



ESTABLISHED 1926

LONDOLZI

LONDOLZI  
ROADS AND  
RURAL ABATTOIR:  
FINAL BASIC  
ASSESSMENT  
REPORT

**PROJECT:**

Final Basic Assessment Report for the development and upgrading of roads, and a rural abattoir on Marthly 258KU and Sparta 259KU, Londolozi Game Reserve, Sabi Sands Wildtuin, Bushbuckridge Local Municipality (MP325), Mpumalanga.

**REPORT DATE:**

30 June 2019.

**REFERENCE NUMBER:**

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## 1 INTRODUCTION

Emross Consulting was appointed by Londolozi Game Reserve to facilitate the process of applying for environmental authorisation and to undertake a basic assessment of proposed road developments and upgrades, and the development of a rural abattoir on the farm Sparta Farms 259KU in the Sabi Sands Wildtuin.

The management of Londolozi continues to strive towards achieving high standards and following global best practice. The long-term Vision as captured in their Management Plan for 2019 to 2029 states that:

**It is the Vision of Londolozi to balance the wildness of the reserve against the needs of an African Safari operation and global best practice land management within an inclusive philosophy in which the benefits of the consumptive use of its ecosystem goods and services is both sustainable and shared by neighbouring and affected communities and broader stakeholders.**

This Vision is unpacked into nine Management Objectives and two of these have bearing on these proposed developments and are as follows:

**To maintain the ecological integrity of the various natural habitats that occur on Londolozi through the application of appropriate management tools such as fire, clearing of bush encroachment, control of invasive and alien plants, erosion control, water provision and management, and the manipulation of animal population demographics.**

**Ensure that roads, quarries and the airstrip are optimally positioned in the landscape and are regularly maintained to mitigate negative impacts on the natural environment while enhancing access for game viewing.**

The first of these two Management Objectives speaks to the proposed development of a rural abattoir as a facility to support the continual efforts to reduce the impact of impala on the natural vegetation as this species is recognized as a habitat modifier; while the second speaks to the proposed road works. It has been recognized that a number of roads on the property are poorly positioned and required substantial maintenance effort to mitigate their impact on the environment. Therefore while the proposed road works includes the development of a total of 5.39km of new roads; a total of 11.96km are to be closed and rehabilitated. The intention with these proposed developments is therefore to facilitate the improved management effectiveness of Londolozi, which in the context of protected area management is a desirable goal to strive for.

## 2 ASSESSMENT DETAILS

### 2.1 The Environmental Assessment Practitioner

The Environmental Assessment Practitioner (EAP) responsible for undertaking the basic assessment and compiling this report is Mr. Kevan Zunckel working on behalf of Emross Consulting (Pty) Ltd., White River, Mpumalanga. Mr Zunckel has more than 30 years of experience as an ecologist and environmental scientist with an MSc Environmental Science

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from the University of Cape Town and affiliation with the South African Chapter of the International Association of Impact Assessments (IAIAsa – Membership number: 2396). His contact details are as follows and his full CV is included with this report as Annex A:

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## **2.2 Names and Expertise of Specialists**

In consideration of the EAPs experience both as an ecologist and environmental scientist, as well as the small scale of the proposed developments and low significance of potential impacts, it was not deemed necessary to commission additional specialist studies. A preliminary heritage assessment was commissioned however and was undertaken by Ms Annie van Deventer-Radford. The signed Declaration of Interest by the EAP is included in this report as Annex B together with details of the specialist and their declaration of interest.

## **3 DESCRIPTION OF PROPOSED ACTIVITY**

### **3.1 Locality of the Activities**

The proposed developments (as described in Section 3.2) are located within the Londolozi Game Reserve on Marthly 258 KU, portions 1, 2 and Remainder; and Sparta 259KU portion Remainder and 1. The Londolozi Game Reserve is located within the Sabi Sands Wildtuin (SSW). It falls within the Mpumalanga Province, the Ehlanzeni District Municipality (DC32) and the Bushbuckridge Local Municipality (MP325). The 21 digit Surveyor General codes for these properties are T0KU00000000025800001, T0KU00000000025800002, T0KU00000000025800000, T0KU00000000025900000 and T0KU00000000025900001 respectively. **Error! Reference source not found.** shows the locality of the property relative to important topographical and cadastral features.

The locality of the proposed new road developments and upgrades, and the rural abattoir are located throughout the property as can be seen in Figure 1 and Figure 2. Coordinates for each of the development components are provided in detail in the relevant sub-sections in Section 3.2.



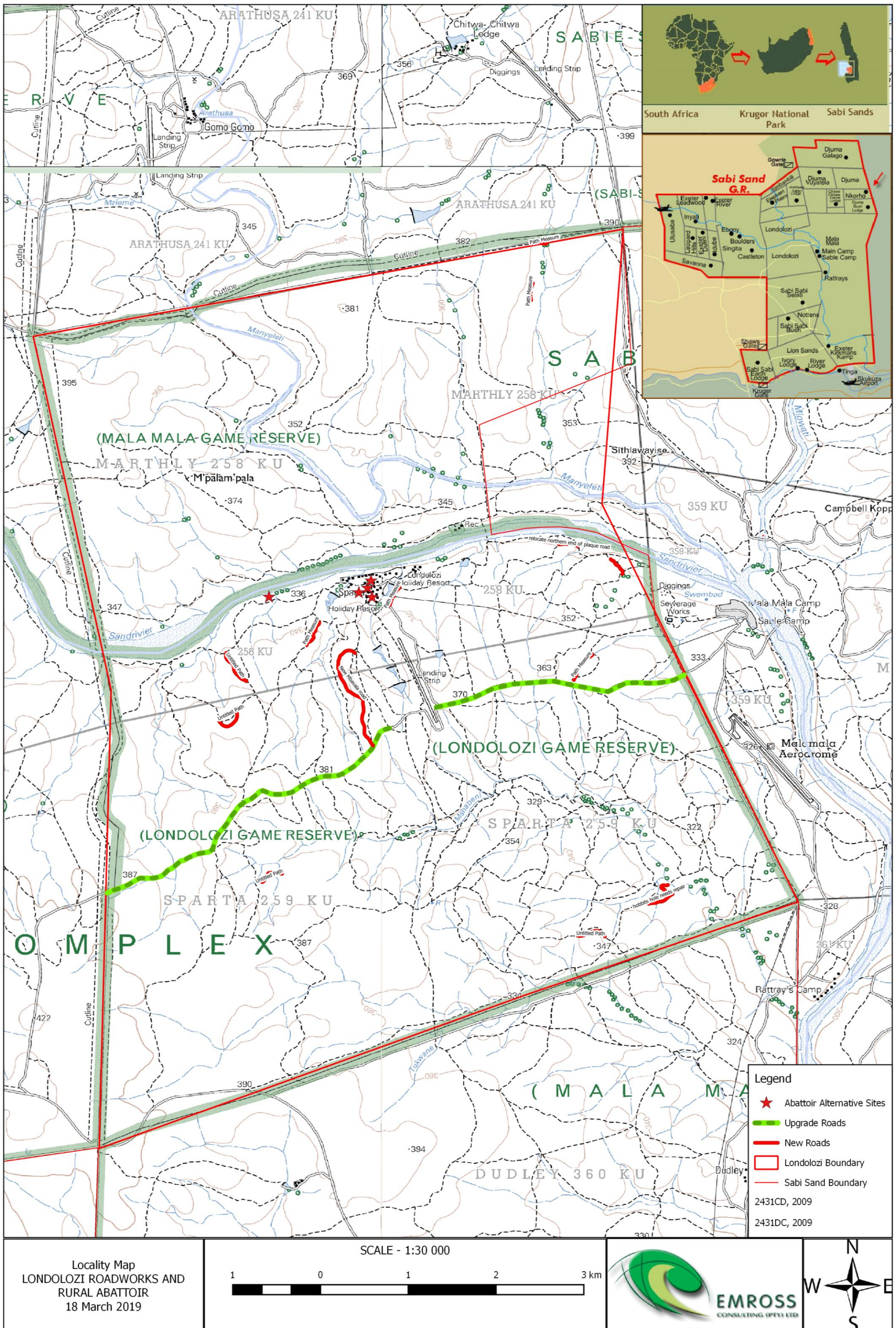


Figure 1: The locality of the proposed roadworks and Rural Abattoir in the Londolozi Game Reserve



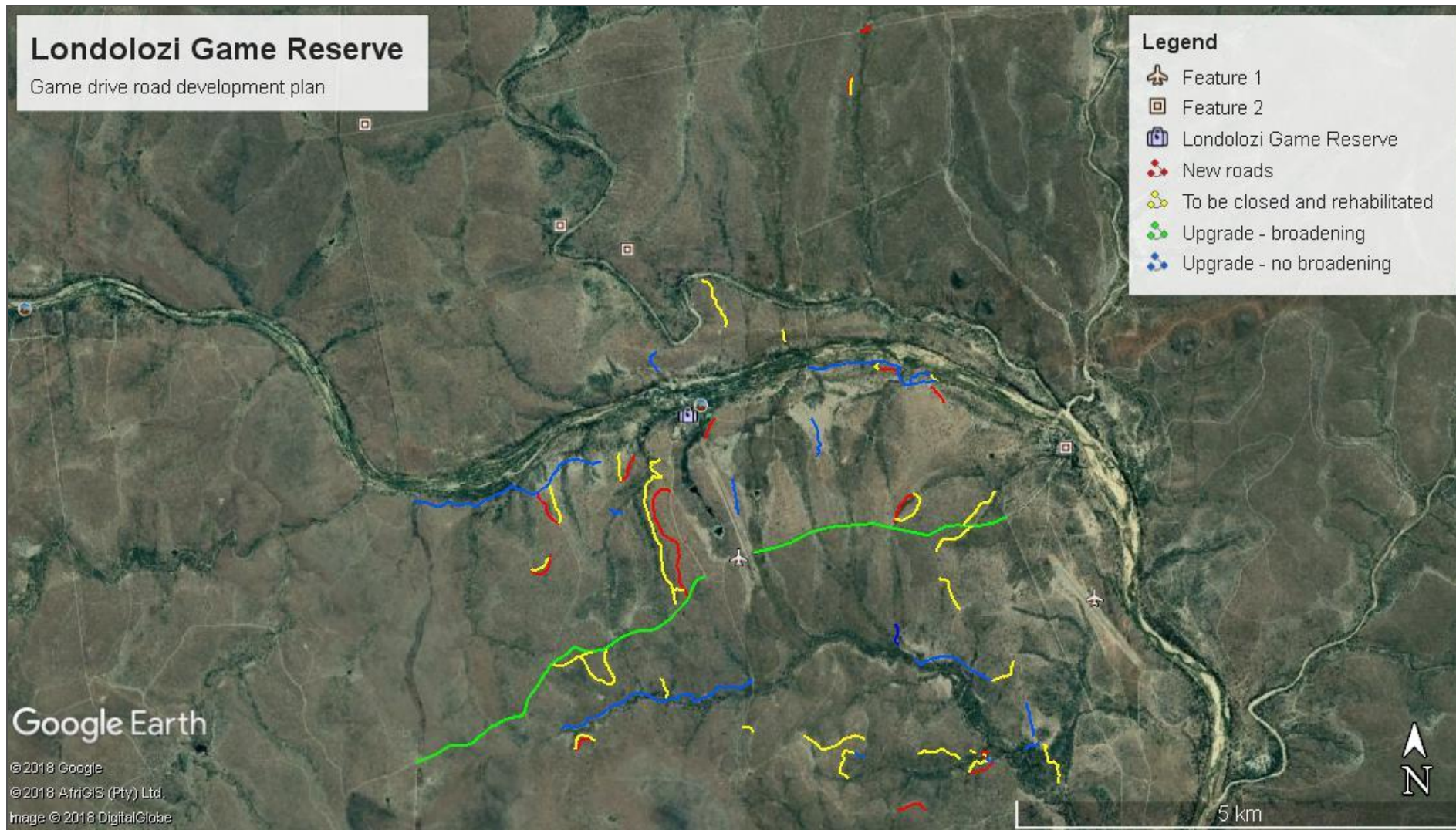


Figure 2: The locality of the proposed road works and Rural Abattoir in the Londolozi Game Reserve.

## **3.2 Description of Proposed Developments**

This Section provides a description of the proposed developments for which environmental authorisation is being sought. It is divided into two sub-Sections which deal with the road works and the rural abattoir respectively. Note that in both instances there will be no need for construction staff and their vehicles and equipment to be accommodated on site.

### **3.2.1 Road Works**

Londolozi wish to improve their road network in order to significantly reduce the environmental impacts while enhancing the game viewing experience for their guests. As such the planned road works includes the closure and rehabilitation of 27 roads totalling 11.96km (see the roads marked in yellow in **Error! Reference source not found.**); the upgrading of 14 existing roads within their current footprint totalling 10.44km (see the roads marked in blue in **Error! Reference source not found.**); the upgrading and broadening of two roads, one of 2.94km and another of 4.11km (see the roads marked in green in **Error! Reference source not found.**); and the development of eight (8) new roads totalling 3.44km (see roads marked in red in **Error! Reference source not found.**). As can be seen from these figures there will be an overall reduction in the road network.

Of the four groups listed above the new roads and those requiring access to adjacent materials for their upgrades are included in this assessment and application for environmental authorisation. The other two groups are mentioned here to provide important context.

All road works on Londolozi are guided by their existing Environmental Management Plan (EMP) for 2013 – 2018 and recently updated. The section of this EMP pertaining to roads is provided with this report as Annex C as well as in the stand-alone EMPr.

#### **3.2.1.1 New Roads**

The eight new roads that total 3.44km are listed in Table 1 together with their individual lengths and start, mid and end point coordinates. In all instances coordinates are recorded either from the north to the south, or from the west to the east of the proposed routes.

*Table 1: The locality of the proposed new roads on Londolozi*

Road Name	Length in km	Coordinates		
		Start	Mid	End
Elmonskraal	0.5	24°48'18.28"S 31°28'55.38"E	24°48'23.86"S 31°29'0.24"E	24°48'29.10"S 31°29'5.37"E
Tsalala	0.29	24°48'4.81"S 31°29'35.07"E	24°48'7.81"S 31°29'31.97"E	24°48'11.17"S 31°29'29.23"E
Hobbits Hole*	0.55	24°49'54.56"S 31°31'55.92"E	24°49'58.73"S 31°31'50.92"E	24°50'1.02"S 31°31'41.69"E
Plaque	0.23	24°47'34.16"S 31°31'12.04"E	24°47'34.23"S 31°31'16.04"E	24°47'34.29"S 31°31'19.77"E
Circuit North	0.2	24°47'39.94"S	24°47'42.05"S	24°47'45.06"S

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Road Name	Length in km	Coordinates		
		Start	Mid	End
		31°31'34.50"E	31°31'36.72"E	31°31'38.02"E
New Mbavala	1.1	24°48'17.94"S 31°29'49.44"E	24°48'33.52"S 31°29'50.56"E	24°48'43.48"S 31°29'54.73"E
Inyathini South*	0.15	24°49'51.74"S 31°31'55.78"E	24°49'52.93"S 31°31'54.38"E	24°49'54.56"S 31°31'55.92"E
Circuit Pan*	0.42	24°48'16.58"S 31°31'25.54"E	24°48'21.42"S 31°31'20.92"E	24°48'27.35"S 31°31'18.43"E

All of the above roads are associated with existing roads in that their start and end points tie in to these. Some and/or portions of the proposed roads are within 32m of a watercourse and these are marked with an asterix in Table 1.

Each of these roads will not be constructed as such but will be developed as twin track roads through the repeated driving of a Land Rover over the route to create the twin tracks. The route will be carefully marked out in order to ensure that all protected trees, shrubs and geophytes are avoided. The route selection will also ensure that watercourse crossings, sensitive soils, seep lines, pans and termitariums are avoided.

The positioning and marking of the roads will be undertaken by the Londolozi Land Care Manager, who will also be responsible for the repeated driving of the Land Rover over the selected routes. No outside contractors will be employed for this work and no other machinery or earthworks will be required.

Photos showing the start and end points of each of the proposed new roads have been included in this report in Annex D. Wherever features such as termitariums and/or protected trees species occur in these photos, the routing will avoid them.

### **3.2.1.2 Road Upgrades**

Two roads are scheduled for upgrades which require access to material within one meter of each side to facilitate infilling and restructuring. These two roads are the Main Roads East and West and measure 2.94km and 4.11km respectively and are marked in green in **Error! Reference source not found..** A typical impression of Main Road West can be seen in Figure 3. The difference between the two roads is that Main Road West is the primary access route into the Londolozi Camps and Staff Village and therefore carries all traffic, while Main Road East is essentially limited to game drive and management vehicles. As a result Main Road East is less incised and even maintains a vegetated centre (see Figure 4). The start, mid and end point coordinates showing the localities of these two existing roads are captured in Table 2.

*Table 2: Coordinates for the start, mid and end point of the two roads to be upgraded*

Road Name	Length in km	Coordinates		
		Start	Mid	End
Main Road West	4.11	24°49'53.85"S 31°28'10.39"E	24°49'15.13"S 31°29'8.91"E	24°48'47.80"S 31°30'3.33"E



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Road Name	Length in km	Coordinates		
		Start	Mid	End
Main Road East	2.49	24°48'39.60"S 31°30'22.35"E	24°48'30.21"S 31°31'16.00"E	24°48'26.35"S 31°32'2.78"E



Figure 3: A section of Main Road West that is typical of both which require upgrading (© KL Zunckel)

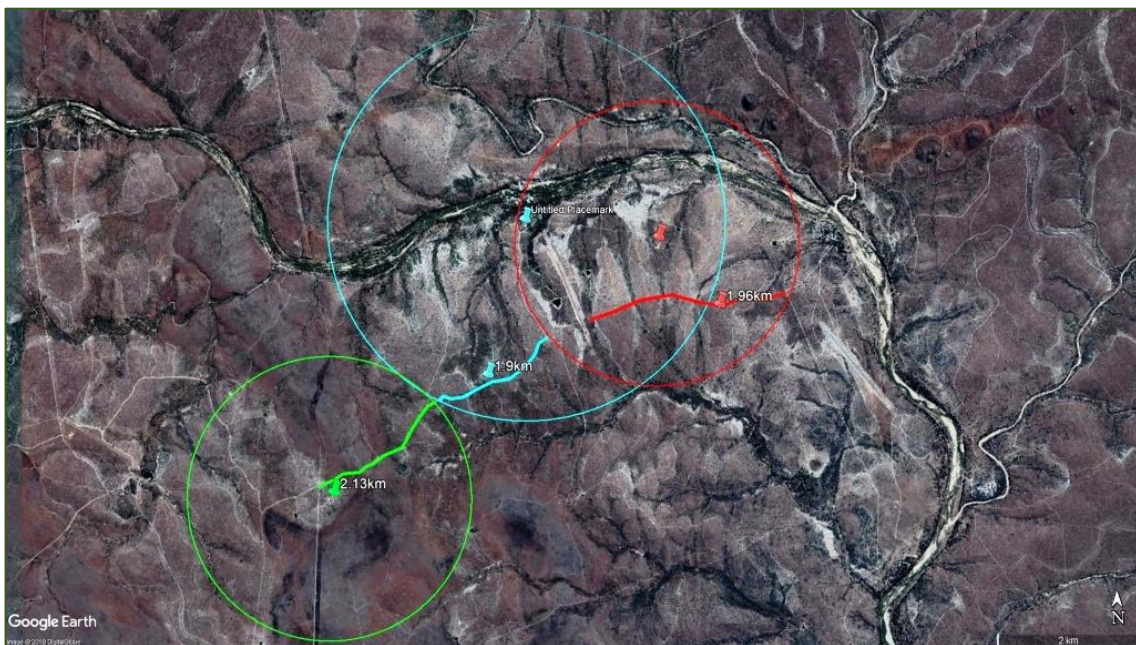




*Figure 4: A typical view of Main Road East with a vegetated centre (© KL Zunckel)*

The plan is to access material for the upgrading from within one meter of each side of the roads through scraping the soil into the road to obtain the required shape. However, Londolozi have access to fill material from the development of their solar power facility which is in the current footprint of the Camps and Staff Village. This facility is being installed on a portion of the staff football field and is being recessed in order to avoid its visual impact on the surrounding area. Approximately 100m<sup>3</sup> of material is to be obtained from this source, otherwise any additional material required will be obtained from existing borrow pits on the properties. The shortfall will be made up from the scraping of material from within one meter of the sides of each road.

Figure 5 illustrates the localities of fill material that will be used to upgrade Main Roads West and East. The light blue pin and circle relates to the 100m<sup>3</sup> available from the solar farm which will be applied to sections of both Main Road West and East. The light green pin and circle illustrates the western portion of Main road West that will be serviced from the borrow pit on the western boundary. The red pin illustrates the locality of the borrow pit from which material will be obtained for the eastern portion of Main Road East.



*Figure 5: The source of fill material for the upgrading of Main Road West and East.*

Where material is obtained from the side of the roads, important features such as ephemeral pans and protected trees and shrubs will be avoided. Geophytes will be carefully removed and replanted in close proximity. No material will be removed from the side of the roads within the buffer to the one watercourse crossing on Main Road West. This is a 2<sup>nd</sup> order non-perennial watercourse that drains northwards into the Sand River. The crossing is at 24°49'43.19"S and 31°28'36.65"E and is buffered according to the illustration provided in Figure 6.

The equipment to be used is a standard road grader (see Figure 7), with two 10m<sup>3</sup> tipper trucks, a Tractor-Loader-Backhoe (TLB) and three tractor/trailer combinations.

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The 1m strips from which material is obtained along the sides of the roads will be rehabilitated through the application of an indigenous grass seed mix and brush packing. Brush will be obtained from the clearing of bush encroached areas which is a standard annual operation on the properties.



*Figure 6: The buffering of the watercourse crossing (24°49'43.19"S & 31°28'36.65"E) on Main Road West shown in red 17m to the west and 27m to the east.*



*Figure 7: A standard road grader to be used in the upgrading of Main Roads West and East.*



**3.2.1.3 Road Closures**

The 8.78km of road closures are being put forward as a positive aspect of this application and therefore their localities are provided for possible inclusion as a condition of authorisation. The start, mid and end points of these 18 roads are captured in Table 3 as they occur on the property from the north to the south. The coordinates for roads with an approximate longitudinal orientation are captured from north to south, while those with a latitudinal orientation are captured from west to east.

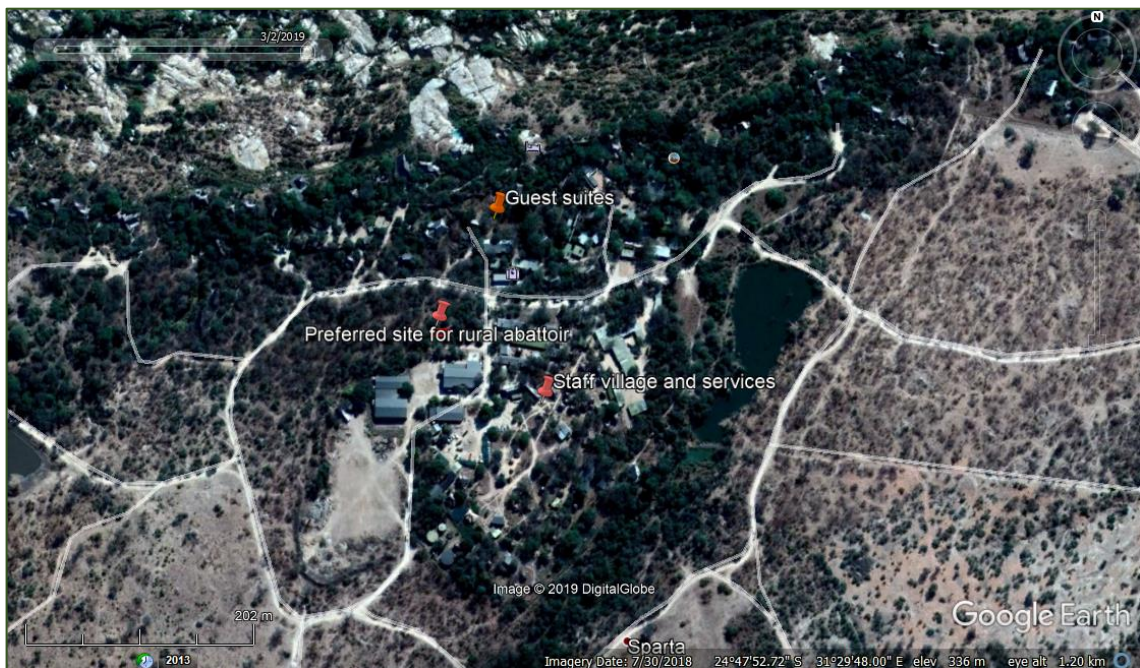
*Table 3: The start, mid and end point of the roads identified for closure*

Road number from north to south	Length in km	Coordinates		
		Start	Mid	End
1	0.66	24°47'0.92"S 31°30'1.53"E	24°47'9.70"S 31°30'7.77"E	24°47'17.72"S 31°30'11.14"E
2	0.14	24°47'18.79"S 31°30'34.04"E	24°47'20.77"S 31°30'34.65"E	24°47'23.08"S 31°30'35.03"E
3	0.33	24°48'2.99"S 31°29'29.39"E	24°48'9.12"S 31°29'29.03"E	24°48'13.89"S 31°29'29.70"E
4	1.98	24°48'5.27"S 31°29'45.15"E	24°48'31.38"S 31°29'42.55"E	24°48'58.09"S 31°29'51.46"E
5	0.11	24°47'35.01"S 31°31'33.02"E	24°47'36.25"S 31°31'34.08"E	24°47'37.25"S 31°31'35.47"E
6	0.49	24°48'13.74"S 31°29'1.26"E	24°48'21.02"S 31°29'3.42"E	24°48'28.70"S 31°29'5.39"E
7	0.13	24°48'52.96"S 31°29'50.59"E	24°48'52.60"S 31°29'53.25"E	24°48'52.44"S 31°29'55.52"E
8	0.53	24°48'17.69"S 31°31'25.69"E	24°48'24.35"S 31°31'26.76"E	24°48'27.14"S 31°31'18.69"E
9	0.55	24°48'29.36"S 31°31'45.90"E	24°48'22.09"S 31°31'52.27"E	24°48'16.87"S 31°31'58.74"E
10	0.55	24°48'39.14"S 31°31'35.36"E	24°48'34.37"S 31°31'42.27"E	24°48'29.56"S 31°31'49.24"E
11	1.27	24°49'18.68"S 31°29'3.19"E	24°49'21.25"S 31°29'17.02"E	24°49'13.79"S 31°29'24.00"E
12	0.14	24°49'16.66"S 31°29'14.42"E	24°49'15.61"S 31°29'16.51"E	24°49'14.81"S 31°29'18.63"E
13	0.50	24°49'51.40"S 31°31'3.09"E	24°49'54.55"S 31°30'57.89"E	24°50'0.85"S 31°31'0.15"E
14	0.55	24°49'51.72"S 31°31'28.13"E	24°49'50.12"S 31°31'37.23"E	24°49'54.04"S 31°31'44.75"E
15	0.10	24°49'51.23"S 31°31'48.75"E	24°49'51.37"S 31°31'49.98"E	24°49'52.01"S 31°31'51.07"E
16	0.04	24°49'52.86"S 31°31'53.91"E	24°49'52.75"S 31°31'54.46"E	24°49'52.76"S 31°31'54.97"E
17	0.31	24°49'58.96"S 31°31'48.49"E	24°49'55.03"S 31°31'51.48"E	24°49'54.55"S 31°31'55.72"E
18	0.40	24°49'25.88"S 31°31'57.53"E	24°49'23.64"S 31°32'4.90"E	24°49'18.37"S 31°32'6.57"E
<b>TOTAL</b>	<b>8.78</b>			

### 3.2.2 Rural Abattoir

The term “Rural Abattoir” is that used by the Mpumalanga Veterinary Services to describe the facility which Londolozi wish to build. The design and placement of the facility has been in consultation with Dr Kashmeel Singh of the Mpumalanga Veterinary Services. It will thus meet all their legal requirements according to the Meat Safety Act, 2000 (Act No. 40 of 2000), Game Meat Regulations No. 1371 of 4 November 2016, Draft for Public Comment. These requirements are extracted from the draft and are included in this report as Annex J.

The preferred locality for the Rural Abattoir is within the Service Zone of the Staff Village, as can be seen in Figure 8 and Figure 10, and the coordinates are 24°47'51.11"S and 31°29'54.00"E.



*Figure 8: The preferred locality for the proposed Rural Abattoir at Londolozi.*

A sketch plan of the proposed Rural Abattoir is provided at a scale of 1cm:1m in Figure 9. The components of the facility, moving from left to right, are as follows:

- Covered area outside the building;
- Skinning and Evisceration room;
- Deboning and processing room; and
- Chiller unit for storing carcasses.

The three rooms on the southern side are as follows:

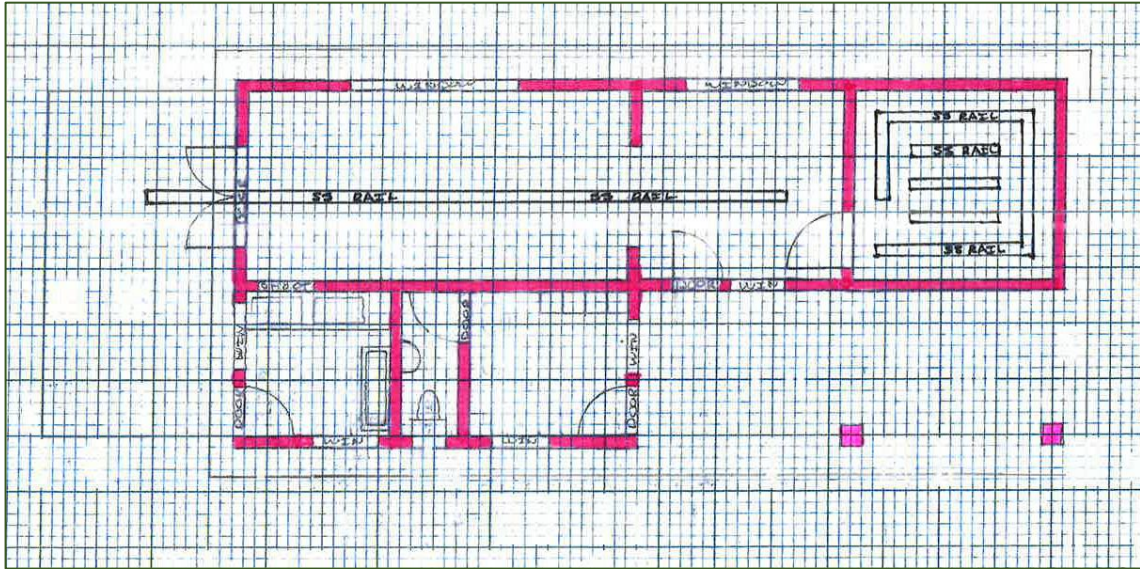
- Offal washing room;
- Staff toilet; and
- Staff changing room.



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The electricity, water and waste water services required for the operation of the facility will also be provided from the existing capacity. In addition to this a biogas digester will be installed to consume the organic waste that is generated.

The abattoir will be constructed using external contractors who will be required to carry out their work according to the section on “Construction and Renovation of Buildings” as per the Londolozi EMP and as captured in Annex E.



*Figure 9: A sketch plan of the proposed Rural Abattoir*

Construction on this facility will begin as soon as authorisation is obtained and will take eight to ten weeks to complete.





Figure 10: The preferred site for the proposed rural abattoir looking from the east, north south and west beginning at the top left and then in clockwise order (© R Crankshaw).

### 3.3 Listed Activities

The activities for which environmental authorisation is being sought are captured in Table 4:

Table 4: Listed activities relative to the development components

<b>Activities under Listing Notice 1 (National Environmental Management Act 107 of 1998, GN No. 983, GG 38282 of 4 December 2014, as amended in GG 40772, GN No. 327 of 7 April 2017)</b>	
<b>Description of project activity</b>	<b>Listed Activity 19</b>
The upgrading of Main Road West where there is one watercourse crossing.	The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse.
<b>Activities under Listing Notice 3 (National Environmental Management Act 107 of 1998, GNR 985, GG 38282 of 4 December 2014, as amended in GG 40772, GN No. 324 of 7 April 2017)</b>	
<b>Description of project activity</b>	<b>Listed Activity 12</b>
The scraping of soil from within one meter of either side of Main Road East and West, and the development of the eight new roads through untransformed indigenous vegetation.	The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan in Mpumalanga: iii. On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning or proclamation in terms of NEMPAA.
<b>Listed Activity 14</b>	
The upgrading of Main Road West where there is one watercourse crossing.	The development of (ii) infrastructure or structures with a physical footprint of 10 square metres or more; where such development occurs (a) within a watercourse, in Mpumalanga i. Outside urban areas: (aa) A protected area identified in terms of NEMPAA
<b>Listed Activity 23</b>	
The upgrading of Main Road West where there is one watercourse crossing.	The expansion of (ii) infrastructure or structures where the physical footprint is expanded by 10 square metres or more; where such expansion occurs— (a) within a watercourse; in Mpumalanga: i. Outside urban areas: (aa) A protected area identified in terms of NEMPAA, excluding conservancies.
<b>Listed Activity 26</b>	
All of the activities associated with the proposed projects cumulatively exceed the thresholds related to the clearing of indigenous vegetation, i.e. the development of eight new roads, the upgrading of two existing roads and the development of the rural abattoir.	Phased activities for all activities- i. Listed in this Notice and as it applies to a specific geographic area, which commenced on or after the effective date of this Notice; or ii. Similarly listed in any of the previous NEMA notices, and as it applies to a specific geographic area, which commenced on or after the effective date of such previous NEMA Notices- Where any phase of the activity was below a threshold but where a combination of the phases, including expansions or extensions, will exceed a specified threshold. All the areas as identified for the specific activities listed in this Notice.

### 3.4 Project Sector

The sector within which the project falls is “Services - hospitality” and “Transformation of land – indigenous vegetation” is also relevant.

## 4 ACTIVITY CONTEXT AND ENVIRONMENTAL FACTORS

### 4.1 Activity Compatibility

From a provincial perspective the Mpumalanga Spatial Development Framework (SDF) was consulted to assess the compatibility of the proposed development with this provincial planning tool. As can be seen from the extracts from the 2014 SDF in Figure 11 below, the provincial planning recognises the SSW as a private nature reserve that is part of the Regional Spatial Development Initiative known as the Kruger to Canyon or K2C (bottom left map).

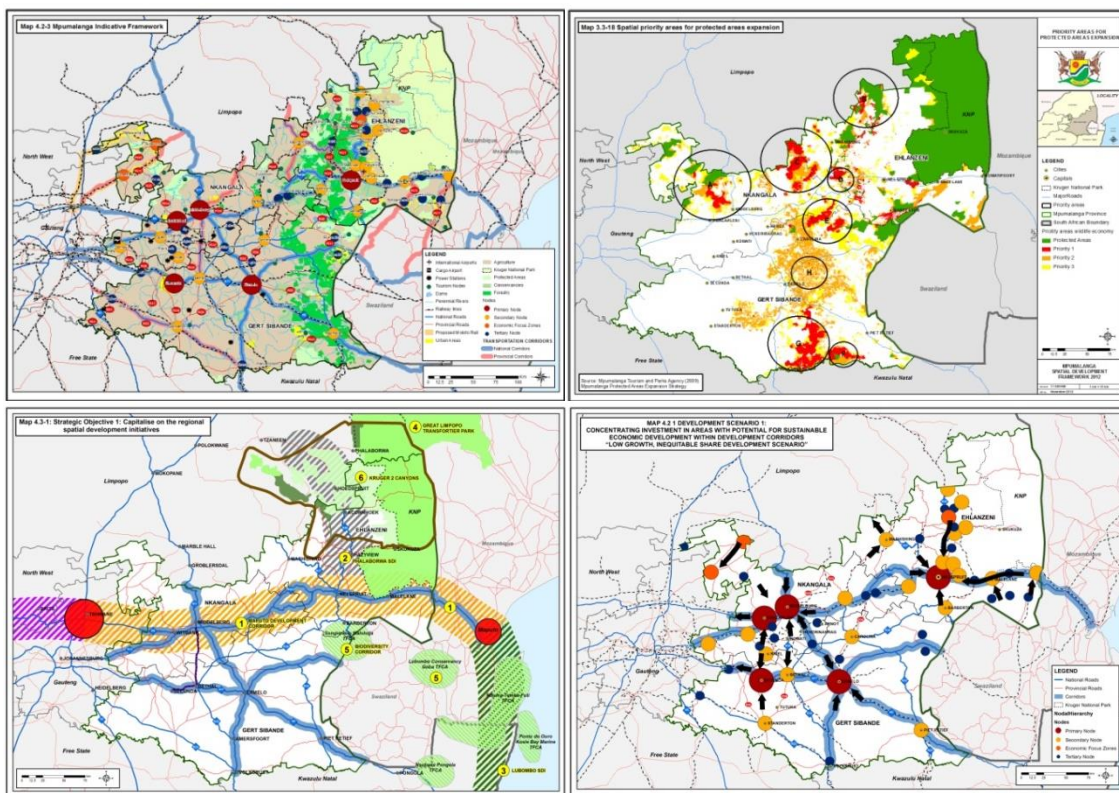


Figure 11: Extracts from the Mpumalanga Spatial Development Framework – 2014 (source: Laduma TAPP).

It may be concluded therefore that the proposed developments are not in conflict with the Mpumalanga SDF.

At a finer scale the proposed developments are compatible with the Purpose of the SSW and Vision of Londolozi itself. According to the draft Management Plan for the SSW for the period 2019 to 2029 the Purpose is (SSW, 2019):

*“To conserve and maintain biodiversity, whilst providing opportunities for sustainable ecotourism and meaningful socio-economic contributions for internal and external stakeholders.”*



The Londolozi Management Plan for the same period has as its Vision the following (LMP, 2019):

*“To balance the wildness of the reserve against the needs of an African Safari operation and global best practice land management within an inclusive philosophy in which the benefits of the consumptive use of its ecosystem goods and services is both sustainable and shared by neighbouring and affected communities and broader stakeholders.”*

As already stated in the Introduction and as can be seen from the above strategic statements, the proposed road developments and upgrades, and the proposed development of a rural abattoir for the processing of impala carcasses are all compatible with the context of the property and land use within which they are located.

## **4.2 Site Descriptions**

The biophysical features that are unique to each of the proposed development sites are captured in Table 6. Otherwise there are a number of these, including heritage, that are common and these are discussed below. Additional information is provided in relation to the aspects covered in the table but at a broader scale and to provide further context. This information has been extracted from Londolozi Management Plan (LMP, 2019).

### **4.2.1 Climate**

The climatic conditions characteristic of Londolozi may be described as semi-arid. Precipitation occurs predominantly as summer thunder showers with occasional light winter rain when cold fronts penetrate deeply into the country. Summer temperatures range between 18° C and 45° C while winter temperatures range between 8° C and 23° C. A south to north rainfall gradient exists in the SSW with the long-term annual averages been 620mm and 570mm respectively. With Londolozi being located roughly in the centre of the SSW and having a longitudinal orientation, this gradient is also applicable.

Typical of semi-arid environments, precipitation is erratic with oscillating period of above and below average rainfall being recorded. Variations range between 248 mm (1991/1992) during drought years to 1147mm (2000/2001) for very wet years with flooding conditions. From a management perspective these extreme oscillations require a dynamic and adaptive approach to ensure that natural responses are simulated and encouraged.

### **4.2.2 Topography**

The topography of Londolozi is gently undulating with moderately dissected and rounded hill country, rising above the floor of the Sand River valley. The Sand River is a dominant feature in Londolozi. It crosses the western boundary at an altitude of just more than 330masl, flowing in an east north easterly direction to exit the property after dropping only 24m over a distance of 6.25km. The highest elevation on Londolozi is approximately 417masl in the south western corner of the property and the lowest is approximately 311masl at the point at which the Sand River crosses the eastern boundary.

### **4.2.3 Geology and Soils**

The following description of the geology and soils is a direct extract from the SSW Management Plan as it applies to Londolozi:

The geomorphology of the eastern parts of Southern Africa and particularly the Lowveld regions, the Kruger National Park and the SSW Protected Area have been directly affected by the large-scale geographical processes which have taken place in South Africa. Due to this, the geological structures and differences in resistance to weathering by different rock types and formations has greatly influenced the current landscape morphology (Venter & Bristow, 1986). The Lowveld is predominantly underlain by the basement gneisses and granites. Using Walraven (Walraven, 1989) the overall area of the SSW Protected Area can be described as follows: A central band runs from close to the eastern boundary to the western boundary and is dominated by medium to coarse grained, sphene-bearing tonalite. Forming an approximate U-shape around the latter is a series classified as quartz-microcline-plagioclase-biotite migmatite and gneiss with mafic and ultra-mafic xenoliths. Local re-crystallisation occurs in the south of the reserve where the Sabie River borders the reserve. A tongue of light grey, medium grained biotite gneiss with coarse grained quartz veldspar leucosomes traverses the area from the north-eastern corner of the reserve (Exeter) through the northern sections of the reserve through to the west to areas adjoining the Kruger National Park. The north-eastern sections of the reserve are classified as grey to pale brown, medium- to coarse grained quartz-feldspar-biotite gneiss with subordinate mafic to ultramafic xenoliths.

In some areas where gabbro and dolerite intrusions strike through, the landscape features are flatter areas of relief (Venter & Bristow, 1986). Within these areas are underlying granophyric quartz gabbro (Sabi Sand Granophyre) which dominates the central and eastern sections of the southern reserve area. The origin of these rocks is unclear, but it may be that the Sabi Sand Granophyre represents some marginal interaction facies between the surrounding Nelspruit suite and gabbroic rocks which formerly overlay the granophyre, but which have been removed by erosion. In a narrow band in the eastern and central areas of the reserve, in a band through the south and west, we find what is termed Timbavati Gabbro, a medium- to coarse-grained gabbro, olivine gabbro and quartz gabbro. These are basic rocks with an irregular outcrop pattern distinguished by a clearly recognizable vegetation type. A very prominent dyke, consisting of fine to medium grained, hybridized gabbro, with abundant inclusions of acid rocks and protrudes prominently above the flat topography formed by the granite and gneiss. In the SSW Protected Area, it stretches in a narrow band from the west and central boundary on the reserve though to the neighbouring Mala Mala adjoining the Kruger National Park (Peel & Stalmans, 2010).

Soil is defined as a natural mass of unconsolidated natural material which can support functional ecosystems within protected areas. This represents a critical resource and through its intrinsic properties delivers critical ecosystem services to the ecosystems in which it is found. Within the SSW Protected Area, there is a strong correlation between the geology and soils of



the Protected Area. In the SSW Protected Area, the soils occur in distinctive catenary sequences on granitoid rocks. Their formation is a result of the following processes:

- a. The mobilisation and eluviation of clay particles and soluble weathering products from porous soils in upland positions by rain water;
- b. The lateral downward transportation of these components under the influence of gravitation to foot slope positions, where they are redeposited to form impermeable clay horizons. At this point the ground water is forced to the surface, thus forming waterlogged zones (seepage lines) during the rainy season which follow the contours (Venter, 1986). Thus, a general catenary sequence from crest to valley bottom, determined by the sequence of soil complexes (i.e. sandy, hydromorphic, duplex and alluvial) and associated vegetation composition, is repeated regularly across the hills and valleys.

Although these catenary sequences associated with granite-gneiss is representative of the area, the presence of gabbro intrusions and dolerite dikes causes a marked change in soil patterns. These metamorphic units generally weather into clayey structured fertile soils which differ from the normal granite-gneiss pattern (Peel & Stalmans, 2010).

#### **4.2.4 Hydrology and Artificial Water Provision**

The main hydrological feature of Londolozi is the Sand River. This river has its source in the foothills of the Drakensberg escarpment to the west and is an important tributary of the Sabie River which forms part of the southern boundary of the SSW. Another important hydrological feature is the Manyaleti River, which is also non-perennial. This river meanders in a southerly direction turning firstly to the north and then to the east after almost 4km of run-of-river within Londolozi. Its confluence with the Sand River is approximately 1.5km to the east of Londolozi's eastern boundary with Mala Mala. These features drain the northern two thirds of the property with the southern one third being drained by the Mxabeni and the Tukwane Rivers. *Figure 12* illustrates these features.

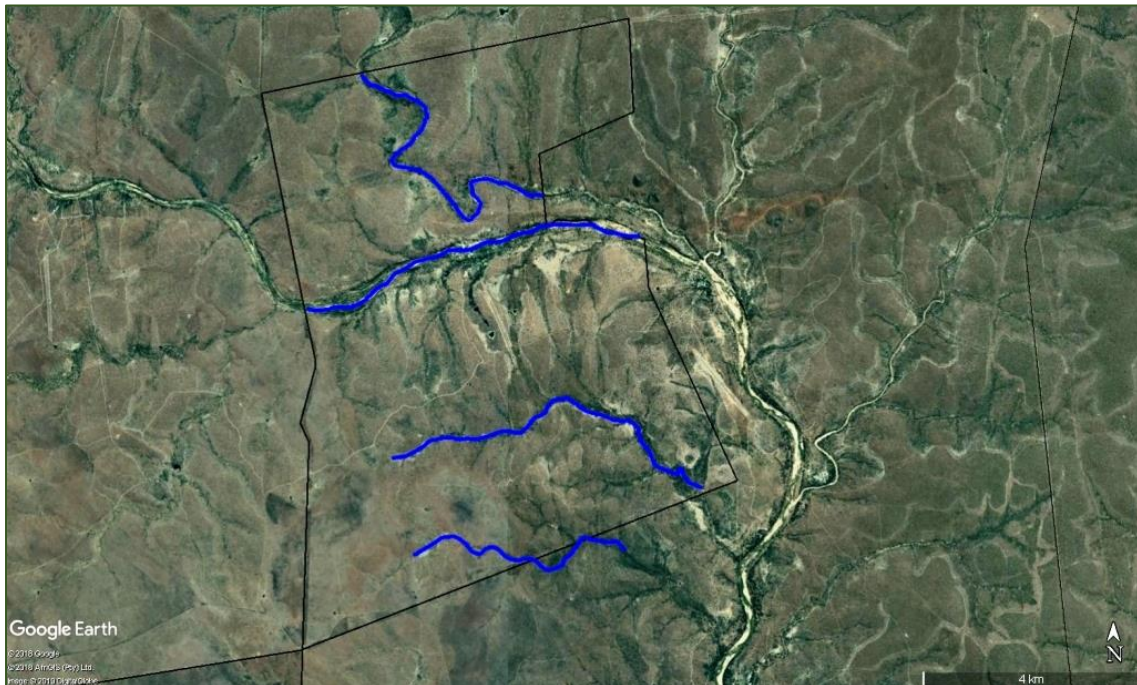
According to the SSW Management Plan, the Sand River is considered to be “moderately modified” from the perspective of its Present Ecological State (PES). This means that a loss and change of natural habitat and biota have occurred but the basic ecosystem functions are still predominantly unchanged. Londolozi is acutely aware of this and therefore are carrying out efforts to influence land and other management decisions in the upper catchment of the river. Being a recipient of the consequences of poor upper catchment management make Londolozi particularly vulnerable, which highlights the need for investments into the catchment to be made on an on-going basis.

In addition to these non-perennial watercourses are ephemeral pans, i.e. natural depressions that temporarily hold water in the wet season. These occur throughout the property and represent important water sources as well as a diversification of habitat.

Due to the non-perennial nature of the natural water on Londolozi, a number of artificial water sources have been developed and maintained as a water source for wildlife and human consumption. Water for human consumption is primarily provided from boreholes. However,

their capacity to deliver is vulnerable to drought and therefore a series of permanent dams, in the small non-perennial watercourse to the south of the camp, are maintained and kept full of water pumped from the Sand River in case of borehole failure. This then allows for the gravitational feeding of the stored water to the camp's water treatment plant.

A network of pumps and pipelines allows Londolozi to manage the water levels in these dams and pans and by doing so, to use them as a management tool in the manipulation of animal



movements and distribution.

*Figure 12: Londolozi with the Sand and Manyaleti Rivers draining the northern portion of the property, and the Mxabeni and Tukwane Rivers in the south.*

#### **4.2.5 Vegetation Types**

A broad description of the vegetation types as per the SSW Management Plan is provided here as it is also applicable to Londolozi:

At a very coarse level, the SSW Protected Area falls within the one biome and one bioregion: The Savanna Biome, and the Lowveld Bioregion. The SSW Protected Area falls mainly within the Granite Lowveld (SVI 3) vegetation type, occurring at altitudes of about 250 - 700 m and is characterised by tall shrubland with few trees to moderately dense low woodland on the deep sandy uplands with *Terminalia sericea*, *Combretum zeyheri* and *C. apiculatum*, and with a ground layer including *Pogonarthria squarrosa*, *Tricholaena monachne* and *Eragrostis rigidior* (Mucina & Rutherford, Reprint 2011). The equivalent vegetation types as described by Acocks (Acocks, 1975) are Arid Lowveld (Veld Type 11) and Lowveld (Veld Type 10). According to Low and Rebelo's classification (Low & Rebelo, 1996), the reserve comprises of Mixed Lowveld Bushveld (Type 19) and Sour Lowveld Bushveld (Type 21).



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These vegetation types have provided the basis from which an accurate and easily recognised framework for the habitat delineation within the SSW has been possible. The habitat or finer scale vegetation types relevant to Londolozi are listed below and their spatial distribution across the property was used to determine the finer scale vegetation types for each of the proposed development sites.

- *Acacia nigrescens/ Sclerocarya birrea/ Dalbergia melanoxylon/ Pterocarpus rotundifolius* sparse to open woodland;
- *Euclea divinorum/ Pappea capensis/ Spirostachys africana/ Pyrostria hystrix* sparse to dense woodland mosaic;
- *Sclerocarya birrea/ Combretum apiculatum/ Combretum zeyheri* open to closed woodland;
- *Sclerocarya birrea/ Terminalia sericea* open to closed woodland;
- *Sclerocarya birrea/ Terminalia sericea/ Combretum apiculatum* open to closed woodland; and
- Remaining 12 minor vegetation types.

**4.2.6 Fauna**

As an open system within the SSW, and the Great Limpopo Transfrontier Conservation Area, the full suite of fauna associated with this semi-arid savanna may be encountered at all of these sites. This would exclude aquatic fauna as all the sites are terrestrial.

The exception to this generalisation to some extent is the preferred site for the Rural Abattoir which is within the Londolozi Camp and Staff Village precinct. As such it has partial exclusion of many of the large mammal species due to the perimeter being fenced with an elephant proof electrical fence. This and the presence of people and much activity keeps many of the large mammal species out of the area. Small mammals, birds, reptiles and insects are less affected by these factors and many still occur within the precinct.

An indication of the fauna that occurs in the SSW is provided in Table 5

*Table 5: A broad indication of the fauna that occurs in the SSW and the Londolozi Game Reserve (LMP, 2019)*

PHYLUM	TOTAL NUMBER SPECIES RECORDED	CONSERVATION STATUS (IUCN RED LIST)	
		Species	Status
Birds	266	Western Red-footed falcon Cape Vulture Lappet-faced Vulture Tawny Eagle Martial Eagle White-breasted Cormorant	Near threatened Vulnerable Vulnerable Vulnerable Vulnerable Protected
Amphibians	24	Lowveld bullfrog Mottled shovel-nosed frog	Near threatened Near threatened
Mammals	41 large 34 small	Cheetah African Elephant Pangolin African Lion	Vulnerable Vulnerable Vulnerable Globally

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		Tsessebe White Rhinoceros Black Rhinoceros	vulnerable Endangered Near threatened Near threatened
Fish	33	Shortfin barb Smallscale yellowfish	Near threatened Protected
Reptiles	55		

**4.2.7 Ecological Functionality**

Each of these sites are part of an open system and as such ecological dynamics are encouraged to functions naturally. Where necessary, management interventions are implemented to simulate natural ecosystem functionality. Therefore all of the sites of proposed development may be considered as having optimum ecological functionality.

Again the exception to this generalisation is the preferred site for the Rural Abattoir where the Londolozi and Staff Village precinct must be considered less ecologically functional than the open system of the Londolozi Game Reserve and the SSW. According to the Londolozi Management Plan the precinct is zoned as an Intensive Development and/or Service Zone. There are however still significant patches of untransformed natural vegetation as well as landscaped areas that maintain a relatively close semblance of the open system outside the precinct. The area therefore still hosts a wide variety of the fauna and flora common to the area.

**4.2.8 Cultural / Historical Features**

No cultural and / or historical heritage features were found to occur along or within any of the sites with the exception of one watercourse crossing and one borrow pit. The detailed Heritage Impact Assessment report is included as Annex O. The conclusion and recommendations from this report are included below and have been integrated into the impact assessment process captured in Section 10, as well as into the EMPr:

Four sites of archaeological potential were identified during the physical survey phase of the project of which only one (Stone Age) will be impacted on by the proposed developments. This site [an existing borrow pit] seems to be the remaining part of a larger deposit and it is suggested that an archaeologist familiar with the Stone Age records it or the site be secure via fencing.

It is also recommended that Londolozi Game Reserve considers the drafting of a Cultural Heritage Management Plan for the whole Reserve that will guide the management of known heritage sites and that will provide guidance in the event of chance finds during any operational activities.

It is recommended that the series of developments for which this HIA was undertaking can proceed once the recommendations made is carry out.



Table 6: Fine scale biophysical features of the proposed development sites

Activity	Elevations (masl) and gradient (%) (north - south or west to east)	Landscape position	Soil types	Rivers and wetlands	Vegetation cover
<b>New roads</b>					
<b>Elmonskraal</b>	343m to 361m 3.8%	Crest	Glenrosa / Clovelly	There are two 1 <sup>st</sup> order non-perennial watercourses that are tributaries to the Sand River more than 200m away from the route, while the Sand River is also more than 200m away from the start point. There are no wetlands within 100m of the route.	<i>Sclerocarya birrea</i> / <i>Terminalia sericea</i> open to closed woodland
<b>Tsalala</b>	339m to 349m 2.7%	Crest	Glenrosa / Clovelly	Closest watercourse is non-perennial tributary of the Sand River 140m away. No wetlands within 100m.	<i>Sclerocarya birrea</i> / <i>Terminalia sericea</i> / <i>Combretum apiculatum</i> open to closed woodland
<b>Hobbits Hole</b>	326m to 315m 2.1%	Bottomland	Sterkspruit / Escourt / Cartref / Glenrose / Glenrosa / Clovelli	Closest watercourse is non-perennial 2 <sup>nd</sup> order tributary of the Sand River 50m away. The temporary wetlands of this watercourse are the closest to the proposed route.	<i>Euclea divinorum</i> / <i>Pappea capensis</i> / <i>Spirostachys africana</i> / <i>Pyrostria hystrix</i> sparse to dense woodland mosaic.
<b>Plaque</b>	324m to 320m 1.8%	Bottomland	Sterkspruit / Escourt / Cartref / Glenrose / Glenrosa / Clovelli	The route is within 45m of a 1 <sup>st</sup> order non-perennial tributary of the Sand River and between 85m and 160m of the Sand River itself.	<i>Euclea divinorum</i> / <i>Pappea capensis</i> / <i>Spirostachys africana</i> / <i>Pyrostria hystrix</i> sparse to dense woodland mosaic.
<b>Circuit North</b>	324m to 328m 1.6%	Bottomland	Glenrosa / Clovelly	The start point of the route is just more than 100m away from the Sand River while the bottom half of the route runs parallel to a 1 <sup>st</sup> order non-perennial tributary of the Sand River. An ephemeral pan occurs within 50m of the southern portion of the route.	<i>Sclerocarya birrea</i> / <i>Terminalia sericea</i> open to closed woodland.

Activity	Elevations (masl) and gradient (%) (north - south or west to east)	Landscape position	Soil types	Rivers and wetlands	Vegetation cover
<b>New Mbavala</b>	357m to 374m 1.6%	Mid-slope	Glenrosa / Clovelly	The route runs parallel to a 2 <sup>nd</sup> order non-perennial tributary of the Sand River and at its closest point it is 100m away. There are no wetlands within 100m of the route.	<i>Sclerocarya birrea</i> / <i>Terminalia sericea</i> open to closed woodland
<b>Inyathini South</b>	315m to 317m 1.3%	Bottomland	Sterkspruit / Escourt / Cartref / Glenrose / Glenrosa / Clovelli	The route is a 150m loop through a 2 <sup>nd</sup> order non-perennial tributary of the Mxabeni River. An ephemeral pan is in close proximity to the route.	<i>Euclea divinorum</i> / <i>Pappea capensis</i> / <i>Spirostachys africana</i> / <i>Pyrostria hystrix</i> sparse to dense woodland mosaic
<b>Circuit Pan</b>	356m to 363m 1.6%	Bottomland	Glenrosa / Clovelly	The closest watercourse is a 1 <sup>st</sup> order non-perennial tributary of the Sand River that is 10m from the route. No wetlands are in proximity of this route, although there are two artificial pans at the start and end point of the route.	<i>Sclerocarya birrea</i> / <i>Terminalia sericea</i> open to closed woodland.
<b>Road upgrades</b>					
<b>Main Road West</b>	Gently undulating with the start point at 378m and the end point at 401m. The lowest point is at a watercourse crossing at 372m. The average gradient across the route is 0.6%.	Crest (watershed)	Glenrosa / Clovelly	This route is located primarily on a watershed and is therefore mostly away from watercourses. There is one point at which it does cross a watercourse which is a 1 <sup>st</sup> order non-perennial tributary of the Sand River. There are no wetlands within 100m of this road with the exception of one ephemeral pan.	<i>Sclerocarya birrea</i> / <i>Terminalia sericea</i> open to closed woodland.
<b>Main Road East</b>	Gently undulating with the start point at 366m and the end point at 345 and a gradient of 0.7%.	Crest (watershed)	Glenrosa / Clovelly	This route is located on a watershed and is therefore away from watercourses. There are three ephemeral pans immediately adjacent to the route at three separate localities.	<i>Sclerocarya birrea</i> / <i>Terminalia sericea</i> open to closed woodland
<b>Rural abattoir</b>					

Activity	Elevations (masl) and gradient (%) (north - south or west to east)	Landscape position	Soil types	Rivers and wetlands	Vegetation cover
<b>Preferred site</b>	The elevation is 335m and the gradient is gently sloping to the north towards the Sand River.	Bottomland	Glenrosa / Clovelly	The site is more than a 100m from the nearest watercourse which is the Sand River. It is on a ridge between two non-perennial tributaries of the Sand River which are more than 200m away. There are no wetlands within 100m of the site.	<i>Sclerocarya birrea</i> / <i>Terminalia sericea</i> / <i>Combretum apiculatum</i> open to closed woodland.



## 5 LEGAL AND POLICY FRAMEWORK

A comprehensive view of policy and legislation relevant to the proposed developments is provided in Table 7 together with an indication of how the proposed developments are compliant and responsive to these.

*Table 7: A list of relevant legislation and policy*

Title of legislation, policy or guideline	Purpose of the legislation and applicability to the project	Administering authority	Proposed activity compliance/response
Constitution of Republic of South Africa (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. "Everyone has the right – (a) to an environmental that is not harmful to health or well-being; and (b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that – a. prevent pollution; b. promote conservation; and c. secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.	National Government	The proposed activities have been conceptualised, designed and planned in respect of meeting these constitutional requirements in that all recommended mitigation actions will be implemented and frequently monitored ensuring that any pollution risks are avoided and addressed and that conservation is promoted. Both construction and operational phases will happen within the limits of sustainability.
Conservation of Agricultural Resources Act 43 of 1983):	The purpose of the Conservation of Agricultural Resources Act No. 43 of 1983 (CARA) is to provide for control over the utilisation of the natural agricultural resources of the Republic in order to promote the conservation of the soil, the water sources and the vegetation and the combating of weeds and invader plants.	National Department of Agriculture (DAFF)	Mitigation measures are in place to ensure that no impacts on soil and water occur during the construction and operational phases of the proposed developments, and the need to address potential weed infestations is also noted in the EMPr.
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 developments fall within a proclaimed Protected Area in terms of this Act, and will therefore be subject to the provisions of this Act.  Specifically including the following: <ul style="list-style-type: none"> <li>• Regulations for the proper administration of special nature reserves, national parks and world heritage sites, published under Government Notice R1061, In Government Gazette 28181, dated 28 October 2005.</li> <li>• Norms and standards for the management of protected areas, published under Government Notice R382, In Government Gazette</li> </ul>	Department of Environmental Affairs	The proposed developments are nested within and are controlled by the SSW Management Association. As a proclaimed private nature reserve, the SSW ensure that the development fits within the relevant legal and policy frameworks for the SSW as per their Standard Operating Procedures, Management Plan and Landowner Co-management Agreements.

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Title of legislation, policy or guideline	Purpose of the legislation and applicability to the project	Administering authority	Proposed activity compliance/response
	399878, dated 31 March 2016.		
National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004):	The objects of the National Environmental Management: Biodiversity Act 10 of 2004 (NEMBA) are to provide for the management and conservation of biological diversity within South Africa and of the components of such biological diversity; to give effect to ratified international agreements that are binding on South Africa; and to ensure the protection of the ecosystem as a whole, including species that are not targeted for exploitation.	Department of Environmental Affairs	As much of the proposed development is located on existing infrastructure and brown field sites there are limited biodiversity concerns. However, their locality within the Londolozi Game Reserve has highlighted the potential impact on the natural environment and relevant mitigation measures have been recommended to ensure that these impacts remain insignificant.
National Spatial Biodiversity Assessment:	The National Spatial Biodiversity Assessment (NSBA) classifies areas as worthy of protection based on their biophysical characteristics, which are ranked according to priority levels. The proposed development sites are located in the Granite Lowveld, which is ranked as vulnerable with a conservation target of 19%. and some 17% statutorily conserved in the Kruger National Park. It also falls within an areas zoned as Limited and Intensive Development Zones as per the Londolozi Management Plan for 2019 to 2029.	Department of Environmental Affairs and SANBI	The localities and types of proposed developments are within an area zoned as Limited and Intensive Development Zones as per the Londolozi Management Plan for 2019 to 2029 and are compatible thus ensuring that the requirements of the NSBA are not compromised.
National Forests Act, 1998 (Act no 84 of 1998):	The purposes of the National Forests Act No. 84 of 1998 (NFA) are, inter alia, to promote the sustainable management and development of forests for the benefit of all and to enact special measures for the protection of certain forests and trees. The minister may declare any tree, group of trees, woodland or species to be protected trees, groups of trees and species (Section 12) or a particular forest to be a "natural forest" (Section 7). Specified activities in respect of these areas or trees are prohibited by the NFA. Protected trees require permits to move, or damage them.	Department of Agriculture, Forestry and Fisheries	All protected species of trees and shrubs will be avoided in all of the proposed developments.
National Heritage Resources Act 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 are 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, whilst unlikely, will need to be monitored.	South African Heritage Resources Agency (SAHRA)	A chance find protocol will be implemented and the site of Stone Age deposits in a borrow pit will be fenced off from further excavations.
The National Water Act, (Act No. 36 of 1998)	The purpose of the National Water Act 36 of 1998 (NWA) is to ensure that the nation's water resources are protected, used, developed, managed and controlled in ways that ensure that the integrity of water resources are protected.	Department of Water and Sanitation through the	None of the proposed activities will trigger the need for a Water Use Licence.
National	The National Environmental	Department of	Waste generation volumes

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Title of legislation, policy or guideline	Purpose of the legislation and applicability to the project	Administering authority	Proposed activity compliance/response
Environmental Management Waste Act 59 of 2008	Management: Waste Act (NEMWA) was primarily enacted to reform the law regulating waste management in order to protect health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development.	Environmental Affairs	are insignificant but will be completely absorbed into the waste management infrastructure at Londolozi. A biogas digester will be installed to deal with organic waste from the abattoir.
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 phases of the project.	National Department of Labour	The EMPr speaks to these aspects for the construction phase and Londolozi has provided commitments to meeting these requirements in both construction and operation.
DEA 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.	Department of Environmental Affairs	These guidelines have been applied in the assessment of the proposed development and its potential impacts on the natural, social and economic environment.

## **6 PUBLIC AND AUTHORITY PARTICIPATION**

### **6.1 Public Participation**

Public involvement in this impact assessment process was facilitated through the actions listed below. Evidence of these actions can be seen in Annex F:

- Site notices in A3 format were posted at the Newington and Shaw's entrance gates to the SSW on 15 November 2018 and remained there for approximately three months.
- Notice of intention to apply for environmental authorisation was placed in and published by the Mpumalanga News on Thursday 22 November 2018 and the Lowvelder on Friday 23 November 2018.
- Notification was sent to all immediate neighbours via email with a Background Information Document (BID) attached, on 28 November 2018. A copy of the BID is provided with this report as Annex G.
- All registered Interested and Affected Parties and immediate neighbours were notified of an amendment to the application in the addition of the rural abattoir with the SSW being notified on 26 February 2019 and immediate neighbours on 6 March 2019. Registered I&APs were notified on 5 March 2019.
- All registered Interested and Affected Parties were provided with a copy of the Draft Basic Assessment Report on 22 May 2019.



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The contacts database for registered I&APs is provided in Table 8.

*Table 8: Contact database for registered I&APs*

FIRST NAME	SURNAME	AFFILIATION	ADDRESS	PHONE	EMAIL
Nicolas	Shilubane			0725210445	<a href="mailto:nichodebuck@gmail.com">nichodebuck@gmail.com</a>
Simphiwe Chris	Vilakazi			0606297121	<a href="mailto:vilakazi3317@gmail.com">vilakazi3317@gmail.com</a>
Lebo	Nkosi			0767681100	<a href="mailto:lebonkosi59@gmail.com">lebonkosi59@gmail.com</a>
Floyd	Themba			0791859216	<a href="mailto:thembapf@gmail.com">thembapf@gmail.com</a>
Riaan	Fourie	SSW MA (ECO)	Portion 4 of Lisbon 297 KU Shaws Gate	0664803861	<a href="mailto:eco@sabisand.co.za">eco@sabisand.co.za</a>
David	Powrie	SSW-MA (Warden)		079 946 7433	<a href="mailto:warden@sabisand.co.za">warden@sabisand.co.za</a>
Iain	Olivier	SSW-MA (HOD of Conservation)		078 804 0347	<a href="mailto:ecologist@sabisand.co.za">ecologist@sabisand.co.za</a>

Considering the low level of interest expressed by the public in the proposed developments it was deemed unnecessary to hold a public meeting. Note that no comment was forthcoming from immediate neighbours and that those who expressed interest from outside of the SSW appear to be interested in potential work opportunities and not the assessment process.

Comments received and responses provided are included in the Comment and Response Report included as Annex J.

## 6.2 Authority Participation

A pre-application meeting was held telephonically with Ms Robyn Luyt of the Mpumalanga Department of Agriculture, Rural Development, Land & Environmental Affairs, ENVIRONMENTAL IMPACT MANAGEMENT (Ehlanzeni District), on 20 November 2018. Minutes of this meeting are included with this report as Annex I.

Hard copies of the Draft Basic Assessment Reports were distributed to the following authorities on 22 May 2019:

- SANParks
- Inkomati Usuthu Catchment Management Agency
- Mpumalanga Tourism and Parks Agency
- District and Local Municipalities (Ehlanzeni and Bushbuck Ridge)
- SSW Management Authority

Comments received and responses provided are included in the Comment and Response Report included as Annex I.

## 7 NEED AND DESIRABILITY

Much has already been said in Sections 1 and 4.1 in terms of the compatibility of these proposed developments and activities in relation to the Purpose, Desired State and Management Objectives of the SSW as stated in their Protected Area Management Plan for 2019 to 2029 (SSW, 2019); as well as the Vision and Management Objectives of the Londolozi

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Game Reserve as stated in their Management Plan for 2019 to 2029 (LMP, 2019). In terms of their need and desirability the same rationale may be used.

From the perspective of the road works Londolozi recognise that the current road network includes roads that were badly positioned in the landscape and which require substantial maintenance to mitigate their negative environmental impact. As such 27 roads totalling 11.96km are being closed and rehabilitated and in lieu of these eight new game drive tracks are proposed totalling 3.44km. In addition to the improved placement of these proposed new roads, the total network of roads is being reduced by a net amount of 8.52km. An additional benefit of this process will be less maintenance requirements and therefore less material from borrow pits and less heavy vehicle movement and activity within the Game Reserve.

As a globally recognised destination for high paying guests, Londolozi needs to ensure that the game viewing opportunities provided remain optimal and thus allow for the perpetuation of the business model which is responsible for the employment of many people from adjacent communities, both permanently and on a temporary basis.

As the main access route into Londolozi, Main Road, and in particular Main Road West, needs to be upgraded to ensure that it has the capacity to carry the relatively heavy traffic volumes. Over the years it has become deeply incised through maintenance activities and now requires reshaping to facilitate better drainage. Without the upgrade the situation will become increasingly unsustainable. This goes against the ethos that underpins the management of the property.

In an attempt to address the negative impact of too many impala in the SSW, while at the same time diversifying the benefits that are derived from the property, Londolozi plans to develop and operate a Rural Abattoir. The facility will primarily be aimed at processing impala carcasses but will have the capacity to handle other ungulates as well, such as nyala which are becoming a problem animal. These off-takes will take place within the context of the SSW and LGR Management Plans, as well as the SSW Standard Operating Procedures for the off-take of impala and the management of damage causing animals (CON-19-03 and CON-19-04). They will also meet the legal requirements of the Mpumalanga Tourism and Parks Agency (MTPA) and the Dept. of Agriculture, Forestry and Fisheries Game Meat Regulations according to Government Notice 1371 and dated 4 November 2016.

In doing this Londolozi are embracing the challenge that is entrenched in the tension which exists between the non-consumptive and consumptive utilisation of Africa's wildlife. In a small way this project may provide a vital demonstration of the realities that both are mutually acceptable and that they can co-exist on the same property managed by the same owner/operator. Although the off-take of certain species will be low key and will not include commercial hunting, the consumptive use of the resource is a clear demonstration of the value of biodiversity and that venison production is an acceptable management tool.

## **8 AUTHORISATION TIME FRAMES**

### **8.1 Validity Period**

All of the proposed developments are planned to be completed within the mandatory five (5) year validity period ascribed to an environmental authorisation, assuming that this is granted.

### **8.2 Activity Schedule**

Considering the small scale of each of the proposed developments a detailed activity schedule is not provided. If they are authorised the road works will be completed before the onset of the wet season, and the Rural Abattoir will be developed

### **8.3 Compliance Monitoring**

#### **8.3.1 Development Phase**

All of the proposed activities will be subjected to continuous compliance monitoring by the Head of Dept.: Technical Services for Londolozi and contractors will be held accountable for adhering to the EMPr through the signing of a contract committing to such. The Environmental Compliance Officer (ECO) for the SSW will carry out frequent inspections to audit compliance and an independent ECO will be appointed by Londolozi to oversee the process and to facilitate reporting to the relevant compliance official/s in the Mpumalanga Department of Agriculture, Rural Development, Land & Environmental Affairs (MDARDLEA). The latter will happen no less than monthly and will begin prior to the commencement of any of the activities and will continue until all rehabilitation work is completed and clearly successful.

#### **8.3.2 Operational Phase**

The SSW and the individual property owners within it have recently instituted an annual "Green Audit" which has been developed and is implemented by an independent environmental auditor. Included within the Green Audits is assessment against compliance with all relevant environmental and natural resource management legislation. Land owners and their managers are expected to keep records of all permits, licences and authorisations; against which activities and developments are audited.

While the above will cover all of the proposed activities, the operation of the Rural Abattoir will be audited by State Veterinary officials to ensure compliance with the design and fitting of the facility, as well as its operations.

## **9 CONSIDERATION OF ALTERNATIVES**

### **9.1 Alternative Sites**

#### **9.1.1 Road Works**

The placement of the eight proposed new roads has been according to best practice as outlined in the roads EMP in Annex D. Essentially the siting avoids erodible soils, seeps, and drainage lines as far as possible. It is however acknowledged that these cannot always be avoided as



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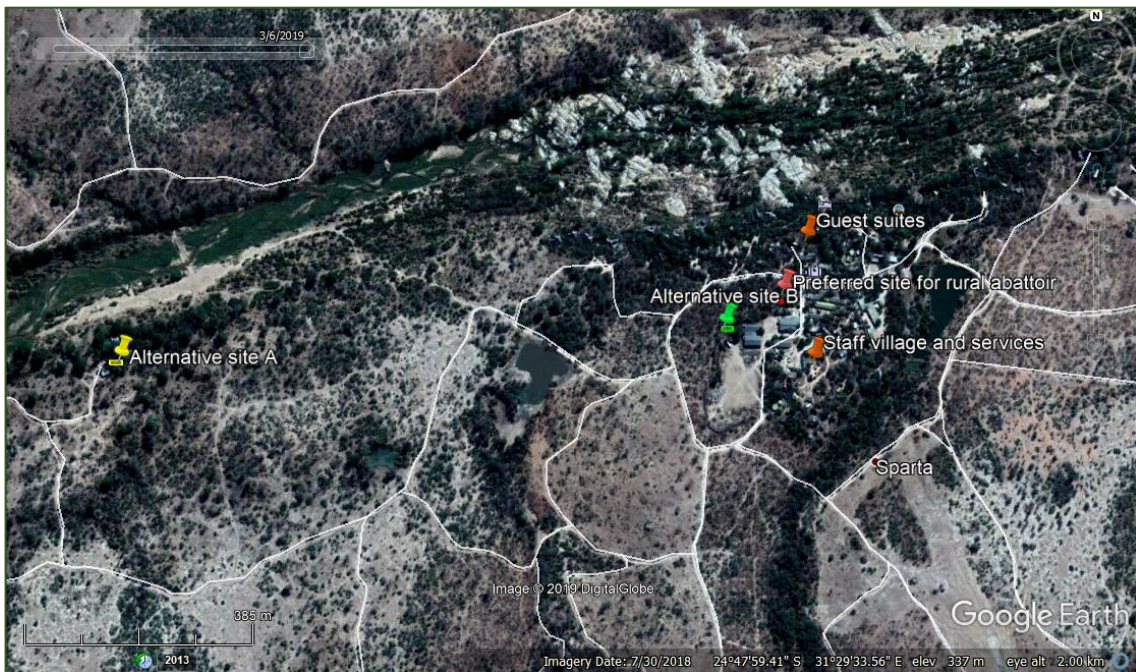
access to a diversity of game viewing habitat requires that roads do traverse these areas from time to time. Of the eight proposed roads, only one, i.e. Inyathini South, is within a watercourse. Its positioning though is an attempt to redress maintenance challenges related to the many existing roads that are there already, of which some are scheduled for closure.

At a very fine scale the exact route of each road has been carefully selected by the HOD Technical Services, firstly on the basis of satellite images and 1m contours, secondly on the basis of ground-truthing, and thirdly on the basis of inputs from the EAP during field surveys for this assessment. It is suggested thus that the positioning of the proposed new roads provides a sustainable compromise between the avoidance and mitigation of potential impacts, and the provision of a world class game viewing experience.

As far as the upgrading of the two Main Roads is concerned, these are existing and well positioned roads and alternative sites are not relevant.

**9.1.2 Rural Abattoir**

Three alternative sites were assessed as possibilities for the development of the Rural Abattoir and these can be seen in Figure 13.



*Figure 13: Three alternative sites assessed for the locality of the Rural Abattoir.*

The rationale for selecting the preferred site for the abattoir has been captured in Table 9.

*Table 9: Comparison of alternative sites for the Rural Abattoir*

SITE ALTERNATIVE	COORDINATES	RATIONALE
A	24°47'54.59"S 31°29'14.38"E	Although the site has an existing building on it, it is relatively far from the main hub of operations and the electricity supply is insufficient. In order to address this trenching in excess of 1km would be required.

B	24°47'52.81"S 31°29'50.87"E	Water and waste water service reticulation is not available and would need to be laid on to this site.
Preferred	24°47'50.96"S 31°29'54.38"E	Access and security are good at this site as well as proximity to electricity, water and waste water reticulation. The facility will fit well within the existing trees and shrubs and only the herbaceous component of the vegetation layer will need to be cleared.

## **9.2 Alternative Uses for the Site**

This aspect is not relevant as this process is being driven by a focus on the uses, i.e. the roads are for game drives and access, and the Rural Abattoir is for the processing of antelope carcasses, primarily impala.

## **9.3 Alternative Technologies**

This aspect is not relevant as the technologies selected follow best practice and meet legal requirements.

# **10 ANALYSIS OF POTENTIAL IMPACTS**

## **10.1 Assessment Method**

This section provides a discussion on the potential impacts of the preferred alternatives and the no-go option, and an indication of their significance through superimposing all phases of the proposed developments, as described in Section 3, on the environmental aspects of the receiving environment as described in Section 4.2. The assessment considers the socio-economic, biophysical, visual/aesthetic and cultural heritage aspects of the receiving environment. In addition to this is an indication of the extent to which these impacts may be avoided or mitigated. It will be shown that as all potential impacts may be successfully avoided or mitigated, no offsets will be required and no fatal flaws were identified. The assessment has considered the three development components separately but recognises that some overlap occurs.

It is noted that environmental impact assessment processes call for the assessment of all the phases of a proposed development, i.e. planning, pre-construction, construction, operation and decommissioning. In the case of these proposed developments it is only the construction and operational phases that are considered relevant for this assessment. The relatively small scale of these proposed developments and the fact that they are planned within and in compatibility with the SSW and LGR Management Plans deems the need to assess the planning and pre-construction phases unnecessary.

The detailed analysis of potential impacts was guided by the scoring allocations as listed in Table 10 and explained in detail in Annex K. Impacts that retain a post-mitigation score higher than 40, i.e. those colour coded from yellow to red, would be recognised as potential fatal flaws that could render the proposed development environmentally unsustainable, and/or which may require further detailed specialist studies.

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Potential impacts have been considered according to the development and operational phases of the proposed development as described in Section 3.2 and for the proposed developments and the no-go option. As there are no plans for decommissioning, assessment of this phase has not been carried.

The outcome of this process for the proposed road works is captured in Table 11, Table 12 and Table 13 below; and for the rural abattoir in Table 14, Table 15 and Table 16. Note that the tables were originally configured to address negative impacts but have been adapted to include positive impacts as well. Where these have been listed, the scoring for 'mitigation efficiency' has been applied conversely in order to cater for the positive effect of the enhancement recommendation. The colour code is also adapted here where only green is used to retain the denoting of a positive impact. In the assessment of the no-go option no mitigating measures have been included as these will not be applicable if nothing is done. The potential impact scores therefore remain the same before and after mitigation.

The tables have been completed by the EAP on the basis of their understanding of both the development proposal and the receiving environment. This understanding has been generated through the interrogation of relevant documents and reports (mostly referenced in this report), a site visit on 2 October 2018 in the company of the HOD Technical Services, and again with the HOD Technical Services on 15 January 2019. Consideration of comments received from registered I&APs and relevant authorities also influenced this understanding. It was deemed unnecessary to commission any specialist studies for this assessment although an opinion from a heritage professional was obtained in terms of the ability to apply for exemption for a full heritage assessment from the South African Heritage Resources Agency (SAHRA).

*Table 10: Impact assessment score allocation guide.*

PRE-MITIGATION						POST-MITIGATION	
Extent	Duration	Intensity	Probability	Weighting factor (WF)	Significance rating (SR) <sup>1</sup>	Mitigation efficiency (ME)	Mitigated aspects (MA) <sup>2</sup>
Site 1	Short term (0-3 years) 1	Low 1	Unlikely 1	Low 1	Low 0-19	High 0.2	Low 0-19
Local 2	Short to medium (3-5 years) 2		Possible 2	Medium low 2	Medium low 20-39	Medium High 0.4	Medium low 20-39
Regional 3	Medium term (5-10 years) 3	Medium 3	Likely 3	Medium 3	Medium 40-59	Medium 0.6	Medium 40-59
National 4	Long term (10-30 years) 4		Highly Likely 4	Medium High 4	Medium High 60-79	Medium low 0.8	Medium High 60-79
International 5	Permanent (>30 years) 5	High 5	Definite 5	High 5	High 80-100	Low 1.0	High 80-100

<sup>1</sup> Significance Rating (without mitigation) = SUM (Extent, Duration, Intensity, Probability) \* Weighting Factor

<sup>2</sup> Significance Rating (with mitigation) = Significance Rating (without mitigation) \* Mitigation Efficiency

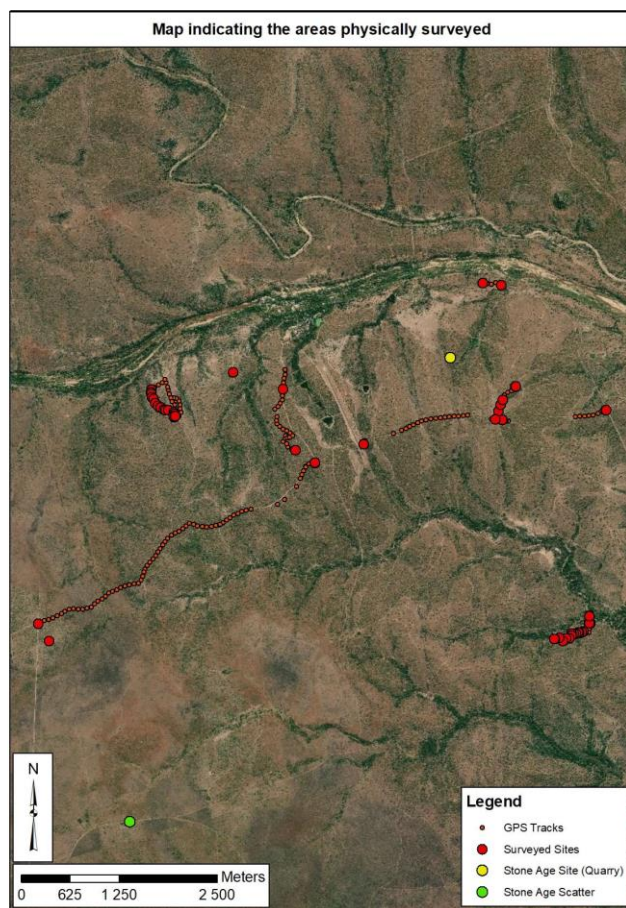


## 10.2 Specialist Findings and Recommendations in terms of Potential Impacts

### 10.2.1 Cultural Heritage Impact Assessment

The cultural heritage specialist visited the proposed development sites at the end of May 2019 and the heritage assessment included the following steps:

- **Literature review** - A survey of available literature was undertaken in order to place the development area in an archaeological and historical context. The sources utilized in this regard are indicated in the bibliography. The South African Heritage Resources Information System (SAHRIS) was consulted to find out if any known sites occur within the footprint of the proposed development or its proximity.
- **Field Survey** - The field assessment section of the study is conducted according to generally accepted HIA practices and aimed at locating all possible objects, sites and features of heritage significance in the area of the proposed development. The location/position of all sites, features and objects is determined by means of a Global Positioning System (GPS) where possible, while detailed photographs are also taken where needed. There were no limiting factors. The survey took one person 13 hours to complete. The Figure alongside shows the tracks of the areas surveyed.
- **Documentation** - All sites, objects, features and structures identified are documented according to a general set of minimum standards. Co-ordinates of individual localities are determined by means of the Global Positioning System (GPS). The information is added to the description in order to facilitate the identification of each locality.



### 10.3 Construction Phase of Proposed Road Works

Table 11: Potential environmental impacts and recommended mitigation measures for the proposed road works during the Construction Phase.

POTENTIAL IMPACTS AND RECOMMENDED MITIGATION MEASURES		EXTENT	DURATION	INTENSITY	PROBABILITY	WEIGHTING FACTOR	SIGNIFICANCE RATING	MITIGATION EFFICIENCY	ENHANCEMENT POTENTIAL	MITIGATED ASPECTS
IMPACT	MITIGATION / ENHANCEMENT									
SOCIO-ECONOMIC										
A direct impact will be the employment of external contractors to undertake the road upgrades and who employ local people to assist with the work.	n/a	3	1	1	5	3	30	H: 1	H: 1	30
BIOPHYSICAL										
The loss of biodiversity from the vegetation cleared under the two tracks made for the new roads and the 1m strips adjacent to the existing roads where material is borrowed for the upgrades.	In both instances important biodiversity features such as protected plants and termitaria will be avoided. In addition to this, the strips cleared adjacent to the upgraded roads will be rehabilitated with brush packs and indigenous grass seed.	1	3	3	5	3	36	0.6		21.6
The loss of ecosystem functionality under both scenarios as described above.	As above.	2	3	2	5	3	36	0.8		28.8
Disturbance caused by noise and the movement of people, machinery and vehicles that may impact on the movement of fauna.	Access to be limited to the immediate development footprint with no movement outside of this allowed. Vehicles and machinery to be well serviced include exhaust dampers and dis-engage reverse signals. All communications on site to be kept low with no unnecessary shouting or raised voices.	2	3	4	5	2	28	0.4		11.2
The creation of dust that settles on adjacent vegetation and decreases its palatability to grazing and browsing fauna.	Where it is apparent that dust is being created the working surface should be kept damp and any vegetation that has become unpalatable due to dust settling on it should be sprayed clean.	1	3	2	5	2	22	0.4		8.8

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Potential soil erosion caused by the removal of the vegetation cover, removal of soil and compaction of the surface. This includes the potential for additional sediments entering watercourses.	Undertake the activity during the dry season, rehabilitate exposed surfaces as soon as possible after development and where the surfaces are permanently exposed ensure that appropriate anti-erosion mechanisms are in place.	1	3	3	5	3	36	0.6		21.6
The introduction of invasive alien plants from contractor's equipment and vehicles as well as the opening of ground cover and the disturbance of soil making the area vulnerable to infestations. Note that this is particularly relevant to <i>Parthenium hysterophorus</i> which is already present along Main Road West after entry through the boom gate at the Anti-poaching Unit (APU).	All current infestations must be cleared before road works are initiated, contractor vehicles must be checked before entering the area, i.e. at Newington Gate, to ensure that they are clean and are not carrying soil in from outside, disturbed areas must be rehabilitated progressively throughout the development process, and the areas must be monitored regularly after completion of the works to ensure that there are no new infestations.	2	4	3	3	5	60	0.4		24
The presence of external contractors poses the threat of poaching of both plants and animals.	Ensure that contractors and their staff are well informed of the codes of conduct for working in a protected area as this relates to the illegal removal of plants and animals, ensure that this aspect is included in the contractors contract, maintain a presence during road works to ensure that all movements are monitored and restricted to the development footprint, and ensure that the control measures at the APU and Newington Gate are aware of external contractors movements and the need to be vigilant in regards to this potential impact.	2	1	5	3	5	55	0.2		11
Potential pollution of the immediate environment through the introduction of solid and liquid waste from contractors and their workers.	Ensure that the contractor is aware of and sign an agreement to ensure that there will be no littering whatsoever and that sufficient and well maintained mobile ablution facilities are provided on site. All waste is to be separated and stored on site during the day and removed at the end of the day on a daily basis.	2	1	3	3	3	27	0.4		10.8
<b>VISUAL / AESTHETIC</b>										
The clearing of vegetation and exposure of soil may increase the visibility of the road network, especially as the new roads are mostly higher up on the slopes, as well as the presence of contractors, workers and their vehicles and equipment.	Limit the development area and related activities to the immediate footprint and ensure that the works are carried out during daylight hours thus preventing the need for lights and that the number of vehicles used and the size of the contract team are kept to the minimum required to get the works done as soon as possible. Ensure that surrounding vegetation, especially well established trees are kept in place to screen construction activities.	1	1	2	2	2	12	0.8		9.6



HERITAGE										
Clearing of vegetation cover and earth works may unearth archaeological material, particularly at the watercourse crossing and the borrow pit referred to in the HIA.	Implementation of 'chance find' procedure and a 'watching brief' as specified in the HIA. Fence off the Stone Age deposits at the borrow pit and ensure no material is removed.	1	1	3	3	3	24	H: 0.2		4.8

#### 10.4 Operational Phase of Proposed Road Works

Table 12: Potential environmental impacts and recommended mitigation measures for the proposed road works during the Operational Phase.

POTENTIAL IMPACTS AND RECOMMENDED MITIGATION MEASURES		EXTENT	DURATION	INTENSITY	PROBABILITY	WEIGHTING FACTOR	SIGNIFICANCE RATING	MITIGATION EFFICIENCY	ENHANCEMENT POTENTIAL	MITIGATED ASPECTS
IMPACT	MITIGATION / ENHANCEMENT									
SOCIO-ECONOMIC										
As an indirect impact the road developments and upgrades will ensure the viability of the visitor experience and the economic model that is Londolozi and therefore retain its capacity to employ local people in its operation.	n/a	3	5	2	5	2	30	H: 1	H: 1	30
BIOPHYSICAL										
The loss of biodiversity from the vegetation cleared under the two tracks made for the new roads.	Ensure that the rehabilitation of the 12km of old roads is successful and that any protected plants and geophytes that were in the path of the new roads are successfully relocated to the adjacent portion of old road that has been closed and rehabilitated.	1	5	1	5	2	24	0.4		9.6
The loss of ecosystem functionality in relation to the new roads.	As above	2	5	1	5	2	26	0.4		10.4

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Disturbance of fauna due to the movement and noise of game drive vehicles.	Ensure that vehicles are maintained to reduce noise, that drivers are well trained in the etiquette of game driving, ensure that the use of the new roads is limited to game drive vehicle use as far as possible, constantly work at reducing the volume of traffic on the Main Roads and ensure that road users are aware of the need to drive slowly and carefully to avoid disturbing fauna.	1	5	1	3	3	30	0.4		12
The creation of dust that settles on adjacent vegetation and decreases its palatability to grazing and browsing fauna.	Ensure that all road users are aware of road use etiquette in a protected area and enforce adherence to this. In times of unusually heavy use of the Main Roads, monitor dust accumulation of adjacent foliage and spray clean, especially in the dry season.	1	3	2	3	3	27	0.6		16.2
Potential soil erosion caused by the removal of the vegetation cover and compaction of the surface. This includes the potential for additional sediments entering watercourses.	Ensure that anti-erosion structures are in place, monitor road conditions regularly and implement maintenance as soon as this is required.	2	5	1	3	3	33	0.4		13.2
The introduction of invasive alien plants on vehicles. Note that this is particularly relevant to <i>Parthenium hysterophorus</i> which is already present along Main Road West after entry through the boom gate at the Anti-poaching Unit (APU).	Ensure that control at the APU boom gate and at the main entrances to the SSW are aware of the need to check that vehicles entering the SSW and LGR are clean. Monitor access roads for signs of <i>Parthenium hysterophorus</i> infestations and deal with them immediately.	2	5	3	4	5	70	0.4		28
<b>VISUAL / AESTHETIC</b>										
The clearing of vegetation and exposure of soil may increase the visibility of the road network, especially as the new roads are mostly higher up on the slopes.	Ensure that the rehabilitation of closed roads happens as quickly as possible and is successful as this will be a meaningful off-set for any potential visual impact.	2	5	1	1	2	18	0.4		7.2
<b>HERITAGE</b>										
The unearthing of archaeological material, particularly at the borrow pit referred to in the HIA.	Implementation of 'chance find' procedure and a 'watching brief' as specified in the HIA. Fence off the Stone Age deposits at the borrow pit and ensure no material is removed.	1	1	3	3	3	24	H: 0.2		4.8

### 10.5 Assessment of the No-go Option for the Road Works

Table 13: Assessment of the No-go Option for the Road Works

POTENTIAL IMPACTS AND RECOMMENDED MITIGATION MEASURES		EXTENT	DURATION	INTENSITY	PROBABILITY	WEIGHTING FACTOR	SIGNIFICANCE RATING	MITIGATION EFFICIENCY	ENHANCEMENT POTENTIAL	MITIGATED ASPECTS
IMPACT	MITIGATION / ENHANCEMENT									
SOCIO-ECONOMIC										
Employment options will not be realised either in the short- or long-term.		2	3	2	5	2	24			
BIOPHYSICAL										
None of the negative biophysical impacts will occur, although the positive impacts of the proposed road closures will be a lost opportunity for addressing badly placed roads and their associated impacts. This loss counteracts the potential positive impact of the no-go options in this regards and affects the scoring.		2	5	3	5	3	45			
VISUAL / AESTHETIC										
As above the no-go option will result in the loss of positive impacts associated with the overall reduction of the road network intensity.		2	5	3	5	3	45			
HERITAGE										



## 10.6 Construction Phase of Proposed Rural Abattoir

Table 14: Potential environmental impacts and recommended mitigation measures for the proposed rural abattoir during the Construction Phase.

POTENTIAL IMPACTS AND RECOMMENDED MITIGATION MEASURES		EXTENT	DURATION	INTENSITY	PROBABILITY	WEIGHTING FACTOR	SIGNIFICANCE RATING	MITIGATION EFFICIENCY	ENHANCEMENT POTENTIAL	MITIGATED ASPECTS
IMPACT	MITIGATION / ENHANCEMENT									
SOCIO-ECONOMIC										
A direct impact will be the employment of external contractors to undertake the development of the rural abattoir and who employ local people to assist with the work.	n/a	3	1	1	5	3	30	H: 1	H: 1	30
BIOPHYSICAL										
The loss of biodiversity from the vegetation cleared for the approximately 100m <sup>2</sup> required to accommodate the building.	The building must be positioned so as not to disturb any protected and/or threatened plants and the clearing of vegetation must be limited to the immediate development footprint with a narrow margin surrounding it to facilitate construction movement. The area must be clearly demarcated and no movement outside will be allowed. Access to the site must also be clearly demarcated and limited to a single entry and exit point. No building material and/or construction equipment is to be stored, even temporarily, on or immediately adjacent to the construction site but rather in a pre-determined area in the service zone of the staff village. Remove and store plants from the development footprint so that they can be used for progressive rehabilitation.	1	5	2	5	3	39	0.6		23.4
The loss of ecosystem functionality through the loss of natural vegetation cover.	As above and ensure that the construction takes place during the dry season.	1	5	2	5	3	39	0.8		31.2

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Disturbance caused by noise and the movement of people, machinery and vehicles that may impact on the movement of fauna.	Access to be limited to the immediate development footprint with no movement outside of this allowed, except on existing roads and paths in the staff village. Vehicles and machinery to be well serviced include exhaust dampers and dis-engage reverse signals. All communications on site to be kept low with no unnecessary shouting or raised voices.	2	3	4	5	2	28	0.4	11.2
The creation of dust that settles on adjacent vegetation and decreases its palatability to grazing and browsing fauna.	Where it is apparent that dust is being created the working surface should be kept damp and any vegetation that has become unpalatable due to dust settling on it should be sprayed clean.	1	1	2	2	2	12	0.4	4.8
Potential soil erosion caused by the removal of the vegetation cover, removal of soil and compaction of surrounding areas.	Undertake the activity during the dry season, rehabilitate exposed surfaces as soon as possible after development and where the surfaces are permanently exposed ensure that appropriate anti-erosion mechanisms are in place.	1	3	2	2	2	16	0.4	6.4
The introduction of invasive alien plants (IAPs) from contractor's equipment and vehicles as well as the opening of ground cover and the disturbance of soil making the area vulnerable to infestations. Note that this is particularly relevant to <i>Parthenium hysterophorus</i> which is already present along Main Road West after entry through the boom gate at the Anti-poaching Unit (APU) although there are a diversity of IAPs in and around the camp and staff village.	All current infestations must be cleared before construction work is initiated, contractor vehicles must be checked before entering the area, i.e. at Newington Gate, to ensure that they are clean and are not carrying soil in from outside, disturbed areas must be rehabilitated progressively throughout the development process, and the areas must be monitored regularly after completion of the works to ensure that there are no new infestations.	2	4	3	3	5	60	0.4	24
The presence of external contractors poses the threat of poaching of both plants and animals.	Ensure that contractors and their staff are well informed of the codes of conduct for working in a protected area as this relates to the illegal removal of plants and animals, ensure that this aspect is included in the contractors contract, maintain a presence during road works to ensure that all movements are monitored and restricted to the development footprint and the staff village, and ensure that the control measures at the APU and Newington Gate are aware of external contractors movements and the need to be vigilant in regards to this potential impact.	2	1	5	2	5	50	0.2	10
Potential pollution of the immediate environment through the introduction of solid and liquid waste from contractors and their workers.	Ensure that the contractor is aware of and signs an agreement to ensure that there will be no littering whatsoever and that they have access to ablution facilities provided on site. All waste is to be separated and stored on site during the day and removed at the end of the day on a daily basis.	1	1	3	3	2	16	0.4	6.4

VISUAL / AESTHETIC										
The clearing of vegetation and exposure of soil, as well as the presence of contractors, workers and their vehicles and equipment may be visible from beyond the construction site.	Limit the development of twin tracks as per the description provided in Section 3.2.1.1 and ensure that areas disturbed for the upgrading of Main Roads East and West are rehabilitated progressively throughout the works. Also ensure that the road works are carried out during daylight hours thus preventing the need for lights and that the number of vehicles used and the size of the contract team are kept to the minimum required to get the works done as soon as possible.	2	1	5	5	3	39	0.6		23.4
HERITAGE										

### 10.7 Operational Phase of the Proposed Rural Abattoir

Table 15: Potential environmental impacts and recommended mitigation measures for the proposed rural abattoir during the Operational Phase.

POTENTIAL IMPACTS AND RECOMMENDED MITIGATION MEASURES		EXTENT	DURATION	INTENSITY	PROBABILITY	WEIGHTING FACTOR	SIGNIFICANCE RATING	MITIGATION EFFICIENCY	ENHANCEMENT POTENTIAL	MITIGATED ASPECTS
IMPACT	MITIGATION / ENHANCEMENT									
SOCIO-ECONOMIC										
As an indirect impact the operation of the rural abattoir will help to maintain the ecological integrity of the LGR and will thus ensure the viability of the visitor experience and the economic model that is Londolozi and therefore retain its capacity to employ local people in its operation.	n/a	3	5	2	5	2	30	H: 1	H: 1	30



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BIOPHYSICAL										
The loss of biodiversity from the vegetation cleared from the 100m <sup>2</sup> for the rural abattoir.	Ensure that the development skirt surrounding the building is immediately rehabilitated with plants removed from the site during construction.	1	5	1	5	2	24	1.0		24
The loss of ecosystem functionality in relation to the development footprint.	As above	2	5	1	5	2	26	1.0		26
Disturbance of fauna due to the movement and noise associated with the operation of the facility, especially as this may be during the night.	Ensure that vehicles bringing in carcasses are maintained to reduce noise, that drivers are well trained in the knowledge of the potential impact and the need to keep the level of disturbance to a minimum. Ensure that the staff handling carcasses at the facility are aware of this need as well and that they adhere to this requirement.	2	5	1	3	3	33	0.4		13.2
Potential soil erosion caused by the increase in hardened surface area in the staff village and the resultant accelerated run-off.	Install gutters and water tanks to harvest rain water and to attenuate run-off from the roof. Ensure the slow release of harvested rainwater to provide attenuation capacity during rainfall events. Ensure that surrounding vegetation remains in a good condition so that it retains the capacity to retard run-off and hold the soil.	2	5	1	2	3	30	0.4		12
The proliferation of invasive alien plant infestations as a result of the disturbances caused by the development.	Monitor the situation closely and ensure that the emergence of any IAPs are dealt with immediately and in the most effective way. Ensure that post development rehabilitation is complete and successful.	1	2	3	3	3	27	0.2		5.4
VISUAL / AESTHETIC										
The roof of the new structure may be visible from outside of the staff village.	Ensure that the surrounding trees are kept in place as a screen to any potential visual impact..	2	5	1	1	2	18	0.4		7.2

### 10.8 Assessment of the No-go Option for the Rural Abattoir

Table 16: Assessment of the No-go Option for the Rural Abattoir

POTENTIAL IMPACTS AND RECOMMENDED MITIGATION MEASURES		EXTENT	DURATION	INTENSITY	PROBABILITY	WEIGHTING FACTOR	SIGNIFICANCE RATING	MITIGATION EFFICIENCY	ENHANCEMENT POTENTIAL	MITIGATED ASPECTS
IMPACT	MITIGATION / ENHANCEMENT									
SOCIO-ECONOMIC										
Employment options will not be realised either in the short- or long-term.		2	3	2	5	2	24			
BIOPHYSICAL										
None of the negative biophysical impacts will occur, although the positive impacts of the proposed rural abattoir will be a lost opportunity for addressing the over population of impala and nyala, and their associated impacts. This loss counteracts the potential positive impact of the no-go options in this regards and affects the scoring. The same is true for the road works as the proposed roads are aimed at improving the road network.		2	5	3	5	3	45			
VISUAL / AESTHETIC										
As above the no-go option will result in the loss of positive impacts associated with the ability to reduce the impact of impala and nyala on the ecological integrity of the LGR as well as improving the road network.		2	5	3	3	4	52			
HERITAGE										
No heritage sites will be impacted on.		1	5	2	5	3	39			

## **10.9 Cumulative Impacts**

### **10.9.1 Road Works**

Any cumulative impacts of the proposed road works will be negated by the nett reduction in the overall road network. The method used for the proposed new roads also introduces a more sustainable approach to the construction of roads in the LGR which bodes well for the future. If the rehabilitation of the areas adjacent to the upgraded roads is completed quickly and is successful, there will be no related cumulative impacts as these works relate to two existing roads. The upgrading will also reduce any impacts that these roads are causing in relation to their current condition.

### **10.9.2 Rural Abattoir**

An additional 100m<sup>2</sup> of hardened surface area in the staff village may be seen as an undesirable cumulative impact. However, the potential contribution that the facility is planned to make to the reduction of populations of habitat changing ungulates needs to be seen as an acceptable trade-off. If the potential of the facility is realised to its full this positive impact may be seen as a desirable cumulative impact.

It must be noted that the current Management Plan for the LGR states that there needs to be a concerted and sustained effort to reduce the cumulative anthropogenic impacts on the area.

## **11 ENVIRONMENTAL IMPACT STATEMENT**

### **11.1 Summary of Key Findings**

#### **11.1.1 Road Works**

Most of the potential impacts are relatively insignificant prior to mitigation and post mitigation they are insignificant. The only potential impacts that are significant prior to mitigation are associated with the introduction of IAPs and the poaching of fauna and flora. Mitigation of both is possible and to levels of insignificance.

Assessment of the no-go option shows that the proposed road works offer a positive trade-off that will have an overall positive impact on the environment.

#### **11.1.2 Rural Abattoir**

The findings in relation to the Rural Abattoir are similar to those of the Road Works with the exception being that the potential impacts associated with IAPs and poaching are slightly less significant prior to mitigation.

### **11.2 Sensitivity Map**

The relatively small scale of the proposed developments and the ability for them to be contained within their footprints negates the need for a sensitivity map showing buffers relative to sensitive



environmental features. Note that where this is relevant in regards to the crossing of a watercourse by Main Road West the question of a buffer has been addressed in Section 3.2.1.2 and illustrated in Figure 6.

## **12 ASSUMPTIONS AND LIMITATIONS**

The Basic Assessment Report has been prepared on the strengths of the information available, from site visits and that provided by the applicant and other relevant sources at the time of the assessment. Comments and inputs from I&APs were carefully considered. Topographical, vegetation and the SSW and LGR Management Plans were consulted. The assumptions made and constraints that were prevalent did not obviously have any restrictive or negative implications on the study.

In undertaking this investigation and compiling the Basic Assessment Report, the following has been assumed:

- The information provided by the client is accurate;
- The scope of this investigation is limited to assessing the environmental impacts associated with the construction and operation of the proposed Road Works and Rural Abattoir; and
- Should the project be authorised, the applicant will implement any recommendations and mitigation measures outlined in the BA and conditions of environmental authorisation into the detailed design and construction contract specifications of the proposed projects.

There is a high level of confidence in the accuracy of the information provided, sourced and gathered and that the resultant assessment has produced recommendations that are appropriate and that will ensure the sustainability of the proposed development.

## **13 RECOMMENDATION AND CONDITIONS OF AUTHORISATION**

It is recommended that the proposed Road Works and Rural Abattoir as described in Sections 3.2.1 and 3.2.2, and the listed activities as presented in Section 3.3 be granted environmental authorisation. The conditions of authorisation are all the mitigation measures listed in Sections 10.3, 10.4, 10.6 and 10.7 which need to be strictly adhered to within the context of the compliance monitoring recommendations in Section 8.3, as well as adherence to the stand-alone EMPr and those included as Annexes C and E.

## **14 CONCLUSION**

In conclusion it may be stated that the two development proposals assessed in this report will have an overall positive impact on the management of the LGR as it progressively works to improve its management effectiveness as well as the redress of negative impacts from past developments.

## 15 REFERENCES

- Londolozi Game Reserve (LGR) (2019). Londolozi Management Plan for 2019 – 2029. Unpublished document compiled by Messrs Kevan Zunckel, Chris Goodman and Rob Crankshaw.
- Mucina, Ladislav & Rutherford, M.C. (2006). The vegetation of South Africa, Lesotho and Swaziland. SANBI, Pretoria, South Africa.
- Nel, J.L., Driver, A., Strydom, W.F., Maherry, A., Petersen, C., Hill, L., Roux, D.J., Nienaber, S., van Deventer, H., Swartz, E. and Smith-Adao, L.B. (2011). ATLAS of FRESHWATER ECOSYSTEM PRIORITY AREAS in South Africa: Maps to support sustainable development of water resources. Report to the Water Research Commission. WRC Report No. TT 500/11, August 2011.
- Sabi Sands Wildtuin (SSW), 2019. Sabi Sand Wildtuin Protected Area | Protected Area Management Plan, 2019 – 2029. Unpublished document compiled by Mr Iain Olivier, Dr Mike Peel and Mr Edwin Pierce.

**ANNEX A: FULL CURRICULUM VITAE OF KEVAN ZUNCKEL:  
ENVIRONMENTAL ASSESMENT PRACTITIONER**

**ANNEX B: SIGNED DECLARATIONS OF INTEREST BY EAP AND  
SPECIALISTS AND SPECIALIST CVs**



## **ANNEX C: LONDOLOZI ENVIRONMENTAL MANAGEMENT PLAN FOR ROAD CONSTRUCTION AND MAINTENANCE**

### **CONSTRUCTION AND MAINTENANCE OF ROADS**

#### **1. SCOPE**

The scope of this Environmental Management Plan (EMP) is to set a protocol for addressing environmental issues, in connection with road management, to ensure that appropriate controls and audits are implemented to prevent potential environmental damage and to mitigate any impacts that may occur.

#### **2. AGREEMENT**

It is important to note that the EMP is to be read as a contract between the Contractor and Londolozi. It is therefore crucial that the Contractor is supplied with a copy of the EMP (or access to this through a web link) and it is made clear that failure to adhere to its requirements may lead to penalties levied against the Contractor.

It is also noted that any damage caused by the Contractor to areas outside the construction site, is to be compensated for, repaired or replaced at the Contractor's expense, to the satisfaction of the Londolozi Management in accordance with the Contractor's penalty schedule as listed in Appendix 2. The Landcare Manager may institute contractual measurements to ascertain that Contractors adhere to the environmental obligations agreed upon. Penalties for non-compliance are enforced and Construction staff must adhere to any Codes of Conduct supplied and requirements of the Sabi Sands Game Reserve.

The Contractor will be required to sign each page of this EMP as an acceptance of the conditions stipulated. Londolozi looks to maintaining a fair, ethical and transparent working environment. Disagreements and grievance structures are in place and should any disagreements or issues arise, these can be managed through the existing company grievance procedures.

It is preferable to all parties that a reasonable attempt be made to resolve issues through open discussion, and if necessary, with a neutral party present.

#### **3. RESPONSIBLE PERSON**

The Landcare Manager, acting in the capacity as Londolozi's Environmental Officer (here after referred to as Landcare Manager), is appointed by Company Board of Directors to ensure full compliance with the requirements of this Environmental Management Plan (EMP). The Landcare Manager should be familiar with the contents of this document and requirements of Londolozi and the Sabi Sands Game Reserve.

The primary role of the Environmental Control Officer is to act as quality controller regarding all environmental concerns. In this respect, the Landcare Manager is to conduct periodic site inspections, attend regular site meetings, pre-empt problems and suggest mitigation and be available to advise on incidental issues that arise.

The Landcare Manager will keep a written record in the form of compliance reports during the construction phase to monitor compliance and general progress. These compliance reports must be kept on file for possible future inspection.

The Landcare Manager may at any time institute action against a contractor due to non-compliance with the EMP.

The Landcare Manager will be responsible for the training of Contractors in terms of conveying the contents of this EMP and associated policy and Codes of Conduct to them through an induction / training session.

Comment: The regulations under NEMA change periodically and not all roads will necessarily require an EIA. Any new roads planned should be evaluated against the current regulations to see if they trigger a listed activity and require environmental authorisation.

Particular care should be considered with regards regulations pertaining to watercourses.

#### **4. DEFINITIONS**

**Incident:** An event resulting in temporary or permanent cumulative or immediate adverse effects on the environment, eg an oil or chemical spillage, or release of refrigerant gas. Typically, the spill of more than 1 litre of petrol or diesel or oil or paint would constitute an incident

**Natural vegetation:** All existing vegetation species, indigenous or otherwise, of trees, shrubs, ground cover, grasses and all other plants found growing on the site.

**Rehabilitation:** Making the land useful again after a disturbance. It involves the recovery of natural ecosystem functions and processes in a degraded habitat. Rehabilitation does not necessarily re-establish the pre-disturbance condition, but does involve establishing geological and hydrologically stable landscapes that support the natural ecosystem mosaic.

**Topsoil:** The upper soil profile irrespective of the fertility appearance, structure, agriculture potential, fertility and composition of the soil, usually containing organic material and which is colour specific.

**Humps:** Compacted placed across the roadway at any angle to aid rapid drainage of water from the roadway. Humps are usually at least a meter wide or more and 300mm high.

**Windrow:** A line of material (soil or other road material) alongside the road, often created by grading.

**Table drains:** A 'V' or trapezoidal shaped open drain located immediately adjacent to the edge of a road.

**Flood Mild:** The result of a local or catchment based rainfall event that leads to increased river flow, but not to the extent that it surpasses the 1:50 year floodline.

**Flood Severe:** Any increased river flow above the 1:50 year flood line.

## 5. INCIDENT REGISTER AND REPORTING

An incident register will be kept on site at all times and completed/updated by the Contractor on a daily basis. All incidents must be recorded in the register. The register is available to Londolozi management for audit inspections.

All incidents must be reported to the Landcare Manager, and the responsible Contractor will sign the logging of the incident, to ensure that the information contained in the register is correct. The register must contain the date, time and place of the incident that took place. Remedial measure taken must also be mentioned in the logbook. Refer to Appendix 1, for an example of the site incident register.

## 6. ROADS MANAGEMENT

All road management should be based on the requirements identified by the Landcare Manager. Each road section should be assessed for drainage and road standard requirements prior to any earth works being undertaken. Minimum standard is dry weather 4WD access for all roads.

### 6.1 ROAD MAINTENANCE

All roads should be assessed at least annually and a maintenance program developed with a costing and priority ranking. Where possible, less used tracks will not be graded and retain the 'middlemannetje'.

Any gravel for a road must be obtained from a licensed borrow pit.

Road camber and drainage should be sufficient to minimise erosion and maintenance requirements. Methods to achieve this is dealt with in greater depth in the sections below.

### 6.2 NEW ROADS LESS THAN 4 METERS WIDE

New roads must be planned with care and receive approval from SSW EXCO prior to development. The following information must be submitted to EXCO for any new road:

- Purpose
- Soils and plant communities that will be traversed
- Maintenance requirements
- Source of gravel (if any)
- Alternatives considered

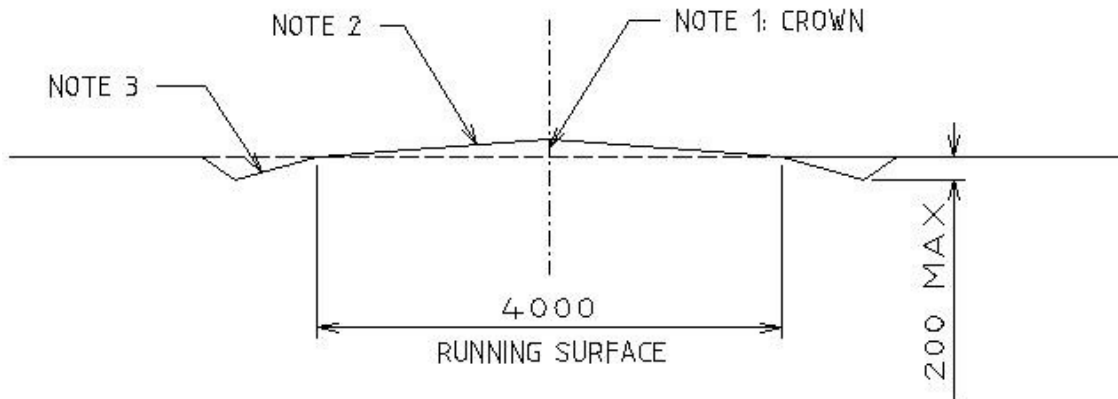
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Road alignment should avoid areas with high erosion potential (slope and soil) as well as seep and drainage lines where possible.

Roads may require environmental authorisation and it is advisable to check with a specialist before commencing the project.

### 6.3 FORMATION PROFILES

#### 6.3.1 Crowned Surface Formation



Note (1) Normally 0.3m above natural surface after consolidation

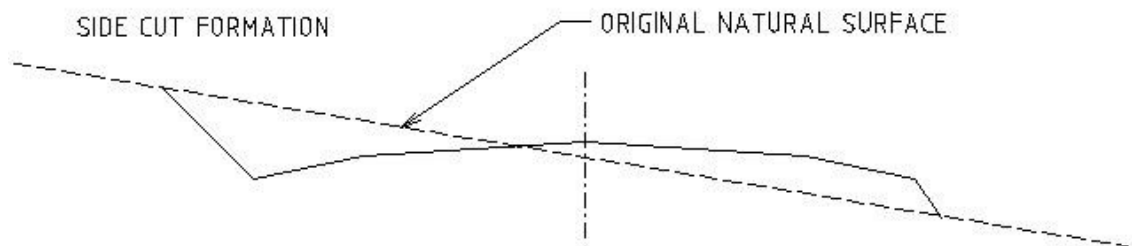
Note (2) Nominal design crossfall of 5% after consolidation ie.  $\approx$  7% unconsolidated

Note (3) Nominal shoulder batter of 1:5

#### Crowned Surface Formation

- Is suitable for tracks where water can be shed from both sides of the formation
- May be used in other situations in conjunction with suitable cross road drainage techniques (see Section 7.5.)
- May require down road drainage (see Section 7.6.)

#### 6.3.2 Crowned Side Cut and fill Formation.

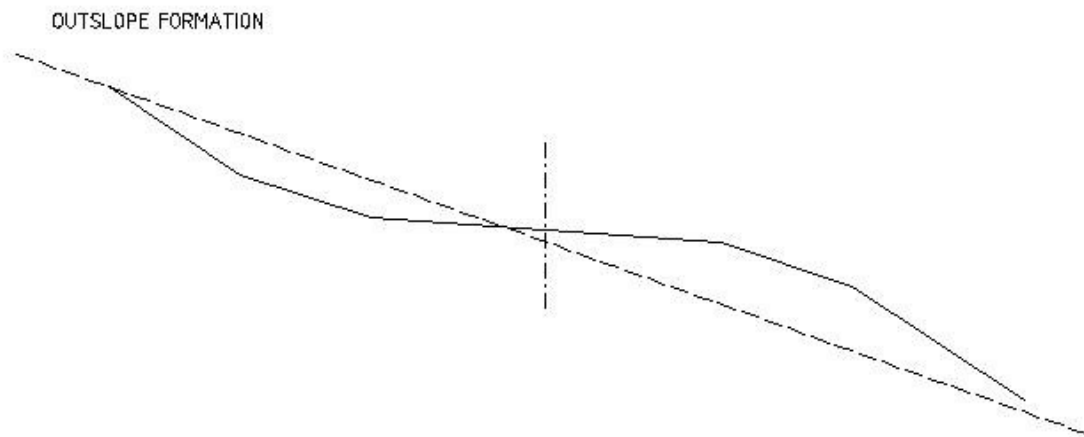


Notes and dimensions as per 6.1.1

#### Crowned Side Cut and fill formation

- Suitable for smaller lengths of side cut where water can be shed from the confined water table further down the road eg at ridge top saddle.
- May be used in limited situations for longer runs if used in conjunction with acceptable cross drainage techniques (see Section 7.5).

### 6.3.3 OUTSLOPE FORMATION



(Notes placed as per 6.1.1)

Note (1) Normally 0.3m above natural surface after consolidation

Note (2) Nominal design crossfall of 5% after consolidation ie.  $\approx$  7% unconsolidated

Note (3) Nominal shoulder batter of 1:5 (20%)

Outslope Formation

- Suitable for longer lengths of side cut where water cannot be shed from the confined shoulder of the road except across the running surface
- This design profile should be used in conjunction with approved cross drainage techniques (see Section 7.6).

### 7 STORM-WATER MANAGEMENT/ ROAD DRAINAGE

In order to avoid damage to roads and drainage areas, any surface water must be led off the road as soon as possible and with as low a velocity as possible.

The following approaches should be used as prescribed.

#### 7.1. BERMS

- Berms are rills of excess or unsuitable road material windrowed on to the side of the worked area.
- Any berm must be discontinuous. Breaks must be opened at intervals of less than 20m.
- Any drainage must extend through the berm
- Berms may be placed on the uphill side of workings; especially in locations suitable for outslope track formation (See Section 6.1.3). Where possible they should be incorporated into the track shoulder.

#### 7.2. ANGLED HUMP SPACING

Angled humps constructed across the road collect water on the road and disperse it either on both sides or on one side, depending on the local topography. Water flow should be intercepted and dispersed from the road into drains at safe locations at least every 0.5 metres of vertical fall of the track.

It is acknowledged that soil type and other local factors on site may vary the ideal from this specification. This specification is to be used as an appropriate requirement for red soils; any variation to this standard must be authorised by the Landcare Manager. Humps should be at least 0.3m high and compacted.

#### 7.3 TURNOUTS OR MITRE DRAINS

Turnouts generally:

- Should be as short as possible whilst achieving the desired result. This will be dependant on soils, permeability and terrain.
- Should be terminated in as wide (level – 2 to 5%) a discharge as is practical.
- Should run at approximate 1.5% grade (shallow slope to slow water velocity)
- Should extend as far as is required to prevent discharged water from flowing back to the road further down the slope.
- Must discharge onto stable areas of undisturbed vegetation and not onto fill slopes, exposed soils or directly into a water course.



- Be constructed with a grader or suitable blade.

## 7.5. CROSS ROAD DRAINAGE TECHNIQUES

### 7.5.1. CULVERTS

A culvert is defined as any pipe box or arch construction used for cross road drainage that is covered and below the surface of the road. Culverts are only to be installed at the express and written instructions of the Landcare Manager and where other options are not practical.

Existing culverts are to be preserved and culvert heads left in a clean and functional condition.

If existing culverts are damaged during maintenance, the location and extent of damage is to be recorded in writing and relayed to the Landcare Manager within 24 hrs.

### 7.5.2 INVERTS

Inverts are man-made or naturally occurring open topped depressions in the surface of the roadway which allow for concentrated cross road drainage. These are often utilised where local topography is appropriate.

### 7.5.3 CROSS FLOW RUN-OFF HUMPS

These structures are used to invert water across the road and are used in areas where the topography is very uniform.

#### Locating Cross Flow Humps

Placement of cross flow Humps requires care and planning. They should be constructed at critical points where there is:

- A significant change of grade
- A significant change of road direction
- A significant point of overland flow concentration
- A safe stable discharge point.

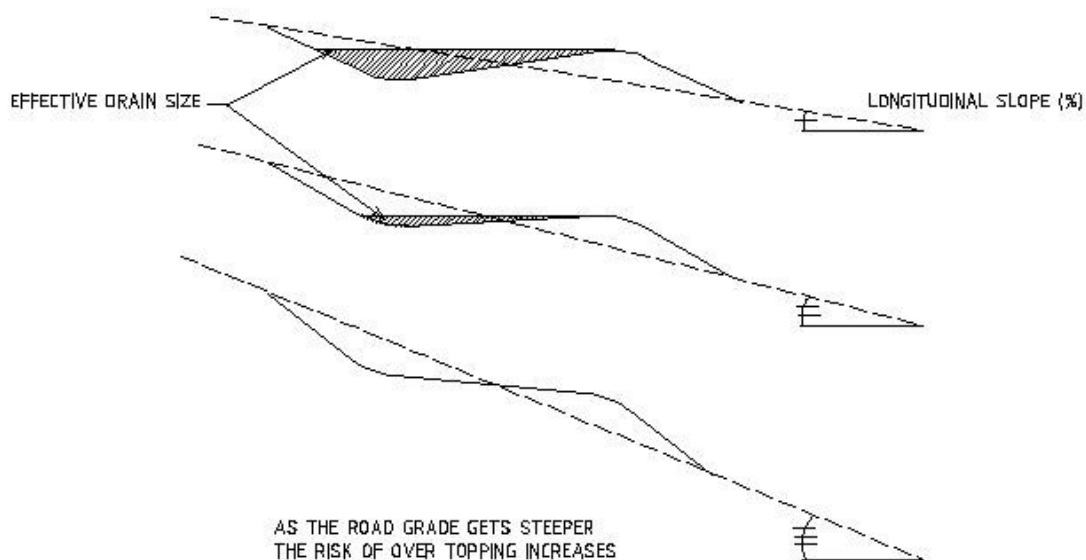
After these key points are located, additional Cross Flow Humps will need to be constructed so as to remain within the minimum specification of 0.5 metres of vertical fall. (see spacing of access track drainage Section 7.2.).

#### Dimensions Of Cross Flow Humps.

Humps must be easily trafficable and must drain water across the road without scouring, ponding or overtopping.

They should be  $\approx$  0.3 to 0.6m high (unconsolidated) and be compacted for a minimum of 2 metres on both top & bottom sides of the mound.

As the longitudinal slope (grade) increases so too does the risk of overtopping. A corresponding degree of care with construction is warranted to preclude any risk of the structure failing.



Generally:

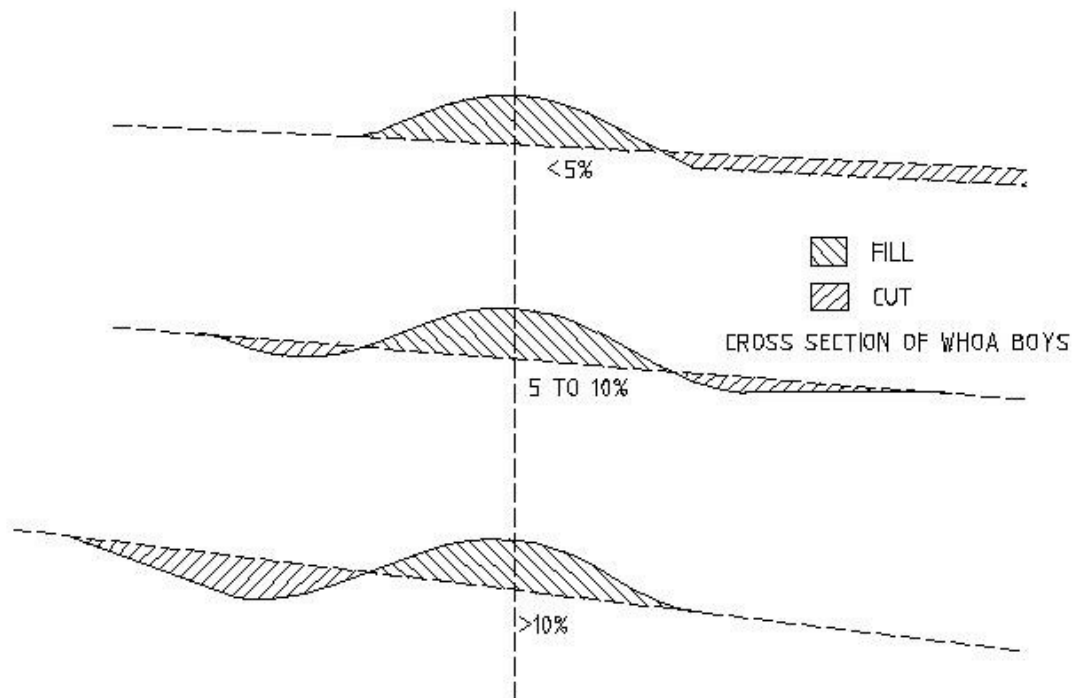
For slopes <5%, materials should be sourced from the lower side of the mound.

For slopes 5% to 10%, materials should be sourced from both sides of the mound

For slopes >10%, all material should be sourced from above the mound (where possible)

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In some very steep situations additional material may be required. Gravel may need to be sourced elsewhere and imported to the required hump location.



#### 7.6. DOWN ROAD DRAINAGE TECHNIQUES

These techniques specifically relate to dispersal of water confined or concentrated on the running surface of the track (eg in wheel ruts or compacted zone).

Water is to be dispersed using:

- Cross Fall of running surface
- Humps
- Combination of the two above

Normally the cross fall of the running surface will suffice. Exceptions occur where the formation is:

- On very steep slopes where the longitudinal slope is much greater than the cross fall of the formation and even minor ruts may channel the water and frustrate water shedding from the running surface.
- In areas of highly erodible soil types In these situations additional protective techniques should be incorporated. The techniques include cross road drainage structures if applicable; or if not applicable, Minor humps should be installed.

If the track intercepts and concentrates overland (surface water runoff) flows of water then normal cross flow humps should be constructed. In these situation it is imperative that the structure discharge extends a sufficient distance to preclude any chance of this water migrating back to the track.

If overland flow is not a problem then Minor Humps would be acceptable.

#### 7.6.3. MINOR HUMPS

##### Positioning Minor Humps

Placement of minor humps requires care and planning. They should be constructed at a critical point where there is:

- A significant change of grade
- A significant change of road direction
- A safe stable discharge point.

After these key points are located, additional Minor humps will need to be constructed so as to intercept the potential flow every 6 metres of vertical fall.

These structures must be free draining. Discharges must extend a sufficient distance to preclude any chance of this water migrating back to the track.

#### Dimensions Of Minor Humps

Minor Humps must be easily trafficable and must drain water off the running surface without scouring, ponding or overtopping.

They should be  $\approx$  0.2 to 0.4m high (unconsolidated) and be compacted for a minimum of 2 metres on both top & bottom sides of the mound.

### 7.7. RIVER, STREAM & DRAINAGE-LINE CROSSINGS

As far as possible, these should:

- Be avoided
- Cross at right-angles
- Be situated to avoid box cuts
- Have minimal clearing
- Be protected by drainage structures immediately above the approach slopes.

Particular care should be paid to the river banks where the slope is likely to increase erosion potential.

NOTE: Any activity where more than 10 cubic meters of material may be moved requires environmental authorisation and a water use licence.

#### 7.7.1 Culverts in drainage lines

Culverts should be placed at the lowest location in a road crossing. Wide, flat culvert profiles are recommended for use but other design criteria should still be the primary deciding factors. The inlets and outlets to the culverts should be protected to prevent erosion, scouring and collapses. In areas where piping in soils occur, all culvert joints should be watertight. The possibility of soil mechanical failure must be taken into account, especially in the case of non-cohesive materials. Where steep gradients occur the need for erosion control on the outlet and downstream side is important to prevent loss of topsoil and erosion.

In the case of flat (shallow) gradients the minimum desirable slope in the culvert should not be less than 0.5% to ensure that maintenance and silting-up within the system can be kept to a minimum.

Each culvert should be treated individually and factors regarding slope of immediate adjacent areas and / or streams also play part in the deciding factor.

Culverts size should err on the side of being too large and too small.

#### 7.7.2. Dry river crossings

These crossings need little maintenance in the river bed itself. Occasional smoothing may make crossings more comfortable.

The access to the river bed is the most important area and most likely to require stabilisation and protection from erosion and damage. Each access point needs to be assessed for the most appropriate and lowest impact methods.

Any of the following should be considered to protect the access against erosion and minor flooding:

- Concrete (re-enforced and 100mm thick)
- Gabion structures
- Well-paced rocks
- Angled approach down the bank before crossing the river bed at 90 degrees
- Existing rock
- Suitability of existing soils
- Gravel packing

The angle of approach to the river bed may be considered to reduce erosion potential.

## 8 GENERAL CONTROLS

### 8.1 VEHICLE ACCESS

Vehicle access to Londolozi will be through Newington Gate only and via the existing approved access road. Access to the footprint of any development location will be via Londolozi roads. No new roads are to be created without prior authorisation from the Game Reserve Trust and SSW and shall be in writing with appropriate GPS co-ordinates and within a defined route.

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The contractor will be responsible for clearly marking any roads that are required to be closed to traffic for the construction or maintenance activity. The closure of any roads must be undertaken in consultation with the Landcare Manager.

Landcare Access time is 9am-3.30pm. An extended access permit may be applied for.

**The reserve speed limit is 40km/h.**

Heavy rain will restrict heavy vehicle access to the reserve as enforced by SSW management.

## **8.2 PROTECTION OF FAUNA AND FLORA**

No tree of a trunk diameter exceeding 100mm should be removed without the written permission of the Landcare Manager and densely wooded areas should be avoided where possible. No protected trees (list in Appendix 3) requiring a permit may be removed without such a permit. If in doubt on a particular tree, the Landcare Manager will assist.

In order to limit damage to the environment during construction, the planning phase includes identification of and pegging /demarcation of any stockpile sites.

No firewood or any other plant material or animal may be removed from the site.

In order to minimise the potential impact on Fauna, the footprints of the proposed development should be scrutinised for the presence of any vulnerable fauna and necessary relocation action taken in the event of finding any. No footprint may be worked until such time that the Landcare Manager has completed the footprint investigation. Contractors should clearly understand that they are working within a nature reserve. Contravention of any conservation and environmental legislation may result in prosecution. The Contractor is responsible for any illegal action by his/her staff, e.g. illegal hunting, setting of snares, fishing etc.

The Landcare Manager shall monitor that there is no introduction of alien invasive species to the construction site. Should any such species be identified, immediate and appropriate control measures are to be implemented under the guidance of the Landcare Manager.

The area is an open system Big 5 reserve. Dangerous wild animals exist in the area and suitable precautions should be undertaken so as not to increase the risk of site personnel. It is also a malaria area. The Landcare Manager will advise on suitable action to take as appropriate to the site, work and equipment.

## **8.3 ESTABLISHMENT OF CONSTRUCTION SITE**

The Landcare Manager will direct where stockpiles and equipment may be stored or parked.

## **8.4 ABLUTION FACILITIES AND WASTE/ REFUSE DISPOSAL**

Toilet facilities are rarely available at the construction site. Road contractors are requested to use existing Londolozi toilets as pointed out by the Landcare Manager and to ensure that they are always left clean.

No refuse or litter may be allowed to be left overnight. Any building rubble and any other non-compactable rubble should be safely stored to be transported at a later stage. Building rubble must be removed from the reserve.

Contractors are expected, as are all staff in the reserve, to pick up any litter they notice in the reserve.

## **8.5 PROVISION OF WATER**

Water may need to be transported to the construction site. Filling of water tankers and similar must be arranged in consultation with the Landcare Manager.

The Landcare Manager is to train Contractors on correct and safe water usage practices. Water is a precious and limited resource and should be used sparingly.

Washing of vehicles is prohibited.

Hose pipes must be entire and free of leaks and taps turned off when not in use.

## **8.6 AIR POLLUTION**

No significant air pollution is anticipated, however, dust suppression may be necessary. This should be discussed with the Landcare Manager.

## **8.7 NOISE**

Contractors must gain confirmation with regards to work hours, as this is highly dependent on guest movements and game drive times. Contractors may be required to vacate the site from time to time to a suitable venue, as directed by the Landcare Manager. Management may require different work times to those normally permitted (7:00 to 17:00). Any work hour schedule should be in agreement with management and obtained in writing.



Unnecessary noise will not be tolerated. Contractors will not be permitted to shout on site. The use of megaphones is prohibited.

#### **8.8 VEHICLE AND EQUIPMENT FUELLING AND MAINTENANCE**

All vehicle fuelling and maintenance is to occur in areas specifically maintained for these activities e.g. the workshop. The servicing and repair of equipment is to take place in the workshop or off site in areas specifically designed and designated for this.

In the event of an on-site emergency repair, the contractor must ensure that all work is conducted over an impervious layer preventing spillage of oils and fuels into the environment. Sufficient absorbent materials and spill kits must be available to assist with clean-up operations.

#### **8.9 SOIL CONTAMINATION AND RESPONSE**

Should any soil contamination occur during construction, such contamination is to be immediately reported to the Landcare Manager. The soil shall be removed and stored in an area determined by the Landcare Manager and shall be labelled as to the form of contamination to prevent its future use. After consultation with the Landcare Manager, the contaminated soil must be disposed of, in accordance with legislation. Minor (less than 50 litres) soil contamination by hydrocarbons (fuel) may be addressed with a bioremediation solution. Bioremediation is the application of biological microbes for the clean-up of hazardous oil spills resulting in a safe, efficient and cost-effective solution. Bioremediation uses microbes, enzymes, oxygen and other nutrients to chemically transform oil into carbon dioxide and water.

#### **8.10 CEMENT**

Cement mixing is to take place on an impermeable layer. Cement mixing areas must not be in the vicinity of drainage-lines or water bodies as cement is toxic to aquatic species. This is particularly important if cement is used on river crossing areas.

The cleaning of cement equipment, at the end of a working day, shall be washed in a drum of water. Allow the water to settle overnight. The top layer of water is subsequently used for further cement mixing and wetting. The process is repeated. Remaining sludge is allowed to dry and disposed of at the end of the project.

Any excess cement and concrete mixes shall be retained on the construction site until completion of the construction when all spoil material and rubble will be removed and the rehabilitation process commences.

All used cement bags are immediately to be disposed of into the solid waste system. These bags are not to be used for other on site applications.

#### **8.11 PROVISION OF STORAGE FACILITIES - DANGEROUS AND TOXIC MATERIALS**

All toxic materials such as paints, fuel, or oil shall be stored in well ventilated areas that can be locked. It is essential for safety reasons that all toxic materials are handled in an appropriate manner as prescribed by the labels on the products used.

Drip trays are to be placed underneath paints and toxic materials in storage to contain accidental spills.

Should any spillage or pollution of any toxic materials occur, the Landcare Manager should immediately be contacted and mitigation measures taken. The Contractor will be liable for any clean-up costs, legal costs or fines, which may arise from such an accident.

Empty containers that contained toxic substances are not to be used for any other application, but are to be returned to supplier, or punctured and discarded (not in the reserve) as recommended by the Landcare Manager and the product label.

#### **8.12 PROVISION OF STORAGE FOR CONSTRUCTION MATERIAL**

The Contractor will be responsible for the storage of construction material at a site determined in conjunction with the Landcare Manager. Where necessary in the stockpiled areas, the topsoil is to be removed and stored adjacent to the stockpile. No bushes or trees are to be removed for this purpose. All storage areas are to be indicated with the Landcare Manager.

#### **8.13 BORROW PITS AND QUARRIES**

The creation of borrow pits and quarries of any size on Londolozzi, is not permitted. Material may be obtained from borrow pits on Londolozzi with management's permission.

Harvest of construction materials such as sand and stone is only to be done in limited amounts and under strict control by the Landcare Manager.

Any imported gravel or sand shall be free of weeds, litter and contaminants.

#### **8.14 SPOIL MATERIAL**

All spoil material shall be disposed of in accordance with legislation. No spoil material will be left on site at completion of the project and the potential of the reuse of any material (excess crushed stone, sand etc) should be investigated. These spoil materials may be relocated to stockpile areas within Londolozi for later use, after arrangement with the Landcare Manager.

#### **8.15 FIRE PREVENTION**

No open fires will be allowed on the construction site or in the veld under any circumstances. It will be expected by all Contractors to indicate their ability to fight accidental fires, through having fully functional and serviced equipment on site in the event of accidental fires. The Landcare Manager will determine the level of equipment and training required by the Contractors.

#### **8.16 STORM WATER MANAGEMENT**

No obstructions of any storm water system will be allowed and the dumping of water used for the cleaning of equipment will also not be permissible, the management of this water has been addressed in detail in section 8.10 above.

Only level areas are to be used for stockpile zones and care is to be taken to prevent the stockpiling of materials in drainage lines. The Landcare Manager will assist in determining these areas.

#### **8.17 TRAFFIC CONTROL**

All vehicles used by Contractors and sub-contractors are to be maintained in a safe working condition. Vehicle operators are to be in possession of valid driver licenses. It is advisable to insure vehicles and operators against claims arising from accidents and third party liability. All vehicles shall undergo regular checks to ensure they are free of oil or other lubricant leaks. The Landcare Manager may at any time prevent sub-standard equipment from being used on Londolozi.

Contractors and sub-contractor drivers are to be courteous in all dealings with all other road users and shall adhere to all roadway signage and speed limits.

All the contractor's vehicles must have the contractor's decal clearly visible on both sides.

Contractors and sub-contractors are to use the shortest possible route between the place of entry and the construction site at all times. Unauthorised driving through the reserve for purposes other than the contract is not permitted.

Road closures necessary for works must be adequately marked.

#### **8.18 COMMUNICATION**

It is essential that good communication channels between the Contractor, Landcare Manager and SSW Reserve Management be maintained. This is particularly important with regard to road closures and wildlife safety.

### **9. REHABILITATION PHASE**

On completion of construction, the site must be rehabilitated through the removal of all construction facilities introduced, removal of waste and any other feature constructed or established during the use of the site. All areas devoid of vegetation or where spoils and stockpiles have been stored shall be scarified or ripped and the topsoil, previously removed, shall be reintroduced to these areas. In some cases it may be necessary to re-seed and mulch. This, however, will be at the discretion of the Landcare Manager.

### **10. DISASTER MANAGEMENT PROCEDURES**

Disasters are a constant threat when working in conservation areas and especially on construction sites.

Where flooding is likely, the Contractor must be informed and trained in the Londolozi flood management procedures.

In order to avoid accidental fires, the Contractors must be instructed in Londolozi fire management procedures.

The greatest factor regarding disaster management in this instance is the proximity to medical care for injuries on duty or evacuation in the case of serious illness. The Contractor is to develop and maintain a medical disaster management procedure that will be communicated to all staff. This procedure will, as a minimum, have evacuation protocols, medical attention detail and a list of necessary contact numbers included. This procedure is to be communicated to all workers and a copy is to be handed to the Landcare Manager for inclusion in the audit results. Contractors will also be required to have a first aid kit available on site at all times.



**ANNEX D: PHOTOS OF THE START, MID AND END POINTS OF THE PROPOSED NEW ROADS**

Elmonskraal



Tsalala





Hobbits Hole



Plaque





Circuit North



New Mbavala





Inyathini South



Circuit Pan



## **ANNEX E: LONDOLOZI ENVIRONMENTAL MANAGEMENT PLAN FOR THE CONSTRUCTION AND RENOVATION OF BUILDINGS**

### **CONSTRUCTION AND RENOVATION OF BUILDINGS**

#### **1. SCOPE**

The scope of this Environmental Management Plan (EMP) is to set a protocol for addressing environmental issues associated with the construction and renovation of buildings, to ensure that appropriate controls and checks are implemented to minimise potential environmental damage and to mitigate the impacts that may occur during the construction, renovation and development of buildings.

#### **2. AGREEMENT**

It is important to note that the EMP is to be read as a contract between the Contractor and Londolozi. It is therefore crucial that the Contractor is supplied with a copy of the EMP (or provided access to this through a web link or by other means) and it is made clear that failure to adhere to its requirements may lead to penalties levied against the Contractor.

It is also noted that any damage caused by the Contractor to areas outside the construction site, is to be compensated for, repaired or replaced at the Contractor's expense, to the satisfaction of the Londolozi Management in accordance with the Contractors penalty schedule as listed in Appendix 2.

The Landcare Manager may institute contractual measurements to ensure that Contractors adhere to the environmental obligations agreed upon. Penalties for non-compliance may be enforced and Construction staff must adhere to any management plans, policies, codes of conduct and other requirements of the Sabi Sands Wildtuin, e.g. Development-Environmental Compliance Standard Operating Procedure (CON-19-01). These documents will be made available to the contractor and will be adhered to by Londolozi.

The Contractor will be required to sign each page of this EMP as an acceptance of the conditions stipulated.

Londolozi looks to maintaining a fair, ethical and transparent working environment. Disagreements and grievance structures are in place and should any disagreements or issues arise, these can be managed through the existing company processes. It is preferable to all parties that a reasonable attempt is made to resolve issues through open discussion, and if necessary, with a neutral party present.

#### **3. RESPONSIBLE PERSON**

The Landcare Manager, acting in the capacity as Londolozi's Environmental Officer (here after referred to as Landcare Manager), is appointed by Company Board of Directors to ensure full compliance with the requirements of this Environmental Management Plan (EMP). The Landcare Manager should be familiar with the contents of this document and requirements of Londolozi and the Sabi Sands Wildtuin.

The primary role of the Environmental Control Officer is to act as quality controller regarding all environmental concerns. In this respect, the Landcare Manager is to conduct periodic site inspections, attend regular site meetings, pre-empt problems and suggest mitigation and be available to advise on incidental issues that arise.

The Landcare Manager will keep a written record in the form of compliance reports during the construction phase to monitor compliance and general progress. These compliance reports must be kept on file for possible future inspection.

The Landcare Manager may at any time institute action against a contractor due to non-compliance with the EMP.



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The Landcare Manager will be responsible for the training of Contractors in terms of conveying the contents of this EMP and associated policy and Codes of Conduct to them through an induction / training session.

#### 4. DEFINITIONS

**Pre-construction:** Involves all facets for the preparation of the site for construction.

**Construction:** For the purpose of this document, construction is defined as the physical action of constructing any structures, temporary as well as permanent. This activity should be checked prior to ensure it complies with all necessary legislation and EIA regulations.

**Post-construction/rehabilitation:** This phase includes the restoration of the surrounding environment that was impacted upon due to the construction process to its original state.

**Decommissioning:** The decommissioning of a building will occur when the use of the said structure is no longer required or when it has become non-viable in terms of maintenance to continue its upkeep. This phase is not anticipated, although it is acknowledged as a potential possibility. An EMP for this task specifically will have to be compiled. This activity should be checked prior to ensure it complies with all necessary legislation and EIA regulations.

**Incident:** An event resulting in temporary or permanent cumulative or immediate adverse effects on the environment, e.g. an oil or chemical spillage, or release of refrigerant gas. Typically, the spill of more than 1 litre of petrol or diesel or oil or paint would constitute an incident.

**Natural vegetation:** All existing vegetation species, indigenous or otherwise, of trees, shrubs, ground cover, grasses and all other plants found growing on the site.

**Rehabilitation:** Making the land useful again after a disturbance. It involves the recovery of natural ecosystem functions and processes in a degraded habitat. Rehabilitation does not necessarily re-establish the pre-disturbance condition, but does involve establishing geological and hydrologically stable landscapes that support the natural ecosystem mosaic.

**Topsoil:** The upper soil profile irrespective of the fertility appearance, structure, agriculture potential, fertility and composition of the soil, usually containing organic material and which is colour specific.

**Protected Tree/ plant:** A tree or plant which is listed as a protected species in terms of the National Forest Act or the Mpumalanga Nature Conservation Act. Both these lists are attached in Appendix 3.

#### 5. INCIDENT REGISTERS AND REPORTING

Accidents, resulting in an incident will happen from time to time. The reporting process seeks to ensure that these are addressed and that environmental damage is minimised and that practical measures are put in place to prevent recurrence where appropriate. The purpose of the reporting is not to apportion blame, however this does not exclude the possibility that action will be taken if a failure to follow the environmental management plan, specific instructions or negligence is shown.

A site book will be kept on site at all times and completed/updated by the Contractor regularly. All incidents, instructions and agreements must be recorded in the site book. The site book must be a copy type book, available to Londolozi management for inspections. All incidents must be reported to the Landcare Manager, and the responsible Contractor will sign the logging of the incident, to ensure that the information contained in the site book is correct. The site book must contain the date, time and place of the incident that took place. Remedial measure(s) taken must also be recorded in the logbook. Refer to Appendix 1, for an example of the information and format for incident recording.

#### 6. CONTROLS DURING PRE-CONSTRUCTION AND CONSTRUCTION

##### 6.1 VEHICLE ACCESS

Vehicle access to Londolozi will be through Newington Gate only and via the existing main access road. No new roads or short-cuts are to be constructed by the Contractor. Access to the



footprint of the development location will be via existing roads and through the Londolozi access control boom gate. No new access is to be created without prior authorisation from the Londolozi Management (in writing) and Sabi Sands Game Reserve (if necessary). The access road should be closely monitored for signs of potential degradation during the course of the project, this particularly due to the movement of heavy machinery. The Landcare Manager will advise on appropriate measures to mitigate any road degradation should it be required.

## 6.2 PROTECTION OF FAUNA AND FLORA

Londolozi has a responsibility to comply with the National Environmental Management Act (NEMA). The Londolozi properties are also declared protected in terms of the National Environmental Management Protected Areas Act (NEMPAA) and there is a SSW management plan in the process of formal approval. Contractors have no right to damage or destroy fauna and flora without written approval from the Landcare Manager. During site layout, trees that are authorised for removal will be identified and tagged and only these trees may be removed. Any trees that are protected species may not be moved or damaged unless this is the only option available. In these cases, efforts will be made to transplant the tree following the granting of the prescribed permits.

**If wood from a protected species, such as Lead Wood, is to be used in construction, permits to possess said wood must be kept on file. If wood from a protected species is purchased, this must come with a permit for transport and possession. If dead wood is collected, permits must be obtained prior to such collection.**

In order to limit damage to the environment during construction, the site layout phase will also identify and peg/demarcate the stockpile sites.

No foreign materials may be nailed or attached to any trees and all 'no-go' areas are to be demarcated through the use of colour coded pegs.

No firewood or any other plant material or animal may be removed from the site.

No soil or overburden or naturally occurring rocks may be removed from the site.

The footprint to be impacted must be scrutinised for the presence of any fauna (burrowing animals such as baboon spiders, scorpions etc.) and necessary relocation action taken in the event of finding any. No footprint may be worked until such time that the Landcare Manager has completed the footprint investigation.

Open trenches must be marked and if left overnight must have escape routes available for animals – such as a sloped end to natural ground level, or a branch 'ladder' placed in the trench.

Debris and litter on site must be removed daily, particularly plastics, rope, string and wire, which can all form animal traps, or entangle on an animal, compromising its survivability.

All toxins, solvents and harmful substances must be removed from site or stored in a locked vermin proof container or room.

Contractors should clearly understand that they are working within a nature reserve. Contravention of any conservation and environmental legislation may result in prosecution. The Contractor is responsible for any illegal action by his/her staff, e.g. illegal hunting, setting of snares, fishing etc.

The Contractor will be held liable for the replacement of any plant or feature under the protection of these specifications that is removed or damaged by the Contractor's negligence or mismanagement.

The Landcare Manager shall monitor that there is no introduction of alien invasive species to the construction site. Should any such species be identified, immediate complete physical removal and any additional appropriate control measures are to be implemented under the guidance of the Landcare Manager.

### 6.3 ESTABLISHMENT OF CONSTRUCTION SITE

#### 6.3.1 Inside of camp:

The location of storage areas etc. will be indicated by the Landcare Manager. No drainage lines may be impacted upon by stored material. Where building materials are stored on the construction site, these must be neatly stacked and kept tidy. It is necessary for the Contractors to travel to and from the construction site on a daily basis.

The site boundaries will be laid out by the Landcare Manager with coloured pegs. This boundary may not be altered without Landcare Manager approval. All activities must be contained within the demarcated area and are the responsibility of the contractor. The demarcations must remain in place until rehabilitation phase has been completed.

#### 6.3.2 Outside of camp:

There is to be no storage of construction materials outside of camp. Should storage be required for an out-of-camp construction job, this will be allocated in camp in consultation with the Landcare Manager.

Where building materials are stored on the construction site, these must constitute a maximum of one days supplies, except for stockpiles of sand and stone. Building materials must be neatly stacked on as small a footprint as possible and kept tidy.

All Contractors are to comply with the terms as stipulated in this document. It is necessary for the Contractors to travel to and from the construction site on a daily basis.

No contractor on site accommodation is available at Londolozi, however, by arrangement, it may be possible for the contractor to erect tents on a site identified for such and with management agreement.

### 6.4. ABLUTION FACILITIES AND WASTE/ REFUSE DISPOSAL

Toilet facilities are not always available at the construction sites. Contractors are encouraged to tap into the existing sewerage pipes and septic tanks wherever possible. However, a temporary ablution facility must be in place. Toilets are to be erected at a ratio of at least 1:15 toilets per persons. The Landcare Manager will monitor the standard of hygiene and maintenance of toilets throughout the duration of the contract. It is the Contractors responsibility to keep these toilets clean and functional. Toilet paper is to be provided by the Contractor. Temporary toilets are to be secured to prevent toppling over.

***Contractors are requested to paint all portable toilets a dull military nutria type colour (eg: Polynesia, matt finish) to lessen the visual impact of these temporary facilities in the natural environment. The same applies to any temporary sheds erected for material storage on building sites.***

In terms of refuse disposal, the Contractor will ensure that, on a daily basis, all refuse is removed from site and disposed of at the Londolozi waste centre. The use of clear plastic refuse liners in the dustbins is obligatory to facilitate the sorting and removal of waste. These dustbins will be managed in accordance with the Londolozi waste management policy and management plan (part 4 of this document). It is essential that no refuse be disposed of amongst the building rubble generated, since this rubble may later be used in other applications. Building rubble and any other non-compactable rubble should be safely stored to be transported at a later stage. A skip container for rubble may be placed at the site as determined by the Landcare Manager. All such rubble and building waste must be removed from the site and the reserve unless specifically directed to do otherwise by the Landcare Manager.

### 6.5. PROVISION OF WATER

Water is currently available from the Londolozi reticulation system. This water is suitable for human consumption.

The Landcare Manager is to train Contractors on correct and safe water usage practices. Water is a precious and limited resource at Londolozi and must be used sparingly.

Washing of vehicles and laundry is prohibited on all construction sites.

Hose pipes must be entire and free of leaks and taps turned off when not in use. Hose pipes should have taps at both ends.

Handwash facilities and drinking water should be available to employees at all times.

#### **6.6. AIR POLLUTION**

No significant air pollution is anticipated. Dust suppression may be necessary if work is conducted in camp. This should be discussed with the Landcare Manager.

#### **6.7. NOISE**

Within camp, contractors must gain confirmation with regards to work hours, as this is highly dependent on existing guest movements and occupation levels. Site personnel may be required to vacate the site from time to time to a suitable venue, as directed by the Landcare Manager.

Outside of camp, management may allow extended work hours. Any work hour schedules should therefore be in agreement with management and obtained in writing.

Noise pollution will be monitored and should the need arise, the Landcare Manager may request the contractors to use manual equipment or to fit sound deadening apparatus to their equipment e.g. silencers, soundproof boxes etc. The Landcare Manager will monitor noise levels and if deemed to be excessive will request for the contractors to limit use to specified times.

Noise levels shall adhere to SABS 0103 specifications and no hooters or sirens may be used on site except where required in terms of SABS standards or in emergencies.

The use of generators may only be done with the prior permission (in writing) from Londolozi Management.

Unnecessary noise will not be tolerated. Contractors will not be permitted to shout on site. The use of megaphones is prohibited. Radios and / or any other music or sound systems are prohibited.

#### **6.8. VEHICLE AND EQUIPMENT FUELLING AND MAINTENANCE**

All vehicle refuelling and maintenance is to occur in areas specifically maintained for these activities e.g. the workshop. The servicing and repair of equipment is to take place in the workshop or off site in areas specifically designed and designated for this.

In the event of an on-site emergency repair, the contractor must ensure that all work is conducted over an impervious layer preventing spillage of oils and fuels into the environment. Sufficient absorbent materials and spill kits must be available to assist with potential clean up requirements.

#### **6.9. SOIL CONTAMINATION AND RESPONSE**

Should any soil contamination occur during construction, such contamination is to be immediately reported to the Landcare Manager. The soil shall be removed and stored in an area determined by the Landcare Manager and shall be labelled as to the form of contamination to prevent its future use. After consultation with the Manager, the contaminated soil must be cleaned or disposed of in accordance with legislation. Minor (less than 50 litres) soil contamination by hydrocarbons (fuel) may be addressed with a bioremediation solution. Bioremediation is the application of biological microbes for the clean-up of hazardous oil spills resulting in a safe, efficient and cost-effective solution. Bioremediation uses microbes, enzymes, oxygen and other nutrients to chemically transform oil into carbon dioxide and water.

#### **6.10. CEMENT**

Cement mixing is to take place on an impermeable layer. Cement mixing areas must not be in the vicinity of drainage-lines or water bodies as cement is toxic to aquatic species. Cement wash must be prevented from entering any drainage lines.

It is suggested that cement working equipment, at the end of a working day, is washed in a drum of water. Allowing the water to settle overnight will make the upper layers of water available for further cement mixing and wetting. The remaining sludge can be allowed to dry and disposed of at the end of the project as building rubble.

Any excess cement and concrete mixes shall be retained on the construction site until completion of the construction when all spoil material and rubble will be removed and the rehabilitation process commences.

All used cement bags are immediately to be disposed of into the solid waste system. These bags are not to be used for other on site applications. On site burning of cement bags is not permitted unless in a controlled manner and with the Landcare Managers permission. The normal process will be for waste cement bags to enter the general waste system.

#### **6.11. PROVISION OF STORAGE FACILITIES - DANGEROUS AND TOXIC MATERIALS**

All toxic materials such as paints, fuel, or oil shall be stored in well ventilated areas that can be locked. It is essential for safety reasons that all toxic materials are handled in an appropriate manner as prescribed by the labels on the products used.

Drip trays are to be placed underneath paints and toxic materials in storage to contain accidental spills.

Toxic substance volumes must be kept at less than a total of 100 litres on site at any one time.

Should any spillage or pollution of any toxic materials occur, the Landcare Manager should immediately be contacted and mitigation measures taken. The Contractor will be liable for any clean-up costs, legal costs or fines, which may arise from such an accident.

Washing of tools used for the application of these materials is to be done in washing trays and water stored in drums, adequately labelled as toxic, with closing lids for disposal on recommendation by the Landcare Manager. No cleaning may take place using the environment as a receptor.

Empty containers that contained toxic substances are not to be used for any other application, but are to be returned to supplier, or punctured and discarded (not in the reserve) as recommended by the Landcare Manager and the product label.

#### **6.12. PROVISION OF STORAGE FOR CONSTRUCTION MATERIAL**

The Contractor will be responsible for the storage of construction material at a site determined in conjunction with the Landcare Manager. Where necessary in the stockpiled areas, the topsoil is to be removed and stored adjacent to the stockpile. No bushes or trees are to be removed for this purpose. All storage areas are to be indicated with the Landcare Manager.

#### **6.13. TOPSOIL REMOVAL AND STORAGE**

The topsoil of all the areas affected by construction (material stockpiles and construction footprint) is to be removed and stored in heaps not higher than 1.5 meters. Periodic watering will be required to maintain the microbial action within the topsoil. Care should be taken to store topsoil in such an area, where it will not be susceptible to soil erosion or contamination from any other materials. Care should be taken to prevent any compaction of the topsoil occurring. In some case it may be necessary to trench the area around the topsoil stockpiles to prevent runoff water from heavy rains eroding these stockpiles.

#### **6.14 BORROW PITS, QUARRIES AND THATCH**

The creation of borrow pits and quarries of any size on Londolozi, is not permitted. Material may be obtained from borrow pits on Londolozi with management's permission.

Any imported fill or sand shall be free of weeds, litter and contaminants.

Thatch grass shall be free of contaminants, combed and be free of viable seed as per standard thatching regulations and standards.

#### **6.15 SPOIL MATERIAL**

All spoil material shall be disposed of in accordance with legislation. No spoil material will be left on site at completion of the project and the reuse of any material (excess crushed stone, sand etc) should be investigated. These spoil materials may be relocated to stockpile areas within Londolozi for later use, by arrangement with the Landcare Manager.



#### **6.16 FIRE PREVENTION**

No open fires will be allowed on the construction site or in the veld under any circumstances.

It will be expected by all Contractors to indicate their ability to fight accidental fires, through having fully functional and serviced equipment on site in the event of accidental fires. The Landcare Manager will determine the level of equipment and training required by the Contractors.

#### **6.17 STORM WATER MANAGEMENT**

No obstructions of any storm water system will be allowed and the dumping of water used for the cleaning of equipment will also not be permissible, the management of this water has been addressed under point 6.10 and 6.11 above.

Only level areas are to be used for stockpile zones and care is to be taken to prevent the stockpiling of materials in drainage lines. The Landcare Manager will assist in determining these areas.

#### **6.18 GROUNDWATER MANAGEMENT**

Caution should always be deployed when working with or in the vicinity of bore holes. No construction site run-off or waste should be allowed within 100m of a borehole.

#### **6.19 WASTE DISPOSAL**

All refuse waste will be managed in accordance with Londolozi's waste management policy and management plan.

Building rubble and any other non-compactable rubble should be safely and suitably stored for later removal. Open vehicles transporting rubble should be carefully loaded to prevent material from falling off the load area. No waste may be buried or burned on site.

#### **6.20 TRAFFIC CONTROL**

All vehicles used by Contractors and sub-contractors are to be maintained in a safe working condition. Vehicle operators are to be in possession of valid driver licenses. It is advisable to insure vehicles and operators against claims arising from accidents and third party liability. All vehicles shall undergo regular checks to ensure they are free of oil or other lubricant leaks. The Landcare Manager may at any time prevent sub-standard or dangerous equipment from being used on Londolozi.

Contractors and sub-contractor drivers are to be courteous in all dealings with other road users and shall adhere to all roadway signage and speed limits.

Contractors and sub-contractors are to use the shortest possible route between the place of entry and the construction site at all times. Unauthorised driving through the reserve for purposes other than the building contract is not permitted.

All the contractor's vehicles must have the contractor's decal clearly visible on both sides.

Contractor's vehicles may not be left on a building site over weekends or holiday periods. These vehicles must be removed and parked in an area indicated by the Landcare Manager during these periods.

#### **6.20 LITTERING**

No littering by the Contractors or sub-contractors shall be allowed. The Landcare Manager shall monitor the neatness of the work site for any litter.

#### **6.21 COMMUNICATION**

It is essential that good communication channels between the Contractor and Landcare Manager be maintained.

#### **6.22 TRENCHING**

Trenching must be undertaken with care, considering appropriate drainage, existing water and power services and other buried obstacles.

***Final Basic Assessment Report for the Proposed Development of Roads and a Rural Abattoir on Marthly 258KU and Sparta 259KU, Londolozi Game Reserve***

For significant trees (as indicated by the Landcare Manager), trenching must be 3m away from the stem.

Where possible, trenches should be excavated and backfilled on a progressive basis. Excavations to stand open for no longer than 2 days if at all possible. Excavations should preferably be opened and closed on the same day. If excavations are to be left open over night, they must be clearly marked with a reflecting material and have exit points for fauna so any such can escape and are not trapped.

Ensure that no trench longer than 500m is exposed at any one time.

Programme excavation to take place only once the required materials are on site. This facilitates the immediate laying of services and / or construction of subsurface infrastructure and minimises open trench time.

## **7. REHABILITATION PHASE**

### **7.1 REHABILITATION OF THE CONSTRUCTION SITE**

On completion of construction, the site must be rehabilitated through the removal of all construction facilities introduced, removal of waste and any other feature constructed or established during the use of the site. All areas devoid of vegetation or where spoils and stockpiles have been stored shall be scarified or ripped and the topsoil, previously removed and stockpiled, shall be reintroduced to these areas. In some cases it may be necessary to re-seed and mulch. This, however, will be at the discretion and under the advice of the Landcare Manager.

All natural and appropriate storm water drainage areas and channels must be restored. This may also entail the creation and installation of appropriate erosion control measures. Such measures will be determined by the Landcare Manager and may involve berms, walls or other construction.

Any concrete from past activity on the site may be required to be broken and removed – as determined by the Landcare Manager.

### **7.2 FINAL REHABILITATION OF THE SURFACE**

On completion of the construction phase, the various surfaces in use by the contractors and subcontractors shall be finally rehabilitated as described in this document. All infrastructures, equipment, plant and any other items used during the construction period must be removed from site. Waste receptacles, scrap and rubble will be removed entirely from site. No burial or burning of any material whatsoever will be allowed on site.

Final rehabilitation shall commence within 1 week from cessation of construction operations.

## **8. SITE SAFETY MANAGEMENT PROCEDURES**

Disasters are a constant threat when working in conservation areas and especially on construction sites.

In order to avoid accidental fires and to aid fire-fighting, the Contractors must be instructed in Londolozi fire management procedures by the Landcare Manager.

In case of flooding, Londolozi will notify contractors of flooding potential as soon as this information is received (from, for example, weather forecasts).

The greatest factor regarding disaster management in this instance is the proximity to medical care for injuries on duty or evacuation in the case of serious illness. The Contractor is to have a first aid kit available on site at all times along with at least one person with a basic first aid training and current / valid certificate.

Contractors are expected to abide by National health and safety standards, and as such, hard hats are expected to be worn on site, protective eye wear, dust masks and ear protection made available for tasks that require such and harnesses for any work above 1.8 meters. Scaffolding

***Final Basic Assessment Report for the Proposed Development of Roads and a Rural Abattoir on Marthly 258KU and Sparta 259KU, Londolozi Game Reserve***

must be secure and appropriate warning signage placed for dangerous activities. Proper footwear should be worn by all employees.

The contractor must identify the following person(s) to the Landcare Manager for each site:

- A safety representative
- A first aid officer

Contractors must be able to demonstrate that all workers are registered with the Workers Compensation Commission - WCA.

ANNEX F: EVIDENCE OF PUBLIC NOTIFICATION



Figure 14: Site notices posted at Newington (top) and Shaw's (bottom) entrance gates to the SSW (© C Goodman)



Final Basic Assessment Report for the Proposed Development of Roads and a Rural Abattoir on Marthly 258KU and Sparta 259KU, Londolozi Game Reserve

50 Lowerlender Friday November 23, 2018

<p><b>FURNISHED COTTAGE</b> 1 Bedroom, White River, available 1 Jan 2019 No children/animals W/L included. 081-885-1263</p>	<p><b>OFFICES / SHOPS / BUSINESS PREMISES</b> <b>IMMEDIATE OCCUPATION</b> 2 PRIME UNITS 346 &amp; 336 SOM FRANKLIN IND PARK 082-960-0527</p>	<p><b>RETIREMENT VILLAGES</b> <b>More than 20 Villages</b> For information or reservation visit our website contact: 082-960-0527 082-960-0527 www.londolozi.co.za</p>	<p><b>New + Used engines + gearboxes</b> Best prices available VAM/CLAIR 013-752-4615-9 013-752-4673</p>	<p><b>PUBLIC / LEGAL NOTICES</b> NOTICE CONSTITUTIONAL COURT IN THE MATTER OF THE APPEAL OF THE LEADER OF THE PUBLIC / LEGAL NOTICES 082-960-0527</p>	<p><b>PUBLIC / LEGAL NOTICES</b> NOTICE CONSTITUTIONAL COURT IN THE MATTER OF THE APPEAL OF THE LEADER OF THE PUBLIC / LEGAL NOTICES 082-960-0527</p>	<p><b>PUBLIC / LEGAL NOTICES</b> NOTICE CONSTITUTIONAL COURT IN THE MATTER OF THE APPEAL OF THE LEADER OF THE PUBLIC / LEGAL NOTICES 082-960-0527</p>	<p><b>PUBLIC / LEGAL NOTICES</b> NOTICE CONSTITUTIONAL COURT IN THE MATTER OF THE APPEAL OF THE LEADER OF THE PUBLIC / LEGAL NOTICES 082-960-0527</p>
<p><b>SCHAGEN</b> 2 bed, 2 bath cottage. Electrical fences. R4,000 pm, including electricity. 081-491-4436</p>	<p><b>KANTOOPUNITS DESIGN/PLAN</b> 10 Fernside Str. 013-753-2052 082-794-0290</p>	<p><b>STAND IN PENNY STREET</b> 673 Sqm. Beautiful views. 082-960-0527 Contact owner only on sms 082-910-0416</p>	<p><b>LOWVELD TRAILERS</b> Rental and Sales - Molepolo - Dabonon 082-796-9616</p>	<p><b>TRAILERS</b> Rental and Sales - Molepolo - Dabonon 082-796-9616</p>	<p><b>TRAILERS</b> Rental and Sales - Molepolo - Dabonon 082-796-9616</p>	<p><b>TRAILERS</b> Rental and Sales - Molepolo - Dabonon 082-796-9616</p>	<p><b>TRAILERS</b> Rental and Sales - Molepolo - Dabonon 082-796-9616</p>
<p><b>SCHAGEN</b> 4 bed, 3 bath family home. Study. Small pool. Electric fences. R7,200 including electricity. Deposit required. Available immediately 079-491-4436</p>	<p><b>WELLSPIRIT</b> +14V Railway &amp; Van Nokentolana Kantoonpunit to use. + 5 x 1.0 vsm loan R12,000 per month. In Dabonon Corner gibson. Onmididibik breakdown. Via various leading dealers. 013-753-2052</p>	<p><b>WOTWOTED</b> 0792 Makhele &amp; 4 x 4s 0796 Huelie &amp; Ceraviva 0796 Margalite 0798 Combe / M-Bikes 0796 Comen / New-Des 0798 Fern 0796 Equipped Insurance 0798 4 Wheelers 0798 Motorbikes 0791 Motor Services 0798 New Car Sales 0796 Rental &amp; Lending 0796 Services / Accessories 0796 Special Motors 0797 Sound &amp; Security 0796 Trailer 0796 Used Cars 0796 Vehicle Finance 0796 Vehicle Maintenance / Services 0796 Storage 0797 Vehicle under R12,000 0796 Motorbikes 0796 Motorbikes</p>	<p><b>CARS &amp; BAKKIES</b> Any place / any condition JAPC 042-944-124</p>	<p><b>WE BUY and sell cars / bakkies</b> any price paid Phone: 013-752-4615 013-752-4673</p>	<p><b>WE BUY and sell cars / bakkies</b> any price paid Phone: 013-752-4615 013-752-4673</p>	<p><b>WE BUY and sell cars / bakkies</b> any price paid Phone: 013-752-4615 013-752-4673</p>	<p><b>WE BUY and sell cars / bakkies</b> any price paid Phone: 013-752-4615 013-752-4673</p>
<p><b>SOHO HOUSES</b> <b>CAMIN &amp; KON OP GROENEPAD</b> + 4 Slap hot mel dierokothus. Village area. Bakkie 1 Des. R7,900 pm.</p>	<p><b>FRANKLIN PLACE</b> <b>WHITE FINISH</b> 3 bed, 3 bath, LLG R10,000 pm. Avail 1 January 2019. 084-285-2857 013-753-0070</p>	<p><b>PROPERTY FOR SALE</b> 0813 Farms &amp; P's in 0819 P's &amp; Units 0818 Houses 0813 Industrial 0818 Properties 0818 Houses 0818 Houses / Offices / Shops 0818 Retail/wholesale Village 0818 Property on fence 0818 Shale 0818 Time-sharing 0818 Timeshare for sale 0818 Train houses / Quarter Homes 0818 Wanted to Buy 0818 Motorbikes</p>	<p><b>LEGAL</b> 013-752-4615 013-752-4673</p>	<p><b>LEGAL</b> 013-752-4615 013-752-4673</p>	<p><b>LEGAL</b> 013-752-4615 013-752-4673</p>	<p><b>LEGAL</b> 013-752-4615 013-752-4673</p>	<p><b>LEGAL</b> 013-752-4615 013-752-4673</p>
<p><b>IN WELLSPIRIT</b> <b>SUBURBS</b> Spacious 2 bed houses, available 1 Dec. W/L included. Pole welcome &amp; open to fenced. R7,700 pm. + Kog R1000 is included. 082-479-4193</p>	<p><b>FOR SALE OR RENT</b> <b>FRANKLIN PLACE</b> 0813 P's &amp; Units 0818 Houses 0813 Industrial 0818 Properties 0818 Houses 0818 Houses / Offices / Shops 0818 Retail/wholesale Village 0818 Property on fence 0818 Shale 0818 Time-sharing 0818 Timeshare for sale 0818 Train houses / Quarter Homes 0818 Wanted to Buy 0818 Motorbikes</p>	<p><b>FOR SALE OR RENT</b> <b>FRANKLIN PLACE</b> 0813 P's &amp; Units 0818 Houses 0813 Industrial 0818 Properties 0818 Houses 0818 Houses / Offices / Shops 0818 Retail/wholesale Village 0818 Property on fence 0818 Shale 0818 Time-sharing 0818 Timeshare for sale 0818 Train houses / Quarter Homes 0818 Wanted to Buy 0818 Motorbikes</p>	<p><b>LEGAL</b> 013-752-4615 013-752-4673</p>	<p><b>LEGAL</b> 013-752-4615 013-752-4673</p>	<p><b>LEGAL</b> 013-752-4615 013-752-4673</p>	<p><b>LEGAL</b> 013-752-4615 013-752-4673</p>	<p><b>LEGAL</b> 013-752-4615 013-752-4673</p>
<p><b>WEST ACRES</b> 3 Slap (type to buy) Helen 082-972-4172</p>	<p><b>FOR SALE OR RENT</b> <b>FRANKLIN PLACE</b> 0813 P's &amp; Units 0818 Houses 0813 Industrial 0818 Properties 0818 Houses 0818 Houses / Offices / Shops 0818 Retail/wholesale Village 0818 Property on fence 0818 Shale 0818 Time-sharing 0818 Timeshare for sale 0818 Train houses / Quarter Homes 0818 Wanted to Buy 0818 Motorbikes</p>	<p><b>FOR SALE OR RENT</b> <b>FRANKLIN PLACE</b> 0813 P's &amp; Units 0818 Houses 0813 Industrial 0818 Properties 0818 Houses 0818 Houses / Offices / Shops 0818 Retail/wholesale Village 0818 Property on fence 0818 Shale 0818 Time-sharing 0818 Timeshare for sale 0818 Train houses / Quarter Homes 0818 Wanted to Buy 0818 Motorbikes</p>	<p><b>LEGAL</b> 013-752-4615 013-752-4673</p>	<p><b>LEGAL</b> 013-752-4615 013-752-4673</p>	<p><b>LEGAL</b> 013-752-4615 013-752-4673</p>	<p><b>LEGAL</b> 013-752-4615 013-752-4673</p>	<p><b>LEGAL</b> 013-752-4615 013-752-4673</p>
<p><b>WHITE RIVER</b> 3 bedroom, 2.5 bath duplex. Close to all amenities. R7,500 pm. Full water and piped electricity. Avail immediately. Contact: 082-941-4172</p>	<p><b>FOR SALE OR RENT</b> <b>FRANKLIN PLACE</b> 0813 P's &amp; Units 0818 Houses 0813 Industrial 0818 Properties 0818 Houses 0818 Houses / Offices / Shops 0818 Retail/wholesale Village 0818 Property on fence 0818 Shale 0818 Time-sharing 0818 Timeshare for sale 0818 Train houses / Quarter Homes 0818 Wanted to Buy 0818 Motorbikes</p>	<p><b>FOR SALE OR RENT</b> <b>FRANKLIN PLACE</b> 0813 P's &amp; Units 0818 Houses 0813 Industrial 0818 Properties 0818 Houses 0818 Houses / Offices / Shops 0818 Retail/wholesale Village 0818 Property on fence 0818 Shale 0818 Time-sharing 0818 Timeshare for sale 0818 Train houses / Quarter Homes 0818 Wanted to Buy 0818 Motorbikes</p>	<p><b>LEGAL</b> 013-752-4615 013-752-4673</p>	<p><b>LEGAL</b> 013-752-4615 013-752-4673</p>	<p><b>LEGAL</b> 013-752-4615 013-752-4673</p>	<p><b>LEGAL</b> 013-752-4615 013-752-4673</p>	<p><b>LEGAL</b> 013-752-4615 013-752-4673</p>
<p><b>WHITE RIVER</b> Spacious 4 bed, 6 bath, study, cuddle pool, fireplace. R13,000 pm + dep + reference. Avail 1 December 082-809-8978</p>	<p><b>FOR SALE OR RENT</b> <b>FRANKLIN PLACE</b> 0813 P's &amp; Units 0818 Houses 0813 Industrial 0818 Properties 0818 Houses 0818 Houses / Offices / Shops 0818 Retail/wholesale Village 0818 Property on fence 0818 Shale 0818 Time-sharing 0818 Timeshare for sale 0818 Train houses / Quarter Homes 0818 Wanted to Buy 0818 Motorbikes</p>	<p><b>FOR SALE OR RENT</b> <b>FRANKLIN PLACE</b> 0813 P's &amp; Units 0818 Houses 0813 Industrial 0818 Properties 0818 Houses 0818 Houses / Offices / Shops 0818 Retail/wholesale Village 0818 Property on fence 0818 Shale 0818 Time-sharing 0818 Timeshare for sale 0818 Train houses / Quarter Homes 0818 Wanted to Buy 0818 Motorbikes</p>	<p><b>LEGAL</b> 013-752-4615 013-752-4673</p>	<p><b>LEGAL</b> 013-752-4615 013-752-4673</p>	<p><b>LEGAL</b> 013-752-4615 013-752-4673</p>	<p><b>LEGAL</b> 013-752-4615 013-752-4673</p>	<p><b>LEGAL</b> 013-752-4615 013-752-4673</p>
<p><b>STUNNING HOUSE</b> <b>FOR SALE IN</b> <b>SILVER HILL</b> 3 bed, 2 bath, garden, pool, stone briar, built-in bar &amp; lounge garden. Japan 082-278-4890 Tanya 082-779-1752</p>	<p><b>FOR SALE OR RENT</b> <b>FRANKLIN PLACE</b> 0813 P's &amp; Units 0818 Houses 0813 Industrial 0818 Properties 0818 Houses 0818 Houses / Offices / Shops 0818 Retail/wholesale Village 0818 Property on fence 0818 Shale 0818 Time-sharing 0818 Timeshare for sale 0818 Train houses / Quarter Homes 0818 Wanted to Buy 0818 Motorbikes</p>	<p><b>FOR SALE OR RENT</b> <b>FRANKLIN PLACE</b> 0813 P's &amp; Units 0818 Houses 0813 Industrial 0818 Properties 0818 Houses 0818 Houses / Offices / Shops 0818 Retail/wholesale Village 0818 Property on fence 0818 Shale 0818 Time-sharing 0818 Timeshare for sale 0818 Train houses / Quarter Homes 0818 Wanted to Buy 0818 Motorbikes</p>	<p><b>LEGAL</b> 013-752-4615 013-752-4673</p>	<p><b>LEGAL</b> 013-752-4615 013-752-4673</p>	<p><b>LEGAL</b> 013-752-4615 013-752-4673</p>	<p><b>LEGAL</b> 013-752-4615 013-752-4673</p>	<p><b>LEGAL</b> 013-752-4615 013-752-4673</p>
<p><b>FIELD SPACES</b> FREE QUOTE 013-752-4615 013-752-4673</p>	<p><b>FOR SALE OR RENT</b> <b>FRANKLIN PLACE</b> 0813 P's &amp; Units 0818 Houses 0813 Industrial 0818 Properties 0818 Houses 0818 Houses / Offices / Shops 0818 Retail/wholesale Village 0818 Property on fence 0818 Shale 0818 Time-sharing 0818 Timeshare for sale 0818 Train houses / Quarter Homes 0818 Wanted to Buy 0818 Motorbikes</p>	<p><b>FOR SALE OR RENT</b> <b>FRANKLIN PLACE</b> 0813 P's &amp; Units 0818 Houses 0813 Industrial 0818 Properties 0818 Houses 0818 Houses / Offices / Shops 0818 Retail/wholesale Village 0818 Property on fence 0818 Shale 0818 Time-sharing 0818 Timeshare for sale 0818 Train houses / Quarter Homes 0818 Wanted to Buy 0818 Motorbikes</p>	<p><b>LEGAL</b> 013-752-4615 013-752-4673</p>	<p><b>LEGAL</b> 013-752-4615 013-752-4673</p>	<p><b>LEGAL</b> 013-752-4615 013-752-4673</p>	<p><b>LEGAL</b> 013-752-4615 013-752-4673</p>	<p><b>LEGAL</b> 013-752-4615 013-752-4673</p>

**NOTICE: APPLICATION FOR ENVIRONMENTAL AUTHORISATION**

Londolozi Game Reserve (Pty) Ltd, is applying in terms of the National Environmental Management Act, 1989 (Act No. 107 of 1989) and the Environmental Impact Assessment Regulations, 2014 to the Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs for environmental authorisation for the development, construction, installation and upgrading of a road network of 5,28km and upgrade two roads by widening and repaving with a cumulative distance of 7,23km. In addition to this 12 widening roads will be upgraded within their current footprint totaling 7,05km and 27 roads totaling 11,05km will be closed and rehabilitated. The scope of these works will cross watercourses, authorisation will also be sought in terms of the National Water Act, 1988 (Act No. 36 of 1988), 12 Water Users.

It is the vision of Londolozi to create a world-class game reserve in terms of environmental management and an assessment of the game drive roads has revealed that there planned development will contribute to this achievement.

It is envisaged that the potential negative environmental impacts that will occur as a result of these developments are either avoidable or will be mitigated through the careful implementation of an environmental management plan, implementation of which will be clearly and regularly monitored.

The proposed roads will be developed and upgraded on Spoil in Terms 2006/1 on the Londolozi Game Reserve which is part of the Tala Savanna Game Reserve and falls within the Subukwazi Local Municipality and the Dabonon District Municipality 92323 which is in the Mpumalanga Province.

In order to participate in the Basic Assessment process you are invited to register as an Interested and Affected Party by contacting the Environmental Assessment Facilitator as per the details provided below. These include your name, contact information and interest in the above mentioned project on Wednesday 14 January 2019.

Name: Emerald of Savanna Consulting (Pty) Ltd.  
Address: 7 Bushbuck Road, Hluma, 2381.  
Tel: 082-983-1770  
Fax: 082-934-4322  
Cell: 082-939-6270  
Email: emeraldofsavanna.co.za

Figure 15: Notice of intent to apply for environmental authorisation in the Lowerlender of 23 November 2018.



20 CLASSIFIEDS
Mpumalanga News | Thursday November 22, 2018

**FOR SALE**

0428 Arms & Ammunition  
0419 Baby & Children's Corner  
0414 Beauty & Health  
0416 Building Material  
0420 Businesses  
0415 Carpets / Furniture & Equipment  
0436 Cellphones  
0435 Clothing  
0440 Computers  
0442 Cosmetics / Antiques  
0447 Farm Equipment  
0450 Food & Beverages  
0451 Flowers / Plants  
0452 Gardening / Lawn Accessories  
0453 Garage Sales  
0456 Jewellery  
0486 Kitchen Appliances  
0488 Musical / Sound Equipment  
0479 Office Furniture & Equipment  
0478 Pets & Livestock  
0480 Print & Machinery  
0489 Sports & Leisure  
0487 Tools  
0486 Under 1920  
0486 Wanted to Buy

**MISCELLANEOUS**

**Woolly Buns**  
baked with wood

1 box 4 for R1,500  
1 box 4 for R1,500  
1 2 days, 1 minute, 100% natural, 100% organic, 100% pure, 100% delicious, 100% guaranteed.

0800-782-2527

**FOR SALE**

100% Pure My Rice  
1kg for R100  
10kg for R900  
100kg for R8000

082-970-0539

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**ANNEX G: BACKGROUND INFORMATION DOCUMENT**

**ANNEX H: MINUTES OF PRE-APPLICATION MEETING**



**ANNEX I: COMMENT AND RESPONSE REPORT**

I&AP	COMMENT	RESPONSE
<b>BACKGROUND INFORMATION DOCUMENT DD 26 FEBRUARY 2019</b>		
ECO SSW dd 30 November 2018	Kindly register the SSW-MA as an I&AP for this development and send all relevant documentation to the ECO, Warden and HOD of Conservation. We also request to please be included in monthly inspections and audit reports during development (refer to SOP 1/18-Development: Environmental Compliance).	Contact details recorded in I&AP database and SOP requirements acknowledged.
Percy Floyd Themba dd 29 November 2018	i am interested in the development and i would also need to learn more.	Contact details recorded in I&AP database
Lebo Nkosi dd 30 November 2018	Hi I'm a lady of 25 years. .I've seen the proposal of roads developed and upgraded on Sparta farms.im interested in this opportunity..wish to be contacted to 0767681100.	Please note that this is not an advertisement for job opportunities but rather for people who wish to contribute to the environmental assessment process. I assume from your email and CV that you read this as a job opportunity, but if you wish to be involved in the process please confirm and I will forward the Background Information Document to you.
Nicolas Shilubane 23 November 2018	Hello. I am Shilubane Nicolas I am interested to participate in the Basic Assessment process. I can be contacted at this number 0725210445	Contact details recorded in I&AP database
Simpfiwe Chris Vilakazi dd 26 November 2018	I would like to participate on the project	Contact details recorded in I&AP database
<b>DRAFT BASIC ASSESSMENT REPORT DD JUNE 2019</b>		
Mr Xolani Nkosi (MDARDLEA) dd 19 June 2019	<ol style="list-style-type: none"> <li>1. Please note that coordinates of all watercourse crossings for the proposed upgrading of Main Road West and the proposed development of new roads must be provided.</li> <li>2. Please note that the EMPr must comply with the requirements Appendix 4 of the EIA Regulations 2014 (as amended). You are specifically referred to paragraph 1(1)(h) and (j), which includes the requirements for the frequency of monitoring and the time periods within which impact management actions must be implemented. The final basic assessment report must include an amended EMPr, that must be dated and that complies with the abovementioned requirements of Appendix 4.</li> <li>3. The final FBAR must provide proof that all potential and registered</li> </ol>	<ol style="list-style-type: none"> <li>1. Coordinates were included in the DBAR and have also been included in the FBAR.</li> <li>2. An amended EMPr that meets the requirements has been provided together with the FBAR.</li> <li>3. Proof has been provided in the FBAR as required.</li> <li>4. Comment and response report has been included in the FBAR.</li> </ol>

I&AP	COMMENT	RESPONSE
	<p>I&amp;APs, including Organs of State, were provided with access to and an opportunity to comment in the draft BAR following submission of the application form (Regulation 40(3)).</p> <p>4. The final basic assessment report must include an issues and response report, as well as copies of and responses to comments received from all I&amp;APs, including these comments.</p>	

## ANNEX J: LEGAL REQUIREMENTS FOR THE DEVELOPMENT OF A RURAL ABATTOIR

STAATSKOERANT, 4 NOVEMBER 2016

No. 40402 27

DRAFT - May 2016

5

### PART II

#### REQUIREMENTS FOR THE REGISTRATION OF SLAUGHTER FACILITIES [Section 11(1)(a)]

##### A Throughput and other requirements for grades

###### (1) Requirements for rural game abattoirs

##### 4. Considering the requirements set out in Part II B (1), for an abattoir to be graded as a rural game abattoir –

- (a) the throughput may not exceed 6 units per day, provided that the PEO may determine a lower maximum throughput for an abattoir on grounds of the hourly throughput potential relative to available equipment and facilities including hanging space, chiller capacity;
  - (b) the abattoir premises must be fenced and provided with a gate to control access of people, vehicles and animals;
  - (c) it must consist of a room equipped with hanging facilities where harvested game carcasses or partially dressed game carcasses are dressed and such room must have an air temperature of not more than 12°C when chilled game carcasses are handled, provided that if chilled carcasses are handled so that its temperature does not rise more than 2°C during dressing, subject to the approval of the provincial executive officer, the temperature of this room need not be maintained at 12°C or less;
- 
- (d) a room adjacent to the dressing room must be provided for the handling, washing and keeping of rough offal intended for human consumption;
  - (e) a room or curbed and drained area adjacent to the abattoir building must be provided to hold containers with inedible products prior to removal;
  - (f) the rooms mentioned in paragraphs (d) and (e) must –
    - (i) be separate and adjacent to the dressing room and interconnected by means of a hatch, door or walkway; and
    - (ii) have exterior doors for the removal of those products and in the case of paunches and intestines from game animals that were eviscerated in the field, they must be received for inspection purposes through this exterior door;
  - (g) doors must be provided –
    - (i) where harvested game or partially dressed game carcasses are offloaded into the abattoir;
    - (ii) where dressed or partially dressed game carcasses and red offal are dispatched, provided that this door may be the same door as contemplated in subparagraph (i) above, if these functions are separated by time and approved by the PEO; and
    - (iii) for entrance of personnel into the abattoir, provided that the door referred to in subparagraph (ii) above may be used, under the approval of the PEO, for this purpose if it does not pose a risk of contamination of the products inside when opened;
  - (h) hand washing facilities must be provided in the abattoir;
  - (i) a steriliser adjacent to a hand wash basin must be provided;
  - (j) toilet with hand wash facilities must be provided;
  - (k) facilities to store items needed in the daily process must be provided;
  - (l) dining facilities must be provided with tables and chairs or benches and must be situated so that personnel do not sit or lie on the ground or soil their protective clothing during rest periods. With the approval of a PEO through a protocol, a dining facility may be omitted if there is provision for personnel to rest and have their meals without the need of such facility,

e.g., where the allocated daily throughput can be handled within a short period of time or personnel are transported to an adjacent facility away from the abattoir to have their meals;

- (m) the design of the abattoir must allow for future upgrading of thereof;
- (n) chilling facilities must be provided for –
  - (i) partially dressed game carcasses but this is not applicable when harvested game and partially dressed game carcasses are transported directly from harvesting for immediate dressing in an abattoir;
  - (ii) game carcasses and red offal; and
  - (iii) rough offal;

Provided that the chilling facilities need not be attached to the abattoir building, but their proximity to the abattoir must be such as not to compromise hygiene standards and must be approved by the PEO;

- (o) the chilling facility referred to in paragraph (n)(i) may be substituted with a mobile chiller where the transfer from this chiller to the abattoir does not compromise food safety;
- (p) the chilling facility referred to in paragraph (n)(iii) may be omitted if rough offal is removed from the abattoir on a continuous basis but within four hours after evisceration, provided that the PEO may determine a shorter period; and
- (q) where freezing facilities are not provided for treatment of conditionally passed game carcasses affected by parasitic intermediate stages (e.g. cysticercosis) at the abattoir, such facilities may be arranged elsewhere with the approval of the PEO.



**ANNEX K: SUMMARY OF QUANTIFIERS AND QUALIFIERS USED FOR ASSESSMENT PURPOSES**

<b>CATEGORY</b>	<b>RATING</b>	<b>EXPLANATION</b>
Sensitivity of Aspect / Magnitude or intensity of impact:	Low	The aspect has very little value in terms of its ecological importance e.g. a highly disturbed area is rated as low);
	Medium	The aspect has certain qualities which make it ecologically valuable); or
	High	The aspect is near pristine and has numerous qualities which make it extremely ecologically valuable).
Duration (time scale):	Short-term	Impact restricted to construction and early operation (0-5 years);
	Medium-term	Impact will cease on closure of the site (6-30 years);
	Long-term	Impacts will exist beyond the life of the site (>30 years); or
	Permanent	Impacts will have permanent potential.
Geographic Spatial Scale:	Site	The impact will be limited to within the site boundaries;
	Local	The impact will affect surrounding areas;
	Regional	The impact will affect areas far beyond the site boundary but limited to the Province of KwaZulu-Natal; or
	National	The impact will affect areas far beyond the site boundary within the South Africa.
Significance rating pre / post-mitigation:	Low	The impact will have a minimal effect on the environment;
	Medium	The impact will result in a measurable deterioration in the environment; or
	High	The impact will cause a significant deterioration in the environment.
Degree of certainty:		Definite (>90%);
		Probable (>70%);
		Possible (40%); or
		Unsure (<40%).
Mitigation:		No mitigation necessary;
	Full	Full mitigation/reversal of the impact is possible;
	Partial	Only partial mitigation/reversal of the impact is possible; or
	None	No mitigation or reversal of the impact is possible.

**ANNEX L: EVIDENCE OF DISTRIBUTION OF DBAR TO I&APS**

**ANNEX M: COPIES OF COMMENTS FROM NATIONAL AND PROVINCIAL  
ENVIRONMENTAL MANAGEMENT AUTHORITIES**

## **ANNEX N: RECORDS OF SITE MEETINGS WITH AUTHORITIES**

A site meeting was undertaken on 20 June 2019 and was attended by the following:

Mr Xolani Nkosi	MDARLEA designated officer
Ms Thokozile Sithole	MDARLEA
Mr Anthony Emery	Emross Consulting
Mr Rob Crankshaw	Londolozi Game Reserve

The comments reflected in Annex M are a record of the findings from this site visit.