FINAL BASIC ASSESSMENT REPORT

DEVELOPMENT OF THE UNIVERSITY OF MPUMALANGA IN NELSPRUIT.

DECEMBER 2013

Ref no: 14/12/16/3/3/2/548

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ASSUMPTIONS & LIMITATIONS

For the purpose of this report it has been assumed that all information received from the Project Management Team form Wits University and specialist has been correct.

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PROJECT INFORMATION

REPORT TITLE: Basic Assessment Report
REPORT STATUS: Final
PROJECT TITLE: Proposed development of the Mpumalanga New University in Nelspruit
CLIENT: Department of Higher Education and training & University of Witwatersrand, Johannesburg

ENVIRONMENTAL CONSULTANTS: Lidwala Consulting Engineers

DEA REFERENCE NUMBER: 14/12/16/3/3/2/548

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EXECUTIVE SUMMARY

1 ACTIVITY INFORMATION

1.1 Background to Proposed Project

The Department of Higher Education and Training (DHET) was formed in 2009 as a new Department with the responsibility of post-school systems. DHET has to **expand the capacity of higher education**, including universities. The annual growth of scholars that need to study at a university is 4.7% per year and current universities are already over enrolled. Government policy as stipulated in the Higher Education Act, Act 101 of 1997 determines through section 20 that the Minister by notice in the Gazette may establish a university which is required to deliver through this act teaching, research and community service. This new University is a national asset serving national interests.

In 2010 the Minister of Higher Education and Training appointed two task teams to investigate the feasibility and possibility models for the establishment of Universities in the Northern Cape and Mpumalanga Province. These are the two Provinces in South Africa that do not have universities at the moment. Stakeholders in the provinces were engaged, taking into account provincial and national needs and imperatives, recommendations on the type and size of the two universities were made including the possible sites for the institutions. Since November 2011, the Department of Higher Education and Training (DHET) has appointed a project management team to take forward the planning process under the guidance of a project steering committee, which includes academics from existing universities as well as representatives of the Premiers and of the National Institutes of Higher Education in the two Provinces. Academic work groups have been set up to flesh out the academic direction of each University. Technical work for the 2 universities started in October 2011 and Wits was appointed as project managers with a multi-disciplinary team that includes an architect, civil engineer, geotechnical engineer and urban planner.

The Mpumalanga University will be a comprehensive university (offering a combination of academic programmes usually offered by universities of technology and by traditional universities) with a maximum of 15 000 Fulltime Equivalent Training Students (FET) of which a maximum of 60% of the students will be housed on on-campus residences. The University will open its doors to new students as from 2014 and will be operating from the main campus in Mbombela – Lowveld Agricultural College and a satellite campus at the former teachers training college at Siyabuswa. Siyabuswa College will offer a B.Ed. in co-operation with the University of Johannesburg. The university will not offer any postgraduate studies in the short term, but with the presence of two centres of research excellence at the University, postgraduate studies will be introduced eventually.

The university has to be properly planned to ensure that the provision of staff and facilities match the growth in student numbers. An enrolment plan has been compiled which provides for the phased introduction of the different programmes. An annual intake of 120 FET students for each of the qualification and an accelerated growth 6 years after the qualification has been introduced, will bring the university to its target of 15 000 students by 2024. The annual intake for the B.Ed. students at Siyabuswa Campus is assumed to be 100 FET's per year and will grow to 368 FET students in

2024. The sum of 368 and 14 623 students by 2024 constitutes the required 15000 FET's of the University of which 60% (9000) of the students will be housed on on-campus residences. As a start-up position four faculties have been selected as a basis for the academic organizational structure, namely:

- Faculty of Science and Information Technology
- Faculty of Engineering and Applied Science
- Faculty of Humanities and Business Management
- Faculty of Agriculture.

1.2 Project description

The development of the New University of Mpumalanga involve the construction of facilities to accommodate 15 000 students and 1250 staff. This includes the **upgrading of existing facilities and the construction of new facilities** such as lecture rooms, hostels, residences, administration buildings and sport facilities over a period of 10 years. Most of the new buildings will be constructed on existing agricultural fields between existing buildings of the Agricultural College or next to the sport fields. An **Eco-waste site to store general waste temporary and to recover recyclable waste** will be constructed near the sport facilities on the Lower campus.

The **existing road network on the campus will be upgraded, new roads on the site will be constructed and the D752 will be upgraded with 3 roundabouts for access to the campus.** An **evaluated circle will be constructed** to link the R40 with the D752.

Bulk services such as electricity, water provision and sewerage will be provided by Mbombela Local Municipality (MLM). **The existing bulk services will be sufficient for the start of the university in 2014**, but have to be upgraded within the next 2 years. An application for environmental authorization will be lodged at the DEA for the electricity and at MDEDET for the water provision, sewerage and construction of the roundabouts.

The above mentioned facilities will be developed on three (3) campuses with the following activities:

- **Hill Campus** will be between the stream and the R40 on portion 31 of the farm Boschrand 283 JT. It will consist of a park, residence, academic and administration buildings. The Hill and Orchard campus will be linked with a bridge over the wetland. This is an existing bridge that has to be upgraded and expanded. A footbridge will be constructed to connect the Hill Campus and the Riverside Mall. The bridge will be constructed over the Nelsriver and underneath the bridge of the N4.
- **Orchard campus** will be west of the stream on portion 32 of the farm Boschrand 286 JT. The Orchard Campus will include residences for students, administration buildings and sport facilities.
- **Lower Campus** will consist of a mixture of residences, administration & academic buildings as well as Sport fields and sport facilities. The Eco-centre to recycle at source will be on the Lower Campus/portions 17, 19, 28 & 36 of the farm Friedenheim 282 JT.

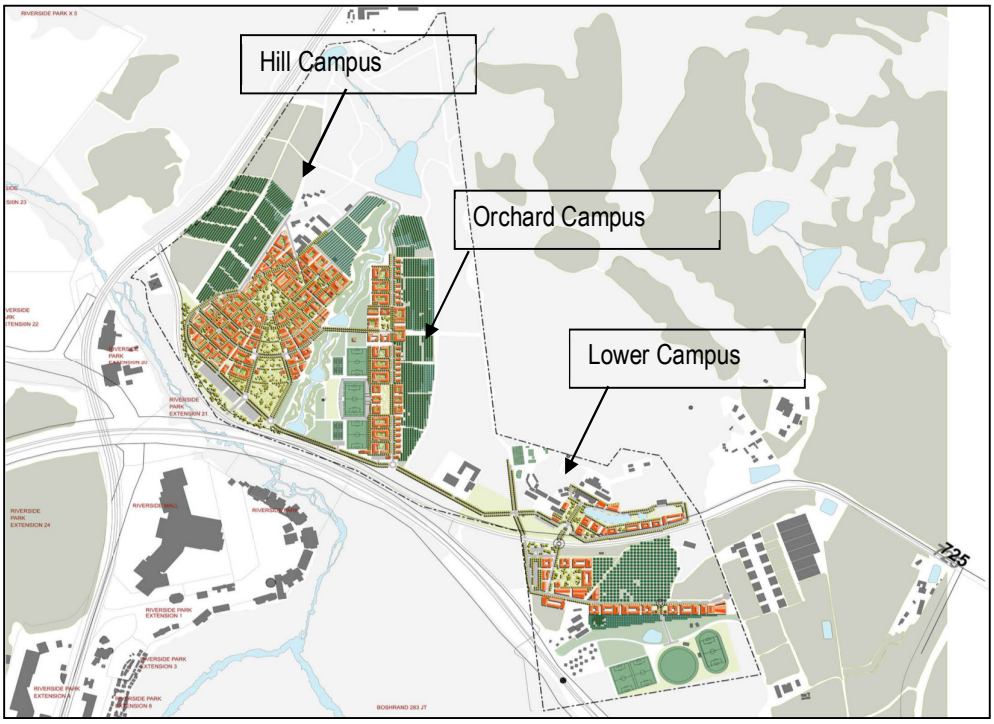


Fig 1: First layout plan for the University of Mpumalanga

1.3 A summary of the scope of the project is:

Mpumalanga University facilities for 15 000 students includes general lecture theatres, seminar rooms, laboratories, accommodation for 60% (9000) students on the campus, multi-purpose sports fields, academic and administration offices, security, IT facility and ancillary facilities. The potential space needed to construct the new university is 449,854m^2 of which 203,880m^2 is for the purpose of academic & administration and 245,974m^2 for student housing. The maximum height of the buildings will be 3 storeys.

1.4 Purpose of application:

The University of Mpumalanga wishes to obtain Environmental Authorization (EA) to construct and operate the university with a capacity of 15 000 students legally and with minimum environmental negative impacts. Waste generated by the university will be recycled and stored at the Eco-Waste centre and it is also important to obtain a Waste Management License (WML) to operate an Eco-Waste Centre legally hereby contributing to national imperatives to minimise environmental impacts and to mitigate possible negative impacts during both the construction and operational phase.

During the scoping phase of the BA process, all possible impacts were identified and appropriate mitigation measures are suggested. It is important to construct and operate a University of this extent, with minimum environmental impacts and to mitigate possible negative impacts. Sensitive areas have to be protected and a management plan to maintain these areas as private open space is important.

1.5 Listed Activities according to EIA Regulations (2010), R543, 544, 545 & 546.

The transformation of undeveloped, vacant or derelict land to institutional use outside urban area and where the total area to be transformed consist of more than 20ha is a listed activity according to the Environmental Impact Assessment (EIA) Regulations (2010) GN R543, and it must be adhered to in terms of Sections 24(2)(a) and 24(d) of the National Environmental Management Act (NEMA), Act no 107 of 1998. Most of the development will be on existing agricultural fields, but it would be necessary to clear an area of 1ha or more of vegetation where 75% of the vegetation constitutes of indigenous vegetation on the Lower campus. An application to downgrade the scoping/EIA process to a BA process was approved by DEA (see attached Appendix J for the approval letter from DEA, dated 26 August 2013). The proposed activities listed are:

Indicate the number and date of the relevant	Activity No (s) (in terms of the relevant or notice):	Describe each listed activity as per the detailed project description (and not as per wording of the relevant Government Notice):
GN R 544	11(iii),(vi), (x), (xi)	A footbridge that will cross the Nels River has to be constructed to link the Hill campus with the Riverside Mall. Storm water outlets will be constructed for the management of storm water on the proposed Hill and Orchard Campuses. The proposed Eco-waste centre for the storage of general and recycling waste will be constructed on the Lower Campus within 32m of the wetland and will exceed more than $50m^3$. The footbridge, storm water outlets, eco waste centre and roads within the 32m of a stream or wetland
GN R 544	18(i)	Existing roads and bridges that cross wetland and streams have to be upgraded. Material such as sand, pebbles or rock of more than $5m^3$ will be used to upgrade the roads and bridge on all 3 campuses .The stream between the Hill and Orchard campuses as well as the wetland on the Lower campus has to be rehabilitated and the necessary material to rehabilitate the area will exceed $5m^3$.
GN R 544	24	A footbridge that will cross the Nels River will be constructed. This footbridge will connect the Hill campus with the Riverside Mall.
GN R 544	39(iii)	An existing bridge will be upgraded to link the Hill- and Orchard campuses. The road/bridge on the wetland on the Lower Campus has to be upgraded (expand) to accommodate expected traffic.
GN R545	15	More than 20ha undeveloped land (agricultural fields) will be physically altered for the construction of buildings for the new university.
GN R 546	4(ii)(ee)	Roads on the proposed developments, Hill, Orchard and Lower campus, have to be upgraded. The D725 road has to be upgraded and roundabouts have to be constructed for access to the university to mitigate the impact of traffic. An elevated roundabout has to be constructed on the R40.
GN R 546	13(a)	Sport facilities and residences have to be constructed on more than 1ha indigenous vegetation.

These listing activities require the Applicant to carry out a Basic Assessment Process according to R 543 R 21 -26.

The List of Waste Management Activities that have, or are likely to have a detrimental effect on the environment published under Government Notice 718 in Government Gazette 32368 of 3 July 2009, in terms of Section 19(2) of the National Waste Management: Waste Act, 2008 (Act no 59 of 2008) for the recycling and storage of general waste was:

Indicate the No. & date of the relevant notice:	**Activity numbers (as listed in the waste management activity list) :**	**Describe each listed activity (and Not as per the wording of the relevant Government notice):**
July 2009	Cat A - 5	The sorting, shredding, grinding, or bailing of general waste at the eco-waste centre that will process more than one (1) ton of general waste per day.
July 2009	Cat A - 18	The construction of facilities for activities listed in Category A

This list of Waste Management Activities has been amended by the Minister of Environmental Affairs on 29 November 2013. The list of waste management activities that have or are likely to have, a detrimental effect on the environment, GN 921, dated 29 November 2013.

Indicate the No. & date of the relevant notice:	**Activity numbers (as listed in the waste management activity list) :**	**Describe each listed activity (and Not as per the wording of the relevant Government notice):**
November 2013	Cat A - 2	The sorting, shredding, grinding, or bailing of general waste at the eco-waste centre that has an operational area of 300m^2. **According to the latest Waste Management (WM) list, the threshold of listed activities for recycling is 1000m^2.**
November 2013	Cat A - 12	The construction of facilities for activities listed in Category A **The threshold of listed activities for recycling is 1000m^{2}and therefore no activities are triggered.**

According to GN 921 of no 37083 (29 November 2013), Section 7(2), an application for a waste management activity which was listed under the previous Waste Management Activities List Notice which is no longer listed in terms of this Schedule and a decision on such an application is still pending on the date of coming into effect of this Notice, such an application will be considered withdrawn.

1.6 Alternative Sites Investigation

The new institution must advance the national goals for higher education and therefore **the selected town must** ensure:

- the success of the new university, now and in future,
- that it is accessible to the largest possible population,
- it must have attractive social and recreational amenities and be able to attract and retain top academics,
- it must be economically and commercially vibrant, able to facilitate some student jobs and internship experience,
- The prestige and viability of the new institution would be enhanced by a town that is host to important government institutions, research institutes and other public entities.

Within the preferred town, **the site must be**:

- Well located,
- Provide an iconic setting for the university, and with
- A strong visibility and a prominent presence.
- A suitable size and shape for current plans as well as future expansion
- It should be quick and cost effectively serviced, and
- It should be unencumbered by complex environmental, land, legal or geotechnical constraints.

Eleven different sites in total were investigated in 5 different towns, eMalahleni, Secunda, White River, Barberton and Nelspruit. **Nelspruit was the preferred town** according to the criteria for the new university and five different properties were investigated and visited in the greater Nelspruit area and the **Lowveld Agricultural College was found to be the preferred site.** Barberton and eMalahleni TUT campus should be considered as possible satellite campuses. (See Fig 2: Alternative site investigated in Nelspruit).

A summary of the investigated sites in Nelspruit is as follows:

A. 1: Mbombela Local Municipality, Nelspruit

Site 1: Lowveld Agricultural College – it is on a 240 ha property with a gentle slope facing south and is directly linked to both the N4 and R40 movement corridors. The college is highly visible and prominent with residences, sport amenities and administration buildings. It is owned by Provincial Government and has an established bulk infrastructure. **This site is recommended as the preferred site** as the property is of adequate size, well located along the R40 and N4 corridors and quick operational establishment is possible. This site best fits the criteria for the development of a new university in Mpumalanga.

Site 2: TUT Mbombela Campus in Nelspruit and CV Investment Group - the campus is well run and very neat but seriously **constraint by the steep topography**. The CV Group site to the north of the TUT campus offers expansion opportunities but environmental and geotechnical concerns are negative. It is **not recommended** as the TUT campus steep topography and the sensitive environment are major constraints. There is a lack of bulk infrastructure and town planning applications will delay the start of construction.

Site 3: Matsafeni Trust/ Hall and Sons Group.

A 45 ha property is donated by the 2 entities for purposes of building the university and serviced with bulk infrastructure and roads. **It is not recommended** as the 45 ha offered **is too small to accommodate the university**. There are concerns about the legal relationship between the future university and surrounding development area as well as concerns about the relationship between the Matsafeni trust and HL Hall & Sons

Site 4: Broham African Rural Investment.

A 500 ha agricultural property about 13 km west of Nelspruit on the N4 was selected as a possible site for the new University. The site is very scenic but **no bulk services and infrastructure exists**. There are also no environmental assessments done or roads and planning applications. It is a private sale for R 18 million. **The**

proposal is excluded from serious consideration as possible location for the new university as it is a private sale with no infrastructure or planning application, located far from any amenities or support facilities.

Site 5: Likweti Lifestyle Estate and Golf Course Development

Private lifestyle golf estate development, approximately 25 km from Nelspruit. Privately owned land sold at commercial rates. The proposal is excluded from serious consideration as it is a **private sale with no infrastructure and located far from any amenities or support facilities**.

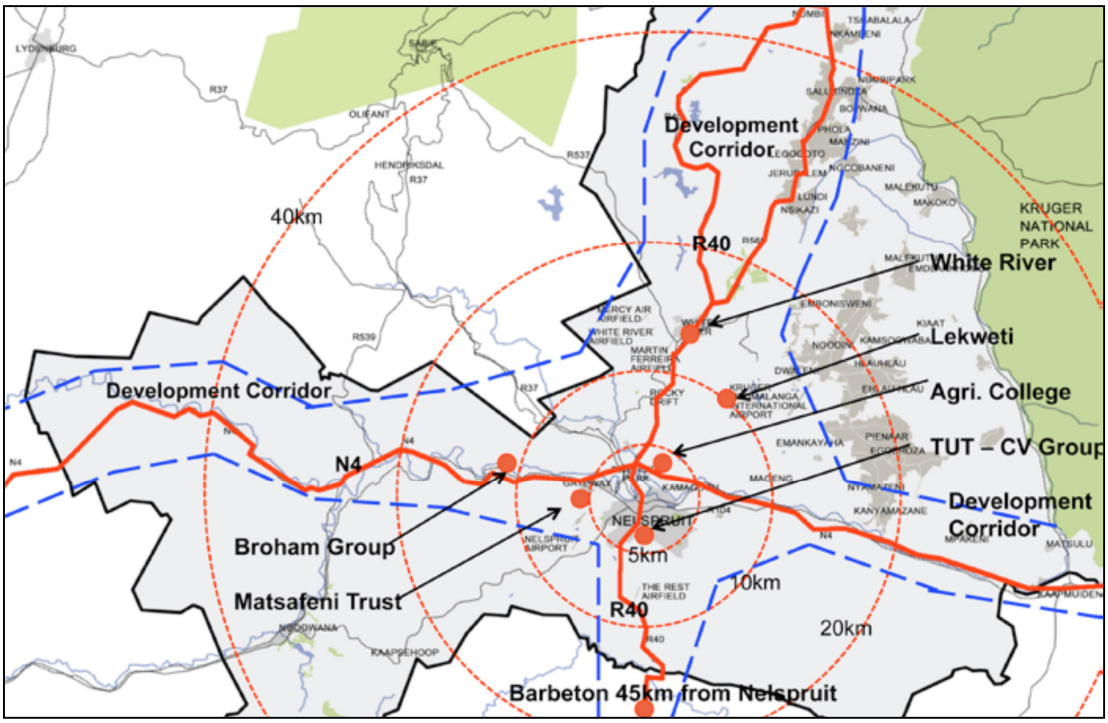


Fig 2: Alternative sites investigated in Mbombela Area

B. No Go Alternative

It is a Strategic Infrastructure Project of the National Department of Higher Education, announced by President Zuma. The Vision of the new University is: "As one of South Africa's first new institutions of higher learning since 1994, the planned university is envisaged as a symbol of South Africa's new order, of democracy, inclusiveness, growth and opportunity. This institution must become an enduring source of pride, both nationally and provincially. It must be able to attract the best academics in South Africa, the continent and the world. The hallmark of this new university must be academic excellence underpinned by quality leadership".

Current universities are already over enrolled and this will impact on the quality of teaching and learning provision. Accommodating a greater number of learners requires additional physical and academic capacity within the university education system. The" no go" alternative means that the proposed University will not be developed and the result will be: **No new University.**

- ***Loss of academic opportunity for 15 000 students per year.***
- ***Loss of income and job opportunities*** of for 1250 permanent workers at the university in the operational phase and temporary workers in the construction phase.
- ***Loss of income for the town and surrounding area.***
- ***Loss of income for the Mbombela Local Municipality in rates and taxes.***

2 PROPERTY DESCRIPTION

2.1 Location and Particulars of Property

The new university will be developed on the existing premises of the Lowveld of College of Agriculture, on the corner of the R40 and D725 (30°58'26.98E, 25°25'50.85"S). It is 8km north of the main Post Office in the CBD of Nelspruit. This proposed site of the New Mpumalanga University belongs to the Government and will be developed on the following farms:

Boschrand 283 JT, Portion 31 (TOJT00000000028300031)
Boschrand 283 JT, Portion 32 (TOJT00000000028300032)
Friedenheim 282 JT, Portion 17 (TOJT00000000028200017)
Friedenheim 282 JT, Portion19 (TOJT00000000028200019)
Friedenheim 282 JT, Portion 28 (TOJT00000000028200028)
Friedenheim 282 JT, Portion 36 (TOJT00000000028200036)

The following farms are potential land to be used for future development:
Friedenheim 282 JT, Portion 75 (TOJT00000000028200075)
Friedenheim 282 JT, Remainder of portion 10 (TOJT00000000028200010).
Both farms are private land.

2.2 Current Land Use & State

In October 1955 Minister P.M.K. le Roux approved the opening of a new Agricultural College in the former Transvaal Region. The Lowveld area however had undergone phenomenal agricultural development and in May 1974 the Cabinet approved the building of an Agricultural College at Nelspruit or in the Northern Lowveld. Eventually Nelspruit was selected as the most strategic location. Land was purchased from various farmers and the last transactions were concluded in 1982.

The current land use is agriculture and comprises of agricultural land including fruit orchards and vegetable crops. It forms part of the Lowveld College of Agricultural and the property belongs to the Government. Various infrastructures such as buildings remain on the site while the northern and north-eastern parts of the site have been less impacted by the farming and or infrastructure. Sport fields are located on the south eastern part of the study site. There are 4 constructed dams on the proposed development site.

The foot print of the existing Agricultural College is approximately 10 000m^2 and consists of the administration building, lecture rooms, library, a computer centre, dining room and kitchen facilities, student accommodation as well as centres for practical classes. The student accommodation consists of four hostels; two for men and two for lady students. Provision has been made for practical training in the production, handling and processing of all the important crops of the Lowveld, as well as practical training on farm implements, welding, and more. A complete hydraulics laboratory is available for the demonstration of pump- and irrigation equipment for practical training in irrigation.

2.3 Description of the Environment

The site for the proposed New Mpumalanga University in Nelspruit falls within the **Savanna Biome** and the vegetation is described as ***Legogote Sour Bushveld*** and ***Pretoriuskop Sour Bushveld***. The *Legogote Sour Bushveld* vegetation, it is greatly transformed by plantations, cultivation and urban development and is classified as an "Endangered" vegetation type. Only 2% of the vegetation type is statuary conserved (Mucina & Rutherford, 2006). The *Pretoriuskop Sour Bushveld* is classified as a "least threatened" vegetation type. *Legogote Sour Bushveld* vegetation type occurs on most of the proposed development site and the *Pretoriuskop Sour Bushveld* occurs on the southern portion of the site.

Although this area is classified as "No natural habitat" and "Least threatened" according to the Mpumalanga Biodiversity Conservation Plan, 2006 (MBCP), this area falls within an "Ecological corridor" associated with the Crocodile River and is rated as an "Ecological Sensitive Area" (ESA). According to *the Ecological Importance Rating of the Environmental Management Framework*, 2006 (EMF) of Mbombela Local Municipality (MLM) this area is rated as Medium Ecological sensitive.

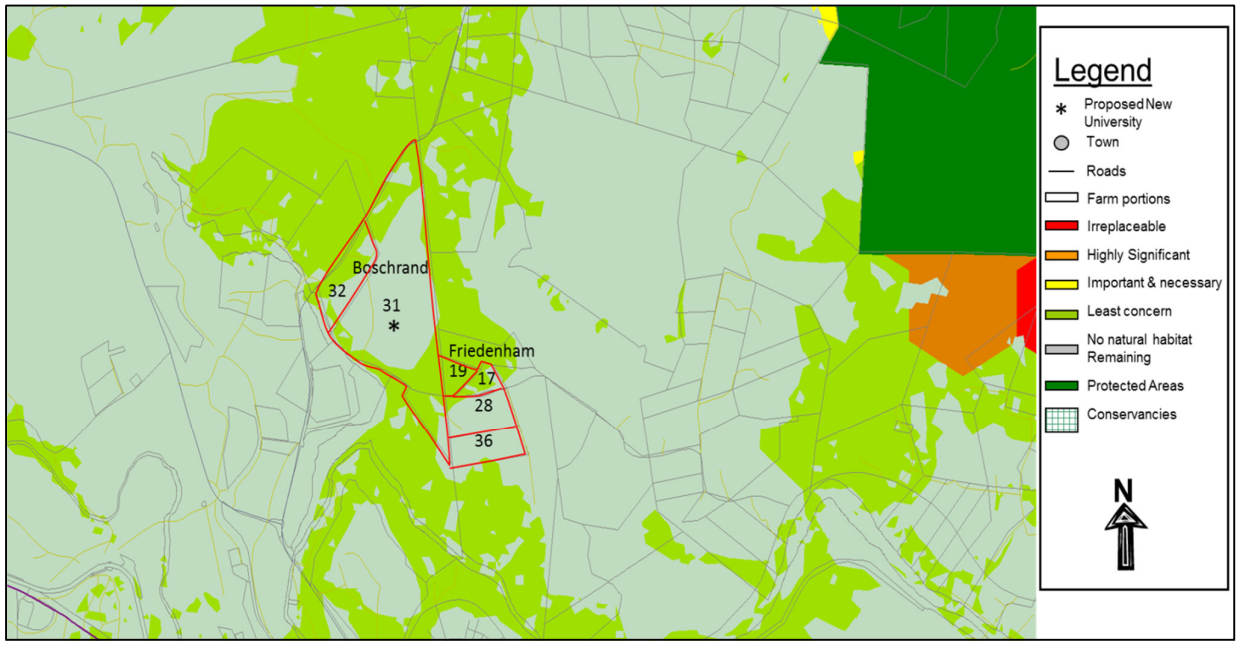


Fig. 3: Sensitive rating of the area where the New university is proposed to be developed (MCBP, 2006)

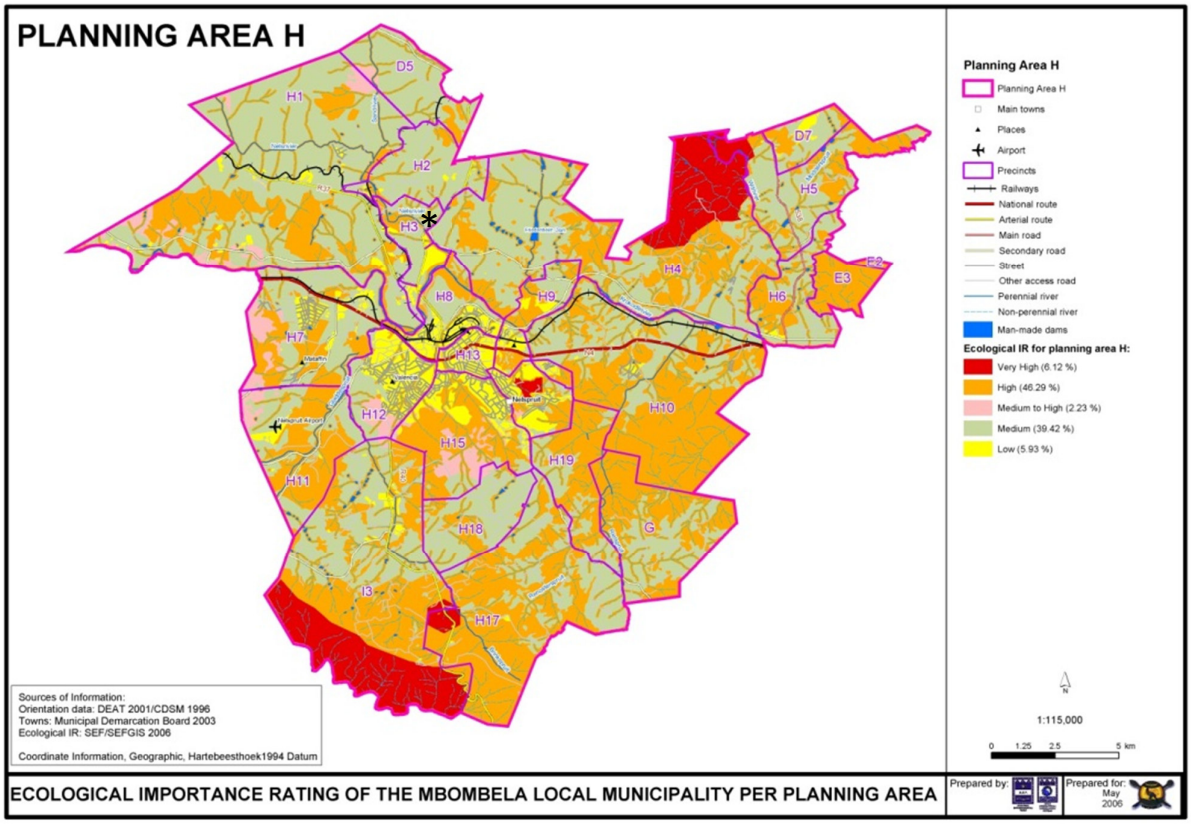


Fig 4: Ecological Importance Rating of the Environmental Management Framework, 2006 (EMF) of MLM.

The terrain of the area slopes to the south with relatively constant slopes of approximately 5-8%. The altitude varies from 640-680 masl. The climate can be described as typical of the southern Lowveld with warm to hot, moist to wet summers and dry, mild to cool winters. Frost is extremely rare. The annual average rainfall of 836.3 mm falls in the summer – October to March.

The geology can be described as gneiss and migmatite of the Nelspruit Granite Suite. Soils have a generally light texture (loamy sand to sandy loam, clay content between 12 and 20%) with little or no structure. The only clay soils occur in the deeper layers of some profiles, especially closer to the stream that dissects the upper part of the proposed development. The soils in the area are inherently stable soils and not prone to erosion due to the large kaolinitic mineralogy. Water erosion can occur with the slopes of 5-8%, if vegetation is removed. No fatal flaws were recorded (Patterson, August 2013).

3 PUBLIC PARTICIPATION PROCESS

3.1 Approach

A public participation process (PPP) was followed according to Section 54 of the EIA regulations, R543, (2010). The PPP was executed as elaborated in the following section.

- The project was advertised in the local newspaper (28 June 2013 & 15 October 2013) and national newspaper (30 June 2014). See copy of advertisement in Appendix E1.

- Site notices were attached to the fence of the Lowveld College of Agriculture and entrance gate- 25°26'13,88"S 30°58'54,18E. See photos in Appendix B.
- Property owners and key interested & affected parties (I&AP) were notified via e-mail. See attached list in Appendix E2.
- Open day and a public meeting took place at the Agricultural College Hall in Nelspruit on 29 October 2013. It was announced in the Local Newspaper on 15 October 2013 in English and Setswadi (See Appendix E1 for the advertisement & Appendix E6 for the attendance registers for the open day and public meeting).
- Issues raised at the open day were addressed and included in the PPP Report. Issues and concerns will be summarized in a Public Participation Report. (PPP Report is attached in Appendix E6).
- The draft report was available from 21 October – 21 November 2013 on the website (www.Lidwala.com) for public comments and for 40 days till 2 December 2013 for Government Departments. All registered I&AP's were notified of the comment period and the direct link (http://www.lidwala.com/new-university-Nelspruit-bar/) to the Draft BAR for download to review.

3.2 Further Participation

After the thirty (30) day I&AP comment period ends for public (21 November) and the 40 day comment period for Government official (2 December 2013), all issues raised was recorded and included in the Public Participation report. The Final BAR will be available for reviewing for another 21 days. After the issuing of the Environmental Authorization (EA), the decision will be communicated to all registered I&AP's and will be afforded the opportunity to appeal against any decision.

4 IMPACT ASSESSMENT

4.1 Potential Impacts

The scoping phase identifies and analyse the potential impacts of the activities of the proposal on the biophysical and socio-economic components of the environment. Activities throughout the project; i.e. Design/Pre-construction, construction, operational and decommissioning phases were considered during the assessment. Both negative and positive impacts were assessed, negative for mitigation and positive for enhancement. The assessment also covered various areas of specialization such as socio-economic, traffic, bulk services, cultural heritage, Agricultural potential and ecological (flora, fauna and wetland). The Specialist studies for the proposed construction and operation were undertaken to determine the possible impacts likely to arise due to the construction and operation phase. The findings of the specialists are summarized as follows:

4.1.1 Socio-economic Assessment

The Mpumalanga Province constitutes 6% of South Africa's total surface areas and 8% (over 8 million individuals) of its population. According to Census 2011, 42% of Mpumalanga's total population is resident in Ehlanzeni District Municipality. The total population of Mbombela which is part of Ehlanzeni district was 588,763 in 2011 (15% of Mpumalanga Province and 35% of Ehlanzeni District). Population growth in Mbombela is significantly higher than the province or district. The age structure of Mbombela Local Municipality (MLM) is mostly between new born to 34 years

(70%) that indicate a youthful population that is typical to developing economies. It requires a growth and development focus with interventions and resources in areas such as education and health.

The household income is one of the most important determinants of welfare in a region and Mpumalanga is struggling with poverty where 67% of the households earn less than R 3201 per month. More than 100 000 households in Mbombela fall in the low income bracket of which more than 21 000 are earning no income at all. The **unemployment rate in the Mpumalanga province is 38% and in MLM is 34% and 19% of the formally employed individuals in MLM are highly skilled, 43% skilled and 38% semi – and unskilled**. The general **government sector is responsible for 23%** of MLM total employment.

The new University in Nelspruit is in line with National, Provincial, District and Local policy and strategic goals to increase education, training and skills development and in the process increasing social and human capital and employment. The development of the new university and its related infrastructure will result in economic impacts during both the construction and operational phase. More detail of the specific impacts can be obtained in the attached report. (See attached Appendix D for the Socio economic Assessment Report, compiled by M Strydom, October 2013)

4.1.2 Agricultural and soil potential

Agricultural potential is determined by the available rooting depth of plants in a soil profile and the colour of the soil. Red soils that are deeper than 750mm with no limitations to water infiltration indicate a higher degree of natural fertility. The red soils, HuA (19,9%) and HuB (4.1%) soils occur in the north of the area and grey soils, Fw and KD with a wetter clay layer deeper in the profile, occur in the part of the site. **Soil conservation measures must be put in place in conjunction with engineering specialists in order to ensure that associated problems do not occur.** (See attached Appendix D for the Agricultural Report compiled by DG Patterson, August 2013).

4.1.3 Ecological Assessment

Vegetation Assessment

Four different plant communities were found on the proposed development area. The site comprise of:

1. Vegetation associated with water courses
2. Natural vegetation on the rocky boulders with minimal disturbances,
3. Secondary vegetation where disturbances were more severe over a long term, and
4. Transformed and fallow land.

Sensitive vegetation that was recorded on the proposed site is vegetation associated with watercourses, natural bushveld and rocky outcrops & hills. A total of 140 plant species were recorded of which 26 species were alien or invasive plant species and 1 endemic pant species. Nine provincial protected plants were recorded and another 5 could possibly exist on the site. Four nationally protected tree species were recorded. The position of all protected plant species nationally, provincial and endemic, are indicated on the sensitivity map (see attached Appendix A for the sensitivity map indicating the position of the protected tree species). A minimum of 11 plants known to be used for

medicinal uses were recorded on site. Many indigenous plant species remained intact or has recovered since the construction and form part of the college gardens.

Areas where the construction of the new university is suggested are large areas of transformed and secondary vegetation. If the development proceeds, mitigations as set out in the Vegetation Report should be adhered to as a minimum. **The most important is the conservation of protected species that occurs in the already transformed areas and within the development footprint. The wetland vegetation, natural bushveld and rocky outcrops are excluded from the development and should be seen as "no-go" areas for the activity other than the rehabilitation thereof.** (See attached Appendix D for the Vegetation Assessment compiled by Dimela Eco Consulting, September 2013 and also see attached Appendix A for the vegetation sensitivity map).

Wetland delineation

Three wetlands were found on the proposed development area. Both the Unchannelled wetlands flow from North to south and ultimately flow into the Nels River and then into the Crocodile River. The wetlands are classified as a

- Hill slope seepage Wetland – on shallow bedrock at the south-western corner, close to R40 ,
- Unchannelled Valley Bottom Wetland – between the Hill and Orchard campuses, and
- Unchannelled Valley Bottom Wetland with seepage – on the Lower campus, close to the sport fields. This wetland is partially dried out for cultivation purposes and water is diverted to a dam.

The wetlands on the site are affected by various activities which have led to an increase in exotic vegetation as well as has an impact on the hydrology and geomorphology of the wetlands. The main hydrology of the wetlands has been impacted by the construction of various dams within and around the wetlands. The vegetation of the wetlands have been impacted by various anthropogenic activities such as land clearing, farming and associated activities, construction and road construction.

An assessment of the Present Ecological State (PES) and Ecological Integrity and sensitivity (EIS) for these wetlands is summarized in the table below:

Wetland Unit	PES score	Description	EIS Score
Hill slope seepage wetland	C	**Moderately modified.** A moderate change in ecosystem processes and loss of natural habitats has taken place but the natural habitat remains predominantly intact	0.9 (Low)
Unchannelled Valley Bottom Wetland	D	**Largely modified**. A large change in ecosystem processes and loss of natural habitat and biota has occurred.	2.0 (High)
Unchannelled Valley Bottom Wetland with seepage	D	**Largely modified.** A large change in ecosystem processes and loss of natural habitat and biota has occurred.	1.97 (Moderate)

The proposed site of the new universities falls within an **Irreplaceable aquatic area**, according to the MBCP (2006) and it is thus important to avoid any activities that might have an impact on the wetlands on the study site. If such activities are unavoidable it is important to mitigate and rehabilitate the affected areas properly.

The following mitigations are important:

- **A minimum of a 30m buffer zone from the edge of the wetlands as delineated by this report.**
- **The wetland area and the buffer zones should be fenced during the construction phase.**
- **Best practice should be applied during the construction phase to prevent degradation of the wetland.**

See attached Appendix A for the layout plan (Layout Plan 2) that includes the wetlands.

See attached Appendix D for the Wetland and Riparian Functional Assessment, Antoinette Bootsma, Limosella Consulting, September 2013.

Faunal assessment

The development will have a **HIGH** impact on habitat fragmentation for example changing from agricultural land, which is utilized by certain opportunistic faunal species, to hard surfaces. The impacts on the fragmentation are **HIGH** but the impact on faunal species itself is **LOW** because the area is classified as a "low ecological function and conservation importance" area. During construction the impact will be higher but certain species will adapt to the anthropocentric activities such as lizards etc. (See appendix D for Faunal Assessment Report from C Kneidinger, dated September 2013).

The impact of the proposed development is considered to be of **low significance on indigenous fauna**, mostly due to the fact that the areas proposed for the development have already been transformed and no species of conservation concern are expected. **There will be a positive contribution during the rehabilitation of the constructed area with indigenous vegetation. The upgrading of the wetland areas and the sensitive area for vegetation will create a corridor for animals. This contributes to an enhanced biodiversity with an increased habitat for avifauna, reptiles, arachnids and small mammals.**

4.1.4 Heritage Assessment

Current developments and previous agricultural activities would effectively have destroyed any prehistorically sites, feature or objects that might have occurred in the study area. The 1943 version of the 1:50 000 cadastral maps shows a total lack of development dating to the historical period in the study area. **No sites, features or objects of cultural significance are known to exist in the study area and therefore no impacts are foreseen.** (See attached Appendix D for the Heritage Impact Assessment Report, compiled by J van Schalkwyk, October 2013)

4.1.5 Traffic Assessment

Current roads that will serve the proposed university are the R40 (road P017-7) that will provide regional accessibility and road D725 that will provide access to the property. There are 8 intersections on the R40 and D725 roads that will have an impact on the traffic flow to and from the new university and needs to be upgraded for example by changing the traffic light settings. In the planning for the next 10 years will be 3 access points/entrances of which 2 will be new and 1 upgraded (existing Lowveld Agricultural College). For the next few years the existing access point/entrance will be used. The preferred mode of control on the D725 road for the access points is roundabouts (traffic circles). The access from the R40 into the D725 will be upgraded with an elevated circle.

The 9000 students that will be accommodated in residences on the Hill, Orchard and Lower campus area will mostly move around on the 3 campuses as pedestrians or cyclists. To accommodate pedestrians and cyclists in a safe environment, a formal on-campus network of pedestrian walkways, class 1 cycle routes, cycle lockers and crossing of busy streets are required. See Traffic Engineering report.

4.1.6 Bulk services

Electrical services

The Electrical installation includes the following major elements:

- Main HV Incoming Power Supply to the site (2 x 20MVA 132/11 kV Substation).
- MV Switching Stations and 11kV Ring Main
- Substations/Mini-substations and MV reticulation
- Standby Emergency Generators, primarily for the academic and admin buildings
- Main LV reticulation including Main Distribution Boards per Building and Primary Reticulation
- Secondary Reticulation (Small Power) including dedicated reticulation for UPS power distribution, where required.
- Uninterruptible Power Supply (UPS) Units, where required
- Energy Management System
- Lighting
- Earthling, Lightning and Surge Protection

The electrical and electronic installations design will be guided by the requirements of the Green Star SA environmental rating system for buildings, which is an objective measurement for green buildings developed by the Green Building Council of South Africa (GBCSA) whose objective is to promote sustainable development.

The electrical supply and phasing is as follows:

Year	Required electricity supply	Electrical supply and phasing
2014	2MVA	The current substation has a 750 kVA supply by Eskom. Current infrastructure can carry the required upgrade from 750kVA to 2MVA.
2016	8MVA	Additional 6MVA is required which will supplied by Mbombela LM from the Nels River Substation. The substation is in the process of being upgraded and will supply the required 6MVA temporarily at the start of 2016 while waiting the construction of the new HV Substation.
2018	11MVA	A new substation consisting of 2X20 MVA 132/11kV transformers will be required for this phase. The substation will be supplied by Eskom via a 132kV link from Eskom's 132 kV overhead lines.
2020-25	20MVA	The new HV substation will supply the remainder of the phases after 2018.

Eskom prefer to do the EIA for their electrical installation which include Eskom's incoming HV lines and the bulk connection switchgear. If Eskom supply electricity directly to the University, the EIA for the construction of the substation will be part the EIA. If Mbombela LM supplies the electricity, the client – Wits University will do the EIA. See attached the Electrical Services Report, compiled by Dorcas Ouma from Selanya Consulting Engineers.

Waste management

The estimated general waste quantities (by mass) that will be generated based on the estimated student and staff figures are 19 560 kg/day. Waste recycling will form an integral part of the waste management strategy of the new university. Separation of the general waste will take place at source and an Eco-waste centre with an area of 300m^2 will be established. On average it will be possible to recycle 69% of the general waste and that amounts to 16.85m^3/day while the rest of the waste (80m^3) will be stored for transfer by Mbombela Local Municipality to the Tekwane Central landfill site. See attached Solid Waste Report prepared by SKCMasakhizwe Engineers (Pty).

According to the GN 921, Government Gazette no 37083 of 29 November 2013, is the threshold size for recycling 1 000m^2 and the capacity for storage of waste is 100m^3. The Mpumalanga new University falls under the threshold of both activities and therefore the waste activities applied for will be withdrawn.

Sewerage

The existing bulk sewer from the Lowveld College of Agricultural and the on-site pump station's capacity will be sufficient for the development till 2017 but not be sufficient for the estimated sewage flow for 2025. The necessity for upgrading the bulk sewerage is therefore unavoidable. The proposed pump stations and rising mains will be constructed in two phases. See attached Water and sanitation Civil Services Report prepared by IJG de Bruyn from SKCMasakhizwe Engineers (Pty) Ltd.

Water supply

The **existing bulk water supply** capacity is not enough to provide the required demand and will require upgrading. It is proposed to construct a **new 3Ml reservoir north of the existing 0.9Ml reservoir**. The proposed reservoirs will be supplied by the old water treatment plant via a 355 mm Ø pipeline. This will be an entirely new pump line and pumping station. Water rights are directly linked to allocation of irrigation water for the use on the Lowveld Agricultural College premises. Potable water to be provided by MLM must be obtained from the water rights allocated to the applicable property. The required portion of water rights will then be transferred to the MLM.

An emergency supply point will be provided from the White River Augmentation Scheme pipeline for the construction of the university for the construction phase. The bulk supply of water to the university will be sufficient for the next 2 years.

It is proposed to **recycle the grey water** from showers, baths, hand was basins and laundry. This will only be recycled at hostels. The grey water recycling system is the "Water Rhapsody Second Movement" where the grey water is harvested, directed through a filter to remove solids; it flows into a sump where it is treated with chlorine and bromide to eliminate bad odours. It is then pumped to the toilets and will not be used for irrigation.

The **collection and storing of rainwater** from rooftops will serve as an additional water supply for irrigation. This water does not require any treatments.

5. CONCLUSION AND RECOMMENDATIONS

For the proposed new university to be sustainable, it needs to demonstrate economic viability, social equity, and ecological integrity within a framework of good governance. All three of these dimensions of sustainability were addressed in specialist reports which include a Socio-economic Report, a Traffic Assessment Report, Civil Engineer Report, Electrical Engineering Report, Heritage Assessment, Agricultural Potential and an assessment of the Ecological Status (Vegetation, Wetland and Fauna) of the property. According to these assessments, the development of the new university will have positive and negative impacts on the socio-economy of Nelspruit where positive impacts such as job creation and upgrading of the level of education can improve quality of living for people in Nelspruit and surrounding areas. Negative impacts such as traffic, impacts on protected plants and wetlands can be mitigated. There will be an increase of traffic in and around Nelspruit and on the R40 but can be mitigated by signal changes, roundabouts, walkways, cycle routes and specific parking areas on the campus. A higher demand for clean water, management of sewerage and increase in waste are addressed in the Civil Engineer Reports and the municipality can accommodate the increased demands. Thus the preferred options – position, second layout plan and technology chosen at the end of the analysis is the one that has minimal impacts, ecologically, including wetlands, socially and economical.

From the analysis given and proposed mitigations in the specialist reports and other site impact assessments, the development of the university and construction of buildings will have minimal negative impacts and therefore is the development of the university at Nelspruit **recommended.** It is however recommended that the mitigation measures presented in the Environmental Management Program (EMPr) be fully implemented. If there is vagueness in the wording and actions to be undertaken, clarifications must be sought from the environmental consultant and specialists involved in the compilation of the reports.

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DEFINITION OF TERMS

"Activity" means an activity identified in Government Notice No. R. 544 and No. R. 545 of 2010 as a listed activity
"Alternatives"*,* in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to property, activity, design or technology.
"Associated Infrastructure" means any building or infrastructure that is necessary for the functioning of a facility or activity or that is used for an ancillary service or use from the facility.
"Cumulative impact"*,* in relation to an activity, means the impact of an activity that in itself may not be significant but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area.
"Derelict land", means abandoned land or property where the lawful/legal land use right has not been exercised during the preceding 10 year period.
"Environmental impact assessment'*,* means the process of collecting, organizing, analyzing, interpreting and communicating information that is relevant to the consideration of that application.
"Environmental management programme" means a detailed plan of action prepared to ensure that recommendations for enhancing positive environmental impacts and/or limiting or preventing negative environmental impacts are implemented during the life-cycle of a project.
"Interested and Affected Party" means any person, group of persons or organization interested in or affected by an activity; and any organ of state that may have jurisdiction over any aspect of the activity;
"Public Participation Process" means a process in which potential interested and affected parties are given an opportunity to comment on, or raise issues relevant to, specific matters;
"Significant impact" means an impact that by its magnitude, duration, intensity or probability of occurrence may have a notable effect on one or more aspects of the environment;
"The Act" means the National Environmental Management Act, 1998 (Act No.107 of 1998).
"Undeveloped" means that no facilities, structures or infrastructure have been affected upon the land or property during the preceding 10 years
"Vacant land" means not occupied for the purpose of its lawful land use during the preceding 10 years.

ABBREVIATIONS

BAR	Basic Assessment Report
BID	Background Information Document
CBD	Central Business District
DAFF	Department of Agriculture, Forestry and Fishery
DEA	Department of Environment Affairs
DENC	Department of Environment and Nature Conservation
DHET	Department of Higher Education & Training
DWA	Department of Water Affairs
DWA&E	Department of Water Affairs and Environment
EA	Environmental Authorization
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EDM	Ehlanzeni District Municipality
EIA	Environmental Impact Assessment
EMF	Environmental Management Framework.
EMPr	Environmental Management Program
FET	Full-time equivalent Training
I&APs	Interested and Affected Parties
LCA	Lowveld College of Agriculture
Masl	meter above sea level
MLM	Mbombela Local Municipality
NEMA	National Environmental Management Act, Act No 107 of 1998
NEM:WA	National Environmental Management: Waste Act, Act No 59 of 2008.
NIHE	National Institute of Higher Learning
NMT	Non-motorised Transport
PPP	Public Participation Process
SABS	South African Bureau of Standards
RoD	Record of Decision
UMP	University of Mpumalanga
WML	Waste Management Licence