African Habitat Conservancy (Pty) Ltd

PROPOSED DEVELOPMENT WITHIN THE BABANANGO PRIVATE GAME RESERVE, KWAZULU NATAL PROVINCE

FINAL ENVIRONMENTAL SCREENING REPORT

May 2018

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1 INTRODUCTION

1.1 BACKGROUND

The proposed site is an amalgamation of community owned and privately owned land.

The largest area is owned by a The Emcakwini Community who successfully claimed 38 000 ha of land in to the north of Babanango area, stretching from the hills of Zululand to the banks of the White Umfolozi River.

The claimant community, represented by the Emcakwini Community Trust (Trust), were forced off the land in the 1950s and today comprise 192 households.

The land claim was submitted in 1998. The first phase of the claim was settled in 2007, then in 2008 through to 2011 a further 21,000ha was settled.

The claim is made up of several parcels of land including private farms and two game farms. It incorporates forestry land (wattle, pine and gum) plus good cattle grazing land. The game farms, situated in the White Umfolozi River valley, include some 4 200 ha of typical indigenous Zululand veldt.

There are approximately 7000 ha of growing timber on the farm, including wattle, gum and pine. Gordon estimates that fires last year burnt 5 000 ha of grazing land. The community have been working these areas, selling timber to Mondi. They have also set up charcoal kilns to produce an income from the wattle plantation and from fire-damaged timber that is not good enough to sell for pulp.

The Trust have also turned to Ezemvelo KZN Wildlife to incorporate approximately 13,000ha immediately south of the White Umfolozi River within its Bio-Diversity Stewardship Programme with the aim of having the area declared a Nature Reserve under the National Environmental Management: Protected Areas Act, 2003 (Act 57 of 2003) (NEMPAA).

The Trust's aim is to develop the site into a game reserve in order that the community might benefit from jobs and income from the reserve.

To this end they have been working with a Non Government Organisation, Conservation Outcomes, to undertake background assessment work and prepare the necessary applications. From discussion with Conservation Outcomes, their programme is well progressed. At the time of reporting, the main constraint is financial in that as it becomes a Nature Reserve it needs to be fenced and protected. According to the Trust they are awaiting a government grant that will cover the cost of fencing and basic infrastructure.

A private investor (African Habitat Conservancy (Pty) Ltd) has recently shown interest in the project. It is possible that this interest could result in initial stages of development within the Reserve.

The same investor has recently had an offer accepted for the purchase of a property (Zulu Rock) to the north of the White Umfolozi River and is in negotiation for one other property (Lulu) which is also to the north of the White Umfolozi. It is the intention that these properties form part of the overall reserve.

Negotiations are also underway with the owners of a third property to the north of the White Umfolozi (Kwanqono) with the intention its incorporation into the overall reserve area. This property is owned by the Kwanqono Community Trust.

1.2 SITE LOCATION

The site is located approximately 51km south south east of Vryheid, approximately 28km west of Ulundi and approximately 7km to the north of the small town of Babanango in the Zululand Region of KwaZulu Natal.

The site is comprised of twenty properties in total.

The Emcakwini Community Trust own the following fifteen properties that are located to the south of the White Umfolozi River;

PROPERTY DESCRIPTION	SG NUMBER	OWNER
The Farm Non-Pareil No. 721	N0GU00000000072100000	Emcakwini Community Trust-Trustees
Ptn 1 of the farm Non-Pareil No.95	N0GU00000000009500001	Emcakwini Community Trust-Trustees
Ptn 2 of the farm Non-Pareil No.95	N0GU00000000009500002	Emcakwini Community Trust-Trustees
Ptn 1 of the farm Goudhoek No. 498	N0GU00000000049800001	Emcakwini Community Trust-Trustees
Ptn 2 of the farm Goudhoek No. 498	N0GU00000000049800002	Emcakwini Community Trust-Trustees
Rem of the farm Paarde Plaat No. 357	N0GU00000000035700000	Emcakwini Community Trust-Trustees
The farm Scheepers Hoek No.375	N0GU00000000037500000	Emcakwini Community Trust-Trustees
Ptn 3 of the farm Doornhoek No. 391	N0GU00000000039100003	Emcakwini Community Trust-Trustees
Rem of the farm Bokkie No. 153	N0GU00000000015300000	Emcakwini Community Trust-Trustees
The farm Tafelberg No.502	N0GU00000000050200000	Emcakwini Community Trust-Trustees
The farm Argyll No.758	N0GU00000000075800000	Emcakwini Community Trust-Trustees
Ptn 1 of the farm Welverdiend No.451	N0GU00000000045100001	Emcakwini Community Trust-Trustees
The farm Wellust No.846	N0GU00000000084600000	Emcakwini Community Trust-Trustees
Rem of the farm Langgewacht No. 449	N0GU00000000044900000	Emcakwini Community Trust-Trustees
Ptn 1 of the farm Langgewacht No. 449	N0GU00000000044900001	Emcakwini Community Trust-Trustees

Zulu Rock is comprised of the following properties;

PROPERTY DESCRIPTION	SG NUMBER	OWNER
Ptn 3 of the farm Jordaan No. 656	N0GU00000000065600003	Zulu Rock Private Game Ranch CC
Ptn 4 of the farm Jordaan	N0GU00000000065600004	Zulu Rock Private Game Ranch CC

No. 656		
Ptn 5 of the farm Jordaan No. 656	N0GU00000000065600005	Zulu Rock Private Game Ranch CC

These properties are currently being transferred to the ownership of African Habitat Conservancy (Pty) Ltd.

Lulu is comprised of the following property;

PROPERTY DESCRIPTION	SG NUMBER	OWNER
Farm No. 722	N0GU00000000072200000	Uno IT CC

This property is currently being transferred to the ownership of African Habitat Conservancy (Pty) Ltd.

The Kwanqono Community Trust own the following property

PROPERTY DESCRIPTION	SG NUMBER	OWNER
Ptn 4 of the farm Doornkroon No. 412	N0GU0000000004120000	Kwanqono Community Trust

Geographic coordinates for the approximate centre of the site are;

South	28°	16′	23.59″
East	31°	04′	36.20″

1.3 TERMS OF REFERENCE

African Habitat Conservancy (Pty) Ltd have employed a team of professionals to undertake an initial feasibility study for the development of the Babanango Private Game Reserve.

Environmental Planning and Design has been employed as part of the professional team to prepare an initial Environmental Screening Report (ESR).

The purpose of this ESR is to present the results of the environmental screening of each of the schemes under investigation in order to:

- Summarise any key environmental issues that should be taken in account when considering and comparing identified development options within the reserve;
- Identify any environmental "fatal flaws" or "red flags" associated with any of the proposed development areas within the reserve; and
- Identify environmental authorisations that will be required for any of the proposed development areas within the reserve.

A "fatal flaw" is an environmental negative impact that is not possible to mitigate and significant enough to prevent the scheme from being able to be implemented.

A "red flag issue" is a negative impact that, although significant, could be mitigated, but warrants special attention in the consideration of scheme alternatives.

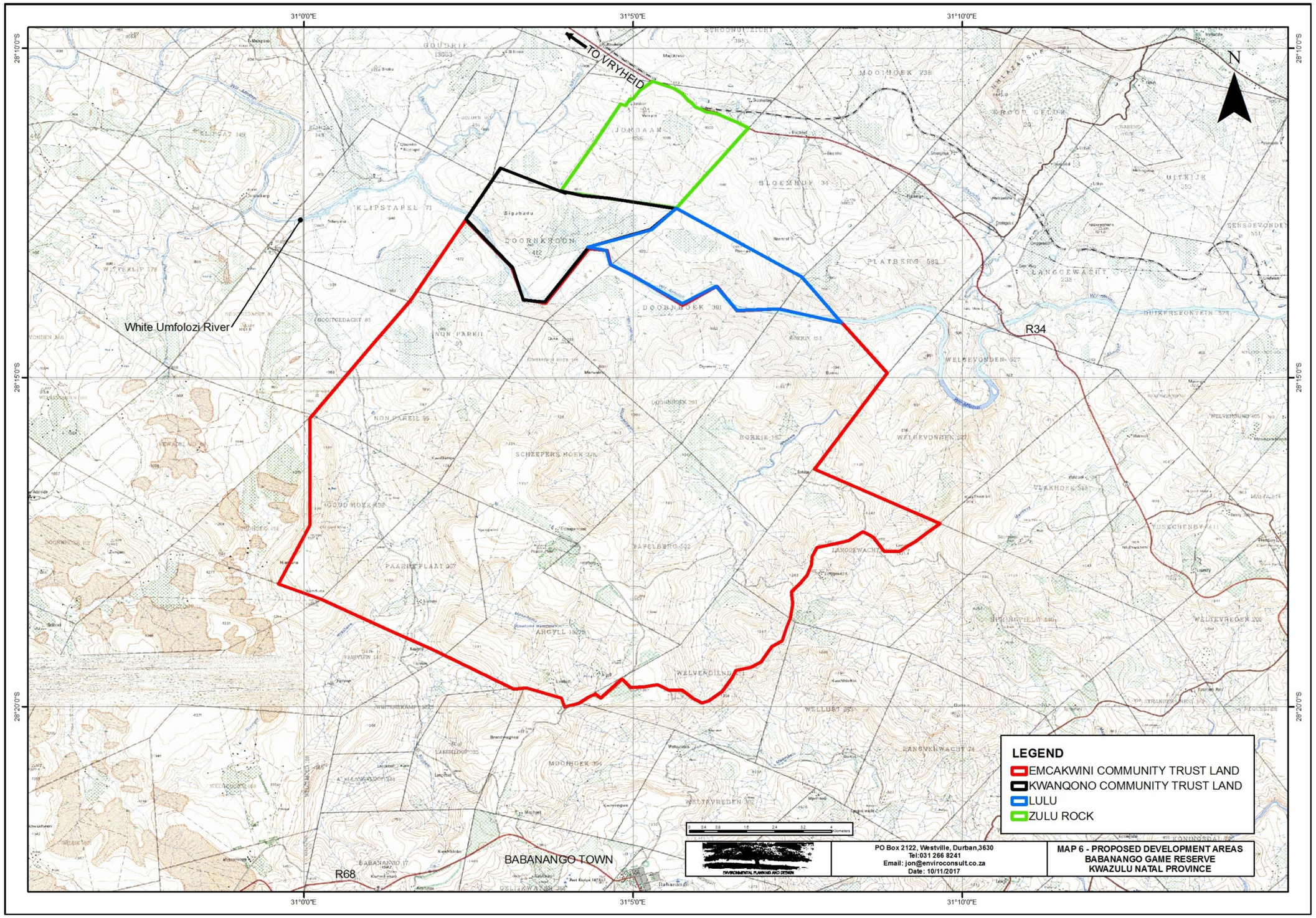
The screening exercise has been undertaken in the context of the existing Integrated Development Plans (IDPs), Strategic Development Frameworks (SDFs), as well as

previous studies and investigations undertaken by Conservation Outcomes as part of their preparatory work for the declaration of the site as a Nature Reserve.

1.4 LIMITATIONS AND ASSUMPTIONS

The following assumptions and limitations apply to this ESR:

- The assessment is based on available documented information, and on a site visits, with the professional team during which possible development areas were identified; and
- The identification of environmental authorisations required is undertaken to provide an indication of the order of magnitude of assessment (e.g. Basic Assessment or Scoping and Environmental Impact Assessment), that will be required to implement the various options. It does not serve as a formal legal review of all requirements.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TO VRYHEID
N
White Umfolozi River
R34
R68
BABANANGO TOWN
LEGEND
EMCAKWINI COMMUNITY TRUST LAND
KWANQONO COMMUNITY TRUST LAND
LULU
ZULU ROCK
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Date: 10/11/2017
MAP 6 - PROPOSED DEVELOPMENT AREAS
BABANANGO GAME RESERVE
KWAZULU NATAL PROVINCE

2 EXISTING ENVIRONMENT

2.1 GENERAL

2.1.1 Emcakwini Community Trust Land

Conservation Outcomes (CO) have undertaken a significant amount of assessment and planning work in order to position the proposed project so that it can be moved forward towards the Emcakwini Community Trust land being declared a Nature Reserve in accordance with the NEMPAA.

From the site visit and discussion with local stakeholders it is understood that much of the proposed site has been managed for game farming. Also from discussion a large amount of game remains on or in the vicinity of the proposed site including approximately 800 impala.

There are also reported to be six pairs of blue cranes using the site. During the site visit two pairs were seen.

2.1.2 Zulu Rock

This property has been used as a game farm and hunting resort. Development includes one large farmstead from where the property is managed and a five unit lodge which overlooks the White Umfolozi River.

2.1.3 Lulu

This property has been used as a cattle farm. Because of this there are degraded areas particularly in the vicinity of the farmstead.

2.1.4 Kwanqono Community Trust Land

This property was the subject of a successful land claim by the Trust. It is understood that they have owned the property for approximately 10 years. Prior to the land claim the property was operated as a game farm. A lodge (Leopard Rock) was also operated from the property.

2.2 LANDFORM AND DRAINAGE

The cross section of topography from the White Umfolozi River to the southern ridgeline the valley side rises approximately 650m over a distance of approximately 7km.

To the west of the Emcakwini Community Trust land, the valley floor is broad and indented by three secondary ridgelines that form discrete side valley systems that fall towards the White Umfolozi River.

The top of the southern ridgeline flattens to form a broad plateau that is approximately 1km wide and 4km long. On the western side of the plateau, the land also falls away steeply into the main Mpophoma Valley. The Mpophoma is the main stream that flows along the western side of the Emcakwini Community Trust land.

There is also a relatively major stream that flows close to the eastern edge of the Emcakwini Community Trust land.

To the north of the river the valley side rises approximately 340m to an indented ridgeline that runs roughly parallel with the river.

To the east within the Lulu property the ridgeline runs close to the river and with a minor ridgeline to the south of the river forms a narrow steep sided valley through which the river flows.

To the west the river meanders south and away from the northern ridgeline.

Because of the relatively steep terrain, the flow in local streams is likely to vary considerably with relatively high peak flows over a short duration.

Implications for development associated with the topography are likely to include:

- The difference in elevation between the valley floor and the main ridgeline should mean that there is large cross section of habitat type which is likely to maximise biodiversity value and create interest for the visitor;
- The broad White Umfolozi valley with its largely indigenous vegetation flanked by the tall steep ridgeline that forms the southern valley side creates a dramatic memorable landscape setting;
- The minor valley systems break the landscape into different compartments creating visual variety and dissipating visitor numbers;
- The steep catchments could result in stream bank erosion over disturbed sections. They could also result in strong flows cutting off crossing points.
- Because the reserve potentially extends from ridgeline to ridgeline on both sides of the White Umfolozi River, this provides opportunity to control development that might be seen from within the reserve ensuring that the risk of visual intrusion resulting from inappropriate development can be minimised.

2.3 GEOLOGY

Four main geological areas have been identified from the National Geological Data Set, these include:

- Granite which comprises the main base geology over the majority of the proposed site and particularly the eastern and the northern segments of the site;
- Tillite forms the majority of the upper valley sides; and
- Shale is the base geology of the upper plateau areas.
- Basalt forms the base geology on the northern most areas of the proposed site.

In accordance with the Public Works Department's Engineering Manual for Problematic Soils in South Africa[1], general implications for development include:

- Granite based soils are likely to have a collapsible grain structure include dispersive soil, have high permeability and high erodibility;
- Tillite is likely to result in expansive clay, pervious to semi-impervious soil, high erodibility and good to excellent compaction and workability;
- Shale is likely to result in expansive clay with a low shear strength and high settlement. Soils are likely to be semi- or impervious and dispersive with poor compaction or workability. It could also result in unstable slopes; and
- Basalt based soils are generally clay based. These soils generally have poor compaction and workability.

[1] Public Works Department, Identification of Problematic Soils in Southern Africa, Technical Notes for Civil and Structural Engineers, June 2007.

2.4 VEGETATION TYPES

The proposed game reserve extends from Mistbelt Grassland areas near the town of Babanango to bushveld areas close to the White Umfolozi River.

According to Mucina & Rutherford[2], the proposed site includes the following vegetation types:

- Zululand Lowveld which generally occupies the valley lines and west facing valley slopes on the western side of the proposed site;
- Northern Zululand Sourveld which occupies the majority of the north and east facing slopes from the tallest ridgeline to the south to the White Umfolozi River in the north;
- Midlands Mistbelt Grassland which occupies the higher ridgelines and plateau areas to the south of the proposed site; and
- Paulpietersburg Moist Grassland which occupies the basalt area to the north of the site.

2.4.1 ZULULAND LOWVELD

According to Muncia and Rutherford, this vegetation type typically covers extensive flat or only slightly undulating landscapes supporting complex of various bushveld units ranging from dense thickets of *Dichrostachys cinerea* and *Acacia* species, through park-like savannah with flat-topped *A. tortilis* to tree-dominated woodland with broadleaved open bushveld with *Sclerocarya birrea* subsp. *caffra* and *A. nigrescens*. Tall grassveld types with sparsely scattered solitary trees and shrubs form a mosaic with the typical savannah thornveld, bushveld and thicket patches.

This vegetation type is indicated as Vulnerable with some 11% statutorily conserved mainly within the Hluhluwe-Umfolozi Park and Phongolapoort Nature Reserve.

2.4.2 NORTHERN ZULULAND SOURVELD

According to Muncia and Rutherford, this vegetation type extends from the Lusthof area in Swaziland southwards with scattered patches in northern Zululand in the surrounds of Hlomohlomo, east of Louwsburg, Nongoma and the vicinity of Ulundi including Nkandla. In the Hluhluwe-Umfolozi Park it occurs at highest altitudes in the park. Altitude mainly 450–900 m.

The dominant structural vegetation type is wooded grassland, in places pure sour grasslands and rarely also dense bushveld thickets. Terrain is mainly low, undulating mountains, sometimes highly dissected, and also some moderately undulating plains and hills.

This vegetation type is indicated as Vulnerable with some 4% statutorily conserved mainly within the Hluhluwe-Umfolozi Park and Ithala Game Reserve.

2.4.3 MIDLANDS MISTBELT GRASSLAND

According to Muncia and Rutherford, this vegetation type extends in a broad belt within the KwaZulu-Natal and Eastern Cape Provinces in the form of several major patches including Melmoth-Babanango area.

[2] The Vegetation of South Africa, Lesotho and Swaziland, 2006.

It generally occupies hilly and rolling landscape mainly associated with a discontinuous east-facing scarp formed by dolerite intrusions (south of the Thukela River). It is dominated by forb-rich, tall, sour *Themeda triandra* grasslands transformed by the invasion of native 'Ngongoni grass (*Aristida junciformis* subsp*. junciformis*). Only a few patches of the original species-rich grasslands remain.

This vegetation type is listed as endangered. It is one of the most threatened vegetation types in KwaZulu-Natal. Only a small fraction (about 0.5%) is statutorily conserved.

2.4.4 PAULPIETERSBURG MOIST GRASSLAND

According to Muncia and Rutherford, this vegetation type extends around the broad surrounds of Piet Retief, Paulpietersburg and Vryheid, extending westwards to the east of Wakkerstroom. It also occurs in the uppermost catchments of the Phongolo River. It is limited to altitudes between 920–1 500m.

This vegetation type is indicated as Vulnerable with only very small portions statutorily conserved.

2.4.5 CONSERVATION VALUE OF THE SITE

CO indicate that the bulk of the site being comprised of the Emcakwini Community Trust land is of significant biodiversity value with unique characteristics and landscape features, and a number of rare and threatened species. It allows for the conservation of landscape –level ecological processes and contributes towards several key protected area targets in KwaZulu Natal and South Africa. Their site assessment for the KZN Biodiversity Stewardship programme drew the following conclusions:

1. Protection of a site with a high biodiversity value, unique characteristics and landscape features;
2. Protection of the only known viable populations of *Aloe gerstneri* and *Aloe vanrooyenii* endemic species;
3. Provides the potential for a landscape scale conservation initiative linking existing protected areas;
4. Contribution to conservation of important ecological process, due to the size of the site;
5. High altitudinal gradient provides for high species diversity within one site;
6. The site falls within the 20 year PAES and contains 3 Natural Heritage Sites;
7. Securing the site will contribution to the tourism development in the region; and
8. The site will contribute sustainable job creation in the conservation sector in a relatively impoverished area.

From a superficial review of the properties to the north of the White Umfolozi River, it appears that these areas are of similar conservation value.

In order to achieve defined conservation targets in KwaZulu-Natal, Ezemvelo KZN Wildlife (EKZNW) has developed a planning tool, known as the Minset. The Minset identifies the minimum number of planning units contained within KwaZulu-Natal which are required to meet biodiversity conservation targets, and the outputs are updated as new information becomes available. The database spatially classifies planning units into the following categories:

- **Existing Protected area network** – Planning units that comprise areas which are formally protected under the National Environmental Management: Protected Areas Act (No 57 of 2003) as amended;

- **100 % Transformed** – Planning units that are 100% transformed in terms of natural asset according to the 2005 EKZNW land cover dataset;

- **Outside Province**– Planning units which fall outside of the KZN provincial boundary;

- **Biodiversity Priority Area 1** - Planning units which contain features that, if lost, EKZNW conservation targets cannot be met in any other planning unit within the Province;

- **Biodiversity Priority Area 2** – Planning units which contain features that, if lost, EKZNW conservation targets can only be met in a very limited number of alternative planning units within the Province; and

- **Biodiversity Priority Area 3** - Planning units which contain features that, if lost, EKZNW conservation targets can only be met in a limited number of alternative planning units within the Province.

Un-shaded planning units are "available" to meet conservation targets if any planning units classified as Biodiversity Priority Area 2 or 3 are lost or transformed.

According to the Ezemvelo KZN Wildlife Minset database, there are two small areas that fall within Biodiversity Priority Area 1 as well as five small areas on the northern and southern fringes of the site that fall into Biodiversity Priority Area 2. The majority of the proposed site is un-shaded.

Its juxtaposition of the proposed site relative to other protected areas including the Ntinini, Gelijkwater, Ophathe and Makhosini reserves indicates that it forms an important biodiversity linkage.

This importance is also reflected by the fact that it falls within a strategic landscape corridor (northern corridor) that has been identified by Ezemvelo KZN Wildlife as critical to conservation linkages. The proposed site sits directly within this linkage corridor which is also reflected on the KZN Spatial development Framework as a conservation priority.

In terms of specific red data listed species, CO noted the presence on site of the following:

1. Protea roupelliae;
2. Faurea saligna;
3. Aloe gerstneri;
4. Leopard(VU/TOPS);
5. Aardwolf(LC/IUCN);
6. Cape clawless otter(P/TOPS);
7. Brown Hyaena;
8. Serval;
9. Reedbuck;
10. Spotted hyeana;
11. Blue Crane;
12. Cape vulture (EN);
13. White-headed Vulture;
14. Tawny Eagle;

15. Black Stork;
16. Bald Ibis;
17. Martial Eagle;
18. Bateleur; and
19. Grass Owl (VN).

2.5 HERITAGE

There is a rich history within the area surrounding Babanango. There are also a number of known artefacts that have been found within the site area.

2.5.1 GENERAL

The site and surrounding areas is the original home of the influential Buthelezi Clan. This makes the area important for this group of people.

The town of Babanango was founded in 1904. Initially the town was part of land granted to White farmers, in 1885, for their support of King Dinuzulu who succeeded his father Chief Cetshwayo as King of the Zulu nation in 1884, upon his death.

The betterment planning programme was initiated by the Department of Bantu Affairs through Proclamation 31 of 1939 and regulated by Proclamation R 169 of 1967 with effective from the 1930s onwards as the major form of rural development planning in an attempt to regulate these areas and control land usage particularly those on trust land in accordance with the Land Act of 1936. This programme was implemented in the former homelands and other so-called black areas.

A vast number of people lost their stock which was their only source of wealth, subsequent to the application of the Stock Limitation Act (1950) introduced by the state under the pretext of land betterment. The Act thus paved the way for the forced removal or slaughter of cattle belonging to African people in the reserves. In terms of the Act, the number of livestock was limited and stock owners (individual or families) paid a small grazing fee annually. This consisted of restrictions on ploughing, prohibitions on cutting trees and the culling of cattle.

Betterment type controls were placed over the agricultural land in an attempt to prevent overgrazing. Betterment type controls refer to the schemes that were used to regulate homelands under the pretext of improving the areas.

More than any other type of apartheid dispossession, betterment resulted in mass removals, of particularly the underprivileged who resided in rural areas. Moreover, some of the evictees were considered to be squatters, because an individual farmer wanted to take over their land. In addition Babanango evictees were old, disabled or unsatisfactory workers whom the farmers considered ineffectual hence they were driven off the land.

Babanango experienced a massive number of farm workers' or tenants' evictions predominantly in the 1950s and early 1960s.

2.5.2 ON SITE HERITAGE

There are a number of areas of heritage interest within the proposed site. The following extract has been taken from the Babanango Valley Lodge web site (http://www.babanangovalleylodge.co.za).

- ***The old copper mine with its workings and associated ruins, was mined between about 1900 and 1910. Here one can see the remnants of the water furrow, the position of the water wheel, the area where the higher grade ore was extracted, the channeling of the stream, some of the shafts and what we assume was the site for the storage of explosives and the ruins of many old buildings.***

- ***The ruins of the mine manager's house. The dwelling was later partly torn down by a "bywoner" (tenant) to construct two rondavels.***

- ***Wagon tracks cut into a sandstone ridge between the mine house and Monkey Kop. The route was used for the removal of ore from the mine.***

- ***An isiVivane, a cairn of stones developed as a result of superstition by Zulu travelers of old. Any traveller passing by would spit on a small round stone and throw it onto the pile to avert the wrath of the spirits or misfortune and so secure safe passage.***

- ***A cave in the cliffs which was probably inhabited circa 1800-1860. Some pottery shards and bone fragments were found in them. The person who first entered (a visitor) initially removed three pieces of pottery but the pieces have been kept in the display cabinet in the lounge.***

- ***Stone age sites (dated 150 000 to 50 000 BC) have been discovered. Some artefacts from these are also in the display cabinet.***

- ***Rock art. These have only just been discovered (31 August 1998) by Geordie Gartrell. The location is Monkeykop. They are not very clear but nonetheless there.***

The fact that the site and surrounding area is the ancestral home of the Buthelezi Clan also provides the site with heritage importance. From initial discussion with the Trust, the Buthelezi's undertake an annual clan gathering in the vicinity of the site. Following the meeting, groups of people visit several areas within the proposed site that are important to them.

From the site visit there is evidence of contemporary settlement in the form of rondavels, stone walls and as Farm House buildings. The majority of these are ruins. It does seem likely that many of these are likely to date from the early to mid 20th century.

Plate 1, The shaft entrance to the Copper Mine near Babanango Valley Lodge

Plate 2, Monkey Kop

Plate 3, One of many stone structures on the site

Plate 4, Graves

2.6 LANDCOVER AND LAND USE

Historically the majority of the site area has been used for low intensity grazing and particularly for game farming. A section of the higher plateau area to the south of the site has been used extensively for timber production.

Since the Emcakwini Community Trust land claim settlement, the Trust has been the working the timber production area by selling timber to Mondi and also producing charcoal. They have also been allowing communal grazing over much of the site and firewood collection.

Poaching is currently a significant problem on the Emcakwini Community Trust land. From discussion with the Trust, this is undertaken by a variety of people for both sport and profit. During the site visit a group of 30-40 people were seen with a pack of hunting dogs towards the southern section of the proposed site.

From reference to the SANBI Landcover Data Set, the majority of the site area is in a natural state.

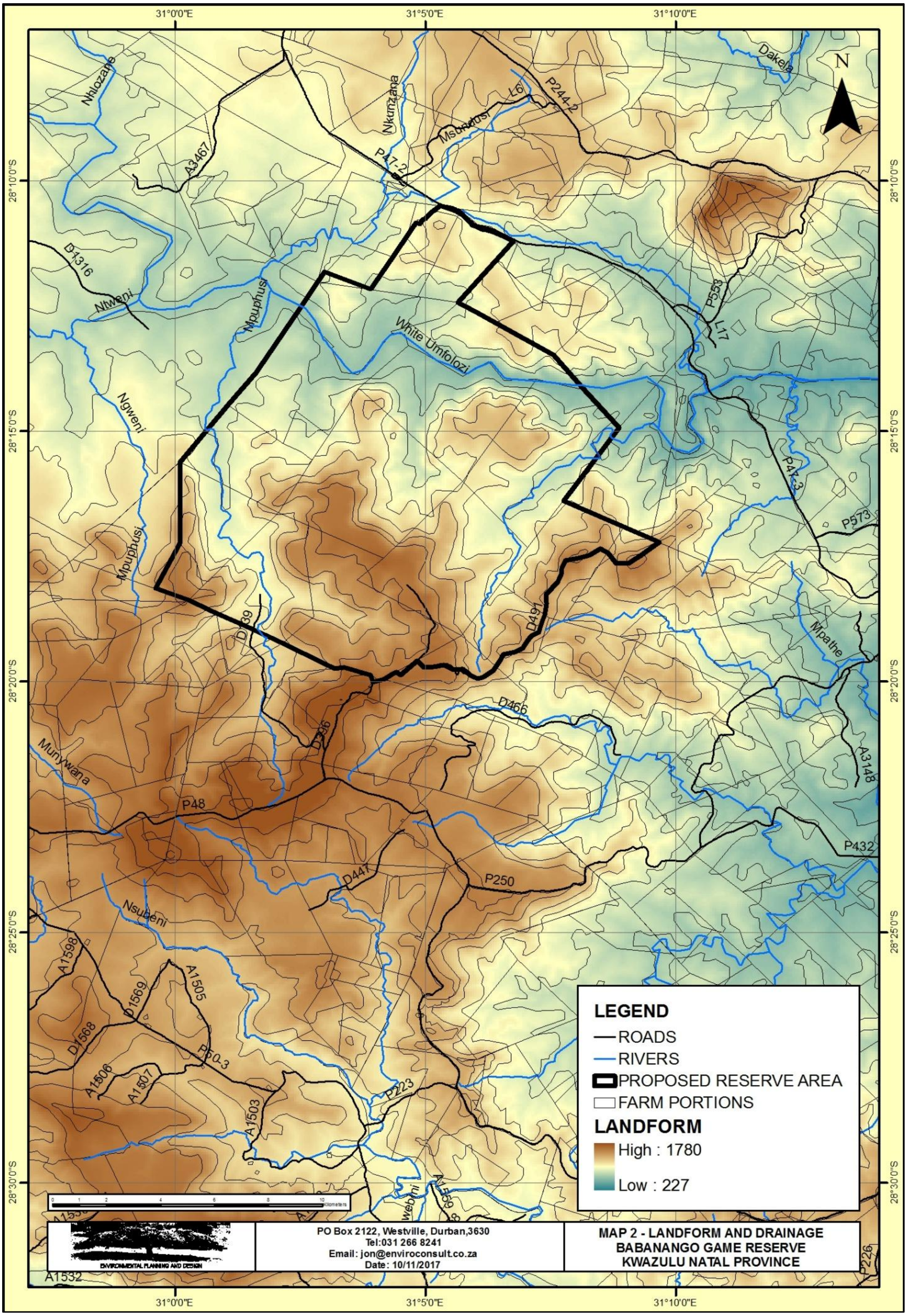
There are areas that are indicated as degraded, including:

- An area to the north west of the Emcakwini Community Trust land;
- An area to the north east of the Kwanqono Community Trust land; and
- A small area within Zulu Rock.

The areas of degraded land within Community Trust land is generally due to cattle grazing.

The degraded area of Zulu Rock coincides with the farmstead.

The other obvious landcover elements are forestry plantations that are generally located on higher plateau areas to the south of the proposed site. It is obvious from the site visit, that in many higher areas of the site, wattle in particular has spread over the site from the formal plantations.


LEGEND
ROADS
RIVERS
PROPOSED RESERVE AREA
FARM PORTIONS
LANDFORM
High : 1780
Low : 227
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Email: jon@enviroconsult.co.za
Date: 10/11/2017
MAP 2 - LANDFORM AND DRAINAGE
BABANANGO GAME RESERVE
KWAZULU NATAL PROVINCE
White Umfolozi
Mpuphusi
Ngweni
Nhlozane
Munywana
Nsubeni
Mpathe
P48
P250
D466
D491
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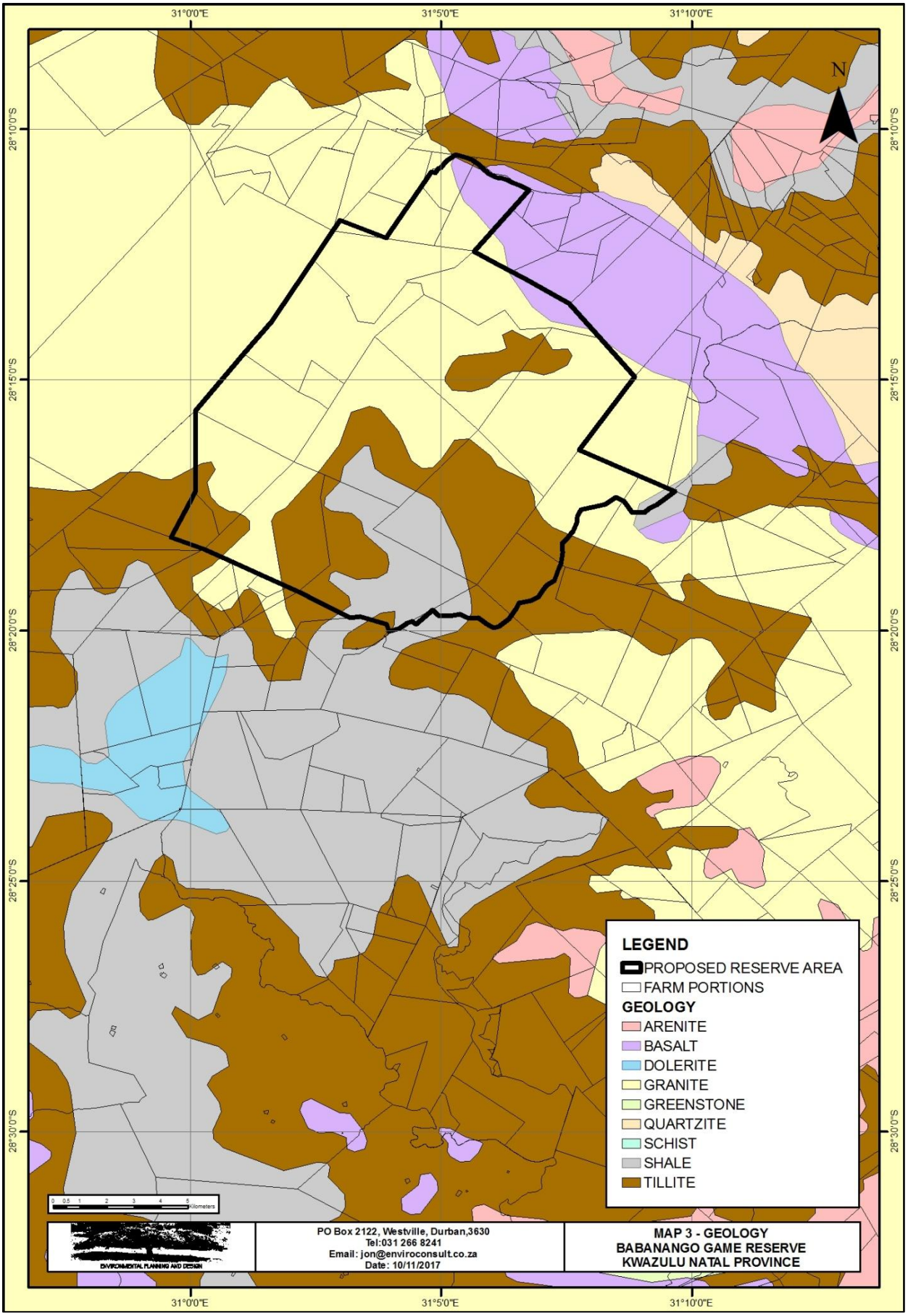
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PROPOSED RESERVE AREA
FARM PORTIONS
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DOLERITE
GRANITE
GREENSTONE
QUARTZITE
SCHIST
SHALE
TILLITE
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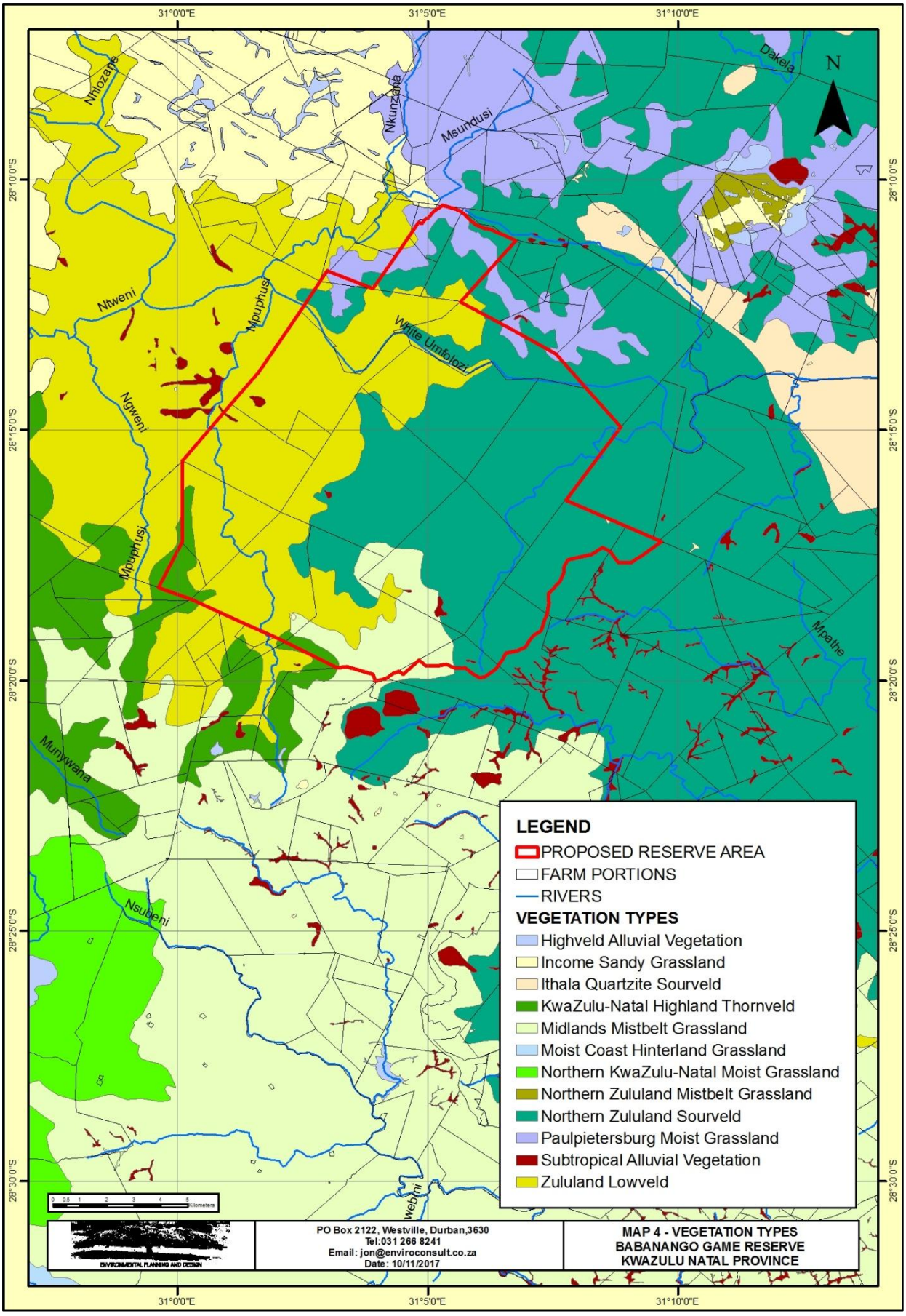
ENVIRONMENTAL PLANNING AND DESIGN
PO Box 2122, Westville, Durban,3630
Tel:031 266 8241
Email: jon@enviroconsult.co.za
Date: 10/11/2017
MAP 3 - GEOLOGY
BABANANGO GAME RESERVE
KWAZULU NATAL PROVINCE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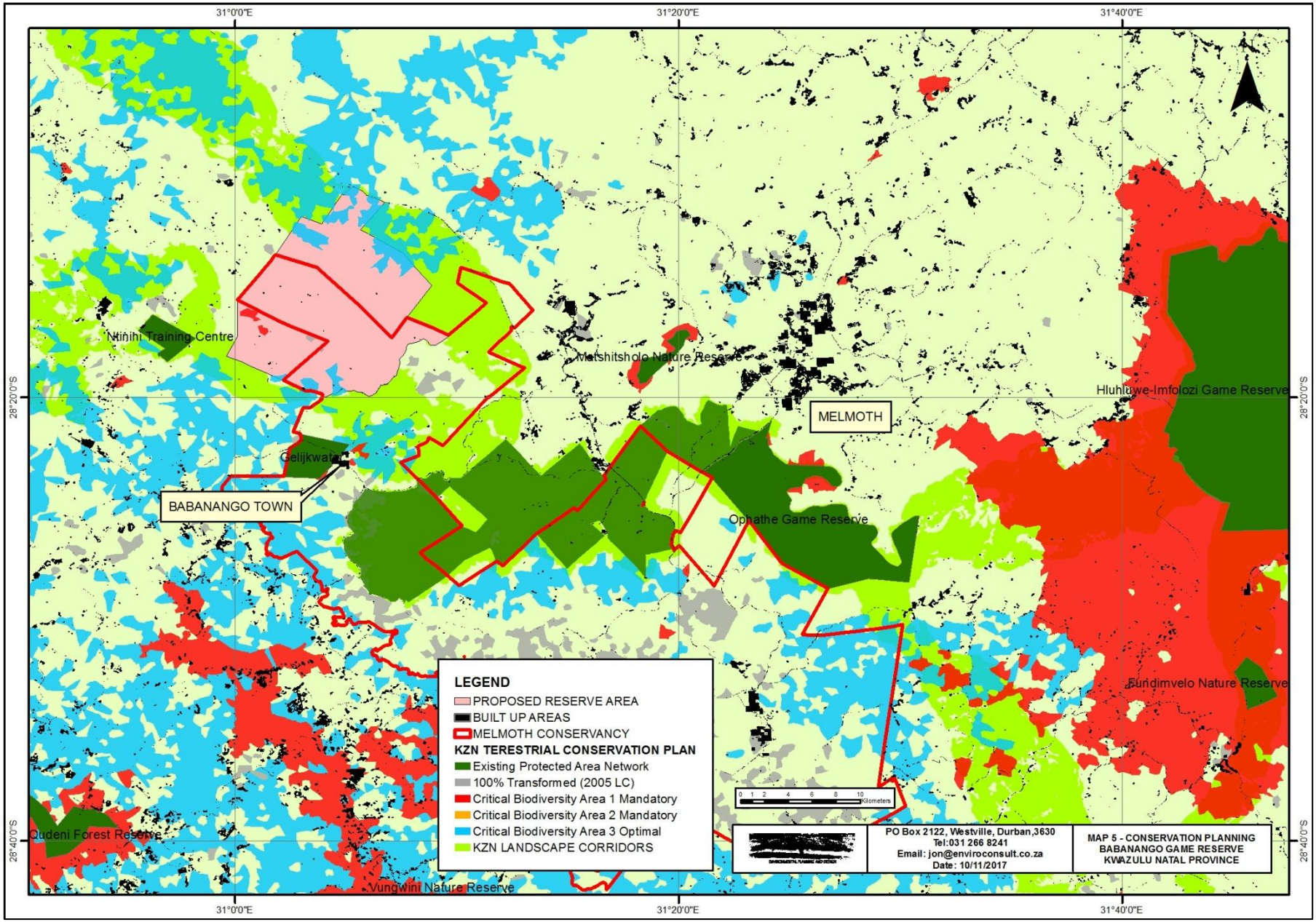
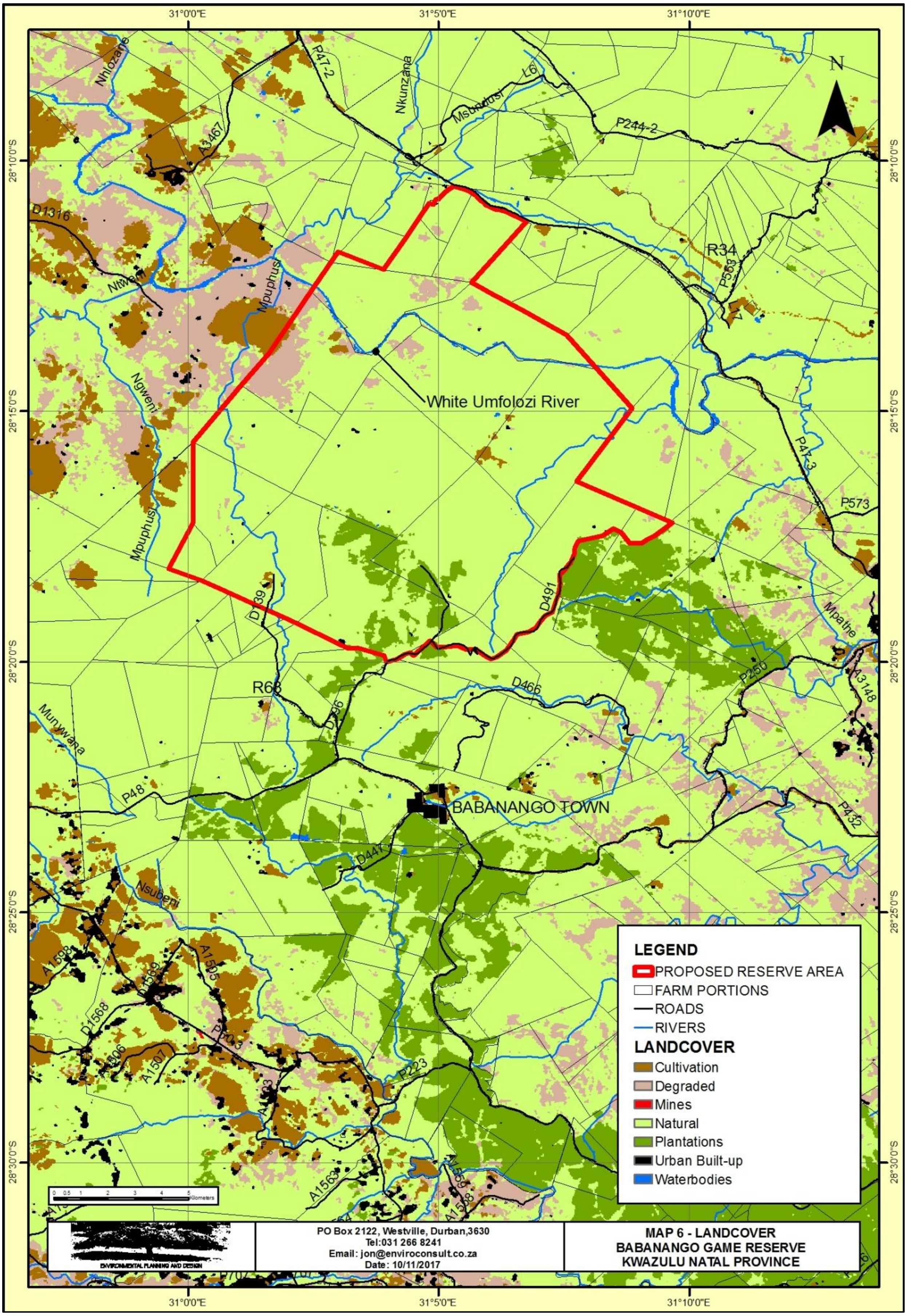
31°10'0"E
28°10'0"S
28°15'0"S
28°20'0"S
28°25'0"S
28°30'0"S
N
Nhlozane
Nkunzana
Msundusi
Dakela
Ntweni
Mpuphusi
White Umfolozi
Ngweni
Mpuphusi
Mpathe
Munywana
Nsubeni
Mkuzane
LEGEND
PROPOSED RESERVE AREA
FARM PORTIONS
RIVERS
VEGETATION TYPES
Highveld Alluvial Vegetation
Income Sandy Grassland
Ithala Quartzite Sourveld
KwaZulu-Natal Highland Thornveld
Midlands Mistbelt Grassland
Moist Coast Hinterland Grassland
Northern KwaZulu-Natal Moist Grassland
Northern Zululand Mistbelt Grassland
Northern Zululand Sourveld
Paulpietersburg Moist Grassland
Subtropical Alluvial Vegetation
Zululand Lowveld
0 0.5 1 2 3 4 5 Kilometers
ENVIRONMENTAL PLANNING AND DESIGN
PO Box 2122, Westville, Durban,3630
Tel:031 266 8241
Email: jon@enviroconsult.co.za
Date: 10/11/2017
MAP 4 - VEGETATION TYPES
BABANANGO GAME RESERVE
KWAZULU NATAL PROVINCE


31°0'0"E
31°20'0"E
31°40'0"E
28°20'0"S
28°40'0"S
Ntinini Training Centre
Matshitsholo Nature Reserve
Hluhluwe-Imfolozi Game Reserve
MELMOTH
Gelijkwater
BABANANGO TOWN
Ophathe Game Reserve
Qudeni Forest Reserve
Vungwini Nature Reserve
Eundimvelo Nature Reserve
LEGEND
PROPOSED RESERVE AREA
BUILT UP AREAS
MELMOTH CONSERVANCY
KZN TERESTRIAL CONSERVATION PLAN
Existing Protected Area Network
100% Transformed (2005 LC)
Critical Biodiversity Area 1 Mandatory
Critical Biodiversity Area 2 Mandatory
Critical Biodiversity Area 3 Optimal
KZN LANDSCAPE CORRIDORS
0 1 2 4 6 8 10 Kilometers
PO Box 2122, Westville, Durban,3630
Tel:031 266 8241
Email: jon@enviroconsult.co.za
Date: 10/11/2017
MAP 5 - CONSERVATION PLANNING
BABANANGO GAME RESERVE
KWAZULU NATAL PROVINCE



31°0'0"E
31°5'0"E
31°10'0"E
28°10'0"S
28°15'0"S
28°20'0"S
28°25'0"S
28°30'0"S
N
Nhlozane
P47-2
Nkunzana
Msunduzi
L6
P244-2
A3467
D1316
Ntweni
Mpuphusi
R34
P553
White Umfolozi River
Ngweni
P47-3
P573
Mpuphusi
D139
D491
Mpathe
R68
D466
P250
A3148
Munywana
P48
BABANANGO TOWN
P432
D441
Nsubeni
A1505
D1569
D1568
P223
A1563
LEGEND
PROPOSED RESERVE AREA
FARM PORTIONS
ROADS
RIVERS
LANDCOVER
Cultivation
Degraded
Mines
Natural
Plantations
Urban Built-up
Waterbodies
ENVIRONMENTAL PLANNING AND DESIGN
PO Box 2122, Westville, Durban,3630
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Email: jon@enviroconsult.co.za
Date: 10/11/2017
MAP 6 - LANDCOVER
BABANANGO GAME RESERVE
KWAZULU NATAL PROVINCE

3 INITIAL DEVELOPMENT PROPOSALS

3.1 SITE VISITS

Development proposals were discussed with the Client's representative during a site visit to the Emcakwini Community Trust land that was undertaken on the 6th, 7th, 8th and 9th November 2017 and a site visit to the properties to the north of the White Umfolozi River (Zulu Rock, Lulu and the Kwanqono Community Trust land)that was undertaken on the 18th April 2018.

The site visits took the form of driving around the sites in 4x4 vehicles, identifying points of interest and areas of existing disturbance and development. Discussions were held both on site and at the end of each day to distil thoughts and understand opportunities and constraints of each identified possible development area.

In total twenty six sites were noted during the visits of which eleven were considered likely to be critical for development in order to provide a sustainable income for the reserve.

The remaining points included points of interest that may be utilised as temporary stops or view points during game drives as well as infrastructure.

3.2 IDENTIFIED SITES AND INITIAL DEVELOPMENT PROPOSALS

3.2.1 EMCAKWINI COMMUNITY TRUST LAND

a) BABANANGO VALLEY LODGE

Site Description

This is an existing facility with ten bedrooms and a communal lounge and dining room. It is associated with two tented camps that are utilised by school groups for environmental education.

Historically the lodge was used for commercial guests visiting the reserve and the battlefield sites. In recent times however, it has been utilised only as accommodation for teachers who accompany the school groups.

There are two tented camps in the vicinity of the lodge;

The tented camp to approximately 50m to the north west of the lodge is comprised of approximately ten units each of which accommodate a number of learners, a communal bathroom and ablution block and a communal kitchen block.

The tented camp approximately 150m to the east of the lodge is also comprised of approximately 10 units with a communal ablutions and kitchen block.

All facilities are located within an area of Zululand Lowveld vegetation.

They are also within an area of granite and tillite geology.

The Babanango Valley Lodge is surrounded by a grass lawn, formal paving and an ornamental garden.

The tented camps are both established below and between existing indigenous canopy trees and are surrounded by bare soil.

There are also two manager's houses and a communications tower located in close proximity to the complex.

The complex is served by mains electricity and piped water. Sewage disposal is via septic tank and soak away. It is noted that electricity supply is cut off from time to time and that there are candles and matches in each room as a precaution.

Car parking for Lodge guests is arranged beneath a shade structure adjacent to the lodge. Paring for school groups tends to be accommodated on an open area immediately adjacent to the tented camp.

Solid waste is currently burned on site.

The existing development has been nestled amongst exiting indigenous vegetation in a relatively informal manner. It appears small and low key with the full extent of development largely being hidden from each development node. In total it is estimated from google earth that the developed area is approximately 15500m^2 in extent.

In total it is estimated that the existing lodge and bush camps could accommodate in excess of 100 people at any one time.

Development Proposals

Development proposals include upgrading and possibly extending the existing lodge probably utilising existing development footprints including adjacent bush camps.

The educational facility is seen as an important aspect of the exiting operation that it is important to retain. However there is a potential conflict in having it sited immediately adjacent to the lodge. The issue being noise from school groups possibly annoying other clientele who are likely to enjoy a more tranquil environment. Whilst it would remain strongly associated with the lodge, it is likely that the education centre would be relocated.

It is possible that some units may extend to 2 storeys in order to maximise viewed over surrounding trees. Building facades and rooflines will be modulated sufficiently so that their apparent scale relates to the surrounding forest trees.

Servicing

In terms of services it is envisaged that the following may be necessary:

1. The installation of a back-up generator;
2. Assessment, expansion and modification of the exiting septic tank system as necessary or installation of a new package plant;
3. Initiating a solid waste collection and disposal system; and
4. An increased car parking area.

Development Issues

The following issues are noted:

1. It is likely that the existing hardened area will increase for guest access as well as car parking this could exacerbate run off;

2. It is possible that quantities of solid waste may increase;
3. It is possible that quantities of sewage effluent may increase;
4. It seems likely that power consumption may increase;
5. It is possible the traffic that is attracted to the lodge may increase;
6. It is possible that the extended development could result in loss of existing indigenous and possibly protected tree species;
7. The vegetation type is listed as vulnerable;
8. The granite based soils on which the development is located are likely to be highly erodible; and
9. It is possible that larger and taller building structures could be more visible in the landscape.

In terms of development the following is likely to be necessary:

1. Ensuring that all paving is permeable;
2. Management of increased surface water flow and minimising erosion;
3. Keeping buildings as low as possible and whilst long views from rooms may be necessary, ensuring that the building receded into the landscape as much as is possible;
4. Minimising light pollution;
5. Additional screen planting and maintenance of all existing trees;

Plate 5 Existing Babanango Valley Lodge

Plate 6 Babanango Valley Lodge Tented Camp for Environmental Education Groups

Plate 7, Babanango Valley Lodge Existing Manager's Cottage

b) ROCK POOLS

Site Description

This is also an existing facility on the western bank of the Mpophoma stream.

It is located within an area of Zululand Lowveld vegetation.

It is also on the edge of an area of granite and tillite geology. Although looking at the rock pools they are obviously formed in granite bed rock.

It is comprised of an eight unit tented camp with a central dining facility and seating area. The units are arranged informally amongst existing mature riverine vegetation. All units are within 10m of the water course.

There is an informal gravelled single track access road running along the length of the development with small parking bays at each unit.

The tented structures are basic but have small kitchens and bathrooms.

Vegetation Type

The proposed site is located within an area of Zululand Lowveld.

Development Proposals

It is intended to service the accommodation from the Lodge. This will include kitchen facilities ensuring that no kitchen facilities will be required at this site.

Services include piped water and mains electricity. Sewage is disposed of via individual septic tanks and soak-aways which are located very close to the bank of the stream.

It is assumed that the electricity supply to this facility may also be cut from time to time due to power outages.

As this area is managed by the Lodge, it is likely that solid waste is burnt on site.

The water course in front of the units is comprised of a series of rock pools which are likely to retain water even when there is little flow.

Development proposals include improvements to the existing units improving the quality of the accommodation. This may include developing enclosed cottages on the footprint of the units. The access road and footpaths will also be upgraded

Servicing

In terms of services it is envisaged that the following may be necessary:

1. The installation of a back-up generator;
2. Assessment and modification of the exiting septic tank system as necessary; and
3. Initiating a solid waste collection and disposal system; and
4. Keeping roof lines as low as possible so as not to exacerbate visibility.

Development Issues

The following issues are noted:

1. If the road and for guest access areas are hardened this could exacerbate run off;

2. Existing septic tanks and soak aways adjacent to the water course could be causing water quality problems ;
3. Power consumption may increase;
4. Solid waste quantities are likely to increase;
5. Some structures are located on the edge of the water course;
6. It is possible that the extended development could result in loss of existing indigenous and possibly protected tree species;
7. The vegetation type is listed as vulnerable;
8. The granite based soils on which the development is located are likely to be highly erodible; and
9. It is possible that a larger building could be more visible in the landscape.

In terms of general development the following is likely to be necessary:

1. Ensuring that all upgraded paving is permeable;
2. Maintenance of all existing trees;
3. Controlling access to adjacent riverine forest areas possibly through the use of formal / elevated pathways;
4. Ensuring that possible flood and erosion issues that may be associated with existing structures are addressed;
5. Protection from animal attack.

Plate 8, Rock Pools, tented structures set amongst riverine vegetation.

Plate 9, Rock Pools, some structures on the edge of the water course.

Plate 10, Rock Pools, septic tanks close to the edge of the water course.

c) EAGLE'S VIEW

Site Description

Eagle's View is a disused homestead being comprised of an existing house, two agricultural buildings and a swimming pool. These structures are located on a platform on the northern side and approximately 50m below the level of the main ridgeline that bisects the reserve.

The platform is highly disturbed and is approximately 30 – 40m wide and 340m long.

The general area surrounding the old homestead is infested with alien tree species.

There is also evidence of informal waste disposal particularly on the slope below the homestead.

Because of the elevation of the site, panoramic views over large portions of the reserve are possible.

An overhead LV power line supplies electricity to the homestead.

It is assumed that sewage disposal is via a septic tank and soak away.

Access is via an established road from the R68 to the south of the site. The existing road is single carriageway and is in poor condition.

Vegetation Type

The site lies within an area of Northern Zululand Sourveld, however it is indicated as being close to Midlands Mistbelt Grassland.

The access road does run through an area indicated as Midlands Mistbelt Grassland, however, thi sis an existing road and the surrounding area has been modified through the planting of forestry plantations. The vegetation in this area is largely comprised of wattle plantation.

Development Proposal

The proposal is to develop a new five star lodge with all amenities that would be expected by a luxury establishment including restaurants and a spa.

From the lodge visitors will visit the reserve by organised game viewing vehicles.

It is likely that the development footprint will extend along the area of existing disturbed platform.

Services

In terms of services it is envisaged that the following may be necessary:

1. There is an electricity supply line extending to the property. This however may not have sufficient capacity for the proposed development;
2. A back-up generator system may be required;
3. Sewage treatment and disposal appears to be septic tank and soak away. The capacity of the sewage system will no doubt have to increase. Given limited space on the platform, a package plant treatment system may have to be considered;

4. It is believed that water supply was provided via a pump station from Fountain Springs in the valley below. It is likely that water usage will increase. Allied to this will be the need to dispose of an increased quantity of waste water within a limited area and a sensitive environment.
5. Initiating a solid waste collection and disposal system;

Development Issues

The following issues are noted:

1. The disturbed platform is backed by a ridgeline that extends approximately 50m above the platform level. This will mean that, subject to the height of new structures, the development is unlikely to break the sky line from most areas of the reserve. The exception to this will be from immediately below the site particularly on approach tracks that climb up to the site from the valley below.
2. Whilst the ridgeline will provide a backdrop for the development, it is still possible that buildings on the platform will be obvious from areas below. The existing building, due to lack of screening, its contrasting colour and form is obvious from large sections of the valley below. The new building could be more obvious.
3. The environment immediately surrounding the platform is degraded. Whilst this may make it more suitable for development, it doesn't provide the natural setting required for a five star lodge;
4. The narrow platform is likely to result in a linear development form. Services, access and car parking may constrain building areas resulting in structures having to be located close to the front of the platform. It is possible that decking extending from the existing platform may be necessary in areas;
5. The area of grassland above the ridgeline is sensitive and is unlikely to be suitable for development; and
6. The management of waste water and surface water runoff will critical to minimising impacts on surrounding areas.

In terms of general development the following is likely to be necessary:

1. A combination of careful site planning, building design and screening may be required to minimise visual intrusion associated with a larger building;
2. Clearing of indigenous trees, herbaceous plants and grassland must be miminmised;
3. Extensive rehabilitation of the ridgeline behind the platform, slopes below the platform and areas of the platform itself will be required.

Plate 11 Eagle's View, the view over the valley from the existing homestead.

Plate 12 Eagle's View, the existing homestead and swimming pool.

Plate 13 Eagle's View, existing out buildings.

Plate 14 Eagle's View, the existing platform is highly degraded.

Plate 15 Eagle's View, the ridgeline behind the platform. Alien invasive species extend up the slope.

d) FOUNTAIN SPRINGS

Site Description

Fountain Springs is a spring that is reported to flow throughout the year. It is slightly warm and is reported to produce uncontaminated, pure water. It feeds into a stream that runs northwards for approximately 5km into the Mflozi.

There is a pump house immediately downstream of the spring which is no longer functioning but it is believed that it provided water supply to Eagle's View.

The valley in which the site is located is likely to hide any development from the main ridgelines to the south.

Vegetation Type

The site lies within an area of Northern Zululand Sourveld.

Riverine vegetation including taller trees borders the stream line.

There is little alien vegetation in the area.

Development Proposal

The proposal is to develop a small lodge which could take the form of small accommodation blocks amongst and beside the trees downstream of the spring.

There is also a possibility that water from the spring may be bottled for use within the game park.

In terms of services it is envisaged that the following may be necessary:

1. The installation of an electricity supply;
    a. An above ground supply line is likely to spoil the of other more natural areas;
    b. A below ground supply line would minimise visual impacts but is also likely to be an expensive option;
    c. A back-up generator may be required. This will however require a small fuel store and may cause noise which could disturb wildlife and guests;
    d. Solar energy is likely to require extensive space and subject to location and extent could be an eyesore particularly when viewed from above; and
2. Sewage treatment and disposal, because of the location close to a water course, care will be needed to minimise risk of contamination;
3. Initiating a solid waste collection and disposal system; and
4. Keeping structures as low as possible and beneath tree canopies in order that the facility is not be visible from surrounding high ground.

Development Issues

The following issues are noted:

1. The site will be an informal camp site that is not permanently occupied.
2. It is not anticipated that power requirements will be large. It may be possible that services may have to be provided on site through gas bottles and a small solar system, should air conditioning be required however this is unlikely to be sufficient and an electricity supply line or generator may be necessary;
3. Whilst the area has historically functioned as a camp, vegetation in and around the site appears pristine, there will therefore be a need to ensure that neither the construction or operation of the camp impacts on this;
4. It is intended that this site function as a camp for hikers. This probably means that a large car park is not required, however a small service yard and parking for game vehicles probably is required.

In terms of general development the following is likely to be necessary:

1. Reinforcing of paths and desire lines in limited areas with paving may be necessary. This should be minimised however;
2. Clearing of trees, herbaceous plants and grassland must be miminmised;
3. A fuel and gas store may be required. This must be designed to minimise risk to the environment, subject to quantities required;
4. Protection from animal attack;
5. Careful consideration of visual impacts. It should be possible to design this camp to ensure that is only visible from its immediate surrounding area.

Plate 16, Fountain Springs

e) FARM HOUSE

Site Description

This site is located close to the Babanango Valley Lodge access road.

It consists of a group of old farmstead buildings within a cleared grass area.

Vegetation Type

The proposed site is located within an area of Zululand Lowveld. The area surrounding the buildings is degraded as it has been part of a working farmstead.

Development Proposal

The proposal is to renovate the existing farmstead buildings to form a cluster of guest chalets. It is also possible that a small number of new buildings in the style of the existing structures could be added to the group.

A degree of formalisation of the area immediately surrounding the buildings will also be necessary in order to provide a secure external area for guests.

It is also intended to develop camp sites and to relocate the education centre to the north of the existing farm house.

Services

The existing level of services is unknown although until relatively recently the farmstead was inhabited. There must therefore be a basic level of services available.

As the site is close to the main access road to the Babanango Valley Lodge (D139). This is likely to simplify servicing.

1. There is an electricity supply line extending close to the site. This however may not have sufficient capacity for the proposed development;
2. A back-up generator system may be required;
3. Sewage treatment and disposal is likely to be comprised of a septic tank and soak away. The capacity of the sewage system will probably have to increase. The buildings are approximately 150m from the stream which indicates that there may be sufficient space for an effective soak away system;
4. The water supply point is unknown although there is obviously a sufficient local supply to run a reasonable size farmstead;
5. Initiating a solid waste collection and disposal system;

Development Issues

As proposed work associated with this site is likely to be largely within existing structures and within the working area of the old farmstead. Because of this there are likely to be minimal environmental issues associated with development.

e) ARGYLL FARM

Site Description

This farmstead is located within an area that is largely comprised of wattle plantation. Since settlement of the land claim it has largely been used as a working base for forestry and charcoal production. The farmhouse has also been used for the manager's accommodation.

Vegetation Type

The proposed site is located within an area of Midlands Mistbelt Grassland. The area surrounding the buildings is degraded as it has been part of a working farmstead. The general area is also degraded as it is part of a wattle plantation.

Development Proposal

The proposal is to keep this farmstead as a maintenance centre for the proposed game reserve.

The extent of development was not known at the time of reporting. However from discussion it is known that fuel (diesel) storage is required, a cold storage facility will be needed and staff accommodation is likely to be required. It is anticipated that staff accommodation for all facilities within the Reserve will be needed. This could be a relatively extensive extension to the existing development.

In addition new elements indicated above, it is likely that existing farm buildings, possibly with some modification, might be utilised as a management and maintenance centre.

It is likely that in the medium term, the existing facilities and buildings would have to be added to.

Services

The existing level of services is unknown although until relatively recently the farmstead was operational. There must therefore be a basic level of services available.

1. There is an electricity supply line extending close to the site. This however may not have sufficient capacity for the proposed development;
2. A back-up generator system may be required;
3. Sewage treatment and disposal is likely to be comprised of a septic tank and soak away. The capacity of the sewage system will probably have to increase. The buildings are approximately 200m from the closest stream which indicates that there may be sufficient space for an effective soak away system;
4. The water supply point is unknown although there is obviously a sufficient local supply to run a reasonable size farmstead;
5. Initiating a solid waste collection and disposal system;

Development Issues

Any development should be focused on existing disturbed area associated with the farmstead. Should development extend outside existing disturbed areas authorisation processes are likely to be more involved.

The main development issue is that the farmstead is located within a threatened ecosystem (Midlands Mistbelt Grassland). Whilst the surrounding area is largely wattle plantation, there are pockets of grassland to the north. Expansion into these areas is unlikely to be possible. It is also possible that with appropriate management, grassland might be re-established within areas currently affected by wattle, particularly those areas that have been subject to relatively recent invasion. Expansion into these areas may therefore be difficult.

Plate 17, View looking towards Argyll Farm from the access road to the east. The farm buildings are located in the alien vegetation immediately to the left of the

power line support.

f) SAND PILE DAM

Site Description

This site is located within a minor valley to the north west of the proposed reserve and approximately 1.3km to the south of the White Umfolozi River.

When the dam is at full capacity it is approximately 100m long and 50m wide at the dam wall.

Downstream the water course runs through the Orange Farm site. It is possible that the dam served as a second water supply for the orange growing operation.

The sluice / overflow for the dam is located on the eastern end of the dam wall. At

Vegetation Type

The proposed site is located within an area of Zululand Lowveld.

The area immediately surrounding the dam is largely comprised of open grassland.

Downstream of the dam, the water course has developed into a relatively narrow series of wetland areas**.**

Development Proposal

The proposal is to develop a small lodge on the eastern side of the dam.

The extent of the possible development is not known, however, development is likely to require removal of an area of existing indigenous vegetation.

The existing dam and downstream wetlands appear rich in birdlife. The dam is also likely to attract game when the reserve is operational. It is possible that a series of small hides for game / bird watching may be more appropriate.

Services

Currently there are no services extending to the possible site.

Development Issues

Developing services into the area is likely to result in loss of indigenous vegetation along service runs.

Developing the lodge is also likely to result in loss of indigenous vegetation.

Access to the eastern side of the dam could be problematic during periods of high flow through the overflow.

Plate 18, Sand Pile Dam, view looking south at the dam from the dam wall.

3.2.2 ZULU ROCK

a) FARMSTEAD / SERVICE CENTRE

Site Description

This is an existing facility with a large farm house and numerous out buildings that are used as stores, workshops and staff accommodation.

The farmstead is located close to an area of rural settlement and a small area of arable land immediately to the west. It is understood that the area of rural settlement was given to workers on the Zulu Rock property by the land owner.

The natural vegetation type is Northern Zululand Sourveld and the base geology is granite. Decomposed granite based soil is obvious at the surface over much of the area.

Vegetation on land to the north, south and east is relatively pristine whereas vegetation on land to the west between the area of informal settlement and the farmstead is relatively degraded.

Vegetation within the farmstead is largely comprised of lawn as well as indigenous trees and shrubs that have either been planted or have been maintained from the original clearing. A large part of the garden is irrigated.

Decomposed granite is subject to erosion. It is obvious that erosion control on internal un-surfaced access roads has been undertaken effectively with regular cut off drains and swales.

Sewage disposal is currently via septic tanks.

Road access is directly from the R34 to the north.

Development Proposals

Proposals include the use of the farmstead as a service centre for the reserve including offices, stores and workshops as well as for staff accommodation.

It is likely that existing structures can be converted for stores and workshops. There is also an existing managers house that can be utilised. It is also likely that a number of additional accommodation units will be required for staff.

There are two existing fuel tanks the legality of which are unknown. From observation on site however, there is no obvious contamination resulting from spillage of fuel.

Servicing

In terms of services it is envisaged that the following may be necessary:

5. The installation of a generator;
6. Assessment, expansion and modification of the exiting septic tank system or installation of a new package plant as necessary;
7. Initiating a solid waste collection and disposal system;
8. An increased vehicle parking area;
9. Increased storage, offices and residential units;
10. Increased hazardous materials storage; and
11. Operational lighting

Development Issues

The following issues are noted:

10. It is likely that the cleared / hardened area will increase particularly for parking areas and this will exacerbate run off;
11. Quantities of solid waste will increase;
12. Quantities of sewage effluent will increase;
13. It seems likely that power consumption will increase;
14. Traffic will increase probably to the extent that un-surfaced vehicular areas may not feasible;
15. It is possible that the extended development could result in loss of existing indigenous and possibly protected tree species;
16. The vegetation type is listed as vulnerable;
17. The granite based soils on which the development is located are likely to be highly erodible; and
18. There may be a need for bright lighting at times to undertake urgent maintenance operations during the hours of darkness. Whilst this section of the development is outside the main White Umfolozi River Valley, lighting within surrounding areas should also be minimised in order to minimise the risk of a loom being seen above the ridgeline from within the valley;

19. Car and vehicle parking areas may be visible when viewed from above. Glint and glare from windscreens and other shiny surfaces could exacerbate this impact;
20. The Service Centre is likely to require storage of fuels and other hazardous materials. Whilst the farmstead is likely to require storage of similar materials, the extended reserve area will significantly increase quantities and associated risk; and
21. Veldt fires could exacerbate risks associated with the storage of hazardous materials.

In terms of development the following is likely to be necessary:

6. Ensuring that where possible paving is permeable in order to minimise run off;
7. Where permeable paving is not possible ensure that surface water drainage is removed through soak away swales at regular intervals in order to avoid concentrated run off that is more likely to result in erosion;
8. Focusing new development on the degraded area to the west of the farmstead.
9. Site buildings in a manner that minimised visibility to the reserve access road.
10. Keep buildings as low as possible in order that the screening capacity of surrounding vegetation is maximised.
11. Augment existing vegetation as necessary in order to help screen the service facility from the reserve access road;
12. Minimising light pollution by sensitive lighting design and by ensuring that brighter operational lighting is only activated when absolutely necessary;
13. Ensure that all reserve vehicles have a matt finish;
14. Ensure that vehicle parking areas are screened from higher elevations, this might be achieved using shade cloth and / or planting;
15. Plan storage of fuel and other hazardous materials in a manner that minimises risk to both the environment and to people. This will require specific storage facilities as well as a bunded store for hazardous liquids;
16. Manage surrounding vegetation to ensure that the risk associated with fire are minimised.
17. Ensuring that personnel are trained and equipment is available for fire fighting; and
18. It may be necessary to consider a package sewage treatment plant in order to minimise the risk of ground and water contamination.

Plate 19 Existing Zulu Rock Homestead

Plate 20, Degraded Veldt to the west of Zulu Rock Farmstead. A meallie field can be seen right of picture and an existing manager's house can be seen through the trees to left of picture.

Plate 21, An existing stable block that is likely to be suitable for conversion for storage to the west of the farmstead.

Plate 22, Existing fuel tanks at the farmstead. It is likely that a greater quantity of fuel and other hazardous materials will be required within the service area. Careful consideration of methods to minimise associated risks will be required. Fuel storage will require a bunded area.

b) ZULU ROCK LODGE / RECEPTION AREA

Site Description

This is an existing lodge facility which included five self catering accommodation blocks and a swimming pool.

It is located on a rocky promontory that overlooks the White Mfolozi River and its surrounding valley.

Whilst there is potential for the blocks to create significant visual intrusion when viewed from across the valley to the south, due to careful siteing and due to the fact that roofs where they are located close to the edge of the promontory have been kept low, during daylight hours it is hard to distinguish the buildings within the natural landscape from areas to the south, east and west. There are exceptions to this however, one of which is the poolside shelter which although it is a thatch construction due to its conical shape it is an obvious man made element within an otherwise relatively natural landscape. It is particularly obvious when viewed from lower areas of the valley to the west.

The natural vegetation type is Northern Zululand Sourveld and the base geology is granite. Decomposed granite is obvious at the surface over much of the area.

Vegetation surrounding the promontory appears to be a relatively pristine treed grassland.

On the promontory and particularly surrounding the self catering units, the natural vegetation has been disturbed and has been manicured to provide a lawn setting surrounding the units. Whilst natural woody elements remain within the lawn area, the majority of trees and shrubs appear to have been cleared.

Decomposed granite is subject to erosion, however, a dense grass sward is currently preventing this.

Sewage and grey water disposal is currently via septic tanks and soak aways.

Road access is directly via an un-surfaced road from the existing Zulu Rock Farmstead. Erosion control has been well managed on this section of road with cut off berms and swales at regular intervals.

Development Proposals

Proposals include the use of this area as the main reception centre for the reserve.

This is likely to incorporate;

1. A large area of car parking for visitor's cars
2. A collection area from where visitors will be transported into the reserve by reserve vehicles;
3. A waiting area for visitors which may be air conditioned;
4. An information centre which may be incorporated into the waiting area;
5. A look out area from where visitors can orientate themselves within the reserve;
6. A waiting area for reserve vehicles;
7. Ablutions; and

8. An administration office possibly incorporating a booking office for day visitors.

Servicing

In terms of services it is envisaged that the following may be necessary:

1. The installation of a generator to run AC units;
2. Fuel storage is likely to be necessary should a generator be required;
3. If AC is not required a small area of PV panels and a battery bank may be sufficient to run basic electrical services;
4. Given the likely number of people passing through the facility, it seems likely that a package sewage treatment plant may be required;
5. Providing water supply for consumption, maintenance and sewage treatment;
6. A significant soak away / evapo-transpiration area is likely to be required for disposal of effluent
7. Initiating a solid waste collection and disposal system;
8. A large vehicle parking area;
9. Low level lighting.

Development Issues

The following issues are noted:

1. It is likely that the existing hardened area will increase due to additional houses and parking areas. This could exacerbate run off;
2. It is likely that quantities of solid waste will increase;
3. It seems likely that water requirements will increase;
4. It is likely that quantities of sewage effluent that needs to be disposed of will increase;
5. It seems likely that power consumption will increase;
6. Traffic will increase to the extent that un-surfaced access roads and parking areas may not be feasible;
7. It is possible that the extended development could result in loss of existing indigenous and possibly protected tree species;
8. It is possible that the development may need to extend into areas that currently are not disturbed. Minimising the loss of natural vegetation is critical as the vegetation type is listed as vulnerable;
9. This section of the development overlooks the White Umfolozi River Valley which is the core focus of the reserve. This will mean that it will be critical to minimise visual impacts associated with development including light pollution on the reserve area and particularly the valley;
10. The granite based soils on which the development is located are likely to be highly erodible, this could result in a significant risk due to increased run off from hardened surfaces as well as the need to dispose of increased quantities of effluent;
11. Car and vehicle parking areas may be visible when viewed from across the valley where there are possible viewpoints that could overlook this section of the development. It is also possible that if vehicle parking extends to the edge of the platform then it could be visible from lower elevations. Glint and glare from windscreens and other shiny surfaces could exacerbate this impact.
12. Coach parking could exacerbate the impact noted in 11 above. Circulation requirements for coaches could also be problematic given the relatively small area of the development platform.

13. Veldt fires could exacerbate risks associated with the storage of hazardous materials.

In terms of development the following is likely to be necessary:

1. Given the visual sensitivity of the White Mfolozi River Valley, visual impacts associated with buildings, lighting, vehicle circulation and parking must be completely mitigated;
2. Buildings and other structures should be as low as possible, be set back from the edge of the existing platform and must use a form, materials and colour that helps to them blend into the surrounding natural landscape;
3. All vehicular areas must be set back from the western edge of the platform that overlooks the valley;
4. Ensure that private vehicle movements only occur during day light hours. Reserve vehicles should use hooded lights.
5. Lighting design must completely mitigate possible lighting impacts that could be experienced from surrounding areas. This may be achieved through the use of low level lighting in order to only illuminate pathways and road surfaces to a minimum level sufficient only for safe circulation;
6. The loss of existing natural vegetation must be minimised;
7. Focusing new development on currently disturbed areas will help to minimise the loss of natural vegetation.
8. Plan storage and use of fuel and other hazardous materials in a manner that minimises risk to both the environment and to people. This is likely to require secure and bunded storage. It is also likely to require fuel traps in the surrounding drainage system
9. Manage surrounding vegetation to ensure that the risk associated with fire is minimised.
10. Risks associated with erosion must be mitigated;
11. The use of urine diversion, composting toilets should be considered in order that water supply and effluent disposal requirements are minimised;
12. Ensuring that where possible paving is permeable in order to minimise run off;
13. Where permeable paving is not possible ensure that surface water drainage is removed through soak away swales at regular intervals in order to avoid concentrated run off that is more likely to result in erosion;

Plate 23 Existing Zulu Rock Lodge. Natural vegetation within the platform area has been transformed. Note the shelter structure beside the pool to right of picture. This is the most obvious "man made" element particularly when the development is viewed from the valley.

Plate 24, Natural treed grassland surrounding Zulu Rock Lodge. Impacts on this must be avoided and risks associated with fire must be mitigated. This might include annual cutting of dead grass in order to minimise combustible material and maintaining fire fighting equipment in close proximity

Plate 25, An existing soak pit that is currently used for disposal of sewage and grey water. This system is likely to be inadequate for the proposed reception facility

3.2.3 LULU

a) LULU HOMESTEAD / PROPOSED HOUSE AND OR A LODGE

Site Description

This is the site of an existing and operational farmstead. The main activity is cattle farming.

The management of cattle requiring cattle pens and existing farm buildings have created a significant area of disturbance.

The farmstead is located on a high promontory that overlooks the White Umfolozi River.

Existing buildings include a large barn, a farmhouse and several smaller accommodation blocks and stores. Due to their scale, colour (white) and visually exposed position the barn and farmhouse are particularly obvious from surrounding areas.

The site does provide opportunity for scenic views to the east and west along the River Valley.

Redevelopment of the site also provides opportunity to provide a more subtle approach to development that will minimise visual impacts on the reserve area.

According to the National Geological dataset, the site appears to fall on an interface between Granite and basalt based geology. From surface boulders however, it appears that granite underlies the site.

Decomposed granite based soils are obvious at the surface. These are subject to erosion, however, no significant erosion was noted on site.

Sewage and grey water disposal is currently via septic tanks and soak aways.

Development Proposals

At the time of reporting, development proposals were unknown although the following was discussed;

- Development of Accommodation units on a large paddock area. The units would face east along the river valley; and
- Development of a family hose for a possible new owner.

Servicing

This farmstead is currently "off the grid" with no formal electricity or water supply. In terms of services it is envisaged that the following may be necessary:

1. The installation of a generator to run AC units;
2. Fuel storage is likely to be necessary should a generator be required;
3. If AC is not required a small area of PV panels and a battery bank may be sufficient to run basic electrical services;
4. It is possible that the a septic tank and soak away system may be acceptable for disposal of sewage and grey water otherwise a package plant may be required;
5. Providing water supply for consumption, maintenance and sewage treatment;
6. Initiating a solid waste collection and disposal system; and
7. Low level lighting.

Development Issues

The following issues are noted:

1. The construction of new road alignments to link the facility to the service centre at Zulu Rock may be required;
2. It is possible that the development may need to extend into areas that currently are not disturbed. Minimising the loss of natural vegetation is critical as the vegetation type is listed as vulnerable;
3. The granite based soils on which the development is located are likely to be highly erodible, this could result in a significant risk due to run off from the extended area of hardened surface as well as the possible need to dispose of increased quantities of effluent; and
4. Veldt fires could exacerbate risks associated with the storage of hazardous materials.

In terms of development the following is likely to be necessary:

1. Given the visual sensitivity of the White Mfolozi Valley, visual impacts associated with buildings, lighting, vehicle circulation and parking must be totally mitigated;

2. Buildings and other structures should be as low as possible and must use a form, materials and colours that help to them blend into the surrounding natural landscape;
3. Lighting design must mitigate lighting impacts that could be experienced from surrounding areas and particularly from the south of the river. This may be achieved through the use of low level lighting in order to only pathways and road surfaces are lit to a minimum level sufficient only for safe circulation, If the development faces east and away from the main body of the reserve this would also help mitigate lighting impacts;
4. Focusing new development on currently disturbed areas will minimise the loss of surrounding natural vegetation.
5. Plan storage and use of fuel and other hazardous materials in a manner that minimises risk to both the environment and to people. This is likely to require secure and bunded storage. It may also require fuel traps in the surrounding drainage system
6. Manage surrounding vegetation to ensure that the risk associated with fire is minimised.
7. Risks associated with erosion must be mitigated;
8. The use of urine diversion, composting toilets in order that water supply and effluent disposal requirements are minimised;
9. Ensuring that where possible paving is permeable in order to minimise run off; and
10. Where permeable paving is not possible ensure that surface water drainage is removed through soak away swales at regular intervals in order to avoid concentrated run off that is more likely to result in erosion;

Plate 26 Overview of the Lulu farmstead from the north.

Plate 27 View from the Lulu Farmhouse looking east down the White Umfolozi River Valley.

Plate 28, Significant disturbance of the natural environment at the Lulu Farmstead due largely to cattle farming

3.2.4 KWANQONO COMMUNITY TRUST LAND

a) LEOPARD ROCK / PROPOSED LODGE

Site Description

This is the site of an old lodge that is reported to have closed down approximately 10 years ago. It is also reported to have been a popular lodge.

The ruins and bases of previous buildings are obvious on the site. It was comprised of nine tented units that were constructed on elevated concrete bases, two office / catering units and a large communal boma with a bar, dining area and covered swimming pool.

The facility is located on a koppie facing west and overlooking a meander in the White Umfolozi River.

The site sits sufficiently low in the landscape to prevent views of rural settlement to the west of the site being possible. This means that the night time view is likely to be relatively pristine with no direct night time lighting being visible.

The natural vegetation type is Northern Zululand Sourveld and the base geology is granite. Decomposed granite is obvious at the surface over much of the area.

The development appears to have been sensitively located in that vegetation immediately surrounding and between the various units appears to be relatively pristine treed grassland.

Decomposed granite is subject to erosion, however, a dense grass sward is currently preventing this.

Sewage and grey water disposal was via septic tanks and soak aways.

Road access currently is directly from the R34 with no easy link from the proposed Zulu Rock Reception Centre. This could mean that a new road alignment will be required.

The proposed Leopard Rock site does have easy access to an existing causeway that crosses the White Umfolozi River approximately 500m to the south west of the site. Historically this crossing has been used for cattle, however it does provide opportunity to link reserve operations on both sides of the river.

Development Proposals

Proposals include the use of this area as a five star lodge with buildings largely making use of the existing building footprints.

This is likely to incorporate:

1. A small vehicle parking and delivery area that will be used by reserve vehicles only for dropping off / picking up guests and delivery of supplies;
2. The development of accommodation units; and
3. The development of communal areas, offices, stores and on site catering facilities;

Servicing

In terms of services it is envisaged that the following may be necessary:

1. The installation of a generator to run AC units;
2. Fuel storage is likely to be necessary should a generator be required;
3. If AC is not required a small area of PV panels and a battery bank may be sufficient to run basic electrical services. These may be difficult to hide however;
4. Given the small number of units and because it is comparable with the previous development on the site, it is possible that the a septic tank and soak away system may be acceptable for disposal of sewage and grey water otherwise a package plant is likely to be required;
5. Providing water supply for consumption, maintenance and sewage treatment;
6. Initiating a solid waste collection and disposal system; and
7. Low level lighting.

Development Issues

The following issues are noted:

5. The construction of new road alignments to link the facility to Zulu Rock and to the south side of the river are likely to be required;
6. It seems unlikely that the development may need to extend into areas that currently are not disturbed. However, minimising the loss of natural vegetation is critical as the vegetation type is listed as vulnerable;
7. The granite based soils on which the development is located are likely to be highly erodible, this could result in a erosion risk due to run off from the extended area of hardened surface as well as the possible need to dispose of increased quantities of effluent; and
8. Veldt fires could exacerbate risks associated with the storage of hazardous materials.

In terms of development the following is likely to be necessary:

11. Given the visual sensitivity of the White Mfolozi Valley, visual impacts associated with buildings, lighting, vehicle circulation and parking must be mitigated;
12. Buildings and other structures should be as low as possible and must use a form, materials and colours that help to them blend into the surrounding natural landscape;

- Lighting design must mitigate lighting impacts that could be experienced from surrounding areas and particularly from the south of the river. This may be achieved through the use of low level lighting in order to only pathways are lit to a minimum level sufficient only for safe circulation. Any lighting external to the accommodation blocks and public areas must be of sufficiently low power so as to have limited impact;

13. The loss of existing natural vegetation must be minimised;
14. Focusing new development on currently disturbed areas will minimise the loss of surrounding natural vegetation.
15. Plan storage and use of fuel and other hazardous materials in a manner that minimises risk to both the environment and to people. This is likely to require secure and bunded storage. It may also likely to require fuel traps in the surrounding drainage system
16. Manage surrounding vegetation to ensure that the risk associated with fire are minimised.
17. Risks associated with erosion must be mitigated;

18. The use of urine diversion, composting toilets in order that water supply and effluent disposal requirements are minimised;
19. Ensuring that where possible paving is permeable in order to minimise run off; and
20. Where permeable paving is not possible ensure that surface water drainage is removed through soak away swales at regular intervals in order to avoid concentrated run off that is more likely to result in erosion;

Plate 29, Existing Leopard Rock structures set amongst treed grassland

Plate 30 View from Leopard Rock over a meander in the White Umfolozi River.

Plate 31, Leopard Rock boma area.

Plate 32, Leopard Rock, original pipe runs were laid on the surface and covered with rocks.

Plate 33, Leopard Rock, original soak away system.

3.2.5 ACCESS ROUTES

Access routes include;

- Access routes to the Game Reserve; and
- Access routes within the Game Reserve

a) ACCESS ROUTES TO THE GAME RESERVE

At the time of reporting two primary access routes were under consideration including:

- An access from the south via the R68; and
- An access from the north via the R34

It is possible that only one of these primary access routes will be utilised.

<u>Southern Access Via the R68</u>

The proposal is to utilise the existing un-surfaced road (D139) that runs from the R68 to the west of the town of Babanango and terminates at the Babanango Valley Lodge. This road is a high quality local access road approximately 6 – 7m wide. In addition to providing access to the existing Lodge, it provides access to a small local settlement and a number of farmsteads. During the site visit very few vehicles were seen while travelling on this road.

<u>Northern Access Via the R34</u>

The proposal is to utilise the existing un-surfaced road that runs from the R34 through Zulu Rock directly to the existing Farmstead / proposed Reserve Service Centre and to the Zulu Rock Lodge / proposed Visitor Reception Centre. This access would provide easy access to Vryheid and to battlefields sites for visitors. The access from the R34 is existing. The internal road is a well maintained un-surfaced road that is likely to require upgrading.

It is also possible that a secondary service orientated access may be considered at the north western corner of the Game Reserve. This would provide access via a community access road providing access to the adjacent community for job opportunities.

In order to connect to the existing road approximately 1.5km of new road is likely to be required as is the upgrading of sections of the community access road. The new section of road is likely to have to cross at least one seasonal water course. This route does utilise a new all weather crossing of the White Umfolozi River.

Because the River divides the proposed reserve, it is proposed that an existing causeway across the river is used to provide a link for visitors. However, this is a low level causeway that is known to be impassable for short periods during the rainy season. This secondary access would provide a reasonably convenient alternative method of crossing the river.

b) ACCESS ROUTES WITHIN THE GAME RESERVE

Internal reserve routes are likely to include the following:

- Upgrading of existing tracks and roads;
- New access roads; and
- River and stream crossings.

Upgrading of Existing Tracks and Roads

There is a well established network of largely single lane tracks within the proposed reserve area and particularly within the Emcakwini Community Trust land to the south of the river. From discussion with the initial planning team, it seems unlikely that a significant extent of new access tracks will be necessary in this area.

The existing tracks are in various states of repair. They all seem currently to be usable by 4x4 vehicles during fine weather. However on steeper sections even 4x4 vehicles experience problems. Significant repair and upgrading is therefore likely to be necessary. This may include:

- Re-grading;
- Surfacing; and
- Drainage measures including swales adjacent to steeper sections of roads.

Associated with repair and upgrading of existing tracks is likely to be the provision of a number of minor stream crossings.

New Roads

The requirement for new alignments is currently unknown, however in areas new roads and tracks may be necessary.

River and Stream Crossings

River and stream crossings include:

- Existing vehicular crossing points of minor streams; and
- The existing causeway that crosses the White Umfolozi River.

Currently all **minor stream crossings** are undertaken directly through the stream bed by 4x4 vehicle. Due to the steepness of catchments and stream beds and because of frequent and heavy thunder showers during the summer, the flow in main stream courses can increase rapidly making crossing by vehicle difficult. It is likely therefore that minor bridges will be required to address this issue. The longest span is likely to be in the order of 20 – 30m (crossing the Mpophoma stream from Babanango Valley Lodge). The majority however are likely to be significantly shorter.

The **causeway** that crosses the White Umfolozi River has been used for coordination of farming activities between the north and south banks of the river. It is currently used for the transporting of firewood from areas to the south of the river to communities that live close to the R34 to the north of the river.

The Causeway is reported to have been constructed around 1984.

The Causeway is located in an area where exposed rock provides a partial crossing. Concrete infilling and a small informal bridge constructed using railway lines have been used to make the causeway easily negotiated by vehicles.

Currently vehicles only occasionally make use of the causeway. Vehicular use has created minor erosion on the steeper northern bank. There is no obvious erosion on the flatter southern bank.

From discussion with local land managers, the causeway is flooded and unusable occasionally during the wet season. It is however only impassable for short periods that generally do not exceed 24 hours.

As can be seen from the photographic plates the causeway has been constructed between granite surfaces that form a section of the river bed.

Due to its age and the nature of construction, the causeway is visually unobtrusive. From a distance greater than 100m it can be difficult to distinguish the crossing from the rocks forming the surrounding river bed.

With the proposed reserve extending over the northern and southern banks of the White Umfolozi River, the causeway is seen as a necessary operational link.

The construction of a larger bridge has been discussed however, in order for a bridge to be crossable during all conditions, it would have to be substantial structure and significantly higher than the existing causeway. This is likely to be visually intrusive and detract from the visitor's experience of the natural landscape.

It is therefore intended to maintain and reinforce the existing causeway for ongoing use.

In terms of development the following is likely to be necessary:

1. The reinforcing of access roads either side of the causeway to prevent erosion; and
2. The rationalisation of materials and construction techniques to ensure that the causeway appears as natural as possible.

Plate 34, View over the causeway from the northern bank of the River.

Plate 35 View over the southern section of the causeway from its centre looking at the southern bank of the River

3.2.9 GAME FENCING

From discussion with Conservation Outcomes, it seems likely that game fencing will occur largely beside existing roads and tracks and where this occurs, no vegetation clearance will be required.

It is possible however that the fence line will not be able to follow existing roads in all areas. The following may be applicable:

- Over limited sections the fence line may have to deviate from existing roads and tracks. This seems likely towards the north eastern side of the boundary. In these areas particularly where fences may have to cross valley lines where woody vegetation is relatively dense, some clearing of vegetation may be required; and
- The possibility of using a suspended fence across the Mflozi River has been discussed. The idea being that the fence is constructed to swing open as water levels rise.

3.2.10 HIDES AND ABLUTION BLOCKS

It is likely that small hides for game and bird watching and ablution blocks for visitors will be required outside the main areas of development.

The hides particularly are likely to be located within sensitive areas outside current areas of disturbance.

Ablution blocks are likely to require septic tanks and soak-aways.

It is likely that these will both require environmental and Water Use License applications to be undertaken.

3.2.11 SERVICING

a. Power Supply

The proposed facility is likely to be at least partly aimed at upmarket and international visitors. This is reflected in the proposal for 5 star lodge accommodation. Due to this it is likely that expectations in terms of servicing will be high. This is likely to mean that power requirements for key areas are also likely to be relatively high.

At this stage no investigation into detailed requirements and existing capacity have been undertaken, however general options have been discussed including a preference for renewable energy where possible.

There are three obvious possibilities, including:

1. Using existing overhead supply lines to Eagle's View and Babanango Valley Lodge and extending them to service more remote areas of the reserve. Whilst visually this may not be the best alternative, it should be noted that this is how many other game reserves are serviced in South Africa. It should also be noted that a 12-15m high LV power line on timber poles quickly visually recedes into the background with distance. In critical areas it may also be possible to underground power cables.
2. The use of solar technology has been discussed. There are two potential issues associated with this:
    a. The space required to general a reliable power supply. Commercial solar farms tend to be extensive being comprised of many hectares. As a general rule of thumb, one hectare is required for each megawatt of power produced

To supply a significant portion of the power requirement from solar is therefore likely to require a large area of photovoltaic panels. This is likely to have visual implications for the development. As a guide Eskom indicate that 1MW capacity can supply around 650 average homes[3]. It seems likely therefore that a lesser capacity will be required for the entire game park; and

b. The efficiency of photovoltaic panels declines rapidly when only a small portion of a panel is in shadow. Whilst Zululand generally warm, it is considered to be a high rainfall area and is often affected by cloud. It should be noted that a recent strategic assessment that was undertaken by the Department of Environment Affairs that identified eight Renewable Energy Development Zones (REDZ)[4] throughout South Africa, did not identify one REDZ in KZN.

The use of solar on a large scale may therefore not be appropriate. It's use on a small scale to provide power for the more rustic and remote sites however may be appropriate.

3. The use of generators has been discussed briefly. Whilst modern equipment is more efficient and less noisy than older technology, substantial amounts of fuel are required if they are to be relied on for ongoing power supply. They are also likely to create low level noise in what should be a tranquil environment. The fuel for generators is considered to be a hazardous substance. Subject to the type of fuel and amounts stored it may be necessary to undertake an application under the Major Hazardous Installation Regulations. The deciding factor for this is whether the stored fuel will pose a potential risk to the health and safety of workers or the public. Should storage of dangerous goods including generator fuel exceed 80M^3, then an environmental application will also be required; and

4. The use of gas for cooking has also been discussed. Gas storage and a gas installation may also require an application under the Major Hazardous Installation Regulations. Should storage of dangerous goods including gas exceed 80M^3, then an environmental application will also be required.

b. Water Supply

No investigation into water supply has been undertaken, but the following existing supply methods are noted:

- It is understood that Eagle's Nest was supplied from Fountain Spring via a pump that was installed directly downstream of the spring;
- One of the existing bush camps was supplied from a stream that was partially dammed; and
- The citrus farm (Orange Farm) was supplied with water directly from the White Umfolozi River.

c. Sewage Treatment

Sewage treatment within the site to date has been undertaken by septic tank and soak away systems. This may be the simplest and most efficient method particularly for small scale development areas. However, it is possible that existing systems particularly in

[3] Eskom fact sheet, What is a megawatt, March 2015.

[4] Renewable Energy Development Zones, DEA Media Release, 24 February 2016

well drained soils and close to water courses, could be having an adverse impact on water quality.

The obvious alternative to septic tanks particularly where larger flows are anticipated is a package plant system. These systems, if managed correctly, are efficient and result in minimal risk of pollution.

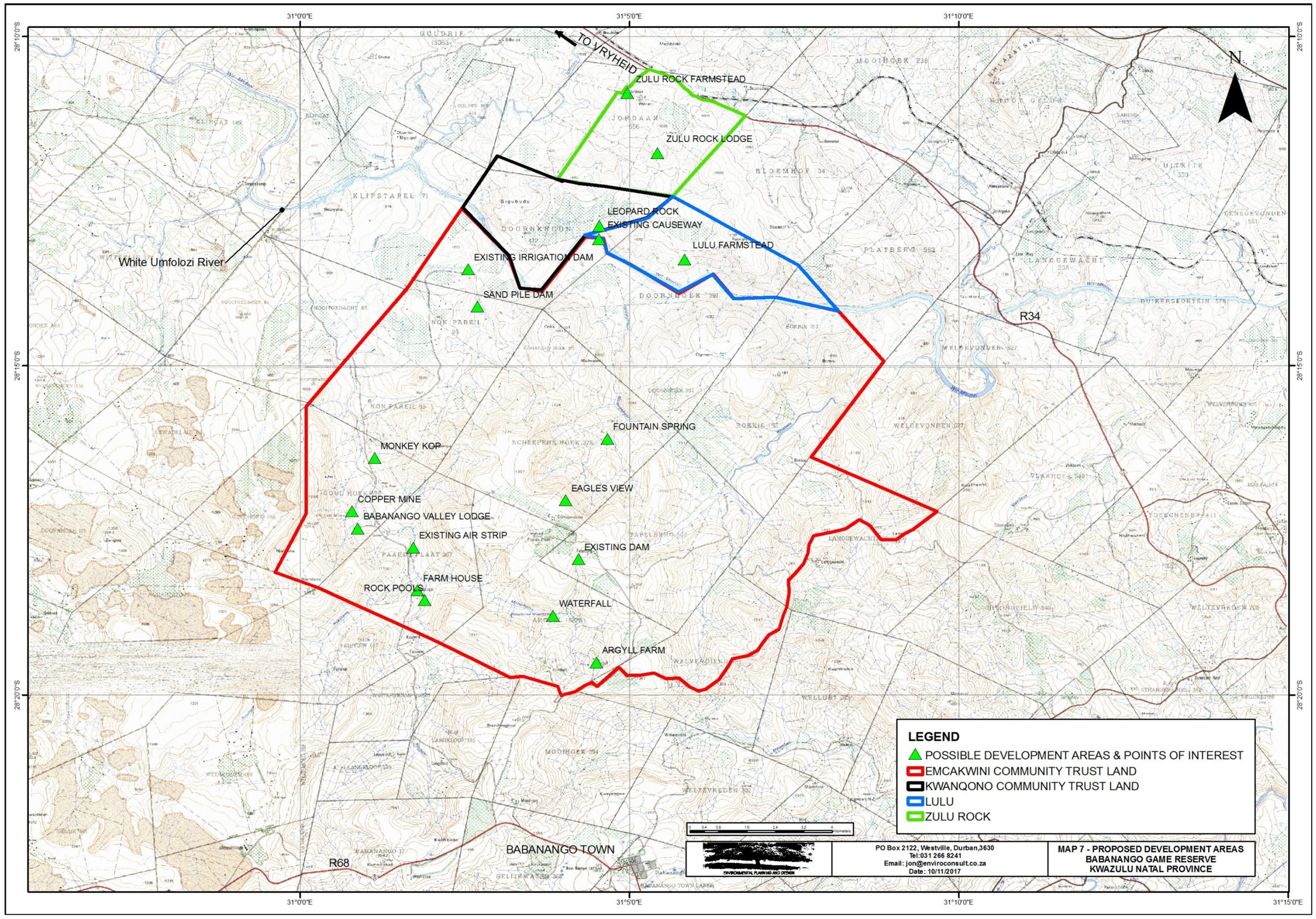
The disposal of effluent could be problematic particularly at Eagle's View where the amount of space for percolation / soak aways is limited and there is no obvious stream course.

d. Communications

Due to the topography within the site, cell phone reception is difficult in some areas. It is also likely that radio reception is also likely to be difficult.

The need for repeater stations probably on high points in the landscape to address reception shadows has been discussed briefly.

The main environmental concerns relate to possible visibility as well as clearance of vegetation for construction and maintenance access.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ZULU ROCK LODGE
LEOPARD ROCK
EXISTING CAUSEWAY
LULU FARMSTEAD
EXISTING IRRIGATION DAM
SAND PILE DAM
White Umfolozi River
R34
FOUNTAIN SPRING
MONKEY KOP
EAGLES VIEW
COPPER MINE
BABANANGO VALLEY LODGE
EXISTING AIR STRIP
EXISTING DAM
FARM HOUSE
ROCK POOLS
WATERFALL
ARGYLL FARM
BABANANGO TOWN
R68
LEGEND
POSSIBLE DEVELOPMENT AREAS & POINTS OF INTEREST
EMCAKWINI COMMUNITY TRUST LAND
KWANQONO COMMUNITY TRUST LAND
LULU
ZULU ROCK
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MAP 7 - PROPOSED DEVELOPMENT AREAS
BABANANGO GAME RESERVE
KWAZULU NATAL PROVINCE

4 LEGAL FRAMEWORK

4.1 GENERAL

There are numerous pieces of environment related legislation that might apply to the proposed development.

The list below highlights the relevance of the main applicable legislation.

LEGISLATION	RELEVANCE
Constitution of the Republic of South Africa (Act No 108 of1996	• Bill of Rights (S2) • Environmental Rights (S24) – the right to an environment which is not harmful to health and well-being • Right to freedom of movement and residence (S22) • Property rights (S25) • Access to Information (S32) • Right to just administrative action (S33) • Recognition of international agreements (S231)
National Environmental Management Act (Act No 107 of 1998)	• National environmental principles (S2), providing strategic environmental management goals and objectives of the government applicable throughout the Republic to the actions of all organs of state that may significantly affect the environment • NEMA EIA Regulations (GN R324 – R327 of 7 April 2017) published in terms of Chapter 5 of the NEMA • Public Participation (S2) • The requirement for potential impact on the environment of listed activities must be considered, investigated, assessed and reported on to the competent authority (S24 – Environmental Authorisation) • Duty of Care (S28) requiring that reasonable measures are taken to prevent pollution or degradation from occurring, continuing or recurring, or , where this is not possible, to minimise & rectify pollution or degradation of the environment • Procedures to be followed in the event of an emergency incident which may impact on the environment (S30) • Appeals against decisions made by authorities (S43)
National Environmental Management: Protected Areas Act (Act No 57 of 2003)	• Declaration of nature reserve (S23)
National Heritage Resources Act (Act No 25 of 1999)	• Stipulates assessment criteria and categories of heritage resources according to their significance (S7) • Provides for the protection of all archaeological and palaeontological sites , and meteorites (S35) • Provides for the conservation and care of cemeteries and graves • by SAHRA where this is not the responsibility of any other authority (S36) • Lists activities which requires developers to notify the responsible heritage resources authority, and furnish it with details, regarding the location, nature, and extent of the proposed development (S38) • Requires the compilation of a Conservation Management Plan as well as a permit from the heritage authorities for the presentation of archaeological sites as part of tourism attraction (S44)
National Environmental Management: Biodiversity Act	• Lists of Threatened and protected species published in terms of S 56(1) – Government Gazette 29657

(Act 10 of 2004)	• Three government notices have been published regarding threatened and protected species. i.e. GN R150 (Commencement of Threatened and Protected Species Regulations, 2007). GN R151 (Lists of critically endangered, vulnerable and protected species) and GN R152 (Threatened or Protected Species Regulations). • A national list of ecosystems that are threatened and in need of protection (9 December 2011). The relevance of this is that the list needs to be read with regulation 30 of listing notice 1 of the EIA regulations in effect making a Basic Assessment a requirement for development within any of the listed ecosystems. • Permit applications for transporting listed alien weed species required by the Alien and Invasive Species Regulations.
Conservation of Agricultural Resources Act (Act No 43 of 1983)	• Prohibition of the spreading of weeds (S5) • Classification of categories of weeds & invader plants (Regulation 15 of GN R1048) & restrictions in terms of where these species may occur • Requirement & methods to implement control measures for alien and invasive plant species (Regulation 15E of GN R1048) • Soil protection/conservation, and erosion control
National Water Act (Act No 36 of 1998)	• National Government is the public trustee of the Nation's water resources (S3) • Entitlement to use water (S4) – entitles a person to use water in or from a water resource for purposes such as reasonable domestic use, domestic gardening, animal watering, fire fighting and recreational use, as set out is Schedule 1 • Duty of Care to prevent and remedy the effects of pollution on water resources (S19) • Procedures to be followed in the event of an emergency incident which may impact on a water resource (S20) Definition of water use (S21) • Requirements for registration of water use (S26 and S34) • Definition of offences in terms of the Act (S151)
National Environmental Management: Waste Act (Act No 59 of 2008)	• Waste management measures • GN 921 Regulations and schedules (Schedules A, B & C) • Listed activities requiring waste licences • Waste disposal practices (S20) • Contamination
National Forest Act (Act No 84 of 1998)	• Protected Trees • Conservation of Forests
KwaZulu-Natal Nature Conservation Ordinance (No. 15 of 1974) as amended	• Protected Species specific to KZN • Activities, permitting relevant to protected areas in KZN.
KwaZulu-Natal Heritage Act (No 4 of 2008)	• Establishment of Amafa / Heritage KwaZulu Natali is the provincial heritage conservation agency for KwaZulu Natal. Amafa. The Council of Amafa administers the permit process for demolition and alteration of protected structures in KZN.
Major Hazardous Installation Regulations (GNR 692 of 30th July 2001)	• Defines requirements for storage of hazardous material that has potential to pose a risk to the health and safety of an employee or the public.

As indicated above there are numerous pieces of legislation that are likely to apply to the proposed development of the game park.

Whilst the project is motivated by conservation and maintaining / improving biodiversity, the site is highly sensitive and regulations will be strictly enforced. Having said that

however, the involvement of Ezemvelo KZN Wildlife and recognised professional bodies such as Conservation Outcomes, should ensure that the correct development decisions are made which should make the authorisation process more straight forward.

4.2 KEY LEGISLATION

There are three main regulatory hurdles that need to be overcome before development can begin, including:

1. The declaration of the site as a nature reserve;
2. Environmental Authorisations; and
3. Water Use Licenses.

The declaration of the site as a Nature Reserve under the National Environmental Management: Protected Areas Act (Act No 57 of 2003). From discussion with Conservation Outcomes, it is understood that, in terms of the biodiversity stewardship process, management plan for the reserve needs to be prepared and legal agreements need to be prepared and finalised. This could happen relatively quickly. It is conceivable to have the reserve declared as a nature reserve by the middle or end of 2018. This is somewhat dependant on the Trust obtaining the promised government grant in order to initiate fencing and road upgrades.

Environmental authorisations under the National Environmental Management Act (Act No 107 of 1998) will be required. EIA regulations are promulgated and updated from time to time under this Act. The latest update occurred in April 2017. It is possible however, that prior to development these may be updated again and so a regular check with requirements is recommended.

Currently there are three listing notices that detail trigger activities that require authorisation. Subject to the activity triggered either a Basic Assessment (BA) or a Scoping and Environmental Impact Assessment (S&EIA) may be required. The difference being that a BA is a single submission process whereas the S&EIA requires submission of a Scoping Report for approval by the Competent Authority, if and when that is gained an Environmental Impact Assessment based on methodology contained in the SR can be commenced for submission to the Competent Authority for authorisation.

GN 327 of 2017 (Listing Notice 1) lists activities that require environmental authorisation for which a **Basic Environmental Assessment** is required.

GN 325 of 2017 (Listing Notice 2) lists activities that require environmental authorisation for which an **Environmental Impact Assessment (EIA)**, including Scoping and Impact Assessment phases, is required.

GN 324 of 2017 (Listing Notice 3) lists activities that require environmental authorisation activity in specific identified geographical areas only for which a **Basic Environmental Assessment** is required.

Typically where an application has implications outside a single province, where it occurs below the high water mark of the sea or where a project is deemed to have national significance then the Competent Authority is the National Department of Environmental Affairs. Where a proposed project only has implications within a single province then the relevant provincial department is the Competent Authority. In the case of KwaZulu Natal the Competent Authority is the KZN Department of Economic Development, Tourism and

Environmental Affairs (EDTEA). It is likely that any environmental application on this project will be to the EDTEA.

As backup to any environmental application, detailed specialist studies are normally required. These studies are undertaken by experts in their field to address environmental concerns raised during discussions with the Competent Authority, during the public participation process and from the Environmental Assessment practitioner's experience.

In addition these studies have to address any other applicable environmental legislation such as the National Heritage Act. It is likely that the Competent Authority will require confirmation from the relevant departments, that all requirements of other environmental legislation have been met before they will consider an application.

Water Use Licence Applications (WULA) in terms of Section 21 of the National Water Act (Act 36 of 1998) (NWA) will be required.

A water use license is a legal document issued by the Department of Water and Sanitation (DWS). It entitles a water user to utilise water in accordance with the requirements of the NWA and conditions specified within the license.

The maximum period that a water use license may be issued for is 40 years. The NWA requires that every license issued must be reviewed at least every five years.

Water use activities which require a license have been specified in section 21 of the NWA and include the following:

a. Taking water from a resource, such as from a stream, river, estuary, wetland or aquifer;
b. Storing water , such as a dam
c. Impeding or diverting the flow of water, for example when the flow of a river is changed during the building of bridges or roads;
d. Stream flow reduction activities, which currently only apply to forestry activities
e. Controlled activities, such as irrigation with wastewater;
f. Discharging waste water directly into a water resource;
g. Disposal of waste water into dams or ponds or land based disposal facilities such as waste sites, slimes dams etc.;
h. Disposal of water which contains waste or has been heated from any industrial or power generation activity;
i. Altering the bed, banks or course of a water course, for example when a water course is turned into a canal, or sand mined from the beds etc.;
j. Removal of underground water for activities such as mining; and
k. Recreation, such as water sports like boating, swimming etc.

Whilst the trigger activities listed above are specific, the DWS requires applications for activities 21C and 21I for any development within 500m of a water course which includes wetland areas. This in effect means that an application is likely to be required for any development within the site area.

The following trigger activities have been identified as likely to be relevant to the various areas of possible development.

DEVELOPMENT ON EMCAKWINI COMMUNITY TRUST LAND		
SITE	**POSSIBLE NEMA EIA TRIGGERS**	**POSSIBLE NWA WULA TRIGGERS**
EAGLE'S VIEW	**Listing Notice 3 trigger 6**, Lodge for more than 15 people **Listing Notice 1 trigger 30**, Activities within listed habitat area. **Listing Notice 1 trigger 25**, Facilities for the treatment of sewage exceeding 2000l per day.	Sections 21 A,B, C & I Possible Section 21 F discharging waste water
SAND PILE	**Listing notice 1 trigger 12**, development within 32m watercourse. **Listing Notice 3 trigger 6**, Lodge for more than 15 people **Listing Notice 3 trigger 12**, Clearing of more than 300m2 of indigenous vegetation.	Possibly section 21 B and sections 21 C & I
VALLEY LODGE	**Listing Notice 3 trigger 6**, (Lodge for more than 15 people) It should be possible to motivate that this doesn't apply as is existing lodge as long as is within existing footprint **Listing Notice 1 trigger 25**, Facilities for the treatment of sewage exceeding 2000l per day.	Sections 21 C & I Possible(f) discharging waste water It may be possible to motivate that this doesn't apply as is existing lodge as long as is within existing footprint
ROCK POOLS	**Listing Notice 3 trigger 6**, Lodge for more than 15 people **Listing notice 1 trigger 12**, development within 32m watercourse. It could be possible to motivate that these do not apply as is existing as long as is within existing footprint	Sections 21 C & I Possible(f) discharging waste water It may be possible to motivate that this doesn't apply as is existing lodge as long as is within existing footprint although the effluent disposal method is a potential problem as septic tanks are close to stream bank.
FARM HOUSE If all work is contained within existing structures, it is likely that application processes can be simplified.	**Listing Notice 3 trigger 6**, Lodge for more than 15 people **Listing Notice 1 trigger 25**, Facilities for the treatment of effluent exceeding 2000l per day.	Sections 21 C & I Possible Section 21 F discharging waste water
ARGYLL FARM	**Listing Notice 1 trigger 14**, Storage of a dangerous good with combined capacity of 80m^3 or more but less than 500m^3. **Listing Notice 1 trigger 30**, Activities within listed habitat area	Sections 21,C & I Possible Section 21 F discharging waste water

DEVELOPMENT ON EMCAKWINI COMMUNITY TRUST LAND		
SITE	**POSSIBLE NEMA EIA TRIGGERS**	**POSSIBLE NWA WULA TRIGGERS**
	Listing Notice 1 trigger 25, Facilities for the treatment of sewage exceeding 2000l per day.	

DEVELOPMENT ON KWANQONO COMMUNITY TRUST LAND		
SITE	**POSSIBLE NEMA EIA TRIGGERS**	**POSSIBLE NWA WULA TRIGGERS**
LEOPARD ROCK	**Listing Notice 1 trigger 25**, Facilities for the treatment of sewage exceeding 2000l per day. **Listing Notice 3 trigger 6**, Lodge for more than 15 people	Sections 21 A,B, C & I Possible Section 21 F discharging waste water

DEVELOPMENT ON ZULU ROCK		
SITE	**POSSIBLE NEMA EIA TRIGGERS**	**POSSIBLE NWA WULA TRIGGERS**
FARMSTEAD / RESERVE SERVICE CENTRE	**Listing Notice 1 trigger 14**, Storage of a dangerous good with combined capacity of 80m^3 or more but less than 500m^3. **Listing Notice 1 trigger 25**, Facilities for the treatment of sewage exceeding 2000l per day. **Listing Notice 3 trigger 12**, Clearing of more than 300m^2 of indigenous vegetation.	Possible Section 21 F, G or H discharging waste water
ZULU ROCK LODGE / RESERVE RECEPTION AREA	**Listing Notice 1 trigger 24**, a road with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres. **L Listing Notice 1 trigger 25**, Facilities for the treatment of effluent exceeding 2000l per day. **Listing Notice 1 trigger 27**, clearing of more than 1ha of indigenous vegetation. **Listing Notice 3 trigger 4,** development of a road wider than 4 metres with a reserve less than 13,5 metres.	Possible Section 21 F, G or H discharging waste water

DEVELOPMENT ON LULU		
SITE	**POSSIBLE NEMA EIA TRIGGERS**	**POSSIBLE NWA WULA TRIGGERS**
LULY FARMSTEAD / HOUSE AND POSSIBLE LODGE	**Listing Notice 1 trigger 14**, Storage of a dangerous good with combined capacity of 80m^3 or more but less than 500m^3. **Listing Notice 1 trigger 25**,	Possible Section 21 F, G or H discharging waste water

DEVELOPMENT ON LULU		
SITE	**POSSIBLE NEMA EIA TRIGGERS**	**POSSIBLE NWA WULA TRIGGERS**
	Facilities for the treatment of sewage exceeding 2000l per day.	

DEVELOPMENT COMMON TO ALL PROPERTIES		
SITE	**POSSIBLE NEMA EIA TRIGGERS**	**POSSIBLE NWA WULA TRIGGERS**
ROAD UPGRADE	**Listing notice 1 trigger 12**, development within 32m watercourse **Listing Notice 1 trigger 27**, clearing of more than 1ha of indigenous vegetation. **Listing Notice 1 trigger 30**, Activities within listed habitat area **Listing Notice 3 trigger 12**, Clearing of more than 300m^2 of indigenous vegetation.	Sections 21 C & I
NEW ROAD DEVELOPMENT	**Listing notice 1 trigger 12**, development within 32m watercourse. **Listing Notice 1 trigger 24**, a road with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres. **Listing Notice 1 trigger 27**, clearing of more than 1ha of indigenous vegetation. **Listing Notice 1 trigger 30**, Activities within listed habitat area **Listing Notice 3 trigger 4,** development of a road wider than 4 metres with a reserve less than 13,5 metres. **Listing Notice 3 trigger 12**, Clearing of more than 300m^2 of indigenous vegetation.	Sections 21 C & I
INFRASTRUCTURE, GAME FENCING	**Listing notice 1 trigger 12**, development within 32m watercourse **Listing Notice 1 trigger 27**, clearing of more than 1ha of indigenous vegetation. **Listing Notice 1 trigger 30**, Activities within listed habitat area **Listing Notice 3 trigger 12**, Clearing of more than 300m^2 of	Sections 21 C & I

DEVELOPMENT COMMON TO ALL PROPERTIES		
SITE	**POSSIBLE NEMA EIA TRIGGERS**	**POSSIBLE NWA WULA TRIGGERS**
	indigenous vegetation.	
INFRASTRUCTURE, RIVER AND STREAM CROSSINGS	**Listing notice 1 trigger 12**, development within 32m watercourse or within a water course. **Listing notice 1 trigger 19**, Infilling or removal of material within a water course in excess of $10m^3$ **Listing Notice 1 trigger 30**, Activities within listed habitat area.	Sections 21 C & I
INFRASTRUCTURE, SOLAR PANELS 1Ha PER MW	**Listing notice 1 trigger 12**, development within 32m watercourse **Listing Notice 1 trigger 27**, clearing of more than 1ha of indigenous vegetation. **Listing Notice 1 trigger 30**, Activities within listed habitat area **Listing Notice 3 trigger 12**, Clearing of more than $300m^2$ of indigenous vegetation.	Sections 21 C & I
INFRASTRUCTURE, FUEL STORAGE FOR GENERATOR USAGE	**Listing notice 1 trigger 14**, storage of a dangerous good in excess of $80m^3$.	
WATER, BOREHOLES / ABSTRACTION FROM WATER COURSE		Section 21 A application for taking water from a water source. Sections 21 C & I also for abstraction
WATER, STORAGE	**Listing notice 1 trigger 12**, development of dams and weirs (iv and v respectively) **Listing notice 1 trigger 13**, development of off stream storage facilities with a combined capacity of $50,000m^3$ or more.	Sections 21 B, C & I

5 THE WAY FORWARD

5.1 NATURE RESERVE STATUS

The declaration of nature reserve status needs to be the initial focus as if this doesn't happen then subsequent applications for development will not occur.

Application papers need to include a reserve management plan. An indication of the proposed nature and areas of development should be included in this plan in order to provide the authorities with confidence that development will not adversely affect the main objective of conservation as well as the ability to help define relevant management measures. To this end feasibility planning needs to be advanced.

The need for game fencing and the upgrade and maintenance of tracks as been noted as a requirement. Whilst this will help provide protection to the area and provide a barrier for game, it will not necessarily stop illegal poaching and other uses by the local communities. The Trust are aware of the issue and intend to approach it proactively with adjacent people, however in addition to consultation and providing a means for the delivery of lost services, strict security will also be required.

From discussion with Conservation Outcomes (CO), it seems possible that fencing and track upgrades may be possible without an environmental application or WULA. This will however be subject to the extent of clearance that is necessary as well as the nature of river and stream crossings. It is recommended that planning for this operation is progressed and implications in terms of vegetation clearance and cutting is assessed following which discussions are undertaken with the relevant authorities in order to clarify and obtain written confirmation that an application is not required.

If an application is required the key specialist studies are likely to include;

- A detailed vegetation assessment.
- A heritage impact assessment
- A wetland delineation and functional assessment.

The range land assessment, stocking plan and management plan that will be prepared by CO will be necessary to include with the application as background justification for the proposed development.

There is normally a need to obtain a release from agricultural use from the Department of Agriculture for all agricultural land that is proposed for any other use. This normally takes the form of a motivation together with an assessment of agricultural potential. From discussion with CO, it is understood that this will be part of the process for the declaration as a nature reserve.

5.2 ENVIRONMENTAL APPLICATIONS FOR DEVELOPMENT WITHIN THE NATURE RESERVE

There are two ways to approach applications for development within the reserve:

1. Break the applications down into individual development areas; and
2. Lump development areas together into a limited number or single application.

The first alternative has the benefit of minimising risk associated with possible delay in obtaining information or possible sticking points in the assessment associated with

consultation or related authorisations. It also possibly has a benefit in terms of cash flow budgeting for fees.

The second alternative possibly has a benefit in terms of overall fee costs.

The rule in terms of an application process is to ensure that the project that is applied for can stand alone and operate for its intended use. A project area therefore cannot usually be broken down into separate applications although recently Competent Authorities have been accepting separate applications for infrastructure associated with development of projects such as wind and solar farms.

In terms of the necessary level of application, from the review it appears that all likely development areas will require a Basic Assessment.

Once nature reserve status has been achieved, it is likely that the anchor development areas including Eagle's View and Babanango Valley Lodge should be self sustaining operations. Assessment processes might therefore be undertaken independently. These should probably be the first applications to be prepared as they will be the main attractors for the reserve.

Should it be decided that the access to the north western corner and service area at Orange Farm be required this is also likely to be a key development area.

Secondary attractions such as Poacher's Camp may be dependent on having a nucleus of visitors on site that are attracted to the anchor developments. These applications for the smaller development areas should therefore maybe follow initial applications.

In terms of specialist requirements, all environmental applications for development within the reserve are likely to require the following:

a. A Heritage Impact Assessment;
b. A botanical impact assessment;
c. A fauna impact assessment including amphibians;
d. A social impact assessment;
e. A traffic impact assessment;
f. A geotechnical assessment;
g. A wetland delineation and functional assessment;
h. A visual impact assessment (possibly only for major development areas).

Development areas close to water courses including bridge crossings are also likely to require a flood line assessment.

The social impact assessment and traffic impact assessment will need to take in a wider context and should perhaps be undertaken for the reserve as a whole identifying contributions made by each individual development area.

Other reports whilst needing to also take in the context are likely to be more focused on each development area.

The range land and carrying capacity assessment that is being undertaken by CO as well as the background consultation that is ongoing between the Trust and neighbouring communities will need to form a backdrop for all the applications in order that the

Competent Authority have a clear understanding regarding the long term sustainability of the reserve.

In terms of timing, the official time period for undertaking a BAR is 197 days which has a possible 50 day extension and an additional 90 day appeal period. In reality however, it is impossible to undertake all necessary work within this period. The way that most applications therefore are arranged is that substantive consultation and all specialist work is undertaken ahead of entering the legislated process. This ensures that there are no surprises that could extend the necessary timeframe as if this should occur, the Competent Authority will automatically reject an application. The applicant then has to recommence an application.

It is therefore advisable to have undertaken all necessary specialist work, consulted with key stakeholders and to enter the formal process with a draft Basic Assessment Report. As a general guideline, a minimum of 12 months should be allowed for the Basic Assessment process to authorisation or rejection. A further 90 days is necessary for the appeal period.

5.3 WATER USE LICENSING

The following six stage process in undertaking a Water Use License Application (WULA) has been extracted from the Department of Water and Sanitation's (DWS) web site[5] :

- **Step 1 - Pre-Application process**:
  This is done when your licence application is received, and is used to check if everything needed to process the licence is available. You will be asked to provide missing information, and may get initial feedback before you pay your application fee (R 114.00) - so you can decide whether to continue.
- **Step 2 - Application Initiation:**
  This is where the Department determines the information required to compile a water use licence application technical report to support the application. The determination of information requirements will be based on the information contained on the form or the site inspection, if required.
- **Step 3 - Screening:**
  This is the screening of the Technical Report and the acceptance or rejection thereof.
- **Step 4 - Processing and Finalising:**
  This includes the assessment of the Technical Report where the information is evaluated by specialist groups, and recommendation to the Delegated Authority for a decision.
- **Step 5 - Decision by the Delegated Authority:**
  After considering all the relevant information, the Delegated Authority will make a decision on whether to approve the application.
- **Step 6 - Implementation:**
  The Regional Office starts with the implementation of the licence, including issuance and highlighting any conditions that might be attached to the water use licence.

The WULA process is intended to run in parallel with the EIA process. Often the same information is required for both processes with the exception that a Geohydrological

[5] http://164.151.129.107/ewulaas/WUL.aspx

impact assessment is usually required for a WULA and is generally not required for an environmental application.

The DWS state that an application for a water use licence can take up to 300 days to process, depending on the complexity of the application, its benefits, and its possible impacts. They say that generally, low impact, high value licence applications will be processed quicker. Applicants may be requested, at any stage, to provide more information, to advertise the proposed water use, or to invite interested and affected parties to comment.

In reality however and mainly due to lack of capacity at the DWS the process is often longer. Because of this it is maybe advisable to commence with a WULA in advance of a Basic Assessment.

It is possible that authorisation might be achieved through a general authorisation (GA) which is an authorisation to use water without a licence, provided that the water use is within certain limits and complies with conditions set out in the Gazetted General Authorisation. This authorisation requires a registration with the Department prior to exercising the water use(s). This can considerably reduce time requirements.

The current GA enables owners and legal occupiers of land to undertake water usage as long as it falls within a low risk category. In order to be granted GA status for a project, a detailed risk assessment needs to be undertaken by a relevant specialist for submission and discussion with the DWS. Such a risk assessment should probably be the starting point for each WULA that is required.

5.4 APPROXIMATE ENVIRONMENTAL ASSESSMENT COSTS

It is assumed that any assessment requirements associated with game fencing, initial infrastructure and stocking associated with the establishment of the nature reserve are undertaken by others.

This is an outline costing intended to provide an order of cost for environmental applications that are likely to be required for the development areas discussed in the report.

5.4.1 SPECIALIST STUDIES

Each environmental application will need to be supported by a number of specialist assessments. The nature of specialist input is likely to be similar for each application. It will probably include two levels of assessment including;

- Strategic reserve level assessments; and
- Site specific assessments that are specific to the area of development in question.

Strategic reserve level assessments are those where the overall impact of the development is critical. These assessments are likely to include;

1. **Traffic Impact Assessment** where the impact on external roads is likely to be the critical item. This will dictate necessary road upgrades for the roads authority. The assessment must also indicate the contributory level of impact associated with each development area.

2. **Social Impact Assessment** which will indicate social costs and benefits. It will need to be based on a thorough community survey, identify negative impacts such as the loss of grazing and areas for firewood collection, highlight possible mitigation measures which could include the identification of other possible land for these activities as well as the social benefits that the development could open up. The contributory impact of each section of the proposed development should be documented in order that they can be stated in each environmental application.
3. **Economic Impact Assessment** which will assess economic costs and benefits of the proposed game reserve.
4. **Servicing report** which will be needed to indicate the servicing method for each section of proposed development. The report will need to highlight how servicing impacts will be minimised on the reserve as a whole whilst providing the means necessary to run each section of development efficiently. The report needs to cover sewage disposal, electricity supply, water supply and communications. It also needs to indicate anticipated levels of service as well prove capacity in sufficient detail to provide the authorities with confidence that the development is feasible.

These reports should be once off costs, however, if development areas or the nature of proposed developments should change, they may require updating from time to time.

Likely Orders of Cost include;

SPECIALIST STUDY	ORDER OF COST
TRAFFIC IMPACT ASSESSMENT	R40,000.00
SOCIO ECONOMIC IMPACT ASSESSMENT	R350,000.00
SERVICING REPORT	Included in Bosch Projects appointment
GEOTECHNICAL OVERVIEW REPORT	R52,000.00

Site specific reports will also need to provide context, however, they need to be more focused on the detail of the site in question. They are likely to include;

1. **A Vegetation assessment** which will need to provide a reasonably detailed survey of vegetation for each site, indicate the species that will be affected, detail possible mitigation measures and list protected species for which additional authorisation for removal, transplanting or pruning will be required.
2. **A faunal assessment** which will need to highlight the impacts of each development on habitat areas. It is possible that Conservation Outcomes survey work might be extended to cover this item.
3. **A wetland delineation and functional assessment** may be required for any wetland area that potentially could be affected by a development. Typically a WULA application requires assessment of any wetland within 500m of a proposed development. This requirement can be relaxed however through the use of a risk assessment as long as the risk can be proven to be low. Whichever approach is applicable, information used in the WULA should also be presented in the environmental application.
4. **A geo-hydrological assessment** indicating potential risks to ground water resources may also be required for any development for a WULA. As in 3 however, this requirement may be relaxed through the use of a risk assessment

as long as the risk can be proven to be low. Whichever approach is applicable, information used in the WULA should also be presented in the environmental application.

5. **A flood line assessment** will be required for development that is located close to water courses. This is likely to include; bridges, fences across water courses, and the Rock Pools. In accordance with the Water Act (Act 36 of 1998), the 1:100 year floodline must be indicated on township layout plans in order that affected parties are aware of flooding risks. In practice the authorities usually require floodlines to be indicated on all development plans where there is a perceived risk of flooding in order that they can satisfy themselves of risks associated with possible blockage of floodwater on upstream properties and to ensure that all measures are in place to ensure that a development is sustainable.
6. **A visual impact assessment** is likely to be required for the larger development proposals that have the potential to compromise the natural setting. Visual impact assessments are usually undertaken in accordance with a set of guidelines that have been produced by the Western Cape Provincial Government. Visual impact assessments can be undertaken at four levels ranging from a site visit and opinion (level 1) to a detailed assessment and realistic simulations (level 4).
7. **A geotechnical overview** is likely to be required for each site with sufficient detail to ensure that there are no major geotechnical issues associated with proposed development and to ensure that all necessary measures are taken into account.
8. **A Heritage Impact Assessment** is likely to be required at least for the more major areas of development. The likely triggers under the National Heritage Act (Act 25 of 1999) include:
    a. Developments exceeding 5000m2; and
    b. Developments involving three or more existing erven or subdivisions thereof which have been consolidated in the past five years.

    The applicability of the latter trigger will be subject to the authority's interpretation. It may be seen that each development is a part of a larger overall development in which case trigger b will apply for all development areas. If this is not the case then only trigger a will apply probably for the larger development areas. Key concerns are likely to include:
    - Existing grave sites;
    - The remains of old stone structures including walls and buildings that are evident at various locations some of which are likely to date from the first quarter of the 20th century when the copper / gold mine was active on site;
    - Areas that are important to the traditional inhabitants and their ancestors;
    - Other known heritage artefacts and items including Stone Age finds that indicate there could be other sites of interest within the proposed reserve.
9. **A rehabilitation plan** is likely to be needed for each proposed development area.
10. **A risk assessment** is likely to be required if more than 80m^3 hazardous goods are stored on any site. Should an application be required under the Major Hazardous Installation regulations then it is likely that the risk assessment used for that application can also be used for the environmental application. This is most likely to apply to Eagle's View and Valley Lodge where there are likely to be catering facilities and Argyll Farm where fuel may be stored for reserve vehicles.

A guide to orders of cost of specialist studies for smaller and simpler projects and larger more complex projects is indicated below.

Specialist Study	Simple Project Order of Cost	Complex Project Order of Cost
Vegetation assessment	R15,000.00	R35,000.00
Faunal assessment	R15,000.00	R35,000.00
Wetland delineation and functional assessment	R30,000.00	R40,000.00
Geo-hydrological assessment	R35,000.00	R35,000.00
Flood line assessment	R24,000.00	R24,000.00
Visual impact assessment	R15,000.00	R40,000.00
Heritage Impact Assessment	R10,000.00	R35,000.00
Rehabilitation plan	R10,000.00	R20,000.00

These orders of cost have been applied in the tables below to the various development sites that have been identified on each section of the proposed overall site.

a) POSSIBLE DEVELOPMENT ON EMCAKWINI COMMUNITY TRUST LAND

SITE	LIKELY SPECIALIST STUDIES REQUIRES	ORDERS OF COST
EAGLE'S VIEW Assuming that less than 80m^3 of hazardous goods will be required to be stored	Vegetation assessment Faunal assessment Wetland delineation and functional assessment Geo-hydrological assessment Visual impact assessment Heritage Impact Assessment Rehabilitation plan	R15,000.00 R15,000.00 R10,000.00 R35,000.00 R40,000.00 R10,000.00 R10,000.00
TOTAL EAGLE'S VIEW SPECIALIST STUDIES		**R135,000.00**
SAND PILE	Vegetation assessment Faunal assessment Wetland delineation and functional assessment Geo-hydrological assessment Floodline assessment Heritage Impact Assessment Rehabilitation plan	R25,000.00 R25,000.00 R30,000.00 R35,000.00 R24,000.00 R10,000.00 R10,000.00
TOTAL SAND PILE SPECIALIST STUDIES		**R159,000.00**
VALLEY LODGE	Vegetation assessment Faunal assessment Wetland delineation and functional assessment Geo-hydrological assessment Visual impact assessment Heritage Impact Assessment Rehabilitation plan	R25,000.00 R15,000.00 R30,000.00 R35,000.00 R25,000.00 R25,000.00 R10,000.00
TOTAL VALLEY LODGE SPECIALIST STUDIES		**R165,000.00**
ROCK POOLS	Vegetation assessment Faunal assessment Wetland delineation and functional assessment	R25,000.00 R15,000.00 R30,000.00

SITE	LIKELY SPECIALIST STUDIES REQUIRES	ORDERS OF COST
	Geo-hydrological assessment Floodline assessment Heritage Impact Assessment Rehabilitation plan	R35,000.00 R24,000.00 R10,000.00 R10,000.00
TOTAL ROCK POOLS SPECIALIST STUDIES		**R149,000.00**
FARM HOUSE Assuming additional structures will be developed. If only within existing structures only a heritage impact assessment is likely to be necessary.	Vegetation assessment Faunal Assessment Wetland delineation and functional assessment Geo-hydrological assessment Heritage Impact Assessment Rehabilitation plan	R10,000.00 R10,000.00 R20,000.00 R35,000.00 R10,000.00 R10,000.00
TOTAL FARM HOUSE SPECIALIST STUDIES		R95,000.00
ARGYLL FARM Assuming that more than 80m^3 of hazardous goods will be required to be stored and that housing development for staff will extend outside the existing development footprint.	Vegetation assessment Faunal assessment Wetland delineation and functional assessment Geo-hydrological assessment Visual impact assessment Heritage Impact Assessment Rehabilitation plan Risk assessment and emergency response plan	R35,000.00 R15,000.00 R5,000.00 R5,000.00 R15,000.00 R10,000.00 R10,000.00 R100,000.00
TOTAL ARGYLL FARM SPECIALIST STUDIES		**R185,000.00**
FOUNTAIN SPRINGS	Vegetation assessment Faunal assessment Wetland delineation and functional assessment Geo-hydrological assessment Floodline assessment Heritage Impact Assessment Rehabilitation plan	R35,000.00 R35,000.00 R30,000.00 R35,000.00 R24,000.00 R10,000.00 R10,000.00
		R179,000.00
ANCILLARY FACILITIES The estimate assumes that a single application will be undertaken for all hides and ablution blocks located outside the main areas of development.	Vegetation assessment Faunal assessment Wetland delineation and functional assessment Geo-hydrological assessment Heritage Impact Assessment Rehabilitation plan	R35,000.00 R35,000.00 R35,000.00 R35,000.00 R5,000.00 R10,000.00
		R155,000.00

b) POSSIBLE DEVELOPMENT ON KWANQONO COMMUNITY TRUST LAND

SITE	LIKELY SPECIALIST STUDIES REQUIRES	ORDERS OF COST
LEOPARD ROCK Assuming that less than 80m^3 of hazardous goods will be required to be stored	Vegetation assessment Faunal assessment Wetland delineation and functional assessment Geo-hydrological assessment Visual impact assessment	R35,000.00 R25,000.00 R10,000.00 R35,000.00 R40,000.00

SITE	LIKELY SPECIALIST STUDIES REQUIRES	ORDERS OF COST
	Heritage Impact Assessment Rehabilitation plan	R10,000.00 R10,000.00
TOTAL LEOPARD ROCK SPECIALIST STUDIES		**R165,000.00**

c) POSSIBLE DEVELOPMENT ON ZULU ROCK LAND

SITE	LIKELY SPECIALIST STUDIES REQUIRES	ORDERS OF COST
ZULU ROCK FARMSTEAD / SERVICE CENTRE Assuming that more than $80m^3$ of hazardous goods will be required to be stored and that housing development for staff will extend only within the existing disturbed area.	Vegetation assessment Faunal assessment Wetland delineation and functional assessment Geo-hydrological assessment Heritage Impact Assessment Rehabilitation plan Risk assessment and emergency response plan	R15,000.00 R15,000.00 R5,000.00 R5,000.00 R10,000.00 R10,000.00 R100,000.00
TOTAL ZULU ROCK FARMSTEAD SPECIALIST STUDIES		**R160,000.00**
ZULU ROCK LODGE / RECEPTION CENTRE Assuming that less than $80m^3$ of hazardous goods will be required to be stored	Vegetation assessment Faunal assessment Wetland delineation and functional assessment Geo-hydrological assessment Visual impact assessment Heritage Impact Assessment Rehabilitation plan	R35,000.00 R25,000.00 R10,000.00 R35,000.00 R40,000.00 R10,000.00 R10,000.00
TOTAL ZULU ROCK RECEPTION CENTRE SPECIALIST STUDIES		**R165,000.00**

d) POSSIBLE DEVELOPMENT ON LULU LAND

SITE	LIKELY SPECIALIST STUDIES REQUIRES	ORDERS OF COST
LULU HOUSE AND LODGE Assuming that less than $80m^3$ of hazardous goods will be required to be stored	Vegetation assessment Faunal assessment Wetland delineation and functional assessment Geo-hydrological assessment Visual impact assessment Heritage Impact Assessment Rehabilitation plan	R15,000.00 R15,000.00 R10,000.00 R35,000.00 R40,000.00 R10,000.00 R10,000.00
TOTAL ZULU ROCK FARMSTEAD SPECIALIST STUDIES		**R160,000.00**

e) ACCESS ROUTES AND STREAM / RIVER CROSSINGS

The extent and nature of this area of work has not been considered in any detail, however, it is known that certain items of work will be required to either formalise existing facilities and to develop new alignments.

SITE	LIKELY SPECIALIST STUDIES REQUIRES	ORDERS OF COST
EXITING CAUSEWAY CROSSING OF THE WHITE UMFOLOZI RIVER	Vegetation assessment Faunal assessment Wetland delineation and functional assessment	R15,000.00 R35,000.00 R40,000.00

SITE	LIKELY SPECIALIST STUDIES REQUIRES	ORDERS OF COST
	Geo-hydrological assessment	R35,000.00
	Heritage Impact Assessment	R10,000.00
	Floodline assessment	R24,000.00
	Rehabilitation plan	R10,000.00
TOTAL UMFOLOZI CAUSEWAY SPECIALIST STUDIES		**R169,000.00**

SITE	LIKELY SPECIALIST STUDIES REQUIRES	ORDERS OF COST
STREAM CROSSING Indicative cost per crossing	Vegetation assessment	R15,000.00
	Faunal assessment	R35,000.00
	Wetland delineation and functional assessment	R40,000.00
	Geo-hydrological assessment	R35,000.00
	Heritage Impact Assessment	R10,000.00
	Floodline assessment	R24,000.00
	Rehabilitation plan	R10,000.00
TOTAL STREAM CROSSING SPECIALIST STUDIES		**R169,000.00**

SITE	LIKELY SPECIALIST STUDIES REQUIRES	ORDERS OF COST
NEW ROAD / TRACK Indicative cost per road	Vegetation assessment	R35,000.00
	Faunal assessment	R35,000.00
	Wetland delineation and functional assessment	R40,000.00
	Geo-hydrological assessment	R35,000.00
	Heritage Impact Assessment	R10,000.00
	Rehabilitation plan	R10,000.00
	Visual mpact assessment	R15,000.00
TOTAL ROAD / TRACK SPECIALIST STUDIES		**R180,000.00**

Note: Requirements of the Major Hazardous Installation (MHI) regulations have not been taken into account in preparing these budgets.

Costs indicated assume that project applications will be undertaken on an individual project basis. Subject to the development strategy, it should be possible to undertake some applications in parallel which should result in cost saving.

The estimates exclude VAT and disbursements. A 10% allowance should be made for disbursements.

5.4.2 ENVIRONMENTAL ASSESSMENT PRACTITIONER COSTS

In addition to specialist work, an independent Environmental Assessment Practitioner (EAP) will be required to run the assessment processes and to draft the application documents.

The EAP's fee is likely to be in the order of R120,000 to R150,000.00 per application for this service. If more than one application is undertaken at a time, there are likely to be cost savings in terms of time required for document production and management of specialists. This is likely to result in a cost saving.

Costs for these inputs are difficult to estimate without detailed terms of reference. Recent tender processes for appointment of EAPs for Basic Assessment processes for government projects have seen prices vary from R90,000.00 to R390,000.00 for the

same project and for full EIA processes from R1.1million to R3.0million again for the same project. Prices can therefore vary considerably.

The best way to ensure that an application progresses in a proactive manner without waste of time and resources it to appoint the EAP as the first step. He / she will review existing information, discuss requirements with the Competent Authority and can then draft terms of reference for specialist studies on which comparable quotations can be called for.

5.4.3 COMPLIANCE MONITORING COSTS

Should authorisation be gained for development it is likely that one condition of authorisation is likely to require compliance auditing. The frequency of audits will be subject to the authorising authority's judgement.

On construction projects, it is usual for a specialist Environmental Control Officer (ECO) to be appointed by the client. The ECO will undertake inspections, have meetings with contractors and issue compliance reports to the relevant authorities as required by the conditions of authorisation.

It is estimated that two to three day input would be required for a single project. Charges for this are likely to be in the order of R15,000.00 exclusive of VAT and disbursements. Should more than one project be audited during the same visit cost savings could be made.

It is possible that audits may only be required on an annual basis or on completion of construction. Even if monthly audits are required, an occasional visit by an ECO will not be sufficient to ensure that contractors are compliant and working in a manner that is likely to minimise disturbance to both wildlife and vegetation. Given the sensitivity and biodiversity importance of the reserve, it would be advisable to have an on-site person to check on and work with contractors on a daily basis. In addition to daily policing of contractors, this person should be tasked with record keeping to ensure that when audits are undertaken all necessary documentation is readily available.

5.5 WATER USE LICENSE APPLICATION COSTS

Where applicable, necessary specialist studies undertaken for an Environmental Application should be designed to fulfil WULA requirements also. This will apply particularly to:

a. The wetland delineation and functional assessment;
b. The geo-hydrological assessment; and
c. The vegetation assessment.

This approach should minimise duplication of effort and fee requirements. It should also mean that the only additional work required for each WULA application will be completion of application forms and the preparation of the necessary Integrated Waste Water Management Plan (IWWMP).

An IWWMP is a document that is specifically designed for mining applications. However, because it provides an overview of water related issues, the Department of Water and Sanitation require a WULA to include a WWMP.

In addition to the IWWMP, the documentation side of a WULA can be onerous with the need for certified copies of land owners IDs and title deeds to prove ownership.

If advertising and consultation can be undertaken for the EA and the WULA as one process and if all necessary specialist work is included in the EA, then discussions with the Department of Water and Sanitation, the preparation of documentation and the preparation of the WWMP should be the only necessary areas of input. It is recommended that a budget of R50,000.00 is allowed for this work.

A WULA will be granted for a time period which will be subject to the nature and timing of a project. The maximum period that a WULA can be granted for is 40 years. Under current legislation WULAs will require renewing on expiry.

6 CONCLUSION

The Emcakwini community successfully claimed 38 000 ha of land in to the north of Babanango area, stretching from the hills of Zululand to the banks of the White Umfolozi River.

The Emcakwini Community Trust have initiated various initiatives to put the community land to good use that will see an income for the community.

One of these uses is to have approximately 13,000ha immediately south of the White Umfolozi River declared as a Nature Reserve under the National Environmental Management: Protected Areas Act, 2003 (Act 57 of 2003) and further to develop it as a Big 5 Game Reserve.

A substantial amount of foundation work has been undertaken by the Trust involving Ezemvelo KZN Wildlife and an NGO, Conservation Outcomes. This work has emphasised both the strategic conservation importance as well as the site specific assets that support this initiative.

Conservation Outcomes listed the following eight reasons for incorporation in the KZN Biodiversity Stewardship programme and declaration as a Nature Reserve;

1. Protection of a site with a high biodiversity value, unique characteristics and landscape features.
2. Protection of the only known viable populations of *Aloe gerstneri* and *Aloe vanrooyenii* endemic species.
3. Provides the potential for a landscape scale conservation initiative linking existing protected areas
4. Contribution to conservation of important ecological process, due to the size of the site.
5. High altitudinal gradient provides for high species diversity within one site
6. The site falls within the 20 year PAES and contains 3 Natural Heritage Sites
7. Securing the site will contribution to the tourism development in the region.
8. The site will contribute sustainable job creation in the conservation sector in a relatively impoverished area.

Three sections of adjoining land to the north of the White Umfolozi River provide an opportunity to reinforce this conservation initiative enabling a larger reserve that might sustain a larger number and range of wildlife and provide enable a larger number of people to experience the natural landscape. Two of these land holdings (Zulu Rock and Lulu) are privately owned and one other is also owned by a Community Trust (Kwanqono Community Trust).

Having the White Umfolozi River running through the reserve area rather than being forming a boundary to the reserve also presents greater opportunities and simplifies fencing requirements.

The containment and control of views from within the proposed reserve provided by control of land from the ridgeline on the one side of the valley to the ridgeline on the other side of the valley also provides an opportunity for providing visitors with the impression of a totally natural landscape.

The work that has been undertaken to date places the project in a positive position with the possibility of Nature Reserve status being gained relatively quickly.

This report reviews possible development areas within the proposed reserve area.

Due to project planning being in its initial stages, there is little detail provided. However, from the initial review it does appear that the various projects might be undertaken without unduly changing the nature of the reserve landscape. This is due to both the nature of the development proposals as well as the fact that all proposed projects are located in areas that historically have been developed. This means that the areas are generally disturbed.

Because the majority of proposed development areas have been developed previously provides some confidence that, from an environmental perspective and subject to final development proposals, the majority of proposed projects should be feasible. From the review however, the main concern with most of the projects is likely to be the ability to provide sufficient levels of services.

The questions raised in this document including servicing issues will be addressed as part of the current feasibility study.

All identified projects are likely to require Environmental Authorisation under the National Environmental Management Act (Act 107 of 1998). Budgets and approaches to applications have been outlined in the report. These are for project planning and budgeting only. It is possible that as additional detail is developed that requirements could change.

All identified projects are also likely to require Water Use Licence authorisation (WULA) under the National Water Act (Act No 36 of 1998), the process for which should run in parallel with applications under the NEMA.

Where applicable, necessary specialist studies should be designed to fulfil requirements of both processes. This should minimise duplication of effort and fee requirements. It should also mean that the only additional work required for each WULA application will be for completion of application forms and the preparation of the necessary Integrated Waste Water Management Plan.

Costs indicated assume that project applications will be undertaken on an individual project basis. Subject to the development strategy, it may be possible to undertake some applications in parallel which may result in some cost saving.

Whilst the outcome of Environmental Applications and WULA's cannot be predicted, that fact that the overall development objective is conservation through which a community income may be derived, as long as this objective is not lost sight of, investors should be positive that this outcome is achievable.

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