

PROPOSED DEVELOPMENT AND “GREENING” OF THE AREA BETWEEN THE ROYAL KHALANGA LODGE AND VALOYI VATSHONGA CULTURAL VILLAGE IN NWAMITWA AREA, TZANEEN LOCAL MUNICIPALITY WITHIN MOPANE DISTRICT

SITE SENSITIVITY VERIFICATION

INTRODUCTION

Jacana Environmentals cc was appointed by DVM Limpopo (Pty) Ltd on behalf of the Valoyi Royal Council as an independent Environmental Assessment Practitioner to undertake an application for environmental authorisation for the proposed development of a recreational area in the Nwamitwa area in terms of the National Environmental Management Act (NEMA), 1998 (Act 107 of 1998) and GN No. R. 982-986 of 4 December 2014: NEMA: Environmental Impact Assessment (EIA) Regulations, as amended.

GN No. 960 dated 5 July 2019 stipulates the requirement to submit a report generated by the National Web Based Environmental Screening Tool in terms of section 24(5)(h) of the NEMA and regulation 16(1)(b)(v) of the 2014 EIA Regulations. The purpose of the Screening Report is to identify the list of specialist assessments that needs to be conducted in support of the EA application, based on the selected classification, and the environmental sensitivities of the proposed development footprint.

GN No. 320 dated 20 March 2020 prescribes general requirements for undertaking site sensitivity verification and for protocols for the assessment and minimum report content requirements of environmental impacts for environmental themes for activities requiring EA in terms of sections 24(5)(a), (h) and 44 of NEMA. The purpose of the site sensitivity verification is to verify (confirm or dispute) the current use of the land and the environmental sensitivity of the site under consideration as identified in the Screening Report.

Site visits were conducted by the Environmental Assessment Practitioner (EAP) on 4 & 22 February 2022. This report documents the findings of the site sensitivity verification conducted by the EAP.

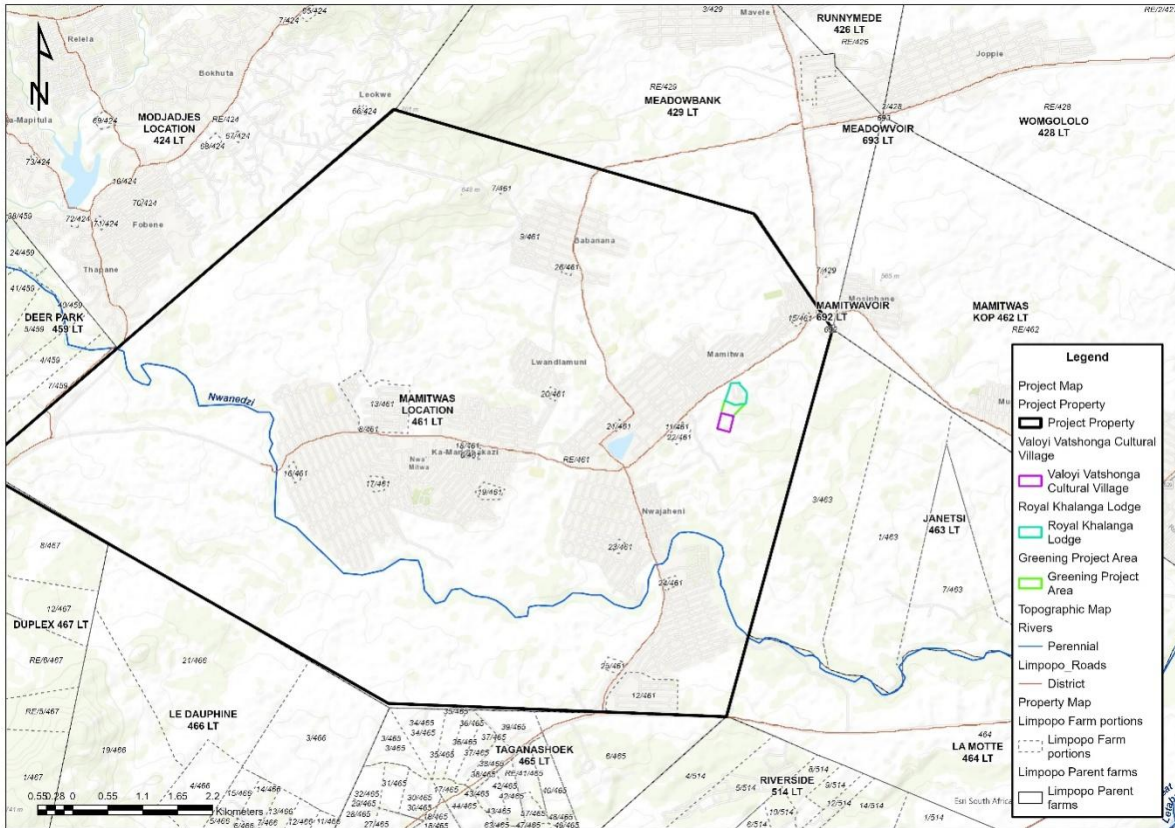
PROJECT LOCATION

The proposed development is situated within Ward 12 of the Greater Tzaneen Local Municipality (GTM) within the Mopane District Municipality (MDM) of Limpopo Province.

The development is situated in the Nwamitwa area next to the road R3248 to Nkambako on a portion of the Remaining Extent of farm Mamitwas Location 461 LT, between the Royal Khalanga Lodge and the Valoyi Vatshonga Cultural Village.

The project development area falls within the jurisdiction of the state under Traditional Council custodianship, in this case the Valoyi Royal Council (Chief Nwamitwa Traditional Council).

Longitude: 30°25'18.92"E Latitude: 23°43'36.93"S



Project location

PROJECT MOTIVATION AND DESCRIPTION

According to the MDM Spatial Development perspective (2007), a Growth Point is a town/village where some form of economic, social and institutional activities and substantial number of people is usually found. These growth points seem to have a natural growth potential, but do not develop to their full potential since capital investments are made on an ad hoc basis without any long-term strategy for the area as a whole. The GTM Spatial Development Framework (2017 - 2022) identified the Nwamitwa Village as a growth point within their area of jurisdiction.

The “greening” of the area between Khalanga Lodge and Valoyi Vatsonga Cultural Village is an approved community project under the Environmental Protection and Infrastructure Programmes supported by the Department of Forestry, Fisheries and the Environment (DFFE).

The development includes the establishment of picnic facilities and park furniture, braai areas with roofed seating and braai facilities, swimming pools, playground facilities for children, hawkers’ stands, park circulation pathways, eco-friendly ablution facilities, park fencing and gates, parking for vehicles and buses/taxis. The area of development is approximately 4 hectares in size.



Development Layout Plan

There are no existing boreholes on site and the municipal water supply is inconsistent. A new borehole(s) must be drilled to provide water for the proposed development. The total supply required for a 12-hour period is approximately 1.9 litres/second (or 73 970 litres/day). Two reservoirs/tanks will be constructed with a 75kL capacity for potable water and 100 kL for fire/pool water. The tanks will be placed on the ground in the north-eastern corner of the development area together with pressure pumps, filters and water softener/RO plant. The RO plant only needs to cater for the potable water, which is in the region of 15 KL/day (peak demand).

Three fire hydrants will be provided, two on the extremities of the site, and one in the middle of the development to provide for any fire risks.

There is no existing sewer reticulation in the area, and there are no immediate plans to construct a formal network with treatment works. A new septic tank with a package treatment plant will be installed in the south-western corner of the development area. The treated water will permeate into the soil using a soak-away (French drain) system. Grey water from the sewage package plant will be utilised for irrigation purposes.

The package plant must be able to treat at least 6.5 kL of effluent per day, but to allow for possible changes in occupancy and requirements, the plant will be designed for a daily capacity of 10kL. The

septic tank will be periodically de-sludged (2-year intervals) using vacuum tankers. The effluent will be disposed of at a registered sewage treatment works in the area. No overflow of the septic tank is envisaged, but if it does occur the overflow will flow into the soak-away system. Soil contamination is a concern, and the treatment plant will be monitored daily. If there is any indication of blockages, vacuum tankers will be brought in to remove the effluent for the required maintenance.

The storm water run-off from the new development will have a negative influence on the Cultural Village site, and both storm water and erosion must receive attention as the area does have steep slopes. Strategically placed concrete channels will be placed on the boundary of the site. These channels will divert the storm water into the natural environment to the east/west of the site.

Solid waste is proposed to feed into the municipal waste stream. Suitable waste bins will be placed within the development footprint which will be cleaned out on regular intervals and disposed at a registered landfill site in the area.

EIA REQUIREMENTS

The project triggers Listed Activities Nos. 27 and 28 in terms of Listing Notice 1 of the 2014 EIA Regulations. Listing Notice 1 triggers a Basic Assessment process contemplated in regulations 19 and 20 of the 2014 EIA Regulations. The Competent Authority responsible for the EA application is the Limpopo Department of Economic Development, Environment and Tourism (LEDET) based in Polokwane.

Listing Notice	Listed Activity	Development Activity
Listing Notice 1 – Activity 27	The clearance of an areas of 1 hectare or more, but less than 20 hectares of indigenous vegetation.	The proposed development entails vegetation clearance of approximately 4 hectares.
Listing Notice 1 – Activity 28	Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such development will occur outside an urban area, where the total land to be developed is bigger than 1 hectare.	The proposed development is situated in an area currently used for agriculture in proximity to the rural village of Nwamitwa.

SUMMARY OF SCREENING TOOL AND SITE SENSITIVITY VERIFICATION

The Table below summarises the findings of the screening tool and the site sensitivity verification conducted by the EAP, together with recommendations on the studies required to be performed in support of the EA application.

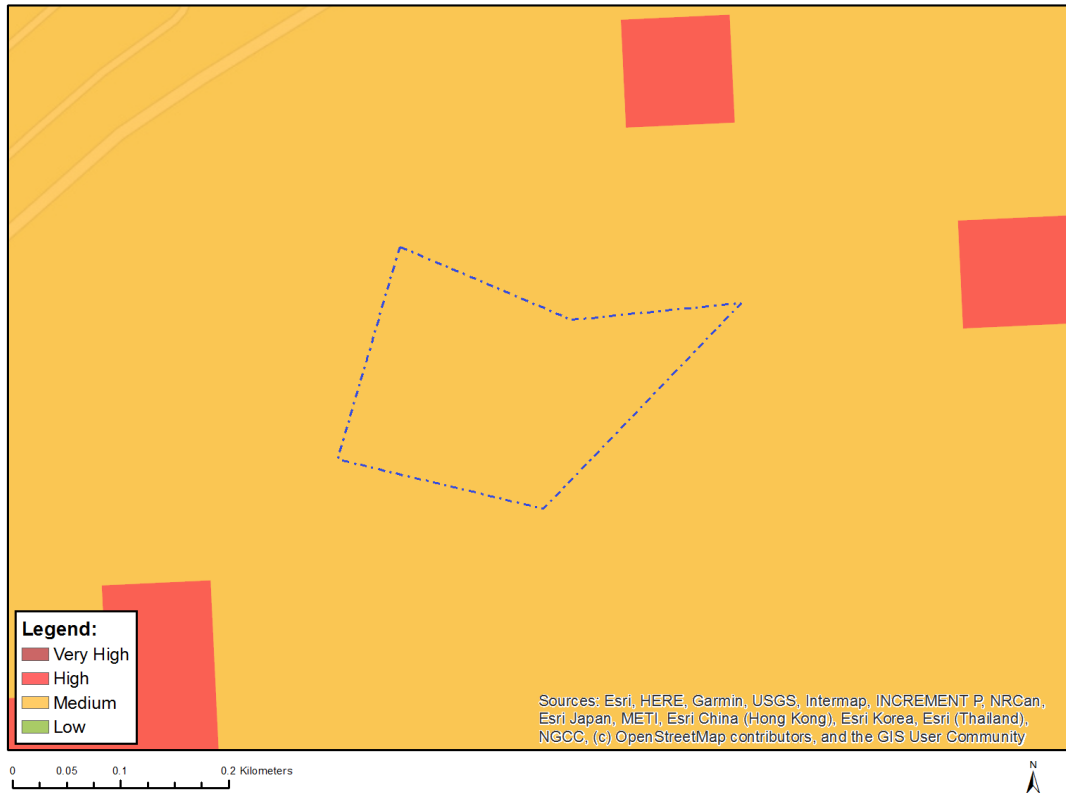
Theme	Screening tool	Site sensitivity verification	Recommendation by EAP
Agricultural	Medium	Low	No studies proposed.
Animal species	Medium	Low	Site investigation conducted on 4 & 22 February 2022 to identify any sensitive species. No further studies proposed.
Aquatic	Low	Low	No studies proposed.
Archaeology and Cultural Heritage	Low	Low	A Phase 1 heritage impact assessment was conducted. No further studies proposed.
Civil Aviation	High	Low	No studies proposed.
Defense	Medium	Low	No studies proposed.
Paleontology	Medium	Low	No studies proposed.
Plant species	Medium	Medium	Site investigation conducted on 4 & 22 February 2022 to identify any sensitive species. No further studies proposed.
Terrestrial Biodiversity	Low	Low	No studies proposed.

The motivation for the recommendations by the EAP is provided in the sections below.

AGRICULTURAL THEME

Screening tool results

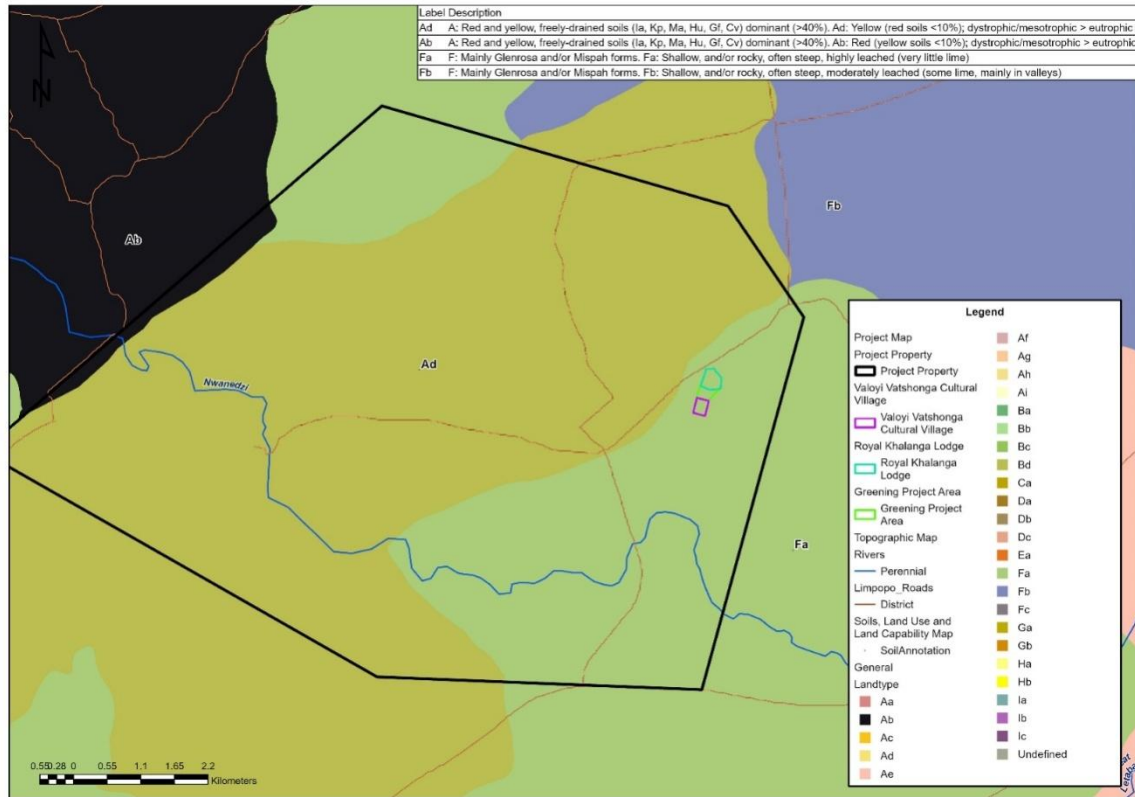
According to the screening tool the site is listed as a medium agricultural sensitivity area, which holds a land capability valuation of 06. Low-Moderate/07. Low-Moderate/08. Moderate.



GIS mapping results

The development footprint is dominated by Glenrosa and/or Mispah soil forms (other soils may occur), within land type Fa. Land Type Fa specifically refers to land in which lime is not encountered regularly in any portion of the landscape. Hillcrest areas in this land type are characterized by rock, Mispah and occasionally shallow Hutton soil forms.

The characteristics of this land type such as steep slope, shallow rooting zone, low water holding capacity, has severe limitations that generally result in the land to be unsuitable for cultivation and limited to pasture, range, woodland or wildlife.



Site visitation results

The site is on the urban edge of the rural town of Nwamitwa. No cultivation is undertaken on the site (currently or historically) and the area is used for informal grazing only. Shallow rock outcrops are evident throughout the development area. Parts of the development footprint are severely overgrown with *Dichrostachys cinerea* (Sickle bush) and *Lantana camara* (Lantana), with limited agricultural potential.

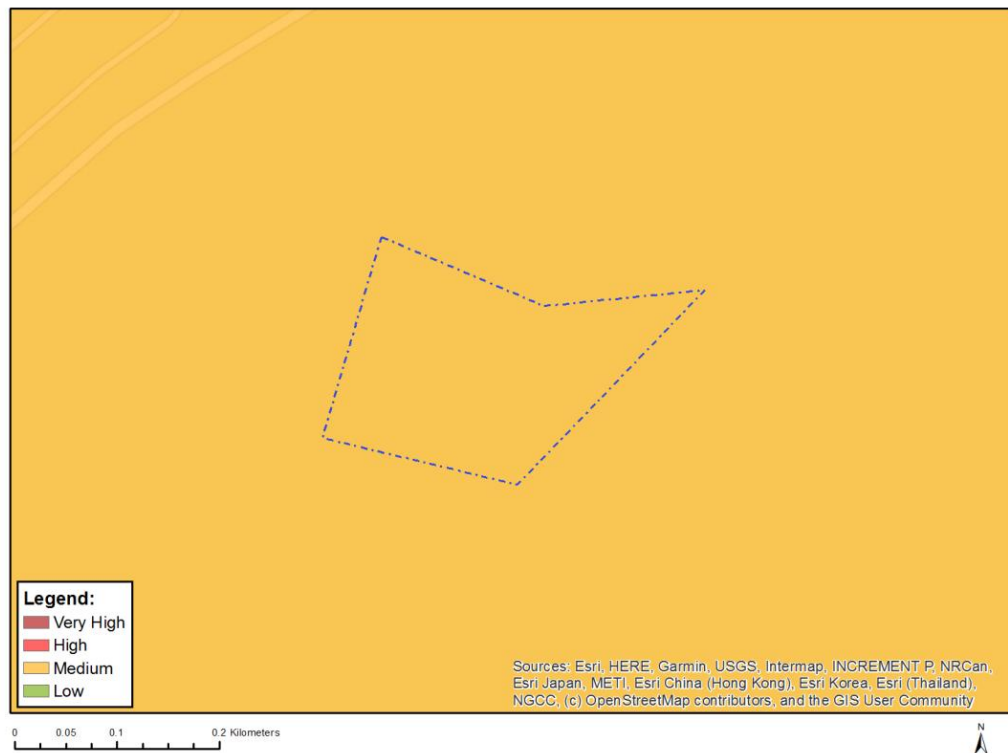
Lantana is one of the worst weeds in the world, a Category 1b species in South Africa in terms of the Alien and Invasive Species (AIS) Regulations promulgated in terms of the National Environmental Management: Biodiversity Act 10 of 2004 (NEMBA). Land occupiers are legally obliged to control it, or to remove and destroy it if possible. No trade or planting is allowed. It comprises a complex of vigorous, prolific, man-made hybrids, bred in Europe from unrecorded parents from Central and South America, and spread all over the world as a hardy, ornamental shrub, with multi-coloured flowers. Dispersed by fruit-eating birds, it establishes along fence lines and under trees, where it out-competes indigenous plants and forms impenetrable, prickly thickets that reduce natural pasturage, productivity of cattle farming, access to water supplies and tree plantations, biodiversity and land values. *Lantana camara* is a poisonous invader of veld and plantations. It replaces indigenous species. This plant is poisonous to humans and animals and responsible for livestock mortalities amounting to millions of rands every year in South Africa. It also reduces the grazing potential of the land.

The site sensitivity is therefore considered **Low** from an agricultural perspective and no further studies are proposed.

ANIMAL SPECIES THEME

Screening tool results

According to the screening tool, the site lays predominantly within the Medium sensitivity for the animal species theme. The national screening tool identifies five species of concern within the study site, namely *Aroegas fuscus* (Brown False Shieldback – invertebrate), *Terathopius ecaudatus* (Bateleur Eagle – aves), *Acinonyx jubatus* (Cheetah – mammalia), *Crocidura maquassiensis* (Maquassie Musk Shrew – mammalia), *Dasymys robertsii* (African Marsh Rat – mammalia).



GIS mapping results

No GIS data for the existence of specific animals within the study site.

Site visitation results

The immediate surroundings of the proposed development include urban areas, provincial road R3248 open fields, the Royal Khalanga Lodge to the north and the Valoyi Vatshonga Cultural Village to the south.

No mammal spoor was noted during the site visit apart from that of cattle which grazes on the property. It is further evident that informal hunting with dogs is conducted in the area, which reduces the possibility of any mammal species inhabiting the area.

In addition, large parts of the development footprint are severely overgrown with *Dichrostachys cinerea* (Sickle bush) and *Lantana camara* (Lantana) and the habitat on the property is unlikely to attract large mammal species.

The following can be stated about the sensitive species:

- The Brown False Shieldback is Endangered under criterion B2. According to the SANBI-website, the Brown False Shieldback only occurs at an elevation of above 1200 m in the Mesic Highveld Grassland bioregion. The site is located within the Lowveld Bioregion at an elevation of 528-549 above mean sea-level (amsl).
- The Bateleur Eagle is Endangered. It inhabits open country, including grasslands, savanna and subdesert thornbush. Bateleurs are shy of man and given the location of the site, it is not envisaged that this species will occur on the development site. No evidence of nests has been observed during the site visit.
- The Cheetah is listed as Vulnerable on the IUCN Red List. Given the proximity of anthropogenic activities to the north, west and south of the proposed development, it is not envisaged that this species will frequent the site. No spoor was observed during the site visit.
- Maquassie Musk Shrew is considered Vulnerable. The species depends on moist habitats, e.g. wetlands and rank grasslands within suitable habitat. The proposed development site is void of any surface water resources or wetlands and therefore does not provide suitable habitat for this species.
- The African Marsh Rat are associated with rivers and wetlands within the northern and southern African savannas. There are no rivers within the proposed development area, the closest being the Nwanedzi River situated approximately 3 km to the south. The site therefore does not provide suitable habitat for this species.

Based on the above, it can be concluded that the risk of disturbing/impacting the sensitive species identified by the screening report is slim.

The site sensitivity is therefore considered **Low** for the animal species theme and no further studies are proposed.

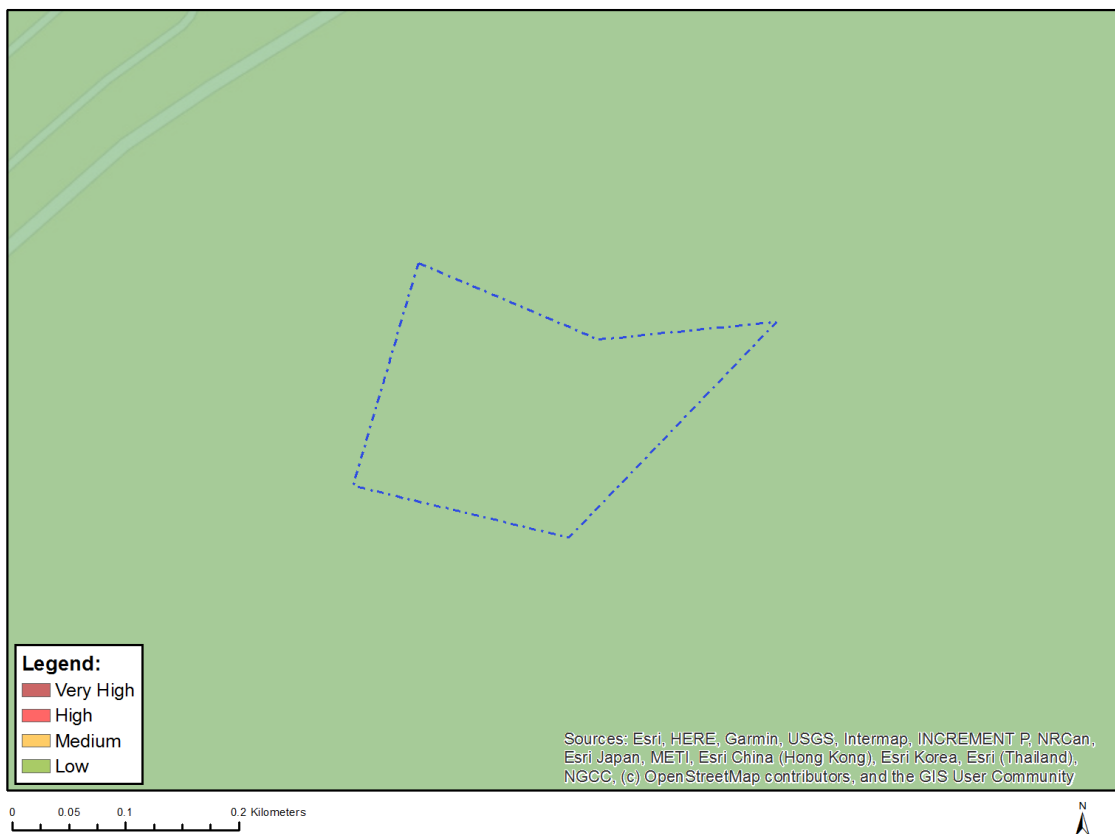


Lantana camara (Category 1b alien & invasive species)

AQUATIC THEME

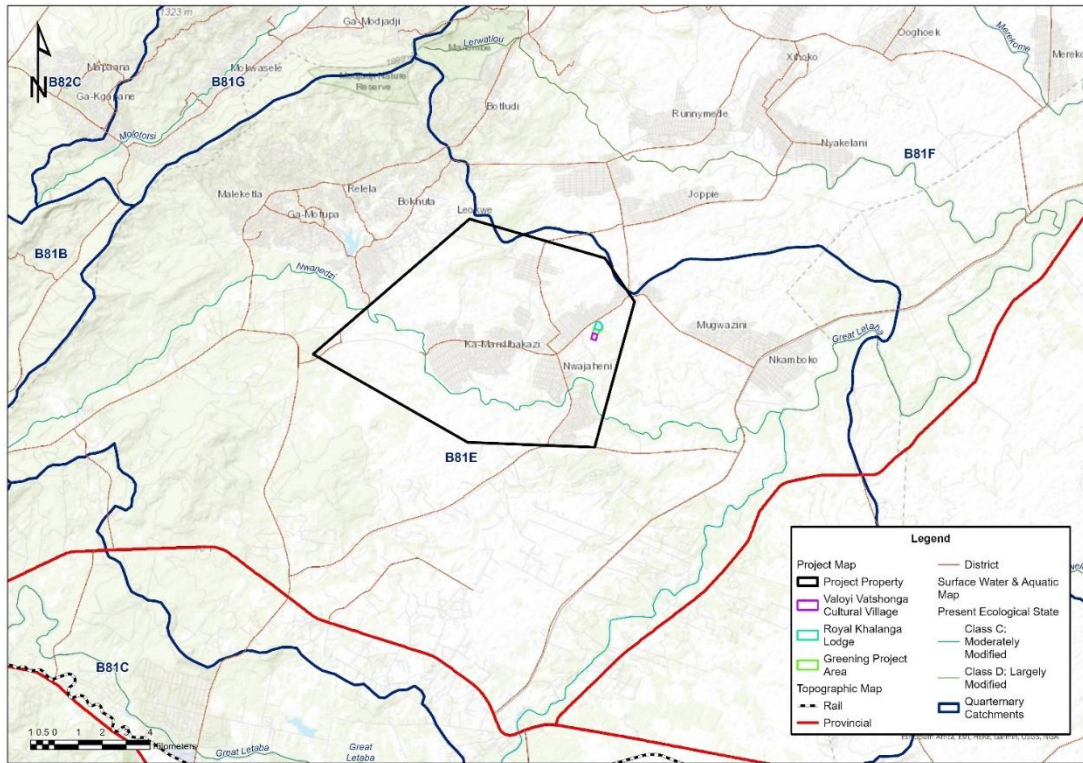
Screening tool results

According to the screening tool, the site lays predominantly within the Low sensitivity for aquatic biodiversity.



GIS mapping results

The site is situated in the B81E quaternary catchment. The closest watercourse is the Nwanedzi River situated approximately 2 km to the south. The present ecological state (PES) of the Nwanedzi River is Class D – Largely Modified. No wetlands are present on the site.



Site visitation results

A small, non-perennial drainage line is situated to the west of the site, which flows only during rainfall events. It is transected by the access road to the Cultural Village. The drainage line diverts storm water runoff past the Cultural Village, thereby preventing flooding of the facility. The photos below depict the drainage line upstream (left) and downstream (right) of the road crossing.

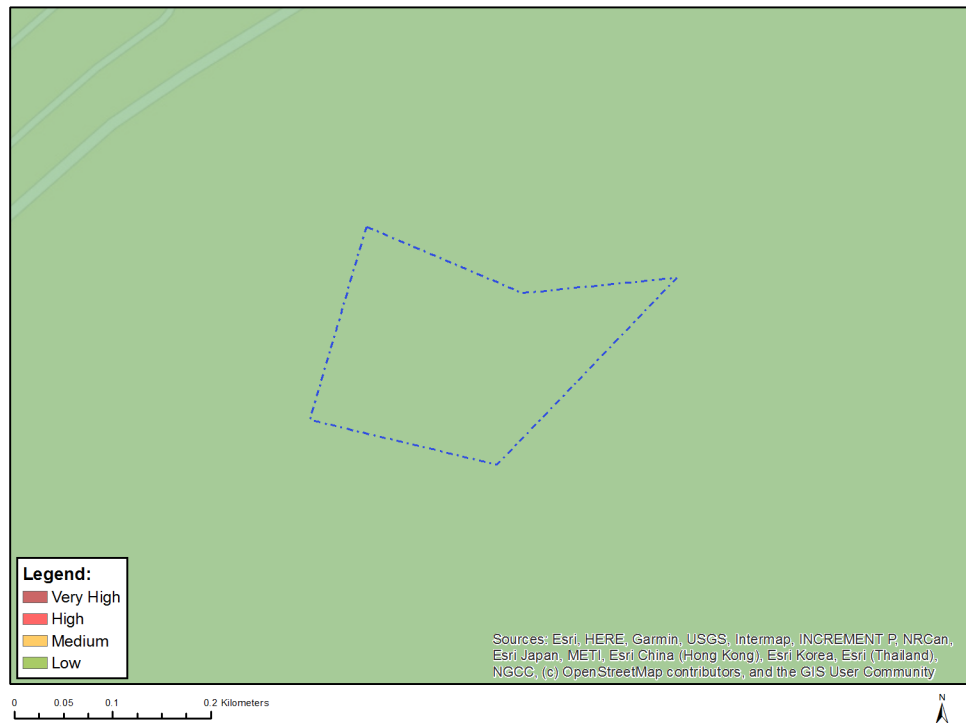


The site sensitivity is considered **Low** from an aquatic perspective and no further studies are proposed.

ARCHAEOLOGICAL AND CULTURAL HERITAGE THEME

Screening tool results

The screening tool identified the site as Low sensitivity with regards to archaeological and cultural heritage of the area.



GIS mapping results

A few graveyards were identified within the rural village, as well as to the south of the Cultural Village from Google Maps. None of these are in close proximity to the proposed development.

Site visitation results

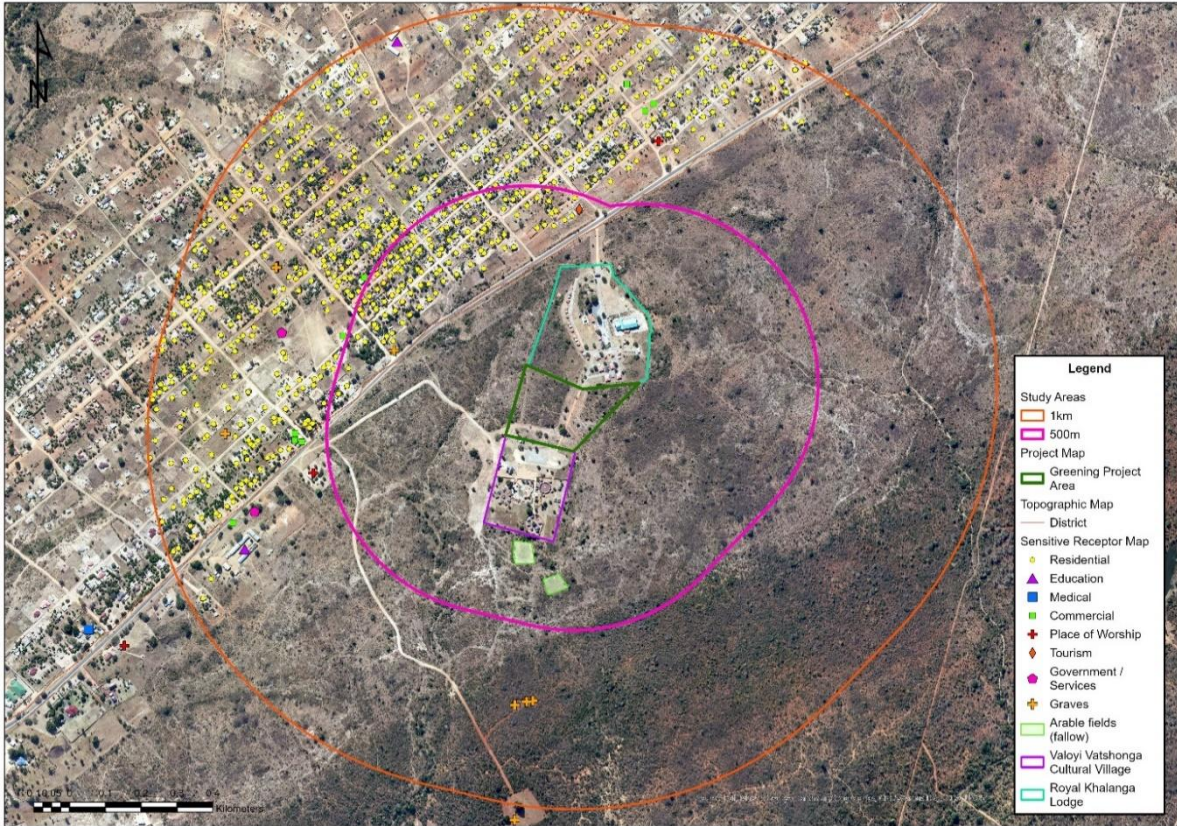
No cultural heritage sites were identified during the site visit, nor any burial sites (graves). Members of the Valoyi Traditional Authority confirmed that there are no burial sites within the development footprint. Some graves have been identified to the south of the Cultural Village, one belonging to the late Hosi Valoyi (S23 44' 12.7" E30 25' 10.0"). The graves identified to the south of the Cultural Village will not be impacted by the development. The site sensitivity is therefore considered **Low** from an archaeological and cultural heritage perspective.

It is noted that most archaeological and paleontological remains are subterranean and there is always a chance that such material may be exposed during earthworks. The discovery of undetected heritage remains must be reported to the archaeologist or the Heritage Authority.



Grave of late Hosi Valoyi





CIVIL AVIATION THEME

Screening tool results

The national screening tool identifies the site as being located within a dangerous and restricted airspace and within 8-15 km of other civilaviation aerodrome. The site is therefore afforded a High sensitivity for the civilaviation theme.



GIS mapping results

Mapping indicated that the site is located approximately 14.5km away from the Tzaneen Airfield within the rural village of Nwamitwa. The Royal Khalanga Lodge (to the north) and the residential area (to the west) are at a higher elevation than the recreational development. Thus, if the lodge and the surrounding residential area does not interfere with the flight path of aircrafts, it is highly unlikely that the site will interrupt the flight path of aircrafts due to its lower elevation.

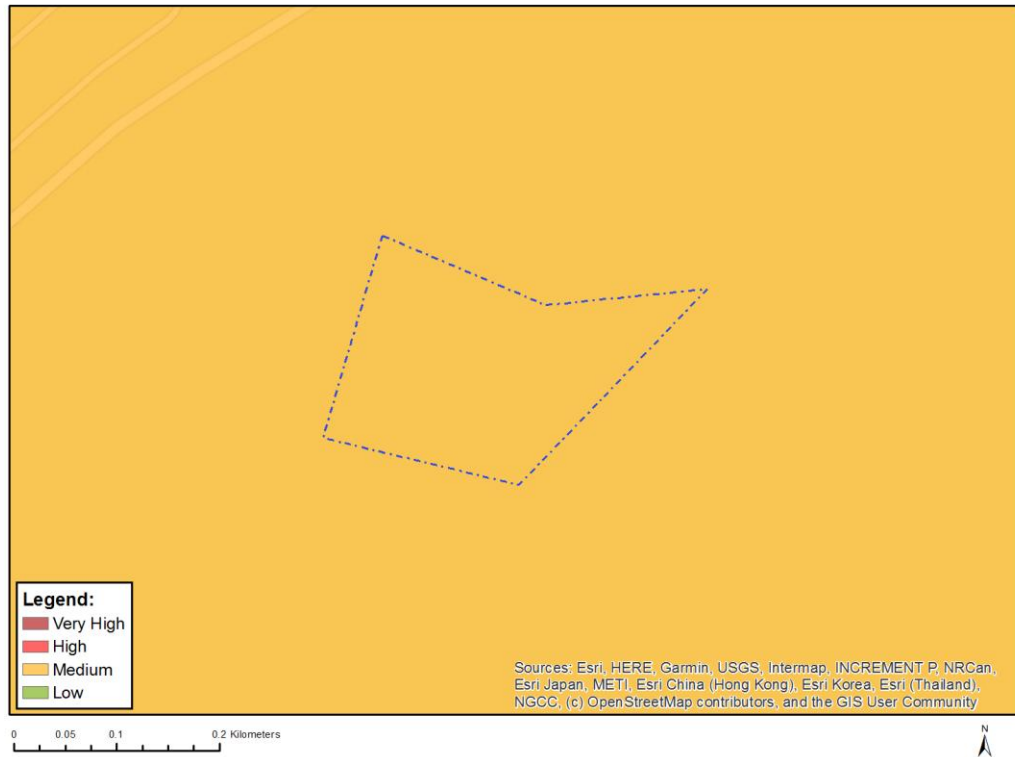
Sitevisitationresults

The development has no plan to implement any infrastructure that can be seen as high rising infrastructure. No radio transmissions are planned for development and thus no frequency remittance will hinder the radio transmissions of the airport towers to the receiving aircrafts and vice versa. Therefore, it is the opinion of the EAP that the site and development will pose minimal risk towards the civilaviation of the area, and therefore the sensitivity should be identified as **Low**.

DEFENSE THEME

Screening tool results

The screening tool identified the site as Medium sensitivity due to the proximity of a military and defense site.



GIS mapping results

No army bases are visible near or within 5 kilometres of the vicinity of the site.

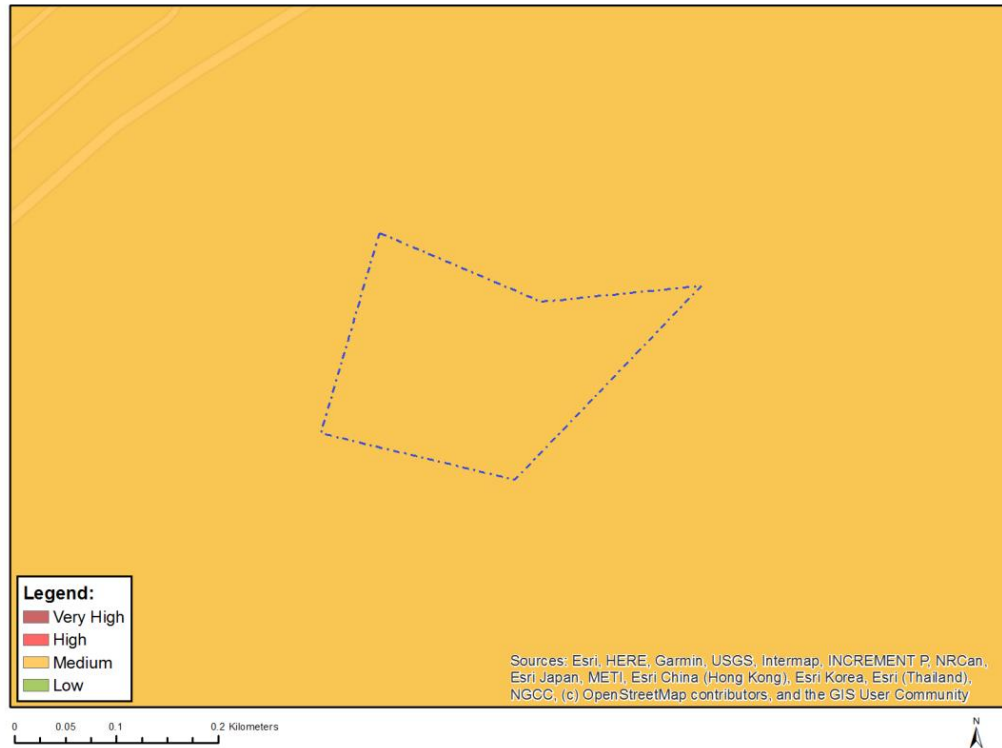
Site visitation results

No factors seem to be an advantage of the site towards defense as it is located within rural residential areas with limited access to major roads in the area. Therefore, it is the opinion of the EAP that the site holds a **Low** sensitivity towards the defense theme.

PALEONTOLOGICAL THEME

Screening tool results

The national screening tool identified the site to have features with a Medium paleontological sensitivity.



GIS mapping results

The site is underlain by the Lebowa Granite Suite (vlg) of the Bushveld Complex, in specific the Duivelskloof Leucogranite. According to the SAHRA Palaeotechnical Report: Palaeontological Heritage of Limpopo (Groenewald, 2014), the rock units are associated with intrusive igneous activities and no life would have been possible during emplacement of the rocks. No fossils have been recorded in this geological unit and is regarded as Very Low Palaeontological sensitivity/vulnerability. There is thus a very low possibility that significant fossils will be present in the bedrock of these geological units.

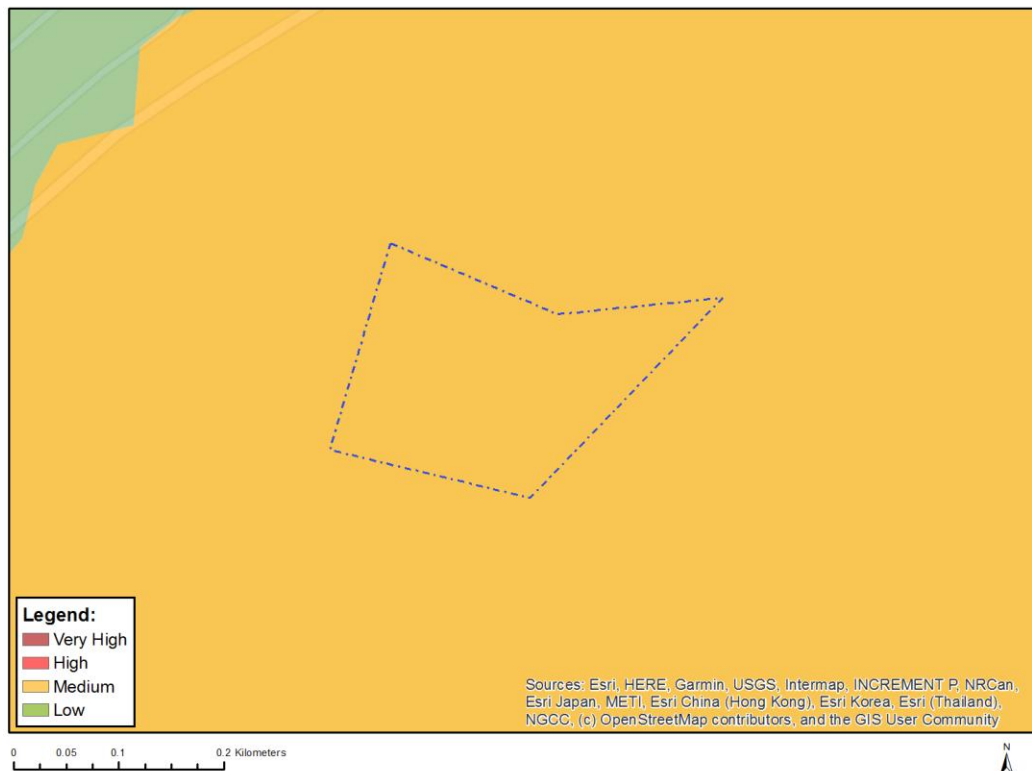
Site visitation results

On site visitation here were no observable paleontological features visible on the site. Old test pits were excavated for the geotechnical specialist, however no observable features could be found within the test pits. Due to the aforementioned mapping and site verification, the EAP is of the opinion that the paleontological sensitivity of the site can be considered as **Low** significance. If artefacts are uncovered during earthmoving activities, a palaeontologist will need to be contacted immediately, this is unlikely however due to excavation not needing to exceed 2m deep.

PLANT SPECIES THEME

Screening tool results

The screening tool identified the site as Medium sensitivity with regards to plant species that occur on the site. Sensitive species 1252 and 575 were identified by the screening tool, which may occur on the site provided sufficient habitat is available. The name has been withheld as the species may be prone to illegal harvesting and must be protected. As per the best practice guideline that accompanies the protocol and screening tool, please, remember that the name of the sensitive species may not appear in the final EIA report nor any of the specialist reports released into the public domain.

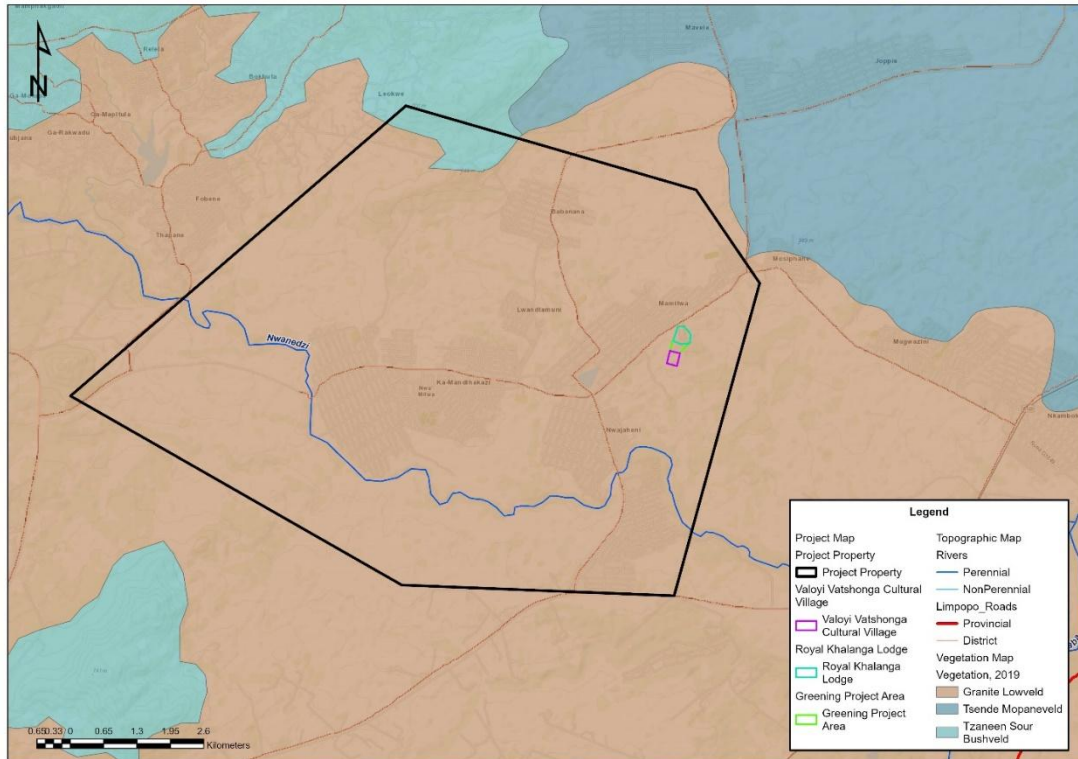


GISmappingresults

The proposed development is situated within the Savanna Biome, the Lowveld Bioregion and falls within the Granite Lowveld vegetation type (SVI3).

The Granite Lowveld vegetation type is considered to be Vulnerable with a conservation target of 19%. Some 17% is statutorily conserved in the Kruger National Park, with roughly the same amount conserved in private reserves. More than 20% is transformed by cultivation and settlement development. Erosion is low to moderate (Mucina and Rutherford, 2006).

Common species include dense thicket to open savanna in the bottomlands with *Senegalia (Acacia) negrensis*, *Dichrostachys cinerea*, *Grewia bicolor* in the woody layer (Mucina and Rutherford, 2006).



Site visitation results

Several plant species were identified during the site investigation, as listed below. Two protected species in terms of the National Forests Act 84 of 1998 (NFA) were identified, namely *Sclerocarya Birrea* subsp. *caffra* (Marula) and *Philenoptera violacea* (Apple leaf). A third species identified on site, *Diospyros mespiliformis* (Jackal-berry), is earmarked to be included in the list of protected trees in the near future.

An abundance of Marula and Apple leaf trees were noted on the development footprint, varying from very young to mature adults. Only two Jackal-berry trees were noted, both of good size. Several other tree/shrub species were identified, as listed below.

Scientific Name	Common Name
<i>Sclerocarya birrea</i> subsp. <i>caffra</i> (SA Tree No: 360)	Marula
<i>Philenoptera violacea</i> (SA Tree No: 238)	Apple-leaf
<i>Diospyros mespiliformis</i> (SA Tree No: 606)	African ebony, jackal-berry
<i>Senegalia nigrescens</i>	Knob thorn
<i>Combretum apiculatum</i> subsp. <i>apiculatum</i> (SA Tree No: 532)	Red bush willow
<i>Ficus stuhlmannii</i>	Lowveld Fig, Stuhlmann's Wild Fig
<i>Terminalia sericea</i> (SA Tree No: 551)	Silver Cluster-Leaf, Silver Terminalia
<i>Lannea schweinfurthii</i> var. <i>stuhlmannii</i> (SA Tree No: 363)	False marula
<i>Dichrostachys cinerea</i> (SA Tree No: 190)	Sickle bush
<i>Strychnos madagascariensis</i> (SA Tree No: 626)	Black monkey orange
<i>Gardenia volkensii</i> (SA Tree No: 690.8 and 691)	Bushveld/Transvaal gardenia
<i>Bauhinia galpinii</i> (SA Tree No: 208.2)	Pride of De Kaap

Scientific Name	Common Name
<i>Bauhinia petersiana</i> subsp. <i>macrantha</i> (SA Tree No: 208.3)	Kalahari bauhinia, Kalahari camel's foot
<i>Senegalia caffra</i> (SA Tree No: 162)	Common hook-thorn, cat thorn
<i>Ziziphus mucronata</i> subsp. <i>mucronate</i> (SA Tree No: 447)	Buffalo thorn
<i>Hibiscus micranthus</i>	Tiny White Wild Hibiscus
<i>Barleria elegans</i>	White Bushveld Barleria
<i>Pavonia burchellii</i>	Dainty Pavonia
<i>Sphedamnocarpus pruriens</i>	Canary Nettle
<i>Crotalaria laburnifolia</i> subsp. <i>australis</i>	Bushveld crotalaria, brown & yellow rattle pod, bird flower
<i>Crotalaria sphaerocarpa</i> subsp. <i>sphaerocarpa</i>	Mealie crotalaria, wild lucerne
<i>Waltheria indica</i>	Meidebossie
<i>Lantana camara</i>	Lantana, tickberry

The larger protected and other tree species were mapped and overlaid on the infrastructure plan – refer to Figure overleaf. It is recommended that the trees indicated on this figure be conserved and that infrastructure are moved/re-aligned to avoid any damage to these trees. Permits for the destruction of the smaller protected species must be obtained from the Department of Agriculture, Forestry and Fisheries (DAFF) before any bush clearance can be undertaken. It can be considered to replant some of these species within and adjacent to the development footprint as part of the landscaping of the area. Permits will also be required for the relocation of these species.

Parts of the development footprint are severely overgrown with *Dichrostachys cinerea* (Sickle bush) and *Lantana camara* (Lantana), which hampered access and proper evaluation of these areas. Lantana is a Category 1b species in South Africa in terms of the AIS Regulations promulgated in terms of the NEMBA. Land occupiers are legally obliged to control it, or to remove and destroy it if possible.

The following can be stated about the sensitive species 1252 and 575 identified by the screening tool:

- Species 1252 is associated with wooded and relatively mesic places (stream sides, wet meadows, springs and seeps, irrigated fields and high-elevation habitats), such as the moister bushveld areas, coastal bush and wooded mountain kloofs.
- Species 575 is a forest floor plant, i.e. cool, moist habitat.

The proposed development site is void of any surface water resources or wetlands and therefore does not provide suitable habitat for these species.

It is of the EAPs opinion that the site is aligned with the screening tool results with regards to the plant species theme. No further site investigations are however proposed.



Crotalaria laburnifolia



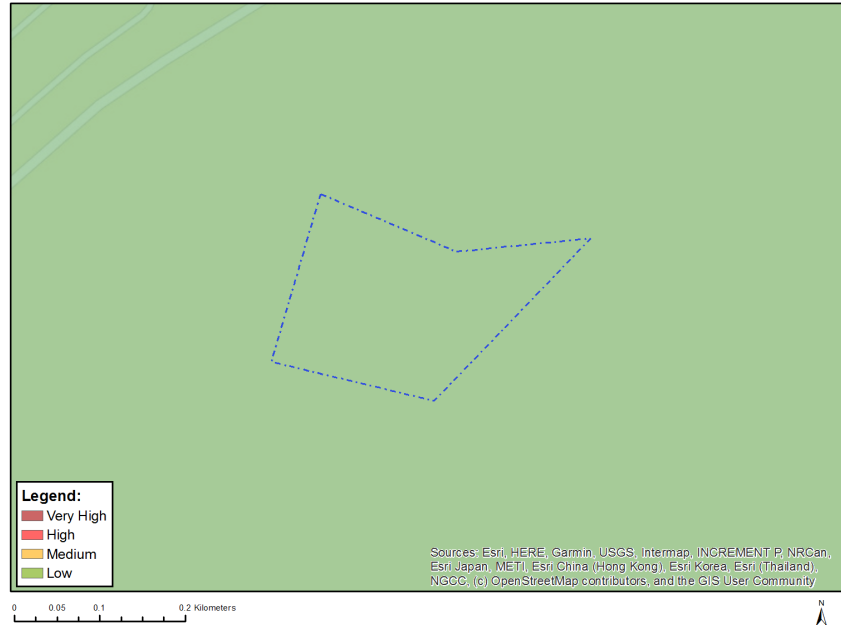
Bauhinia galpinii



TERRESTRIAL BIODIVERSITY THEME

Screening tool results

The screening tool identified the site to have Low sensitivity towards terrestrial biodiversity.



GIS mapping results

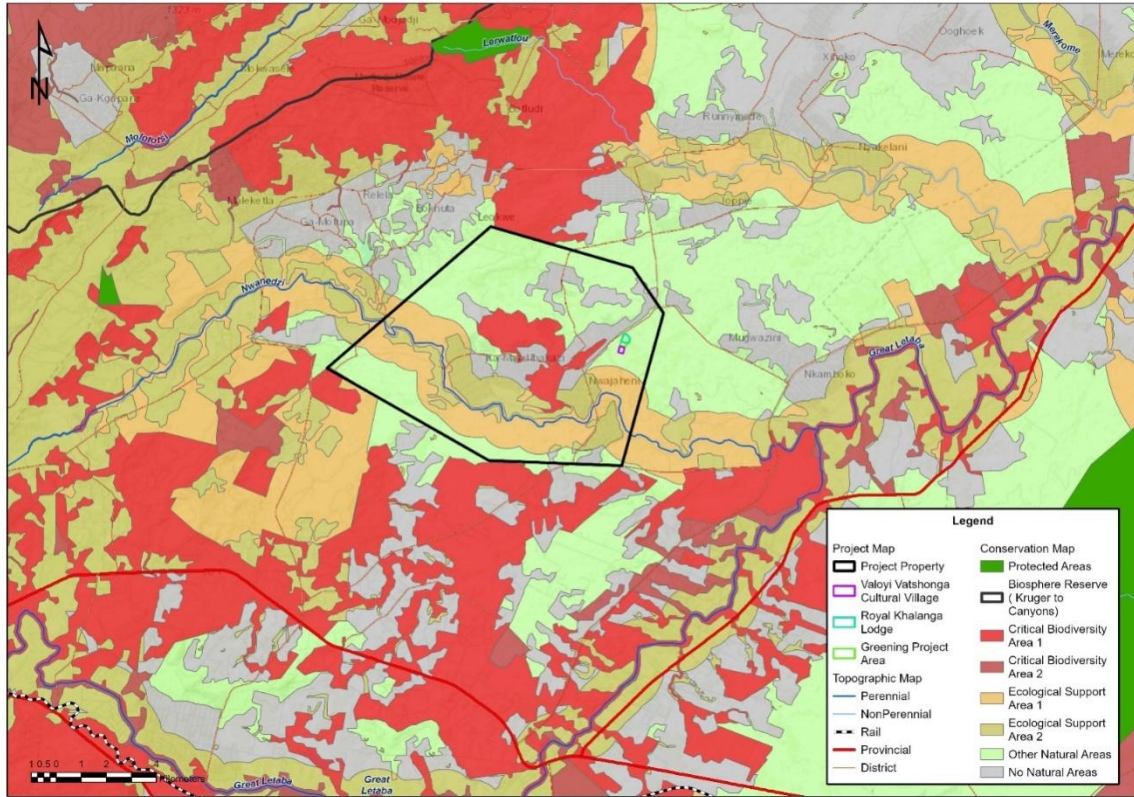
The proposed development is situated within the Savanna Biome, the Lowveld Bioregion and falls within the Granite Lowveld vegetation type (SVI3). The Granite Lowveld vegetation type is considered to be Vulnerable with a conservation target of 19%. Some 17% is statutorily conserved in the Kruger National Park, with roughly the same amount conserved in private reserves.

According to the Limpopo Conservation Plan V2 (2013), the site is situated in “Other natural areas” which is of low conservation concern. Critical Biodiversity Areas (CBA) and Ecological Support Areas (ESA) is situated to the south and the west of the site, associated with the Nwanedzi River and some of its tributaries.

Site visitation results

Although several protected tree species were observed during the site visit, most of the site is overgrown with sickle bush and a Category 1b alien and invasive species, Lantana. The site is situated within areas of low conservation value, mainly because of the anthropogenic influences from the adjacent villages and road/infrastructure developments, as well as informal hunting.

Therefore, it is agreed that the sensitivity of the site towards terrestrial biodiversity is **Low**.



Site overgrown with Lantana and sickle bush

DETAILS OF ENVIRONMENTAL ASSESSMENT PRACTITIONER

Company	Jacana Environmentals cc
Independent EAP	Marietjie Eksteen
Physical address	7 Landdros Mare Street, Polokwane
Postal Address	PO Box 31675, Superbia, 0759
Telephone	015 291 4015
Facsimile	086 668 4015
E-mail	marietjie@jacanacc.co.za
Professional Affiliation	<p>Registered Environmental Assessment Practitioner at the Environmental Assessment Practitioners Association of South Africa (EAPASA) – Number 2020/1800.</p> <p>Registered as a Professional Environmental Scientist (Pr.Sci.Nat.) at the South African Council for Natural Scientific Professions – Registration No. 400090/02.</p> <p>Member of the Land Rehabilitation Society of Southern Africa (LaRSSA): Membership ID 30835.</p>
Abbreviated Curriculum Vitae	<p>Marietjie Eksteen is the Managing Member of the consulting firm Jacana Environmentals cc, an environmental consulting firm based in Polokwane. She is an environmental scientist with more than 30 years’ experience, her main fields of expertise being water quality management, mine water management, environmental legal compliance and project management. Ms. Eksteen is a registered Professional Environmental Scientist (Pr.Sci.Nat.) at the South African Council for Natural Scientific Professions (SACNASP) – Registration No. 400090/02 and is a Registered Environmental Assessment Practitioner at the Environmental Assessment Practitioners Association of South Africa (EAPASA) – Number 2020/1800. She is a member of the Land Rehabilitation Society of Southern Africa (LaRSSA): Membership ID 30835.</p> <p>She obtained a Masters’ degree in Exploration Geophysics (MSc) from the University of Pretoria in 1993. Since establishing Jacana Environmentals in 2006, she has been involved in a variety of mine- and industry-related environmental projects serving clients such as MC Mining Limited, South32 SA Coal Holdings, Glencore Operations South Africa, Consol Glass and Silicon Smelters, amongst others. Prior to 2006 she was employed by Pulles Howard & De Lange Inc as an environmental consultant for 2 years. Before consulting, Ms. Eksteen was employed by BHP Billiton as a mine environmental manager at their operations in Mpumalanga, as well as the Department of Water Affairs where she was appointed as a water quality specialist for the mining industry. Her career started off as a geophysicist at Genmin in 1990.</p>