N3, at a local, regional and national scale?

- Employment creation, capacity building (+ve).
- Improved road safety (+ve).
- Reduced travel time (reduced traffic congestion and improved road conditions) (+ve).
- Improved transport corridor (+ve).
- Stimulation of the local, regional and national economy (+ve).

With management, these positive impacts are considered to be of medium and high significance.

What effects will the proposed widening/capacity improvements to the N2 and N3 have on adjacent properties, infrastructure and services, and* vice versa*?

- Increased interaction with landowners and entry onto private properties by investigative teams (e.g. geotechnical) (-ve).
- Potential loss and disruption due to expropriation[1] of properties (-ve).
- Resettlement of formal households and loss of privately owned land (-ve).
- Potential change in the values of adjacent properties (+ve or –ve).
- Damage to/disruption of services and infrastructure in and adjacent to the road reserve (-ve).
- Unintended damages to private property (-ve).
- Increased repairs and maintenance to adjoining affected roads (-ve).

With management, these impacts are considered to be of low significance.

What potential health, safety, security and nuisance impacts may be experienced as a result of the proposed widening/capacity improvements to the N2 and N3 during construction?

- The effect of increased noise on surrounding receivers during construction (-ve).
- Increased likelihood of road traffic accidents (-ve).
- Disruption to vehicle traffic and access (-ve).
- Health and safety risks to those in proximity to construction activities (-ve).
- Increased dust and vehicle emissions (-ve).
- Increased spread of disease (-ve).
- Increased risk of crime (increased security risk) (-ve).
- Potential protest action (-ve).
- Effects of disposal of large amount of demolition rubble (-ve).

With management, these impacts are considered to be of low and medium significance.

[1] It is expressly stated that expropriation discussed in this report is expropriation to be undertaken within the context and provisions of the current laws of the country. Expropriation for purposes of capacity improvements to the N2 and N3 is in no way linked to or to be interpreted within the context of the current debate concerning 'land expropriation without compensation'.

What negative impacts will the proposed widening/capacity improvements to the N2 and N3 have on the social environment, during operation?

- Increased safety and security risks to nearby properties and occupants during operation of the widened road (-ve).
- Increased noise where the distance from the road to receptors is reduced (-ve).
- Increased effect of vibrations from heavy vehicles, where the distance from the road to buildings is reduced (-ve).
- Risk of stormwater damage to adjacent properties (-ve).
- Increased proximity to vehicle emissions (-ve).

With management, these impacts are considered to be of low and medium significance.

What effects will the proposed widening/capacity improvements to the N2 and N3 have on cultural heritage resources?

- Increased risk of damage to structures on Bellevue Farmstead.

With management, these impacts are considered to be of low significance.

What effects will the proposed widening/capacity improvements to the N2 and N3 have on the biodiversity of protected areas, D'MOSS and other natural habitat (terrestrial/riparian)?

- Loss of topsoil (-ve).
- Destabilisation of banks, erosion and sedimentation (-ve).
- Loss/degradation of Disturbed Grassland/Thicket Mosaic (-ve).
- Loss/degradation of riparian thicket at Mpushini Crossing (-ve).
- Loss/degradation of a xeric cliff community (-ve).
- Loss/degradation of Bushveld/thornveld and grassland mosaic (-ve).
- Loss/degradation of riparian and wetland areas (-ve).
- Faunal mortalities and negative effect on local faunal populations due to disturbance, loss of habitat and poaching (-ve).

With management, the impacts are considered to be of low and medium significance.

What potential cumulative impacts can result from the proposed widening/capacity improvements to the N2 and N3?

A cumulative impact is an incremental impact on the environment that results from the impact of a proposed action when added to existing and reasonably foreseeable future actions. Cumulative effects can be both positive and negative. Also, the nature of cumulative impacts can be both temporary (i.e. impacts that are restricted to the construction period) and permanent (i.e. impacts that occur in both the construction and operation phases).

To enhance the positive impacts of the proposed widening/capacity improvements to the N2 and N3 and, thus, enhance positive cumulative effects, the project should be implemented efficiently according to best environmental practice and the infrastructure should be well maintained.

To minimise negative impacts of the proposed widening/capacity improvements to the N2 and N3 and, thus, its negative contributions towards cumulative effects on the environment, the project should be implemented with the application of recommended mitigation measures. There will also need to be sound co-ordination between contracts running concurrently.

What are the impacts of the No Development Alternative (not implementing widening/capacity improvements to the N2 and N3?

- Deferment/avoidance of the negative impacts of construction (social disruption, noise and nuisance, and destruction/disturbance of natural habitat) (+ve).
- Increased traffic congestion and increased commuter time (-ve).
- Decreased road safety (-ve).
- Disadvantages to the local, regional and national economies (-ve).

Apart from the deferment of negative construction impacts, according to the assessment, the predicted impacts of the No Development Alternative are considered to be of high (-ve) significance without mitigation (mitigation would be implementation of the capacity improvements).

ENVIRONMENTAL IMPACT STATEMENT

Effects of the project on the social environment and vice versa

The project constitutes major roadworks to be implemented on national roads carrying high volumes of traffic, including heavy vehicles. As such, during the construction period approximately 36 to 42 months), there will be numerous negative impacts on the social environment, which will be experienced by both road users and adjacent property owners/occupiers on the affected sections. These will largely be nuisance impacts related to the disruption of traffic flows, road access, increased noise, increased crime risks and general construction related disturbances. The road restrictions will pose higher road safety risks to motorists and pedestrians. Equally, the high traffic volumes and space constraints will make it more difficult for the project team to execute construction efficiently.

Existing services in the current road reserve will have to be relocated and related disruptions may ensue. While all these impacts will be temporary, it can be anticipated with a high level of certainty that they will affect thousands of road users and local residents on a daily basis at varying intensities over a period of several years. Good co-ordination between contracts running concurrently, therefore, will be essential to reduce cumulative impacts. While the majority of the road widening will be contained within the existing road reserve, limited sections will require expropriation of adjacent land and, thus, some property owners will lose land. SANRAL has entered into property acquisition processes with affected property owners and fair compensation will be negotiated in line with legislated procedures.

With efficient and proper project management and implementation by SANRAL, as well as the application of the mitigation measures recommended in this report (carried over into the Environmental Management Programme (EMPr), **the negative social impacts during construction, while onerous, will be of medium and low significance, with no negative social impacts of high significance.**

The positive impacts of the project on the social environment during operation will be of high significance. They can be predicted with a high level of certainty to benefit thousands of road users on a daily basis through improved road travelling conditions, including improved road safety and reduced travel times. Negative impacts during operation such as increased traffic noise and exhaust emissions are not a result of the project but rather a result of increasing traffic volumes over time, which will unavoidably affect any occupiers and users of properties adjacent to any national road. In the case of this project, the intensity of impacts will increase where the widened road brings the receivers into closer proximity to traffic. With respect to emissions, the impacts will be variable, depending on the topography and micro-climate of the location. Indeed, some areas where previously there was congestion are likely to improve with respect to emissions, as free flowing traffic is likely to decrease the concentration of exhaust emissions. With respect to operational noise, it is clear that noise levels are already problematic within generally, 300 m from the road and they are predicted eventually (over the next 30 years and in the absence of mitigation) to reach unacceptable levels

according to predicted increases in traffic volumes. SANRAL, as the road authority, is tasked with ensuring that the roads can safely and efficiently accommodate traffic growth to facilitate economic development and to do this, has to widen the road. SANRAL has taken into consideration low noise surfacing in the road design and is in the process of appointing an acoustic specialist to investigate further possible and feasible noise control measures over time. Control of the growth of traffic volumes is a broader issue that requires high level interventions such as improved public transport and migration of freight from road to rail. These issues are being addressed but will take time. Ultimately there must also be an adaptation to prevailing conditions, i.e. a change of land use/receptors adjacent to national roads, towards those which are less sensitive to noise. **With mitigation, the negative impacts on the social environment associated with operation of the widened national roads are anticipated to be of a low and medium significance.**

Effect of the project on the economic/socio-economic environment
During the construction period, it is definite that some **positive economic/socio-economic impacts of low significance will accrue to the local and regional community** due to the provision of temporary jobs for semi-skilled and unskilled workers, the increased opportunities for local contractors and SMMEs, and a general increase in spending on a wide range of goods and services in Durban, Pietermaritzburg and KZN. There is also likely to be spending nationally on specialist materials/equipment. The estimated overall cost to upgrade the N3 including interchanges, is R235 million per km (2018 rand, Vat exclusive) i.e. an estimated cost of R17,64 billion over 75km. The interchange upgrades contribute a substantial portion of the N3 upgrading, including the N2/N3 EB Cloete Interchange. The latest Preferential Procurement Policy Framework Act (Act 5 of 2000) (PPPFA) regulations makes it mandatory that thirty percent of the contract value is subcontracting to specific target groups which includes Emerging Micro Enterprises and Qualifying Small Enterprises.

There will also be negative economic/socio-economic impacts during the construction period. Economic losses are likely to be incurred indirectly due to poorer access, poorer road and travelling conditions, an increased likelihood of road traffic accidents, possible damage to infrastructure and services, expropriation of properties, resettlement processes, etc. **With mitigation, the negative economic/socio-economic impacts of the project during construction are anticipated to be of low and medium significance.**

Economic impacts during operation will be positive. The project has SIP2 status (and as such, national priority). The primary motivation for implementing this project is to stimulate economic growth through improved transport infrastructure and an improved logistics/transport corridor between Durban and Gauteng. In conjunction with several other short-, medium- and long-term strategic Government plans and interventions it is, thus, designed to positively impact on the economy of the country. Positive economic benefits will be incurred locally, regionally, provincially and nationally as a result of the improved transport infrastructure. **With good project management and execution, the positive impacts of this particular project on the economy will be of high significance. The project will also contribute cumulatively with other SIP projects to significantly benefit the country's economy.**

Effects of the project on cultural heritage resources and vice versa
Based on the findings of the cultural heritage assessment, impacts on cultural heritage resources during construction of this section of the N3 upgrades is considered to be of low significance. Only one known cultural heritage resource, namely Bellevue Farmstead, could potentially be impacted by the proposed upgrades. However, to avoid this, the design engineers have modified their designs and care will be taken during construction to avoid damage to the structures (which are already in a state of decay). **With mitigation, it is anticipated that the potential impacts on cultural heritage resources will be of low significance.**

Effects of the project on the biophysical environment and vice versa
While construction will inevitably impact negatively on natural habitat, it should be noted that this project is an upgrade of an existing road and is located primarily within the existing road reserve. The works will, thus, largely affect previously disturbed habitat. There are, however, some expanded interchanges and areas adjacent to the existing N3 which will affect terrestrial and riparian areas outside of SANRAL's road reserve. Road widening will entail lengthening of existing drainage structures and existing culverts at stream crossings. Vegetation potentially affected by the road upgrade includes 30 ha of disturbed grassland/thick mosaic; 15 ha of bushveld/thornveld/grassland mosaic; 12 ha of secondary grassland (largely in islands at the Ashburton Interchange in particular); 0.5 ha of xeric cliff vegetation (also at the Ashburton Interchange), a stand of *Spirostachys africana* at the Lynnfield Interchange and riparian vegetation at the Mpushini River crossing. Direct impacts to vegetation will result in the loss of mainly common and widespread plant species, but also at least one Red Data species (i.e. *Aloe pruinosa*). The impact on natural vegetation that can be expected from upgrading the N3 between Lynnfield Park and Ashburton is not likely to require any offsetting on the basis that the impacts can be adequately mitigated as specified in the EMPr, which includes plant rescue and relocation. Even though the majority of the aquatic systems in this section are in a fair condition, they are already modified. Given that the risks to the systems are low, the construction phase impacts of the N3 upgrade can largely be controlled and mitigated, and rehabilitation through an appropriate and comprehensive environmental management plan is possible. Once rehabilitation post construction has been completed, the impacts during operation of the road will not be significant. The protection measures implemented to minimise impacts on natural habitat, along with other specifications in the EMPr, will serve to minimise impacts on fauna and flora. **With mitigation, the negative impacts of construction and operation on the biophysical environment (soils and substrates, terrestrial and riparian habitat, as well as associated fauna) will be of low significance.**

Effects of the No Development Alternative
While the No Development Alternative would defer the negative impacts of construction on the social and biophysical environment, as described above, this would be of short term benefit only. In the longer term, the No Development Alternative will result in increasingly congested, unsafe and inefficient national road infrastructure. The negative consequences of not widening and upgrading the national roads will be severe and will have far reaching impacts on all South Africans and be contrary to the strategic plans of the South African Government. **The negative impacts of the No Development Alternative have been assessed as being of high significance. For these reasons, this alternative is not recommended.**

RECOMMENDATION OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER
It is the opinion of the EAP that the information contained in this report and the documentation attached hereto is sufficient to make a decision in respect of the activity applied for, viz the proposed capacity upgrades to the N3 from Lynnfield Park to Gladys Manzi Road.

It is recommended that the proposed activity is authorised, based on the findings of the assessment process and conditional on the items listed in Section 11 of this report.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

ACRONYMS AND ABBREVIATIONS

ACER	ACER (Africa) Environmental Consultants
BA	Basic Assessment
BAR	Basic Assessment Report
BID	Background Information Document
CBA	Critical Biodiversity Area
CRCP	Continuously Reinforced Concrete Pavement
CRLHC	Cato Ridge Logistics Hub Consortium
DAFF	Department of Agriculture, Forestry and Fisheries
DDI	Diverging Diamond Interchange
DEA	Department of Environmental Affairs (National)
DEDTEA	Department of Economic Development, Tourism and Environmental Affairs (KwaZulu-Natal)
DM	District Municipality
DWS	Department of Water and Sanitation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EKZNW	Ezemvelo KwaZulu-Natal Wildlife
EMF	Environmental Management Framework
EMPr	Environmental Management Programme
ESA	Ecological Support Area
eThembeni	eThembeni Cultural Heritage Consultants
GN	Government Notice
ha	hectare
I&APs	Interested and Affected Parties
I/C	Interchange
IDP	Integrated Development Plan
kl	Kilolitre
km	Kilometre
KZN	KwaZulu-Natal Province
LM	Local Municipality
m	Meter
m^3	Cubic Meter
MOSS	Metropolitan Open Space System
Mtons	million tons
N3	National Road 3
NEMA	National Environmental Management Act (Act No. 107 of 1998)
NEMPAA	National Environmental Management: Protected Areas Act
NMPP	New Multi Products Pipeline
PPE	Personal Protective Equipment
PPPFA	Preferential Procurement Policy Framework Act (Act 5 of 2000)
PU	Planning Units
SANRAL	South African National Roads Agency SOC Limited
SCA	Systematic Conservation Assessment
SDF	Spatial Development Framework
SIP	Strategic Infrastructure Project
SMME	Small Medium and Micro Enterprise
TOPS	Threatened or Protected Species
UTFC	Ultra-thin friction wearing course

DETAILS AND EXPERTISE OF THE ENVIRONMENTAL IMACT ASSESSMENT (EAP) AND SPECIALIST TEAM

Details and CVs of specialists are contained in Appendix D. Details and CVs of the EAP are contained in Appendix G.

ADHERANCE TO REGULATORY REQUIREMENTS

Table 1 Required content of Basic Assessment Report according to GNR 326 (7 April 2017)

		Content of Basic Assessment report according to GNR 326 (7 April 2017)		Reference
1			A basic assessment report must contain the information that is necessary for the competent authority to consider and come to a decision on the application must include	
	A		Details of	
		i	The EAP who prepared the report and	Appendix G
		ii	The expertise of the EAP, including a curriculum vitae	Appendix G
	B		The location of the activity, including	Section 1.3, Figures 1 & 2
		i	The 21-digit Surveyor General code of each cadastral land parcel	Appendix C2
		ii	Where available, the physical address and farm name	Not available
		iii	Where the required information in items (i) and (ii)is not available, the coordinates of the boundary of the property or properties	Government Gazette No 40085, Vol. 734, 22 June 2016 details the existing proclaimed road reserve.
	C		A plan which locates the proposed activity or activities applied for as well as associated structures and infrastructure at an appropriate scale, or if it is	
		i	A linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken, or	Refer to Table 6. Government Gazette No 40085, Vol. 734, 22 June 2016 details the existing proclaimed road reserve.
		ii	On land where the property has not been defined, the coordinates within which the activity is to be undertaken	N/a
	D		A description of the scope of the proposed activity, including	Section 1.3, Chapter 3
		i	All listed and specified activities triggered and being applied for, and	Section 1.4.1, Table 6
		ii	A description of the activities to be undertaken including associated structures and infrastructure	Section 1.4.1, Table 6; Chapter 3, Appendix A
	e		A description of the policy and legislative context within which the development is proposed including	Chapter 2
		i	An identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that are applicable to this activity and have been considered in the preparation of the report, and	Chapter 2

		Content of Basic Assessment report according to GNR 326 (7 April 2017)		Reference
		ii	How the proposed activity complies with and responds to the legislation and policy context, plans guidelines, tools frameworks and instruments	Section 1.2
	f		A motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location	Section 1.2
	g		A motivation for the preferred site, activity and technology alternative	Chapter 4
	h		A full description of the process followed to reach the proposed preferred alternative within the site including	Chapter 4
		i	Details of all the alternatives considered	Chapter 3&4
		ii	Details of the public participation process undertaken in terms of regulation 411 of the Regulations, including copies of the supporting documents and inputs	Chapter 6, Appendix E
		iii	A summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them.	Section 6.4. Appendix E3
		iv	The environment attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspect.	Chapter 5
		v	The impact and risks identified for each alternative, including the nature significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts	Chapter 8
		aa	Can be reversed	Chapter 9
		bb	May cause irreplaceable loss of resources, and	Chapter 9
		cc	Can be avoided, managed or mitigated	Chapter 8 & 9
		iv	The methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives,	Chapter 7
		vii	Positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects	Chapter 8
		viii	The possible mitigation measures that could be applied and level of residual risk	Chapter 8
		ix	The outcome of the site selection matrix	N/a
		x	If no alternative locations for the activity were investigated, the motivation for not considering such, and	Chapter 4
		xi	A concluding statement indicating the preferred alternatives, including preferred location of the activity	N/a
	i		A full description of the process undertaken to identify assess and rank the impacts the activity will impose on the preferred location through the life of the activity including	Chapter 7
		ii	A description of all environmental issues and risks that were identified during the environmental impact assessment process, and	Chapter 8
		ii	An assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation	Chapter 9

		Content of Basic Assessment report according to GNR 326 (7 April 2017)		Reference
	j		An assessment of each identified potentially significant impact and risk, including	Chapter 9
		i	Cumulative impacts	Chapter 9
		ii	The nature, significance and consequences of the impacts and risk	Chapter 9
		iii	The extent and duration of the impact and risk	Chapter 9
		iv	The probability of the impact and risk occurring	Chapter 9
		v	The degree to which the impact and risk can be reversed	Chapter 9
		vi	The degree to which the impact and risk may cause irreplaceable loss of resources and	Chapter 9
		vii	The degree which the impact and risk can be avoided, managed or mitigated	Chapter 9
	k		Where applicable, a summary of the findings and impact management measures identified in any specialist's report complying with Appendix 6 to these regulations and an indication as to how these findings and recommendations have been included in the final report	Chapter 8
	l		An environmental impact statement which contains	
		i	A summary of the key findings of the environmental impact assessment	Chapter 10
		ii	A map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers and	Figure 2. Appendix C. Appendix A of the Vegetation Specialist Report which is appended to this BAR (Appendix D5)
		iii	A summary of the positive and negative impacts and risks of the proposed activity and identified alternatives	Executive Summary, Chapter 10, and Chapter 11
	m		Based on the assessment, and where applicable, impact management measures from specialist reports, the recording of the proposed impact management objectives and the impact management outcomes for the development for the inclusion in the EMPr	Chapter 8, Appendix F
	n		Any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation	Chapter 11
	o		A description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed.	Section 7.2
	p		A reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation.	Chapter 11
	q		Where the proposed activity does not include operational aspects, period for which the environmental authorisation is required, the date on which the activity will be concluded, and the post construction monitoring requirements finalised	N/a to national roads

		Content of Basic Assessment report according to GNR 326 (7 April 2017)		Reference
	r		An undertaking under oath or affirmation by the EAP in relation to	
		i	The correctness of the information provided in the reports	Appendix G3
		ii	The inclusion of comments and inputs from stakeholders and I&APs	Appendix G3
		iii	The inclusion of inputs and recommendations from the specialist reports where relevant, and	Appendix G3
		iv	Any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties, and	Appendix G3
	s		Where applicable, details of any financial provision for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts	N/a
	t		Any specific information that may be required by the competent authority, and	N/a
	u		Any other matters required in terms of section 24(4)(a) and (b) of the Act.	N/a

Table 2 Regulatory requirement for public participation in a Basic Assessment Process according to Chapter 6 of GNR 326 (7 April 2017)

			Public Participation Process (Chapter 6 of GNR 326, 7 April 2017)	Undertaken during the Basic Assessment
41(1)			This regulation only applies in instances where adherence to the provisions of these regulations specifically required.	
2			The person conducting a public participation process must take into account any relevant guidelines applicable to public participation as contemplated in section 24J of the Act and must give notice to all potential interested and affected parties of an application or proposed application which is subjected to public participation by—	
	a		fixing a notice board at a place conspicuous to and accessible by the public at the boundary, on the fence or along the corridor of—	
		I	the site where the activity to which the application or proposed application relates is or is to be undertaken; and	Appendix E1
		ii	any alternative site	Appendix E1
	b		giving written notice, in any of the manners provided for in section 47D of the Act to—	
		i	the occupiers of the site and, if the proponent or applicant is not the owner or person in control of the site on which the activity is to be undertaken, the owner or person in control of the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken	Section 6.3; Appendix E1, E2 & E4
		ii	owners, persons in control of, and occupiers of land adjacent to the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken;	Section 6.3; Appendix E1, E2, E4 & E5
		iii	the municipal councillor of the ward in which the site and alternative site is situated and any organisation of ratepayers that represent the community in the area;	Section 6.3; Appendix E5
		iv	the municipality which has jurisdiction in the area	Section 6.3; Appendix E5
		v	any organ of state having jurisdiction in respect of any aspect of the activity; and	Section 6.3; Appendix E5
		vi	any other party as required by the competent authority;	Section 6.3
	c		placing an advertisement in—	
		i	one local newspaper; or	Section 6.3; Appendix E1
		ii	any official Gazette that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations;	N/a
	d		placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or may have an impact that extends beyond the boundaries of the metropolitan or district municipality in which it is or will be undertaken: Provided that this paragraph need not be complied with if	Section 6.3; Appendix E1

			Public Participation Process (Chapter 6 of GNR 326, 7 April 2017)	Undertaken during the Basic Assessment
			an advertisement has been placed in an official Gazette referred to in paragraph (c)(ii); and	
	e		using reasonable alternative methods, as agreed to by the competent authority, in those instances where a person is desirous of but unable to participate in the process due to—	
		i	illiteracy;	
		ii	disability; or	
		iii	any other disadvantage.	
3			A notice, notice board or advertisement referred to in subregulations (2) must—	
	a		give details of the application or proposed application which is subjected to public participation; and	Appendix E1
	b		state—	
		i	whether basic assessment or S&EIR procedures are being applied to the application;	Appendix E1
		ii	the nature and location of the activity to which the application relates;	Appendix E1
		iii	where further information on the application or proposed application can be obtained; and	Appendix E1
		iv	the manner in which and the person to whom representations in respect of the application or proposed application may be made	Appendix E1
4			A notice board referred to in subregulation (2) must—	Appendix E1
	a		be of a size of at least 60cm by 42cm; and	Appendix E1
	b		display the required information in lettering and in a format as may be determined byte competent authority.	Appendix E1
5			Where public participation is conducted in terms of this regulation for an application or proposed application, subregulation (2)(a), (b), (c) and (d) need not be complied with again during the additional public participation process contemplated in regulations 19(1)(b) or 23(1)(b) or the public participation process contemplated in regulation 21(2)(d), on condition that—	Noted.
	a		such process has been preceded by a public participation process which included compliance with subregulations (2)(a), (b), (c) and (d); and	N/a
	b		written notice is given to registered interested and affected parties regarding where the—	N/a
		i	revised basic assessment report or, EMPr or closure plan, as contemplated in regulation 19(1)(b);	N/a
		ii	revised environmental impact assessment report or EMPr as contemplated in regulation 23(1)(b); or	N/a
		ii	environmental impact assessment report and EMPr as contemplated in regulation 21(2)(d) may be obtained, the manner in which and the person to whom representations on these reports or plans may be made and the date on which such representations are due.	N/a
6			When complying with this regulation, the person conducting the public participation process must ensure that—	

			Public Participation Process (Chapter 6 of GNR 326, 7 April 2017)	Undertaken during the Basic Assessment
	a		information containing all relevant facts in respect of the application or proposed application is made available to potential interested and affected parties; and	This BAR
	b		participation by potential or registered interested and affected parties is facilitated in such a manner that all potential or registered interested and affected parties are provided with a reasonable opportunity to comment on the application or proposed application.	Section 6.3; Appendix E
7			Where an environmental authorisation is required in terms of these Regulations and an authorisation, permit or licence is required in terms of a specific environmental management Act, the public participation process contemplated in this Chapter may be combined with any public participation processes prescribed in terms of a specific environmental management Act, on condition that all relevant authorities agree to such combination of processes.	Noted.

1. INTRODUCTION

1.1 Background

This report is a Basic Assessment Report (BAR) for part of the South African National Roads Agency SOC Limited's (SANRAL) proposed capacity improvements to existing sections of the N3 national road in KwaZulu-Natal. It has been prepared on behalf of SANRAL by ACER (Africa) Environmental Consultants (ACER), in terms of the requirements of the Environmental Impact Assessment (EIA) Regulations of 2014 (as amended), published under the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA). The details of the ACER Environmental Assessment Practitioner (EAP) team are provided in Appendix G.

This assessment, referred to as **Basic Assessment 5**, forms part of a suite of six Basic Assessments being undertaken by ACER for SANRAL's proposed upgrades[2]. They will all ultimately be submitted to the Department of Environmental Affairs (DEA) as part of the requirements of the application for environmental authorisation[3]. (Note that two N3 sections are not included below; Key Ridge to Hammarsdale and Gladys Manzi (formerly Murray) Road to New England Road, which are being undertaken by other environmental practitioners).

- **Basic Assessment 1.** Capacity Upgrades to the N2 (Solomon Mahlangu I/C to south of the Umgeni Road I/C), including expansion of the EB Cloete and Solomon Mahlangu Interchanges, and the N3 (EB Cloete to Paradise Valley) including provision of temporary access for construction below Westville and Paradise Valley Viaducts.
- **Basic Assessment 2.** Capacity Upgrades to the N3 (Paradise Valley to Key Ridge), including provision of temporary access for construction below the Umhlatuzana Viaduct.
- **Basic Assessment 3.** Capacity Upgrades to the N3 from Hammarsdale to Cato Ridge.
- **Basic Assessment 4.** Capacity Upgrades to the N3 from Cato Ridge (Km 19.4) to Lynnfield Park (Km 30.6).
- **Basic Assessment 5.** Capacity Upgrades to the N3 from Lynnfield Park (Km 30.6) to Gladys Manzi Road (Km 6.0).
- **Basic Assessment 6.** Capacity Upgrades to the N3 from New England Road I/C (Km 8.8) to Twickenham Road Underpass (Km 16.5).

This report deals with Basic Assessment 5 (BA5), which includes widening of approximately 9.8 km of the N3 from Lynnfield Park to Gladys Manzi Road and the realignment of portions of the R103, relocation of two local intersections and provision alternative access for some farm properties

BA1 and BA2 are being undertaken in parallel, under a shared public participation process. Please note that BAs 3-6 commenced together, during early 2018, approximately nine months after the commencement of BAs 1 and 2. BA's 3-6 have shared the project announcement phase of the public participation process.

2 Please note that Basic Assessment 4 is being undertaken by Metamorphosis Environmental Consultants (albeit that the production of the six BARs has been a collaborative effort between the two companies).

3 DEA, along with their counterparts in the KwaZulu-Natal Department of Economic Development Tourism and Environmental Affairs (DEDTEA) will review the BAR for the purposes on adjudicating the application for environmental authorisation.

1.2 Project purpose, need and desirability

SANRAL is responsible for improving, managing and maintaining the network of national roads which act as the "economic arteries" of South Africa. The N2 and N3 carry large volumes of traffic, with a high percentage of heavy vehicles carrying freight to and from the Port of Durban, forming the backbone of South Africa's freight network. Sections of these national roads are operating at full or near full capacity. Traffic studies commissioned by SANRAL have projected traffic growth figures, which indicate the need to provide additional lanes to alleviate current traffic congestion and to accommodate future growth and improve road safety and efficiency. SANRAL (Eastern Region), therefore, proposes to provide additional lanes along a section of the N2 near the Port of Durban and a section of the N3 from the N2/N3 (E.B Cloete) Interchange (I/C) on to Pietermaritzburg. The proposed capacity improvements, which are divided into sections and covered ultimately by several engineering work packages, will be implemented at different stages according to timing priorities and factors related to funding availability (albeit the reality is that there will be overlapping construction periods between the work packages). The proposed capacity improvements will improve safety, increase mobility and accommodate traffic growth to 2047.

Importantly, the upgrades are planned in line with South Africa's Strategic Infrastructure Projects (SIPs) as described in the National Development Plan, 2011. Specifically, the proposed capacity improvements form the backbone of the SIP2 project, which focuses on strengthening the Durban-Free State-Gauteng logistics and industrial corridor. In line with SIP2 goals, the capacity improvements will improve access to Durban's export and import facilities. National roads are essential infrastructure supporting the economy of the country and, therefore, the project will benefit all citizens of South Africa either directly or indirectly. As such, this project has been taken into account by, and is compatible with, national, provincial and municipal development, and planning frameworks.

1.3 Location and scope of proposed capacity upgrades (for Basic Assessment 5)

The section of road under assessment in this study (see Figure 1 in the Executive Summary) falls primarily within the Msunduzi Local Municipality (LM) which forms part of the uMgungundlovu District Municipality (DM) in KwaZulu-Natal. However, for approximately 2.5 km on the northern side of the Lynnfield Interchange, the N3 forms the boundary between the Msunduzi LM and Mkhambathini LM and, thus, a small portion of the Mkhambathini LM will also be affected by the proposed upgrades between Lynnfield Park and Gladys Manzi Road. The affected wards are shown in Table 3. Road widening falls primarily within the existing road reserve (indicated by the black lines in Figure 1), but additional land will also be required (indicated by the red lines in Figure 1).

Table 3 Municipalities and wards affected by the project

Province	KwaZulu-Natal	KwaZulu-Natal
District Municipality	uMgungundlovu District Municipality	uMgungundlovu District Municipality
Local Municipality	Msunduzi LM	Mkhambathini LM
Ward Number(s)	36, 37	3

The basic scope of the project is outlined below (and shown in Figure 1). GPS co-ordinates of the various components are provided in Tables 4 and 5. A detailed description of proposed improvements and construction activities associated with the two engineering contracts is provided in Section 3.1. Details of affected properties are provided in Section 5.2. Drawings are provided in Appendix A.

Road sections to undergo construction (Appendix A1) are:

- N3 from the south of Lynnfield Park I/C to south of the Ashburton I/C.
- N3 from the Ashburton I/C to Gladys Manzi Road.

Within these sections, the major interchanges[4] to be upgraded (Appendices A2 and A4) are

- Lynnfield Park (N3/Wally Hayward Drive).
- Ashburton (N3/Pope Ellis Drive).

In addition, this project requires:

- Realignment of sections of Umgeni Water Pipeline.
- Proposed sleeve widening of a section of Transnet NMPP Multifuel Pipeline.
- Realignment and widening of the R103 within the current road reserve.
- Relocation/widening of two intersections, MR477 and iBhubesi.
- Relocation/realignment of sections of farm access (gravel) roads (Appendix A3).

GPS co-ordinates of the linear sections of existing road to be improved and main interchanges are provided in Tables 4 and 5. Please note that there is only one site (route) alternative as this is an *in situ* upgrade of an existing national road.

[4] Note that the reconstruction of the Gladys Manzi bridge forms part of a separate contract.

Table 4 Geographical co-ordinates of the existing and proposed linear road sections affected by the project

	Latitude (S)	Longitude (E)
N3 from south of Lynnfield I/C to south of Ashburton I/C (approx 4.6 km)		
Starting point of the activity	29°41'58.67"S	30°29'21.49"E
Middle/additional point of the activity	29°40'53.16"S	30°28'24.53"E
End point of the activity	29°39'59.98"S	30°27'39.40"E
Access Road 1 to Martin Bekker Property (approx 0.29 km)		
Starting point of the activity	29°41'36.69"S	30°29'15.98"E
Middle/additional point of the activity	29°41'26.54"S	30°29'7.66"E
End point of the activity	29°41'13.03"S	30°28'42.55"E
Access Road 2 to Dave Rigby's and other properties (approx 1.27 km)		
Starting point of the activity	29°41'36.69"S	30°29'15.98"E
Middle/additional point of the activity	29°41'35.60"S	30°29'13.64"E
End point of the activity	29°41'32.41"S	30°29'10.77"E
Ibhubesi Road 1 (approx 0.310 km)		
Starting point of the activity	29°41'19.87"S	30°28'29.11"E
Middle/additional point of the activity	29°41'23.14"S	30°28'25.22"E
End point of the activity	29°41'27.05"S	30°28'22.92"E
Ibhubesi Road 2 (approx 0.09 km)		
Starting point of the activity	29°41'26.37"S	30°28'23.96"E
Middle/additional point of the activity	29°41'26.43"S	30°28'21.26"E
End point of the activity	29°41'27.98"S	30°28'18.06"E
MR477 (approx 0.09 km)		
Starting point of the activity	29°41'41.23"S	30°29'20.61"E
Middle/additional point of the activity	29°41'40.87"S	30°29'24.10"E
End point of the activity	29°41'41.35"S	30°29'26.75"E
N3 from south of Ashburton I/C Gladys Manzi Road (approx. 5.2 km)		
Starting point of the activity	29°39'59.88"	30°27'39.64"
Middle/additional point of the activity	29°38'51.88"	30°26'42.30"
End point of the activity	29°38'25.56"	30°25'16.32"

Table 5 Geographical co-ordinates of the existing interchanges to undergo improvements

Interchanges	Latitude (S)	Longitude (E)
N3/Wally Hayward Drive Lynnfield I/C	29°41'28.35"S	30°28'54.38"E
MR477/R103 Intersection	29°41'41.02"S	30°29'21.97"E
N3/Pope Ellis Drive Ashburton I/C	29°39'34.05"	30°27'17.85"

1.4 Environmental authorisation requirements and listed activities triggered by the project

1.4.1 Listed activities triggered by the project

Activities from Listing Notice 1 (GN R.327) and Listing Notice 3 (GN. R. 324) are triggered by the project and are detailed in Table 6. The description and co-ordinates of these activities are also provided in Table 6 and the locations are shown on Figure 2.

Table 6 Listed activities in terms of which SANRAL is seeking environmental authorisation for the proposed N2 and N3 improvements

	Listed activity as described in GN R. 327, GN R. 325 and GN R.324 (EIA Regulations 2014, as amended)	**Description of project activity that may trigger the listed activity**	**Description/co-ordinates of activity (refer also to Figure 2)**
1	Listing Notice 1 (Government Notice, No. R. 327, 7 Apr 2017) Item 12: The development of— (i) .. (ii) infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs— (a) within a watercourse; (b) in front of a development setback; or (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse; — excluding— (aa) .. (cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies; (dd) where such development occurs within an urban area; (ee) where such development occurs within existing roads, road reserves or railway line reserves; or (ff) ..	A farm access road near Lynnfield Park I/C will be constructed to maintain access for surrounding farms. This may entail the development of infrastructure or structures with a physical footprint of 100 square metres or more; within a watercourse or within 32 m of a watercourse. Additionally, at the Ashburton Interchange, the upgraded interchange will occur within 32 metres of a watercourse.	29 ° 41' 42.6"S; 30 ° 29' 7.6"E (northeast of Lynnfield Park I/C) 29 ° 39' 40.5" S; 30 ° 27' 26.8" E (near Ashburton I/C)
2	Listing Notice 1 (Government Notice, No. R. 327, 7 Apr 2017) Item 14: The development and related operation of facilities or infrastructure, for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic metres.	Contractors may store and use fuel and other hazardous substances at their site camps, in containers that have a combined capacity of 80 cubic metres or more, but not exceeding 500 cubic metres.	These sites will be identified by the contractor and will be sited where possible within the road reserve and away from sensitive sites identified in the BAR.

	Listed activity as described in GN R. 327, GN R. 325 and GN R.324 (EIA Regulations 2014, as amended)	Description of project activity that may trigger the listed activity	Description/co-ordinates of activity (refer also to Figure 2)
3	Listing Notice 1 (Government Notice, No. R. 327, 7 Apr 2017) Item 19: The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse;	Construction along the N3 between Lynnfield Park and Ashburton will affect 8 watercourses, as road and bridge widening will require existing culverts and bridges at watercourses to be extended or replaced. The construction of new culverts may be required in places where interchanges are to be upgraded. The project, therefore, will involve excavation, removal, infilling and/or depositing of material of more than 10 m^3, in watercourses.	29 ^{o} 40’ 30.1” S; 30 ^{o} 28’ 4.5” E (wetland near Lynnfield Park) 29 ^{o} 40’ 07.0” S; 30 ^{o} 27’ 45.5” E (Mpushini River) 29 ^{o} 39’ 52.9” S; 30 ^{o} 27’ 34.5” E (drainage line, Ashburton area) 29 ^{o} 39’ 11.1” S; 30 ^{o} 27’ 0.5” E (north of Ashburton) 29 ^{o} 38’ 51.3” S; 30 ^{o} 26’ 43.1” E (between Ashburton and Gladys Manzi) 29 ^{o} 38’ 46.6” S; 30 ^{o} 26’ 17.5” E (between Ashburton and Gladys Manzi) 29 ^{o} 38’ 48” S; 30 ^{o} 25’ 56” E (drainage line near Cleland area) 29 ^{o} 39’ 40.5” S; 30 ^{o} 27’ 26.8” E (Ashburton I/C
4	Listing Notice 1 (Government Notice, No. R. 327, 7 Apr 2017) Item 24: The development of a road— (i) ..... or (ii) with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres; but excluding a road— (a) which is identified and included in activity 27 in Listing Notice 2 of 2014; (b) where the entire road falls within an urban area; or which is 1 kilometre or shorter.	This activity is included so as to cover any new ramps of the upgraded interchanges, which may not fall within an urban area.	29°41'28.35"S;30°28'54.38"E (N3/Wally Hayward Drive Lynnfield I/C) 29°41'41.02"S; 30°29'21.97"E (MR477/R103 Intersection) 29^{o}39’31.81”;30^{o}27’20.43” (N3/Pope Ellis Drive Ashburton I/C)

	Listed activity as described in GN R. 327, GN R. 325 and GN R.324 (EIA Regulations 2014, as amended)	Description of project activity that may trigger the listed activity	Description/co-ordinates of activity (refer also to Figure 2)
5	Listing Notice 1 (Government Notice, No. R. 327, 7 Apr 2017) Item 48: The expansion of— (i) infrastructure or structures where the physical footprint is expanded by 100 square metres or more; or (ii) ..... where such expansion occurs— (a) within a watercourse; (b) in front of a development setback; or (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse; excluding— (aa) ..... (cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies; (dd) where such expansion occurs within an urban area; or (ee) where such expansion occurs within existing roads, road reserves or railway line reserves.	This activity is being applied for as some of the infrastructure will be in areas that are still to be acquired and will be proclaimed as road reserve. Thus, the expansion might encroach into areas that are not currently proclaimed as road reserve. Some of the works at the interchanges will be on the provincial roads outside of SANRAL's road reserve.	29 ^{o} 40' 30.1" S; 30 ^{o} 28' 4.5" E (wetland near Lynnfield Park) 29 ^{o} 40' 07.0" S; 30 ^{o} 27' 45.5" E (Mpushini River) 29 ^{o} 39' 52.9" S; 30 ^{o} 27' 34.5" E (drainage line, Ashburton area) 29 ^{o} 39' 11.1" S; 30 ^{o} 27' 0.5" E (north of Ashburton) 29 ^{o} 38' 51.3" S; 30 ^{o} 26' 43.1" E (between Ashburton and Gladys Manzi) 29 ^{o} 38' 46.6" S; 30 ^{o} 26' 17.5" E (between Ashburton and Gladys Manzi) 29 ^{o} 38' 48" S; 30 ^{o} 25' 56" E (drainage line near Cleland area) 29 ^{o} 39' 40.5" S; 30 ^{o} 27' 26.8" E (Ashburton I/C)
6	Listing Notice 1 (Government Notice, No. R. 327, 7 Apr 2017) Item 56: The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre— (i) where the existing reserve is wider than 13,5 meters; or (ii) where no reserve exists, where the existing road is wider than 8 metres; excluding where widening or lengthening occur inside urban areas.	Parts of the N3 to be widened are outside of urban areas and, thus, the widening of these sections would trigger this activity.	Various sections of the N3 between Lynnfield Park and Gladys Manzi Road pass through non-urban areas. Please refer to the zonation map in Appendix C, which indicates areas that are not zoned urban.

	Listed activity as described in GN R. 327, GN R. 325 and GN R.324 (EIA Regulations 2014, as amended)	Description of project activity that may trigger the listed activity	Description/co-ordinates of activity (refer also to Figure 2)
7	Listing Notice 3 (Government Notice, No. R. 324, 7 Apr 2017) Item 4 (d) (iv), (vi), (viii), (x), (xii aa) and (xiii cc) The development of a road wider than 4 metres with a reserve less than 13,5 metres. (d) In KwaZulu-Natal: iv- Biodiversity Stewardship Programme Biodiversity Agreement areas; viii Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; x Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose; xii Outside urban areas: (aa). Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve;	The project requires the construction of minor access roads to maintain access to local farms and iBhubesi Industrial Park near the Lynnfield I/C. The road(s) may be wider than 4 metres with a reserve less than 13.5 metres. This may affect Critical Biodiversity Areas, or other conservation areas mentioned in Listing Notice 3, item 4.	Refer to Table 4 for co-ordinates of the access roads and to Appendix A3 for a locality map.
8	Listing Notice 3 (Government Notice, No. R. 324, 7 Apr 2017) Item 10 (d) (iv) (vii) (xi) (xiii aa, cc) (xiv aa) The development and related operation of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres. d) In KwaZulu-Natal: iv Biodiversity Stewardship Programme Biodiversity Agreement areas; ix Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans xi Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose; xii Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; xiii Outside urban areas: (aa). Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any terrestrial protected area identified in terms of NEMPAA or from the core areas	Contractors may store fuel and other hazardous substances at their site camps, in containers that have a combined capacity of 30 cubic metres or more, but not exceeding 80 cubic metres. Site camp locations are not known as yet and will be identified by the contractor. Care will be taken to use existing transformed areas for site camps. Nevertheless, these may fall within a mapped Critical Biodiversity Area, within 100 m from a water course or wetland, within 5 km of other conservation area mentioned in Listing Notice 3, item 10. See adjacent column.	There are several areas along this section of the N3 that adjoin land classified as CBA: Irreplaceable and CBA: Optimal areas, and which are designated sensitive areas in the draft 2017 EMF developed for the Umgungundlovu District Municipality and the 2010 EMF for the Msunduzi Local Municipality. Refer to Figure 4. Between Ashburton and Cleland (29° 38' 50.55" S; 30° 26' 39.5" E) The Mpushini Protected Area south of Ashburton (29° 40' 07.0" S; 30° 27'45.5" E)

	Listed activity as described in GN R. 327, GN R. 325 and GN R.324 (EIA Regulations 2014, as amended)	Description of project activity that may trigger the listed activity	Description/co-ordinates of activity (refer also to Figure 2)
	of a biosphere reserve; or (cc) Areas within a watercourse or wetland; or within 100 m from the edge of a watercourse or wetland. Xiv In urban areas: (aa) Areas zoned for use as public open space;		R103 near Lynnfield I/C on southeast side (29° 41'32.4" S; 30° 29'13.8" E) R103 near Lynnfield I/C on southwest side (29° 41'37.3" S; 30° 28'42.0" E)
9	Listing Notice 3 (Government Notice, No. R. 324, 7 Apr 2017) Item 12d (iii), (xi) The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan. In KZN: iii Biodiversity Stewardship Programme Biodiversity Agreement areas v Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; vii On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning; xi Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose; xii Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;	The upgrading of the N3 carriageways, upgrades to interchanges and any associated deviations of services will require the clearance of indigenous vegetation exceeding 300 m^2. Vegetation clearance may affect various areas of conservation importance, as mentioned in Listing Notice 3, item 12.	Vegetation clearance will occur in the N3 road reserve and in some areas, additional land adjacent to the reserve, where the N3 passes through the following areas classified as CBA: Irreplaceable and CBA: Optimal areas, and which are designated sensitive areas in the draft 2017 EMF developed for the Umgungundlovu District Municipality and the 2010 EMF for the Msunduzi Local Municipality. Refer to Figure 4. Between Ashburton and Cleland (29° 38' 50.55" S; 30° 26' 39.5" E) The Mpushini Protected Area south of Ashburton (29° 40' 07.0" S; 30° 27'45.5" E) R103 near Lynnfield I/C on southeast side (29° 41'32.4" S; 30° 29'13.8" E)

	Listed activity as described in GN R. 327, GN R. 325 and GN R.324 (EIA Regulations 2014, as amended)	Description of project activity that may trigger the listed activity	Description/co-ordinates of activity (refer also to Figure 2)
10	Listing Notice 3 (Government Notice, No. R. 324, 7 Apr 2017) Item 14 (ii)a&c d(iv), d(vii) and d((xi)(bb)) The development of ii infrastructure or structures with a physical footprint of 10 square metres or more; where such development occurs— a) within a watercourse; c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse; d) In KwaZulu-Natal: vii Critical biodiversity areas or ecological support areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; xi Inside urban areas: aa) Areas zoned for use as public open space; bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority, zoned for a conservation purpose;	It is possible that new ramps on interchanges, or small access roads required around the Lynnfield area that need to be constructed, will intersect with watercourses or within 32 m of a watercourse. These may occur within Critical Biodiversity Areas or other areas of conservation importance, as mentioned in Listing Notice 3, item 14.	R103 near Lynnfield I/C on southeast side (29° 41'32.4" S; 30° 29'13.8" E)
11	Listing Notice 3 (Government Notice, No. R. 324, 7 Apr 2017) Item 18d (iii), (vi), (viii), (x), (xii aa), (xiii aa and cc) The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre. In KZN: iii Biodiversity Stewardship Programme Biodiversity Agreement Areas viii Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; x Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose; xii Outside urban areas: (aa) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any terrestrial protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve; xiii In urban areas: (aa) Areas zoned for use as public open space;	The N3 carriageway will be widened by more than 4 m, although the widening will take place primarily within SANRAL's existing road reserve. Widening may affect various areas of conservation importance, as mentioned in Listing Notice 3, item 12. Potentially, the widening may affect the Mpushini Stewardship Site between Lynnfield Park and Ashburton. Part of the N3 is within 5 km of the Queen Elizabeth Park protected area in Pietermaritzburg. The N3 also passes through areas designated as Critical Biodiversity Areas. Also, between Lynnfield Park and Ashburton, there are some local access roads that require construction, widening or lengthening, which may trigger this listed activity.	Between Ashburton and Cleland (29° 38' 50.55" S; 30° 26' 39.5" E) The Mpushini Protected Area south of Ashburton (29° 40' 07.0" S; 30° 27'45.5" E) R103 near Lynnfield I/C on southeast side (29° 41'32.4" S; 30° 29'13.8" E) R103 near Lynnfield I/C on southwest side (29° 41'37.3" S; 30° 28'42.0" E)

	Listed activity as described in GN R. 327, GN R. 325 and GN R.324 (EIA Regulations 2014, as amended)	Description of project activity that may trigger the listed activity	Description/co-ordinates of activity (refer also to Figure 2)
12	Listing Notice 3 (Government Notice, No. R. 324, 7 Apr 2017) Item 23(ii) a and c: d(ii), d(iv), d(vii), d(x aa) and d(xi aa and bb) The expansion of— ii infrastructure or structures where the physical footprint is expanded by 10 square metres or more; where such expansion occurs— a) within a watercourse; c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse; d In KwaZulu-Natal ii Biodiversity Stewardship Programme Biodiversity Agreement areas; iv A protected area identified in terms of NEMPAA, excluding conservancies; vii Critical biodiversity areas or ecological support areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; x Outside urban areas: aa) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any terrestrial protected area identified in terms of NEMPAA or from the core area of a biosphere reserve; Xi In urban areas: aa) Areas zoned for use as public open space; bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority, zoned for a conservation purpose	The N3 carriageways and associated interchanges and immediate approaches will be widened. The roads cross numerous drainage lines, streams and rivers. Bridges and drainage structures in or near watercourses will need to be expanded to accommodate the expanded roads. These may occur within Critical Biodiversity Areas or other areas of conservation importance, as mentioned in Listing Notice 3, item 23.	29° 40' 30.1" S; 30° 28' 4.5" E (wetland near Lynnfield Park) 29 ° 40' 07.0" S; 30 ° 27' 45.5" E (Mpushini River) 29° 39' 52.9" S; 30° 27' 34.5" E (drainage line, Ashburton area) 29° 39' 11.1" S; 30° 27' 0.5" E (north of Ashburton) 29° 38' 51.3" S; 30° 26' 43.1" E (between Ashburton and Gladys Manzi) 29° 38' 46.6" S; 30° 26' 17.5" E (between Ashburton and Gladys Manzi) 29° 38' 48" S; 30° 25' 56" E (drainage line near Cleland area) 29° 39' 40.5" S; 30° 27' 26.8" E (Ashburton I/C)
For clarity, please note that Listing Notice 1 (Government Notice, No. R. 327, 7 Apr 2017) *item 48, does not apply because it falls within the ambit of Listing Notice 3 item 14.*			

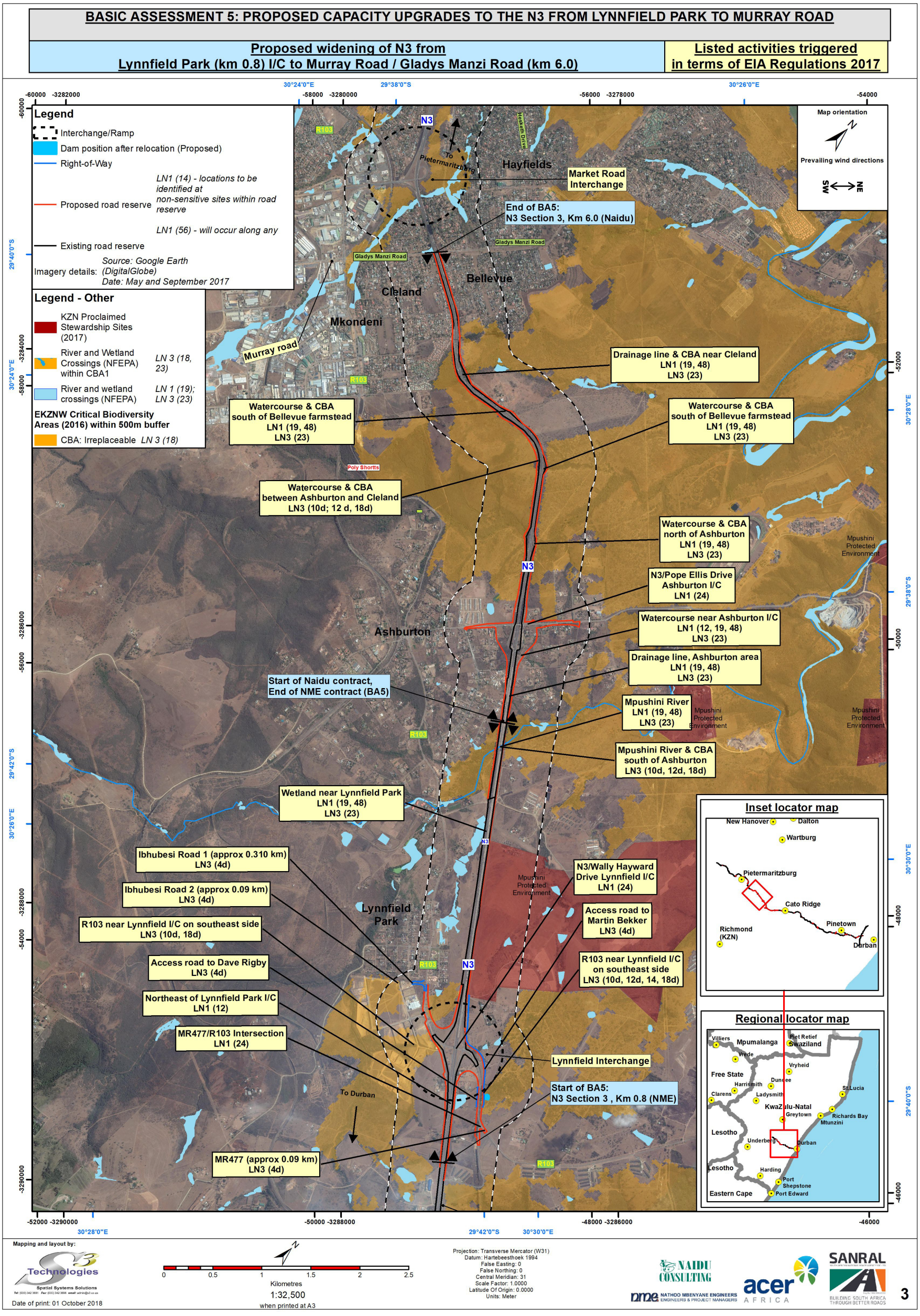
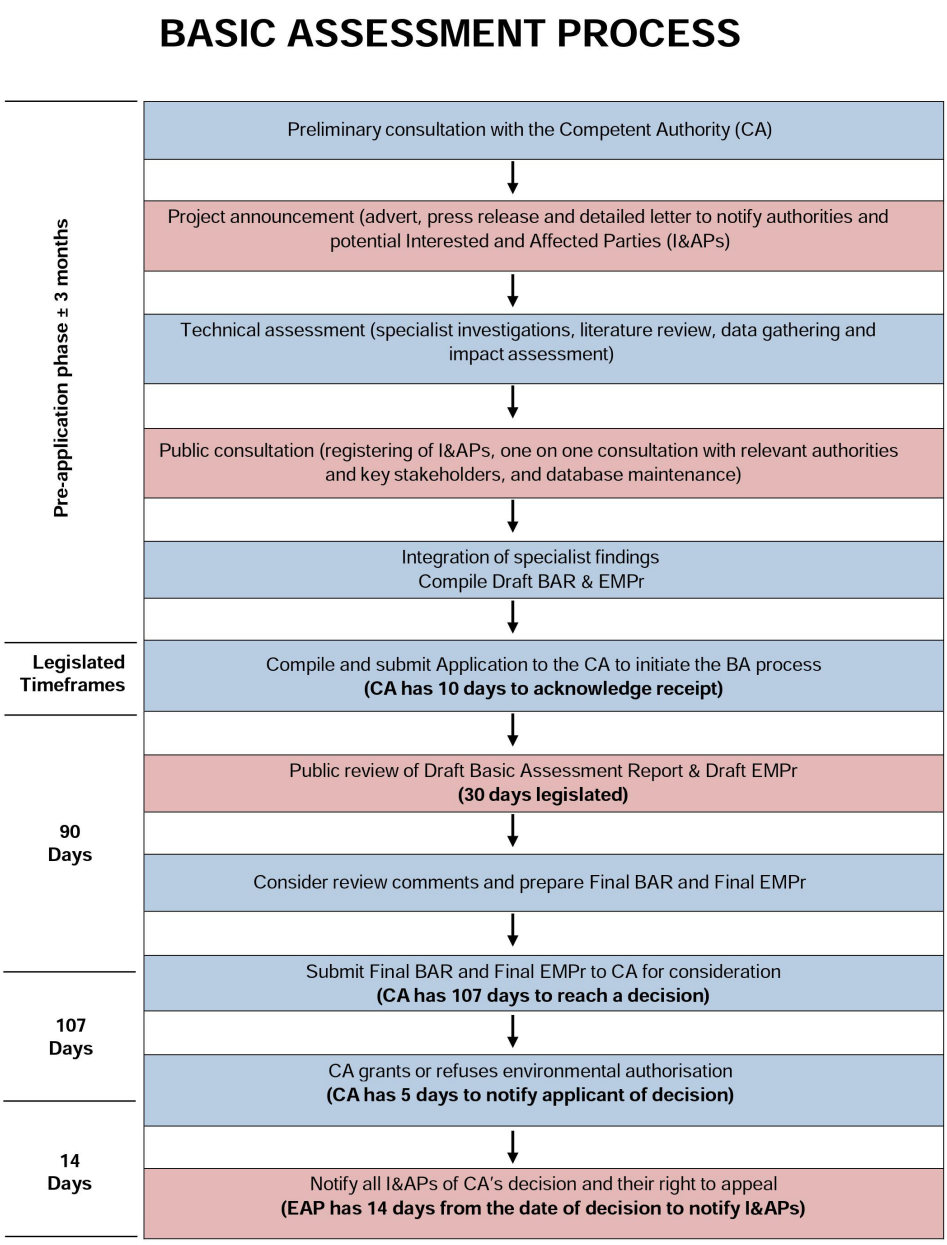


Figure 2 Location of listed activities triggered by proposed capacity upgrades to the N3 from Lynnfield Park to Gladys Manzi Road

4.2 Basic assessment process and requirements

The application for environmental authorisation requires a Basic Assessment to be undertaken in accordance with regulations 19 and 20 of GN No. 326 (07 April 2017) as shown below.



1.4.3 Contents of a Basic Assessment Report (BAR)

A BAR must contain the information set out in Appendix 1 of GN No. 326. Table 1 indicates where in this BAR these various components are covered.

1.4.4 Public participation process during the Basic Assessment

Public participation is to be undertaken in accordance with Chapter 6 of GN No. 326 (refer to Table 2). A detailed description of public participation undertaken for this project is provided in Chapter 6 of this BAR.

2. LEGISLATIVE FRAMEWORK

Further to the regulatory process for environmental authorisation outlined in Section 1.4, the environmental legislation applicable to this project includes but is not limited to that indicated in Table 7. Note that as they are national roads and part of planned SIP2 projects, the proposed capacity improvements to the national roads have been taken into account by, and are in line with national, provincial and municipal development goals and planning frameworks.

Table 7 Applicable legislation, policies and guidelines

Title of legislation, policy or guideline	Applicability to the project	Administering authority	Date
The Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996) (as amended)	The Environmental Clause, Access to Information, Fair Administrative Action, Enforcement of Rights and Administrative Review.	Government of South Africa	1996
National Environmental Management Act, 1998 (Act No. 107 of 1998)	Management of activities that may have a significant impact on the environment. Principles include: ❒ The sustainability principle. ❒ The life-cycle, cradle-to-grave principle. ❒ The 'polluter pays' principle. ❒ The precautionary principle. ❒ The duty of care principle. ❒ Fair and transparent public consultation.	Department of Environmental Affairs	1998
National Environmental Management: Biodiversity Act, 2004 (Act No 10 of 2004)	The conservation of natural habitats, fauna and flora. Permits required to remove or relocate protected plant species.	Department of Environmental Affairs	2004
National Environmental Management: Protected Areas Act, 2003 (Act No 57 of 2003)	To provide for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes. Permission to construct a road within a protected area will be required by SANRAL from the protected area's management authority.	Department of Environmental Affairs	2003

Title of legislation, policy or guideline	Applicability to the project	Administering authority	Date
National Environmental Management: Waste Act, 2008 (Act No.59 of 2008)	Management of activities that generate waste.	KZN Department of Economic Development, Tourism and Environmental Affairs	2008
KwaZulu-Natal Nature Conservation Management Act, 1997 (Act 9 of 1997)	The Act provides for the management of nature conservation within KZN and protected areas. Permits required to remove or relocate protected plant species.	Ezemvelo KZN Wildlife	1997
Natal Nature Conservation Ordinance (Act No. 15 of 1974).	For plants designated as 'specially protected' under the Natal Nature Conservation Ordinance (Act No. 15 of 1974), an application must be submitted to EKZNW to clear or translocate these plants.	Ezemvelo KZN Wildlife	1974
Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)	The conservation of agricultural resources. Protection of soils.	Department of Agriculture, Forestry and Fisheries	1983
National Forests Act, 1998 (Act No. 84 of 1998)	The conservation of natural forests. Permits required to remove or cut protected tree species.	Department of Agriculture, Forestry and Fisheries	1998
National Heritage Resources Act, 1999 (Act No. 25 of 1999)	The protection of cultural heritage resources and the management of activities that may have a significant impact on cultural heritage resources.	South African Heritage Resources Agency	1999
KwaZulu-Natal Heritage Act, 2008 (Act No. 4 of 2008)	The protection of cultural heritage resources and the management of activities that may have a significant impact on cultural heritage resources (specifically within KZN).	Amafa aKwaZulu-Natali	1997
Environment Conservation Act, 1989 (Act No 73 of 1989)	National Noise Control Regulations (GN R154 dated 10 January 1992).	Department of Environmental Affairs	1989
National Water Act, 1998 (Act No 36 of 1998)	Legislation regulating and protecting water resources in South Africa which includes non-consumptive water uses such as the impeding or diverting of water in a water course or altering of beds, banks or characteristics of a watercourse. Also regulates abstraction of large volumes of water from natural water bodies.	Department of Water and Sanitation Provincial Office of Water and Sanitation	1998
National Environmental Management: Air Quality Act, 2004 (Act No 39 of 2004)	Measures in respect to air quality.	District Municipalities	2004
National Roads Traffic Act, 1996 (Act No 93 of 1996)	Measures in respect to road use in South Africa.	South African National Roads Agency Limited (national roads); Provincial	1996

Title of legislation, policy or guideline	Applicability to the project	Administering authority	Date
		Department of Transport	
Promotion of Access to Information Act, 2000 (Act No 2 of 2000)	All requests for access to information held by the state or private bodies are provided for in the Act under Section 11.	Department of Justice and Constitutional Development	2000
Promotion of Administration Justice Act, 2000 (Act No 3 of 2000)	In terms of Section 3, the Government is required to act lawfully and take procedurally fair, reasonable, and rational decisions. Interested and affected parties have a right to be heard.	Department of Justice and Constitutional Development	2000
Infrastructure Development Act, 2014 (Act No. 23 of 2014)	To provide for the facilitation and co-ordination of public infrastructure development which is of significant economic or social importance to the Republic.	Department of Economic Affairs Presidential Infrastructure Coordinating Commission	2014
Public Participation Guideline in Terms of the National Environmental Management Act, 1998 and Environmental Impact Assessment Regulations	The guideline provides information and guidance for proponents or applicants, I&APs, competent authorities and Environmental Assessment Practitioners on the public participation requirements of the Act. It further provides information on the characteristics of a rigorous and inclusive public participation process.	Department of Environmental Affairs	2017
Guideline Series 5: Companion to the Environmental Impact Assessment Regulations of 2010 Guideline Series 7: Public Participation in the Environmental Impact Assessment Process Guideline Series 9: Need and Desirability in terms of the Environmental Impact Assessment Regulations of 2010 (Draft) DEA Alternatives Guideline 5 DEA Guidelines for EMPs	These guidelines provide information and guidance on the requirements of the EIA Regulations and various associated aspects of the environmental impact assessment process.	Department of Environmental Affairs	2010

3. DESCRIPTION OF THE PROPOSED ACTIVITY

3.1 Proposed capacity improvements

BA5 deals with proposed road upgrades covered by two different detail design engineering contracts. A description of the proposed works for each contract is outlined below. Further information/technical drawings are provided in Appendix A.

3.1.1 Upgrade of the N3 from Lynnfield Park (km 30.6) to Ashburton (km 0.8)

- This contract deals with a 4.6 km section of the N3 from south of the Lynnfield Park I/C (N3 section 2, km 30.6) to south of the Ashburton I/C (N3 section 3, km 0.8).
- The N3 will have 4 lanes in the northbound direction and 5 lanes in the southbound direction including a climbing lane.
- The existing Lynnfield Park I/C will be upgraded to a Diverging Diamond Layout[5]. The on and off ramps will have 2 lanes each. The layout has been selected to provide free-flow for all directions of traffic movement.
- An additional lane will be constructed in each direction on the R103. Two additional lanes will be constructed in each direction on the R103, under the Lynnfield Bridge, as well as a walkway at the median within the ramp intersections with the R103.
- Retaining walls are required at some sections. Reinforced concrete walls will retain cut embankments at a maximum height of 2 m. Where fills exceed 3 m, the embankment will be retained by "gabion type" retaining walls ranging from 1.5 m to 3.5 m in height. Mechanically stabilised concrete walls will be used to retain fill embankments at the Mpushini Spruit Bridge.
- All sections of the N3 and interchange ramps within the project area will be provided with overhead street lighting (masts in the median).
- All road signage will be replaced with new signs to accommodate the additional lanes. All signs will be mounted on overhead sign gantries.
- Walkways will be provided at the median of the R103, under the Lynnfield Bridge, within the ramp intersections.
- The following work will be carried out on the crossroads and bridges:
  - ***Lynnfield Park I/C*** will be signalised in the first phase (with construction of a Diverging Diamond layout to be implemented in a later phase). The existing bridge will be demolished and reconstructed to accommodate the proposed N3 mainline and R103 cross section.
  - ***R103***: portions of the R103 will be realigned to suit the upgrade. The alignment of the R103 crosses the N3 mainline perpendicular to the N3. The R103 consists of 2 lanes which taper down to one lane in each direction at the proposed iBhubesi Industrial Park access and the new proposed intersection of the R103 and MR477.
  - ***Mpushini Spruit Bridge*** will be widened to accommodate the proposed N3 mainline cross section.
- Various accesses exist along the R103, mainly to farms and to the iBhubesi Industrial Park. These accesses require realignment and will be formalised:
  - ***iBhubesi Industrial Park access*** will be relocated.
  - ***R103/ MR477 Intersection*** will be upgraded and realigned. A portion (approx. 120 m) of the MR477 will be realigned.
  - Approximately 1.6 km of ***farm access roads*** will be relocated and upgraded. This includes:
  - Access Road 1 to Dave Rigby and other properties.
  - Access Road 2 to Martin Bekker's Property.

[5] It must be noted however, that SANRAL has requested the engineers to design for an initial construction phase, which is to signalise the intersection and undertake only the initial necessary works required to accommodate a DDI layout in the future. The DDI layout will then be implemented at a later stage when traffic demand dictates.

- Realignment of a section of Transnet's NMPP pipeline:
  - The Transnet pipeline will not need to be realigned prior to construction as it will be affected only in a future phase. Transnet Fuel Pipelines will be responsible for stopping and restarting operations of the pipeline during construction works and ensuring all technical and safety standards are met. The existing pipeline sleeves will need to be extended under the R103 and N3 due to the road being widened on both sides. A future servitude will be registered for relocation of the pipeline which will be done prior or during ultimate interchange construction. The servitude will be registered as a pipeline servitude and owned by the existing land owner.
- Relocation of a section of uMgeni Water pipeline:
  - Prior to construction, portions of the uMgeni pipeline will need to be realigned. At the access and drainage culverts, the pipeline will need to be relocated vertically, and at the crossing of the R103, the pipeline will need to be relocated horizontally and vertically. A new pipeline servitude has been identified near the crossing of the R103. This land will be registered as a pipeline servitude and will be owned by the existing land owner.

The **estimated construction period for this section of the N3 (Lynnfield Park to Ashburton)** is 3 - 3.5 years and is anticipated to commence in 2019, to be preceded by the realignment of the uMgeni Water pipeline.

3.1.2 Upgrade of the N3 from Ashburton (km 0.8) to Gladys Manzi (km 6.1) including the upgrade of the Ashburton I/C (km 1.8)

- This contract deals with a 5.2 km section of the N3 between south of the Ashburton I/C (N3 Section 3, km 0.8) and Gladys Manzi Road (N3 section 3, Km 6.1).
- The N3 will have 4 lanes in the northbound and southbound directions with the provision of a climbing lane (5^{th} lane) where required.
- Additional climbing lanes will be provided between km 2.5 and the Market Road I/C in the northbound direction. In the southbound direction, the climbing lane is between the Market Road I/C and km 4.4, and then picks up again from km 2.62 continuing towards the Lynnfield Road I/C.
- The proposed Ashburton I/C configuration follows a similar configuration to the existing layout configuration. The on and off ramps will have one lane each. The I/C layout has been selected to provide safer driving conditions and improve traffic movement. This is a significant improvement to the existing configuration, which is substandard. The proposed upgrade to Pope Ellis Drive (Main Road 478) in the vicinity of the I/C shall consist of a divided dual carriageway, making allowance for refuge right hand turning movements. The design then ties-in to the existing road cross section at the limits of construction. There will be provision made for pedestrians, with a 1.8 m sidewalk at the Ashburton I/C on Pope Ellis Drive. The Pope Ellis overpass will be demolished and a new longer bridge will be constructed in the existing position.
- Retaining structures will be constructed at specific locations to retain the new road embankments, thereby limiting the extent of land acquisition in densely built areas.
- Most of the cuts and fills will be restrained by retaining walls in built up areas to limit land acquisition. Cut retaining walls will consist of soil nails together with mesh and geofabric covering. Fill retaining walls will be either mechanically stabilised earth walls ("reinforced earth type walls") or conventional reinforced concrete walls. The use of gabions or Terramesh gabion type baskets with tails or similar, will also be used.
- All sections of the N3 and interchange ramps within the project area will be provided with overhead street lighting (masts in the median) (note that street lighting forms part of a separate contract).

- All road signage will be replaced with new signs to accommodate the additional lanes. All signs will be mounted on overhead sign gantries.
- The use of Armco barriers will be limited, as nearly all cuts will have New Jersey-type (concrete) barriers at the base of the cut retaining wall and nearly all fills will have concrete parapets on the top of the fill retaining walls. Armco barriers will, however, be used where circumstances dictate and where concrete walls/parapets are not already provided, such as in fill situations.
- The following work will be carried out on crossroads:
  - ***Pope Ellis Overpass:*** this is part of the Ashburton I/C. A new longer bridge will replace the existing bridge in the existing position.
  - ***Cleland Overpass Bridge:*** this is no longer in use and will be demolished.
- Realignment of a section of uMgeni Water pipeline:
  - Prior to construction, an existing 5.1 km length of uMgeni Water pipeline will need to be moved out of the existing road reserve to accommodate widening. New pipeline sections will be constructed and tied into the existing ends, and the redundant section will be closed off and removed where necessary. The construction of the new section of pipeline will be undertaken by a separate appointment. The location of the deviated section of pipeline will require acquisition of land. This land will belong to uMgeni Water.

The **estimated construction period for this section of the N3 (Ashburton to Gladys Manzi)** is 36 months and is anticipated to commence during 2020.

3.2 Construction phase activities

3.2.1 Access to construction sites

All access for construction will be via existing roads, including lanes of the N3. No additional haul roads will be built.

3.2.2 Relocation of services

Various services will need to be relocated out of the road reserve, where required to accommodate road widening. Co-ordination between the affected service providers and SANRAL's appointed engineers and contractors is undertaken to effect this, and a separate services relocation contract will be implemented prior to road construction. Services that are affected by the proposed upgrade include those belonging to:

- uMgeni Water.
- Transnet Fuel Pipelines.
- Liquid Telecom (formally Neotel).
- Dark Fibre Africa.
- Telkom (now Openserve).
- MTN.
- Vodacom.
- Mikros.
- Link Africa.
- Msunduzi Water.
- uMgungundlovu District Municipality.
- Eskom.

3.2.3 Contractors' site offices and stockpile areas

Contractors' site offices and stockpile areas will be located either within the road reserve or on nearby properties as negotiated and agreed with property owners. The exact sites[6] will be identified by the contractors who are awarded the tender for the work. Siting and establishment will be guided by specifications in the Environmental Management Programme (EMPr). No staff (except security) will be accommodated overnight at site offices/stockpile sites, although the facilities may be used during possible night work.

3.2.4 Waste management

Solid waste
Solid waste will be produced during construction. However, there will be no waste management activities requiring a permit in terms of the Waste Regulations under the National Environmental Management: Waste Act. Wherever possible, inert waste will be re-used in construction.

The project will generate large volumes of demolition rubble consisting of reinforced concrete, when bridges, parapets, the northbound Continuously Reinforced Concrete Pavement (CRCP) climbing lane and concrete-lined side drains are demolished. The removal, where necessary, of concrete islands, concrete barriers, signage, etc. will also result in large volumes of rubble/solid waste. The inert material will be re-used as fill, re-used in pavement layers[7]; excess sold to outside contractors (for similar purposes) and/or disposed at licensed landfill sites. Monthly quantities are unknown at present.

Waste asphalt and possibly tar from the older sections of the original roadway resulting from removal of pavements will be generated as well as other general waste such as cement bags, packaging, plastic and used metal canisters. It is intended that general waste, including any excess inert waste, will be disposed at the nearest licensed municipal landfill site. However, it is proposed that the milled off asphalt be stockpiled for use in new asphalt on other sections of the N3.

The project will also generate a large amount of surplus cut material from earthworks, estimated at approximately 270,000 to 280,000 m^3 (roughly 410,000 tons). However, this will not be waste as it is SANRAL's intention to use this on other sections of the N3 which are part of the broader project (between Durban and Pietermaritzburg). It will be stockpiled on SANRAL's own land, recently acquired just east of Lynnfield Park.

Layerworks material from the existing roadworks will be temporarily stockpiled off site. Where practical, however, it will be transported from one section directly to another.

Liquid effluent/waste water
The project will not produce effluent other than normal sewage. Rented portable chemical toilets will be used for workers at the site of works, to be serviced by the contractor's appointed service provider.

6 Between Ashburton and Gladys Manzi Road, access from the northbound to the southbound carriageway, and *vice versa*, will be via the Ashburton Bridge at the southern end and the Mkondeni Bridge at the northern end, and so there appears to be no particular advantage to any site in terms of access. However, on the west side of the Ashburton Interchange, the area is fully serviced and there is existing infrastructure which could be utilised.

7 The design, still subject to refinement, requires a 100-mm thick 10 MPa interlayer, followed by a 260-mm thick CRCP surfacing. It has been recommended by the engineers that an existing concrete batch plant at Sterkspruit Quarry is used to crush the waste concrete for reuse in these layers or alternatively, the batch plant will be situated on land recently acquired by SANRAL just East of Lynnfield Park. This would have to e authorised in a separate application.

There will be no waste water generated by the project that can be recycled. Batching plants will not be on site (unless authorised in a separate application). It is envisaged that concrete as well as asphalt will be obtained from commercial sources, however should the contractor establish on site, a separate approval will be required.

Emissions
There will be no emissions other than exhaust and dust emissions. Dust will be controlled during construction.

3.2.5 Borrow pits and quarries

Materials will be sourced from commercial sources[8] and/or existing SANRAL borrow pits as well as from within the road reserve. Should new borrow pits or quarries need to be established, these will be applied for under a separate licensing process.

3.2.6 Batching plants

There is an existing concrete plant and an asphalt batch plant at the Sterkspruit Quarry. Batching plants will not be provided on site, unless applied for under a separate licensing process.

3.2.7 Water use

The estimated average volume of water required during construction for the two contracts involved in this section is a maximum of 30 kl (m^3) and 75 kl per day, respectively. Water will be obtained from a municipal supply and/or will be abstracted from rivers near to site. The Department of Water and Sanitation (DWS) has been consulted regarding the water use registrations (General Authorisations) that will be required.

3.2.8 Energy use

During construction, conventional sources of energy will be used (e.g. municipal electrical supply, generators, and conventional fuels and oils). Alternative energy sources will not apply, unless the contractor chooses to make use of them.

3.2.9 Demolition

The N3 will be closed temporarily during the initial stages of demolition. Demolition will take place at the following sites:

- Lynnfield Park I/C.
- Existing Cleland Overpass Bridge.
- Existing Pope Ellis Bridge (Ashburton I/C).

Demolition rubble volumes are estimated to reach approximately[9] 35,000 m^3 and 50,000 m^3 for each contract, respectively, and will consist of pavement, concrete structures and reinforcement. The material will be broken into smaller, more uniform pieces using mechanical breakers. The steel will be removed and sold to recycling contractors. The concrete rubble will

[8] There is an existing commercial quarry at Sterkspruit, approximately 5 km to the east of the Ashburton Bridge, which would be able to supply all the layerworks materials.

[9] Volumes can only be confirmed once final geometrics alignment and pavement designs have been completed.

be re-used in new construction as far as possible. Excess demolished material will be disposed at licensed landfill sites. The demolition sites will be restored to a safe and neat condition.

3.2.10 Generation of noise

During construction, construction activities will elevate existing noise levels over and above those already generated by traffic on the N3. The existing noise generated by traffic exceeds 65 dB (A)[10] within (generally) 300 m from the road and 60 dB(A)[11] up to 340 m from the road. Project construction activities will add to these noise levels. Although this will be temporary and confined mostly to daylight hours, there will, however, be some need to work at night, due to the heavy traffic volumes.

Blasting will occur at the Lynnfield Park I/C and at high cuts on the N3 at km 32.800 to km 33.000. It will also occur near the Ashburton I/C. Blasting will generate temporary and short lived loud noises. Blasting will be undertaken in accordance with relevant legislation and with prior notice to affected neighbours. The noise receptors likely to me most sensitive are existing residences in Ashburton, on either side of the Ashburton I/C Bridge, which may be affected by the noise from bridge construction, as well as blasting of the tillite cuttings. Construction noise will also affect properties in the residential areas of The Meadows and Bellevue, where some of the properties butt onto the road reserve.

Note that the contractors will inspect and record the condition of structures and buildings within the blast area before and after blasting.

3.2.11 Accommodation of traffic during construction

Traffic will be managed according to a Traffic and Road Safety Management Plan approved by SANRAL for each contract, ensuring that co-ordination between adjacent contracts is undertaken as relevant. The contractors will be required to submit the final traffic management and road safety plans for approval by the engineers prior to implementation.

3.2.12 General construction activities

The main construction activities for the N3 capacity upgrades are presented hereunder.

Site preparation

- Establishment of site camps and stockpile areas.
- Provision for on-site waste management – sewage, waste water, solid waste, general waste, etc.
- Provision for storage/handling/disposal of hazardous substances (e.g. cement, asphalt, fuels and oils). A bunded area will be provided for storage. Storage volumes may exceed 50 m^3.
- Clearance of vegetation.
- Removal and stockpiling of topsoil and subsoil.

Road and bridge widening

- Accommodation of traffic according to an approved final Traffic Management Plan.
- Demolition.
- Blasting (where required).

[10] The Draft Noise Control Regulations (NCR) GNR 154 of January 1992 and Application of Noise Control Regulations, CNR 155 10 January 1992 framed under the Environment Conservation Act 1989 (Act 73 of 1989) identify a level of 65 dB(A), equivalent noise level (L_{Reqd}) cut off for road noise impact.

[11] The SANS code of practice level is 60 dB(A).

- Excavation with heavy plant.
- Stockpiling of spoil for building and levelling on site or other parts of the proposed N3 upgrades.
- Stockpiling of demolition rubble for building and levelling on site or other parts of the proposed N2 & N3 upgrades, as well as for use in the new road layers.
- Disposal of excess spoil/rubble to licensed landfill sites and/or use on adjacent contracts, where feasible.
- Provision of drainage structures where crossing drainage lines and watercourses.
- Haulage and placement of materials with heavy plant.
- Water abstraction from local streams, if feasible.
- Water spraying.
- Rolling and compaction with heavy plant.
- Bridge jacking.
- Retaining walls/other stabilisation/erosion control structures (as required).
- Erection of lighting, Armco or concrete barriers, road signs, and road lane markings.
- Relocation of existing traffic management infrastructure (cameras, etc).

Re-instatement and rehabilitation

- Reinstatement of slopes.
- Reinstatement of topsoil.
- Revegetation.
- Erosion control.
- Alien plant control.

3.2.13 Employment opportunities

Contractors, with their skilled labour, will be appointed in accordance with the procurement policies of SANRAL. Unskilled labour will be sourced by the contractors involved in the work. At present, it is unclear exactly how many jobs will be created as a result of the proposed project. However, based on previous projects it is anticipated that, per contract, the most people employed on site at any one time will not exceed 550. A portion of these will be semi-skilled and unskilled labour. It is anticipated that contractors may use their own skilled personal and, thus, direct employment opportunities for people from the surrounding communities may be predominantly for unskilled and semi-skilled jobs. The number of job opportunities will, however, vary on a month to month basis and will be dependent on the stage in the construction process.

3.2.14 Communication with land owners and stakeholders

This is a linear development with several affected land owners over and above the applicant themselves (SANRAL). Consultation with directly affected property owners will be initiated by the land acquisition team as part of the land acquisition process. The design engineers have notified service owners with respect to the relocation of services and utilities in the road reserve. All key stakeholders including as many as possible of the adjacent property owners have been notified and given an opportunity to consult with the project team as part of the public participation process conducted for this application for environmental authorisation. During construction, SANRAL and its appointed contractor(s) will be responsible for keeping road users and adjacent landowners informed of relevant planned construction activities (e.g. blasting, road closures, deviations, etc).

3.3 Operation phase activities

3.3.1 Vehicle traffic

The main activity of the N3 during operation is obviously the carrying of the nation's vehicle traffic, which comes with noise related impacts and safety hazards. These are largely controlled by road design (including the road reserve which acts as a buffer between the road and surrounding land), speed restrictions, signage, monitoring by camera, traffic policing and emergency services as needed.

3.3.2 Road maintenance

During operation, SANRAL conducts routine maintenance activities which include:

- Maintenance of vegetation in the road reserve, e.g. trimming of grass and shrubs, weed removal and control of alien invasive plants.
- Erosion control in the road reserve.
- Clean-up of litter from the carriageway and road reserve.
- Keeping drains and culverts free of vegetation and litter.
- Checking and repairing/resurfacing of the road surface as required.
- Checking and repair of road related infrastructure as required (barriers, guard rails, signage, etc).
- Operation of speed cameras, variable messaging system, etc.

SANRAL appoints a Routine Maintenance Engineer for each section of road to advise on the physical maintenance that is required on the travelled road surface, so that tenders and contracts for the work can be set up as required. Contracts for road reserve maintenance (mowing, etc) are longer term. All maintenance activities will remain in place during construction.

3.3.3 Waste generation

During operation, the national roads *per se* will not generate solid waste. However, road users do throw out litter from their vehicles and this accumulates on the roadsides. The road reserves are also maintained and this produces grass cuttings and other 'waste' vegetation. This waste is collected on a regular basis by SANRAL's routine road maintenance contractors and disposed at the closest licensed municipal landfill sites.

3.3.4 Energy use

Lighting of the interchanges and road sections is provided by a conventional electrical connection. A performance based approach is used for the procurement of the luminaires (street lighting) on the N3 corridor. This means that as technology evolves after the procurement phase, the latest technology will be made available to this project. LED street lights with high efficiency and low energy consumption are being specified. In addition to the luminaires, a Lighting Management System will also be implemented which allows the dimming of the lights as required, thus extending the life spans of the luminaires.

Generally, the capacity upgrades should facilitate smooth traffic flow and thus better energy efficiency. Where Parclo configuration is used for interchanges, it allows for free movement of traffic, which is more fuel efficient for vehicles.

3.3.5 Generation of noise

During operation, noise will continue to be generated from the traffic using the N3, as is already the case. Currently, noise levels are above local and international standards. The 65 dB Noise Control Regulations standard is exceeded within, generally, 300 m of the edge of the highway and the SANS Code of Practice limit of 60 dB(A) up to 340 m from the road.

With increasing growth in traffic volumes, noise levels will continue to increase. It must be noted that an increase in traffic volumes will occur, regardless of whether the proposed upgrade proceeds or not. Thus, the project itself will not result in more noise; it is the increase in traffic volumes which will result in increased noise. However, where road widening encroaches closer to receivers, the source of the noise will be closer to recipient residences, businesses and other community facilities.

4. PROJECT ALTERNATIVES

Given that this project entails the upgrade of an existing national road, alternatives investigated by SANRAL have revolved mostly around technical engineering issues (road design, materials, etc.). Alternatives that have been considered during the course of SANRAL's planning are discussed below. It must, however, be understood that the final project proposal put forward for consideration by DEA consists only of one feasible alternative.

No additional feasible alternatives have been put forward by SANRAL as the final design selected has been based on detailed modelling to best meet traffic demands and road safety standards.

4.1 Macro alternatives: use of road versus rail

The South African Government recognises the need to introduce an efficient rail freight service to reduce truck traffic long term, ease traffic burden on road networks and at the same time enhance the longevity and quality of roads. A migration from road to rail will improve road safety and decrease road maintenance costs. However, given the major role that road plays in South Africa, being able to migrate from road to rail is a long term venture and dependency on road transport will still continue even after required rail upgrades take place. Thus, the use of rail cannot be considered as an alternative to the proposed project; rather, road and rail are complementary alternatives, both required to meet demand.

Of the 643 million tons (Mtons) of freight moving through South Africa annually, only 22.5% is moved by rail and the rest by road. Within the Gauteng to Durban corridor, general freight moved by road is 46 Mtons and a mere 6.4 Mtons via rail[12]. Of the 2.7 million containers moving over Durban's wharf per annum, 70% are spread around Durban and only 30% are sent to Gauteng. There is a high dependence on the movement of freight in rural corridors via road (255 Mtons) versus rail (39 Mtons), with a similar trend for metro corridors[13]. This highlights a need for road freight movement through these corridors and a particular need for freight movement via road for short, local hauls and rail for longer hauls. Given the high density of rural and metro areas in South Africa, freight movement via road is essential. However, there is a requirement for the migration of more freight from road to rail and rail upgrades are needed to enable this[14].

SIP 2 included the Durban–Free State-Gauteng logistics corridor, which is expected to create 135,000 jobs, strengthen the movement of freight and transport corridors between major industrial hubs in the country, improve access to the port and increase efficiency. The programme includes the construction of a new railway line between Gauteng and Durban. The Durban to Gauteng corridor is one of the most important corridors in the country and is expecting massive increases in freight volumes (Havenga *et al.*, undated). With freight forecasts considered, it is expected that during the next 25 to 30 years, containers moved from the Port of Durban to Gauteng will grow almost eightfold. This cannot be done without a new rail line, as the expected increases in freight will result in a heavy increase in freight trucks travelling within this corridor. The existing rail lines need upgrades to be dedicated to carry freight. However, in the absence of rail line upgrades and new line construction, the need for road upgrades are essential and are regarded as of high importance. Without a present back up for freight movement, it is essential that road upgrades are made to manage the increase in freight movement, particularly between the Durban to Gauteng corridor.

12 https://www.environment.gov.za/sites/default/files/docs/publications/freightshift_roadtorail.pdf
13 https://roadtransportnews.co.za/wp-content/uploads/2017/01/Havenga.pdf
14 http://www.transport.gov.za/documents/11623/39906/7_FreightTransport2017.pdf/a3f7cb55-8d77-4eea-b665-4c896c95a0d8

4.2 Property/location/route alternatives

Early in the planning process, SANRAL's decision was to make use of the national road median to contain the extra lanes as far as possible within SANRAL's existing road reserve, rather than having to expand on the outer edges of the road, which may require the acquisition of much more additional adjacent land. Similarly, through road design, acquisition of adjacent properties has been minimised.

As this is an upgrade of an existing national road and existing interchanges, route alternatives were not considered.

4.3 Design/layout alternatives

This project has undergone a preliminary engineering design phase followed by detailed design. It has taken several years and numerous reviews of different options and iterations to arrive at acceptable design proposals that meet cost, safety and technical requirements. The design proposals were based on numerous engineering factors and models, taking into account the results of Traffic Analyses, forecasts of future traffic loads based on predicted developments and land use changes, the existing and required road standards, road gradients, geological conditions and other factors. Based on this information, the optimal number of lanes and lane configurations, and corresponding interchange layouts were proposed.

This project has involved a technical and iterative design process which has entailed modelling and testing of various alternative layouts to arrive at financially feasible designs that meet the required safety standards and traffic carrying capacity to 2047. It is beyond the scope of this environmental report to provide detailed engineering motivation for each iteration that has played out during the design process, nor to assess these alternatives. However, it can be said that the various interchanges have been designed (within the individual confines and restrictions of the surrounding physical environment) for optimal traffic flow of forecast traffic on approach and exit lanes, and to accommodate the number of additional lanes on the main carriageway. The feasibility of phased upgrades has also been considered, i.e. to design for maximum carrying capacity but to construct initially to provide an intermediate carrying capacity (the design would allow for provision of additional ramps at a later stage, should development in the area call for maximum carrying capacity).

Specifically, for the section from Lynnfield Park to Ashburton, three conceptual alternative options for the Lynnfield I/C were prepared by the engineer for consideration by SANRAL. A modified free flow I/C was proposed and was further developed for consideration. The I/Cs were then developed for implementation in phases, an Interim phase (Cloverleaf I/C) and an Ultimate phase (Modified Free Flow Cloverleaf I/C). A second interim phase was explored for the interchange, for implementation, as requested by SANRAL. The aim of this was to establish for how long the capacity of the existing I/C would remain at acceptable levels if converted to a Diverging Diamond I/C (DDI). A traffic study was undertaken for the DDI and the analysis indicated that the DDI could operate at an acceptable level of service. SANRAL accepted the proposed DDI and the engineers were requested to undertake a preliminary design for this interim option. Subsequently a further request was made by SANRAL to develop the DDI in two construction phases (phase one being signalizing the existing I/C, and phase two the DDI[15]. The Engineer was requested to undertake a detail design for the DDI and implement the signalised option during the first phase of construction.

[15] SANRAL has requested the engineers to design for an initial construction phase, which is to signalise the intersection and undertake only the initial necessary works required to accommodate a DDI layout in the future. The DDI layout will then be implemented at a later stage when traffic demand dictates.

For the N3 Ashburton to Gladys Manzi Road, the existing interchange layouts have not been modified, but have been upgraded to improve safety and the level of service. The design of the Ashburton I/C allows for a future additional directional ramp, if traffic volumes warrant and the current loop ramp provided for this traffic exceeds capacity. However, current traffic predictions indicate that the two lanes will be sufficient to year 2047. Alternatives were also considered with respect to the alignment of the N3 in the vicinity of the Bellevue farmstead, a listed heritage site (see Section 5.4). The engineers changed the initial alignment and design of the N3 widening at this point, in order to avoid having to destroy structures forming part of the Bellevue Farmstead.

Taking into consideration the above, it must be noted that SANRAL has put forward one final recommended layout proposal for environmental authorisation. For a project of this scale and nature, which constitutes an *in situ* upgrade, it would be impractical to assess additional alternatives for authorisation, that are not recommended by SANRAL and which they cannot implement.

4.4 Technology alternatives

Aspects such as pavement structure, retaining structures, lighting, signage, barriers, etc. have also been subjected to a process whereby various design proposals have been investigated and the optimal design selected based on technical engineering, road safety and cost criteria.

A key operational aspect taken into account has been noise management/reduction. SANRAL has considered the use of ultra-thin friction course surfacing. This type of asphalt surfacing has been proven to be quieter than conventional asphalt and concrete surfacing and can also be used to overlay the sections of the N3 where SANRAL is proposing to construct a concrete pavement. As an alternative, diamond grinding of the concrete surface, which reduces tyre noise, has also been considered. Diamond grinding creates grooves of uniform depth and spacing unlike conventional grooving techniques. The consistent grooves within the road pavement reduce the noise of the vehicle tyres over the pavement. SANRAL's design team will use different surfacing types according to the requirements of the different sections of road, taking into account the proximity of noise sensitive receptors. .

It should be noted that SANRAL has commenced the process of sourcing an acoustic specialist to investigate further feasible and cost effective noise mitigation measures which can be considered for implementation to reduce noise levels adjacent to the N3.

4.5 The no-go alternative

The No-Go (no-development) alternative implies that the *status quo* remains and no widening of the national road and upgrading of interchanges occur. If no widening occurs, no listed activities will be triggered, for example, the clearance of indigenous vegetation or construction within or near wetlands and riparian channels. The resultant impacts of construction on vegetation, riparian areas and wetlands along the N3 sections of interest will, thus, be avoided. The nuisance impacts and disruption to traffic which will result from road widening construction activities will also be avoided.

However, the fact that this proposed project is one of South Africa's Strategic Infrastructure Projects (SIP2 status) is an indication of its importance and priority. The project will assist in strengthening the logistics and transport corridor between South Africa's main industrial hubs, improve access to Durban's export and import facilities, and raise efficiency along the corridor. Currently, the N3 carries between 40,000 and 120,000 vehicles per day and in excess of 75 million tons of freight per annum. The sections of N3 under consideration are operating at near

full capacity with ongoing safety related incidents with the mix of heavy and light vehicles, topography and limited capacity and the failure to widen and upgrade these sections will lead to increasing congestion as traffic volumes continue to increase with substantial costs to the economy in lost time. This, in turn, will lead to increased safety risks and accidents. It will also result in more road maintenance requirements, causing further congestion during maintenance and much road user frustration and dissatisfaction. The ongoing decrease in the efficiency of transport of people and goods, due to increasing traffic congestion, will result in widespread negative effects on the social and economic environment. The No-Go Alternative is, therefore, not considered to be a feasible alternative.

While the no-development option is not preferred, it forms the baseline against which all other options are assessed.

5 DESCRIPTION OF THE RECEIVING ENVIRONMENT

5.1 Current land use and zoning

Land use in the vicinity of the Lynnfield Park Interchange is characterised by small holdings to the east and south west with the development of a light industrial and/or logistics hub to the west. Between the Lynnfield Park Interchange and the Ashburton Interchange the land adjacent to the N3 is largely agricultural land (grassland) with residential properties and small holdings on both the eastern and western side of the N3 as one approaches the Ashburton Interchange. Between the Ashburton Interchange and Gladys Manzi Road, the land adjacent to the N3 is largely under indigenous bush, however, as one approaches Gladys Manzi Road, there are residential properties on both the eastern (Bellevue) and western (Cleland) side of the N3 (Figure 1).

Land use zonation is shown in Appendices C1a and C1b. The section of N3 in this assessment that falls within the Mkhambathini LM is outside the Town Planning Scheme, however, in terms of the Rural Land Use Designation for the municipality, the land adjacent to the N3 is zoned *Agriculture Limited Tourism, Agriculture Opportunity Area and Conservation*. While much of the land is currently not developed, environmental authorisation has been granted for the Acaciadale Retail & Eco-Tourism Development on the eastern side of the Lynnfield Park Interchange albeit that development has not commenced. Again, within the Msunduzi LM, the section of road is largely outside of a town planning scheme, however, in terms of the Municipal Spatial Development Framework, land adjacent to the N3 passes through areas identified as *Existing Formal Residential* and *Future Formal Residential*. It needs to be noted that in the event of the areas zoned *Future Formal Residential* being developed, the noise levels generated by the N3 will need to be taken into consideration.

5.2 Land ownership and affected properties

5.2.1 Land ownership

This is a linear development located primarily within the proclaimed N3 road reserve belonging to SANRAL, as use will be made of the median and existing road reserve to accommodate widening. However, additional property will need to be acquired adjacent to the N3 in certain areas where expansion beyond the existing road reserve is required. These areas are indicated by the red lines in Figure 1 and include private and institutionally owned properties. Among these properties is the property associated with the proposed Acaciadale Retail & Eco-Tourism Development (Best Vest), where a portion a land needs to be acquired. SANRAL undertakes a land acquisition process whereby negotiations are entered into with property owners to purchase the land at market based values and to take into consideration other financial impacts. In the rare circumstances where agreement cannot be reached, SANRAL is compelled to embark on legal proceedings to expropriate[16] the land. The newly acquired land will be proclaimed as road reserve.

5.2.2 Property names and numbers

This 9.8 km linear project involves hundreds of property subdivisions, mostly within SANRAL's proclaimed road reserve. The property diagrams and property numbers in the proclaimed N3 road reserve are published in Government Gazette No 40085, Vol. 734, 22 June 2016. Due to the size of the document (amount of electronic data as well as paper for hard copies) it is not appended to this BAR. The gazettes can be downloaded from the government website: http://www.gov.za/sites/www.gov.za/files/40085_gon733.pdf

[16] It is expressly stated that acquisition and/or expropriation discussed in this report is acquisition and/or expropriation to be undertaken within the context and provisions of the current laws of the country.

The property numbers of all properties within 50 m of the national road sections to be widened are included in Appendix C2. This includes property names and numbers for properties to be acquired by SANRAL (a separate property acquisition list is still subject to finalisation by the engineers).

5.3 The social/socio-economic environment

A summary of the socio-economic character of the receiving environment is provided below. More detailed information is provided in the Social Impact Assessment Specialist Report (Appendix D).

5.3.1 Demographics

The Msunduzi LM, one of seven local municipalities forming the uMgungundlovu DM, covers an area of approximately 2,385 km² with a total population of approximately 682,000 people (Msunduzi IDP, 2018/2019). The population is characterised by a high proportion of people under the age of 35 with 67% of the population aged between 0 and 34 years (27% under 15 and 40% between 15 and 34) (StatsSA, 2012). Comparatively, the municipal wards where the proposed upgrades will take place (Ward 36 and Ward 37), exhibit a more evenly distributed population with 50% and 58% respectively of the population in the ward below the age of 35 (StatsSA, 2012).

Within the municipal wards where the upgrades are taking place, 87% of households are reported to reside in formal dwellings, 12% in informal dwellings and 1% in traditional dwellings (StatsSA, 2011). These figures show that the proportion of households reported to be residing in formal dwellings is above the municipal, district and provincial average, while those reported to be residing in informal and traditional dwellings is below these averages. This is likely due to the study area generally being characterised by middle income households residing on the urban-periphery of Pietermaritzburg.

In the Msunduzi LM, an estimated 5% of the population over the age of 20, reported having no formal education, 25% a grade 12 level of education and 10% some form of tertiary education (Stats SA, 2012). These figures suggest the municipal population on average has better access to education than the population within the Umgungundlovu DM and KZN. The trend of better access to education in urban areas (Msunduzi is the economic hub, the municipality with the highest level of urban settlement in the DM and seat of the provincial capital) is to be expected and is a trend which exists throughout South Africa (StatsSA, Undated).

This is further illustrated when looking at education levels within the municipal wards where the project will be taking place. Within Ward 36 and Ward 37, on average 2% of the population reported no access to formal education, 31% a grade 12 level of education and 33% some form of tertiary education (StatsSA, 2011). These figures are higher than the municipal average and significantly better than the district and provincial averages.

5.3.2 Economic profile

Unemployment in the municipality is reported to be 18%, well below unemployment levels for KZN which are reported to be 33% (Stats SA, 2011). While these figures appear relatively good, the Msunduzi LM has a high portion of the population of working age classified as ‘not economically active’ (40%) and discouraged work-seekers (6%) which implies that despite a low

level of unemployment, a high number of the potentially economically active population is not economically active and, thus, dependant on a small base of employed people (StatsSA, 2011). Unemployment levels within the wards where the proposed upgrades will take place are on average lower than the municipal and provincial average, with 6% of the potentially economic active population reportedly unemployed (StatsSA, 2011). Importantly, in these wards, less people are classified as not economically active (35%) and discouraged work seekers (2%) (StatsSA, 2011).

While the average annual household income in KZN, Umgungundlovu and Msunduzi are similar, the average annual income within the wards where the proposed upgrades will be taking place is higher, with 25% of households being classified as 'upper income'. However, it needs to be noted that the proportion of households reported to have no income, throughout all areas, including the study area, remains high, while all households classified as 'Low income' are in fact living below the food poverty line[17] and technically living in extreme poverty (StatsSA, 2017).

5.3.2 Noise receptors adjacent to the N3

The most sensitive noise receptors along the section of the N3 between Lynnfield Park and Gladys Manzi Road are within 300 m of the edge of the N3, particularly those situated above the level of the road and within direct line of sight (i.e. with no intervening structures or natural barriers between the receptor and the N3). There are some residences in proximity to the N3 in the vicinity of the Ashburton I/C, and several residences close to the N3 (Cleland, the Meadows and Bellevue) which will potentially be sensitive to an increase in noise levels. However, it must be noted that most properties affected close to the interchanges have been acquired by SANRAL.

5.4 Cultural heritage resources

eThembeni Cultural Heritage Consultants (eThembeni) were appointed to assess potential impacts of the project on heritage resources within the study area. Much of the proposed development has already been the subject of various heritage studies. In 1998 a preliminary archaeological study was undertaken for the farm Bellevue (Anderson, 1998, cited in the Heritage Specialist Assessment, Appendix D). In 1998/9, 2007 and 2010 the northern parts of the farm were surveyed and various archaeological sites excavated in mitigation of the Transnet New Multi-Products Pipeline. In 2010 and 2011, the area was again surveyed in mitigation of the Hillcove Hills residential development (Anderson, 2011; Whelan, 2010, both cited in the Heritage Specialist Assessment, Appendix D). The latter survey included the entire area between the suburb of Bellevue and the Msunduzi River.

The area between the Msunduzi River and Pope Ellis Drive in Ashburton was the subject of a survey undertaken for the proposed Sami Palace residential, commercial and leisure development on the north-eastern boundary of the current Ashburton Interchange (Wahl & Van Schalkwyk, 2011, cited in the Heritage Specialist Assessment, Appendix D). The findings and recommendations of all these studies were taken into account by eThembeni when assessing potential impacts of the project on heritage resources within the study area. Based on these assessments, no significant heritage resources were recorded within or in proximity to the development footprint other than Bellevue Farmstead (discussed below).

[17] The Food Poverty Line represents the amount of money that a person needs every month to purchase enough food to consume around 2,100 calories per day (the United Nations threshold for the minimum daily energy requirement for someone living in an emergency situation).

The N3 national route in KwaZulu-Natal has been constructed over the past approximately forty years. Accordingly, no infrastructure associated with the road, such as bridges, is older than sixty years and, therefore, generally protected in terms of the KwaZulu-Natal Heritage Act or the National heritage Resources Act.

Findings by eThembeni (Appendix D) indicate the following cultural heritage resources in the project area:

- Various structures associated with the Bellevue Farmstead, located at 29 38' 46" S 30 26' 13" E, as having heritage significance for their historical, architectural, social and aesthetic values and landmark qualities. Two structures of the Bellevue Farmstead are located less than 20 m from the existing road reserve and 15 m from the proposed road upgrade.

After discussions between the design engineers and eThembeni, the design engineers have modified their road design to reduce the extent of land required on the northern side of the existing N3 in the vicinity of Bellevue Farmstead, to avoid impacting directly on structures.

5.5 The biophysical environment

5.5.1 Site gradient

The terrain between Lynnfield Park and Ashburton is gently rolling. The route lies at an altitude ranging from 683 m to 773 m above sea level. The N3 intersects the R103 to form a grade separated Diamond Interchange. The N3 carriageway does not exceed 1:19 at its steepest point and the R103 is 1:58 at its steepest. Banks within the road reserve vary from 1:5 to 1:2 slopes. Between Ashburton and Gladys Manzi Road, the N3 traverses rolling to mountainous terrain. The expected road gradients in the worst-case situation range between 5 to 6 percent.

5.5.2 Geological conditions along the route

The geotechnical information in this section has been provided from preliminary geotechnical reports for the different engineering contracts and can be made available on request. The geology in this area is dominated by diamictite and shale of the Dwyka formation as well as shale from the Pietermaritzburg formation of the Ecca Group (Table 8). In many areas bedrock is close to the ground surface and hard rock exposure occurs over most of the route. Transported soils, comprising fine grained colluvium hillwash occur in some areas of the site. The presence of compressible cohesive soils is rare and only occasionally found in fractures in the tillite rock as clay gouge. The Ashburton area is characterised by shale bedrock at very shallow depths. Approaching Pietermaritzburg, there are high cut faces that show the deterioration and ravelling of the exposed rock face. In places, the weaker weathered tillite has eroded, leaving ledges of unsupported harder tillite protruding out of the cut face. These will be addressed by the proposed geotechnical design engineering measures to be installed in areas where required.

The weathered tillite and shale can achieve hard status at shallow depth, requiring large excavators or even blasting to remove.

Soil erosion has not been identified as a major risk, however, it will need prevention and management at the river and wetland crossings. The route has been investigated by the geotechnical team to inform engineering design and specific recommendations have been made.

Table 8 Summary of geological conditions along the route

Lithology	Comment
Diamictite/Shale	Majority of the route
Shale (Pmb formation)	Small section to the west of Lynnfield Park

5.5.3 Rivers and wetlands

The information below is referenced from the specialist riparian assessment report (Appendix D).

The study area falls within the uMngeni River catchment and the N3 crosses the Mpushini River (Msunduzi catchment) within this area. The Mpushini River is a tributary of the uMsunduzi River which, in turn, is a tributary of the uMngeni River. The uMngeni River catchment forms the main water catchment for the water supply dams of the Pietermaritzburg-Durban development node, the second most important economic complex in South Africa after Gauteng, supplying water to over 5 million people. Due to the strategic importance of the uMngeni catchment water resource, and the high level of impacts and demands on the river systems within the eThekwini Municipality, it is essential that river and wetland integrity is maintained and improved during all developments within the uMngeni River catchment.

Major rivers all drain in a predominantly easterly direction eventually discharging into the South Indian Ocean off the east coast.

There are several watercourses within 500 m of the proposed road upgrade. Most of these have been heavily impacted by the road and associated drainage structures, by canalisation and by urban development. Vegetation is largely degraded and heavily invaded by alien species. Six of the eight crossings (Figure 3) have been identified as providing wetland/riparian habitat (the remaining two are drainage lines) and these were assessed by GroundTruth (Appendix D). It must be noted that because these are existing road crossings, the watercourses are already modified at the crossing points. They include:

- N3-05-01. This is a valley bottom wetland without a channel. It has a health score of 'critically modified' due to erosion, pollution, compaction, general disturbance and high levels of alien vegetation. This site is flagged as orange due to the size of the wetland indicating mitigation is important; however, the site is critically modified and the wetland edge is outside of development footprint.
- N3-05-02. Mpushini River crossing. The health score is 'Good' despite channel modification by the N3 and invasion by exotic plants.
- N3-05-03. Unnamed tributary of the Mpushini River. This is a drainage line and river health was not assessed.
- N3-05-05. Valley bottom wetland with channel. The health score for the wetland is 'Fair' as a result of alterations in flow regime, erosion, sedimentation, pollution, compaction, habitat disturbance and alien plant invasion. The wetland is flagged orange due to the site being a wetland in fair condition, therefore, mitigation measures are important. However, risk is deemed to be low.
- N3-05-06. Valley bottom wetland with channel. The health score for the wetland is 'Fair' as a result of alterations in flow regime, erosion, sedimentation, pollution, compaction, habitat disturbance and alien plant invasion. The wetland is flagged orange due to the site being a wetland in fair condition. The risk is deemed to be low.

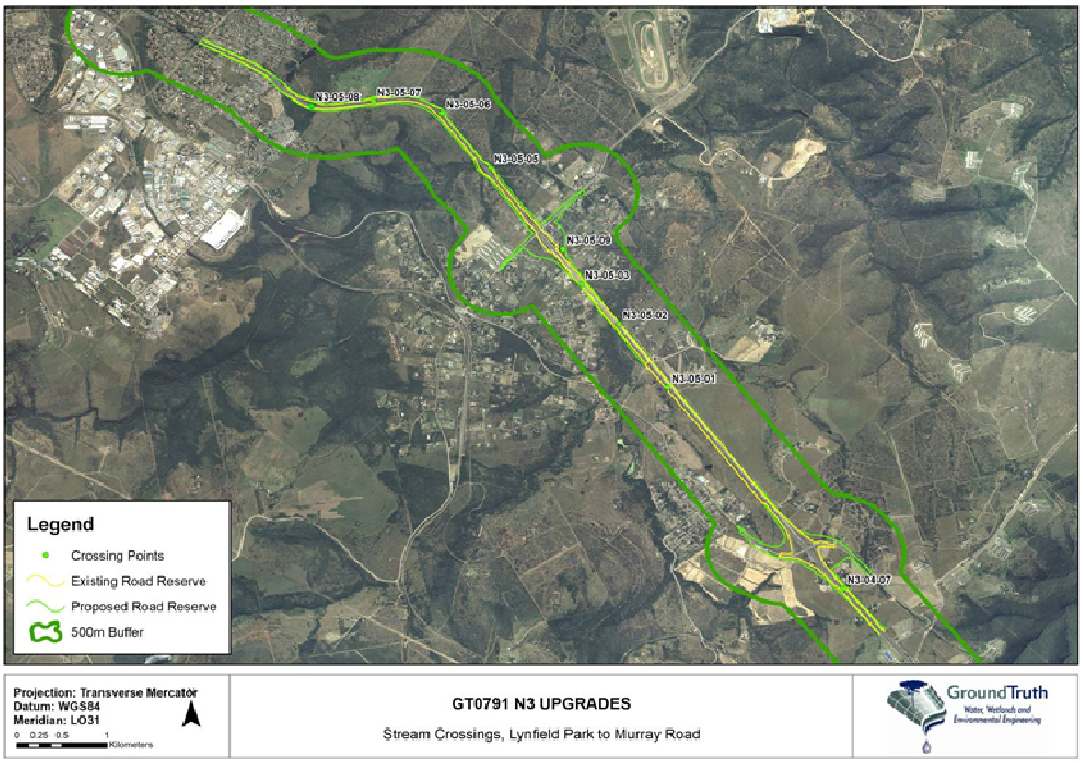


Figure 3 Watercourses crossed in the study area

- N3-05-07. Valley bottom wetland with channel. The health score for the wetland is 'Fair' as a result of alterations in flow regime, erosion, sedimentation, pollution, compaction, habitat disturbance and alien plant invasion. The wetland is flagged orange due to the site being a wetland in fair condition. However, the risk is deemed to be low.
- N3-05-08. Unnamed drainage channel. Being a drainage line, the river health was not assessed.
- N3-05-09 Riparian channel, draining from the eastern offramp. The channel has a health score of 'Fair' as a result of alterations to flow regime, poor water quality, bed/channel modification and the presence of exotic vegetation.

Further detailed information is provided in the wetland specialist report (Appendix D).

Water Use Licence Requirements
The ecological condition of all the sites is a fair condition, bar one wetland in a critically modified condition and a riparian area in a good condition. However, the direct footprint of the N3 upgrade is either outside of the wetland boundaries or associated with bridge crossings. The risk assessment for all sites was low and, therefore, the crossings in this section fall within DWS' General Authorisation.

5.5.4 Natural habitat affected by the project

Land use within the study area is mixed and is comprised of non-intensive agriculture (grazing, dams), chicken battery farms, conservation areas, residential settlement, national and provincial roads, rural dwellings and open grassland/scrub areas. In these areas, vegetation is largely

transformed or disturbed. Approximately 50% of the study area is untransformed. Most of the riparian zones and wetlands are similarly disturbed and modified due to development and land use impacts. There are, however, sections of natural habitat that require special consideration. One stewardship site, the Mpushini Protected Environment, is partially affected by widening along this section of the N3.

Table 9 provides a general indication of the habitat condition and levels of transformation on site. Disturbed grassland/thicket is the most widespread community within the direct footprint of the existing and proposed extensions of the road reserve, and comprises a patchy mosaic of degraded and secondary grass and woody-dominated vegetation dominated by ruderal, weedy and alien invasive species. Other, more intact areas with grassland and thicket vegetation have closer resemblance to the natural/reference vegetation types of the areas (i.e. Eastern Valley Bushveld and KwaZulu-Natal Hinterland Thornveld) owing to the presence of a number of indicator species. This bushveld/thornveld and grassland mosaic occurs mostly at the Ashburton Interchange, as well as along sections of the N3 between Ashburton and Pietermaritzburg. These areas are also more likely to support a range of species of conservation concern, including specially protected plants listed under the Natal Nature Conservation Ordinance (Act No. 15 of 1974), as well as the Red Listed *Aloe pruinosa* (Vulnerable).

Please refer to the specialist vegetation report in Appendix D for detailed information and mapping.

Table 9 Summary of habitat condition on site

Vegetation/Habitat Condition	Percentage (%) of Vegetation/Habitat Condition Class	Description and Additional Comments and Observations
Natural (includes areas with a high proportion (>75%) of indicator plant species that characterise the vegetation that originally occurred in the area as presented in Section 5.2)	4.1%	A small proportion of the area along this section on the N3 supports bushveld and/or thornveld vegetation that can be considered natural. These more natural areas occur as patches within a largely degraded to near natural vegetation mosaic, and tend to be restricted from the Ashburton Interchange and leading towards Pietermaritzburg
Near Natural (includes areas with low to moderate level of alien invasive plants, with a moderate proportion (25 to 75%) of indicator plant species that characterise the vegetation that originally occurred in the area as presented in Section 5.2)	9.6%	A relatively small proportion of the remaining untransformed areas along this section on the N3 comprise vegetation that is considered to be in a near natural state, with a reasonable diversity of indigenous plant species (including some species that are indicative of Eastern Valley Bushveld and KwaZulu-Natal Hinterland Thornveld). These are more or less scattered along the entire section, as well as at the Ashburton and Lynnfield Park Interchanges
Degraded (includes areas heavily invaded by alien plants, secondary vegetation, with a low proportion (<25%) of indicator plant species that characterise the vegetation that originally occurred in the area as presented in Section 5.2)	39.2%	A significant proportion of the remaining untransformed areas along this section on the N3 comprise vegetation that is degraded as a result of a long history of disturbance and edge effects associated with the land transformation and land use activities that typically have occurred along the N3 (e.g. road construction, earthworks, footpaths, livestock grazing, illegal dumping, borrow pits, mowing/burning, residential/industrial/commercial development, etc.). The vegetation is described as largely a disturbed mosaic of grassland and thicket, interspersed by patches of vegetation in near natural to natural condition, as well as bisected by riparian vegetation along rivers such as the Mpushini and Mkondeni Rivers. Indigenous plant diversity is generally low, and made up of mostly ruderal/weedy species, as well as a number of invasive alien plant species
Transformed (includes cultivation, dams, urban, plantation, roads, etc)	47.2%	Most of the areas along this section on the N3 are already transformed by the existing N3 national road, interchanges, bridges and other roads, as well as by cultivated lands

5.5.5 Vegetation types

The original, reference vegetation defining the study area includes two dominant vegetation types, viz. Eastern Valley Bushveld and KwaZulu-Natal Hinterland Thornveld. Nestled within this grassland/savanna mosaic are aquatic ecosystems containing wetland vegetation (e.g. Temperate Alluvial Wetland and Eastern Temperate Wetland Vegetation). In terms of the proposed N3 upgrades, impacts will only affect a portion of these vegetation types that remain in the landscape owing to the high levels of transformation.

Eastern Valley Bushveld falls within the Savannah Biome and occurs in the lower reaches of deeply incised river valleys. It occurs between 100 and 1,000 m above mean sea level, and very seldom extends to the coast. The vegetation is characterized by semi-deciduous savanna woodlands in a mosaic with thickets, often succulent and dominated by *Euphorbia* and *Aloe* species. North-facing slopes receive more insolation and tend to be drier and xerophilous, while south-facing slopes tend to be moister. Alien invasive plants are also a serious threat and the more recent and regionally appropriate assessments by Scott-Shaw and Escott (2011) have characterised Eastern Valley Bushveld as **Least Concern**.

KwaZulu-Natal Hinterland Thornveld falls within the Savannah Biome and is described by Rutherford *et al.* (2006) as open "thornveld" dominated by *Acacia* trees on undulating plains found on upper margins of river valleys. Compared to Dry Coast Hinterland Grassland, the more savanna-like KwaZulu-Natal Hinterland Thornveld generally supports a greater floristic richness of trees, shrubs, climbers, herbs and grasses. This vegetation type is classified as Vulnerable by Rutherford *et al.* (2006), however, according to the more recent and regionally appropriate assessments by Scott-Shaw and Escott (2011) it is **Least Threatened**. Only a small portion of the study area is defined by KwaZulu-Natal Hinterland Thornveld (see Appendix D for more detail).

5.5.6 Provincial conservation planning

EKZNW's Systematic Conservation Assessment (SCA, also referred to as systematic conservation planning) highlights areas that vary in terms of conservation importance as identified and mapped under the KZN biodiversity spatial planning terms and processes (EKZNW, 2016). This includes areas that are proclaimed as conservation areas or formally protected areas (e.g. provincial reserves, private reserves and stewardship sites), as well as unprotected areas that are considered a priority in terms of containing important biodiversity features. In terms of the latter, areas within KZN are subdivided into Planning Units (PUs) of varying spatial scales each supporting/potentially supporting biodiversity features (e.g. conservation important species, vegetation types/ecosystem, etc.). The SCA broadly classifies areas of biodiversity value/importance using two categories, namely Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs). CBAs comprise two subcategories, CBA: Irreplaceable and CBA: Optimal. (See Appendix D for more detail).

There are several areas along this section of the N3 that adjoin land classified as CBA: Irreplaceable and CBA: Optimal areas, particularly around the Lynnfield Interchange, around the Mpushini River and to the west of the Ashburton Interchange (Figure 4).

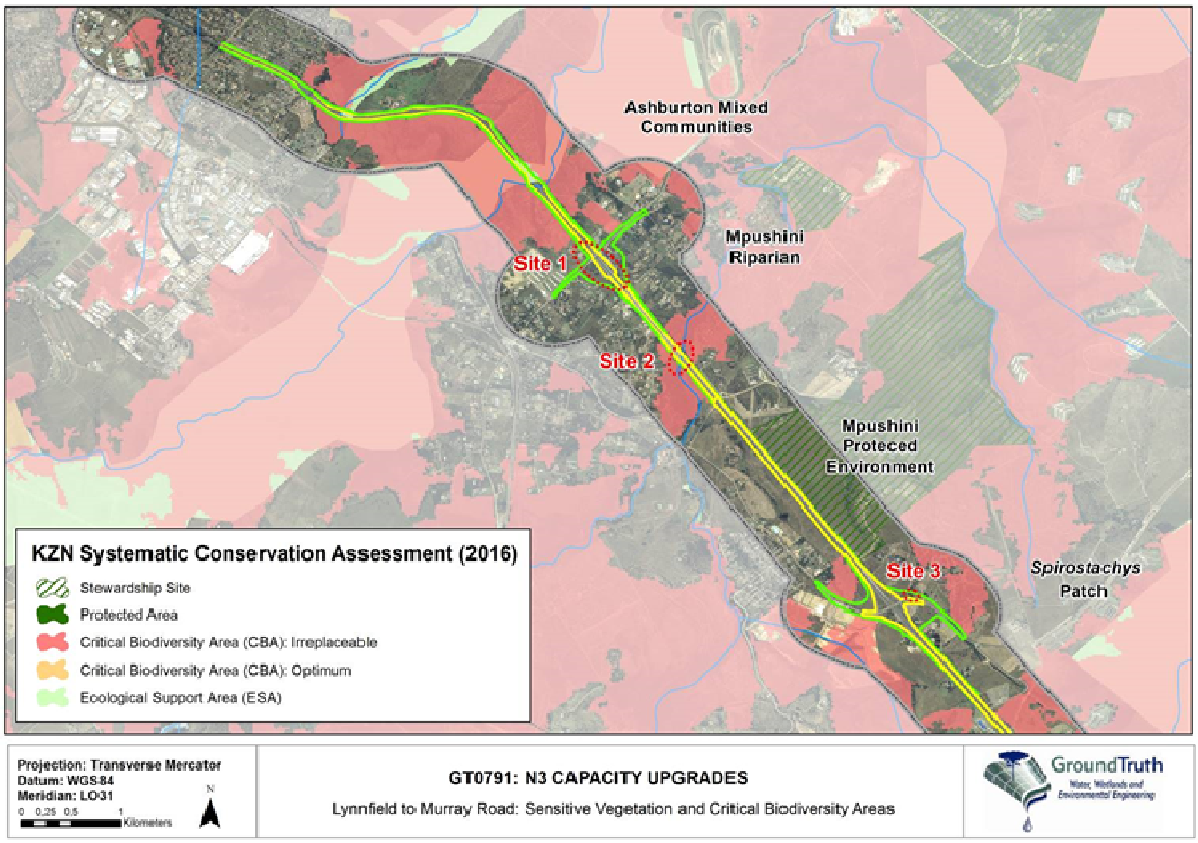


Figure 4 Overview of important conservation areas between Lynnfield Park and Gladys Manzi Road (after EKZNW, 2016) and sensitive areas identified along the route

5.5.7 MOSS (Metropolitan Open Space) and protected areas

This section of the N3 does not pass through any provincial or municipal reserves but does partially affect the western boundary of a Stewardship Site, the Mpushini Protected Environment. The Lower Mpushini Valley was registered with EKZNW as a conservancy by the landowners in the valley, who have been actively involved in conserving their natural environment. The Lower Mpushini Valley consists of fairly steep hillsides sloping down into the many drainage ravines that flow into the Mpushini and Msunduzi Rivers. The terrain is rugged and vegetation comprises valley bushveld, thicket and savanna grasslands. In view of this, several property owners recently applied to have their properties proclaimed as “Protected Environments” in terms of the National Environmental Management : Protected Areas Act, 2003 (Act No 57 of 2003). The applications were reviewed by a panel consisting of EKZNW and the KZN Department of Economic Development, Tourism and Environmental Affairs, which determined that the properties qualified for Protected Environment status in terms of the Act. The panel was of the opinion that the sites were of biodiversity value and make important contributions to the conservation of species, are valuable for the conservation of habitats, are important to conserve ecological processes and are essential for the conservation of systems that provide ecosystem services. The Mpushini Nature Reserve is identified in the Msundusi SDF and management recommendations must be in accordance with the requirements of the Municipality.

Widening of the N3 will impact slightly on this Stewardship Site, however, with mitigation, impacts are likely to be low.

There is a large area identified as a 'key MOSS area' in terms of the Msundusi Municipal Open Space System, extending from the north of the Ashburton Interchange, which may be affected by the upgrade of the road.

5.5.8 Environmental Management Framework (EMF) Sensitive Areas

The 2010 Environmental Management Framework (EMF) Regulations (General Notice R547 of Government Gazette 33306, 18 June 2010) require that any EMF, as gazetted under NEMA (Act No 107 of 1998), is considered in applications for environmental authorisation by taking into account sensitive areas as identified in the EMF. For this section of the N3, this includes sensitive areas for biodiversity as identified in the Draft 2017 EMF developed for the Umgungundlovu District Municipality as well as the 2010 EMF for the Msunduzi Local Municipality (see Appendix D for more detail). For this section of the N3, areas of biodiversity sensitivity may only be marginally impacted as these areas largely occur outside of the direct footprint of the proposed N3 upgrade. Nevertheless, it is recommended that all areas identified as high or very high sensitivity/development constraint are safeguarded as far as possible through implementation of appropriate mitigation measures as presented in the EMPr (Appendix F).

5.5.9 Plants of Conservation Importance

A number of biogeographically important and endemic taxa are associated with natural occurrences of Eastern Valley Bushveld and Hinterland Thornveld Veld. In addition, there are several conservation important plant species (i.e. Red Listed, rare and endemics, and protected species) that may occur within the study area based on known species distribution ranges (Raimondo *et al.*, 2009; SANBI, 2017). A number of these are listed as **Threatened** species (see Appendix D for more detail).

Modelled and recorded data from EKZNW's MINSET data highlight two species:

- *Acalypha angustata,* which has a conservation status of Least Concern (Pillay, 2004), and its typical habitat is Hinterland Grassland/Ngongoni Veld.
- *Aloe pruinosa,* which has a conservation status of Vulnerable (Victor and Scott-Shaw, 2005).

This section of the N3 road reserve supports and has the potential to support a moderate number of conservation important plant species, particularly within the sensitive and unique vegetation areas as presented in Figure 4.

5.5.10 Vegetation on site

The vegetation on site is described below, with an emphasis on sensitive areas. Detailed species lists are provided in the specialist report (Appendix D). Alien species are denoted with an asterisk (*).

Disturbed Grassland/Shrubland/Thicket Mosaic
This community is widespread along this section of the N3 and comprises a mosaic of largely degraded and secondary grassland (approximately 1 to 1.5 m tall) and thicket between 4 and 5 m tall, together with taller stands of *Eucalyptus*, Pinus** and *Acacia mearnsii** trees, up to 15 m tall. The original natural vegetation has become transformed and degraded through road

construction, residential and agricultural development, earthworks, footpaths, illegal dumping and borrow pits. Road verges and other grass-dominated areas tend to be mowed annually. A range of generalist, ruderal[18]and alien invasive species are common.

Notable species found include:

- *Aloe arborescens* and *Aloe ferox*, which are designated as specially protected under the Natal Nature Conservation Ordinance (Act No. 15 of 1974).
- The geophyte *Hypoxis hemerocallidea* which has a status of Declining in the National Red List of South African Plants (Williams *et al*., 2016).
- A stand of *Spirostachys africana* (Tamboti) at point location S29^{O}41.432' E30^{O}28.991' will be affected by widening at the Lynnfield Interchange (Site 3, Figure 4).
- *Sclerocarya birrea* subsp. *caffra* which is protected under the National Forest Act (Act No. 84 of 1998).

Riparian and Wetland Areas
The section of the N3 under investigation passes though the tributary headwaters of the uMngeni River catchment, with the road either crossing or passing within 50 m proximity to the Mpushini River, a tributary of the Msunduzi River.

Many of the waterways and wetlands present have been variably impacted by the road and associated drainage structures, by canalisation, and by urban and agricultural development. Livestock impacts such as grazing, trampling and siltation are common. Natural environmental gradients are often obscured and vegetation is largely degraded or disturbed.

In temporarily to seasonally wet areas, disturbed hygrophilous grassland is common (between 0.5 and 1.5 m tall) and typically contains a range of grasses, sedges and forbs. Where more permanently wet conditions prevail,*Typha capensis* reedbeds occur (up to about 2 m tall). There are a variety of indigenous species that tend to increase in abundance in response to disturbance events, and it is likely that nutrient pollution and grazing impacts have contributed to the dominance of *Typha capensis* in these situations.

Riparian Thicket – Mpushini River
This community is associated with the Mpushini River and will be partially affected by widening of the Mpushini crossing (Site 2, Figure 4). Construction and operation of the existing crossing, ongoing grazing and trampling by livestock, and nutrient loading and hydrological alteration from the upstream catchment have resulted in disturbance of natural riparian vegetation, which contains a range of generalist, ruderal and alien invasive grasses, forbs, climbers, shrubs and trees, together with a reasonable representation of indigenous species typical of riparian zones. The canopy is between 8 and 10 m tall and comprises mostly trees such as *Melia azedarach** and *Acacia natalitia* together, with several other indigenous and alien tree species. The shrub layer is approximately 1.5 m tall and comprises a combination of indigenous and alien shrubs.

Climbers frequently festoon the canopy where disturbance has been more intense (see Appendix D for more detail). Due to the light shade and mesic conditions, a well-developed herb layer is present. Along the wet edge of the stream, patches of reedbed, sedges and other hydrophytes are present.

Xeric Cliff Community
Succulent and drought-tolerant species grow on the steeper, rocky road cuttings along the N3, immediately north west of the Ashburton Interchange (see Site 1 on Figure 4 and Appendix D).

[18] A plant that is associated with human dwellings or agriculture, or one that colonises waste ground. Ruderals are often weeds, which have high demands for nutrients and/or are intolerant of competition.

Construction and operation of the N3 has resulted in disturbance of adjacent natural vegetation, although alien invasive species are not as dense as within other communities described due to the harsh xeric conditions. A range of succulent plants together with a sparse cover of short trees, shrubs and woody climbers typical of valley bushveld are present, together with a number of alien invasive species. Trees are between 4 and 6 m tall, with shrubs approximately 1 to 2 m tall.

Notable species found include:

- The bulb *Hypoxis hemerocallidea* which has a national status of Declining in the National Red List of South African Plants (Williams *et al*., 2016).
- *Aloe ferox* and *Aloe maculata*are designated as specially protected under the Natal Nature Conservation Ordinance (Act No. 15 of 1974).

Bushveld/thornveld and grassland mosaic
Vegetation at the Ashburton Interchange, as well as sections along the N3 between Ashburton and Pietermaritzburg comprise vegetation that is more or less typical of Eastern Valley Bushveld with variable condition and levels of disturbance. Condition and plant species composition generally improves with distance away from existing roads due to edge effects. Grass-dominated cover with a reasonable diversity of grass species occupy open areas between patches of woody-dominated vegetation. The latter includes various indigenous shrubs, trees and climbers, a number of which are indicative of Eastern Valley Bushveld and KwaZulu-Natal Hinterland Thornveld.

In more degraded/disturbed areas there tend to be a high abundance of invasive alien plants such as *Cardiospermum grandiflorum**, *Lantana camara**, *Melia azedarach**, *Morus alba**, *Opuntia* sp.*, *Senna hirsuta**, *Senna pendula**, *Solanum mauritianum** and *Tagetes minuta**.

Notable species found include:

- *Aloe cf. pruinosa,* a range-restricted species centred outside of Pietermaritzburg, which is listed as Vulnerable (Victor and Scott-Shaw, 2005). It is known from only 10 locations, however, these subpopulations are not severely fragmented as aloes are wind dispersed. Species declines are mainly due to urbanization and illegal harvesting. Several aloes assumed to be *A. pruinosa*were were observed at the south western side of the Ashburton Interchange within the proposed extension to the interchange.
- *Aloe ferox, A. maculate* and *Ledebouria cf. ovatifolia,* which are designated as specially protected under the Natal Nature Conservation Ordinance (Act No. 15 of 1974).
- The geophyte *Hypoxis hemerocallidea* which has a status of Declining in the National Red List of South African Plants (Williams *et al*., 2016).

5.5.11 Fauna and avifauna

Due to the transformation of natural habitat along the N3, animal biodiversity and populations are limited in the area. However, a high diversity of naturally occurring species may be found in the protected areas, nature reserves and less disturbed areas, which provide habitat for a large variety of amphibians, reptiles, mammals, birds and invertebrates. Mammals include various small antelopes, jackal, bush pig, porcupine, genet, caracal, mongeese, dassies and vervet monkeys as well as a variety of rodents.

There are likely to be breeding and foraging areas located in the less disturbed habitats along the route and these will need to be examined prior to disturbance to ensure that faunal impacts are minimised. Specific information will be sourced from the municipality by the Environmental

Control Officer in sensitive areas prior to commencement of construction. Rescue and relocation will be undertaken if required.

Management recommendations pertaining to the reduction on impacts on fauna (such as prohibiting hunting, etc) are included in the EMPr.

5.5.12 Site sensitivity mapping

Appendix C and Appendix A of the specialist vegetation assessment provide maps of environmental sensitivities.

6 PUBLIC PARTICIPATION PROCESS

6.1 Objectives

The public participation process for the proposed project was designed to comply with the requirements of the EIA Regulations and NEMA (Table 2). The objectives of public participation are to provide sufficient and accessible information to I&APs in an objective manner to assist them to:

- Identify issues of concern, and provide suggestions for enhanced benefits and alternatives.
- Contribute local knowledge and experience.
- Verify that their issues have been considered.
- Comment on the findings of the assessment, including the measures that have been proposed to enhance positive impacts and reduce or avoid negative ones.

6.2 Stakeholder/I&AP profile

Table 10 lists the stakeholder profile registered on the database (Appendix E2) and Table 11 lists the organs of state that have been identified as key stakeholders. Note that as the public participation processes were run for BAs 3, 4, 5 and 6 simultaneously, the database contains individuals and groups associated with the N3 sections from all projects (including all municipalities affected).

Table 10 Sectors of society represented by I&APs on the direct mailing list

Government (National, Provincial and Local)
State owned companies (e.g. Telkom, Transnet, Eskom)
Utility providers with services in road reserve
Transport sector (taxis, buses)
Non-Governmental Organisations/Community Based Organisations
Private and institutional adjacent landowners
Local residents and businesses
Conservation authorities
Business and industry

Table 11 Authorities and organs of state identified as key stakeholders

Authority/Organ of State	Contact person	Tel No	Fax No	e-mail	Postal address
South African National Roads Agency Limited (SANRAL)	Ms Busisiwe Mlambo	033392 8100	033 386 3365	mlambob@nra.co.za	58 Van Eck Place, Mkondeni, Pietermaritzburg, KwaZulu-Natal
Department of Water and Sanitation (Licensing Dept)	Ms Zama Hadebe	031 336 2737 /082 895 8445		hadebez@dws.gov.za	P O Box 1018 Durban, 4000
Department of Water and Sanitation	Ms Manisha Maharaj	031 336 2750 /082 808 1191		thakurdinm@dws.gov.za	P O Box 1018 Pietermaritzburg, 3200
KZN Department of Transport	Mrs Judy Reddy	033 355 8600	033 342 3962	Judy.Reddy@kzntransport.gov.za	224 Prince Alfred Street Private Bag X9043 Pietermaritzburg, 3200
KZN Department of Economic Development, Tourism and Environmental Affairs	Reka Kallicharan	033 347 1820	033 347 1826	Reka.Kallicharan@kznedtea.gov.za	Private Bag X07, Cascades, 3202, Pietermaritzburg, KwaZulu-Natal
DAFF- KZN Forestry Regulations & Support	Miss Karen Moodley	0333927741	033 3428783	KarenM@daff.gov.za	Private Bag X9029 Pietermaritzburg, 3200
AMAFA Heritage KwaZulu-Natal	Ms Bernadette Pawandiwa	033 394 6543	033 394 6552	bernadetp@amafapmb.co.za	P.O. Box 2685 Pietermaritzburg 3201
Ezemvelo KZN Wildlife	Ms Dineshree Thambu	033 845 1999	033 845 1499	thambud@kznwildlife.com	P O Box 13053, Pietermaritzburg, 3232
Dept. of Transport, Community Safety & Liaison	Mr Sibusiso Gumbi	033 355 8808	033 355 8021	sbusiso.gumbi@kzntransport.gov.za	Private Bag X9043, Pietermaritzburg, 3200
eThekwini Metropolitan Municipality (Engages with all Municipality Departments)	Mrs Diane van Rensburg	031 311 7136	031 311 7859	Diane.VanRensburg@durban.gov.za	PO Box 680, Durban, 4000

Authority/Organ of State	Contact person	Tel No	Fax No	e-mail	Postal address
Transnet Ltd	Mr Willy Joubert	035 906 7487		willie.joubert@transnet.net	
Transnet Pipelines	Mrs Khosi Zondi	031 361 1347	031 361 1346	khosi.zondi@transnet.net	PO Box 3113, Durban, 4001
uMgeni Water	Ms Lyn Archer	033 341 1345	033 341 1349	lyn.archer@umgeni.co.za	310 Burger Street, Pietermaritzburg, 3201
Dept Co-operative Governance & Traditional Affairs	Ms Hlengiwe Phewa	033 355 6472	033 355 6424	hlengiwe.phewa@kzncogta.gov.za	Private Bag X9123, Pietermaritzburg, 3200
Department of Public Works	Mr T.L. Mchunu	033 897 1421/1422	033 897 1399	PA.RegionalManager@kznworks.gov.za / Thobiyisi.mchunu@kznworks.gov.za	10 Prince Alfred Street, Pietermaritzburg, 3201
Department of Rural Development and Land Reform	Ms Thembeka Ndlovu	033 355 4388		Thembeka.Ndlovu@drdlr.gov.za	200 Church St, Pietermaritzburg, 3201
Department of Human Settlements KZN	Mr Lindani Khoza	031 336 5316		Lindani.khoza@kzndhs.gov.za or Sli.zwane@kzndhs.gov.za	Legal Wise building,, 199 Pietermaritz St, Pietermaritzburg, 3201
Mkhambathini Local Municipality (Environmental)	Ms Elaine Donaldson	031 785 9341		DonaldsonE@mkhambathini.gov.za	Private Bag X04, Camperdown, 3720
Msunduzi Local Municipality (Environmental)	Ms Esmeralda Ramburran	033 392 2470		esmeralda.ramburran@msunduzi.gov.za	P.O. Box 321, Pietermaritzburg, 3200
Msunduzi Local Municipality (Planning)	Mr Atkins Khoali	033 392 2135	033 392 2576	nyakane.khoali@msunduzi.gov.za	Private Bag X321, Pietermaritzburg, 3200
Umgungundlovu District Municipality (Planning)	Ms Mandisa Khomo	033 897 6811		Mandisa.Khomo@umdm.gov.za	P O Box 3235, Pietermaritzburg, 3200

6.3 Project notification and invitation to participate

Notification of the project and the opportunity to participate in the Basic Assessment process was announced during May 2018. Notifications to I&APs were made available in two local languages, English and isiZulu. The process undertaken is described below and summarised in Table 12. All relevant documentation associated with the public participation is contained in Appendix E.

- Direct personal notification of **directly affected property owners** (where they have been contactable) has been undertaken to date by the responsible engineers along the relevant sections of roads. This refers to the owners of properties which SANRAL needs to acquire, where expansion to the existing road reserve is necessary and where the owner will be required to sell a portion of land to SANRAL. Wherever these property owners were contactable, these property owners were also sent information regarding the Basic Assessment process (see further below and Appendices E1 & E2 & E3). Please note that contact details for some property owners have not been available and the search for property owner details is ongoing.
- **Landowners adjacent to the site** – a deeds search was done to identify owners of several hundreds of properties adjacent to the affected sections of the N3, and all reasonable attempts were made to obtain current contact details. Many property owners own multiple properties and are in the form of Companies or Trusts, and several properties belong to the State or Municipality. Some are individuals. A letter, Background Information Document (BID) and comment sheet were posted to the identified addresses of owners and in the letter, the I&APs were requested to update their details for the database. Where addresses were not available or invalid (returned to sender) an sms was sent to the property owner (where cell numbers were available) (Appendix E4 provides proof of postage/bulk sms).
- Compilation of a **database of I&APs** (Appendix E2) identified as being potentially interested and/or affected, including authorities, municipalities, organs of state, ward councillors, conservation bodies, non-government organisations, landowners, local residents, etc. The registered I&APs from databases used for other recent projects (e.g. upgrade of the N3 Hammarsdale I/C and Proposed N3 Capacity Upgrades BA1 and BA2) were also included in the database, as relevant.
- **Personalised letters and electronic mail, including a Background Information Document** (Appendix E1) containing relevant details of the project and environmental application process were sent to all I&APs on this database. A comment sheet was provided for I&APs to update their contact details, register themselves on the database, to record issues and to send back by fax or email. Contact telephone numbers of the project public participation office were provided to enable direct telephonic liaison with the project team, if required.
- **Advertisements** (Appendix E1) were placed during 9-11 May 2018 in local, provincial and national newspapers (Table 12) providing project details and contact details of where to register and obtain further information:
  - The Maritzburg Fever (English).
  - The Citizen (English).
  - Ilanga (Zulu).
  - The Witness (English).
  - Intshonalanga Eyethu (Zulu).

- **Public notices** (A3 posters) (Appendix E1) were posted at the nearest public facilities such as public libraries and municipal offices and larger site notices were placed in selected areas adjacent to the N3. SANRAL does not allow notices to be placed directly along the side of their national roads as they can cause a safety hazard (distraction to motorists), thus, it was not possible to place notices directly on the site. This limitation was raised and discussed with DEA during the pre-application meeting.
- A **project website** containing relevant documentation was set up on www.acerafrica.co.za.
- SANRAL was provided with relevant information to place on the **SANRAL website and Facebook page**.
- During the project announcement phase between May and August 2018, one on one meetings were held with certain **key authorities** such as municipal environmental and planning departments, and the regional Department of Water and Sanitation (Appendix E6). The technical engineering teams have held direct meetings with the KZN Department of Transport and municipal transport departments as indeed the capacity upgrades constitute a joint planning exercise between all three road authorities.
- Three **Public Open Days** were held: Cato Ridge Golf Club, Vine Church at Lynnfield Park and Maritzburg Golf Club on 28, 29 and 30 May, respectively. The dates of the Open Days were advertised in the media and invitation reminders circulated to all I&APs on the database.
- Receipt of comments from I&APs and acknowledgement of comments has been ongoing since project announcement in May 2018. Responses to these comments are in the **Comments and Responses Report** (Appendix E3).

Table 12 Summary of adverts and project notifications to the public and key stakeholders

Publication/event	Type	Placement date 2016
Maritzburg Fever	English Advert	9 May 2018
Citizen	English Advert	9 May 2018
Ilanga	Zulu Advert	10 May 2018
The Witness	English Advert	11 May 2018
Intshonalanga Eyethu	Zulu Advert	11 May 2018
A2 On Site Notices	6 (English) and 5 (Zulu)	11 May and 14 May 2018
A3 posters	20 English and 15 Zulu	11 May and 14 May 2018
Email and post to database	Letter (English and Zulu), Background Information Document (English) and comment sheet (English and Zulu)	Posted and Emailed 11 May 2018
ACER Project Website	BID, Comment Sheet and Letter including invitation to Open Days	11 May 2018 to date
Bulk SMS	Bulk SMS to send to remind the I&APs about the Public Open Days	24 May 2018
Public Open Days	Cato Ridge Golf Club Rhema Vine Ministries Maritzburg Golf Club	28 May 2018 29 May 2018 30 May 2018
Bulk SMS	Bulk SMS to send to remind the I&APs about the Public Open Days	24 May 2018

6.4 Summary of Issues Raised by I&APs

Table 13 provides a summary of issues raised by I&APs and the responses provided by the EAP. A full Comments and Responses Report is provided in Appendix E3.

Table 13 Summary of issues raised by interested and affected parties

Summary of main issues raised by I&APs	Summary of response from EAP
Increased noise during construction	Construction activities will involve the use of heavy plant and equipment, which will generate noise, adding to the operational noise already generated by the N3. Construction noise will vary in intensity depending on the equipment being used at any given time. Generally, noise will be most severe on receivers up to 300 m from the N3. Construction noise cannot be avoided and will negatively affect people situated close to the source. Also, the works will on occasions require construction during night time hours and on weekends, which will be a further disturbance on close receptors. In mitigation, construction noise will be managed by the contractors, with the aim of keeping noise nuisance to the best attainable minimum. Specifications are provided in a Noise Management Plan appended to the EMPr and include several control measures including liaison with affected parties, possibly limiting work hours, managing vehicles/equipment and noise monitoring.
Increased noise during operation	There will be increased noise during operations due to an increased number of vehicles using the N3. Noise generated by traffic on national roads is already high and over time, with the projected increase in traffic volumes, noise levels will increase. Noise levels will differ according to the topographical position of the receiver relative to the road (whether above or below the road), weather conditions and depending on whether any physical barriers to sound are located between the road and receiver (walls, other houses, vegetation, banks, etc). Steep sections of road may generate more noise due to heavy vehicles having to engage lower gears and/or air brakes. Generally, however, according to the noise specialist report, noise is most problematic to receivers located within 300 m of the side of the road (further in some areas). Within this distance, noise levels are generally above the limits set in the Noise Control Regulations. It is not possible to eliminate noise next to a national road and owners who have chosen to purchase properties adjacent to the N3 have done so being aware of the road, existing noise and the potential for noise levels to increase over time (due to growth in traffic volumes and decreased distance from properties when necessary expansion of roads is undertaken to accommodate traffic growth). However, there are several measures that can be implemented to reduce noise. These include using low noise road surface and the construction of barriers. The road surfacing will include either asphalt or concrete on different packages. SANRAL are considering ultra-thin wearing surfaces which are low-noise surfaces. They are also investigating other noise limiting surfaces and will apply the one best suited to the area. For barriers (walls, earth berms, etc), their effectiveness is dependent on the location, height and distance between the noise source and the

Summary of main issues raised by I&APs	Summary of response from EAP
	receiver. Noise barriers are effective in reducing the level of noise received on severely impacted locations close to the road provided the barrier screens the receivers' (ground floor and upper floors) windows from the noise source. Their effectiveness is good near the source and decreases with distance. The design engineers, in conjunction with an acoustic specialist, are investigating the feasibility of barriers in areas where noise is anticipated to be particularly problematic. Home and business owners may be able to reduce noise levels on their properties by erecting walls around their properties and using double glazing on windows. An evaluation of the noise source should be undertaken first so that optimum measures can be put in place. According to the noise specialist, the use of hedges and vegetation generally provides little noise reduction.
Effect on property values	The effect on property values will differ according to each individual circumstance and can be influenced by multiple factors. Generally, properties increase in value over time but the rate at which they increase will be influenced by the nature of the area and trend in surrounding and uses. Where an owner has purchased property adjacent to an existing national road, this is presumably done in awareness of noise as well as the current and future disadvantages of such a location (such as increase in noise levels and encroachment due to road widening). Properties adjacent to national roads are, for these reasons, generally lower in value and less expensive to purchase. However, depending on the nature of the property and its use, and proximity and access to the national road, the location may be advantageous and a widened national road may not devalue the property. For example, easy access to a national road often adds value to business and institutional premises. Where land is to be acquired, SANRAL will negotiate with each land owner as part of land acquisition. The valuator takes into account individual circumstances and potential financial losses caused by acquisition. SANRAL will compensate land owners at fair market value for the land they purchase and may compensate for financial losses in line with applicable legislation, viz. The Constitution, Section 25 (3) and Expropriation Act (Act 63 of 1975). In terms of the Expropriation Act, compensation is not payable for the perceived or real devaluation of properties.
Numerous individual queries from property owners as to whether the road widening will affect their properties and businesses adjacent to the upgrades	The EAP has responded to all individual queries with information to indicate the footprint of construction in relation to individual properties. Where requested, further information has been provided by the engineers involved.
Various questions relating to specific interchanges, roads and accesses were raised by individuals	The EAP has responded to all individual queries in the Comments and Responses Report.
Increased dust during construction	The contractor will implement dust control measures during construction, in accordance with the specifications of the EMPr.

Summary of main issues raised by I&APs	Summary of response from EAP
Refer to Environmental Management Frameworks in the assessment	The Msunduzi EMF and uMgungundlovu draft EMF have been taken into consideration in the biodiversity assessments.
Linkages to Cato Ridge Logistics Hub	This proposed development is subject to separate investigations and licensing processes by the Cato Ridge Logistics Hub Consortium (CRLHC). All queries relating to this development have been forwarded to the CRLHC.
Loss of trees on boundaries	Existing tree barriers would need to be replaced or alternative barriers established.
Employment of local labour and use of local contractors	SANRAL's procurement policies require the optimisation of the use of local labour. The sourcing of labour will be done by contractors within the provisions of these policies. In terms of SANRAL's 14 point plan, a structure will be established, including municipal representation for employment, labour, small contractors and suppliers.
Impact of project on boundary walls, fences and banks of adjacent properties	Existing fences (and boundary walls) between the N3 and neighbouring properties will be protected. Where land is being acquired due to expansion of the road reserve and existing fences and boundary walls need to be removed, SANRAL will provide a new fence/wall to the minimum standard of the current fence/wall, as part of the works contract. This will be at SANRAL's cost. Any affected banks in the road reserve will be stabilised to the required standard.
Damage/cracks to buildings	Where it can be proven that construction activities have resulted in cracks or damages, SANRAL, through the appointed contractors, will be liable for compensation or repairs. Prior to any potentially damaging construction activities, e.g. blasting, the contractors will undertake asset condition surveys to establish the baseline condition of potentially affected infrastructure. Any reported damages will be evaluated in terms of this baseline.
Damage to windows and structures as a result of blasting	If blasting is required, all potentially affected parties will be informed prior to any blasting taking place. Improved blasting techniques allow for more controlled blasts, with impacts being confined to small targeted areas. Controlled blasting will be done in accordance with relevant legislation and due regard for the proximity of structures that may be vulnerable to vibrations from the blast. Photo reports pre- and post-blasting can be requested for infrastructure in very close proximity to the blast area to support any damage claims.
Vibrations on windows and doors from heavy vehicles passing, during operation	The widening of the road may result in the source of vibrations passing closer to residences. However, the improved road surface may well reduce vibrations as it is usually a rough or uneven road surface which can cause vibration. Regular maintenance and ensuring that uneven surfaces are repaired will help reduce vibrations.
Increased security risks/crime during construction including at properties located near site camps	It is possible that security risks will increase during construction, due to an influx of workers and potential increased opportunity for criminals. Crime is more likely to occur where properties are located in proximity to construction activities and where existing fencing is required to be removed and replaced in closer proximity to residences or business premises. During construction, measures will be put in place by the contractor to help minimise security risks. This will include strict control of staff, identification of staff and maintenance of boundary fencing (including provision of temporary fencing if required). No staff (except

Summary of main issues raised by I&APs	Summary of response from EAP
	security) will be accommodated overnight at site offices/stockpile sites. These measures are stipulated in the EMPr.
Increased health and safety risks during construction, where there is proximity of construction to houses and properties	Property boundary fences will remain in place during construction to provide a barrier between properties and construction activities. Where boundary fences have to be moved, they will be reinstated prior to the commencement of construction. Health and safety risks during construction will be managed by the contractor and will include various measures required in terms of the Construction Regulations under the Occupational Health and Safety Act,1993 (Act 85 of 1993) as well as relevant specifications in the EMPr. An important component of safety during construction will be the management of traffic according to an approved Traffic Management Plan.
Safety risks to properties and houses due to proximity to freeway during operation (from vehicle accidents)	Boundary fences will be retained between the road reserve and neighbouring properties. Where there are currently no walls and the need for such is indicated for safety reasons, these will be erected as part of the works for the construction of the N3. Similarly, where the need is indicated, guardrails, screens, etc, will be constructed for purposes of enhancing safety of road users and those living adjacent to the N3. The proposed upgrade of the N3, by providing additional lanes and improving road safety through design, will contribute to a safer national road which should assist in reducing the risk of accidents. However, driver error cannot be controlled and accidents do occur. Where these cause damages to third parties, police investigations will inform courts of law as to who is the liable party. Insurances (private, company, third party and/or the road accident fund) are in place for monetary compensation.
Land acquisition process and compensation	Where land is to be acquired to accommodate widening, SANRAL negotiates with each land owner as part of land acquisition and takes into account their individual circumstances and potential financial losses caused by expropriation. SANRAL will compensate land owners at fair market value for the land they purchase and may compensate for financial losses in line with applicable legislation, viz. The Constitution, Section 25 (3) and the Expropriation Act.
Compensation values used for land purchase	All SANRAL's land acquisition is undertaken within the provisions of the applicable laws at the time. The land values are based on market value in the area at the time of negotiations. Several factors are taken into account by professional valuators and final rates negotiated with affected property owners on an individual basis. Should either party feel aggrieved, the matter can be referred to a court of law for a decision.
Control of stormwater	Control of stormwater during operation forms a key part of the road design. According to the design engineers, the total catchment areas feeding all the cross-drainage structures will not increase. The runoff, however, will increase by a very small margin due to the relatively high runoff on the additional road surface width. In comparison to the total stormwater runoff, this is minimal and the culverts crossing the road will be operating at very similar runoffs as in the past. All the stormwater which runs off the road surface is accommodated in lined stormwater channels adjacent to the road surface. The concentration of stormwater from the concrete side drains is mitigated by the construction of energy dissipaters which ease the flow of water into the natural streams.

Summary of main issues raised by I&APs	Summary of response from EAP
	Stormwater management plans will be in place for each construction contract. A generic stormwater management plan is appended to the EMPr but specific stormwater management specifications are provided by the engineers for each contract and must be approved by SANRAL.
Use of rail to alleviate congestion, high accident risk and high maintenance costs caused by heavy vehicles on national roads	The South African government recognises the need to introduce an efficient rail freight service to reduce truck traffic long term, ease traffic burden on road networks and at the same time enhance the longevity and quality of roads. A migration from road to rail will improve road safety and decrease road maintenance costs. Currently, 22% of freight is moved by rail and government intends to double this. However, given the major role that roads play in South Africa, being able to migrate from road to rail is a long term venture and dependency on road transport will still continue even after required rail upgrades take place. It is to be noted as well that freight will travel on the best mode of transport for convenience and cost effectiveness, which road based transport currently offers.
Lighting along the N3	Internationally, it has been shown that lighting does reduce the number of accidents on freeways dependant on the volumes of traffic. Due to the substantial volumes of vehicles between Durban and Pietermaritzburg (between 45,000 – 110,000 vehicles per day) including a high percentage of heavy vehicles, lighting will reduce the number of light vehicle accidents during night conditions. Light efficient luminaries, e.g. LED'S are being investigated.
Traffic management during construction	Traffic management plans will be in place for all sections of the N3 under construction which provide for continuity of access, minimising disruption of traffic and safety risks, including maintaining access for emergency vehicles. A minimum of two lanes shall be open to traffic in each direction at all times. A generic Traffic Management Plan is appended to the EMPr but actual plans will be site-specific along and within the different sections of the N3 under construction. Final plans will be submitted by the contractors to the Engineers, for approval prior to construction.
Impact on schools	Various schools in the Pietermaritzburg area will be impacted due to road widening requiring all or parts of the property, affecting access and/or leading to increased noise levels as well as nuisance impacts during construction. SANRAL is negotiating directly with the schools to find solutions for alternate land, access, etc. Issues affecting close neighbours to the N3 such as increased noise, dust, etc are discussed elsewhere in this table. Refer also to the Comments and Responses Report, Appendix E3, where more detail is provided.
Increased security risks/crime during construction including at properties located near site camps	It is possible that security risks will increase during construction, due to an influx of workers and potential increased opportunity for criminals. Crime is more likely to occur where properties are located in proximity to construction activities and where existing fencing is required to be removed and replaced in closer proximity to residences or business premises. During construction, measures will be put in place by the contractor to help minimise security risks. This will include strict control of staff, identification of staff and maintenance of boundary fencing (including provision of temporary fencing if required). No staff (except security) will be accommodated overnight at site offices/stockpile sites.

Summary of main issues raised by I&APs	Summary of response from EAP
	These measures are stipulated in the EMPr.
Increased dust during construction	The contractor will implement dust control measures during construction, in accordance with the specifications of the EMPr.
Air emissions and health	The increase in vehicle emissions results from an increase in traffic volumes over time and is not a direct impact of the widening of the N3. When the road is widened, the source of vehicle emissions (carbon dioxide and nitrous oxide) will encroach closer to residences than previously and will cumulatively contribute to existing air pollution levels. However, the concentrations/dilution of emissions and other air pollutants at different positions along the N3 will vary depending on topography, prevailing winds and weather conditions. Where congestion is eased and traffic flows freely, vehicle emissions should decrease in areas where there was previously congestion.
Loss of privacy	People choose to live adjacent to or near national roads and, when doing so, must be aware of the consequences, including the possible widening of the road. It is the responsibility of individual land owners to secure their own privacy. Nevertheless, where the need is indicated for safety purposes, SANRAL will build walls (or similar structures) between the N3 and private properties.
Maintenance of the Road Reserve	SANRAL has a Routine Road Maintenance team in place which maintains the road reserve. Areas of concern should be reported to SANRAL, Eastern Region, RRM Division, responsible maintenance engineer (033 392 8100).
Location of site camps and stockpile areas	These will be decided by contractors and, as far as possible, will be located within the road reserve. Environmental guidelines for the siting of contractors' infrastructure and services are provided in the EMPr.
Traffic studies	The capacity improvements to the N3 are underpinned by a comprehensive traffic assessment undertaken during detailed design. As soon as the detailed design reports have been completed, they may be requested from SANRAL.
Interruption of services/utilities	Where services need to be relocated out of the road reserve, this will be done n full consultation with the service provider. The service provider will notify customers of scheduled interruptions when disconnections and connections occur.
Increase in traffic on local roads	Traffic studies have taken into consideration pressure on local roads and where necessary, these will be upgraded to accommodate the additional traffic attraction and some of the smaller local access streets will be reconfigured to restrict access to residents only.
Impacts on biodiversity	Specialist assessments have been undertaken to identify impacts on vegetation and riparian/wetland areas. While the N3 is an existing corridor with adjacent road reserve having been previously disturbed, the N3 runs through various areas considered to be Critical Biodiversity Areas in terms of conservation planning. It also crosses various rivers, streams and wetlands. These areas provide important habitat for fauna and flora, including protected species. SANRAL's design seeks to minimise the amount of additional land required for widening, therefore, limiting vegetation clearance from adjacent areas. Indeed, the majority of land needed for widening will come from the median and the existing road reserve. Prior to vegetation clearance ahead of construction,

Summary of main issues raised by I&APs	Summary of response from EAP
	there will be a plant rescue and relocation exercise undertaken to conserve notable species. Where possible, fauna will be relocated. Maintenance of natural drainage patterns and erosion protection measures are taken into account in the design to limit impacts on aquatic and terrestrial habitat. Several mitigation measures have been identified to limit impacts on biodiversity and natural habitat during construction. These are specified in the EMPr.
Impacts on cultural heritage	Specialist assessments have been undertaken to identify impacts on cultural heritage along the N3 corridor to be widened. The cultural heritage features at risk of destruction (e.g. structures at Bellevue Farmstead) have been avoided through design changes. Those that have been identified as at risk due to proximity to construction activities have specifications in the EMPr to provide for additional protection during construction. Should any cultural heritage artefacts or graves be encountered during construction, works in the affected area will be stopped and Amafa will be notified.
Realignment of water and fuel pipelines	Realignment of short sections of pipelines is required along some sections of the N3 between Hammarsdale and Pietermaritzburg to accommodate the capacity upgrades. This will be planned, co-ordinated and implemented in conjunction with the service provider. SANRAL will comply with all legislative and regulatory requirements.
Notification of the public regarding construction activities, prior to and during construction	The public will be notified of construction activities by the contractor. During construction, contract boards are posted at either end of the road section under construction. They list the details of the project, the start and end dates as well as the relevant contact numbers for the Traffic Safety Officer. Should there be specific closures, demolition, blasting or other activities, these will be communicated via media advertisements as well as additional construction information boards.

6.5 Circulation of draft BAR for public review

- Stakeholders on the project database (registered stakeholders) were notified of the availability of the draft BAR & EMPr for comment, for a period of 30 days (all I&APs including authorities). Notification was done by post, email and sms.
- The documents were made available on ACER's website www.acerafrica.co.za .
- Hard copies of the draft BAR and EMPr were made available at the following public libraries: , Camperdown Public Library, Ashburton Public Library, Msunduzi Public Library
- Hard copies and/or CDs of the draft BAR & EMPr were provided to key municipalities and organs of state which include: eThekwini Metropolitan Municipality, eThekwini Transport Authority, Mkhambathini Local Municipality (Planning), Msunduzi Local Municipality (Planning and Environmental Units), Umgungundlovu District Municipality (Planning), Amafa, KwaZulu-Natal, Department of Economic Development, Tourism and Environmental Affairs, KZN Department of Transport, Department of Agriculture, Fisheries and Forestry (Forestry Department), Department of Water and Sanitation, and the National Department of Environmental Affairs.
- CDs were made available to key stakeholders affected by the project such as ward councillors, business forums, Settlers Pre-Primary School, St Johns' DSG School, St Charles School, New England Pre-Primary School, Ingonyama Trust, and other landowners on request.

7 ASSESSMENT METHODOLOGY

7.1 Identification and assessment of significance of key issues and impacts

Issues and potential impacts of the project on the environment (and *vice versa*) were identified by way of field investigations, desktop studies and interaction with I&APs. Key issues and impacts requiring further investigation were addressed by specialist studies[19] (Appendix D) and/or further detailed input from the environmental and technical teams. Specialist studies were guided by Terms of Reference [20](Appendix D) to ensure that issues and associated impacts were correctly identified, understood and addressed, thereby enabling an integrated assessment of the development proposal. Mitigation measures were identified with inputs from I&APs, the specialists, the design engineers and the EAP team. Information was collated, evaluated and integrated. Thereafter, the significance of each impact was assessed using the assessment conventions outlined in Table 14 (in line with the requirements of the EIA Regulations). It should be noted that the significance of an impact is a function of all the attributes outlined in Table 14, and the relationships between them. The assessment conventions are applied qualitatively by the EAP, based on an understanding of the receiving environment, the proposed project components and activities, and the information gathered from different sources, including specialists and the public.

7.2 Assumptions, limitations and gaps in knowledge

7.2.1 General assumptions, limitations and gaps in knowledge

- It is assumed that technical data supplied by the applicant and its appointed engineers are correct and valid at the time of compilation of the BAR. It must be noted that all designs were not necessarily final.
- It is assumed that data supplied by external institutions were correct and valid at the time of compilation of the specialist reports and the BAR.
- While every effort was made to directly contact all affected landowners and adjacent landowners, there were cases where current contact details could not be obtained. However, it is assumed that the widespread advertising, public notices and delivery of flyers to numerous households adjacent to the N3, would serve to notify the public at large.

7.2.2 Specialist assumptions, limitations and gaps in knowledge

The assumptions, limitations and gaps in knowledge stated in the specialist reports are listed below.

Social Impact Assessment
Assumptions

- All information, including maps, provided by SANRAL is accurate.
- It is not the purpose of this SIA report to quantify resettlement impacts. If necessary this will take place immediately following the receipt of Environmental Authorisation and the completion of detailed design.
- The project will not undergo decommissioning and, as such, social impacts during decommissioning have not been considered.
- The information provided herein will be adequate for effective decision-making in the EIA process.

[19] Note that ACER's in-house specialist reports were subject to independent review.
[20] Terms of Reference for each specialist are contained in their relevant reports. Terms of reference for updating each of these studies are provided in Appendix D7.

Table 14 Conventions applied to the impact assessment

Criteria	Rating Scales	Definition
Nature	Positive	This is an evaluation of the overall impact of the construction, operation and management that the proposed N2/N3 upgrades would have on the affected environment (social, biophysical and economic)
	Negative	
	Neutral	
Spatial extent	Low	Site-specific, affects only the development footprint
	Medium	Local (< 2 km from site)
	High	Regional (within 30 km of site) to national
Duration	Very low	Temporary (less than 1 year)
	Low	Short term (1-4 years, i.e. duration of construction phase)
	Medium	Medium term (5-10 years)
	High	Long term (impact will only cease after the operational life of the activity) to permanent
Intensity	Low	Negligible alteration of natural systems, patterns or processes
	Medium	Noticeable alteration of natural systems, patterns or processes
	High	Severe alteration of natural systems, patterns or processes
Irreplaceability of resource caused by impacts	Low	No irreplaceable resources will be impacted (the affected resource is easy to replace/rehabilitate)
	Medium	Resources that will be impacted can be replaced, with effort
	High	Project will destroy unique resources that cannot be replaced
Reversibility of impacts	Low	Low reversibility to non-reversible
	Medium	Moderate reversibility of impacts
	High	High reversibility of impacts
Consequence (a combination of spatial extent, duration, intensity and irreplaceability of impact on resources).	Low	A combination of any of the following: - Intensity, duration, extent and impact on irreplaceable resources are all rated low - Intensity is low and up to two of the other criteria are rated medium - Intensity is medium and all three other criteria are rated low
	Medium	Intensity is medium and at least two of the other criteria are rated medium
	High	Intensity and impact on irreplaceable resources are rated high, with any combination of extent and duration Intensity is rated high, with all of the other criteria being rated medium or high
Probability (the likelihood of the impact occurring)	Low	It is highly unlikely or there is a less than 50% chance that an impact will occur
	Medium	It is between 50 and 75% certain that the impact will occur
	High	It is more than 75% certain that the impact will occur or it is definite that the impact will occur
Significance (all impacts including potential cumulative impacts)	Low	Low consequence and low probability Low consequence and medium probability Low consequence and high probability
	Medium	Medium consequence and low probability Medium consequence and medium probability Medium consequence and high probability High consequence and low probability
	High	High consequence and medium probability High consequence and high probability

- The impact assessment conventions (Table 14) are more applicable to the biophysical environment. Therefore, for social/socio-economic impacts, the SIA practitioner has applied professional judgement to the conventions to arrive at the assessment of impact significance.

Limitations

- As statistical data can only be obtained at a ward level, they do not necessarily represent the socio-economic conditions occurring within the project footprint.

Gaps in knowledge

- The engineering designs are yet to be finalised and, thus, some alterations are to be expected.
- The exact number of jobs and the breakdown of skilled, semi-skilled and unskilled is not available.
- Future plans by Transnet, regarding the development of rail infrastructure for the transportation of freight to reduce pressure on the road infrastructure are unknown.

Cultural Heritage Resources Impact Assessment

Assumptions

- The description of the proposed project provided by the client is accurate.
- The public consultation process undertaken as part of the Environmental Impact Assessment is sufficient and adequate and does not require repetition as part of the heritage impact assessment.

Limitations

- Soil surface visibility varied from good to non-existent. Heritage resources might be present below the surface or in areas of dense vegetation and we remind the client that the NHRA requires that a developer cease all work immediately and observe the protocol in Section 9 of this report (the specialist study report) should any heritage resources, as defined in the Act, be discovered during the course of development activities.
- No subsurface investigation (including excavations or sampling) were undertaken, since a permit from Amafa is required to disturb a heritage resource.
- Stopping or parking of vehicles and walking are not allowed on the N3 and the minimum speed allowed on the N3 is 60 kilometres per hour.
- A key concept in the management of heritage resources is that of non-renewability: damage to or destruction of most resources, including that caused by bona fide research endeavours, cannot be reversed or undone. Accordingly, management recommendations for heritage resources in the context of development are as conservative as possible.
- Human sciences are necessarily both subjective and objective in nature. eThembeni staff members strive to manage heritage resources to the highest standards in accordance with national and international best practice, but recognise that their opinions might differ from those of other heritage practitioners.
- Staff members involved in this project have no vested interest in it; are qualified to undertake the tasks as described in the terms of reference; and comply at all times with the Codes of Ethics and Conduct of the Association of Southern African Professional Archaeologists and the Association of Professional Heritage Practitioners (SA).
- eThembeni staff members take no personal or professional responsibility for the misuse of the information contained in this report, although they will take all reasonable precautions against such misuse.

Vegetation Ecology Impact Assessment

Assumptions

The following assumptions have been made regarding affected areas and associated impacts on vegetation, and assumes a worst-case scenario:

- All vegetation within the existing road reserve will be cleared during construction.
- All areas within proposed extensions to the road reserve will be completely destroyed during construction.
- Habitat degradation is likely to occur directly adjacent to cleared areas, due to edge effects that will manifest over time once construction activities have commenced.

Limitations

It is important to note that the original field survey was undertaken in late summer (i.e. February 2012), and the true botanical diversity present is under-represented by this study, particularly amongst the herbaceous plants. However, all effort was made to identify Red Data, specially protected and other important species, and surrounding land use and condition of natural vegetation were surveyed to identify levels of disturbance and potential biodiversity issues. A second field survey was undertaken in May 2018 to assess additional areas for the proposed N3 extension – timing from a botanical perspective was, therefore, suboptimal in terms of identifying and locating sensitive species. In some cases, for example, where grass cover was tall and dense, detection of plants was limited, in comparison to other areas where grass cover has been reduced through fire and grazing. This said, edge effects caused by the existing road reserve has no doubt compromised the plant species composition over all the years to the extent that natural vegetation within and adjacent to the existing road reserve is generally degraded, supporting few and/or isolated occurrences of conservation important plant species.

Wetland and Riparian Impact Assessment

Assumptions

Studies relating to natural ecosystems and understanding historical conditions rely on various assumptions, with the following assumptions being made during the assessment of these particular wetland and riparian systems:

- The reference benchmark vegetation of the wetlands and riparian areas within 500 m of the road reserve are considered to consist of Dry Coast Hinterland Grassland (Gs 19), KwaZulu-Natal Hinterland Thornveld (SVs 3), Eastern Valley Bushveld (SVs 6), Southern Mistbelt Forest (FOz 3), Eastern Temperate Freshwater Wetlands (AZf 3) and Highland Alluvial Vegetation (Aza 5) (SANBI, 2006), within the Sub-Escarpment Savanna (SVs)
- The final development layout would remain within the indicated proposed development footprint.
- The development foot print provided was accurate.
- The pre-upgrade condition of all sites was already impacted by the current N3 operation.

Limitations

- Due to time and budgetary constraints, wetland and riparian areas were delineated at a desktop level and were verified infield.
- The original assessments were done in Summer of 2012, and the 2018 update assessments were done at the beginning of Autumn following a period of good rains and riparian vegetation was in a moderately good condition for identification.
- Riparian and wetland areas were only assessed within the 50 m buffer of the footprint area as per the original TOR.
- The determination of risk was confined by the choices available within the risk assessment matrix as per appendix A of Government Notice 509 of 2016.

Noise Assessment

- This assessment evaluated the noise levels over specific periods. These results are based on the road traffic at times of assessment and also on the activity. In most instances normal road operations occurred.
- This assessment updated the findings and compared the results to those provided in a previous assessment and the road noise level predictions.
- Data provided by the client were used. Where no data could be provided, the assessment used normal or project or potential from other recognised sources.

8 INTEGRATED DESCRIPTION OF ENVIRONMENTAL ISSUES AND POTENTIAL IMPACTS

The key issues identified and assessed during this Basic Assessment were formulated as eight questions:

- What economic and socio-economic benefits will result from the proposed widening/capacity improvements to the N3, at a local, regional and national scale?
- What effects will the proposed widening/capacity improvements to the N3 have on adjacent properties, infrastructure and services, and *vice versa*?
- What potential health, safety, security and other nuisance impacts may be experienced as a result of the proposed widening/capacity improvements to the N3 during construction?
- What negative impacts will the proposed widening/capacity improvements to the N3 have on the social environment during operation?
- What effects will the proposed widening/capacity improvements to the N3 have on cultural heritage resources?
- What effects will the proposed widening/capacity improvements to the N3 have on the biodiversity of protected areas, MOSS and other natural habitat (terrestrial/riparian)?
- What potential cumulative impacts can result from the proposed widening/capacity improvements to the N3?
- What are the impacts of the No Development Alternative (not implementing widening/capacity improvements to the N3)?

Potentially significant impacts associated with each of the above issues (including cumulative impacts) are discussed in the sections below. The assignment of significance ratings to impacts (where applicable), according to the assessment conventions (Table 14), is provided in Chapter 9 (Tables 15 - 21).

8.1 What economic and socio-economic benefits will result from the proposed widening/capacity improvements to the N3, at a local, regional and national scale?

A summary of impacts (incorporating a summary of specialist findings as applicable) is provided below, including recommended measures for management/mitigation of impacts. For further detail, please refer to the Social Impact Assessment specialist report (Appendix D). According to the assessment, the various positive impacts during construction are considered to be of a low significance and the positive impacts during operation, of medium significance, without management. With management, the impacts during construction and operation are likely to be of medium and high significance, respectively (Table 15 in Chapter 9).

8.1.1 Employment creation

During the planning, design and construction phases, economic and socio-economic benefits will accrue locally, regionally and nationally through project spend, with the entire N3 upgrade estimated to be in the region of R17,64 billion (2018 Rand, excl VAT). Of this, targeted local labour component will be 8%, equating to an estimate of R1,41 billion and small contractor involvement of 30%, equating to R5,29 billion. There will be increased opportunities for temporary employment (albeit largely unskilled and semi-skilled positions) and capacity building for individuals, local contractors, SMMEs and service providers. In addition, opportunities will be created for informal traders, which will have positive economic impacts.

8.1.2 Improved road network, stimulation of the economy and achieving SIP 2 goals

An efficient and effective road network is critical to sustain economic growth and development. As such, to accommodate increasing traffic volumes, upgrading of roads as well as regular maintenance are essential. There are numerous positive and wide reaching social and socio-economic effects that provision of a high quality and safe road network have on the economy and the daily lives of people in general. As indicated in Section 1.2 of this report, this project forms part of national infrastructure (National Infrastructure Plan - Strategic Infrastructure Project 2[21]) to strengthen the logistics and transport corridor between SA's main industrial hubs and improve access to Durban's export and import facilities. The successful implementation of the project will, therefore, have numerous cumulative wide-ranging economic and socio-economic benefits as a result of *inter alia*:

- Improved road safety.
- Reduced travel time (reduced traffic congestion and improved road).
- Improved transport network and corridor.

8.1.3 Potential positive economic and socio-economic impacts and recommended measures for management (enhancement)

Pre-construction and construction

- Increased employment creation/opportunities for local contractors and SMMEs and informal traders (all project phases):
  - Ensure that, wherever possible, labour is sourced locally.
  - Sub-contractors, SMMEs and service providers should be sourced locally where the requisite skills exist.
  - Conduct procurement in accordance with the Preferential Procurement Policy Framework Act, specifically Section 10, pre-qualification criteria for preferential procurement, which stipulates that a required value of the contract must go to Exempted Micro Enterprises and Qualifying Small Business Enterprises which, as a minimum, are Black owned. These criteria are likely to enhance the potential positive impacts for local contractors and SMMEs. This will be addressed via the Contract Participation Goals in the contract documents which assist the Targeted Enterprises.

Operation

- Improved transport corridor and road conditions:
  - Provide budget to beautify the road reserve with appropriate (aesthetic but low maintenance) indigenous plant species (noting that the aloes currently on the existing reserve should be relocated to the remaining or new road reserve, as far as possible).
  - In conjunction with the Msunduzi Local Municipality, develop a database of all locally based service providers.
  - Ensure budget is provided for regular road and road reserve maintenance, and that this is implemented timeously in a cost effective manner.

[21] **SIP 2: Durban-Free State-Gauteng Logistics and Industrial Corridor**
Strengthen the logistics and transport corridor between SA's main industrial hubs; improve access to Durban's export and import facilities; integrate Free State Industrial Strategy activities into the corridor; new port in Durban; Aerotropolis around OR Tambo International Airport.

8.2 What effects will the proposed widening/capacity improvements to the N3 have on adjacent properties, infrastructure and services and *vice versa*?

A summary of impacts (incorporating a summary of specialist findings as applicable) is provided below, including recommended measures for management/mitigation of impacts. For further detail, please refer to the Social Impact Assessment specialist report (Appendix D).
According to the assessment, the impacts on adjacent properties, infrastructure and services are of low, medium and high significance, without management. With management, the impacts are considered to be of low significance (Table 16 in Chapter 9).

8.2.1 Increased interaction with owners and residents of adjacent properties

During the planning phase, adjacent landowners (depending on the location of their properties) may be contacted and required to interact with engineers, land acquisition teams and/or other investigative teams (e.g. geotechnical) who may require access to properties. Where adjacent properties are required by SANRAL for road widening, SANRAL's land acquisition team will enter into negotiations with landowners.

8.2.2 Property loss, compensation, resettlement, effect on property values

SANRALs design seeks to minimise the amount of land that must be acquired. However, to meet the required technical and safety standards, some land acquisition will be unavoidable. The project will result in the permanent loss of portions of some adjacent, privately owned properties, and encroachment of a busy national road closer to existing residences, which may affect property values. Some residents may be required to move if SANRAL needs to procure a large proportion of the property. Where SANRAL needs to acquire the entire property, property owners will be bought out and will need to relocate. On the eastern side of the Lynnfield Park Interchange, environmental authorisation has been granted for the Acaciadale Retail & Eco-Tourism Development albeit that development has not yet commenced. SANRAL will need to engage with the property owner to establish how the proposed development will be accommodated. Where formal property owners have unlawfully encroached into the road reserve, either with buildings or fences, they may lose these structures without compensation.

8.2.3 Damage to/disruption of services and infrastructure in and adjacent to the road reserve

During construction, there is the potential for incurring damage to boundary fences/walls and banks of adjacent properties. Where adjacent roads are affected by construction works (or gaining access to construction works), damage may be incurred. Existing services and infrastructure below and on the surface of the road reserve may need to be excavated/removed disconnected and relocated, which may cause temporary disruptions to services (e.g. water/electricity/telecommunications). This will be dealt with by SANRALs appointed engineers and the relevant authorities/service providers, and landowners will be kept informed.

8.2.4 Increased pressure/disruptions on adjacent roads and alternative routes

As a result of construction activities, construction vehicles may be required to use provincial or municipal side roads for access. Traffic may need to be deviated onto provincial and municipal roads during roadworks involving blasting or demolition. These alternative roads/routes may deteriorate and will have to be repaired and maintained on a more regular basis, by the contractor. SANRAL is currently in discussions with the KZN Dept of Transport in terms of critical sections of the R103 that need to be repaired before the N3 construction can commence. This will create extra nuisance for residents/business owners who use these roads

daily. In addition, the alternate roads are also likely to become increasingly congested due to people attempting to avoid the construction activities, thereby further exacerbating the pressure on these routes.

In the vicinity of the Lynnfield Park Interchange some property owners/occupants access their properties via a culvert(s) which pass under the N3 and/or the R103. This access will be disrupted during construction. Furthermore, property owners complain in general about the culvert access, because in some cases the height of the culvert restricts the height of farm trucks passing through. The lengthening of culverts used for cattle creeps can decrease the light (forming a dark corridor). Farmers have explained that their animals will refuse to enter a dark corridor should the lengthening be excessive.

8.2.5 Potential impacts to adjacent properties, infrastructure and services, and recommended measures for mitigation/ management

Planning and design

- Increased interaction with landowners and entry onto private property.
  - Maintain good communication with affected landowners throughout the project lifecycle.
  - Ensure that any investigative activities on private properties are undertaken with due consideration and respect for people and property.
  - Conduct land acquisition negotiations timeously and professionally.
- Geotechnical investigations.
  - Geotechnical team to comply with relevant industry standards.
- Resettlement/relocation of formal households and/or loss of privately owned land.
  - Design to minimise expropriation of land.
  - Engage with affected parties on a case by case basis.
  - Ensure that it is clear that all valuations are conducted by an independent person.
  - Fair and equitable compensation should be paid in line with SANRAL's policies and according to the legal framework of the country (The Constitution Section 25 (3) and the Expropriation Act (Act 63 of 1975).
- Risks associated with illegal infrastructure in road reserve.
  - SANRAL has dedicated route managers on its routes to identify immediately when illegal occupants/infrastructure occupy the road reserve[22].
- Increased need for repairs and maintenance to associated roads.
  - This must be budgeted for in the contract.
- Problems with access via underpasses.
  - SANRAL to negotiate access solutions with affected landowners.

Pre-construction and construction

- Risks to property fencing/walls.
  - Existing fences/walls between the N3 and neighbouring properties will be protected. In cases where land is being acquired due to expansion of the road reserve, requiring existing fences to be removed, SANRAL will provide a new fence/wall to the standard of the current fence/wall, as part of the works contract, at SANRAL's cost.
  - In the event of security being compromised as a result of unintended damages, SANRAL is to ensure that suitable security is provided until such time as repairs have been made.
- Relocation of services.

[22] This is made more difficult where fences demarcating the road reserve are stolen.

- The design engineers must ensure that all encroachment consents are identified and the service providers timeously notified so that services can be relocated timeously and preceded by proper forward planning.
- The relocation costs will be borne by the Service Owners should there be a need to relocate services in the current road reserve. However where services are required to be relocated outside the current road reserve, then SANRAL will pay for such relocations. Importantly, however, SANRAL requires proof from service owners that their services that are legally in the road reserve (covered by existing encroachment consents/wayleaves).

❒ Illegal structures in the road reserve.
- It will be necessary to remove existing unlawful structures in the road reserve where widening is to take place. Property owners will not be compensated for the loss of unlawful building or structures in the road reserve. The owner will be responsible for the cost of demolition or removal of these structures. It is recommended that adjacent property owners finding themselves in this situation contact Mr I Ramklown (033 392 8100) at SANRAL Eastern Region offices as soon as possible.

❒ Increased need for repairs and maintenance to associated roads.
- Contractors are to maintain roads/repair damages caused by construction vehicles. This must be budgeted for in the contract.

8.3 What potential health, safety, security and nuisance impacts may be experienced as a result of the proposed widening/capacity improvements to the N3 during construction?

A summary of impacts (incorporating a summary of specialist findings as applicable is provided below, including recommended measures for management/mitigation of impacts. For further detail, please refer to the Social Impact Assessment specialist report (Appendix D). According to the assessment, the impacts on adjacent health, safety, security and other nuisance impacts are of low, medium and high significance, without management. With management, the impacts are considered to be of low and medium significance (Table 17 in Chapter 9).

8.3.1 Influx of construction workers/job seekers and increased spread of disease and criminal activity

As a result of the proposed project, it is likely that there will be an influx of people to, and through, the project area, inclusive of construction workers, jobs seekers, informal traders and criminal opportunists. The movement of people into or through the project area may lead to people spreading disease, in particular HIV and AIDS, or alternatively contracting the disease within the project area and spreading it elsewhere. In addition, the increase in human traffic makes the movement of criminal opportunists easier. The potential of compromised boundary fences exacerbates the potential for increased criminal activities.

8.3.2 Increased likelihood of road traffic accidents and disruption to vehicle traffic

Increased congestion in and around where upgrades are taking place, increased travel time leading to driver fatigue and the potential for increased aggressive driving as a result of delays will result in an increased likelihood of road traffic accidents. The presence of slow moving construction vehicles and construction personnel adjacent to the N3 (left and right hand sides) is also likely to increase the potential for road traffic accidents.

8.3.3 Protest action

It is becoming increasingly common for large construction projects to be delayed as a result of protest action, often concerning the lack of employment opportunities provided for members of local communities. In addition, protests by disaffected contractors (usually smaller and emerging contractors) is an eventuality arising from mistrust in procurement processes. Such delays may have significant financial implications for the project, while also increasing the risk of damage to infrastructure, road closures and ultimately injuries and/or fatalities. The potential for protest action, and how it may affect construction contracts is an issue which needs to be considered carefully in SANRAL's planning.

8.3.4 Increased noise and dust

Households and businesses located close to where construction activities will be taking place are likely to be affected by an increase in noise and dust.

Ambient noise within generally 300 m from the N3 exceeds the regulated standards. Construction noise will result in sudden and significant increases in noise to all receptors within an area of up to 500 m from the road. Haulage trucks will have noise impacts beyond this distance. The requirement for night work will be minimised, however, will potentially be a source of disturbance at night. Blasting will generate short lived loud noises. Although noise from construction will be a variable and temporary impact, construction will occur over many months and will negatively impact at variable times on receptors within an area of up to 500 m from the road.

Areas of exposed soil and stockpiles, as well as the movement of construction vehicles on dirt access roads, will result in increased dust in the area. During periods of strong winds, this is likely to affect adjacent households and businesses.

8.3.5 Disposal of large amounts of demolition rubble and management of inert material

Over the duration of the project an estimated 50,000 – 80 000 m^3 of rubble will be produced from the demolition of structures. It is intended that as much as possible of this will be crushed and re-used for the road building. The project will also generate a large surplus of cut material from earthworks, estimated at approximately 270,000 to 280,000 m^3 (roughly 410,000 tons). It is SANRAL's intention to use this on other sections of the N3 which are part of the broader project, and to stockpile on SANRAL's own land, adjacent. The balancing of material requirements for each project will be done in line with what is best/ economically feasible to SANRAL. A separate professional team has been appointed to manage the materials utilisation between the various projects for the N3 upgrading. Two dedicated stockpiles areas adjacent to the N3 have been identified on land recently acquired by SANRAL for this specific purpose.

Surplus volumes could cause temporary stockpiles of massive proportions and will cost large amounts in haulage for disposal. Without good forward planning as to disposal and stockpiling procedures, it may become difficult to deal with such large volumes which may accumulate in unwanted stockpiles and/or not be accepted by authorised landfill sites.

8.3.6 Potential nuisance impacts and impacts to health, safety and security and recommended measures for mitigation/ management

Planning and Design

- Management of demolition rubble and other inert waste.

- SANRAL must ensure that the construction contracts that go out to tender are clear about re-use and/or disposal of material. Should the material need to be stored prior to use on other sections of the road, sites must be identified upfront and any necessary authorisations /permits obtained, should they be required.
- Landfill sites should be contacted prior to construction, to ensure that anticipated volumes can be accepted.

❒ Potential protest action.
- Conduct open and transparent procurement processes.
- Optimise use of local labour.
- Set up Project Liaison Committees (PLC's) to engage with communities and local businesses.
- Brief security team on site and the South African Police Services on steps to respond to protest action.

Pre-construction and construction

❑ Increased spread of disease.
- An HIV/AIDS awareness/education component should be included in the induction programme for all personnel working on the proposed road upgrades.
- Ensure there is easy access to HIV/AIDS related information and condoms for all workers involved with the proposed road upgrades.

❑ Increased likelihood of road traffic accidents.
- Develop a traffic management plan.
- Ensure that all staff members and people on site undergo road safety training.
- Ensure that all staff members and people on site have suitable Personal Protective Equipment (PPE).
- Ensure there is suitable signage informing road users of construction activities.
- Implement measures to reduce traffic speed, including rumble strips, speed cameras and digital signage showing approaching drivers their vehicle speed.
- Ensure measures are put in place to prevent unauthorised people from accessing the areas where upgrades are taking place.

❑ Increased crime.
- Construction teams should be clearly identified by wearing uniforms and/or identification cards that should be exhibited in a visible place on their body.
- Instant dismissal and prosecution of any staff caught in criminal activities of any kind.
- Inform local law enforcement agencies of the possibilities of increased criminal activity in the area.
- In the event of boundary fences being temporarily compromised, alternative security measures should be put in place.

❑ Increased dust.
- Dust caused by strong winds on exposed soils should be controlled by means of water spraying.
- Ensure all stockpiles are wet or covered.
- Minimise the amount of exposed soils by removing vegetation for construction only when required.
- Ensure good 'housekeeping' is practiced on the construction site.
- Strict speed limits should be applied on any gravel roads so as to reduce dust levels.

❑ Increased noise.
- In areas where construction will be taking place in proximity to residential and/or business property, make use of noise reduction techniques as applicable and as indicated in a Noise management Plan.

- Avoid undertaking construction activities after daylight hours. In instances when this is not possible, ensure that potentially affected parties are communicated with and kept informed on a regular basis.
- If blasting is required, ensure that potentially affected parties are informed prior to any blasting taking place.

8.4 What negative impacts will the proposed widening/capacity improvements to the N3 have on the social environment during operation?

A summary of impacts (incorporating a summary of specialist findings as applicable) is provided below, including recommended measures for management/mitigation of impacts. For further detail, please refer to the Social Impact Assessment specialist report (Appendix D). According to the assessment, the potential negative impacts on the social and socio-economic environment during operation are of medium significance, without management. With management, the impacts are considered to be of low and medium significance (see Table 18 in Chapter 9).

8.4.1 Increased safety and security risks due to closer proximity of the widened road to adjacent properties

Residents are concerned about safety risks during operation. Where houses and structures have been brought into closer proximity to the widened road, they may be at increased risk of damage due to vehicle collisions, spillages, fires, etc. In certain places, the edge of the road is within 3 m of a property boundary. Guardrails/concrete parapets will be constructed as protection where required adjacent to banks.

There are instances where sections of road reserve are overgrown with vegetation near residential areas and these areas are used by criminals to hide and aid them in their criminal activities. Where houses and structures have been brought into closer proximity to the widened road, the security risks could increase if the road reserve is not kept clear of thick vegetation. However, where the road reserve has substantially narrowed, it is likely there will be less space for thick vegetation and less opportunity for criminals to hide.

8.4.2 Increased noise during operation of the widened road

The predicted increase in traffic over time will be accompanied by an increase in noise levels adjacent to the national road. In addition, due to the widening of the N3, the edge of the road will be closer to residential and business properties. The noise generated by traffic on the national roads is already high. Noise levels will differ according to the topographical position of the receiver (whether above or below the road) and depending on whether any physical barriers to sound are located between the road and receiver (walls, other houses, vegetation, banks, etc.). Steep sections of road may generate more noise than flatter sections, due to heavy vehicles having to engage lower gears and/or air brakes. Generally, however, according to the noise specialist report (Appendix D), noise levels are most problematic to receivers located within 300 m of the road. Within this distance, the noise levels are currently above the standards set in the Noise Control Regulations. Based on the predicted traffic volumes, the noise specialist predicts a small increase in noise initially, but with an annual increase in noise, by the year 2047 the increase would be significant. Operational noise can, thus, be expected to increase significantly over time and will ultimately reach unacceptable levels up to 300 m from the road if no mitigation is undertaken (calculated increase of up to 5 dB over 20 to 30 years – a perceived doubling in noise to the receptor).

Unfortunately, it is not possible to eliminate noise next to a national road. Owners who have chosen to purchase properties adjacent to the N3 have done so being aware of the existing noise levels and the potential for these noise levels to increase over time (due to growth in traffic volumes and decreased distance from properties when necessary expansion of roads is undertaken to accommodate this growth). However, there are various measures that can be implemented to help reduce noise levels. These include using low noise road surfacing and, potentially, the construction of barrier walls.

SANRAL will apply low noise surfacing to all sections of roads that pass residential areas. Barrier walls, however, need to be location specific and may have very limited effect, depending on the location of the receptor in relation to the road. Barrier walls are generally extremely costly and come with their own set of negative impacts, particularly negative visual impacts. The noise they deflect from one receptor may potentially become a problem for another receptor. SANRAL will commission an acoustic design specialist to investigate if there are feasible and affordable options that may be incorporated into the design, or implemented over time, post construction, for particular noise hotspots in urban areas. These would then need to be assessed for *in situ* impacts.

Ultimately, however, it should be understood that it is the increase in traffic that causes an increase in noise and not road widening. SANRAL, as the road authority, is tasked with ensuring that the roads can safely and efficiently accommodate traffic volumes, to facilitate economic development. This is especially important for the N3, being the busiest road freight corridor in South Africa. Control of the growth of traffic volumes is a broader planning exercise that would include interventions from various government departments, such as better public transport and increased movement of freight by rail. Ultimately there must also be an adaptation to prevailing conditions i.e. a change of land use/receptors adjacent to national roads, towards those which are less sensitive to noise.

8.4.3 Possible stormwater damage to neighbouring properties during operation of the widened road

SANRAL has received a few complaints regarding the damaging effect of stormwater on adjacent properties being attributed to runoff from the national road. The risk of stormwater damage should be low if drainage is properly designed.

8.4.4 Damage to adjacent properties as a result of increased vibrations from traffic

Some residents living adjacent to the national road complain of vibrations when heavy vehicles go past. The vibrations rattle windows and are a source of disturbance and/or may cause damage to adjacent structures such as boundary walls. As a result of the proposed expansion, the N3 will be closer to various properties in a number of locations and, thus, may increase the likelihood of vibrations. However, the proposed expansions will result in an improved road surface which is likely to reduce vibrations as the generation of vibrations is usually the result of a rough or uneven surface.

8.4.5 Increased exposure to air emissions during operation of the widened road

When the road is widened, the source of vehicle emissions (carbon dioxide and nitrous oxide) will encroach closer to residences than previously and will cumulatively contribute to existing air pollution levels. However, the concentrations/dilution of emissions and other air pollutants at different positions along the N3 will vary depending on topography, prevailing winds and weather conditions.

8.4.6 Potential negative social impacts during operation and recommended measures for mitigation/management

Planning and design

- Safety risks to adjacent properties.
  - Retain boundary fences between the road reserve and neighbouring properties (note SANRAL will always provide a boundary fence along its road reserve, providing some form of safety).
  - Construct guardrails/concrete parapets as protection, where required.
- Risk of damage from stormwater runoff.
  - Ensure drainage design prevents damaging stormwater runoff on adjacent properties.
- Increased noise.
  - Ultra-thin friction wearing course (UTFC) will be used, which is a low noise surface. For surfacing on concrete, the option of UTFC and diamond grinding are both under consideration. Surfacing is to be regularly maintained.
  - The engineers responsible for detailed design must investigate, in conjunction with acoustic design specialists, the feasibility of constructing barrier walls to mitigate noise in particular problem areas. The effectiveness of walls is, however, very dependent on the location, height and distance between the noise source and the receiver.

    Noise barriers are effective in reducing the level of noise received on severely impacted locations close to the road provided the barrier screens the receivers' (ground floor and upper floors) windows from the noise source. Their effectiveness is good near the source and decreases with increasing distance.

Operation and maintenance

- Increased noise.
  - Home and business owners may be able to reduce noise levels on their own properties by erecting walls around their properties and using double glazing on windows. An evaluation of the noise source should be undertaken first, however, so that optimum measures can be put in place. According to the noise specialist, the use of hedges and vegetation generally provides little noise reduction.
  - Ensure regular maintenance of the noise reducing road surfacing.
- Increased vibrations.
  - Maintain the road surface regularly and ensure uneven surfaces are repaired.
- Increased security/crime risks.
  - Ensure the road reserve is kept clear of overgrown vegetation that can harbour criminals.

8.5 What effects will the proposed widening/capacity improvements to the N3 have on cultural heritage?

A summary of impacts (incorporating a summary of specialist findings) is provided below, including recommended measures for management/mitigation of impacts. For further detail, please refer to the Cultural Heritage Resources Impact Assessment specialist report (Appendix D). According to the assessment, the potential negative impacts on cultural heritage during construction, operation and rehabilitation of the N3 near Bellevue Farmstead are of medium to high significance, without management and implementation of the recommended mitigation measures. With management and mitigation, the impacts are considered to be of low significance (see Table 19 in Chapter 9).

8.5.1 Potential impact on Bellevue Farmstead

Two structures of the Bellevue Farmstead are located less than 20 m from the existing road reserve and 15 m from the proposed road upgrade. The design engineers, within the safety limits they are required to maintain, have limited the proximity of the upgraded N3 to the farmstead as far as possible, through design and use of retaining walls. eThembeni considers that this should be favourably entertained by Amafa as currently, the buildings are standing unused and in a state of decay ("demolition by default"). Further, the proposed extension of the road reserve appears not to have a physical impact on the buildings. It has been recommended that the project proceed as there is no significant physical impact on these heritage resources.

8.5.2 Potential impacts on cultural heritage and recommended mitigation/management actions

Design, pre-construction and construction

- Impacts on structures at Bellevue Farmstead.
  - Ensure that structures are protected from damage during construction and that all contractors' staff are informed accordingly.
- General protection of cultural heritage.
  - Should any other cultural heritage resources be encountered during the course of construction, work in the affected area must be immediately be halted, the area cordoned off and the heritage authority contacted for advice on further action.
  - Amafa should undertake an inspection of the surveyed road reserve prior to construction and periodic inspections during construction to ensure that heritage resources are not damaged.
  - Any extension of the project beyond its current footprint involving vegetation and/or earth clearance should be subject to prior assessment by a qualified heritage practitioner, taking into account all information gathered during the initial heritage impact assessment.

8.6 What effects will the proposed widening/capacity improvements to the N3 have on the biophysical environment (soils, riparian, wetland and terrestrial natural habitat, fauna) during construction, operation and rehabilitation?

A summary of impacts (incorporating a summary of specialist findings) is provided below, including recommended measures for management/mitigation of impacts. For further detail, please refer to the Riparian/Wetland and Vegetation specialist reports in Appendix D. According to the assessment, the potential negative impacts on biodiversity and natural habitat during construction, operation and rehabilitation are of high and medium significance, without management. With management, the impacts are considered to be of low significance (see Table 20 in Chapter 9).

8.6.1 Loss/degradation of soils and substrates

The project will entail significant excavation work with heavy machinery, including cuts and fills. River banks and beds will be altered as the length of the existing crossings is increased. Blasting will be required where steep rock banks occur. These activities will potentially result in increased soil erosion, increased loss of topsoil, increased safety risk due to unstable banks or rockfall, destabilisation of river banks and will also result in high sediment loads entering drains and nearby water courses.

8.6.1.1Potential impacts on soils and substrates and recommended measures for mitigation/management

Preconstruction and construction

- Increased soil erosion and increased slope instability.
  - Topsoil is to be removed separately to subsoil and be safely stockpiled for use in rehabilitation.
  - Exposed soils and cut and filled surfaces are to be adequately safeguarded as per recommendations of the engineer's geotechnical reports and other applicable mitigation measures provided in the EMPr (Appendix F).
  - Specialist geotechnical advice must be followed to ensure all new fill embankments are constructed to rule out the potential for large-scale instability and the associated negative environmental implications.
  - Soil erosion on site must be controlled in accordance with the relevant specifications in the EMPr (Appendix F).
  - Large sediment loads must be prevented from entering drains and watercourses.
  - Controlled blasting is to be undertaken in accordance with legal requirements and best practice.
  - The impacts on soils and substrates must be monitored during the construction phase as part of environmental management of the contract.

8.6.2 Loss/degradation of terrestrial vegetation and natural habitat

- Clearance of vegetation cover.

  The clearing of vegetation for widening of the road reserve, stockpiling of materials, vehicular access during construction, and the establishment of construction camps will lead to the direct loss of vegetation cover, but only within the road reserve and newly acquired land. Based on the existing road reserve and proposed extensions, up to 58 ha of vegetation may be cleared, including 30 ha of disturbed grassland/thick mosaic, 15 ha of bushveld/thornveld/grassland mosaic, 12 ha of secondary grassland (largely in islands at interchanges), and 0.5 ha of xeric cliff vegetation. Direct impacts to natural vegetation will also result in the loss of mainly common and widespread plant species, but also a few more notable species including at least one Red Data species (i.e. *Aloe pruinosa*).

  Due to the disturbed nature of the majority of the natural vegetation along the N3, the significance of impacts within sections of disturbed grassland/thicket mosaic is likely to be medium. With mitigation, particularly through alien plant and soil erosion control, the significance is likely to be low.

  With adequate mitigation, impacts are likely to be low for the xeric cliff community, provided that any succulents and bulbs of conservation concern, which may be present, are rescued (together with specific mitigation presented in the EMPr).

  The impact of the N3 upgrade on the riparian vegetation along the Mpushini River (Site 2, Figure 4) is considered low on the basis that construction activities will not require an access road through the Mpushini riparian area below the N3.

  While *Spirostachys africana* (Tamboti) is not a protected species, it is recommended that SANRAL minimise disturbance of the unique stand of *Spirostachys africana* (Tamboti) at the Lynnfield Interchange (See Site 3, Figure 4).

- Edge effects.
  The clearing of vegetation during construction will result in an increase in disturbed edge habitat immediately adjacent to developed areas. Edge habitat is characterised by a predominance of generalist and alien species because these areas experience higher levels of stress and more frequent disturbance (in both time and space), for example, higher light conditions, lower soil moisture conditions and higher exposure to wind (and fire for closed woody communities). Edge habitat is characterised by highly competitive species which can invade areas of established vegetation, resulting in a loss of sedentary species of mature habitats which are normally considered sensitive. Within the area of interest, edge effects will be lowest where natural vegetation is already disturbed (e.g. disturbed grassland/thicket mosaic), and higher where vegetation is less disturbed (e.g. bushveld/thornveld and grassland mosaic). Shade cast on habitat under bridges may have a small effect on the composition of plant communities.

- Habitat fragmentation.
  Given the N3 route is already in existence, it is expected that widening will increase the distance between natural areas bisected by the highway, although this effect is likely to be small relative to the current width of the highway.

  Clearing of vegetation for temporary vehicle access and stream crossings through riparian and wetland vegetation will, however, result in further habitat fragmentation and the consequent loss of habitat connectivity. Rehabilitation would be important to reinstate (and potentially improve) habitat connectivity in the long-term.

- Alien invasive plants.
  The clearing of vegetation during construction and operation, and the operation of machinery and stockpile/lay down areas during construction will result in increased levels of disturbance. Alien invasive plants often outcompete indigenous plants and are likely to become established in disturbed areas, thereby reducing habitat quality and contributing to the loss of indigenous species/biodiversity. Some alien plants exacerbate soil erosion while others contribute to reduction of natural streamflow.

- Soil erosion and siltation.
  The clearing of vegetation for vehicular access during construction, stockpiling of materials, establishment of construction camps and operation of machinery will result in the removal of protective plant cover and compaction of soils, exposing soils to erosion by water and wind. Habitat quality will be degraded by soil erosion and siltation of down slope areas. This will increase the disturbance experienced in surrounding areas of natural vegetation and increase the footprint of the development. It is likely that the ecology of wetland and riparian systems will also be adversely impacted. Similarly, temporary crossings over riparian zones and wetlands can have negative impacts on natural habitats downstream. Negative ecological impacts can operate long after construction is complete if soil erosion and siltation remain uncontrolled.

- Harvesting of indigenous plants.
  Increased access for labour during construction and operation could result in the increased collection of medicinal plants, firewood, building wood, and other plant material. This could impact negatively on biodiversity, as well as result in the general degradation of habitat quality.

8.6.2.1 Potential impacts on terrestrial vegetation and natural habitat and recommended measures for mitigation/management

Planning and design

- Loss/degradation of habitat and loss of biodiversity.
  - Ensure during project planning and tender processes that sufficient budget is allowed for plant rescue prior to vegetation clearance and rehabilitation post construction.
  - Ensure sufficient funding will be available for an effective alien plant control programme.

Pre-construction and construction

- Loss/degradation of habitat and loss of biodiversity.
  - Where construction occurs close to any sensitive areas of natural vegetation or areas supporting any plants of conservation concern (i.e. listed Red Data, TOPS, protected and rare plant species), as specified in Appendix A of the specialist vegetation assessment attached in Appendix D of this BAR, these areas must be clearly/visibly demarcated and cordoned off by an Environmental Control Officer (ECO) prior to, and during construction. Should these areas be unavoidable, then permits and authorisations will need to be obtained from EKZNW and DAFF, followed by a plant rescue programme as far as is appropriate.
  - A plant 'rescue' operation must be undertaken under the direction of an ecologist/botanist prior to construction, where plants of high conservation value will be impacted by any part of the development (construction or operation phase). The contractor is to conduct plant rescue according to the specifications for plant rescue provided in the Appendices to the EMPr.
  - It will be particularly important to ensure that construction contractors are made aware of the CBAs that are proximal to the N3 as shown in Figure 4, with due guidance and monitoring by an ECO prior to, and during construction to ensure that the construction footprint is kept to a minimum, with no works occurring outside of the negotiated servitude/working area. The working area/s must also be clearly demarcated. Ancillary infrastructure (e.g. construction camps, lay down areas, stockpiles, etc.) should be positioned away from any CBAs.
  - The construction footprint is to be kept to a minimum. No works are to occur outside of the negotiated servitude/working area and the working area is to be clearly demarcated.
  - Clearance and cutting back of natural vegetation to be kept to a minimum. The contractor is to conduct vegetation clearance according to the relevant specifications in the EMPr, including the relevant Appendices to the EMPr that deal with specific sensitive areas.
  - Stockpile and lay down areas are to be kept away from areas of sensitive natural vegetation.
  - Where good quality Hinterland Grassland/Ngongoni Veld are to be affected by construction activities, the following, mitigation measures need to be carefully considered to avoid or reduce impacts:
    - The construction footprint is kept to an absolute minimum.
    - A plant 'search and rescue' operation must be undertaken prior to construction.
    - Once all plants of conservation value/concern have been rescued, impacted sections of Hinterland Grassland/Ngongoni Veld affected by construction

should be carefully removed and transplanted at nearby disturbed sites[23] within the same vegetation type and with similar habitat characteristics. This can be done by carefully removing strips of grassland along with the first 250 mm of topsoil using a front-end loader (or by hand). The removed grassland strips/swards should then be transported to the new site where they are to be placed on the ground in sections side-by–side. Gaps between sections should then be filled with sand and the grass must be given a good watering. Depending on the time of year and natural rainfall patterns, watering should continue approximately once a week for six to eight weeks until the grassland has become established.

- Alien invasive plants around any excavated areas/work areas and within the road reserve must be kept under control during both construction and operation in accordance with SANRAL's existing protocol. Additional effort (follow ups) will be required in sensitive areas and additional funding will need to be made available.
- Where construction may impact on plants designated as 'specially protected' under the Natal Nature Conservation Ordinance (Act No. 15 of 1974), an application must be submitted to EKZNW to clear or translocate these plants as part of the plant rescue operation.
- Where construction requires tree species that are protected in terms of the National Forests Act to be cut, disturbed, damaged or destroyed protected tree; and, an application must be submitted to DAFF. Only one protected tree as listed under the National Forests Act (Act No 84 of 1998) was recorded from this section of the N3, namely *Sclerocarya birrea* subsp. *caffra*.
- Where construction may impact on MOSS areas, then the relevant municipality will need to be engaged to authorise and consent to the clearing of vegetation within these areas.
- Where construction may impact on plants listed as Threatened or Protected species (TOPS) under the National Environmental Management Act: Biodiversity Act, 2004 (10 of 2004), an application must be submitted to EKZNW to translocate these plants as part of the plant rescue operation.
- Relevant general specifications in the EMPr are to be followed. These include specifications relating to:
  - Vegetation clearance.
  - Plant rescue.
  - Control of soil erosion.
  - Site access and working areas.
  - Pollution and waste management.
  - Siting of construction camps.
  - Rules for construction teams.
  - Control of alien invasive plants.
  - Site rehabilitation.
  - Dealing with demolition rubble.
- Specific management must be employed regarding site access to viaducts and/or culverts:
  - The number of access tracks is kept to a minimum. Adequate drainage (mitre drains) should be constructed at regular intervals in accordance with the local topography to minimise soil erosion potential. Alien plant control should also be undertaken along these access tracks.
  - As far as possible, work takes place during the winter low flow period.
  - Existing crossings are used as far as possible for vehicle access.

[23] Care should be taken to select sites which are not subject to on-going disturbance that would destroy translocated sections of grassland and to ensure that compacted soils on receiving areas are ripped before grassland is translocated.

- The width of the crossings is kept to the absolute minimum required for access. Construction of new and/or temporary crossings must be suitably designed and constructed to limit interference of hydrological flows and connectivity. Crossing designs must be accompanied by stormwater management plans.
- Soil compaction should be minimised by keeping access and parking areas for vehicle and construction plant to a minimum and making use of existing compacted/hardened surfaces wherever possible.
- Where new tracks are required, sensitive areas of vegetation, wetlands and riparian zones are to be avoided. Wherever feasible, shaping new tracks with a grader is to be avoided, and new vehicle tracks are to be created by simply driving over the grass cover without removing grass cover/topsoil.
- The same track is to be used to access a site and widening and creating alternative or parallel tracks must not be allowed. Likewise, the same vehicle turning areas are to be used (for both construction and maintenance).
- Where new access tracks are required, as far as possible, these must follow the contour on steep slopes, rather than being aligned directly down steep slopes. Stormwater runoff must be such to limit concentration of runoff, and consequently erosion of soils.
- Where watercourse and drainage line crossings are unavoidable, drains and culverts must be designed in conjunction with relevant experts to the correct invert levels to prevent damming of flows or draining of wet areas. Culverts should be designed to prevent concentration of flows, and to maintain natural flows as free flowing as possible. Levels and elevations must also be set and aligned according to the natural flow of water to limit headcuts and channel incision developing.
- If water for construction is to be sourced from local water bodies, then this must occur at existing disturbed sites due to potential for damage by temporary access roads and water tankers.
- Temporary access tracks are rehabilitated as quickly as possible after construction ceases by removing excess imported material, ripping compacted soils, reinstating natural ground levels, implementing soil erosion controls and re-establishing a dense cover of indigenous vegetation appropriate to the plant community in which the road/track is located.
- Where dewatering of silt laden water is required at excavations, it is recommended that this water is not pumped directly into watercourses (i.e. wetlands and rivers), and that separate collection areas/sumps should be created in existing disturbed areas where suspended sediments can be settled out.

Operation

- Spread of alien invasive plants.
  - Alien invasive plants around any excavated areas/work areas and within the road reserve must be kept under control during operation. Additional effort (follow ups) will be required in sensitive areas for which additional funding will need to be made available.

8.6.3 Degradation of wetland and riparian areas

The road widening will require the extension (lengthening) of the existing drainage infrastructure. Where needed, inlets and outlets will be improved/enlarged and erosion protection provided up and/or downstream.

Six of eight crossings (Section 5.5.3) have been identified as providing wetland/riparian habitat (the remaining two are drainage lines) The works will result in the destruction of small sections of riparian habitat where existing crossings are widened, modification of riparian river bank and beds, and potential degradation of water quality resulting from construction activities and materials. Six of the eight crossings have been identified as providing wetland/riparian habitat (the remaining two are drainage lines).

Many of the riparian habitats assessed are dominated by alien plants, with construction activity, therefore, having limited impact on indigenous species and providing an opportunity for localised removal of aliens and rehabilitation with indigenous riparian species.

Given that the majority of the systems are already highly modified, the construction phase impacts can largely be controlled, mitigated and rehabilitated through an appropriate and comprehensive EMPr and mitigation measures, followed by prompt and appropriate rehabilitation. Key areas of focus would be habitat destruction, erosion, successful and rapid re-vegetation, the maintenance of riparian vegetation and bank stability, and pollution prevention. If the correct measures are implemented during construction, longer term impacts of construction on water quality can be managed. The higher risk is rendering riparian and wetland biophysical habitat unstable as a result of bed, bank and grade modification, particularly when coupled with vegetation clearing and earthworks.

Risks related specifically to construction associated with the wetland and riparian areas may include the following:

- The introduction of foreign and hazardous materials to the habitat which may result in pollution, such as fuel, cement, explosives and other building materials.
- Erosion and the sedimentation of watercourses and aquatic habitat.
- Removal of terrestrial and riparian indigenous vegetation.
- Loss of sections of wetland and riparian habitat.
- Compaction of wetland soils by construction vehicles.
- Modifications to the wetlands, river banks and beds as a result of earthworks, excavations and sloping.
- River canalisation and diversion.
- Erosion and the diversion of subsurface flow if artificial preferential flow paths are created as a result of earthworks.
- Risk of erosion forming if infilling is not adequately compacted or the longitudinal slope of the wetland system is not maintained.
- Vegetation disturbance leading to increased encroachment by alien invasive or ruderal plant species.
- The impoundment of flows upstream of the crossing during construction, and desiccation of the systems downstream during construction. These conditions could continue post-development depending on how effectively the area has been rehabilitated.
- The production of a large amount of inert waste (reinforced concrete rubble) which could be dumped in a manner that degrades watercourses.

8.6.3.1 Potential impacts on wetland and riparian areas and recommended measures for mitigation/management

Planning and design

- Increased erosion and instability due to earthworks and crossings.
  - The crossings should be designed to ensure that flow patterns along the stream/river channel are not altered or diverted potentially resulting in stream bed and bank erosion and instability.

- Culverts should be placed in a manner that allows for the free movement of water and sediment.
- Culverts should be placed at the same level as the base of the channel.
- Culverts need to allow for the natural flows of water across the freshwater ecosystems and not confine flows.
- Culverts should have sufficient grade to be self-scouring or self-cleaning and not be prone to sedimentation build up within the culverts. However, the culverts must be equipped with energy breakers at their outlets to ensure the downstream freshwater ecosystems do not scour or erode as a result of the culvert grade.
- Construction of the causeway should ensure that the banks of the stream channels are stabilised so as not to erode at the edges.
- The crossing support infrastructure should be constructed at right angles to the freshwater habitat wherever possible (new crossings as existing angles will remain).

- Potential problems due to generation of large volumes of demolition rubble and rock material.
  - SANRAL must ensure that the construction contracts that go out to tender are clear about re-use and/or disposal of material. Should the material need to be stored prior to use on other sections of the road, sites must be identified up front and any necessary authorisations /permits obtained, should they be required.

Pre-construction, construction

- Increased soil erosion, sedimentation and instability due to earthworks and crossings.
  - Earthworks associated with river crossings should take place in the winter months as this is the driest period for this region. It is acknowledged that this is not always practically achievable but should be accommodated as far as possible in construction scheduling. In addition, it should be noted that working in river channels during summer can be dangerous due to sudden flooding following thunder storms upstream in the catchment. Construction personnel need to be aware of this risk.
  - The crossings should be designed to ensure that flow patterns along the stream/river channel are not altered or diverted potentially resulting in stream bed and bank erosion and instability.
  - On steep slopes draining towards the identified freshwater ecosystems, small-scale diversion berms should be constructed, to reduce the risk of the earthworks becoming a preferred surface flow path leading to erosion. Where space is insufficient, suitable road fill embankment protection must be designed.
  - “Trench-breakers”, which are in-trench barriers, should be installed within any trench excavations to minimise the interception and accumulation of surface runoff water from upslope areas.
  - During earthworks, the top 50 cm of the wetland/riparian topsoil must be removed and stockpiled, to be replaced once activities have been completed. This is to maintain the existing seed bed and soil profiles as best as possible.
  - Excavated soils should be placed on the upslope side, to allow the excavated area to intercept any water thereby minimizing the risk of erosion and excess sediment and minimizing the risk of the loose soils entering the freshwater ecosystems.
  - The construction footprint across the systems must be as narrow as practically possible, i.e. machinery must utilise the same route through the systems at all times so as to avoid unnecessary disturbance.
- Increased soil compaction due to access and working areas.
  - Each construction working area must be clearly demarcated. Vehicle and personnel traffic must be minimised and must be restricted to within designated working areas.

- Vehicle access routes must not pass through watercourses, wetlands and any areas of sensitive vegetation. Where access routes have to cross wetland communities these must be single track entry and exit routes. The ECO must be notified of any spills or leakages in these sections. These spills/leaks should be treated with hydrocarbon degrading bacteria (products such as or similar to biologX or Oil Spill Gobbler^{TM}).
- Existing roads, tracks and pathways should be used wherever possible, and multiple pathways must not be allowed to develop.
- Disturbance to steep slopes must be kept to an absolute minimum.
- The activity must cover as small a working area as is feasible, to minimise the areas disturbed on site at any one time. If applicable to non-working areas, buffers must be established around open water, aquatic habitats, riparian and wetland vegetation and riparian banks.

❑ Degradation of riparian and wetland vegetation, and faunal habitat.

- The activity must cover as small a working area as is feasible to minimise the area disturbed at any one time.
- Strict buffers must be established around all open water, aquatic habitats, riparian and wetland vegetation and riparian banks, outside of necessary access routes and designated work areas. It is recommended that a 32 m buffer be maintained from the edge of wetlands and a 50 m buffer from the edge of riparian zones. These limits are subject to review by authorities.
- The buffers outside of access routes and designated working areas become strict no-go areas where habitats must not be disturbed, and personnel and machinery are not permitted entry unless directed by the ECO during rehabilitation.
- The removal, damage or disturbance of any flora outside the working areas is not permitted. Fishing must be strictly prohibited in and around the working areas.
- Clearing or pruning of indigenous vegetation at the site of activity must be kept to an absolute minimum. This must be done under the supervision of an appropriately qualified specialist. Any trimming or clearing of any threated or protected species (TOPS) will require a permit from Ezemvelo KZN Wildlife.
- Where protected or otherwise important fauna and flora are encountered and require removal, the ECO should be consulted and the individuals transferred to a nearby 'safe', similar habitat.
- Where clearing is required outside of earthwork/construction areas, vegetation should be brush-cut rather than cleared to speed re-establishment following site closure.
- No herbicides may be used on indigenous vegetation, particularly within proximity to wetland and riparian areas.
- No project workers are permitted to catch, trap, poison, kill or disturb any animals present in the project areas.
- No disturbance of nesting or feeding sites and fauna habitat is allowed. Advice from the ECO should be sought if such sites are encountered.

❑ Increased risk of damage due to erosion and stormwater runoff.

- Where construction activity takes place within floodlines of watercourses, temporary berms need to be formed to ensure the construction site and disturbed soils are protected from flooding, storm flows and erosion. This is particularly important when construction activities are taking place outside of the dry season.
- Erosion that takes place during rainfall events must be rehabilitated immediately. A stock of suitable materials (e.g. sub- and top soil stock piles from excavated areas) for this purpose must be kept in a secure facility.
- Stormwater control measures must be implemented with all stormwater generated within disturbed earthwork areas channelled to temporarily constructed settling

ponds which allow the water to naturally filter back to the watercourse after settling.
    - Storm water retention and other constructed settling ponds must be suitably sited or protected so that river channel high flows will not cause flooding of the ponds. Siting of such ponds must be undertaken by a suitably qualified specialist (e.g. agricultural/wetland engineer) who must also provide advice as to the size and maintenance of the ponds.
- Increased risk of pollution.
    - Fuel and hazardous material storage, handling and refuelling areas must not fall within the 1:100 year flood line of riparian/wetland habitat and buffer zones. Such storage areas must be located far (100 m (horizontal distance)) from riparian zones and any other sensitive environments.
    - All spills of foreign or hazardous materials or fluids must be cleaned up immediately, with all spills larger than 20 litres being reported to the ECO immediately.
    - A record must be kept of all spills and the corrective action taken.
    - Vehicles should not be parked in or near sensitive areas, such as watercourses or drainage areas.
    - Drip trays are to be provided under all standing vehicles to minimise hydrocarbon spills.
    - No eating or cooking and cleaning of persons, utensils or equipment may take place near rivers, streams or watercourses.
    - Appropriate provision must be made for ablutions during construction. If chemical toilets are used, they must be well serviced, and must be placed on level surfaces well away from any water courses, drainage lines or seeps, and any areas which may be subject to flooding. No spillage must occur during servicing and contents must be correctly removed from site.
- Increased risk from demolition rubble and rock material.
    - No rubble or rock/soil from earthworks may be temporarily stockpiled or dumped within 32 m of the river channels and wetlands.

Construction and post construction

- Site rehabilitation following construction (construction and post construction).
    - In riparian areas, backfilling should occur as soon as possible, with soil compaction undertaken and shaping to original levels.
    - All disturbed areas are to be rehabilitated, with the wetland and riparian habitat at the crossing points and areas where disturbance has resulted from excavation being restored to near-natural conditions. This must be implemented immediately following completion of construction activities at each localised crossing.
    - The crossings should be rehabilitated to ensure that no barriers exist within the stream and that in-stream habitat is comparable to the natural or, at a minimum, preconstruction state.
    - Re-vegetation and rehabilitation must take place at worked sections immediately following completion so that vegetation can re-establish as quickly as possible.
    - Within, and in proximity to riparian and wetland areas, successful re-vegetation is crucial to stabilise soils and limit infestation by invasive alien plant species and dominance by ruderal species.
    - Simple re-vegetation with terrestrial species will not be suitable. Correct species for riparian and wetland habitats of the region must be re-established in consultation with an appropriately qualified specialist (e.g. botanist/vegetation ecologist).
    - Progress of vegetation establishment must be monitored regularly, with slow recovery requiring intervention to ensure site recovery and integrity, as well as physical stability.

- Vehicle access tracks, footpaths and other areas of soil compaction and vegetation denudation as a result of the construction activities must be appropriately contoured, scarified and re-vegetated where required.
- Any soil stockpile sites and sites of excavation must also be rehabilitated in the same fashion. Rehabilitation of such sites must be monitored and the results reported to the ECO.
- All excess soil stockpile not taken off site or used to fix erosion problems must be spread evenly over the disturbed areas, and capped with topsoil, prior to rehabilitation and re-vegetation.
- Construction areas must be rehabilitated to a land surface which integrates with the surrounding slope morphology and river channel form so as not to create areas of soil instability, or flow paths which incorrectly direct stormflows and floods, thereby causing scour, erosion and damage to adjacent habitats and infrastructure.
- Areas subject to concentrated water flows during rainfall or high flow events must receive particular attention during rehabilitation and re-vegetation. Where possible, these must be identified prior to commencement of construction activities. Where required, erosion protection structures may need to be designed and installed.
- Artificial embankments, depressions and holes created by the construction activity must be contoured/rehabilitated to minimise risk to, and death of, all fauna types, from large mammals to small invertebrates.
- Upon site closure, all infrastructure, foreign materials, waste, litter and contaminated water, rock or soil must be removed from site and disposed in accordance with the legal requirements for particular waste streams.

8.6.4 Faunal mortalities and negative effects on local faunal populations due to disturbance, loss of habitat and poaching

All disturbance to natural habitat (whether degraded or not) will impact negatively on the fauna that uses this habitat. Various types of fauna including reptiles, rodents, spiders and various other invertebrates will be disturbed and exposed during the works. Some may be injured and/or killed due to physical impact from machinery. Those that are exposed and displaced will be vulnerable to harm from other predators and from human beings. The project will result in a loss of habitat (albeit disturbed) when the road reserve is paved for the widened road.

8.6.4.1 Potential impacts on fauna and recommended measures for mitigation/management

Construction

- Increased animal mortalities (including poaching).
  - Mortalities of various types of animals are inevitable due to the earthworks and movement of heavy machinery. This should be minimised by keeping the construction footprint to a minimum and by using existing access roads and disturbed areas for vehicle access and for stockpiling.
  - If snakes are encountered, they are not to be killed. There are several snake experts who can be contacted to remove and relocate snakes (e.g. Zane Barnard: Pmb and surrounds, cell: 082 850 7713).
  - Where possible, exposed vulnerable animals should be removed from the work area along with some of the soil/substrate they were found in (if applicable) and placed carefully in similar but safe habitat adjacent to/up or downstream of the works. The ECO must be notified and consulted in this regard.
  - Fishing must be strictly prohibited in and around the working areas.
  - No project workers are permitted to catch, trap, poison, kill or disturb any animals present in the project areas.

- No disturbance of nesting or feeding sites and fauna habitat is allowed. Advice from the ECO should be sought if such sites are encountered in the work areas.
- All drivers must obey the speed limits and be on the lookout for animals particularly in the vicinity of any sensitive areas, so that collisions with animals can be avoided.
- Monitoring of impacts on fauna must be included in environmental compliance monitoring.

8.7 What potential cumulative impacts can result from the proposed widening/capacity improvements to the N3?

A cumulative impact is an incremental impact on the environment that results from the impact of a proposed action when added to existing and reasonably foreseeable future actions. Cumulative effects can be both positive and negative. Also, the nature of cumulative impacts can be both temporary in nature (i.e. impacts that are restricted to the construction phase) and permanent (i.e. impacts that occur in both the construction and operation phases).

To enhance the positive impacts of the proposed widening/capacity improvements to the N3 and, thus, enhance positive cumulative effects, the project should be implemented efficiently according to best environmental practise and the infrastructure should be well maintained.

To minimise negative impacts of the proposed widening/capacity improvements to the N3 and, thus, its negative contributions towards cumulative effects on the environment, the project should be implemented with the recommended mitigation measures.

Potential cumulative impacts from the proposed widening/capacity improvements to the N3 on the environment, as related to the key identified issues and impacts, are described below. Where relevant and applicable, significance ratings are assigned to impacts, according to the assessment conventions (Table 14) in the relevant impact tables (Chapter 9).

8.7.1 Cumulative national, regional and local economic and social benefits arising from an improved transport corridor between the Port of Durban and Pietermaritzburg

This project, along with other planned upgrades to other sections of the N3 as well as to other linking roads and interchanges will cumulatively contribute to improved road and transportation conditions, which will allow for more efficient and better functioning of most aspects of day to day business and the provision of services which rely on transport. The project's contribution towards SIP2 goals along with other SIP2 projects will contribute to social and economic development and growth and allow for increased income generation opportunities. The cumulative contribution of the project to the local, regional and national economy in South Africa is considered to be of high (+) significance (see Table 15 in Chapter 9).

8.7.2 Cumulative health, safety, security and nuisance impacts during construction

All or most of the health, safety, security and nuisance impacts discussed in Section 8.3 have the potential to be compounded if other developments in proximity occur simultaneously in the area. Activities that place additional pressure on traffic flow could be particularly problematic. Possible cumulative impacts may include increased traffic congestion on alternate routes, damage to alternate routes as a result of increased traffic, and public dissatisfaction. These potential cumulative impacts are considered to be of high (-) significance without mitigation and of medium (-) significance with mitigation (see Table 17 in Chapter 9).

8.7.3 Cumulative impacts on the social and socio-economic environment during operation

The national road is generally a conduit for commerce. Increasingly, business premises are being constructed on properties close to national roads. As widening decreases the distance between the national road and adjacent residences, living on these properties will become less attractive due to the disturbance and noise from the road. However, better access and exposure to the public can be beneficial to commercial properties. Over time, road widening could, therefore, contribute cumulatively to a change of land use/zonation from residential to business, along sections adjacent to national roads. The significance of this impact would vary, depending on the precise locality, properties and individuals that it affects.

When the road is widened, the source of vehicle emissions (carbon dioxide and nitrous oxide) will encroach closer to residences than previously and will cumulatively contribute to other sources of air pollution. The significance of this impact would vary, as the concentrations/dilution of emissions and other air pollutants at different positions along the N3 will vary depending on time of day, traffic volumes, topography, prevailing winds, weather conditions and whatever other emissions are being released at the time. Areas where traffic flows more freely are likely to have less traffic emissions than previously congested areas. Serious concerns regarding persistent high levels of air pollution in a particular area should be reported to the relevant authority for further investigation and monitoring.

8.7.4 Cumulative impacts on natural habitat

Human development needs continually place pressure on land and result in increasing levels of vegetation removal for both domestic and commercial needs. Along with general development taking place, the proposed project will contribute cumulatively to the loss of good quality natural habitat and biodiversity in the study area and may accelerate degradation of adjacent areas through soil erosion, edge effects, spread of alien invasive plants, etc. The cumulative impact of the project on natural habitat is considered to be of medium (-) significance without mitigation and of low (-) significance with mitigation (see Table 20 in Chapter 9).

8.8 What are the impacts of the No Development Alternative (not implementing widening/capacity improvements to the N3)?

The No Development Alternative would imply that the proposed widening of the N3 sections of interest, and the upgrading of the associated interchanges, will not occur. This would avoid or, at least defer till a later date, the negative impacts of construction that have been described in this report. However, even with other potential interventions (such as rail) to reduce the future predicted traffic volumes, widening will still eventually be required, because these sections of road are reaching full capacity and cannot accommodate further growth in traffic. The failure to upgrade will, thus, lead to increasing congestion as traffic volumes increase over time. Interchanges will come under increasing pressure. Road safety risks will increase and there will likely be an increase in accidents. Commuter time will increase along with road user frustration. Heavy volumes of traffic will increase the need for maintenance. Without additional lanes, maintenance activities will exacerbate traffic congestion and associated negative impacts. The No Development Alternative will, thus, have widespread negative effects on the social and economic environment. The No Development Alternative is likely to have significant negative indirect impacts on the national, local and regional economy as freight haulers, commuters and businesses would have to move, alter their routes or otherwise adapt to a poorly functioning road network, more difficult access and increased safety risks. The No Development Alternative is not consistent with the strategic infrastructure planning of Government and will fail to assist in achieving SIP2 goals.

According to the assessment, the predicted impacts of the No Development Alternative are considered to be of high (-) significance without mitigation. Mitigation measures are not applicable in this case (see Table 21 in Chapter 9).

For the above reasons, the No Development Alternative is not recommended.

9 ASSESSMENT OF THE SIGNIFICANCE OF POTENTIAL IMPACTS

9.1 Assessment

This Chapter deals with the assessment of the significance of the potential impacts, both with and without management measures (mitigation). Impact tables, **where applicable** to the key issues discussed in this report, are provided in Tables 15-21.

Table 15	What economic and socio-economic benefits will result from the proposed widening/capacity improvements to the N3, at a local, regional and national scale?
Table 16	What effects will the proposed widening/capacity improvements to the N3 have on adjacent properties, infrastructure and services, and *vice versa*?
Table 17	What potential health, safety, security and other nuisance impacts may be experienced as a result of the proposed widening/capacity improvements to the N3 during construction?
Table 18	What negative impacts will the proposed widening/capacity improvements to the N3 have on the social environment during operation?
Table 19	What effects will the proposed widening/capacity improvements to the N3 have on cultural heritage resources?
Table 20	What effects will the proposed widening/capacity improvements to the N3 have on the biophysical environment (soils, riparian, wetland and terrestrial natural habitat, fauna) during construction, operation and rehabilitation?
Table 21	What are the impacts of the No Development Alternative (not implementing widening/capacity improvements to the N3)?

Table 15 Assessment of potential beneficial economic and socio-economic impacts resulting from the proposed widening/capacity improvements to the N3, at a local, regional and national scale, during planning, construction, operation and rehabilitation (with and without mitigation)

Description and Nature of Impact	**Mitigation**	**Nature** (Positive, Negative, Neutral)	**Spatial Extent** (Low, Medium, High)	**Duration** (Very Low, Low, Medium, High)	**Intensity** (Low, Medium, High)	**Irreplaceable Loss of Resources** (Low, Medium, High)	**Reversibility of Impacts**(Low, Medium, High)	**Consequence** (Low, Medium, High)	**Probability** (Low, Medium, High)	**Significance** (Low, Medium, High)
Employment creation	Unmitigated	Positive	High	Low	Low	N/A	Low	Low	High	Low
	Mitigated	Positive	High	Low	Medium	N/A	Low	Medium	High	Medium
Opportunities for local contractors and SMMEs	Unmitigated	Positive	Medium	Low	Low	N/A	Low	Low	Low	Low
	Mitigated	Positive	Medium	Low	Medium	N/A	Low	Medium	Medium	Medium
Opportunities for informal traders	Unmitigated	Positive	Medium	Low	Low	N/A	Low	Low	Low	Low
	Mitigated	Positive	Medium	Low	Low	N/A	Low	Low	Medium	Low
Improved transport network (improving road safety)	Unmitigated	Positive	High	Medium	Medium	N/A	Low	Medium	Medium	Medium
	Mitigated	Positive	High	High	High	N/A	Low	High	High	High
Reduced travel time	Unmitigated	Positive	High	Medium	Medium	N/A	Low	Medium	Medium	Medium
	Mitigated	Positive	High	High	High	N/A	Low	High	High	High
Stimulation of the local, regional and national economy	Unmitigated	Positive	High	Medium	Medium	N/A	Low	Medium	High	Medium
	Mitigated	Positive	High	High	High	N/A	Low	High	High	High
Cumulative benefits to the country's economy	Unmitigated	Positive	High	Medium	Medium	N/A	Low	Medium	High	Medium
	Mitigated	Positive	High	High	High	N/A	Low	High	High	High

Table 16 Assessment of potential impacts of the proposed widening/capacity improvements to the N3 on adjacent properties, infrastructure and services, and *vice versa*, during planning, construction, operation and rehabilitation (with and without mitigation)

Description and Nature of Impact	**Mitigation**	**Nature** (Positive, Negative, Neutral)	**Spatial Extent** (Low, Medium, High)	**Duration** (Very Low, Low, Medium, High)	**Intensity** (Low, Medium, High)	**Irreplaceable Loss of Resources** (Low, Medium, High)	**Reversibility of Impacts**(Low, Medium, High)	**Consequence** (Low, Medium, High)	**Probability** (Low, Medium, High)	**Significance** (Low, Medium, High)
Unintended damages to private property	Unmitigated	Negative	Medium	Low	Medium	N/A	High	Medium	Medium	Medium
	Mitigated	Negative	Medium	Low	Low	N/A	High	Low	Low	Low
Resettlement/relocation of formal households and/or loss of privately owned land	Unmitigated	Negative	Low	High	High	N/A	Low	High	High	High
	Mitigated	Negative	Low	High	Low	N/A	Low	Low	Low	Low
Increased interaction with landowners and entry onto private properties by investigative teams (e.g. geotechnical)	Unmitigated	Neutral	Low	Low	Medium	N/A	High	Low	High	Low
	Mitigated	Neutral	Low	Low	Low	N/A	High	Low	High	Low
Damage to/disruption of services and infrastructure in and adjacent to the road reserve	Unmitigated	Negative	Low	Low	Medium	N/A	High	Low	Medium	Low
	Mitigated	Negative	Low	Very Low	Low-Medium	N/A	High	Low	Low	Low
Increased repairs and maintenance to adjoining affected roads	Unmitigated	Negative	Low	Low	Low	N/A	Medium	Low	Medium	Low
	Mitigated	Negative	Low	Medium	Low	N/A	Medium	Low	High	Low

Table 17 Assessment of potential health, safety, security and nuisance impacts resulting during construction of the proposed widening/capacity improvements to the N3 (with and without mitigation)

Description and Nature of Impact	**Mitigation**	**Nature** (Positive, Negative, Neutral)	**Spatial Extent** (Low, Medium, High)	**Duration** (Very Low, Low, Medium, High)	**Intensity** (Low, Medium, High)	**Irreplaceable Loss of Resources** (Low, Medium, High)	**Reversibility of Impacts**(Low, Medium, High)	**Consequence** (Low, Medium, High)	**Probability** (Low, Medium, High)	**Significance** (Low, Medium, High)
Increased spread of disease	Unmitigated	Negative	High	Low	Medium	N/A	Low	Medium	High	Medium
	Mitigated	Negative	High	Low	Low	N/A	Low	Low	Medium	Low
Increased likelihood of road traffic accidents	Unmitigated	Negative	Medium	Low	Medium	N/A	High	Medium	High	Medium
	Mitigated	Negative	Low	Low	Low	N/A	High	Low	Medium	Low
Increased noise (during construction)	Unmitigated	Negative	Medium	Low	Medium	N/A	Low	Medium	High	Medium
	Mitigated	Negative	Low	Low	Medium-Low	N/A	Low	Low	High	Medium
Aesthetic impacts	Unmitigated	Negative	Low	Low	Low	N/A	Low	Low	High	Low
	Mitigated	Negative	Low	Low	Low	N/A	Low	Low	Low	Low
Increased dust	Unmitigated	Negative	Medium	Low	Medium	N/A	Medium	Medium	High	Medium
	Mitigated	Negative	Low	Low	Low	N/A	High	Low	Medium	Low
Increased crime	Unmitigated	Negative	Medium	Low	Medium	N/A	High	Medium	Medium	Medium
	Mitigated	Negative	Medium	Low	Low	N/A	High	Low	Low	Low
Protest action	Unmitigated	Negative	Medium	Low	High	N/A	Low	Medium	High	Medium
	Mitigated	Negative	Medium	Low	Low	N/A	Low	Low	Medium	Low
Cumulative health, safety, security and nuisance impacts	Unmitigated	Negative	Medium	Low	High	Low	Medium	High	High	High
	Mitigated	Negative	Medium	Low	Medium	Low	High	Medium	High	Medium

Table 18 Assessment of potential negative impacts of the proposed widening/capacity improvements to the N3 on the social and socio-economic environment during operation (with and without mitigation)

Description and Nature of Impact	**Mitigation**	**Nature** (Positive, Negative, Neutral)	**Spatial Extent** (Low, Medium, High)	**Duration** (Very Low, Low, Medium, High)	**Intensity** (Low, Medium, High)	**Irreplaceable Loss of Resources** (Low, Medium, High)	**Reversibility of Impacts**(Low, Medium, High)	**Consequence** (Low, Medium, High)	**Probability**(Low, Medium, High)	**Significance** (Low, Medium, High)
Increased noise where the distance from the road to receptors is reduced	Unmitigated	Negative	Medium	High	High	N/A	Low	High	High	High
	Mitigated	Negative	Low	High	Medium	N/A	Low	Low	High	Medium
Safety risks to nearby properties and occupants during operation of the widened road	Unmitigated	Negative	Low	High	Medium	N/A	Medium	Medium	Medium	Medium
	Mitigated	Negative	Low	High	Low	N/A	Medium	Low	Low	Low
Increased vibrations from heavy vehicles as a result of passing closer to buildings and residences	Unmitigated	Negative	Low	High	Medium	N/A	Low	Medium	High	Medium
	Mitigated	Negative	Low	High	Low	N/A	Medium	Low	Medium	Low
Damage to adjacent properties due to poorly designed stormwater drainage	Unmitigated	Negative	Low	Medium	Medium	N/A	Medium	Medium	Low	Medium
	Mitigated	Negative	Low	Low	Low	N/A	High	Low	Low	Low

Table 19 Assessment of potential impacts of the widening/capacity improvements to the N3 on cultural heritage resources during construction, operation and rehabilitation (with and without mitigation)

Description and Nature of Impact	**Mitigation**	**Nature** (Positive, Negative, Neutral)	**Spatial Extent** (Low, Medium, High)	**Duration** (Very Low, Low, Medium, High)	**Intensity** (Low, Medium, High)	**Irreplaceable Loss of Resources** (Low, Medium, High)	**Reversibility of Impacts**(Low, Medium, High)	**Consequence** (Low, Medium, High)	**Probability** (Low, Medium, High)	**Significance** (Low, Medium, High)
Destruction of structures at Bellevue Farmstead	Unmitigated	Negative	Low	High	Medium-High	Medium-High	Low	Medium-High	Medium-High	Medium-High
	Mitigated	Neutral	Low	Low	Low	N/A	N/A	Low	Low	Low

Table 20 Assessment of potential impacts of the proposed widening/capacity improvements to the N3 on the biophysical environment (soils, riparian, wetland, terrestrial natural habitat and fauna) during construction, operation and rehabilitation (with and without mitigation)

Description and Nature of Impact	**Mitigation**	**Nature** (Positive, Negative, Neutral)	**Spatial Extent** (Low, Medium, High)	**Duration** (Very Low, Low, Medium, High)	**Intensity** (Low, Medium, High)	**Irreplaceable Loss of Resources** (Low, Medium, High)	**Reversibility of Impacts** (Low, Medium, High)	**Consequence** (Low, Medium, High)	**Probability** (Low, Medium, High)	**Significance** (Low, Medium, High)
Loss of topsoil	Unmitigated	Negative	Medium	High	High	Medium	Low	High	High	High
	Mitigated	Negative	Low	Low	Low	Medium	Low	Low	Low	Low
Destabilisation of banks, erosion, sedimentation	Unmitigated	Negative	Medium	Low	Medium	Low	Medium	Medium	High	Medium
	Mitigated	Negative	Low	Low	Low	Low	High	Low	Low	Low
Loss/ degradation of disturbed grassland/ thicket mosaic	Unmitigated	Negative	Medium	High	Medium	Low	Medium	Medium	High	Medium
	Mitigated	Negative	Low	High	Low	Low	High	Low	High	Low
Loss/ degradation of riparian thicket at Mpushini River	Unmitigated	Negative	Low	High	Low	Low	High	Low	High	Low
	Mitigated	Negative	Low	High	Low	Low	High	Low	High	Low
Aloe Pruinosa and Xeric Cliff Community	Unmitigated	Negative	Low	High	High	High	Medium	Medium	High	Medium
	Mitigated	Negative	Low	High	Low	Low	High	Low	High	Low
Loss/ degradation of Bushveld/ thornveld and grassland mosaic	Unmitigated	Negative	Medium	High	Medium	Medium	Medium	Medium	High	Medium
	Mitigated	Negative	Low	High	Low	Low	High	Low	High	Low

Description and Nature of Impact	**Mitigation**	**Nature** (Positive, Negative, Neutral)	**Spatial Extent** (Low, Medium, High)	**Duration** (Very Low, Low, Medium, High)	**Intensity** (Low, Medium, High)	**Irreplaceable Loss of Resources** (Low, Medium, High)	**Reversibility of Impacts** (Low, Medium, High)	**Consequence** (Low, Medium, High)	**Probability** (Low, Medium, High)	**Significance** (Low, Medium, High)
Loss/ degradation of riparian and wetland areas	Unmitigated	Negative	Medium	High	Medium	Low	Medium	Medium	High	Medium
	Mitigated	Negative	Low	High	Low	Low	High	Low	High	Low
Faunal mortalities and negative effect on local faunal populations due to disturbance, loss of habitat and poaching	Unmitigated	Negative	Medium	Medium	Medium	Low	Medium	Medium	High	Medium
	Mitigated	Negative	Medium	Medium	Low	Low	High	Medium	Medium -Low	Low
Cumulative impacts on natural habitat	Unmitigated	Negative	Medium	High	Medium	Medium	Medium	Medium	High	Medium
	Mitigated	Negative	Medium-Low	High	Low	Low	High	Low	High	Low

Table 21 Assessment of potential impacts of the No Development Alternative

Description and Nature of Impact	**Mitigation**	**Nature** (Positive, Negative, Neutral)	**Spatial Extent** (Low, Medium, High)	**Duration** (Very Low, Low, Medium, High)	**Intensity** (Low, Medium, High)	**Irreplaceable Loss of Resources** (Low, Medium, High)	**Reversibility of Impacts**(Low, Medium, High)	**Consequence** (Low, Medium, High)	**Probability** (Low, Medium, High)	**Significance** (Low, Medium, High)
Deferment/avoidance of the negative impacts of construction (social disruption, noise and nuisance, and destruction/disturbance of natural habitat)	Unmitigated	Positive	High	N/A	N/A	N/A	N/A	N/A	High	Low-Medium
	Mitigated	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Increased traffic congestion and increased commuter time	Unmitigated	Negative	Medium	High	High	High	Low	High	High	High
	Mitigated	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Decreased road safety	Unmitigated	Negative	Medium	High	High	High	Low	High	High	High
	Mitigated	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Disadvantages to the local, regional and national economy	Unmitigated	Negative	High	High	High	High	Low	Medium	High	High
	Mitigated	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

10 ENVIRONMENTAL IMPACT STATEMENT

Taking the assessment of potential impacts into account, a summary of the environmental impacts of the proposed activity (after mitigation) is provided below.

Effects of the project on the social environment and *vice versa*
This project is located primarily within the Msunduzi LM, however, there is a small section (approximately 2.5 km) where the N3 forms the boundary between the Msunduzi LM and the Mkhambathini LM. The nature of the surrounding area varies from agricultural land to residential areas in the vicinity of the Ashburton I/C and Gladys Manzi Road. The project constitutes major roadworks (including widening of bridges) to be implemented on a national road carrying high volumes of traffic including heavy vehicles. As such, during the construction period (approximately 36 to 42 months) there will be numerous negative impacts on the social environment, which will be experienced by both road users and adjacent property owners/occupiers on the affected sections. These will largely be nuisance impacts related to the disruption of traffic flows, road access, increased noise, increased crime risks and general construction related disturbances. The road restrictions will pose higher road safety risks to motorists, pedestrians and construction workers. Equally, the high traffic volumes and space constraints will make it more difficult for the project team to execute construction efficiently.

Any existing services in the current road reserve will have to be realigned/relocated and related disruptions may ensue. While all these impacts will be temporary, it can be anticipated with a high level of certainty that thousands of road users and local residents will be affected on a daily basis at varying intensities over a period of a few years. While the majority of the road widening will be contained within the existing road reserve, expropriation of adjacent land will be required and, thus, some property owners will lose land and, in some cases, potentially entire properties. SANRAL has entered into property acquisition processes with affected property owners and fair compensation will be negotiated in line with legislated procedures. With efficient and proper project management and implementation by SANRAL, as well as the application of the mitigation measures recommended in this report (carried over into the EMPr), **the negative social impacts during construction, while onerous, will be of medium and low significance, with no negative social impacts of high significance.**

The positive impacts of the project on the social environment during operation will be of a medium and high significance. They can be predicted with a high level of certainty to benefit thousands of road users on a daily basis through improved road travelling conditions, including improved road safety and reduced travel times.

Negative impacts during operation such as increased traffic noise and potentially, increased exhaust emissions, are not a result of the project but rather a result of increasing traffic volumes over time, which will unavoidably affect any occupiers and users of properties adjacent to any national road. In the case of this project, the intensity of impacts will increase where the widened road brings the receivers into closer proximity to the traffic. With respect to emissions, the impacts will be variable, depending on the topography and micro-climate of the location. Indeed, some areas where previously there was congestion are likely to improve with respect to emissions, as free flowing traffic is likely to decrease the concentration of exhaust emissions. With respect to operational noise, it is clear that noise levels are already problematic within generally 300 m from the road and they are predicted eventually (over the next 30 years and in the absence of mitigation) to reach unacceptable levels according to predicted increases in traffic volumes. SANRAL, as the road authority, is tasked with ensuring that the roads can safely and efficiently accommodate traffic growth to facilitate economic development and to do this, has to widen the road. SANRAL has taken into consideration low noise surfacing in the road design and is in the process of appointing an acoustic specialist to investigate further

possible, economically feasible noise control measures over time. Control of the growth of traffic volumes is a broader issue that requires high level interventions such as improved public transport and migration of freight from road to rail. These issues are being addressed but will take time. Ultimately, there must also be an adaptation to prevailing conditions i.e. a change of land use/receptors adjacent to national roads, towards those which are less sensitive to noise. **With mitigation, the negative impacts on the social environment associated with operation of the widened national roads are anticipated to be of a low and medium significance.**

Effect of the project on the economic/socio-economic environment

During the construction period, it is definite that some **positive economic/socio-economic impacts of low significance will accrue to the local and regional community** due to the provision of temporary jobs for semi-skilled and unskilled workers, the increased opportunities for local contractors and SMMEs, and a general increase in spending on a wide range of goods and services in Durban, Pietermaritzburg and KZN. There is also likely to be spending nationally on specialist materials/equipment. The estimated cost for the N3 upgrades between Durban and Pietermartizburg, including interchanges, is R235 million per km (2018 rand, Vat exclusive) i.e. an estimated cost of R17,64 billion over 75km. The interchange upgrades contribute a substantial portion of the N3 upgrading, including the N2/N3 EB Cloete Interchange. The latest Preferential Procurement Policy Framework Act (Act 5 of 2000) (PPPFA) regulations makes it mandatory that thirty percent of the contract value is subcontracting to specific target groups which includes Emerging Micro Enterprises and Qualifying Small Enterprises.

There will also be negative economic/socio-economic impacts during construction. Economic losses are likely to be incurred indirectly due to poorer access, poorer road and travelling conditions, an increased likelihood of road traffic accidents, possible damage to infrastructure and services, expropriation of properties, resettlement processes, etc. **With mitigation, the negative economic/socio-economic impacts of the project during construction are anticipated to be of low and medium significance.**

Economic impacts during operation will be positive. The project has SIP2 status (and as such, national priority). The primary motivation for implementing this project is to stimulate economic growth through improved transport infrastructure and an improved logistics/transport corridor between Durban and Gauteng. In conjunction with a number of other short-, medium- and long-term strategic Government plans and interventions it is, thus, designed to positively impact on the economy of the country. Positive economic benefits will be incurred locally, regionally, provincially and nationally as a result of the improved transport infrastructure. **With good project management and execution, the positive impacts of this particular project on the economy will be of high significance. The project will also contribute cumulatively with other SIP projects to significantly benefit the country's economy.**

Effects of the project on cultural heritage resources and *vice versa*

Based on the findings of the cultural heritage assessment, impacts on cultural heritage resources during construction of this section of the N3 upgrades is considered to be of low significance. Only one known cultural heritage resource, namely Bellevue Farmstead, could potentially be impacted by the proposed upgrades. However, to avoid this, the design engineers have modified their designs and care will be taken during construction to avoid damage to the structures (which are already in a state of disrepair). **With mitigation, it is anticipated that the potential impacts on cultural heritage resources will be of low significance.**

Effects of the project on the biophysical environment and *vice versa*

While construction will inevitably impact negatively on natural habitat, it should be noted that this project is an upgrade of an existing road and is located primarily within the existing road reserve. The works will, thus, largely affect previously disturbed habitat. There are, however, some expanded interchanges and areas adjacent to the existing N3 which will affect terrestrial and riparian areas outside of SANRAL's road reserve. Road widening will entail lengthening of existing drainage structures and existing culverts at stream crossings. Vegetation potentially affected by the road upgrade includes 30 ha of disturbed grassland/thick mosaic; 15 ha of bushveld/thornveld/grassland mosaic; 12 ha of secondary grassland (largely in islands at the Ashburton Interchange in particular); 0.5 ha of xeric cliff vegetation (also at the Ashburton Interchange), a stand of *Spirostachys africana* at the Lynnfield Interchange and riparian vegetation at the Mpushini River crossing. Direct impacts to vegetation will result in the loss of mainly common and widespread plant species, but also at least one Red Data species (i.e. *Aloe pruinosa*). The impact on natural vegetation that can be expected from upgrading the N3 between Lynnfield Park and Ashburton is not likely to require any offsetting on the basis that the impacts can be adequately mitigated as specified in the EMPr, which includes plant rescue and relocation. Even though the majority of the aquatic systems in this section are in a fair condition they are already modified. Given that the risks to the systems are low, the construction phase impacts of the N3 upgrade can largely be controlled and mitigated, and rehabilitation plan is possible. Once rehabilitation post construction is complete, the impacts during operation of the road will not be significant. The protection measures implemented to minimise impacts on natural habitat, along with other specifications in the EMPr, will serve to minimise impacts on fauna and flora. **With mitigation, the negative impacts of construction and operation on the biophysical environment (soils and substrates, terrestrial and riparian habitat, as well as associated fauna) will be of low significance.**

Effects of the No Development Alternative

While the No Development Alternative would defer the negative impacts of construction on the social and biophysical environment, as described above, this would be of short term benefit only. In the longer term, the No Development Alternative will result in increasingly congested, unsafe and inefficient national road infrastructure. The negative consequences of not widening and upgrading the national roads, will be severe and will have far reaching impacts on all South Africans and be contrary to the strategic plans of the South African Government. **The negative impacts of the No Development Alternative have been assessed as being of high significance. For these reasons, this alternative is not recommended.**

11 RECOMMENDATION OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

It is the opinion of the EAP that the information contained in this report and the documentation attached hereto is sufficient to make a decision in respect of the activity applied for, viz the proposed capacity upgrades to the **N3 from Lynnfield Park to Gladys Manzi Road.**

It is the opinion of the EAP that the proposed activity can be authorised, based on the findings of the assessment process and conditional on the following:

- Compliance with the SANRAL EMP and site specific EMPr.
- Financial provision must be made for environmental management of the contract in accordance with the specifications of the Environmental Management Programme and associated subsidiary plans. This includes provision for:
  - Alien plant control additional to SANRAL's standard provisions.
  - Plant rescue and site-specific rehabilitation of specified sensitive areas (as per the rehabilitation plan).
  - Public liaison to ensure timeous notification to the public and affected landowners, and particularly regarding requirements in the Noise Management Plan.
  - Noise mitigation. SANRAL must engage acoustic engineering specialists to better understand noise abatement measures. Should such measures prove beneficial and provided they are affordable, specific noise hot spots in urban areas along this section of the N3 should be mitigated during the projected lifespan of the upgraded road.
- SANRAL is to compile a detailed plan for the re-use and/or disposal of demolition rubble and excess inert material, and the relevant specifications are to be included in the contract documents.
- The Bellevue Farmstead structures must be safely barricaded and monitored during construction.
- Crime is rife and the costs of crime to the victims and to the municipality and province are far reaching. During construction, the integrity of boundary fences of adjacent properties is to be maintained and/or other contingency measures put in place to ensure that security is not compromised due to construction activities. This must be priced by contractors as part of their tenders.
- SANRAL is to ensure that close liaison is maintained with the provincial and municipal Road Transport Authorities to ensure that the relevant authorities and public are kept informed of road closures and deviations that affect provincial and municipal roads.

12 CONCLUDING REMARKS

This draft BAR has been submitted to the competent authority, DEA, along with an application for environmental authorisation. This BAR has been made available for public review and will be finalised after consideration of comments submitted. Thereafter, the final report will be submitted to DEA. Registered I&APs will be kept informed of all further submissions and DEA's decision making with respect to the issuing of an Environmental Authorisation, as well as the appeal procedure which should be followed should a member of the public or the applicant wish to appeal the EA.

MA McKenzie

NAME OF EAP:

SIGNATURE OF EAP

10 October 2018

DATE

13 REFERENCES

(note most references cited in this BAR are from the specialist reports in Appendix D)

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Websites referenced (where not cited directly in text)

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APPENDIX A: FACILITY ILLUSTRATIONS

- A1 N3 BA5 Lynnfield to Murray Rd
- A2 N3 BA5 Lynnfield IC schematic
- A3 N3 BA5 Lynnfield farm access
- A4 N3 BA5 Mpushini access proposed
- A5 N3 BA5 Ashburton IC schematic

APPENDIX B: SITE PHOTOGRAPHS

- B1 N3 BA5 Photo Report

APPENDIX C: ZONATION, PROPERTIES AND ENVIRONMENTAL SENSITIVITY MAPS

- C1a BAs 3-6 Land Use and Zonation Map Legend
- C1b BAs 3-6 Land Use and Zonation Map
- C2 BAs 3-6 Properties within 50 m of Site
- C3 BAs 3-6 General Environmental Sensitivities.

APPENDIX D: SPECIALIST STUDIES

- D1 BA5 Social Impact Assessment
- D1a BA5 Specialist Declaration (Social)
- D1b CV Social Specialist
- D2 BA5 Heritage Impact Assessment Phase 1
- D2a BA5 Specialist Declaration (Heritage)
- D2b CV Heritage Specialist
- D3 BA5 Riparian & Wetland Assessment.
- D3a BA5 Riparian & Wetland Assessment Appendix D
- D3b BA5 Specialist Declaration (Riparian & Wetland)
- D3c BA5 CV Riparian & Wetland Specialist
- D4 BA5 Vegetation Assessment.
- D4 BA5 Specialist Declaration (Vegetation)
- D4b CV Vegetation Specialist
- D5 BA5 Noise Assessment Report
- D5 BA5 Noise Assessment Report Appendix 4
- D5 BA5 Noise Assessment Report Appendix 5
- D5 BA5 Noise Assessment Report Appendix 6
- D5a BA5 Specialist Declaration (Noise)
- D5b CV Noise Specialist
- D6 Specialist Terms of Reference for Report Updates.

APPENDIX E: PUBLIC PARTICIPATION DOCUMENTATION & CORRESPONDENCE

- E1 Adverts, BID & Notices.
  - E1 BA3-6 Site Notices Placed.
  - E1a BA3-6 Advert Citizen (09.05.18).
  - E1b BA3-6 Advert Maritzburg Fever (09.05.18).
  - E1c BA3-6 Advert Ilanga (10.05.18).
  - E1d BA3-6 Advert Witness (11.05.18).
  - E1e BA3-6 Advert Intshonalanga Eyethu (11.05.18).
  - E1f BA3-6 Infrastructure News N3 Corridors Mega Makeover (29 03 18)
  - E1g L2B News- N3 Corridor Upgrades (15 06 18)
  - E1h BA3-6 Background Information Document.
  - E1i BA3-6 Cover Letter Announce with BID
  - E1j BA3-6 Comment Sheet sent with BID

- E2 List of Registered I&APs.
  - E2a BA3-6 Database (Company).
  - E2a BA3-6 Database (Surname).
  - E2c BA5 Owners of Property to be acquired.

- E3 Comments and Responses Report.
  - E3a N3 BA3-6 CRR Project Announce 27 09 18

- E4 Proof of Key Stakeholder Notification.
  - E4a BA3-6 Proof of Postage, Cover Letter and BID (11.05.18).
  - E4b BA3-6 Proof of Sent Emails, Cover Letter and BID (11.05.18).
  - E4c BA3-6 Proof of Bulk SMS Log for N3 POD (24 05 18)

- E5 Proof of Written Notification to Authorities.
  - E5a BA3-6 Proof of Postage, Cover Letter and BID (11.05.18).
  - E5b BA3-6 Proof of Sent Emails, Cover Letter and BID (11.05.18).

- E6 Stakeholder Correspondence & Meetings.
  - E6a BA3-6 Msunduzi Environmental Dept Meeting notes (30 05 18)
  - E6b BA1-6 Mins Meeting Ethekwini Env Planning 12.03.15(Rev 0)
  - E6b BA3-6 meeting G Mullins ECPPD 06 06 18
  - E6c BA1-6 Agenda Co-ordn meeting with DWS (25 07 18).
  - E6c BA1-6 Minutes Co-ordn meeting with DWS (25 07 18).
  - E6d BA3-6 Public Open Day Cato Ridge Club 28 05 18 att reg
  - E6e BA3-6 Public Open Day Vine Lynnfield Park 20 05 18 att reg
  - E6f Ba3-6 Public Open Day PMB Golf Club 30 05 18 att reg
  - E6g (23.05.18) K.Van Heerden KZNDEDTEA Comment
  - E6h (14.05.18) AMAFA comment
  - E6i (3.07.18) Ezemvelo KZN Wildlife formal Comment
  - E6j (12.07.18) eThekwini Co-ordinated Comment
  - E6k (23.07.18) Msunduzi EMU (Cato Ridge to Lynnfield Park)
  - E6l (23.07.18) Msunduzi EMU (Lynnfield Park to Gladys Manzi)
  - E6m (23.07.18) Msunduzi EMU (New England to Twickenham)
  - E6n (06.08.18) Sandile Dladla (eThekwini Fire)
  - E6o (30.08.18) KZN DoT Comment
  - E6p (17.08.18) K Moodley DAFF

- E7 I&AP Correspondence

APPENDIX F: ENVIRONMENTAL MANAGEMENT PROGRAMME (DRAFT)

- ❑ BAs 1-6 SANRAL Overarching EMP (Construction)
- ❑ BA5 Site Specific Environmental Management Programme (Construction)
- ❑ Appendices to Site Specific Environmental Management Programme (Construction)
  - BA5 Appendix A: Sensitive Vegetation Rehabilitation Plan
  - BA5 Appendix B: Wetland and Riparian Areas Rehabilitation Plan
  - BAs 3-6 Appendix C: Erosion and Soil Management Plan
  - BAs 3-6 Appendix D: Storm Water Management Plan
  - BAs 1-6 Appendix E: Noise Management Plan
  - BAs 1-6 Appendix F: Traffic Management Plan

APPENDIX G: DETAILS AND CV OF EAP

- ❑ G : N3 BA5 EAP Declaration of Interest
- ❑ G1: N3 BAs 1-6 Details of EAPs
- ❑ G2: N3 BAs 1-6 CV A McKenzie
- ❑ G3: N3 BAs 1-6 CV V King
- ❑ G4: N3 BAs 1-6 CV RD Heinsohn
- ❑ G5: N3 BAs 1-6 CV M Straeuli

APPENDIX H DEA CORRESPONDENCE & MEETINGS

- H1 Pre-Application
  - H1a BA3-6 DEA Pre-Application Meeting 23 04 18 notes
  - H1b BA3-6 DEA Pre-Application Meeting 23 04 18 attendance register
- H2 Application
  - H2a BA5 Application DEA (Rev 1) 05 10 18