Draft Basic Assessment Report

PROPOSED DEVELOPMENT OF NATURE ESTATE FOR RESIDENTIAL PURPOSES ADJACENT TO KOMATIPOORT TOWN IN MPUMALANGA PROVINCE

January 2021

Prepared by:

NuLeaf PLANNING & ENVIRONMENTAL

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Foreword

This report constitutes the Draft Basic Assessment Report, and has been circulated digitally for Stakeholder Comment on 28 January 2021.

NuLeaf Planning and Environmental would like to thank all Stakeholders for their participation and input into this process to date, and hereby invite Stakeholders to review this draft report and to provide feedback, input, concerns and comments.

All written comments received, including NuLeaf's response to each, will be captured in a Comments and Responses Register, which will be made available to all I&AP's and included in the Final Basic Assessment Report for submission to the Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs (DARDLEA).

All comments on the Draft BAR must be in writing and must reach NuLeaf by no later than close of business on 1 March 2021.

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Acronyms and abbreviations

BA:	Basic Assessment
BAR:	Basic Assessment Report
CBA:	Critical Biodiversity Area
CMP:	Construction Management Plan
DARDLEA:	Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs
DWS:	South African National Department of Water and Sanitation
EA:	Environmental Authorisation
ECO:	Environmental Control Officer
EIA:	Environmental Impact Assessment
EMPr:	Environmental Management Programme
EMS:	Environmental Management System
EO:	Environmental Officer
I&AP:	Interested and Affected Party
IDP:	Integrated Development Plan
IEM:	Integrated Environmental Management
KNP	Kruger National Park
LED:	Local Economic Development
MTPA:	Mpumalanga Tourism and Parks Agency
NEMA:	National Environmental Management Act, Act No. 107 of 1998
NEMPAA:	National Environmental Management: Protected Areas Act, Act No. 57 of 2003
NPAES:	National Protected Area Expansion strategy
OMP:	Operational Management Plan
SAHRA:	South African Heritage Resources Agency

GLOSSARY OF TERMS

Alien Vegetation:	Alien vegetation defined as undesirable plant growth which shall include, but not be limited to all declared category 1 and 2 listed invader species as set out in the Conservation of Agricultural Resources Act (CARA) regulations.
Alien Species:	A plant or animal species introduced from elsewhere: neither endemic nor indigenous.
Alternatives:	In relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to: (a)The property on which or location where it is proposed to undertake the activity; (b) The type of activity to be undertaken; (c) The design or layout of activity; (d) The technology to be used in the activity; and (e) The operational aspects of the activity.
Applicant:	Any person who applies for an authorization to undertake an activity or to cause such activity to be undertaken as contemplated in the National Environmental Management Act (Act No. 107 of 1998), as amended and the Environmental Impact Assessment Regulations, 2010.
Buffer zone:	Is a collar of land that filters out inappropriate influences from surrounding activities, also known as edge effects, including the effects of invasive plant and animal species, physical damage and soil compaction caused by trampling and harvesting, abiotic habitat alterations and pollution. Buffer zones can also provide more landscape needed for ecological processes, such as fire.
Construction Activity:	Any action taken by the Contractor, his subcontractors, suppliers or personnel during the construction process.
Ecology:	The study of the inter relationships between organisms and their environments.
Environment:	All physical, chemical and biological factors and conditions that influence an object and/or organism.
Environmental Impact:	An Impact or Environmental Impact is the degree of change to the environment, whether desirable or undesirable, that will result from the effect of a defined activity. An Impact may be the direct or indirect consequence of the activity and may be simple or cumulative in nature.
Environmental Impact Assessment:	Assessment of the effects of a development on the environment.
Environmental Management Programme:	A legally binding working document, which stipulates environmental and socio-economic mitigation measures that, must be implemented by several responsible parties throughout the duration of the proposed project.

Indigenous:	Means a species that occurs, or has historically occurred, naturally in a free state within the borders of South Africa. Species that have been introduced to South Africa as a result of human activity are excluded (South Africa (Republic) National Environmental Management: Biodiversity Act, 2004: Chapter 1).
Interested and Affected Party:	Any person, group of persons or organization interested in or affected by an activity contemplated in an application, or any organ of state that may have jurisdiction over any aspect of the activity.
Invasive vegetation:	Plant species that show the potential to occupy in unnatural numbers, any disturbed area, including pioneer species.
Mitigate:	The implementation of practical measures to reduce adverse impacts Public Participation Process: is a process in which potential interested and affected parties are given an opportunity to comment on, or raise issues relevant to, specific matters.
Public Participation:	The legislated process contemplated in terms GN R543, in which all potential interested and affected parties are informed of the proposed project and afforded the opportunity to input, comment and object. Specific requirements are listed in terms of advertising and making draft reports available for comment.
Road Reserve:	The road reserve is a corridor of land, defined by co-ordinates and proclamation, within which the road, including access intersections or interchanges, is situated. A road reserve may, or may not, be bounded by a fence.
Road Width:	The area within the Road Reserve including all areas beyond the Road Reserve that are affected by the continuous presence of the road i.e. the verge.
Red data plant species:	Are fauna and flora species that require environmental protection based on the World Conservation Union (IUCN) categories and criteria.
RoD:	Record of Decision pertaining to the Application for Environmental Authorisation issued by the Competent Authority. The RoD is legally binding on the Applicant and may contain a positive or negative decision on the Application as well as conditions and provisions for each.
Soil Compaction:	Mechanically increasing the density of the soil, vehicle passage or any other type of loading. Wet soils compact easier than moist or dry soils.
Species:	Means a kind of animal, plant or other organism that does not normally interbreed with individuals of another kind. The term “species” include any sub-species, cultivar, variety, geographic race, strain, hybrid or geographically separate population (South Africa [Republic] National Environmental Management: Biodiversity Act, 2004: Chapter 1).
The Contractor:	The contractor, as the developers agent on site, is bound by the ROD and EMP conditions through his/her contract with the developer, and is responsible for ensuring that conditions of the EMP and ROD are strictly adhered to at all times. The contractor must comply with all orders

	(whether verbal or written) given by the ECO, project manager or site agent in terms of the EMPr.
The Developer:	Remains ultimately responsible for ensuring that the development is implemented according to the requirements of the EMP and the conditions of the Environmental Decision throughout all phases of the project.
The Environmental Control Officer (ECO):	The ECO is appointed by the developer as an independent monitor of the implementation of the EMP i.e. independent of the developer and contractor.
The Environmental Officer (EO):	The Contractor shall submit to the Site Agent a nominated representative of the Contractor as an EO to assist with day to day monitoring of the construction activities for the contract.
Vegetation:	Is a collective word for plants occurring in an area.
Vulnerable:	A taxon is 'Vulnerable' when it is not 'Critically Endangered' or 'Endangered' but is facing a high risk of extinction in the wild in the medium term future.
Watercourse:	A river or spring; a natural channel in which water flows regularly or intermittently; a wetland, lake or dam into which, or from which, water flows; and any collection of water which the Minister may by notice in the Government Gazette, declare to be a watercourse, and a reference to a watercourse includes, where relevant, its bed and banks" (South Africa [Republic] National Water Act, 1998).

Executive Summary

The proposed development entails the creation of a Nature Estate for residential purposes and has been zoned as such in the Spatial Development Framework. The development will entail the construction of 54 river front erven and 39 bush erven. A new road is also proposed to provide access to the site via Rietbok Street. All associated civil infrastructure (water, electricity and waste treatment) will be included.

The entire study area is situated within the Ecological Support Areas (ESA): Protected Area Buffers unit. ESA's are "areas that are not essential for meeting (conservation) targets, but play an important role in supporting the functioning of CBA's and that deliver important ecosystem services" (Lötter et al., 2014). Protected Area Buffers are areas that surround proclaimed protected areas that moderate the negative impacts of land-uses that may affect the ecological functioning of those protected areas. The recommended land-use guidelines for these areas are to maintain in a functional, near-natural state but allowing for some habitat loss.

Most of the study area is also situated within an ESA: Local Corridor.

According to the MBSP freshwater assessment, the study area falls within an ESA Important Sub-catchment as it is a Fish Support Area (FSA), as per NFEPA. This particular FSA supports the Tiger Fish (*Hydrocynus vittatus*), a fish species of conservation concern.

Three SCC were recorded from the study area, namely the succulent *Aloe komatiensis* which is classified as VU and the trees *Elaeodendron transvaalense* and *Dalbergia melanoxylon* which are classified as NT.
Six species found are protected under the NFA, namely the trees *Sclerocarya birrea, Boscia albitrunca, Combretum imberbe, Afzelia quanzensis, Philenoptera violacea* and *Elaeodendron transvaalense*. Nine confirmed species are protected under the MNCA, namely the succulents *Aloe chabaudii, A. marlothii, A. spicata, A. komatiensis, Eulophia petersii, Stapelia gigantea* and *Pachypodium saundersiae* and the trees *Spirostachys africana* and *Berchemia zeyheri.*

No archaeological (Stone Age and Iron Age) or historical settlements, structures, features, assemblages or artefacts were recorded on the site.

The proposed development site is acceptable for development and is not fatally flawed in any way. The construction impacts, if effectively managed according to the mitigation measures proposed in this report, specialist reports and the draft environmental management programme (EMPr), will mostly be of low significance, post mitigation. Similarly, operational impacts can also be mitigated and will result in low post mitigation significance ratings.

It is recommended that the proposed development of a nature estate for residential purposes be supported on the condition that all mitigation measures mentioned in this report, the specialist reports and the draft EMPr are implemented and adhered to throughout the project lifecycle.

SECTION A: ACTIVITY INFORMATION

1. PROJECT DESCRIPTION

1.1. Development Components

The proposed development entails the creation of a Nature Estate for residential purposes and has been zoned as such in the Spatial Development Framework. The development will entail the construction of 54 river front erven and 39 bush erven sleeping a total of 930. A new road is also proposed to provide access to the site via Rietbok Street. All associated civil infrastructure (water, electricity and waste treatment) will be included.

The proposed development will consist of the following:

- 54 river front erven
    - approximately 30 x 80m in size
    - 10 beds
- 39 bush erven
    - approximately 50 x 50m/ 80 x 40m in size
    - 10 beds
- Reception
- 3x bird hides
- A new access road

Please note that the following infrastructure will be located within 32 m of a watercourse:

- 3 x Bird hides

The minimum allowable distance from the ephemeral systems are 15 m, from the wetlands 20 m, the riparian zone in along the eastern boundary 35 m and from the Crocodile River is 60m. All of the above mentioned infrastructure is located outside of the stipulated buffer zones with the exception of the 3 bird hides which are located within 32 m of the ephemeral systems (drainage lines) and valley bottom wetlands.

1.2. Detailed description of the listed activities associated with the project as applied for

Government Notice R327 Activity No.	**Describe the relevant Basic Assessment Activity in writing as per Listing Notice 1 (GN No. R327)**	**Describe the portion of the development as per the project description that relates to the applicable listed activity**
19 (i)	The infilling or depositing of any material more than 10 cubic meters into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic meters from a (i) watercourse	A new abstraction well and a raw water pump station will be constructed in the Crocodile River to pump raw water to the water treatment plant.
27	The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation.	The total cleared footprint of indigenous vegetation will be approximately 26 000 m^2 (2.6 Ha).
28 (i)	Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 where such development (i) will occur inside an urban area where total land to be developed is bigger than 5 Hectare.	The property is currently being utilized to breed Buffalo. The area to be developed is approximately 2.6 Ha.
Government Notice R325 Activity No:	**Describe the relevant Basic Assessment Activity in writing as per Listing Notice 3 (GN No. R325)**	**Describe the portion of the development as per the project description that relates to the applicable listed activity**
Government Notice R324 Activity No:	**Describe the relevant Scoping and EIA Activity in writing as per Listing Notice 2 (GN No. R324)**	**Describe the portion of the development as per the project description that relates to the applicable listed activity**
12 (f) (iii)	The clearance of an area of 300 square meters or more of indigenous vegetation in (f) Mpumalanga (iii) on land, where, at a time of the coming into effect of this Notice or	Approximately 26 000 square meters of indigenous vegetation will be cleared for the proposed development.

	thereafter such land was zoned open space, conservation or had an equivalent zoning or proclamation in terms of NEMPAA.	
Please note: Only those activities listed above shall be considered for authorisation. The onus is on the applicant to ensure that all applicable listed activities are included in the application. Environmental Authorisation must be obtained prior to commencement with each applicable listed activity. If a specific listed activity is not included in an Environmental Authorisation, an application for amendment or a new application for Environmental Authorisation will have to be submitted.		

2. FEASIBLE AND REASONABLE ALTERNATIVES

No alternatives are under consideration for the proposed development. Extensive planning and layout options were investigated prior to the submission of the application to ensure that the positioning of the units would not intrude on sensitive visual receptors and environmental sensitivities.

Only one site is under consideration for the proposed development of a nature estate for residential purposes. The preferred site is predominately a greenfields site with a farm residence in the far southern portion. There are also three (3) dams found throughout the site as well as a large network of tracks.

54 river front erven sleeping a total of 540 will be located along the eastern boundary of the property overlooking the Crocodile River and Kruger National Park beyond. The development envelope for the residential units will be 30 x 80 m in size with a maximum height of 7 meters whether they are single or double storey. The final placement of the units within the erven will be determined on site.

39 bush erven sleeping 390 will be located near the centre and western portion of the site. These residential units will be 50 x 50m / 80 x 40 m whereby the final placement of the units within the erven will be determined on site.

A reception area will be constructed in the southern tip of the proposed site.

Three (3) bird hides/viewpoints will be located throughout the property- one in the south western corner overlooking a small dam and two (2) along the eastern boundary, one overlooking the Crocodile River and the other by a small dam. These hides will be based on bird hides that are found within the Kruger National Park and will be no greater than 4x3 meters, be on elevated decks, lower than the tree line, made from natural materials and earth tones used so that the hides blend into the natural environment. Additionally, no spot lights will be used. Please refer to Appendix C for the 'look and feel' of the proposed hides.

The preferred layout respects the 1:100 flood line along the Crocodile River and other watercourse buffers. Three (3) bird hides are located within the 32m buffer of a watercourse on site.

Additionally a new access road to the property will be constructed. It is approximately 145m in length and veers off of the existing Rietbok Street in a northerly direction before joining with an existing road.

Advantages of this site and layout for the proposed development include the following:

- Majority of the site will remain natural and used as green space/ buffers
- The 1:100 year flood line is respected

Disadvantages of this site and layout for the proposed development include the following:

- 3 bird hides are located within the 32 m buffer
- 8 bush erven encroach into high biodiversity area buffer
- The new access road passes through vegetation and its buffer that has high biodiversity/conservation value

A sewage treatment plant will be constructed at a suitable position within the development site and all the sewage from the units within the development will be treated at this treatment plant. A sewage pump station or stations will be required to convey the sewage from the lowest positions to the plant.

The treated effluent will comply with the General Standards required by the DWS and will be discharged into the stream located within the development area. The treatment processes for the plant will include screening, anaerobic digestion, trickling filter, settler and chlorine contact tank.

Electricity supply will be via the Eskom lines on site which will be buried underground to reduce the visual impact on the surrounds and Kruger National Park.

Advantages of this technology for the proposed activity include the following:

- Existing service infrastructure is already in place

Disadvantages of this technology for the proposed activity include the following:

- Existing energy supply, which will be extended, is not renewable and sustainable green technology
- The long term cost of energy from Eskom is set to increase significantly in the future, meaning a long term escalation in operational energy costs

Coordinates of infrastructure:

	Latitude (S):			Longitude (E):	
• River front erven in north east	25º	24'	22.82"	31º	58'	7.66"
• River front erven east	25º	24'	36.92"	31º	57'	53.77"
• River front erven south east	25º	25'	3.59"	31º	57'	38.24"
• Bush erven south	25º	24'	50.54"	31º	57'	28.10"
• Bush erven in north west	25º	24'	26.37"	31º	57'	32.37"
• Bush erven west	25º	24'	38.53"	31º	57'	33.71"
• Bush erven top centre	25º	24'	23.21"	31º	57'	39.08"
• Bush erven centre	25º	24'	38.33"	31º	57'	39.30"
• Reception	25º	25'	16.31"	31º	57'	29.81"
• Bird hide 1	25º	24'	27.93"	31º	58'	3.16"
• Bird hide 2	25º	24'	48.53"	31º	57'	44.86"
• Bird hide 3	25º	24'	57.28"	31º	57'	31.96"
• Water treatment works	25º	25'	4.18"	31º	57'	22.48"
• Wastewater treatment works	25º	25'	4.95"	31º	57'	22.62"
• Reservoir	25º	24'	31.37"	31º	57'	27.17"
• Raw water well in Crocodile River	25º	24'	50.49"	31º	57'	47.67"

Coordinates of linear infrastructure: new access road alignment

	Latitude (S):			Longitude (E):		
• Start	25º	25'	23.46"	31º	57'	31.63"
• Middle	25º	25'	20.90"	31º	57'	31.69"
• End	25º	25'	18.76"	31º	57'	32.23"

Coordinates of infrastructure located within 32m of a watercourse:

	Latitude (S):			Longitude (E):		
• Bird hide 1	25º	24'	27.93"	31º	58'	3.16"
• Bird hide 2	25º	24'	48.53"	31º	57'	44.86"
• Bird hide 3	25º	24'	57.28"	31º	57'	31.96"

2.1. No- project Alternative

The No-Project Alternative implies that the proposed development of nature estate for township development and all associated infrastructure will not take place. In this scenario no negative environmental impacts relating to surface water and biodiversity will be incurred.

The No Project Alternative also implies that no positive impacts or benefits will be experienced such as the generation of employment opportunities, job creation and diversification of tourism offerings in the region.

3. SITE ACCESS

Ready access is available to the proposed development site via Riebok Street in Komatipoort, however a new access road stemming from Rietbok street of approximately 145 m is proposed. Existing internal game viewing roads are located throughout the property, however small portions of new internal access tracks will need to be constructed to allow access to certain units.

4. LOCALITY MAP

Please refer to Appendix A1 for the locality map.

5. LAYOUT/ ROUTE PLAN

Please refer to Appendix A2 for the Preferred Alternative layout map.

6. SENSITIVITY MAP

Please refer to Appendix A3 for the Preferred Alternative sensitivity map.

7. SITE PHOTOGRAPHS

Please refer to Appendix B for photographs taken at the 8 compass points.

8. FACILITY ILLUSTRATION

Please refer to Appendix C for the facility illustration(s).

9. ACTIVITY MOTIVATION

a) IDP, SDF other guidelines

The proposed site is located within the Nkomazi local municipality which is ideally situated to the North of Swaziland, South of the Kruger Park and East of Mozambique. The proposed site itself shares a border with the Kruger National Park to the north and east, as well as being located close to other areas of pristine natural environment such as Marloth Park.

The Kruger National Park has influenced the spatial form of the local municipality and dictates the type of land uses to be found adjacent to its border, including agriculture and tourism related developments i.e. eco areas, conservancies and uses focussing on nature conservation.

Unemployment rates are high in Nkomazi and with a growing population this is a big concern for the future. Limited job opportunities combined with other factors such as low levels of skill development and literacy has resulted in a large portion of Nkomazi being poverty stricken. Eco-tourism is a mechanism that has been successfully used to boost job creation and in doing so reduce the impact of other negative socio-economic aspects.

The Nkomazi SDF guidelines state that mixed use development is encouraged within Kompatipoort, supporting amongst others, medium to higher density residential development. The proposed development area has also been earmarked for future residential and is included in the urban edge as per the Nkomazi SDF.

In this regard, the proposed development of a nature estate falls within the Nkomazi IDP and SDF.

b) Need and Desirability

The motivation and reasoning behind the proposed development of a Nature Estate with a number of residences in a nature area is to provide more housing for a growing population. The site is situated in a prime position overlooking the Crocodile River and Kruger National Park beyond. The site falls within the Nkomazi Spatial Development Framework which earmarked the site for future residential expansion.

Additionally, the site falls within an Ecological Support Area: Protected Area Buffer. These are areas around Protected Areas where changes in land use may affect the ecological functioning or tourism potential of the Protected Areas. The purpose of these buffer zones is to mitigate the impacts of biodiversity-incompatible land uses that may have a negative effect on the environment.

Additionally, the proposed development will also provide job opportunities during both the construction and operational phase to the Nkomazi community.

10. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

The following legislation may also be applicable:

TITLE OF LEGISLATION, POLICY OR GUIDELINE	APPLICABILITY TO THE PROJECT	ADMINISTERING AUTHORITY	DATE
LEGAL FRAMEWORK			
Constitution of Republic of South Africa (Act No.108 of 1996):	This is the fundamental law of South Africa, setting out the Bill of Rights as well as the relationship of various government structures to each other.	National Government	1996
Conservation of Agricultural Resources Act (Act No. 43 of 1983):	Provides for control over the utilization of the natural agricultural resources of the Republic. The proposed project will be required in terms of this legislation to ensure that: • The soil mantle is protected and conserved, • The natural water sources are protected, • Vegetative cover is conserved and weeds and invader plants are removed from the site.	Department of Agriculture	1983
National Environmental Management Act (Act No. 107 of 1998)	To provide for co-operative environmental governance by establishing principles for decision-making on matters affecting the environment, institutions that will promote cooperative governance and procedures for co-ordinating environmental functions exercised by organs of state; to provide for certain aspects of the administration and enforcement of other environmental management laws; and to provide for matters connected therewith.	Department of Environmental Affairs	1998
National Environmental Management: Protected Areas Act (Act No. 57 of 2003):	The Act provides for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes; for the establishment of a national register of all national, provincial and local protected areas; for the management of those areas in accordance with national norms and standards; for intergovernmental co-operation and public consultation in matters concerning protected areas, and for matters in connection therewith. The proposed development is adjacent to the Kruger National Park, a Protected Area in terms of this Act.	Department of Environmental Affairs	2003
National Environmental Management: Biodiversity Act (Act No. 10 of 2004):	The purpose of the Biodiversity Act is to provide for the management and conservation of South Africa's biodiversity within the framework set out by NEMA and the protection of species and ecosystems that warrant national protection. As part of its implementation strategy, the National Spatial Biodiversity Assessment was developed (see below). Rare or protected species may be affected during construction. The Act lists species that are threatened or require protection to ensure their survival in the wild, while regulating the activities, which may involve such listed threatened or protected species and activities which may have a potential impact on their long-term survival. The Act has listed flora and fauna species.	Department of Environmental Affairs	2004

National Spatial Biodiversity Assessment, 2011:	The National Spatial Biodiversity Assessment (NSBA) classifies areas as worthy of protection based on its biophysical characteristics, which are ranked according to priority levels.	Department of Environmental Affairs	2011
National Forests Act (Act No. 84 of 1998):	This Act provides for the management, utilisation and protection of forests through the enforcement of permitting requirements associated with the removal of protected tree species, as indicated in a list of protected trees (first promulgated in 1976 and updated since). Although not anticipated, should any protected tree species require removal or relocation within the project area, a permit will be required.	Department of Agriculture, Forestry and Fisheries	1998
National Veld and Forest Fire Act (Act No. 101 of 1998)	The purpose of this Act is to prevent and combat veld, forest and mountain fires throughput the Republic. The Act provides for a variety of institutions, methods and practices for achieving this purpose.	Department of Water Affairs	1998
National Heritage Resources Act (Act No. 25 of 1999)	The National Heritage Resources Act legislates the necessity for cultural and heritage impact assessment in areas earmarked for development, which exceed 0.5 hectares (ha) and where linear developments exceed 300 metres in length. In this regard, the proposed development site will be subject to engagement with the South African Heritage Resources Agency (SAHRA). Potential impact on cultural heritage, paleontological or archaeological resources through excavation activities or disturbance will need to be monitored. However, it must be noted that no archaeological (Stone Age and Iron Age) or historical settlements, structures, features, assemblages or artefacts were recorded during the survey of the site.	South African Heritage Resources Agency (SAHRA)	1999
Spatial Planning and Land Use Management Act (Act No.16 of 2013)	The Spatial Planning and Land Use Management Act aims: • to provide a framework for spatial planning and land use management; • to specify the relationship between the spatial planning and the land use management system and other kinds of planning; • to provide a framework for the monitoring, coordination and review of the spatial planning and land use management system; • to provide a framework for policies, principles, norms and standards for spatial development planning and land use management; • to provide for the facilitation and enforcement of land use and development measures;	Department of Rural Development and Land Reform	2013
The National Water Act (Act No. 36 of 1998)	This Act aims to provide management of the national water resources to achieve sustainable use of water for the benefit of all water users. The proposed development will have to ensure that local water resources are protected, used, developed, conserved, managed and controlled in a responsible way.	Department of Water Affairs	1998
The National Water	The Act legislates the necessity to provide for the rights of access to basic water supply and basic	Department of Water	1997

Services Act (Act No. 108 of 1997)	sanitation; to provide for the setting of national standards and of norms and standards for tariffs; to provide for water services development plans; to provide a regulatory framework for water services institutions and water services intermediaries; to provide for the establishment and disestablishment of water boards and water services committees and their powers and duties; to provide for the monitoring of water services and intervention by the Minister or by the relevant Province; to provide for financial assistance to water services institutions; to provide for certain general powers of the Minister; to provide for the gathering of information in a national information system and the distribution of that information; to repeal certain laws; and to provide for matters connected therewith.	Affairs	
National Environmental Management Waste Act (Act No. 59 of 2008)	The Waste Act reforms the law regulating waste management in order to protect the environment by providing reasonable measures for the prevention of pollution and ecological degradation. The proposed development will be subject to this Act in terms of the disposal of waste.	Department of Environmental Affairs	2008
Hazardous Substances Act (Act No. 15 of 1973)	To provide for the control of substances which may cause injury or ill-health to or death of human beings by reason of their toxic, corrosive, irritant, strongly sensitizing or flammable nature or the generation of pressure thereby in certain circumstances, and for the control of certain electronic products; to provide for the division of such substances or products into groups in relation to the degree of danger; to provide for the prohibition and control of the importation, manufacture, sale, use, operation, application, modification, disposal or dumping of such substances and products; and to provide for matters connected therewith.	Department of Health	1973
National Environmental management Air Quality Act (Act No. 39 of 2004)	To reform the law regulating air quality in order to protect the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development while promoting justifiable economic and social development; to provide for national norms and standards regulating air quality monitoring, management and control by all spheres of government; for specific air quality measures; and for matters incidental thereto.	Department of Environmental Affairs	2004
Occupational Health and Safety Act, 1993 (Act No. 85 of 1993):	The purpose of this Act is to provide for the health and safety of persons at work and for the health and safety of persons in connection with the use of plant and machinery; the protection of persons other than persons at work against hazards to health and safety arising out of or in connection with, the activities of persons at work. The proposed development will therefore be subject to this Act during the construction and operational Application for Environmental Authorisation.	Department of Labour	1993
Integrated Environmental Management Information Series	IEM is a key instrument of NEMA and provides the overarching framework for the integration of environmental assessment and management principles into environmental decision-making. The aim of the information series is to provide general information on techniques, tools and processes for environmental assessment and Management. These various documents have been referred to for information on the most suitable approach to the environmental assessment process	Department of Environmental Affairs	1992

	for the proposed development.		
Local Government: Municipal Structures Act, No. 117 of 1998	To provide for the establishment of municipalities in accordance with the requirements relating to categories and types of municipality; to establish criteria for determining the category of municipality to be established in an area; to define the types of municipality that may be established within each category; to provide for an appropriate division of functions and powers between categories of municipality; to regulate the internal systems, structures and office-bearers of municipalities; to provide for appropriate electoral systems; and to provide for matters in connection therewith	National Government	1998
Local Government: Municipal Systems Act, No. 32 of 2000	To provide for the core principles, mechanisms and processes that are necessary to enable municipalities to move progressively towards the social and economic upliftment of local communities, and ensure universal access to essential services that are affordable to all; to define the legal nature of a municipality as including the local community within the municipal area, working in partnership with the municipality's political and administrative structures; to provide for the manner in which municipal powers and functions are exercised and performed; to provide for community participation; to establish a simple and enabling framework for the core processes of planning, performance management, resource mobilisation and organisational change which underpin the notion of developmental local government.	National Government	2000
REGIONAL PLANNING POLICIES			
Nkomazi Local Municipality IDP	The Kruger National Park has influenced the spatial form of the local municipality and dictates the type of land uses to be found adjacent to its border, including agriculture and tourism related developments i.e. eco areas, conservancies and uses focussing on nature conservation. The tourism sector is one of the most thriving sectors in the local economy whereby Nkomazi continues to attract large numbers of tourists, specifically to the KNP and Marloth Park. The hospitality industry in Nkomazi continues year on year to improve its product offering and has turned Nkomazi into a tourist hot-spot in the province.	Nkomazi Local Municipality	2015/2016
Integrated Pollution and Waste Management White Paper	To develop, implement and maintain an integrated pollution and waste management system which contributes to sustainable development and a measurable improvement in the quality of life, by harnessing the energy and commitment of all South Africans for the effective prevention, minimisation and control of pollution and waste.	Department of Environmental Affairs	2000
Environmental Management Policy White Paper	This is the government's national policy on environmental management. It sets out the vision principles, strategic goals and objectives and regulatory approaches that government will use for environmental management in South Africa.	Department of Environmental Affairs	1998

11. WATER, WASTE AND EFFLUENT

11.1. Solid Waste Management

Solid waste generated from the chalets and safari lodge will separated at source into wet waste, recyclables and non-recyclables. Recyclables will be separated into the various categories, namely paper, plastic, cans and glass and stored in marked 240 litre wheeled bins located at strategic points throughout the site. Non-recyclables will be stored in a similar manner. All recyclables and non-recyclables will then be collected from the various points and taken to the refuse storage facility near the entrance gate. This area will be fenced off and screened. The Nkomazi Local Municipality or Private contractors will collect the waste once per week or as and when needed and taken to the nearest recycling centre and/or landfill site.

11.2. Liquid effluent

A wastewater treatment plant will be constructed at a suitable position on the development area. The treated effluent will comply with the general standards required by the department of Water Affairs and Forestry and will be of such quality that the treated water can be used for irrigation purposes.

The anticipated Annual Average Daily Dry Weather Sewage flows for the proposed Nature Estate for residential purposes is calculated as follows:

The Annual Average Daily Water Demand for the Estate is 162.75 m^3/day and it is estimated that 70% of the AADWD will be transferred to the sewer system. Making provision of 15% ground water infiltration it is estimated that the AADWF will be 131 m^3/day.

The combined AADWF is 361 m^3/day.

A hybrid sewage treatment package plant is proposed that utilizes trickling filter technology. Trickling filter plants have the following advantages when compared to alternative technologies:

- Simple, reliable technology with minimal automation and control
- No skilled operators required
- Flexibility of effluent load
- Low sludge production
- Compact
- Odourless

The WWTW proposed consists of 3 shipping containers (2 x 12 mHC container double stacked for the trickling filter) and 1 x 6 m for the equipment container.

The treated effluent will comply with the with the RSA General Standard for Discharge as published in Table 3.2 of Gazette No. 20526 of 8 October 1999 and is suitable for irrigation. The treatment processes for the plant will include screening, anaerobic digestion, trickling filter, settler and chlorine contact tank.

Screening: Raw sewage will enter the system up to the battery limits. A screening facility consisting of an inlet box (civil) with bar screen and drip tray will be required. Once a week, an operator will rake trapped matter (screenings) with the rake onto the drip tray and leave this to dewater. The (semi-dry) screenings from the previous week will be carted away by the operator to a proper disposal site.

Primary treatment tank (anaerobic Reactor): The raw sewage, after screening, will enter a two compartment anaerobic reactor. The anaerobic reactor will be a concrete structure. The anaerobic reactor has been designed with enough retention time to allow the solids and sludge to settle out and be digested in the first compartment,

while the second will mainly contain grey water. Anaerobic conditions in this tank will ensure BOD removals of at least 40 % to 50 %. Additionally, aerobic sludge from the secondary settler will be recycled to the inlet of this tank, to be further digested. This reduces the overall sludge volume produced in the biological system.

Trickling Filter Feed Pumps (installed in the primary treatment tank): After primary treatment, the effluent will be discharged into a pump sump (Anoxic Reactor) from where it will be re-circulated by open impeller submersible pumps (duty/standby) through the trickling filter. This sump has been sized with a hydraulic retention time in excess of 60 min, which allows for anoxic conditions to prevail.

Trickling Filter (Aerobic Reactor): The trickling filter system consists of a bed of highly permeable medium, which serves as host for micro-organisms to attach to and grow on and form a biological film. The wastewater is sprayed over and percolates through the media. Organic material in the wastewater is absorbed by the micro-organisms growing as a biological film on the media. In the outer portion of the film, aerobic organisms degrade organic material, whereas anaerobic organisms exist deeper into the biological film, i.e. near the surface of the media.

Clarifier: The water from the trickling filter basin will be directed to the clarifier by transfer pumps (duty/standby) only if there is inflow into the plant. Water from the trickling filter contains solids made up of a mixture of aerobic and anaerobic sludge. This sludge will be heavier (and lower in volume) than aerobic sludge produced in an activated sludge plant and does not produce scum. It will settle and accumulate at the bottom of the clarifier.
Sludge will periodically be withdrawn from the bottom of the clarifier and will be gravitationally fed to the anaerobic reactor. To achieve this, an electrically actuated valve has been provided. The valve's opening time and frequency is controlled by a timer for the duration and interval of sludge extraction.

Disinfection: Clarified water from the clarifier is discharged into the chlorine contact tank. This tank has been sized for an effective contact time of 20 min at ADWF. Disinfection will be provided by a hypochlorite dosing system. The treated water will be suitable for irrigation and dust control.

Sludge Removal and Drying Beds (supplied by others): Sludge stabilisation and digestion takes place in the anaerobic reactor. This tank is annually inspected. If the sludge at the bottom of the first compartment of the anaerobic reactor has accumulated to a height of ca 400 mm the sludge has to be emptied (pumped) into sludge drying beds or taken away for dumping at a suitable location. An easy procedure for checking the sludge level inside the anaerobic reactor is given/described in our operation manuals. Sludge to be emptied every one to two years or alternatively collect and transport the accumulated sludge to a suitable disposal site. Since it is expected that the removal of the sludge will need to be done once every 1 – 2 years, this method may be more suitable for the proposed plant.

11.3. Water Use

Water will be sourced from current water rights from the Crocodile River. A 20 ha water entitlement from the Crocodile River Irrigation Board for a total of 260 000 m³/annum is available for use for the development. If the irrigation water use is converted to primary (household) use, the allocation is reduced by 30%. The available water is therefore 182,000 m³/annum or 498.63 m³/day.

The expected Annual Average Daily Water Demand is estimated at 461 m³/day. The water available from the irrigation board is therefore sufficient.

A new river well and a raw water pump station will have to be constructed in the Crocodile River with a new rising main to the Water Treatment Plant.

The Annual Average Daily Water Demand for the residential estate is estimated as follows:

- 54 river front erven @2.0 m³/erf = 108 m³/day;
- 39 bush erven @ 1.75 m³/unit = 68.25 m³/day;

The total AADWD for the Estate is therefore estimated to be 176.25 m³/day.
The total AADWD for the Leisure Resort (located on the northern portion and part of a separate application) is estimated to be 284.75 m³/day.

Therefore the total AADWD for the two phases combined is estimated to be 461 m³/day.

It is proposed that storage is provided for 36 hours of the AAADWD which equates to 691.5 m³.

The minimum additional storage capacity required for firefighting is 15 l/s for a duration of 1 hour, which equates to 54kl.

The total storage capacity required equates to 745.5 m³ (691.5 m³ for 36 hours domestic demand and 54 m³ for firefighting purposes).

A new reservoir of at least 625 m³ will be installed at a suitable position on the property. The elevation of the reservoir area is not sufficient to provide sufficient pressure, and a booster pump system with standby electricity will have to be provided.

Two outlets will also be provided at different heights to ensure that water for firefighting purposes cannot be used for domestic purpose.

Smart water meters will be installed as well as bulk meters to enable the developer to manage the water consumption, have minimal water losses and to identity leaks.

A New Water Treatment Plant will be provided at a suitable location on the property. The plant will consist of the following process:

- Clarification
- Sand filtration
- Carbon filtration
- Dosing equipment

SECTION B: SITE/AREA/PROPERTY DESCRIPTION

12. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

The study area is underlain by transported sandy, clayey and gravelly soils overlying granophyre and gabbro bedrock belonging to the Komatipoort Suite and by basalt bedrock belonging to the Letaba Formation, Lebombo Group, Karoo Supergroup. Most of the study area is characterised by an abundance of rock outcrops and has been apportioned into three prominent geotechnical soil zones, Soil Zones “A, B and C.”

The southernmost portion of the site falls within Soil Zone B which can be described as follows:

- Thin to prominent horizon (1,0 m to 1,6 m thick) of dense voided, silty sand clayey fine sand and very stiff, voided and shattered sandy silt of colluvial origin.
- Upper soil horizon is potentially collapsible and compressible
- Occasional hard hand tool excavation can be expected in shale bedrock

The centre of the proposed site falls within Soil Zone C:

- Thin to moderate (0.1 m to 1.0 m) of very stiff shattered, sandy clay of colluvial origin overlying a dense, gravelly pebble marker horizon over very dense residual soils and very hard rock granophyre. Scattered to numerous outctop and sub-outcrop of very hard rock
- Upper soil horizon is potentially expansive
- Undulating bedrock and foundation horizon can be expected
- Very hard excavation and possibly blasting will be required for the installation of service and foundation trenches

The remainder of the property falls within Soil Zone A:

- Thin to moderate horizon (0,1 m to 0,8 m thick) of loose to medium dense sandy, gravelly and boulder colluvium overlying a dense to very dense gravelly pebble marker overlying dense to very dense residual soils and basalt and granophyre bedrock. Scattered to numerous outcrop and sub outcrop of hard rock basalt and granophyre occur throughout this soil zone
- Very hard excavation and possibly blasting will be required for the installation of service and foundation trenches
- Undulating bedrock and foundation horizon can be expected
- Upper colluvial horizon is potentially compressible

Refer to Appendix D.1 for the full geotechnical report.

The municipal area is regarded as high potential agricultural soils, 75.3% as medium potential agricultural soils and 15.3% as very low potential soils. Most of the agriculture activities (grazing and irrigation) take place on medium potential land (Nkomazi Local Municipality IDP 2016/17).

13. GROUNDCOVER

According to the National Vegetation Map (SANBI, 2018), the study area is situated within Tshokwane-Hlane Basalt Lowveld. This vegetation type occurs from the Balule and Satara Camps in the central KNP in the north, through the Park down to Komatipoort and then south to Big Bend in eSwatini. It is usually found on fairly flat plains with open tree savanna.

Tshokwane - Hlane Basalt Lowveld is not listed as a Threatened Ecosystem (Notice 1002 of Government Gazette 34809, 9 December 2011).

The project area is not situated within any centres of plant endemism as defined by Van Wyk & Smith (2001).

One small area, one in the far south corner is classified as Critical Biodiversity Area (CBA): Irreplaceable. These are areas that are the most important in Mpumalanga for meeting biodiversity targets outside of formally protected areas and for conserving critical biodiversity ecosystems. CBA areas should be maintained in a natural state with no further loss of natural habitat. The desired management objective in these areas is conservation management which includes, for example, low-intensity livestock or game farming.

Two small areas in the southern portion of the study area are classified as being situated within Other Natural Areas by the MBSP. These are areas that have not been identified as a priority in the current systematic biodiversity plan but retain most of their natural character, while performing a range of biodiversity and ecological functions. While not considered priority areas for biodiversity conservation at present, they are still an important part of the natural ecosystem. Other Natural Areas offer much more flexibility in terms of permissible land uses, but the desired management objective should be to minimise habitat and species loss and ensure ecosystem functionality through strategic landscape planning.

The entire study area is situated within the Ecological Support Areas (ESA): Protected Area Buffers unit. ESA's are "areas that are not essential for meeting (conservation) targets, but play an important role in supporting the functioning of CBA's and that deliver important ecosystem services" (Lötter et al., 2014). Protected Area Buffers are areas that surround proclaimed protected areas that moderate the negative impacts of land-uses that may affect the ecological functioning of those protected areas. The recommended land-use guidelines for these areas are to maintain in a functional, near-natural state but allowing for some habitat loss.

Most of the study area is also situated within an ESA: Local Corridor. These are areas that connect natural areas and protected areas to facilitate the functioning of CBA's. The recommended land-use guidelines for these areas are to maintain in a functional, near-natural state but allowing for some habitat loss.

14. SURFACE WATER.

According to the MBSP freshwater assessment, the study area falls within an ESA Important Sub-catchment as it is a Fish Support Area (FSA), as per NFEPA. This particular FSA supports the Tiger Fish (*Hydrocynus vittatus*), a fish species of conservation concern. FSAs are fish sanctuaries that are in a lower than A or B ecological condition. Fish sanctuaries, which include both river FEPAs and FSAs, are rivers and their associated sub-catchments that are essential for protecting threatened and near-threatened fish; consequently, there should be no further deterioration in the condition of the associated rivers (Nel et al., 2011).

According to the MBSP freshwater assessment, the study area is associated with one ESA wetland area and also includes two dams. The National Wetland Map 5 shows this ESA wetland area to be a riverine/ floodplain wetland (associated with the Crocodile River).

The study area borders the perennial Crocodile River and also includes several non-perennial rivers. According to the 2014 PES for South African rivers, the section of the Crocodile River flowing through this sub-catchment has a PES of 'D' (i.e. "Largely modified. A large loss of natural habitat, biota and basic ecosystem functions has occurred.").

Refer to Appendix D.2 for the full Wetland Report.

15. LAND USE CHARACTER OF SURROUNDING AREA

The proposed site is located on Portion 2 Tenbos 661 JU and lies on the south-eastern border of the Kruger National Park, about 1.5 km north of the town of Komatipoort, and about 3 km west of Mozambique. The N4 lies approximately 3.5 km to the south. The study area falls under the Ehlanzeni District Municipality, Nkomazi Local Municipality, Mpumalanga Province. According to the 2013/2014 land-cover data, the study area is entirely natural, although it borders on cultivated land to the west (sugar cane). The Kruger National Park lies to the north and east, while the land-use of the surrounding area to the west and south is predominantly cultivation, with some urban development/ residential to the south.

16. CULTURAL/HISTORICAL FEATURES

Francois P. Coetzee, an independent Cultural Heritage Consultant, was commissioned by NuLeaf Planning and Environmental to undertake a Heritage Impact Assessment in order to determine the heritage potential and the impact on possible heritage resources.

No archaeological (Stone Age and Iron Age) or historical settlements, structures, features, assemblages or artefacts were recorded during the survey.

Additionally, the SAHRIS Palaeontological Sensitivity Map was consulted. The affected property is located within a blue and grey zone indicating that there is a low/ insignificant sensitivity and that no palaeontological studies are required however a protocol for finds is required.

Refer to Appendix D.3 for the full Heritage Impact Report.

17. SOCIO-ECONOMIC CHARACTER

The unemployment rate of Nkomazi deteriorated from 30.7% in 2014 to 32.4% in 2017, the unemployment rate was the 6th highest among all the municipal areas of Mpumalanga. In 2017 the unemployment rate for females was 36.7% and that of males 28.4%. youth unemployment rate according to the census figures was 42.3%- challenge with especially very high youth unemployment rate of females.

The unemployment rates for women and for youth aged 15-35 are significantly higher than the general population aged 15-64 years. The inability of these vulnerable groups to access employment is a major determining factor in their general development. In the case of women heading households it will also affect the development status of the entire household. Education is not only one of the main factors that contribute unemployment, but is a key indicator of development in general. As a municipality we are facing high rate of unemployment due to the fact that the municipality is a rural municipality which mainly focuses on agriculture for job creation.

18. BIODIVERSITY

18.1. Terrestrial Ecology

A specialist terrestrial ecology assessment was undertaken by ECOREX Consulting Ecologists CC in October 2020.

18.1.1. Flora

A total of 230 taxa from 66 families were recorded from the study area during August 2020 fieldwork, representing 45% of the BODATSA total.

Four (4) vegetation communities were identified within the study area on the basis of distinctive vegetation structure (grassland, woodland, thicket, etc.), floristic composition (dominant and diagnostic species) and position in the landscape (mid-slopes, terrace, crest, etc.). The untransformed vegetation communities are described in detail below:

- *Euphorbia confinalis – Sterculia rogersii* Outcrop Woodland

Outcrop Woodland occurs in relatively small, scattered pockets throughout the study area. Vegetation structure is mostly Short to Tall Closed Woodland, becoming Open Woodland on the larger outcrops (sensu Edwards, 1983). Many outcrops are too small to have been mapped, and are embedded within the Plans Woodland community.

This community contains a high diversity of trees and shrubs, as well as many succulents. The canopy cover is dominated by a number of succulent and semi-succulent trees such as Euphorbia confinalis, *E. cooperi*, *E. ingens* and *Sterculia rogersii.* Other regularly encountered trees include A*cacia nigrescens, Ficus abutilifolia, Peltophorum africanum, Pappea capensis, Sclerocarya birrea, Lannea schweinfurthii and Strychnos madagascariensis.* Shrubs and dwarf shrubs found are D*ichrostachys cinerea subsp. africana, Xerophyta*

retinervis, Jasminum multipartitum and Ochna inermis. Smaller succulents include *Aloe spicata, A. chabaudii, Pachypodium saundersii, Cynanchum viminale, Cissus cactiformis* and *Sansevieria hyacinthoides.*

A total of 105 species (46% of the entire list) was recorded from Outcrop Woodland during fieldwork; the highest of the four communities present. This is a relatively high species richness given the relatively small area covered by this community and the timing of the survey. Species fidelity is very high, with 55 species (52% of the community list) not shared with the other three communities.

Nine conservation-important species were recorded from this community, with one of these considered to be Near Threatened (NT), namely *Elaeodendron transvaalense*. Three species are protected under the NFA, namely the trees *Sclerocarya birrea, Boscia albitrunca* and *Elaeodendron transvaalense*. Six confirmed species are protected under the MNCA, all of which are succulents, namely *Aloe chabaudii, A. marlothii, A. spicata, Eulophia petersii, Stapelia gigantea* and *Pachypodium saundersiii*

- *Acacia nigrescens – Dichrostachys cinerea* Disturbed Closed Woodland

This vegetation community occurs across most of the study area. It covers 260 ha, or 79% of the area surveyed. Vegetation structure is mostly Short to Tall Closed Woodland (sensu Edwards, 1983), but approaches Low Thicket in areas invaded by shrubs. Rock cover varies from low to moderate, especially in the portions adjacent to the Outcrop Woodland vegetation community. When present, rocks occur in the form of small to medium-sized boulders, as opposed to the larger, exposed boulders and sheetrock of the former community. Historical overgrazing is the most likely cause of large areas being invaded by the indigenous shrub *Dichrostachys cinerea subsp. africana*, leading to a disturbed state in this community.

The canopy is moderately diverse with *Acacia nigrescens, A. nilotica, Combretum hereroense, C. apiculatum, C. imberbe, Sclerocarya birrea, Ziziphus mucronata* and *Strychnos madagascariensis* frequently recorded. Dominant shrubs are *Dichrostachys cinerea subsp. africana, Commiphora africana, Grewia flavescens, G. bicolor, Gymnosporia maranguensis* and *Euclea daphnoides.* Herbs are infrequent due to the dry conditions, but include *Dicoma tomentosa, Polydora steetziana, Waltheria indica, Leucas sexdentata, Kyphocarpa angustifolia* and *Justicia flava.* Grasses are relatively diverse and dominate the ground layer. Dominant species are *Heteropogon contortus, Panicum maximum, Aristida congesta subsp. barbicollis, Eragrostis rigidior* and *Enneapogon cenchroides.*

Ninety-four species (41% of the entire list) was recorded from Disturbed Closed Woodland during fieldwork; the second-highest of the four communities present. Species fidelity is high, with 33 species (35% of the community list) being restricted to this community.

Nine conservation-important species were recorded from this community, with one of these considered to be Vulnerable (VU), namely *Aloe komatiensis*, and the tree *Dalbergia melanoxylon*, which is assessed as NT. Four confirmed species are protected under the NFA, namely the trees *Sclerocarya birrea, Boscia albitrunca, Philenoptera violacea* and *Combretum imberbe.* Four species are protected under the MNCA, namely the succulents *Aloe komatiensis, A. marlothii and Stapelia gigantea* and the tree *Spirostachys Africana.*

- *Dichrostachys cinerea- Cynodon dactylon* Degraded Woodland

Degraded Woodland occurs in a few small, scattered pockets throughout the study area. It covers just more than 10 ha, or 3% of the entire study area. Vegetation structure is mostly Short Open to Closed Woodland (sensu Edwards, 1983). Various anthropogenic factors have combined to degrade the ecological state of this community, including bush-clearing, alien plant invasion, grass mowing and other activities.

The invasive shrub *Dichrostachys cinerea subsp. africana* dominates the often low canopy of this community, with other trees and shrubs including *Sclerocarya birrea, Gymnanthemum coloratum, Strychnos*

madagascariensis, Acacia nigrescens, Ziziphus mucronata, Baccharoides adoensis, Grewia flavescens and *Phyllanthus reticulatus*. Dwarf shrubs and herbs found are *Lippia javanica, Waltheria indica, Solanum campylacanthum, * Parthenium hysterophorus* and * *Alternanthera pungens.* Grasses are dominated by *Cynodon dactylon, Eragrostis superba, Tragus berteronianus* and *Panicum maximum.*

A total of 57 species (25% of the entire list) was recorded from Degraded Woodland during fieldwork; the lowest of the four communities present. Species fidelity is high, with 20 species (35% of the community list) being restricted to this community. Many of these are alien invasive or pioneer species, reflecting the high level of degradation in this community.

Only three conservation-important species were recorded from this community, namely the trees *Sclerocarya birrea, Combretum imberbe* and *Philenoptera violacea* which are all protected under the NFA.

- *Diospyros mespiliformis- Acacia xanthophloea* Riparian forest/ Wetland mosaic

This vegetation community occurs in fairly narrow strips along a number of drainage lines across the study area. A very narrow strip has also established along an old but functional irrigation canal situated in the south-central portion of the study area. This community covers just more than 17 ha or just over 5% of the study area. Dams, which contain some wetland vegetation, are included in this community, and cumulatively measure approximately 2 ha in size. Vegetation structure is mostly Tall Forest, but smaller stretches contain rushes and reeds and become Tall to High Closed Grassland (sensu Edwards, 1983). Significant alien plant infestation is present within the large, southern-most strip of this community, adjacent to the town of Komatipoort. The remaining stretches are mostly free of alien plants.

The canopy contains large specimens of *Diospyros mespiliformis, Acacia xanthophloea, Ficus sycomorus, Combretum imberbe, Bridelia micrantha, Trichilia emetica* and *Schotia brachypetala.* The understory contains the shrubs and small trees *Maclura africana, Kraussia floribunda, Gymnosporia senegalensis, * Chromolaena odorata, Tabernaemontana elegans, Bridelia cathartica* and *Phyllanthus reticulatus*. Rarer woody species include *Cordyla africana, Afzelia quanzensis* and *Ziziphus rivularis.* The ground layer is dominated by various plants across the community, and include the fern *Christella dentata,* the herb * *Ageratum conyzoides,* the grass *Panicum maximum*, the reed *Phragmites mauritianus,* the sedge *Cyperus sexangularis* and the rush *Typha capensis.* Climbers feature strongly in this community, and include *Combretum microphyllum, Jasminum fluminense, * Passiflora subpeltata, Cocculus hirsutus* and * *Ipomoea alba.*

Seventy-four species (32% of the entire list) was recorded from Riparian Forest / Wetland Mosaic during fieldwork; the second-lowest of the four communities present. Species fidelity is understandably very high, with 47 species (64% of the community list) being restricted to this community.

Six conservation-important species were recorded from this community, namely the trees *Sclerocarya birrea, Combretum imberbe, Afzelia quanzensis* and *Philenoptera violacea* which are protected under the NFA, and the trees *Spirostachys africana* and *Berchemia zeyheri* which are protected under the MNCA.

- Conservation- Important Flora

A total of 230 plant species in 66 families was recorded during fieldwork. Three SCC were recorded from the study area, namely the succulent *Aloe komatiensis* which is classified as VU and the tree *Dalbergia melanoxylon* which is classified as NT. These two plants are discussed in greater detail below.

Aloe komatiensis Reynolds Komatipoort Aloe is listed as VU due to significant habitat loss within its small local distribution. Three sterile plants were recorded in two localities within the Plains Woodland vegetation community.

Dalbergia melanoxylon Guill. & Perr. Zebra Wood usually grows as a small to medium-sized tree and is found throughout the Lowveld and as far north and west as Senegal. Although not locally listed, it is assessed by the IUCN as NT due to over-collection for the wood carving industry and in the manufacturing of musical instruments. A few small colonies were located within the study area, mostly in the northern parts.

Six species found are protected under the NFA, namely the trees *Sclerocarya birrea, Boscia albitrunca, Combretum imberbe, Afzelia quanzensis, Philenoptera violacea* and *Elaeodendron transvaalense*. Nine confirmed species are protected under the MNCA, namely the succulents *Aloe chabaudii, A. marlothii, A. spicata, A. komatiensis, Eulophia petersii, Stapelia gigantea* and *Pachypodium saundersiae* and the trees *Spirostachys africana* and *Berchemia zeyheri.*

18.1.2. Fauna

- Mammals

The farm Tenbos 661 JU is situated in the savanna biome adjacent to the KNP in the foothills of the Lebombo Mountains in the Lowveld of far eastern Mpumalanga. This area has high mammal diversity but relatively low numbers of endemics and Red Data species. Eighty-eight mammal species have been recorded for the grid 2531 BD in the Fitzpatrick Institute of African Ornithology's Virtual Museum database. This is a high total but true diversity will be somewhat higher as many mammals are either small, cryptic or nocturnal in habit and therefore difficult to photograph. The KNP is situated along the entire northern and eastern boundary, along the Crocodile River, and some mammals, such as Lion *Panthera leo*, may occasionally enter under or over the fence into the property.

Eighteen mammal species were recorded from within the study area during fieldwork. An estimated 30 conservation-important mammals potentially occur within the study area. Several cave-roosting bat species of conservation concern such as the Short-eared Trident Bat (Cloeotis percivali – EN) could potentially occur overhead but these species are only likely to feed over the site because of the shortage of suitable roosting sites and have been excluded from this assessment.

No SCC were recorded from within the study area, although some such as Spotted Hyaena *Crocuta crocuta* and Leopard *Panthera pardus* may infrequently enter from the adjacent KNP. These are unlikely to remain for long durations due to human disturbance as these would probably be discouraged due to undesirable predation on existing, valuable game species such as Southern Savanna Buffalo.

Of the 30 potentially occurring species, 19 are considered to be species of conservation concern with only 9 considered threatened. None of these threatened species potentially occur as regular or resident species within the proposed development area due to a lack of suitable habitat present, regional scarcity or human disturbance.

The African Clawless Otter *Aonyx capensis* (NT) and the Serval *Leptailurus serval* (NT) have a moderate likihood of occurring on site.

Twenty-six potentially occurring species are protected under either the NEMBA ToPS or MNCA. Two confirmed species are protected under NEMBA ToPS, namely Plains (Burchell's) Zebra *Equus quagga burchellii* and Blue Wildebeest *Connochaetes taurinus*, and three are protected under the MNCA, namely South African Giraffe *Giraffa camelopardalis giraffa,* Common Waterbuck *Kobus ellipsiprymnus* and Southern Savanna Buffalo *Syncerus caffer.*

- Birds

The savanna biome, within which the study area is situated, supports the highest diversity of bird species within the Southern African sub-region. The Komatipoort area is well sampled, with a total of 393 species having been recorded from 1930 lists submitted for the nine pentads in the QDGS 2531 BD. This is the highest for any QDGS in Mpumalanga and contains the pentad with the highest individual Full Protocol species list for anywhere in South Africa. This highlights the very high avian diversity of the Komatipoort area.

The study area falls within the Kruger National Park and Adjacent Areas Important Bird & Biodiversity Area (IBA) and qualifies as a Global IBA. Eleven globally threatened species are resident within the GKNP, in addition to fourteen resident regionally threatened birds. A number of migratory and vagrant threatened species also occur.

A high total of 162 bird species were confirmed to occur within or adjacent to the study area during August 2020 fieldwork, which equates to 41% of the 2531 BD QDGS species list.

Three broad assemblages or species-habitat associations were identified, and are briefly described below:

- Woodland Assemblage: Woodland represents the dominant habitat within the study area and is characterised by deciduous *Acacia* and *Combretum* species. Common and widespread species found include Black-headed Oriole *Oriolus larvatus*, Kurrichane Thrush *Turdus libonyanus*, Arrow-marked Babbler *Turdoides jardineii*, Chinspot Batis *Batis molitor,* Brown-crowned Tchagra *Tchagra australis,* Yellow-breasted Apalis *Apalis flavida,* Long-billed Crombec *Sylvietta rufescens,* Rattling Cisticola *Cisticola chiniana* and White-browed Scrub Robin *Cercotrichas leucophrys.* Seedeaters are fairly diverse and include Blue Waxbill *Uraeginthus angolensis*, all three local firefinch species, Golden-breasted Bunting *Emberiza flaviventris*, White-winged Widowbird *Euplectes albonotatus* and Yellow-fronted Canary *Crithagra mozambica.* Woodland supports 89 species, or 55% of the entire list, the highest of the three assemblages.

- Forest Assemblage: Tall Riparian Forest occurs along the small streams and the old canal running through the study area. This habitat provides refuge for a number of bird species that favour taller and denser vegetation than the surrounding shorter, dry woodlands, such as Purple-crested Turaco *Tauraco porphyreolophus,* Yellow-rumped Tinkerbird *Pogoniulus bilineatus,* Trumpeter Hornbill *Bycanistes bucinator,* Tambourine Dove *Turtur tympanistria,* White-browed Robin-Chat *Cossypha heuglini,* Yellow-bellied Greenbul *Chlorocichla flaviventris,* Spectacled Weaver *Ploceus ocularis* and African Green Pigeon *Treron calvus*. Thirty-nine species (24% of the total list) were recorded from this assemblage, the lowest of the three assemblages

- Wetland Assemblage: Wetland habitat, including open water and vegetated edges, are present along the adjacent Crocodile River within the KNP, as well as in smaller pockets such as around the small dams that are scattered throughout the study area. Birds recorded that are associated with wetland vegetation include Thick-billed Weaver *Amblyospiza albifrons,* Red-faced Cisticola *Cisticola erythrops,* Black Crake *Amaurornis flavirostra* and Common Waxbill *Estrilda astrild.* Birds associated with open water habitats include many storks and herons such as Yellow-billed Stork *Mycteria ibis*, African Openbill *Anastomus lamelligerus,* Goliath Heron *Ardea goliath* and Little Egret *Egretta garzetta,* ducks such as Egyptian Goose *Alopochen aegyptiaca* and Knob-billed Duck *Sarkidiornis melanotos*, kingfishers such as Malachite Kingfisher *Corythornis cristata* and the predatory

African Fish Eagle *Haliaeetus vocifer.* Forty-eight species (30% of the total list) were recorded from this assemblage, the second highest of the three assemblages

An estimated 35 species of conservation concern potentially occur within the Komatipoort area. Twenty-five of these are considered threatened, three of which were confirmed to occur within the boundaries of the study area during fieldwork. These three are described below.

- Bateleur *Terathopius ecaudatus*: This mid-sized eagle is listed as EN primarily due to habitat loss and is now mostly restricted to larger conservation areas, at least as a breeding species. Two young birds were observed flying over the study area and suitable nesting locations (tall trees such as *Acacia nigrescens*) are present, although no active nests were located during fieldwork.
- White-backed Vulture *Gyps africanus:* This vulture is assessed as Critically Endangered (CR) due to a variety of anthropogenic impacts such as habitat loss, poisoning, electrocution and collision with powerlines, drowning in concrete farm reservoirs and collection for the medicinal trade. A large number of birds were observed flying over the study area from the adjacent KNP and suitable nesting locations (tall trees such as *Acacia nigrescens*) are present, although no active nests were located during fieldwork.
- Hooded Vulture *Necrosyrtes monachus:* This vulture is assessed as CR due to similar anthropogenic impacts as the White-backed Vulture described above such as habitat loss, poisoning, electrocution and collision with powerlines, drowning in concrete farm reservoirs and collection for the medicinal trade. A pair was observed flying over the study area during fieldwork. It is resident within the adjacent KNP and potentially forages within the study area on a regular basis. Suitable breeding trees are present, although no active nests were located.

Yellow-billed Stork *Mycteria ibis* (EN) and Black Stork *Ciconia nigra* (VU) were observed foraging in the adjacent Crocodile River within the KNP.

- Reptiles and Frogs

The Lowveld of far eastern Mpumalanga supports a very high diversity of reptile species, with levels ranking in the top 10% of all areas in South Africa. The two reptile groups showing the highest diversity include the lizards and snakes (Bates et al., 2014). However, reptile endemicity is very low, which is to be expected in an area that lies in close proximity to Mozambique and is situated within the widespread savannah biome (Bates et al., 2014).

Only four reptiles were recorded during fieldwork, namely Striped Skink *Trachylepis striata*, Rainbow Skink *T. margaritifer,* Common Dwarf Gecko *Lygodactylus capensis* and Nile Crocodile *Crocodylus niloticus*.

Of the potentially occurring species, one has been nationally assessed as VU, namely Nile Crocodile *Crocodylus niloticus,* which is also protected under NEMBA ToPS. A single small animal was observed walking towards one of the small dams in the southern portion of the study area, and they probably regularly move between them and the adjacent Crocodile River.

Southern African Python *Python natalensis* is protected under the NEMBA ToPS and is likely to be resident within the study area as suitable habitat is present.

Only one frog was recorded during fieldwork, namely Snoring Puddle Frog *Phrynobatrachus natalensis,* primarily due to the timing of the survey. This is a common and widespread species. One species of frog

has a Red Data or protected status, namely Whistling Rain Frog *Breviceps sopranus,* which is classified as Data Deficient (DD) due to a lack of information regarding this little-known forest species. This frog has a low likelihood of occurrence due to the small size and disturbed nature of the Riparian Forest vegetation type present within the study area.

Refer to Appendix D.4 for the full Ecology report.

18.2. Riparian Ecology

A specialist wetland/riparian survey was undertaken by Wet-Earth Eco-Specs to identify and delineate wetlands and riparian area, as well as, determine the present ecological state (PES) and the ecological importance and sensitivity (EIS).

A total of two (2) ephemeral drainage lines, three (3) valley bottomed wetlands and two (2) riparian zones were encountered on the proposed site.

Drainage systems which only have occasional water flowing through them are called ephemeral systems and they flow mostly during rare flash floods. These systems do not qualify as wetlands or riparian areas; however, they are deemed to be necessary to accommodate surface water flowing from its catchment basin, the integrity also adds to the quality of water conveyed to the downstream systems, and they act as corridors between terrestrial and the aquatic environment.

TB05 Ephemeral Drainage: This linear drainage line is narrow, with good vegetation cover, and water is conveyed in a controlled manner with little erosion visible. Impacts currently experienced are road crossing, dam, overgrazing and trampling along the edge of the dam footprint and surface erosion in the upstream portion (the result of flows during rain events).

TB06 Ephemeral Drainage: An ephemeral pan feature was found with an indication of wetness. A dyke occurs which acts as a barrier resulting in the damming water in the upstream portion. Impacts currently experienced are a road crossing and trampling and grazing.

TB07 Artificial Canal: An artificial canal has been constructed to provide water to two dams. The water is released from a water pump within the sugarcane cultivation area. Based on the vegetation setting, it appears that this canal is old and has been operating for many years. The vegetation, in and adjacent to the canal comprises typical facultative riparian species. The canal is manually maintained, and in so doing the vegetation and soil surface is damaged. Although artificial, this feature hosts several interesting and diverse habitats.

TB08 Riparian:

This riparian zone is located along the eastern boundary in the southern portion of the site and extends upstream from above the dam, and downstream, where it joins the Crocodile River. The Riparian Index of Habitat Integrity (RIHI) is a C/D (61%). The main impacts are the road crossings, a dam that destroyed a large portion of the original riparian area, and the presence of exotic vegetation. Due to the influence of the dam, less alluvial material is released to the downstream areas which has resulted in the degradation of the riverbank, referred to as bed-armouring. The result of this can be seen in some bank collapse and under-cutting. The road crossing contributes to preferential flows which eventually contribute to the surface erosion in the non-marginal zone. The present ecological status (PES) is a C/D.

- *Marginal zone:* The presence of a dam, road crossings and channel undercutting has resulted in a somewhat disturbed environment. The dam contributes to the fact that a large portion of this zone is drowned and deprived of vegetation cover. The rest of the zone has sporadic cover and is dominated by woody species, with some grasses and sedges. The substrate consists of soil, with rocky features occurring in places. The dominant tree species are: *Diospyros mespiliformis, Ficus sycomorus, Maclura africanum, Kraussia floribunda, and Trichilia emetica. Other species that occur in this zone: Phragmites mauritianus, Cyperus sexangularis, Panicum maximum, Commelina bengalensis, etc. Around the rim of the dam, Typha capensis, Schoenoplectus sp., Leersia hexandra, Potamogeton schweinfurthii, Ludwigia adscendens, etc. occurs.* Exotic vegetation, such as *Melia azedarach, Lantana camara, Tagetes minuta, etc.* are also present.

- *Non-marginal zone:* This zone has a steep gradient towards the marginal zone and is mostly covered by shrubs and trees. The substrate consists mainly of soil material with rocky habitat in places. The groundcover consists mainly of leaf litter and other moribund material. The following woody species occur: *Diospyros mespiliformis, Kraussia floribunda, Cordia africana, Afzelia quineensis, Bridelia micrantha, Acacia xanthophloea, Acacia nigrescens, Philenoptera violacea, Phyllanthus reticulatus, Ficus sycomorus, Maclura africanum, Euclea natalensis, Sclerocarya birrea subsp. caffra, Grewia flavescens, Bridelia cathartica, Gymnosporia buxifolia, Dichrostachys cinerea and Gymnanthemum coloratum, etc.* Understory plants such as: *Vernonia colorata, Setaria megaphylla, Hypoestes forskaolii, and Panicum maximum occur.* The exotics, *Melia azedarach and Chromolaena odorata* are dominant in places within this zone. Other exotics found include: *Solanum mauritianum, Lantana camara, Ageratum conyzoides, etc.*

TB09 Valley Bottom Wetland (Unchannelled):

This site is located in the far south, close to the entrance of the property. The wetland extends up- and downstream of the dam, where it then joins the Crocodile River. The wetland is characterised by vegetation conducive to wet conditions. Facultative tree species occur in large numbers with the presence of obligate and facultative herbs, sedges and graminoids.

Disturbances to the wetland catchment include sugarcane crops and management roads. The untransformed area appears to be slightly overgrazed. Disturbances to the wetland itself include a dam, road crossings and an artificial canal. The untransformed wetland area is in good condition with lush vegetation. Although, the dam is having a major impact on the wetland, the water that is leaking from the dam does contribute towards the wetness in the wetland and its associated lush vegetation. The dam itself has good vegetation cover along its edges with reeds, grasses, and sedges.

The hydrology of the wetland can be categorised as moderately modified (a "C" PES Category), where the change in ecological processes and loss of natural habitat have resulted in a moderate modification of the wetland. From the assessment, it is clear that the dam covers most of the wetland area, modifying the habitat, impeding/drowning wetland habitat and resulting in an artificial environment. Overflows and leakage from the dam have resulted in a very wet environment downstream of the dam wall that is expected to be different from the natural hydrology regime, although contributing towards an assorted range of wetland habitat.

TB10 Unchannelled Valley Bottom Wetland:

This site is located at the southernmost portion of the proposed site . The wetland extends upstream of the earthern dam, to where it flows into the Crocodile River. The wetland is characterised by vegetation conducive to wet conditions. Facultative tree species occur in large numbers, and obligate and facultative herbs, sedges and graminoids are present.

The following disturbances within the wetland's catchment were observed: sugarcane crops (34.7%), road crossings (9.6%), dwelling (2.4%), dumping (0.03%), etc. The untransformed area comprises 53.27% of the catchment and is in a reasonable condition (some mowing occurs, bush encroachment, etc.).

The following impacts occur within the wetland: a dam (5%), and road and footpath crossings (14%). The untransformed area makes up 81% of the wetland, and its condition is hindered by the presence of exotic and terrestrial species.

The hydrology of the wetland can be categorised as 'moderately modified' (a "C" PES Category), where a moderate change in ecological processes and loss of natural habitat has taken place, but the natural habitat remains predominantly intact. The wetland's catchment is dominated by sugarcane crops, with road crossings and a dwelling, resulting in an increase in peak flows due to a decrease in the roughness of the vegetation and hardening of surfaces.
The wetland is rated as having a "C" Category classification for Geomorphology while the current state of vegetation is regarded as 'largely modified', and loss of wetland/natural habitat and biota has occurred. The disturbed wetland reflects a "D" Category.

TB11 Valley Bottom Wetland:

This site is located near the access road to the site and new access road alignment. The wetland extends upstream from the road and downstream to the third road crossing, close to the Komatipoort municipal area (Figure 5-24). This wetland reflects many characteristics of a swamp forest. A swamp forest is a wetland ecosystem characterised by mineral soils with poor drainage, and tree-dominated vegetation.

The primary disturbance in the catchment is sugarcane crops comprising 93% of the surface area. The wetland has been altered by road crossings (11%) and an artificial canal (0.1%). The untransformed area (88.9%) is dominated by trees and shrubs, with scattered clumps of grass and sedges. The wetland has good forest cover with little sign of erosion.

The hydrology of the wetland can be categorised as 'largely modified' (a "D" PES Category), where a large change in the hydrological processes has taken place. The wetland can, therefore, be currently described as having a "C" Category.

TB12 Riparian (Crocodile River):

The Riparian Index of Habitat Integrity (RIHI) is a C (62.3%), with the main impacts being flooding events, grazing and trampling (stunted trees and shrubs), and the presence of exotic species. the main impacts include infrastructure within the riparian footprint, overgrazing and trampling resulting in exposed bare soils, exotic infestation and impacts on the water quality from sugar factory and housing developments. The present ecological status (PES) is a C.

- *Marginal Zone:* The dominant vegetation consists of grass and sedges. The substrate consists mainly of alluvial soils. The following grass and sedge species occur: *Cynodon dactylon,*

Panicum maximum, Sporobolus africanus, Leersia hexandra, Commelina diffusa subsp. scandens, Phragmites australis, Cyperus sexangularis, Schoenoplectus brachyceras, etc. Exotic vegetation such as the macrophyte, *Eichhornia crassipes* occurs in places along the edge of the active channel. Other exotic species such as *Flaveria bidentis, Ricinus communis, Centella asiatica, Sesbania bispinosa, Sesbania punicea,* etc. are also present.

- *Non*-marginal *zone:* The dominant vegetation consists of grass and scattered shrub species. Grazing and trampling have resulted in bare soil surface areas and trees being stunted due to continuous grazing and browsing. It appears that the woody species are trying to recover after past flood events. The substrate consists mainly of alluvial material and rocky dykes crossing the riverine area. The following woody species are dominant: *Euclea natalensis, Combretum imberbe, Dichrostachys cinerea, Gymnosporia senegalensis, Ziziphus mucronata, Acacia nigrescens, Philenoptera violacea, Phyllanthus reticulatus, Peltophorum africanum, Pluchea dioscoridis,* etc. Grass species, such as *Sporobolus africanus, Cynodon dactylon, Setaria sphacelata, Panicum deustum and Panicum maximum,* occur. *Cyperus sexangularis* and *Schoenoplectus spp*. are the dominant sedges. Some exotic vegetation, such as *Senna didymobotrya, Conyza bonariensis, Melia azedarach, Solanum mauritianum, Lantana camara, Parthenium hysterophorus, Sesbania punicea*, etc. were also found.

Refer to Appendix D.2 for the full Wetland Report.

19. VISUAL

A visual impact assessment was undertaken by NuLeaf Planning and Environmental in order to determine the possible visual impact of the proposed development.

A site visit as well as a desktop review was undertaken. No visual receptors were identified within the area with the exception of Shinshangeni Lodge, located within the KNP to the north east of the proposed site. Based on this, a decision was made to conduct a viewshed analysis from the perspective of Shishangeni Lodge in order to determine which areas of the proposed development site would be most visible to the Lodge. This allowed for visually exposed areas to be excluded from the development zones.

The northern and eastern boundaries of the properties are formed by the Kruger National Park and the Crocodile River. Cultivated farmlands (sugarcane) forms the western boundary and the town of Komatipoort lies to the south.

Land cover within the study area is characterised as being entirely natural with the KNP to the north and east, however cultivated lands can be found to the west and south with some urban development present. Land use is deemed predominately cultivation and recreation.

The town of Komatipoort is the largest populated town just outside the study area and is situated approximately 3 km south from the site. Shishangeni Lodge is located 500m to the north east of the proposed development site, within the KNP. Shishangeni is a 4-star lodge consisting of 22 individual chalets. Of note is that the chalets are orientated to the east and south east and do not look directly onto the proposed development site.

The visual quality of the broader study area is moderate to high, generally as a result of the large areas given over to conservation within the region. There is no evidence of widespread erosion or natural degradation, and development, where this occurs, is domestic and residential in nature.

Tourists and residential receptors in natural contexts are more sensitive than those in more built-up contexts, due to the absence of visual clutter in these undeveloped and undisturbed areas. In this regard, Shishangeni Lodge is considered to be highly sensitive to visual intrusion.

Overall, the Visual Absorption Capacity (VAC) of the site and surrounds is moderate to high, mainly due to the vegetation being intact and undisturbed and the KNP bordering the site. Towards the centre of the site, the VAC is considered to be high, while the edges of the property have a low-moderate VAC owing to the vegetation having been cleared for the road that circles the property.

Refer to Appendix D5 for the full Visual Impact Assessment.

SECTION C: PUBLIC PARTICIPATION

1. ADVERTISEMENT AND NOTICE

An advertisement was placed in the Corridor Gazette on 11 November 2020. Site notices were placed at the following locations in and around the proposed property on 27 October 2020:

Site Notice Position	Latitude	Longitude
Entrance gate to the proposed property	25°25'20.82"S	31°57'28.11"E
Entrance gate to the proposed property	S25°23'59.73"	E31°57'22.38"
Crocodile Bridge Gate	S25°21'29.91"	E31°53'34.94"

2. DETERMINATION OF APPROPRIATE MEASURES

The following details the measures taken to include all potential I&APs as required by Regulation 41 and 42 of GN 326:

- A list of interested and affected parties (I&AP's), as well as, compliance authorities was compiled inclusive of Local and District Municipalities, local landowners and environmental organizations.
- Written notification of the proposed development, including a background information document, was sent to all identified I&AP's and Compliance Authorities on 13 November 2020.
- A printed advertisement was placed in the Corridor Gazette, a local publication, on 11 November 2020.
- Site notices were placed at the entrances to the affected property and at Crocodile Bridge Gate on 2 November 2020.
- Flyers were placed in local residents post boxes/ fences on 11 November 2020.

The following key stakeholders (other than organs of state) identified in terms of Regulation 41 and 42 of GN 326 were notified:

Name	Affiliation	Contact Details
Chris Auty	Shishangeni Lodge	gm@shishangeni.com
Greg Beyer	RCL Foods	Greg.beyers@rclfoods.com
Wehncke van der Merwe	SANParks	bufferzone@kruger2canyons.org
Nancy O'Farrel	Malalane Irrigation Board	nancy@rmputter.co.za

Proof of stakeholder engagement is included in Appendix E.2.

3. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

Interested and Affected Party	Issue
Greg Buyers- RCL	Will water and waste be municipal
Wehncke van der Merwe- SANParks	How human wildlife conflict will be addressed Development densities Water Supply Noise management Impacts on the riparian vegetation How waste will be managed to minimise impacts on the water system Safety and security

4. COMMENTS AND RESPONSE REPORT

Please refer to Appendix E for the comments and response report.

5. AUTHORITY PARTICIPATION

Authorities and organs of state identified as key stakeholders:

Authority/ Organ of State	Contact Person	Contact Details
DARDLEA	Robyn Luyt	rluyt@mpg.gov.za
Ehlanzeni District Municipality	Pretty Masego	pmashego@ehlanzeni.gov.za
Nkomazi Local Municipality	Shirely Shabungu	Shirely.shabangu@nkomazi.gov.za
DAFF	Themba Khoza	khozab@daff.gov.za
MTPA	Frans Krige	Frans.krige@mtpa.co.za
DWS	Silo Kheva	khevas@dws.gov.za

Refer to Appendix E.4 for proof that the Authorities and Organs of State received written notification of the proposed activities.

6. CONSULTATION WITH OTHER STAKEHOLDERS

Refer to Appendix E.5 for a list of registered I&APs.

SECTION D: IMPACT ASSESSMENT

1. IMPACTS THAT MAY RESULT FROM THE PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL, DECOMMISSIONING AND CLOSURE PHASES AS WELL AS PROPOSED MANAGEMENT OF IDENTIFIED IMPACTS AND PROPOSED MITIGATION MEASURES

All potential environmental impacts, both positive and negative, have been identified for the entire lifecycle of the project i.e. Planning / design, construction and operations. The decommissioning of the proposed development is not anticipated and has therefore not been assessed.

1.1. Impact assessment

Activity	Impact summary	Significance	Proposed mitigation
Preferred Alternative (Alternative 1)			
Planning and Design Phase	*Direct impacts:*		
	Ground Water		
	None.		
	Hydrology (Surface Water)		
	Risk to ecological function of the riparian habitat along the Crocodile River and drainage lines	27 L	• Management as per the EMPr Section 7.1.2.
	Risk to hydrological function (quality and fluctuation properties) along the Crocodile River and drainage lines	36 M	
	Soil		
	Erosion risk to soils	27 L	• Management as per the EMPr Section 7.2.1.
	Air		
	None.		
	Biodiversity (Flora)		
	Risk to critical biodiversity areas and ecological support areas	27 L	• Management as per the EMPr Section 7.2.2 & 7.2.3.
	Risk to sensitive habitats, specifically riparian zones	30 L	
	Risk to Conservation Important Species and protected trees. i.e. *Aloe komatiensis (VU), and Dalbergia melanoxylon (NT), Sclerocarya birrea, Boscia albitrunca, Combretum imberbe, Afzelia quanzensis, Philenoptera violacea and Elaeodendron transvaalense, Aloe chabaudii, A. marlothii, A. spicata, A. komatiensis, Eulophia petersii, Stapelia gigantea and Pachypodium saundersii and the trees Spirostachys africana and Berchemia zeyheri*	20 L	
	Biodiversity (Fauna)		
	Risk to habitat for conservation important fauna and habitat fragmentation	27 L	• Management as per the EMPr Section 7.2.4.
	Land use and Agricultural potential		
	None.		
	Heritage		
	None.		
	Visual		
	Risk to visual quality of the surrounding area and sense of place	22 L	• Management as per the EMPr Section 7.4.1.
	Socio-economic		
	None.		
	Municipal services and Traffic		
	None.		
	Indirect impacts:		
	None.		

Activity	Impact summary	Significance	Proposed mitigation
	Cumulative impacts:		
	Biodiversity (Flora)		
	Cumulative reduction of Conservation Important Species and protected trees. i.e. *Aloe komatiensis (VU), and Dalbergia melanoxylon (NT), Sclerocarya birrea, Boscia albitrunca, Combretum imberbe, Afzelia quanzensis, Philenoptera violacea and Elaeodendron transvaalense, Aloe chabaudii, A. marlothii, A. spicata, A. komatiensis, Eulophia petersii, Stapelia gigantea and Pachypodium saundersii and the trees Spirostachys africana and Berchemia zeyheri.*	28 L	• Management as per the EMPr Section 7.2.2 & 7.2.3.
	Biodiversity (Fauna)		
	Cumulative loss of faunal habitat.	20 L	• Management as per the EMPr Section 7.2.4.
Construction Phase	*Direct impacts:*		
	Ground Water		
	Depletion of ground water due to overuse and waste during construction activities	14 L	• Management as per the EMPr Section 8.2.1
	Pollution and contamination of ground water	18 L	
	Hydrology (Surface Water)		
	Disturbance and loss of ecological function of the habitat (physical structure) along the Crocodile River and drainage lines	16 L	• Management as per the EMPr Section 8.2.2 & 8.2.3
	Disturbance and loss of hydrological function (quality and fluctuation properties) of the Crocodile River and the drainage lines	24 L	
	Flow modification due to concentrating flows and storm water runoff from hard surfaces especially roads.	18 L	
	Pollution and contamination of surface water of the Crocodile River and drainage lines	30 L	
	Soil		
	Soil contamination and pollution	18 L	• Management as per the EMPr Section 8.3.1, 8.3.2 & 8.3.3.
	Soil erosion by wind and rain	18 L	
	Soil compaction	18 L	
	Air		
	Air pollution due emissions from construction vehicles and equipment.	24 L	• Management as per the EMPr Section 8.3.4.
	Dust liberated by general construction activities and	21 L	

Activity	Impact summary	Significance	Proposed mitigation
	movement of construction vehicles.		
	Smoke from open fires used by site staff for heating and cooking as well as from uncontrolled fires	21 L	
	Biodiversity (Flora)		
	Removal of invader alien species found on site (positive impact).	*50* *M*	• Management as per the EMPr Section 8.3.5, 8.3.6 & 8.3.7.
	Loss of critical biodiversity areas and ecological support areas	30 L	
	Destruction of riparian areas	36 M	
	Disturbance and impacts on the riparian areas due to vegetation removal and the generation of dust	27 L	
	Disturbance of sensitive habitats such as riparian and high biodiversity areas	48 M	
	Destruction and damage to Conservation Important Species and protected trees. i.e. *Aloe komatiensis (VU), and Dalbergia melanoxylon (NT), Sclerocarya birrea, Boscia albitrunca, Combretum imberbe, Afzelia quanzensis, Philenoptera violacea and Elaeodendron transvaalense, Aloe chabaudii, A. marlothii, A. spicata, A. komatiensis, Eulophia petersii, Stapelia gigantea and Pachypodium saundersii and the trees Spirostachys africana and Berchemia zeyheri*	24 L	
	Increase in exotic vegetation/alien species and bush encroachment into disturbed soils and areas	26 L	
	Biodiversity (Fauna)		
	Loss of faunal habitat	22 L	• Management as per the EMPr Section 8.3.8 & 8.3.9.
	Impoverishment of populations of important fauna confirmed on site	27 L	
	Disturbance of fauna along the Crocodile River within KNP due to noise from worker and construction vehicles.	32 M	
	Loss of general faunal habitat and ecological connectivity.	20 L	
	Mortality of fauna	18 L	
	Increased illegal harvesting of plant and animal resources	22 L	
	Poaching and snaring of fauna on site and in the greater Kruger National Park	27 L	
	Increased opportunity for smuggling of poached items out of the site and KNP	27 L	
	Land use and Agricultural potential		
	None.		

Activity	Impact summary	Significance	Proposed mitigation
	Heritage		
	Possible discovery of new important artefacts (positive impact)	*16 L*	• Management as per the EMPr Section artefacts N 8.5.1 & 8.5.2
	Damage to and / or destruction of archaeological, paleontological or historical artefacts unearthed during construction	8 N	
	Visual		
	Visual impact of construction, lighting and dust on sensitive visual receptors i.i. Shishangeni Lodge owing to the presence of construction equipment, camps and workers.	10 N	• Management as per the EMPr Section 8.6.1
	Visual impact of construction, lighting and dust on conservation areas within the region (KNP).	24 L	
	Socio-economic		
	Stimulation of the local economy, especially the local service delivery industry (i.e. accommodation, catering, cleaning, transport and security, etc.)(positive impact)	*24 L*	• Management as per the EMPr Section 8.7.1 & 8.7.2.
	Creation of short-term employment and business opportunities and the opportunity for skills development and on-site training (Positive impact).	*36 M*	
	Noise, dust and safety impacts and disturbance to adjacent tourism developments and KNP	27 L	
	An increase in construction workers and associated increase in social problems for the community	16 L	
	Increase in casual workers and associated increase in poaching.	24 L	
	Increased risk of veld fires due to the presence of construction workers on site.	21 L	
	Municipal services and Traffic		
	Increase in traffic on the local roads and other roads due to construction vehicles.	21 L	• Management as per the EMPr Section 8.7.3.
	Increase in the number and frequency of construction vehicles accessing the site and the resultant noise, dust, and safety impacts on other road users, residents of the local community and adjacent tourism developments.	21 L	
	Indirect impacts:		
	Biodiversity (Flora)		
	Loss of floral biodiversity, plant species of conservation importance and protected trees	22 L	• As above
	Biodiversity (Fauna)		

Activity	Impact summary	Significance	Proposed mitigation
	Loss of faunal biodiversity due to increased incidence of veld fires	20 L	• As above
	Socio-economics		
	Loss of property and threat to human life due to increased incidence of veld fires	16 L	• As above
	Traffic and services		
	Degradation of local roads due to the increase in the numbers of heavy vehicles.	21 L	• As above
	Cumulative impacts:		
	Biodiversity (Flora)		
	Cumulative loss of critical biodiversity areas and ecological support areas	33 M	• Management as per the EMPr Section 8.3.5, 8.3.6 & 8.3.7.
	Cumulative loss of ecological function of sensitive habitats.	26 L	
	Cumulative reduction and damage to Conservation Important Species and protected trees. i.e. *Aloe komatiensis* (VU), and *Dalbergia melanoxylon* (NT), *Sclerocarya birrea, Boscia albitrunca, Combretum imberbe, Afzelia quanzensis, Philenoptera violacea* and *Elaeodendron transvaalense, Aloe chabaudii, A. marlothii, A. spicata, A. komatiensis, Eulophia petersii, Stapelia gigantea and Pachypodium saundersii and the trees Spirostachys africana and Berchemia zeyheri*	24 L	
	Biodiversity (Fauna)		
	Cumulative loss of faunal habitat.	24 L	•
	Socio-economics		
	Community upliftment and the opportunity to up-grade and improve skills levels in the area (positive impact)	*24* *L*	• Management as per the EMPr Section 8.7.1 & 8.7.2.
	Traffic and services		
	Cumulative increase in traffic and the resultant noise, dust, and safety impacts on other road users, residents of the local community and adjacent tourism developments.	16 L	• Management as per the EMPr Section 8.7.3.
Operational Phase	*Direct impacts:*		
	Ground Water		
	Depletion of ground water resources due to over use and waste during operation.	18 L	• Management as per the EMPr Section 9.1.1.
	Pollution and contamination of ground water	22 L	
	Hydrology (Surface Water)		
	Disturbance and loss of ecological function of the habitat (physical structure) along the Crocodile River	18 L	• Management as per the EMPr Section 9.1.2, 9.1.3 & 9.1.4.

Activity	Impact summary	Significance	Proposed mitigation
	and drainage lines		
	Pollution and contamination of surface water	20 L	
	Disturbance and loss of hydrological function (quality and fluctuation properties) along the Crocodile and drainage lines	18 L	
	Soil		
	Soil contamination and pollution	18 L	• Management as per the EMPr Section 9.2.1 & 9.2.2.
	Soil erosion	18 L	
	Air		
	Air pollution by emissions from increased numbers of vehicles	33 M	• Management as per the EMPr Section 9.2.3.
	Biodiversity (Flora)		
	Loss of critical biodiversity areas and ecological support areas	18 L	• Management as per the EMPr Section 9.2.4, 9.2.5 & 9.2.6
	Disturbance of sensitive habitats such as riparian and high biodiversity areas	27 L	
	Destruction and damage to Conservation Important Species and protected trees. i.e. *Aloe komatiensis* (VU), and *Dalbergia melanoxylon* (NT), *Sclerocarya birrea, Boscia albitrunca, Combretum imberbe, Afzelia quanzensis, Philenoptera violacea* and *Elaeodendron transvaalense, Aloe chabaudii, A. marlothii, A. spicata, A. komatiensis, Eulophia petersii, Stapelia gigantea and Pachypodium saundersii and the trees Spirostachys africana and Berchemia zeyheri*	20 L	
	Increase in exotic vegetation/alien species and bush encroachment into disturbed soils and areas in the event that the rehabilitation process is not successful.	22 L	
	Biodiversity (Fauna)		
	Loss of faunal habitat	18 L	• Management as per the EMPr Section 9.2.7, 9.2.8 & 9.2.9.
	Faunal disturbances especially along the Crocodile river in KNP, displacement of taxa and changes in distribution	27 L	
	Mortality of fauna	20 L	
	Poaching and snaring of faunal species by staff.	24 L	
	Land use and Agricultural potential		
	None.		•
	Heritage		
	None.		•
	Visual		

Activity	Impact summary	Significance	Proposed mitigation
	Potential visual impact on sensitive visual receptors in close proximity to the proposed developments i.e Shishangeni Lodge.	14 L	Management as per the EMPr Section 9.4.1.
	Potential visual impact on sensitive visual receptors within the region.	20 L	
	Potential visual impact on protected and conservation areas (i.e. Kruger National Park) within the study area.	20 L	
	The potential visual impact of safety and security lighting of the developments at night on sensitive visual receptors in close proximity i.e. Shishangeni Lodge and KNP	16 L	
	Socio-economic		
	Stimulation of the local economy, especially the local service delivery industry (accommodation, catering, cleaning, transport, security etc.) (positive impact)	*33* *M*	Management as per the EMPr Section 9.5.1.
	Creation of long term employment and business opportunities as well as opportunities for skills development and transfer (positive impact)	*56* *M*	
	Creation of opportunities for local SMME's (positive impact)	*48* *M*	
	Impact on adjacent land uses, activities and Shishangeni Lodge.	8 N	
	Municipal services and Traffic		
	Operational cost of running services and infrastructure, specifically electricity	44 M	• Management as per the EMPr Section 9.5.2.
	Increase in traffic on the local roads and on other roads due to increased visitor numbers.	30 L	
	Increase in the number and frequency of vehicles accessing the site, and the resultant noise, dust, and safety impacts on other road users, residents of the local community and adjacent tourism developments.	20 L	
	Indirect impacts:		
	Visual		
	Visual impact of the proposed development on the sense of place and visual character of the region.	18 L	• Management as per the EMPr Section 9.4.1.
	Cumulative impacts:		
	Biodiversity (Flora)		
	Cumulative disturbance of sensitive habitats.	22 L	•
	Cumulative reduction and damage to Conservation Important Species and protected trees. i.e. *Aloe komatiensis* (VU), and *Dalbergia melanoxylon* (NT), *Sclerocarya*	24 L	

Activity	Impact summary	Significance	Proposed mitigation
	birrea, Boscia albitrunca, Combretum imberbe, Afzelia quanzensis, Philenoptera violacea and *Elaeodendron transvaalense, Aloe chabaudii, A. marlothii, A. spicata, A. komatiensis, Eulophia petersii, Stapelia gigantea and Pachypodium saundersii and the trees Spirostachys africana and Berchemia zeyheri*		
	Visual		
	The accumulation of built forms and within an otherwise natural environment.	22 L	• Management as per the EMPr Section 9.4.1.
	Socio-economics		
	Creation of permanent employment and skills and development opportunities for members from the local community and creation of additional business and economic opportunities in the area (positive impact)	*33* *M*	• Management as per the EMPr Section 9.5.1.
	Promotion of social and economic development in the local communities and improvement in the overall wellbeing of the community (positive impact)	*27* *L*	
	Services and traffic		
	Cumulative increase in traffic on local roads and on other roads due to increased visitor numbers.	18 L	•
	Cumulative increase in the number and frequency of vehicles accessing the site, and the resultant noise, dust, and safety impacts for other road users, adjacent tourism development and residents of the local communities	22 L	
	Waste disposal practices will have an accumulative effect on the local landfill site's capacity to absorb waste.	22 L	

Please refer to Appendix F for the full impact assessment.

2. ENVIRONMENTAL IMPACT STATEMENT

The entire study area is situated within the Ecological Support Areas (ESA): Protected Area Buffers unit. ESA's are "areas that are not essential for meeting (conservation) targets, but play an important role in supporting the functioning of CBA's and that deliver important ecosystem services" (Lötter et al., 2014). Protected Area Buffers are areas that surround proclaimed protected areas that moderate the negative impacts of land-uses that may affect the ecological functioning of those protected areas. The recommended land-use guidelines for these areas are to maintain in a functional, near-natural state but allowing for some habitat loss.

One small area in the far southern corner is classified as Critical Biodiversity Area (CBA): Irreplaceable. These are areas that are the most important in Mpumalanga for meeting biodiversity targets outside of formally protected areas and for conserving critical biodiversity ecosystems.

According to the MBSP freshwater assessment, the study area falls within an ESA Important Sub-catchment as it is a Fish Support Area (FSA), as per NFEPA. This particular FSA supports the Tiger Fish (*Hydrocynus vittatus*), a fish species of conservation concern.

According to the MBSP freshwater assessment, the study area is associated with one ESA wetland area and also includes two dams. The National Wetland Map 5 shows this ESA wetland area to be a riverine/ floodplain wetland (associated with the Crocodile River).

The study area borders the perennial Crocodile River and also includes several non-perennial rivers. According to the 2014 PES for South African rivers, the section of the Crocodile River flowing through this sub-catchment has a PES of 'D' (i.e. "Largely modified. A large loss of natural habitat, biota and basic ecosystem functions has occurred.").

Majority of the erven fall within the Plains Woodlands which has a moderate sensitivity rating. Six (6) erven and the reception fall within the Degraded woodlands which has a low sensitivity rating. However, approximately 8 bush erven encroach into the biodiversity area buffer which has a high sensitivity rating. Similarly, the new access road passes through vegetation and its buffer that has high biodiversity/conservation value and is rated as having a high sensitivity.

Two bird hides are to be located along the eastern boundary of the property in a high sensitivity area, while a third is to be constructed in the south west also in an area of high sensitivity.. An environmentally-friendly and tread light approach will be utilized for the construction of these bird hides/viewpoints. These hides will be on elevated platforms so that minimal vegetation clearing will have to take place.

All areas with a high sensitivity rating have been avoided with the exception of the 8 erven and 3 bird hides. Additionally, the 60 m buffer around the Crocodile River has been respected. The 1:100 year flood line is also respected.

Statement:

The proposed development site is acceptable for development and is not fatally flawed in any way. The construction impacts, if effectively managed according to the mitigation measures proposed in this report, specialist reports and the draft environmental management programme (EMPr), will mostly be of low significance, post mitigation. It should be noted that a moderate post mitigation significance rating is anticipated for the destruction of riparian habitat and placement of infrastructure within high biodiversity areas and disturbance of fauna along the Crocodile River. This is mainly due to the placement of infrastructure in areas of high sensitivity and along the fence line. No post mitigation impacts of high significance are expected.

Operational impacts can be similarly mitigated and residual impacts are expected to be of low significance overall. However, it should be noted that post mitigation significance is anticipated to be moderate in terms of air pollution due to emissions from an increase in the number of vehicles to the area and the operational cost of services pertaining to the use of Eskom power. No post mitigation impacts of high significance are expected.

Positive impacts include job creation and employment opportunities for both the construction and operational phases, skills transfer and development. Diversifying the tourism offerings within the region will also have an overall positive impact.

In light of the above discussion, it is recommended that the proposed development of a nature estate for residential purposes be supported on the condition that all mitigation measures mentioned in this report, the specialist reports and the draft EMPr are implemented and adhered to throughout the project lifecycle.

No-go Alternative

The No-go Alternative implies that the proposed development will not take place. In this scenario receiving environment will not be negatively impacted upon in any manner, particularly with regard to biodiversity and surface water.

It should be noted that while no negative impacts will be incurred, the same can be said for positive impacts such as, the creation of employment and job opportunities, skills transfer and development.

SECTION E. RECOMMENDATION OF PRACTITIONER

The proposed development of a nature estate for residential purposes will take place in predominately undisturbed areas. Limited encroachment into sensitive areas will occur and 1:100 flood line of the Crocodile River will be respected.

As discussed in the preceding section, all significant negative impacts can be successfully mitigated and managed to acceptable levels (moderate to low) during the entire project lifecycle.

All mitigation measures as detailed in this BAR, the attached specialist reports and the draft EMPr must be implemented and adhered to for all phases of the project i.e. planning, construction and operation.

In addition, the following specific recommendations apply:

Planning and Design

- All permanent structures and infrastructure must be located outside/above of the 1:100 year floodline.
- No construction camps should be allowed in or within 20m of riparian and/or wetland areas.
- The construction of pathways (disturbance zones) in or adjacent to the riparian and/or wetland areas is to be closely managed and strictly controlled to minimise damage to riparian and/or wetland areas.
- No development to take place over the larger exposed rocks within the Outcrop Woodland vegetation community, which has High SEI.
- A 10 m wide ecological buffer should be established around the outcrops, and this must be incorporated into conservation "open space" land, or can form part of an erf as long as no development takes place on the outcrop. The one exception is the current footprint containing the two tourist huts where development can take place on that exact footprint. This area has been slightly degraded historically.
- No development to take place within the Riparian Forest / Wetland Mosaic vegetation community or the ephemeral drainage lines and drier portions of the riparian forest/wetland. The following buffers are to be implemented:
    - 30 m conservation no development zone should be implemented in the three larger, wetter portions
    - 15 m conservation no development zone around the ephemeral drainage lines
- Construction should preferably take place during the low flow/winter months in order to minimise the risk of sediment and debris being washed into riparian and/or wetland areas.
- A follow-up survey in late summer (February to April) should be performed to search for the VU-listed Sensitive Plant Species No. 3 and the EN-listed Barleria oxyphylla, both of which potentially occur within the study area and flower in that period. If a population is confirmed, then a monitoring program needs to be implemented to check the health of these populations each year.

Construction

- No construction camps are allowed in or within 20m of riparian and/or wetland areas.
- No stockpile areas are to be located in or within 20m of riparian and/or wetland areas.
- A 50 m conservation buffer will be implemented around the two small colonies of *Aloe komatiensis*, and this area should be incorporated into conservation "open space" land.
- Each stand, lodge, road or other proposed development areas should be checked by an experienced botanist prior to clearing and all SCC or protected plants should be marked with hazard tape to indicate where development may not take place. These plants must remain in situ.
- Buffers zones as indicated below are to be demarcated and declared as no-go zones for the duration of the construction period:
    - TB01-07 (ephemeral) 15 m

    - TB08 (riparian) 35 m
    - TB09 (wetland) 30 m
    - TB10 (wetland) 30 m
    - TB11 (wetland) 30 m
    - TB12 (Riparian- Crocodile River) 60 m
- The construction of pathways (disturbance zones) in or adjacent to the riparian areas is to be closely managed and strictly controlled to minimize damage to riparian areas.
- Destruction of trees during construction to be kept to an absolute minimum. Permits will be required for the removal of protected trees.
- New infrastructure should not impact any large indigenous trees, wherever possible.
- Plan and develop outside riparian areas.
- In order to comply with the National Environmental Management: Biodiversity Act (Act No. 10 OF 2004), all listed invasive exotic plants as indicated in Appendix 1 of the ecology report should be targeted and controlled. This may necessitate the compilation of an alien plant control plan as at least 18 declared invasive species were recorded during fieldwork.
- The measures currently in progress to curb bush-encroachment from the indigenous shrub *Dichrostachys cinerea* should continue to operate.

Operation

- Remove all dumped and refuse material in the riparian area.
- Rehabilitation of disturbed riparian areas habitat should commence immediately after construction is completed.
- Management measures to eradicate and control alien plants need to be informed by a invasive species management program.
- Grounds staff should be trained to recognize and eradicate potential invasive plants.
- Undertake yearly removal of aliens within the area (done in summer) until equilibration is reached. This may take several years.
- Management should periodically search the natural bush in the general vicinity of the Lodge site in order to detect whether snaring is taking place.
- Yellow light bulbs should be utilized as they attract fewer insects and arachnids.
- Outside lighting should preferably be directed away (or “inland”) from the riparian zone.
- Internal lights should be shielded by blinds/curtains.
- No feeding of any animals is permitted anywhere.
- Noise should be kept to a minimum at night.

SECTION F: APPENDIXES

Appendix A: Maps

Appendix B: Photographs

Appendix C: Facility illustration(s)

Appendix D: Specialist reports

Appendix E: Public Participation

Appendix F: Environmental Management Programme (EMPr)

Appendix G: Impact Tables

Appendix H: Details of EAP and expertise

Appendix I: Specialist's declaration of interest

Appendix J: Additional Information
- J.1: Fossil Finds Procedure
- J.2: Services Report

APPENDIX A: MAPS

APPENDIX B: PHOTOGRAPHS

APPENDIX C: FACILITY ILLUSTRATIONS

APPENDIX D: SPECIALIST REPORTS
APPENDIX D.1: GEOTECHNICAL REPORT

APPENDIX E: PUBLIC PARTICIPATION

APPENDIX G: IMPACT TABLES

APPENDIX I: SPECIALIST DECLARATION

APPENDIX J: ADDITIONAL INFORMATION
APPENDIX J.1: FOSSIL FIND PROCEDURE