



NHLATSE
Planning Consultants
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25B Excelsior Street
Polokwane 0699

P.O Box 4863
Polokwane
0699

Unit 2, 24 Mill Street
Hamilton
Bloemfontein
9301
051 4360260

Cell:(082) 558 7739

T/F: (015) 297 8673


Email:

mmaphuti@telkomsa.net

LEBOMBO PORT OF ENTRY: SITE CLEARANCE AND DEVELOPMENT OF STRUCTURAL PLAN

STATUS QUO REPORT

<p>Prepared for:</p> <p>DEPARTMENT OF PUBLIC WORKS Private Bag X65, Pretoria, 0001</p> <p>Contact Person: Mr Gudani Magau</p> <p>Tel : 061 9840 678</p> <p>Email : gudani.magau@dpw.gov.za</p> 	<p>Prepared by:</p> <p>NHLATSE PLANNING CONSULTING 25B Excelsior Street P.O Box 4865 Polokwane 0699</p> <p>Contact Person: Mrs Julia Setati</p> <p>Tel : 015297 8673/ 0825587739</p> <p>Email : mmaphuti@telkomsa.net / nhlatsetp@gmail.com</p> 
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Rev	Date	Compiled by:	Checked by:	Approved by
0	14 August 2020	Julia Setati	Gudani Magau	
Signatures				

EXECUTIVE SUMMARY

This project entails all planning work for the Lebombo Land Port of Entry Area Site Clearance. The project is initiated by the client of the National Department of Public Works which is the Border Management Authority (BMA).

The site clearance process will require:

- Land Use application through application to the Municipality, due to the extent and multiple nature of land uses on the site. In this regards the process will be executed up to the stage of enabling a service level agreement with the Municipality.
- Environmental Authorisation. Subject to the site assessment permitting for plant rescue and resettlement activities and water use.
- Possibly SAHRA approvals.
- Land procurement through preliminary negotiations and conclude a Land Availability Agreement confirming owners' willingness to make land available.

This report analyses and reviews the current planning status of the Lebombo Land Port of Entry as well as the surrounding area. The report further contextualises the current situation at the border post with a brief reflection on the environmental impact and the availability of bulk services as well as providing an overview of the most salient considerations influencing the conceptualisation of the site clearance.

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1 INTRODUCTION

1.1 BACKGROUND

The project entails all planning work for the Lebombo Land Port of Entry area site clearance. The project is initiated by the client of the National Department of Public Work and Infrastructure's which is the Border Management Authority (BMA). The town planning work includes site audit among others and need to be undertaken to complete a full township establishment process including acquisition of land identified through the master planning process.

1.2 PURPOSE OF REPORT

The purpose of this report pertains to the analysis and review of the current status of the Lebombo Land Port of Entry as well as the surrounding area with regards to the current planning context, availability of bulk services and environmental features. This report will contextualise the current position of the Lebombo Port of Entry in relation to the existing cadastral arrangement as well as provide an overview of the most salient town planning considerations influencing the Site Clearance process required for the border post.

1.3 STRUCTURE OF REPORT

The report comprises the following sections:

- **Section 2:** Approach
- **Section 3:** Review of Current Planning
- **Section 4:** Land Surveying
- **Section 5:** Environmental
- **Section 6:** Civil
- **Section 7:** Electrical
- **Section 8:** Geotechnical Investigation
- **Section 9:** Master Planning
- **Section 10:** Conclusion

1.4 GLOSSARY OF TERMINOLOGY

Terminology used in this report is included in **Table 1-1** below for reference purposes.

Table 1-1: Glossary of Terminology

TERM	EXPLANATION
BMA	Border Management Authority
NPC	Nhlatse Planning Consultants
IDP	Integrated Development Plan
NDPWI	National Department of Public Works and Infrastructure
LPoE	Land Port of Entry
SDF	Spatial Development Framework
WWTW	Waste Water Treatment Works

The methodology that will be adopted during the Site Audit is outlined below:

- Firstly, define and demarcate the boundaries reflecting the extent of the study area.
- Secondly, conduct an assessment of all salient information in order to report on the existing status of each aspect of the study area.
- Thirdly, capture and document relevant details in respect of all the aspects analysed within the subject area.
- Fourthly, having established the cadastral arrangement as well as ownership dynamics of all landholdings within the study area, specific portions of land will be identified that could potentially be utilised for expansion purposes.
- Fifthly, identify current and future developments for the border post and surrounding area with reference to projects identified within the Spatial Development Framework and Integrated Development Plan of the Nkomazi Local Municipality; and
- Lastly, the report further contextualises the current situation at the border post with a brief reflection on the environmental impact and the availability of bulk services.

3 REVIEW OF CURRENT PLANNING

3.1 DEFINING THE STUDY AREA

3.1.1 PROPERTY LOCATION

The border post is located within the Nkomazi Local Municipality in Mpumalanga and is situated along the border line that separates South Africa and Mozambique. The nearest town is Komatipoort, which is 5km from the Port.

Refer to Locality Plan in **Appendix A**.

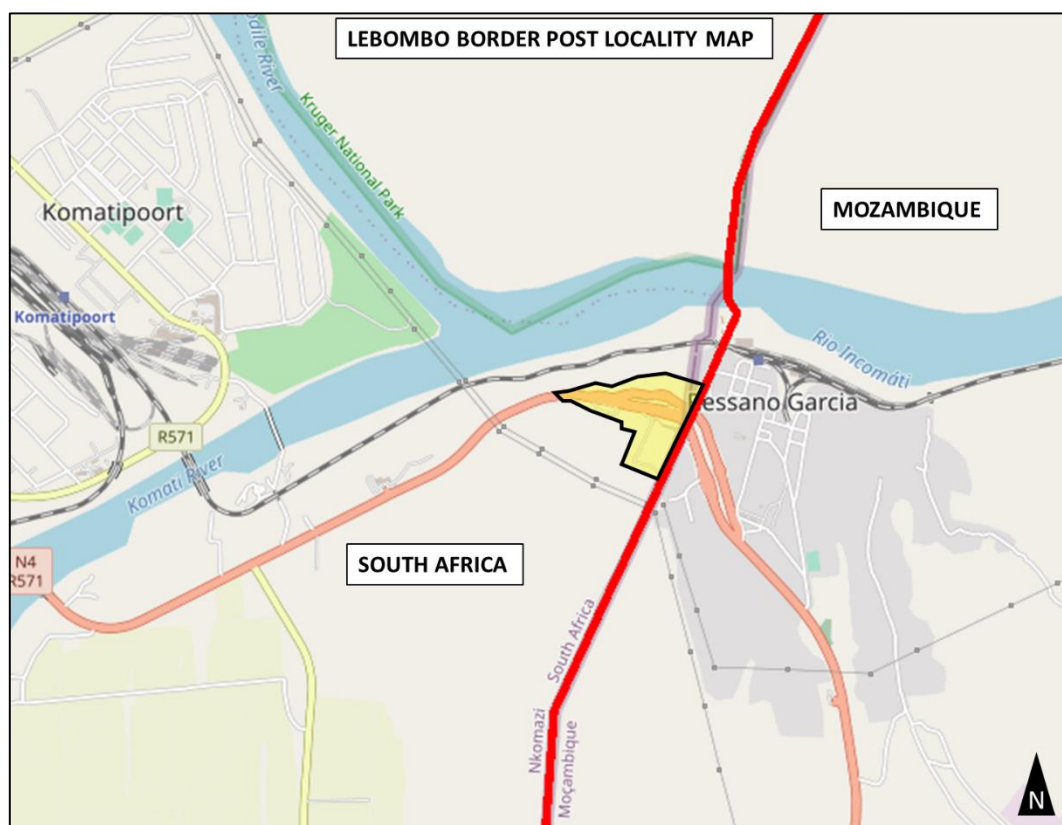


Figure 3-1: Study Area Locality

3.1.2 ACCESSIBILITY

3.1.2.1 Road

The study area can be accessed via the N4 national road. The N4 was designed as an international link between Johannesburg/Pretoria and Mozambique (Lebombo). The N4 follows an east-west alignment reaching from Gauteng (Johannesburg/Pretoria) in the west to Mozambique at the Lebombo Border Post in the east. The road currently passes through or alongside important urban areas in the district including Emalahleni, Middelburg, Belfast, Machadodorp, Waterval Boven, Mbombela, Matsulu, Malalane and Hectorspruit. Notably, the N4 is an important freight corridor for the transportation of timber, agricultural produce and coal. The N4 connects to the R571, R570 and R36(N4).

It is important to note that a portion of the road that falls under the jurisdiction of SANRAL is included within the masterplan layout area of the Port of Entry.

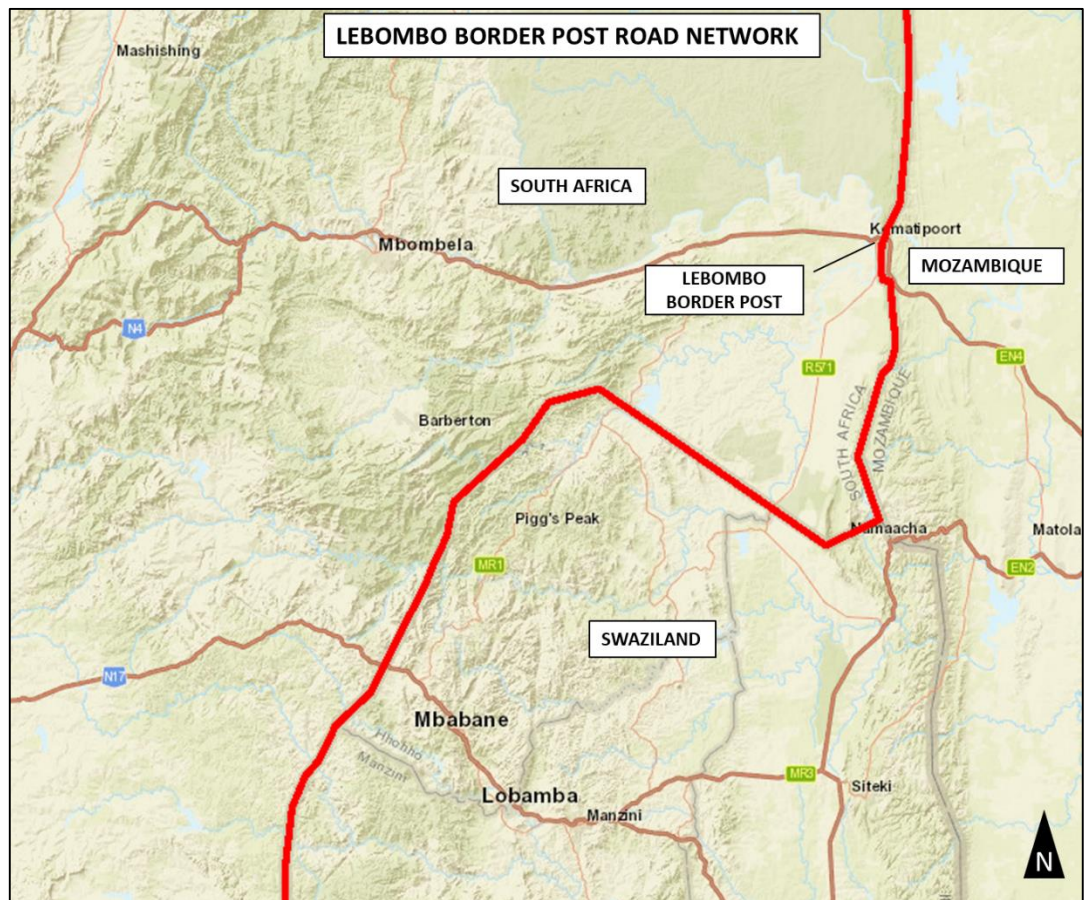


Figure 3-2: Road Network

3.1.2.2 Rail

The study area is accessible by rail. There is a railway line that travels from Gauteng (Brakpan/Springs area) traversing through several towns in Mpumalanga all the way to Komatipoort. The railway line further travels east into Mozambique and south towards Swaziland.

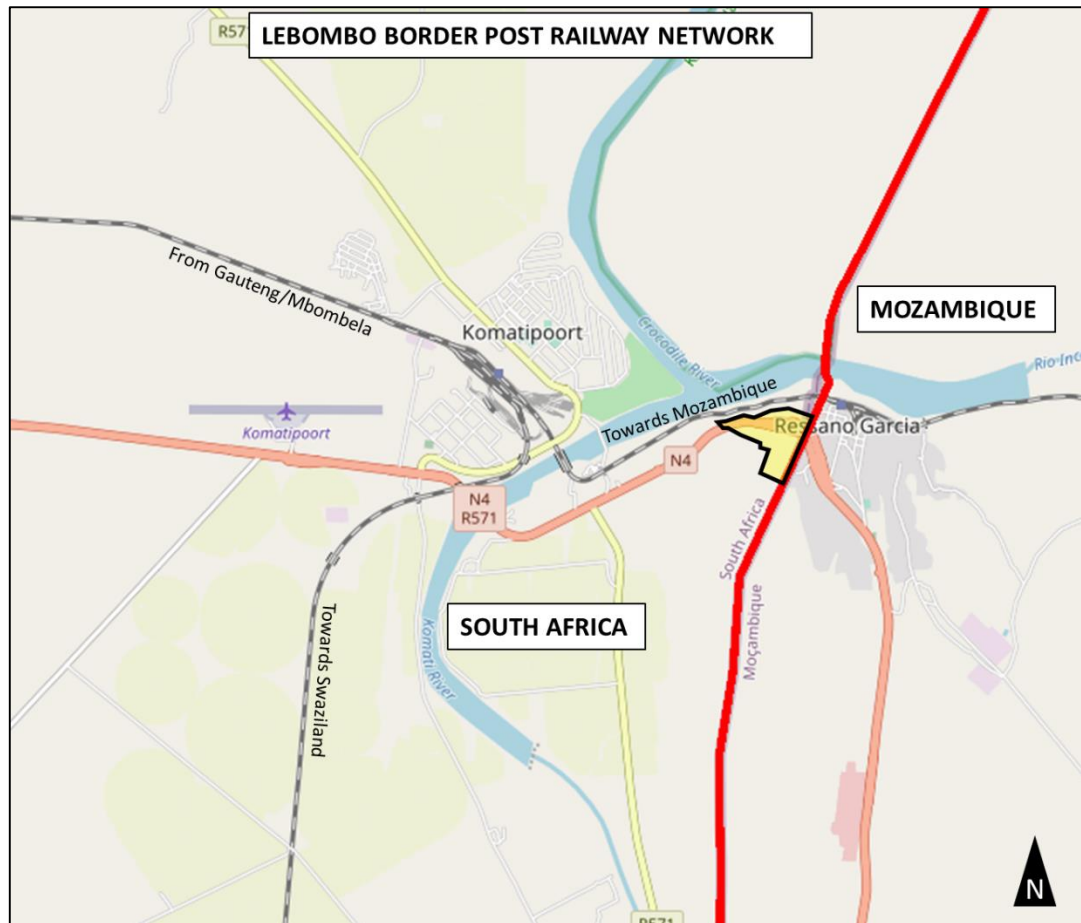


Figure 3-3: Railway Network

3.1.2.3 Air

The District's transportation network includes a number of airfields in the vicinity of Nelspruit Airport, Kruger Mpumalanga International Airport, The Rest airstrip, Chimp Eden airstrip, Blackie Swart Airport, Tonetti airstrip, TSB Airfield, Gazebo Fly-in, Mtiti Fly-in and Komatipoort. The functioning of these is however limited due to the absence of air traffic control and landing lights.

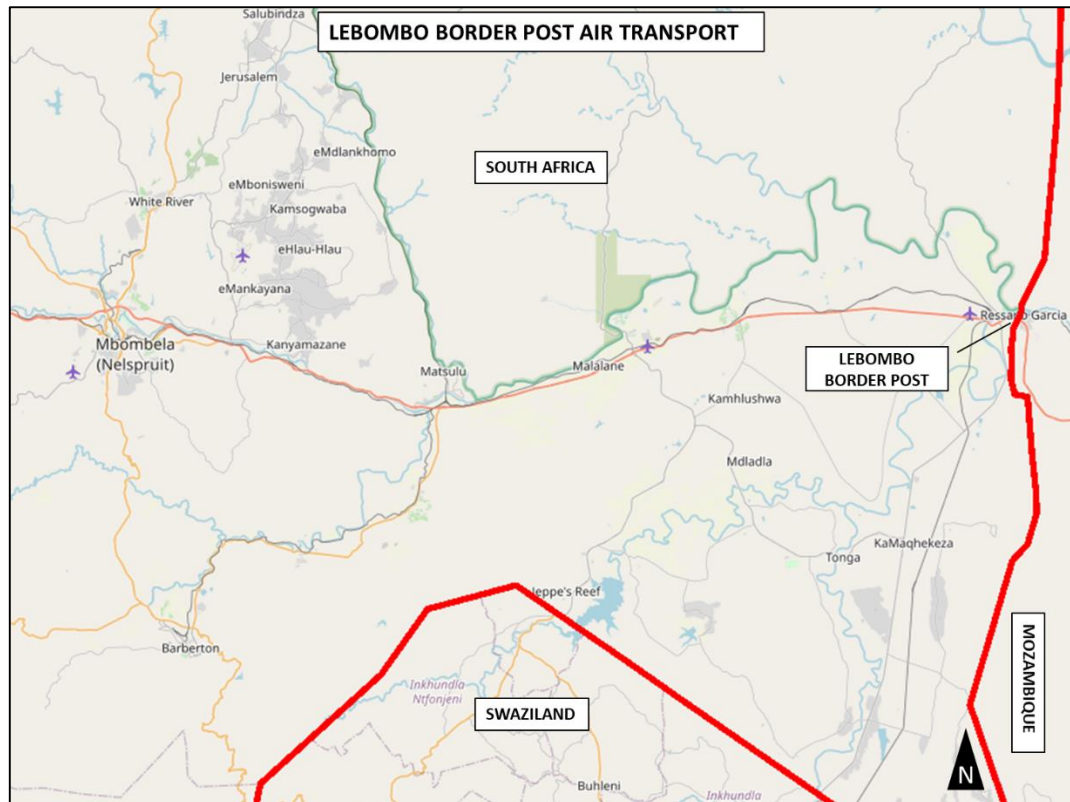


Figure 3-4: Air Transport

3.2 CADASTRAL ASSESSMENT

3.2.1 PROPERTIES LOCATED WITHIN THE STUDY AREA

This section establishes the exact position and location of the property as well as the existence of any servitude or restrictive conditions that could potentially influence the utilisation of the property.

In order to determine and identify the properties that are situated within the study area, the boundaries of the subject area were spatially mapped and superimposed onto the existing cadastral dataset for the larger geographical area.

Superimposing the boundary of the study area over the cadastral database enabled the identification of all properties situated within the boundaries of the subject area.

The cadastral arrangement of all properties within the study area are illustrated in **Figure 3-5**. All servitudes affecting the study area are also included on the cadastral base plan.

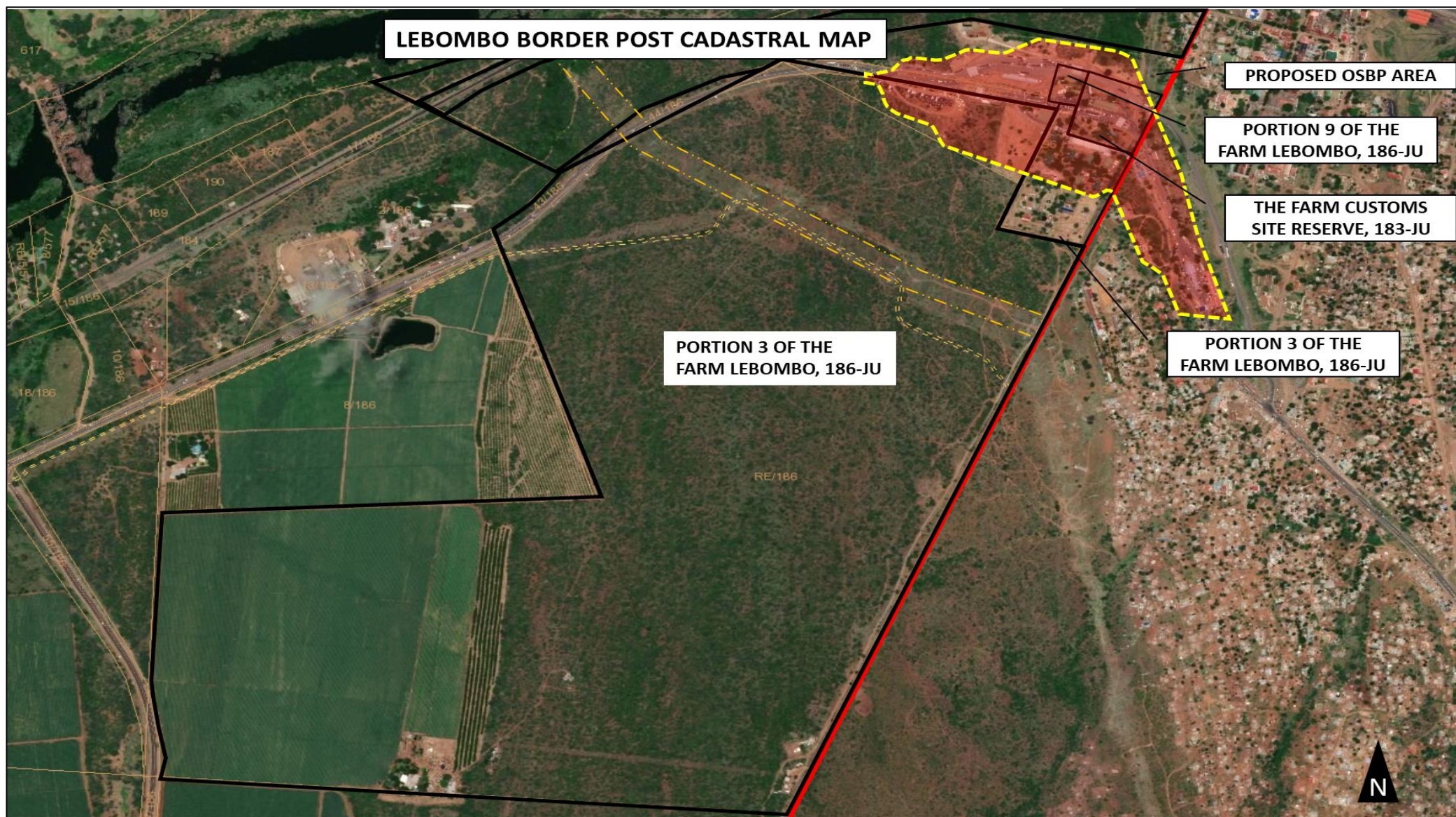


Figure 3-5: Cadastral Map

Following from the spatial mapping of the study area boundary it is evident that the study area consists of a number of different farm portions. **Table 3-1** below summarises all properties located within the study area boundary.

Table 3-1: Property details within subject property

	Farm Number	Farm Name	Extent (Ha)
1	Remaining Extent	of the farm, Customs Site Reserve, 183-JU	2.049 Ha
2	Portion 7	of the Farm Lebombo, 186-JU	33.729 Ha
3	Portion 3	of the Farm Lebombo, 186-JU	214.26623 Ha
4	Portion 9	of the Farm Lebombo, 186-JU	0.555 Ha
Overall size			250.59923 Ha

3.2.2 SIZE

The study area measures approximately 20 hectares in extent off the overall 250.59923 hectares.

3.3 LEGAL STATUS

3.3.1 OWNERSHIP

*Refer to Title Deeds in **Appendix B**.*

The ownership of all properties located within the study area was investigated and the results of the assessment are documented in the **Table 3-2** below:

Table 3-2: Property ownership within study area

FARM NUMBER	FARM NAME	OWNER	TITLE DEED
Remaining Extent	of the farm, Customs Site Reserve, 183-JU	National Government of South Africa	DU1000/800
Portion 7	of the Farm Lebombo, 186-JU	Van Standen Marthinus Pretus	T9218/2017
Portion 3	of the Farm Lebombo, 186-JU	National Government of South Africa	T36311/1963
Portion 9	of the Farm Lebombo, 186-JU	National Government of South Africa	T9609/1970

3.3.2 BONDS

There are no Mortgage Bonds over the properties.

3.4 STUDY AREA PROPERTY DETAILS OF PROPERTIES

3.4.1 REMAINING EXTENT OF THE FARM, CUSTOMS SITE RESERVE, 183-JU

3.4.2 PORTION 7 OF THE FARM LEBOMBO, 186-JU

3.4.3 PORTION 3 OF THE FARM LEBOMBO, 186-JU

3.4.4 PORTION 9 OF THE FARM LEBOMBO, 186-JU

3.5 LAND USE

Following from the mapping of facilities, a broad land use map was created by categorising all facilities and existing uses into the following land-use categories:

- Agricultural
- Businesses
- Road/Transport
- Border Post Staff Residences
- Water Treatment
- Border Post South African Side

The land use map is indicated in **Figure 3-6** below.



Figure 3-6: Land Use

3.6 PROPERTY ZONING

3.6.1 PROPERTY ZONING

The zoning of the farm portions is per definition agriculture since it is not included in the municipal scheme per se. The purpose of the project is to ensure the correct zoning.

3.7 POTENTIAL EXPANSION OF THE LEBOMBO PORT OF ENTRY

3.7.1 VACANT LAND

There are several farm portions situated towards the north, south and west of the study area which could be used for expansion purposes. It is indicated by the SDF that the majority of land portions surrounding the border post falls within private land and thus land access requires acquisitions through negotiations with private land owners.

3.7.2 DEVELOPMENT CONSTRAINTS

3.7.2.1 Servitudes

Refer to **Figure 3-5** mentioned earlier in **Section 3.2**. The following servitudes have been identified on the study area:

3.7.2.1.1 Physical Constraints

The physical constraints in the expansion of the border post includes the Topography of the area to the north of the border post, the informal business at the entrance of the border post.

3.7.3 ADJOINING DEVELOPMENTS

3.7.3.1 Current Developments

There are no current developments within close proximity to the border post.

3.7.3.2 Future Developments

According to the Nkomazi Local Municipality there is no new development that is envisaged close proximity to the Lebombo Port of Entry.

3.8 NKOMAZI MUNICIPALITY SPATIAL DEVELOPMENT FRAMEWORK.

The Nkomazi Local Municipality has developed a draft Land-Use Scheme (LUS) in 2017. The LUS seek to regulate how land will be used within the municipality. In the case of Mantsopa, the LUS does mention boaderpost nor have concent uses related to PoE.

The municipality have further developed a Spatial Development Framework (SDF) 2017 for the area. However that SDF does not say anything about the development of PoE in the area. Thus the current land use at the port of entry and its surroundings are currently not regulated by any authority. They are haparzard and have naturally grown over time responding to the needs at the PoE.

4 LAND SURVEYING

The surveyor as part of the team surveyed the area of the proposed development. The following were the findings of the investigation:

- The entire port of entry infrastructure is situated on the farm LEBOMBO BORDER POST No.996-JU. The farm measures 19, 9062 hectares in extent.

The farm is a consolidation of the following farm portions:
farm portions:

- (1) Remaining Extent of Portion 29 of the farm Lebombo No.186-JU
- (2) Remaining Extent of Portion 28 of the farm Lebombo No.186-JU
- (3) Portion 9 of the farm Lebombo No.186-JU
- (4) Portion 3 of the farm Lebombo No. 186-JU and
- (5) The farm Customs Site Reserve No.183-JU

➤ Land Uses found on the property

The entire farm is used for offices and activities relating to the port of entry.
The is also residential accommodation within the farm

➤ Servitudes

There is are no servitudes affecting the farm.

Surveyor s report is attached as **Annexure C**

5 LAND SURVEYING

The following figure was created by professional Land Surveyor and indicates the contours on the study area. The detailed figure is also attached in **Appendix D**.

Figure 5-1: Land Survey

The methodology adopted during the Environmental Screening Assessment is broadly outlined below:

- Define and demarcate the boundaries reflecting the extent of the study area
- Specify attributes of the environment including the sensitivity, extent inter-relationship and significance of attributes identified
- Identify environmental management priorities
- Indicate the kind of activities that would have a significant impact on sensitive features
- Indicate undesirable activities in the study area

6.1 DESCRIPTION OF RECEIVING ENVIRONMENT

This section provides an understanding of the receiving environment within the study area and provide the groundwork for sustainable development planning within the study area.

The sub-sections listed below provides a baseline of the receiving environment within the study area and include:

- Climate
- Air quality
- Topography
- Geology and Soils
- Land capability
- Biome
- Vegetation
- Hydrology
- Threatened terrestrial ecosystems
- Terrestrial and freshwater critical biodiversity areas
- Cultural heritage
- Palaeontology.

6.1.1 CLIMATE

The mean annual precipitation (MAP) of the region is 910 mm. The frequency of frost varies between three and 20 days per annum (Mucina & Rutherford, 2006).

6.1.2 AIR QUALITY

An air quality monitoring station, providing data of the ambient air quality of the area is not available in Nkomazi Local Municipality or within the proximity of the study area.

6.1.3 TOPOGRAPHY

The altitude of the study ranges between 880 m to 1740 m above mean sea level. The topography associated with KaNgwane Montane Grassland vegetation, which occurs in the study area, is characterised by Mucina & Rutherford (2006) as undulating hills and plains.

6.1.4 GEOLOGY AND SOILS

The geology of the area is described by Mucina & Rutherford (2006) as mainly granite of the Mpuluzi Granite (Randian Erathem).

The soil type (code Ac) of the study area can be described as red and yellow soils with low to medium base status. The soil type is normally associated with high rainfall areas where soils are subject to leaching of nutrients from the soil profile. The soil is thus mostly low in base elements (K, Ca, Mg, and Na). The soil within the study area is classified as undifferentiated structureless soils with favourable physical properties. The limitations of the soil include a restricted soil depth, excessive or imperfect drainage and high potential for erosion.

The following chapter will discuss the Geotechnical Investigation conducted for the study area.

6.1.5 LAND CAPABILITY

Schoeman, *et al* (2000), defined land capability as the extent to which land can meet the needs of one or more uses under defined conditions of management. Land capability is also an important determinant of whether or not a change of land use from agriculture to non-agricultural use will be allowed.

The land capability of the study area is classified as Class III - Moderate potential arable land. The Land Capability Class is presented in the table below.

Table 6-1: Land capability

CLASS	DEFINITION	CONSERVATION NEED	USE SUITABILITY
III	Moderate Limitations. Some erosion hazard	Special conservation practice and tillage method	Rotation of crops and ley (50%)

6.1.6 BIOME

The study area is situated within Mpumalanga's grassland biome. The grassland biome occurs mostly on deep, fertile soils of high agricultural value. For this reason, a large proportion of the study area's landscape has already been modified for the cultivation of crops. It should be noted that most grassland plants are long-lived, slow-growing perennials and can be easily degraded by change of land-use that causes the removal or damage of natural vegetation. Once this happens, the grassland is invaded by weedy pioneer plants, many of which are woody invasive alien species, which out-compete the slower-growing grassland plants.

This can have damaging effects on grassland ecosystems and may lead to serious landscape management problems. Grasslands occupy just over 61% the surface area of the Province and are currently the most at-risk and least well-protected biome of the Province.

6.1.7 VEGETATION

The study area is situated within the Mpumalanga's KaNgwane Montane Grassland vegetation unit. This unit is considered vulnerable with a conservation target of 27% (Mucina & Rutherford, 2006). The KaNgwane Montane Grassland vegetation structure comprise a short-closed grassland layer with many forbs, and a few scattered shrubs on the rocky outcrops. The following biogeographically important taxa are associated with this vegetation type (Mucina & Rutherford, 2006).

Table 6-2: Biogeographically important taxa

SPECIES	TYPE	ENDEMIC
<i>Hemizygia modesta</i>	Herb	Barberton endemic
<i>Hemizygia thorncroftii</i>	Herb	
<i>Selago stewartii</i>	Herb	
<i>Watsonia watsonioides</i>	Geophytic herb	Northern sourveld endemic
<i>Kleinia galpinii</i>	Succulent herb	
<i>Hemizygia albiflora</i>	Low shrub	

Endemic taxa include the following:

Table 6-3: Endemic taxa

SPECIES	TYPE
<i>Lotononis difformis</i>	Herb
<i>Lotononis spicata</i>	Herb
<i>Streptocarpus occultis</i>	Herb
<i>Syncolostemon comptonii</i>	Low shrub

6.1.8 WATER MANAGEMENT AREA

The study area falls within the Inkomati Water Management Area (WMA) which is located in the north east of South Africa. The Inkomati WMA consists of three main rivers, the Komati in the South, the Sabie in the North and the Crocodile River in the centre. All three of these rivers flow into Mozambique to form the Inkomati River which flows into the Indian Ocean just north of the city of Maputo.

6.1.9 WATER RESOURCE ZONE

The study area is located within the catchment of the Komati West (Sub-WMA) predominantly situated within the Elands River water resource zone (quaternary catchment X21K and W56B). The area is categorised as a Strategic Water Source

Area comprising high rainfall areas that produce 50% of Mpumalanga's runoff in only 10% of the surface area, thus supporting biodiversity and underpinning regional water security (SANBI). The ecology/rivers within this zone are categorised as moderately modified (C PES)¹. Impacts are mostly non-flow related associated with forestry, farming, irrigation and the presence of small (farm) dams. Some water quality deterioration, associated with these land-uses (irrigation return flows, recreation and upstream towns) is also prevalent.

The desired management objective pertaining to Strategic Water Source Areas includes the following:

- Maintain ecological integrity across the entire sub-catchment, paying particular attention to maintaining water quantity, water quality and habitat integrity
- Strategic Water Source Areas tend to be favoured for plantation forestry and the application of best-practice management is encouraged.
- The clearing of invasive alien plants from drainage lines and wetlands within these areas must be a provincial priority.
- Restoration of wetlands and degraded areas within these catchments is encouraged.

6.1.10 HYDROLOGY

A non-perennial river is to the west and north of the Lebombo Land Port of Entry's Wastewater Treatment Works (WWTW).

¹ DWAF, The Determination of Water Resource Classes and Associated Resource Quality Objectives in the Inkomati Water Management Area, 2013,

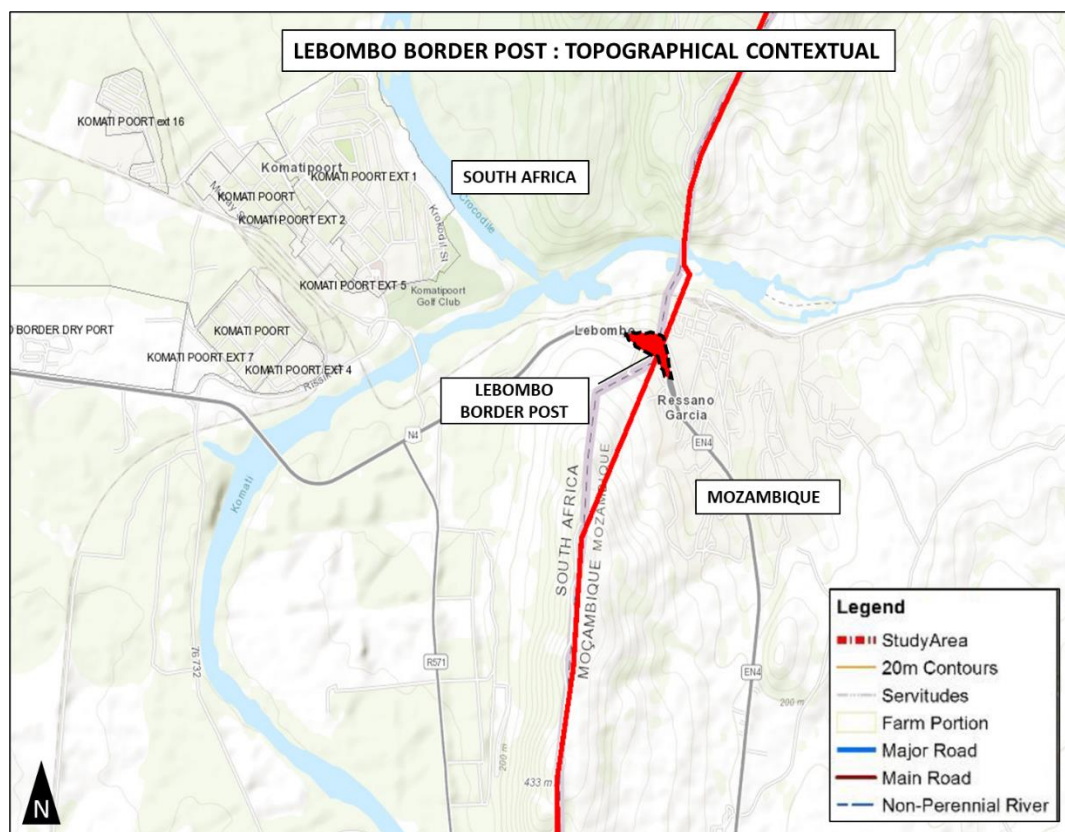


Figure 6-1: Non-perennial rivers

No National Freshwater Ecological Protected Area Rivers (River NFEPA) or Wetland NFEPA are located within close proximity to the study area.

The Environmental Impact Assessment Regulations, 2017, (GN R. 326) published under the National Environmental Management Act (NEMA) (Act No. 107 of 1998) requires environmental authorisation to be obtained through undertaking a basic assessment process should the following listed activities be triggered:

- **Activity 12 in Listing Notice 1 of EIA Regulations, 2014** relates to the development of infrastructure or structures with a physical footprint of 100 square metres or more. No wetlands or watercourses were found to be present on the proposed site or within 32m of the proposed site.
- **Activity 19 in Listing Notice 1 of EIA Regulations, 2014** relates to the infilling or depositing of any material of more than 10 m³ into, or the dredging, excavation or moving of soil, sand, shell grit, pebbles or rock of more than 10 m³ from a watercourse.
- Any development (structures, pipelines, roads, etc.) within the regulated area of a watercourse², constitutes a **section 21(c) and (i) water use**.

- a. The outer edge of the 1 in 100-year flood line and/or delineated riparian habitat, whichever is the greatest distance, measured from the middle of the watercourse or a river, spring, natural channel, lake or dam;
- b. In the absence of a determined 1 in 100-year flood line or riparian area the area within 100 m from the edge of a watercourse where the edge of the watercourse is the first identifiable annual bank fill flood bench; or
- c. A 500 m radius from the delineated boundary (extent) of any wetland or pan.

- A General Authorisation should be applied for from the Department of Water and Sanitation for the use of water in terms of **section 21(c) or (i) of the National Water Act, 1998 (Act No. 36 of 1998)** provided that the water use has a low-risk class as determined through the Risk Matrix. If the water use is of a high-risk class, a Water Use Licence should be applied for.

6.1.11 THREATENED TERRESTRIAL ECOSYSTEMS

The ecosystem threat status within the study area is classified as vulnerable in terms of SANBI's Mpumalanga Biodiversity Sector Plan. The ecosystem threat status informs the degree to which the ecosystems are still intact or alternatively losing vital aspects of its structure, function and composition to provide ecosystem services.

6.1.12 TERRESTRIAL AND FRESHWATER CRITICAL BIODIVERSITY AREAS

The terrestrial and freshwater critical biodiversity within the study area has been identified as heavily modified and other natural areas, refer to the figure below.

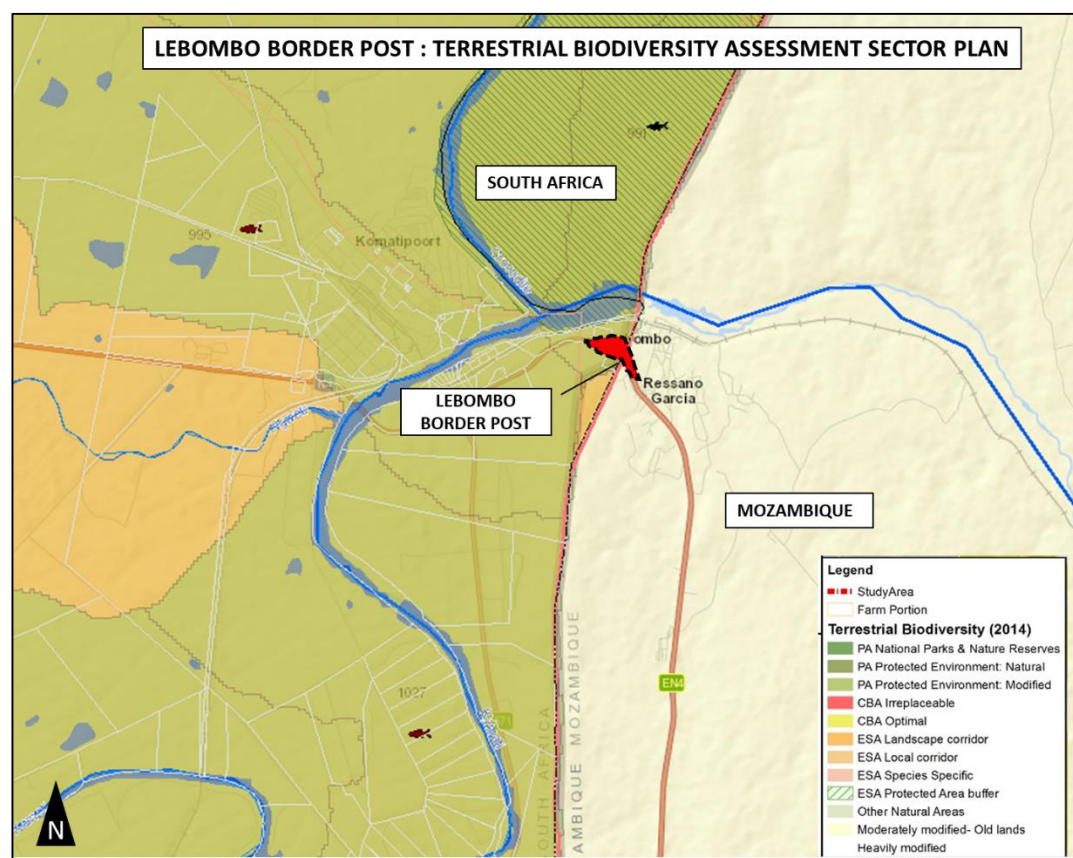


Figure 6-2: SANBI's Mpumalanga Biodiversity Sector Plan

Areas identified as heavily modified include areas that have been modified by human activity to such an extent that any valuable biodiversity and ecological function has been lost, whilst the other natural areas recognised are not currently identified as priority areas, however, most of the natural character is retained and various biodiversity and ecological infrastructural functions are performed.

6.1.13 CULTURAL HERITAGE

A heritage impact assessment shall be undertaken by a heritage consultant to determine if any cultural heritage resources exist within the study area.

6.1.14 PALAEOLOGY

According to the SAHRA's fossil heritage layer database, the study area falls within an area with insignificant palaeontology sensitivity. No palaeontology studies are required.

6.2 DESCRIPTION OF OPERATIONS

The sub-sections listed below provides a baseline of the operations and environment aspects to be considered:

- Water and Wastewater Management
- Materials Handling and Storage
- Waste Management
- Air Quality Management.

6.2.1 WATER AND WASTEWATER MANAGEMENT

The supply of water and the way in which wastewater is treated is discussed under the following sub-headings:

- Water Supply
- Wastewater
- Water Quality Testing.

6.2.1.1 Water Supply

No boreholes are located in close proximity to the property. No natural surface water features are present within the property.

An application for a water use registration must be lodged with the Department of Water and Sanitation. Data from historic records show that the average monthly abstraction rate for portable water is approximately 207 067 m³. No water use licence was available for review on the day of the site visit that permits the abstraction of groundwater. It should be noted that in terms Notice 538 of 2016 of the National Water Act, 1998 (Act No. 36 of 1998) the maximum volume of water that may be taken from groundwater resources on each property or piece of land owned by DPW within quaternary drainage regions X21K and W56B is equal to 75 cubic metres per hectare per year.

The WTW is located at the north eastern corner of the border. The border extracts water from the Komati River for consumption. The water that is extracted is treated before being used. There is no WUL on site for the extraction of water. Jojo tanks are used to collect raw water for other uses.

The statutory requirements related to water use are summarised below:

- **National Water Act, 1998 (Act No. 36 of 1998); Section 21 (a): Taking water from a water resource:** “All water users who are using water for agriculture: aquaculture, agriculture: irrigation, agriculture: watering livestock, industrial, mining, power generation, recreation, urban and water supply service must register their water use with Department of Water and Sanitation.”
- **National Water Act, 1998 (Act No. 36 of 1998); Section 21 (a): Taking water from a water resource:** Should the maximum volume of water that may be taken from groundwater resources exceed the permissible volumes a water use licence would be required.
- **EIA Regulations, 2014, Listing Notice 1 (GN R. 983), Activity 13:** “The development of facilities or infrastructure for the off stream storage of water, including dams and reservoirs, with a combined capacity of 50 000 cubic metres or more” would require environmental authorisation through undertaking a basic assessment process.

6.2.1.2 Wastewater

The WWTW is situated at the northern extent of the Lebombo Border Post. No records were available for review, indicating the status of the registration of the WWTW. According to the site personnel, the WWTW works is classified as a Class C Wastewater Treatment Plant. The gate at the WWTW was not locked on the day of the site visit. The lack of access control resulted in the surrounding livestock entering the plant, feeding on the reed beds of the WWTW. The alteration to the reed bed system will result in the filtering process not functioning as intended. The access gate should be kept locked to provide adequate control access to the WWTW. Signs along the fence should be installed to indicate that entry is not permitted and to warn intruders that they will be prosecuted.

6.2.1.3 Wastewater Discharge Consent

Records were not available for review on the day of the site visit, indicating that a water use licence was received from the Department of Water and Sanitation for the discharge of effluent into the nearby watercourse. Historic records show that the average monthly throughput of the WWTW is approximately 6 312 m³.

The WWTW is located on the south eastern side of the border post. Currently the border posts treat the waste water (sewage) that is generated on site. The final product is discharged into Komati River. Department of Public Works (DPW) is responsible for the WWTW. There are records of the treatment of the wastes on site; however, there is no Water Use Licence (WULA) for the discharge of the final product.

The following legislation relates to the treatment of effluent and the discharge of water containing waste into a water resource.

- **EIA Regulations, 2014, Listing Notice 1 (GN R. 983), Activity 25:** *“The development and related operation of facilities or infrastructure for the treatment of effluent, wastewater or sewage with a daily throughput capacity of more than 2000 cubic metres but less than 15 000 cubic metres”, would require a waste management license through undertaking a basic assessment process.”*
- **National Water Act, 1998 (Act No. 36 of 1998); Section 21 (f) & (g):** Discharging waste or water containing waste into a water resource through a pipe, canal, sewer, or other conduit and disposing of waste in a manner which may detrimentally impact on a water resource requires a water use licence.

6.2.2 MATERIALS HANDLING, USE AND STORAGE

6.2.2.1 Pollution Control

Paved areas were identified where regular spills occurs such as the truck parking area. No adequate containment infrastructure/or spill kits were observed. With reference to Section 19 and 151 of the National Water Act No. 36 of 1998, landowners and persons in control of land on which a situation exists that could give rise to water pollution are required to implement reasonable measures (as defined) to prevent such pollution from occurring, continuing and/or recurring. These measures include pollution prevention at source, containment of pollutants and remedial action, as the case may be. Significant infrastructure improvements and spill response systems are required to eliminate the risk of pollution through spillages at the study area.

6.2.2.2 Above Ground Fuel Storage Tanks

Two above ground diesel tanks are located at the WWTW and at the backup generator. The capacity of each storage tank is 2 000 litres. No safety signs or fire prevention facilities were displayed at the diesel storage tank.



Figure 6-3: Diesel tank

Safety signs and fire prevention facilities should be available at all diesel storage facilities. A risk assessment should be undertaken in consultation with the municipal fire brigade to determine the type and amount of facilities that will be required. Emergency numbers for local authorities (fire department, police, and ambulance) should be placed in a prominent area. Further reference should be made to the controlling regulations covering above-storage tanks for petroleum products as part of the National Building Regulations are incorporated in SANS 10131: Above-ground storage tanks for petroleum products.

The following legislation relates to the storage and handling of dangerous goods:

- **EIA Regulations, 2014, Listing Notice 1 (GN R. 983), Activity 14:** *“The development of facilities or infrastructure, for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic metres.”* Such an activity, if triggered, will require that a Basic Assessment process.

6.2.2.3 Asbestos

Before the 1980's asbestos was widely used in cement building materials, pipework lagging, insulating mattresses and rope, fire resistant insulation boards, sprayed fire-proofing products, floor tiles and coverings, water and sewage pipes, lifts and machinery. It is currently unknown if asbestos is present or not present at the study area.

An asbestos survey should be done prior to any demolition work, building maintenance, repair or remodelling work, should the possibility exist of asbestos being present at the study area. The Asbestos survey must be undertaken by an accredited asbestos contractor, registered at Department of Labour.

6.2.3 WASTE MANAGEMENT

The National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) is the principal legislation governing waste management. The most important obligations imposed by the Act are:

- a) The obligation to avoid, minimise, reuse and recycle waste as far as possible (the so-called “waste hierarchy”)
- b) The obligation to ensure disposal of waste in an “environmentally sound manner”
- c) Licensing obligations for certain specified activities
- d) General storage requirements.

A dedicated waste storage area is available at the study area. During the site visit, the occurrence of illegal dumping was observed next to the WWTW. Inadequate waste management service delivery and sustainability for the region has been identified as a challenge within the Chief Albert Luthuli Local Municipality.

6.2.3.1 General Waste

The current operations at the study area, do not provide for processes of identifying the general waste categories generated by the activities undertaken at the port of entry. No data or information with regard to general waste volumes, management procedures and related waste registers were available for review on the day of the site visit.

The types of general waste that can be expected at the study area include mainly domestic waste and travellers waste, comprising mainly from, but not limited the following:

- Paper and cardboard
- Plastic (bottles and bags)
- Wood (crates)
- General garden waste
- Food waste
- Glass
- Metals
- Tyres.

A waste management facility for the sorting and storage of general and recyclable waste is proposed. The waste management facility should be constructed with adequate containment infrastructure. It is further proposed that the feasibility of recycling the waste is investigated.

The feasibility of a recycling initiative will be determined by the volumes generated by the operations and households located at the study area and the availability of recycling companies in the proximity of the study area, that will be willing to collect the recyclables.

6.2.3.2 Hazardous Waste

No data or information with regard to the categories of hazardous waste, hazardous waste volumes, safe disposal certificates, management procedures and related waste registers were available for review on the day of the site visit. The following hazardous waste has been identified, which may pose threats to public health or the environment.

6.2.3.2.1 Insoluble solid waste

The insoluble solid waste includes the waste collected from inlet screens e.g. sanitary products and paper material that are removed from the inlet screens of the WWTW.

The insoluble solid waste should be classified as hazardous waste until proven otherwise due to its potential hazardous properties and be disposed of and/or treated accordingly. An investigation is currently undertaken to determine the possible waste types that may be incinerated such as the waste collected from the inlet screen.

The borders collect waste in bins and this waste is disposed of site. The RAMP contractors are responsible for ensuring that the disposable waste is collected. There was no documentation stipulating the time frames for neither the collection nor the disposable mechanisms. There was also no evidence of an incinerator or the burning of disposable waste within the boundary of the site.

6.2.3.2.2 Sewage Sludge

Sewage sludge should be classified as hazardous waste until proven otherwise due to its potential hazardous properties and be disposed of/treated accordingly. Sewage sludge treatment and disposal for certain agricultural and other beneficial uses is receiving increasing attention. Investigations regarding the feasibility of using the sewage sludge for agricultural and/or other beneficial uses is recommended.

6.2.3.3 Atmospheric Emissions

An incinerator is located within the premises of the WWTW and was not found to be operational. No record was available for review, indicating that the relevant permits/licences have been applied for.

The site personnel are currently investigating the type of the waste that can be incinerated e.g. insoluble waste from the inlet screens at the WWTW. The incinerator is equipped with three burners and has the capacity to dispose of a large animal carcass.

An application for an atmospheric emission licence should be made in terms of the National Environmental Management: Air Quality Act, 2004 (Act no. 39 of 2004), Subcategory 8.1 and 8.2 should the following activities apply:

- Facilities where general and hazardous waste are treated. All installations treating 10 kg per day of waste
- All installations for the cremation of human remains, companion animals and the incineration of veterinary waste.

6.3 SUMMARY

Table 6-4 below provides an overview of the situation analysis of the environment and operations at the study area.

Table 6-4: Environmental Summary

ASPECT	SITUATION	MANAGEMENT ACTION/COMMENT
Soils	Soils susceptible to erosion.	The existing vegetation cover needs to be preserved and maintained as far as possible to prevent erosion.
Vegetation	KaNgwane Montane Grassland vegetation type is classified as vulnerable.	The clearance of 1 ha or more vegetation will require environmental authorisation.
Hydrology	The study area falls within quaternary catchment X12K and W56B.	Both catchments allow for water use under General Authorisation.
Cultural Heritage Resources	A specialist study will be undertaken by a heritage consultant to determine if any cultural heritage resources exist within the study area.	Sensitive cultural heritage resources in the study area needs to be confirmed by the Heritage Consultant.
Palaeontology	The study area falls within an area with insignificant palaeontology sensitivity.	No palaeontology studies are required.
Water Management	Poor access control at the wastewater treatment plant.	Access control methods need to be implemented at the WWTW.
	Lack of information regarding the authorisation for the discharge of effluent into the nearby watercourse.	Authorisation is required by Department of Water and Sanitation for the discharge of effluent into the nearby watercourse.
	Lack of information regarding the authorisation for the abstraction of groundwater.	Authorisation is required by Department of Water and Sanitation for the abstraction of groundwater.

ASPECT	SITUATION	MANAGEMENT ACTION/COMMENT
	Inadequate water pollution prevention.	Significant infrastructure improvements and spill response systems are required to eliminate the risk of pollution through spillages at the study area.
Material Handling, Use and Storage	It is unknown if asbestos is present or not present at the study area.	<ul style="list-style-type: none"> • An asbestos survey should be done prior to any demolition work, building maintenance, repair or remodelling work, should the possibility exist of asbestos being present at the study area. • The Asbestos survey must be undertaken by an accredited asbestos contractor, registered at Department of Labour.
	Lack of demarcated hazardous chemical substances storage areas.	<ul style="list-style-type: none"> • Demarcated area should be made available for the storage of hazardous chemical substances. • Provision should be made for statutory safety signs and notices at all hazardous storage areas. • Sufficient firefighting equipment should be made available where hazardous chemical substances are stored. • All hazardous chemical substance containers must be labelled with the details of the contents and handled, stored, disposed of and transported as specified by the supplier and the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) and regulations.
Waste Management	Lack of data or information with regard to general waste volumes, management procedures and related waste registers were available for review on the day of the site visit.	<ul style="list-style-type: none"> • A waste management facility for general waste materials is proposed. The waste management facility should be constructed with adequate containment infrastructure (bund area with spill collection drains/sumps). • It is further proposed that the feasibility of sorting general waste into the different waste categories are undertaken, as well as the possibility of recycling the recyclable waste.

ASPECT	SITUATION	MANAGEMENT ACTION/COMMENT
	Lack of data or information with regard to the categories of hazardous waste, hazardous waste volumes, safe disposal certificates, management procedures and related waste registers.	<p><u>Insoluble solid waste</u></p> <ul style="list-style-type: none"> The insoluble solid waste should be classified as hazardous waste until proven otherwise due to its potential hazardous properties and be disposed of and/or treated accordingly. Investigations are in the process of being undertaken by the site personnel n to determine the possibilities of incinerating the waste collected from the inlet screen. <p><u>Sewage Sludge</u></p> <ul style="list-style-type: none"> Sewage sludge should be classified as hazardous waste until proven otherwise due to its potential hazardous properties and be disposed of/treated accordingly. The recycling of sewage sludge for certain agricultural and other beneficial uses are in the process of being investigated.
Air Quality Management	The incinerator located at the study area was not found to be operational. No record was available for review, indicating that the relevant permits/licences have been applied for.	An application for an atmospheric emission licence should be made prior the operation of the incinerator located at the study area.

7 CIVIL ENGINEERING STATUS QUO

This section will describe the following items:

- Potable water reticulation
- Firewater reticulation
- Sewer reticulation
- Wastewater treatment works
- Stormwater reticulation
- Roads, pavement and parking.

7.1 POTABLE WATER RETICULATION

2 x 11KW pumps pump water from the Crocodile River to a concrete reservoir tank at Lebombo Border Post. Water from the aforementioned concrete reservoir tank goes through an onsite water treatment plant which consists of a grit channel, two settling tanks, three sand filters and a chlorination tank where it is disinfected with chlorine.

Water is pumped into an elevated concrete water tank from the chlorination tank and distributed via gravity to the site. There is a dedicated fire storage tank of approximately 120m³ at the site with its own dedicated fire reticulation system. There are 6 x 10ML polyethylene water tanks on site, dedicated for irrigation with their own reticulation system.

7.1.1 CURRENT SUPPLY CAPACITY

The supply capacity at the site is adequate in catering to the current demand of the border post. There are no reported water shortages at the border post.

7.1.2 ISSUES AND PROBLEMS

One of the 11KW pumps at the water abstraction point at Crocodile River once ceased to function. The second 11KW pump was able to act as a back-up to provide water supply to the site until the non-functioning pump was repaired.

7.1.3 CONSIDERATIONS

Though the current water supply is adequate for the status quo, an upgrade of the border post would constitute to an increase in water demand. This would potentially result in the need to also upgrade the water supply infrastructure for the site. The options that may be considered in upgrading the water supply are:

- Increase the size of the water abstraction pumps and the pipe dimensions;
- Increase the water storage capacity of the water reservoirs; and
- Increase the magnitude of the operations of the onsite water treatment facility to cater for the higher flows.

7.2 SEWER RETICULATION

The sewage from the site is collected, treated and disposed of in the following way:

- The sewage is collected from various ablution facilities and other sewage generating mediums, through a series of pipe networks throughout the border post.
- The sewerage drains via gravity to an onsite waste water treatment plant.
- The sewage is treated in the waste water treatment plant through a biological process consisting of a buffer tank, biological reactor and clarifiers.
- The final effluent from the biological treatment process is then disinfected with chlorine before being discharged into the Crocodile River.
- There are drying beds located onsite for the sludge created from the treatment process. The sludge, once dry, is disposed at a dumping ground offsite.

7.2.1 CURRENT CAPACITY

The design capacity of the waste water treatment plant is not adequate to cater to the current loading at the border post. From the daily flow records observed on site, the treatment plant is operating at approximately an average of 200% of its design capacity during off peak times, this figure is definitely significantly higher during peak times.

7.2.2 ISSUES AND PROBLEMS

The public toilets at the border post suffer from frequent blockages. It is likely that the pipework leading from the public toilets are undersized or are sloped too gently.

The current waste water treatment plant is overloaded which could potentially compromise the quality of effluent from the plant.

7.2.3 CONSIDERATIONS

The current waste water treatment plant is inadequate for the status quo. An upgrade of the border post would constitute to an even higher sewage loading for the plant; therefore, it is imperative that upgrading the waste water treatment plant be a priority in regards to the master plan. The following options may be considered in upgrading the sewerage system and treatment facilities.

- Enlargement and/or introduction of new biological treatment infrastructure in the waste water treatment plant.

- Upgrading of the outfall sewer pipe to adequately accommodate the increase in sewage flows.

7.4 WASTEWATER TREATMENT WORKS

The port of entry has its own private WWTW within their premises. A schematic layout of the WWTW is shown below as taken from the site's maintenance room.



Figure 7-1: Lebombo WWTW

The WWTW consists of the following units and their functions:

- Manual bar screen (with rag catcher) – the purpose of having a bar screen is to remove large objects such as rags and plastics from wastewater.
- Two grit channels – the function of the grit channel is to slow down the flow so that solids such as sand and eggshells will settle out of water.
- Flow meter – the purpose is to measure the total inflow to the WWTW at different times.
- Aeration basin (three compartments) – the function of this unit is to pump air into a tank, which promotes the microbial growth in the wastewater. The microbes feed on the organic material forming flocs, which can easily settle out.
- Clarifier – the function of this unit is to remove solids that are heavier than wastewater and suspended solids called scum.
- Sludge Lagoon – its purpose is to store the collected sludge from the clarifier.

- Two maturations – the function of this unit is to remove pathogens, nutrients and algae.
- Reeds bed – are aquatic plant-based systems that allow bacteria, fungi and algae to digest the wastewater
- Chlorine contact channel – the function is to inactivate harmful microorganisms to humans.

The WWTW shows no sign of overspill or being highly loaded in terms of organic loading.

During the site visit, only a few minor concerns with regard to the operation of the plant were identified. It was noted that the WWTW is not functioning as it was designed to operate. A few of the concerns are mentioned below:

- The aeration basin is being used as the sludge lagoon.
- Animals have access to the reeds bed for grazing, which reduces the functionality of the unit.

The perimeter fence around the maturation ponds and reed bed has reached its design life span and animals around the area have access to the ponds.

Effluent from the WWTW is being discharged into Ngwenya River downstream on the northern side of the study area. The samples of the discharged effluent were not available; a discharge outlet was not accessible to check if the effluent complies with effluent discharge standards.



Figure 7-2: WWTW Inlet headworks



Figure 7-3: WWTW Settling tank



Figure 7-4: WWTW maturation ponds



Figure 7-5: WWTW aerobic tank used as a drying bed

7.5 STORMWATER RETICULATION

Lebombo Border Post has a number of storm-water side channels and pipe networks around the site that direct excess storm-water during heavy rain to a nearby stream. Sections of the storm-water network are no longer functional and require urgent maintenance. These sections are completely filled with silt. In other sections, the grid inlet is completely blocked, thus reducing the capacity of the system.

Silt build up on an open earth channel suggests that the channel is not self-cleansing and therefore the channel will need to be redesigned to the adequate slope. Earth channels need to be cleaned regularly.

The storm water from the site is collected on the site through a network of concrete lined drainage channels and underground pipes. The storm-water drains towards the north of the site into Crocodile River.

The images indicate the condition of the storm-water network.



Figure 7-6: Proof of storm water management



Figure 7-7: Poor housekeeping within the proposed development

7.5.1 CURRENT CAPACITY

The current capacity of the storm water systems seems to be adequate. There are no attenuation ponds or tanks that were observed on site.

7.5.2 ISSUES AND PROBLEMS

No issues were mentioned about the storm-water system on site but currently there is no provision to cater for oil leaks and/or spills from vehicles and tankers.

7.5.3 CONSIDERATIONS

The storm-water system should be sized adequately to take the upgrade of the border post into account.

Since the storm-water runoff discharges into a river, there is need to look at the effects of oil leaks from vehicles and/or potential oil spills from tankers that could affect the quality of the storm-water being discharge and how significant it is.

7.6 ROADS, PAVEMENT AND PARKING

The Lebombo Border Post has a ring network of block paved roads and asphalt paving. The parking lots are also paving block paved.

The road network is in a fair condition with just minor concerns. Certain sections of the road network are not maintained with grass growing over the paving blocks.

8 ELECTRICAL STATUS QUO SUMMARY

This section describes the following electrical infrastructure elements:

- Electrical connection
- Site reticulation
- Diesel generator
- Distribution kiosks and LV reticulation
- Area lighting

8.1 ELECTRICAL CONNECTION

The border post sometimes experiences power outages from ESKOM but this is mitigated by the back-up generator which provides enough electricity to cater to the electrical demands.

8.1.1 SUPPLY AUTHORITY

Electricity to the site is supplied by Eskom.

8.1.2 CONNECTION SIZE

The connection size is currently unknown. The main substation transformer is rated 400 kVA, with the other pole mounted transformers totalling 800 kVA. This means that the total connected load has the potential to be up to 1 200 kVA.

Contact has not yet been established with Eskom. Delta BEC is currently in the process of determining the connection size and spare capacity in the area. Once this information has been received, it will be included in the services design report that will be generated in the next stage of the project.

8.1.3 SPARE CAPACITY

The spare capacity is currently unknown and will be provided once contact with Eskom is made and included in the services design report that will be generated in the next stage of the project. The main supply system and the back-up generator at present have enough capacity to supply the site.

8.2 SITE RETICULATION

8.2.1 MV DISTRIBUTION

The main incomer appears to be a 22 kV overhead Eskom line, metered at 22 kV. At the metering point, the overhead line splits into two to feed the port of entry's main substation, and several pole-mount transformers in the residential area, respectively.

Electrical reticulation throughout the site is achieved by overhead and underground MV and LV cables supplying the local substation and various buildings and distribution kiosks.

The condition of the underground cables could not be determined visually. The overhead lines appear to be in a good condition. They are operational and no faults have been reported.

8.2.2 LOCAL SUBSTATION

The capacity of the supply is currently unknown. However, a 400 kVA, 22 kV / 400 V main transformer is installed in a substation building to the right of the main entrance, next to the generator room. The transformer nameplate is shown below. The transformer was found in good working condition. No leaks were found and the cable terminations appeared to be in good condition.

A third pole mounted transformer is located to the right of the main entrance, just after the two pole mounted transformers mentioned above. This transformer is rated 200 kVA.

A fourth pole mounted transformer is located towards the far right of the main entrance along the road towards the water reservoir. The transformer is rated 500 kVA. The transformer seems to supply several distribution kiosks along the road.

The fifth transformer is located two houses below the water reservoir, towards the right. The transformer is unlabelled and seems to have been disconnected from the supply. From visual inspections, it seems to have been replaced by the pole mounted transformer down the street from its location (that transformer is described above).

8.3 DIESEL GENERATOR

The generator room is to the south of the public parking area, behind the light vehicle inspection area (inbound) and contains a Barlow world (CAT) 280 kVA generator. It is currently unknown which loads are fed from this generator.



Figure 8-1: Diesel generator

8.4 DISTRIBUTION KIOSKS AND LV RETICULATION

A basic electrical assessment of the distribution kiosks and equipment was conducted to provide data on the current condition of the electrical installations and are described below.

There is a 320 V rotor pump control panel for the Water Treatment Plant to the north of the border post, behind the vehicle impound.

There are 16 distribution kiosks in total, two located just after border post, three to the north of the border post and 12 in the residential area to the south of the border post.

Most of the distribution kiosks have nameplates but do not indicate where they are fed from or where they supply power to. The kiosks were locked at the time of inspection and therefore the capacity of the main breakers is unknown. Pictures of the distribution kiosks are show in Appendix A.

8.5 AREA LIGHTING

The lighting on site is achieved by pole mounted street lights and high-mast area lights for the border post, and Post top light fittings for the residential area.

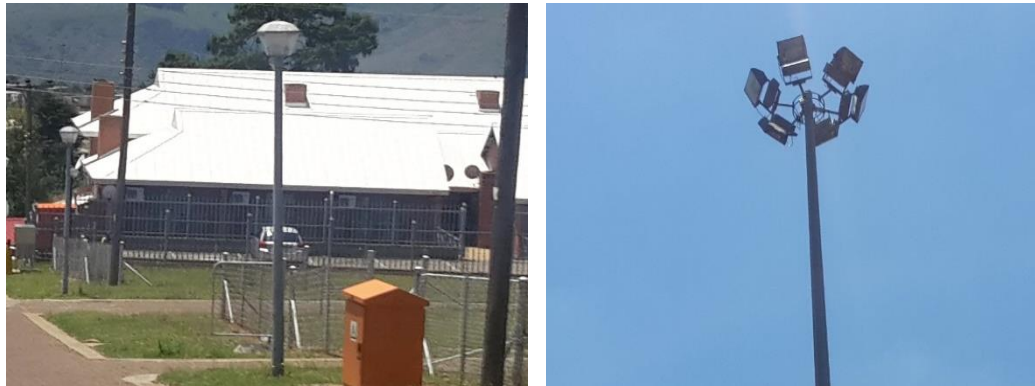


Figure 8-2: Post-top lights and high-mast lights

8.6 SUMMARY

The existing electrical infrastructure throughout the site is generally in good condition.

The main substation transformer is rated 400 kVA, with the other pole mounted transformers totalling 800 kVA. This means that the total connected load has the potential to be up to 1 200 kVA. There is also a 280 kVA standby diesel generator. It is unknown which loads are connected to this generator.

The size of the Eskom connection to the site is currently unknown. Contact has not yet been established with Eskom. Our company is currently in the process of determining the connection size and spare capacity in the area. Once this information has been received, it will be included in the services design report that will be generated in the next stage of the project.

Any future expansion or upgrading of the border post would most likely require a larger ESKOM transformer. Likewise, the back-up generator would most likely need to be upgraded. Usage information and monitoring would be required to ascertain exactly what will be needed.

9 GEOTECHNICAL INVESTIGATION

The purpose of this section is to:

- Provide an overview of the geology of the site
- Discuss the soil profile encountered
- Evaluate anticipated problems by means of laboratory testing
- Identify problematic geotechnical considerations
- Present founding and geotechnical related recommendations.

9.1 AVAILABLE INFORMATION

10 MASTERPLANNING

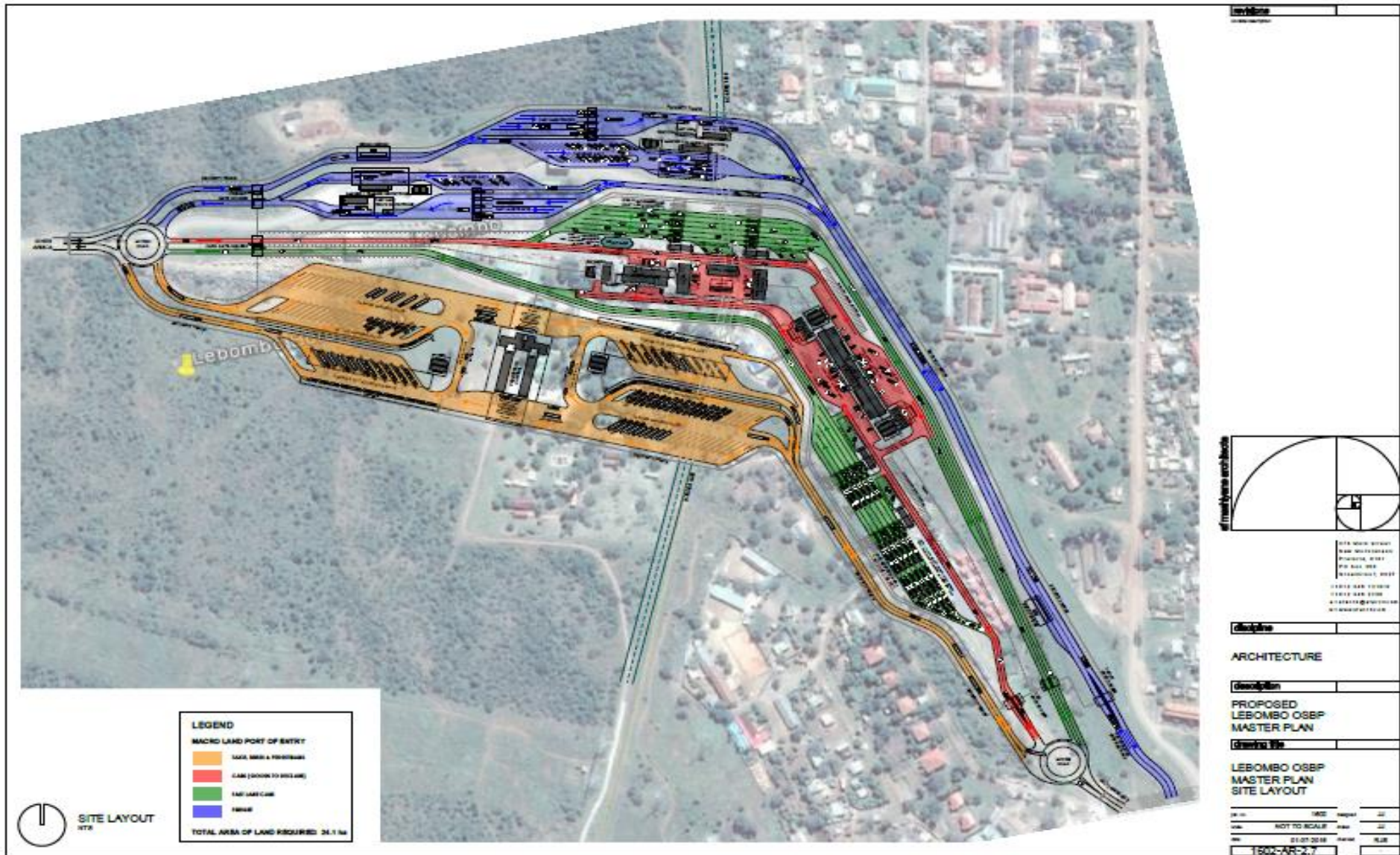
The Masterplan for the Lebombo Port of Entry provided to our company by the Department is depicted in **Figure 10-1** below.

The Master Plan indicates the expansion of the border post demonstrating the new form and function of the border post. It appears from the master plan layout that the border post will be much more accessible allowing for better movement between South Africa and Mozambique

The Master Plan makes provision for future taxis, buses, cars and pedestrians at the border post.

The Master Plan is attached in **Appendix F**.

Figure 10-1: Lebombo Master Plan Layout

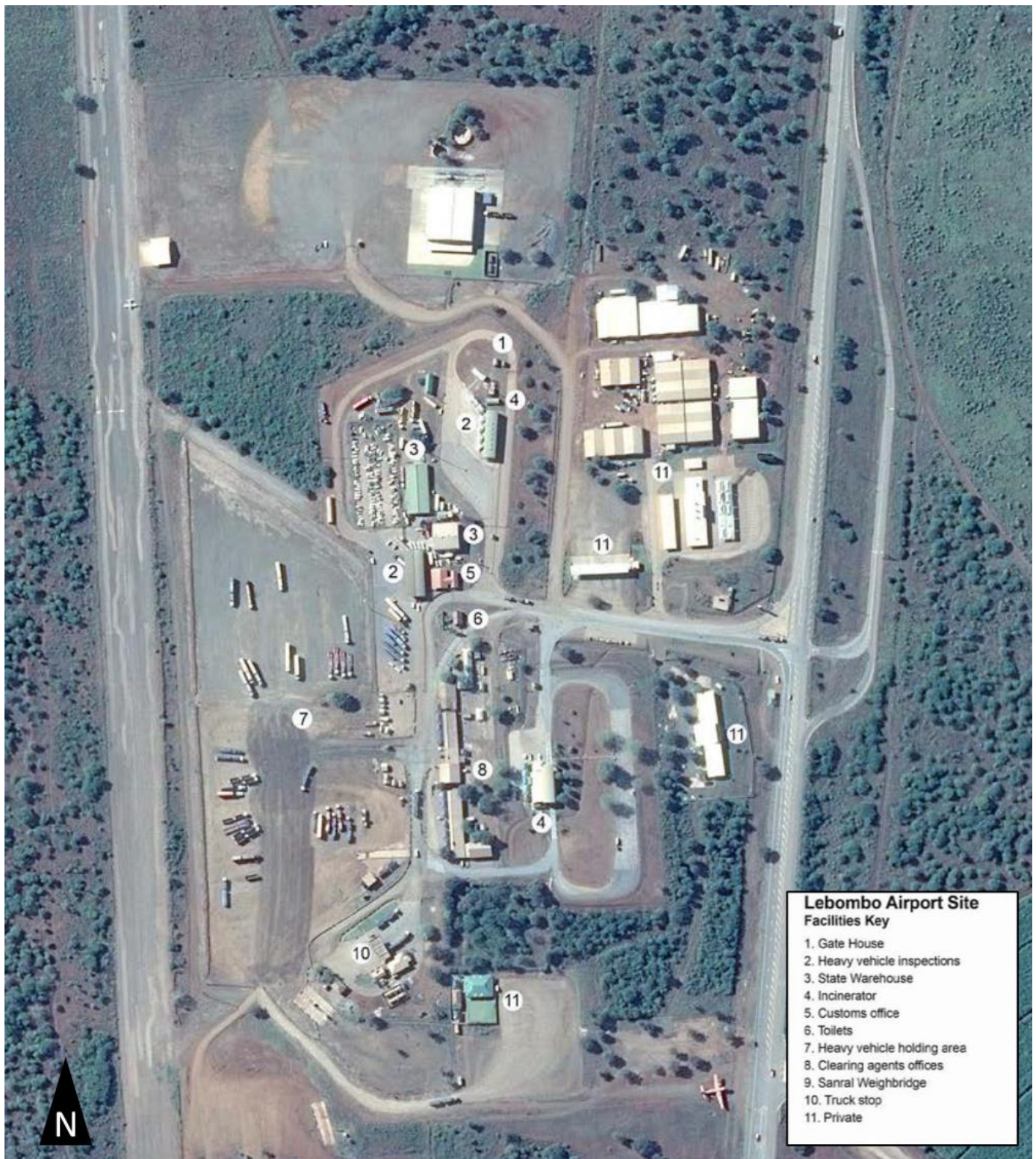


10.1.1 BORDER POST LAND USES

The following land uses/facilities are located at the Lebombo Border Post and are depicted in Error! Reference source not found. and Error! Reference source not found. below:

- Conference room
- Customs & Immigration
- Gate house
- Generator room
- Heavy vehicle inspection bay
- Incinerator
- Light vehicle inspection bay
- Married Quarters
- Maturation pond
- Offices
- Public Parking
- Public toilets
- Scanner room
- Single Quarters
- Store
- Vehicle impounds
- Water reservoir

10.1.2 AERIAL PHOTOGRAPH OF LEBOMBO AIRPORT SITE LAYOUT



10.1.3

11 CONCLUSION

The Lebombo Land Port of Entry is the main point of entry into South Africa from Mozambique. The Lebombo border Post is situated within the Mpumalanga Province and lies within the jurisdiction of the Nkomazi Local Municipality. The study area measures approximately 24.1 hectares in extent. The Land Port of Entry is accessible via the N4 and consists of 6 properties. The majority of the properties is owned by the Republic of South Africa. The properties are also affected by the Private land owner as well as several servitudes.

The servitudes identified are in the form of electrical power lines that traverses some of the properties. Several projects are proposed for the Lebombo area according to the Nkomazi Local Municipality SDF and IDP. The study area has adequate availability of bulk services although some of the services are in need of upgrading and or maintenance. The study area includes part of the N4 route under the control of SANRAL.

Nhlatse Planning Consultant (NPC) consulted with the Municipality on the land use of the study area. A change in land use application will be submitted to the Municipality in due course.

NPC will ensure that the applicable environmental approvals are obtained from the relevant Departments.

12 REFERENCES

- Nkomazi Local Municipality. Spatial Development Framework. Mpumalanga.
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- Guidelines for Human Settlements Planning and Design. (2005). 2nd ed. [ebook] Pretoria: Capture Press. Available at: https://www.csir.co.za/sites/default/files/Documents/Red_BookVol2.pdf [Accessed 25 Oct. 2017].

APPENDIX A: LOCALITY PLAN

APPENDIX B: TITLE DEEDS

APPENDIX C: CONVEYANCER CERTIFICATE

APPENDIX D: LAND SURVEY

APPENDIX E: ELECTRICAL SITE LAYOUT

APPENDIX F: LEBOMBO MASTER PLAN LAYOUT