



**DRAFT REPORT:  
BASIC ENVIRONMENTAL IMPACT ASSESSMENT &  
APPLICATION FOR AUTHORIZATION OF WATER USES**

**Proposed housing project on portions 85 & 86 of  
Friedenheim 282JT, City of Mbombela**

Applicant: Collfin Projects (Pty) Ltd  
DARDLEA Ref No: 1/3/1/16/1E-246

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## **EAP DECLARATION**

I, Danie van der Walt, as the appointed environmental assessment practitioner (EAP) hereby declare/affirm that I:

- have performed the work relating to the application in an objective manner;
- have disclosed to the proponent or applicant, registered interested and affected parties and the competent authority all material information in my possession that reasonably has or may have the potential of influencing any decision to be taken with respect to the application by the competent authority or the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority (unless access to that information is protected by law, in which case I will indicate that such protected information exists and is only provided to the competent authority);
- have ensured that information containing all relevant facts in respect of the application has been distributed or made available to interested and affected parties and the public and that participation by interested and affected parties has been facilitated in such a manner that all interested and affected parties has been provided with a reasonable opportunity to participate and to provide comments on documents that are produced to support the application;
- included all written responses and comments received from stakeholders and interested and affected parties with the report;
- included all the inputs and recommendations from the specialist reports with the report;
- declare that all the information furnished by me in this report are true and correct;

L.D. VAN DER WALT

2020-03-24

## EXECUTIVE SUMMARY

The applicant, Collfin Projects (Pty) Ltd, propose a housing development on these properties. The Environmental Assessment Practitioner (EAP), Afrika Enviro & Biology (environmental and biodiversity consultants) was appointed to obtain authorization in terms of Chapter 5 of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended and the Environmental Impact Assessment Regulations as published in 2014 for regulated activities associated with this project.

The applicant proposes to construct much needed affordable housing on the properties. The development site is located to the north of Nelspruit and the Crocodile River, adjacent to the suburb known as Kamagugu. The following land uses are proposed:

Zoning	Land use	Erf number	Area (ha)	Number of erven
Residential 1	Residential	1-515	12.92	515
Residential 3	High density residential	516-518	0.99	3
Private open space	Park	520-527	7.97	8
Special	Bus stop	519	0.08	1
Roads and widenings	Public access road		4.56	
Total			26.52	527
Total area subject to environmental authorization			18.55	

There is a definite need and desirability for the site location and operational activity - if no undesirable or unmanageable environmental impacts are identified which suggest that the activity and the site alternatives are undesirable/unsuitable and/or pose a risk to the local environment or resident people. The proposed activity is the establishment of an affordable residential suburb. No viable activity alternatives are available and no alternative sites are available. The activity site was chosen with the objectives of being closest to available services links and to minimize the potential impact on the natural environment. The potential environmental aspects (geographical, physical, biological, social, economical, cultural and heritage) related to each activity site were assessed and specialist inputs were sourced where necessary. Alternatives related to site conditions and technology was considered upon review of the specialist reports.

No high priority environmental issues or concerns that could not be resolved were brought to the attention of the EAP as result of the specialist investigations, public opinion or the authorities consultations. During the EIA process all potential environmental impacts have been identified and assessed. The EAP trusted on the integrity and professional opinions of the specialists, officials and public that was consulted during the process. The EIA process concludes that the proposed activities and preferred sites will not result in significant environmental impacts if the recommendations and formulated mitigation measures are adhered to. The environmental impacts that were assessed are largely of low magnitude and those impacts with a larger negative consequence can be mitigated or managed to achieve an acceptable level of significance/consequence. This ensures the best outcome for all stakeholders and the environment. The EAP therefore recommends a positive final decision on authorization of the activity. Conditions that should be considered by the competent authority and may be required for authorization are given in the following section as well as the draft Environmental Management Programme.

## CONTENT

EAP DECLARATION	02
EXECUTIVE SUMMARY	03
1. INTRODUCTION	06
1.1 The EIA process	06
1.2 This EIA application	06
2. THE ENVIRONMENTAL PRACTITIONER (EAP)	08
3. PROJECT DESCRIPTION	08
3.1 Particulars of proponent	08
3.2 Description of proposed activity	08
3.3 Relevant legislation and policy	09
4. NEED & DESIRABILITY	16
5. ALTERNATIVES	17
5.1 Activity alternatives	17
5.2 Site alternatives	17
5.3 Method and technological alternatives	17
5.4 Specialist recommendations	18
5.5 The no-go alternative	18
6. SITE AND LOCAL ENVIRONMENT	18
6.1 Description of the site	18
6.2 Description of the environment	19
6.2.1 Geography	19
6.2.2 Physical features	19
6.2.3 Biology	19
6.2.4 Social and economic environment	19
6.2.5 Cultural and heritage	19
7. PUBLIC PARTICIPATION PROCESS	20
7.1 Identification and notification of Interested & Affected Parties	20
7.2 Authorities Consultation	20
7.3 IAPs consultations and comments	21
8. SUMMARY OF SPECIALIST REPORTS AND RECOMMENDATIONS	21
8.1 Biodiversity & Ecology Report	21
8.2 Flood line Report	22
9. IMPACT & RISK ASSESSMENT	25
9.1 Environmental issues and concerns	25
9.2 Assessment of activity and site alternatives	25
9.3 Assessment of the no-go alternative	26
9.4 Impact Assessment Methodology	26
9.5 Environmental impact assessment of the preferred alternative	26
10. STATEMENTS	29
10.1 Assumptions and uncertainties	29
10.2 Professional opinion	29
10.3 Environmental impact statement	30
11. REFERENCES	31

## **APPENDIXES**

### APPENDIX A: MAPS & PLANS

- APPENDIX A-1: LOCALITY MAP
- APPENDIX A-2: PROPOSED SUBDIVISION
- APPENDIX A-3: SITE MAP
- APPENDIX A-4: DESIGN LAYOUT PLAN
- APPENDIX A-5: MBSP MAPS

### APPENDIX B: PHOTOGRAPHIC ILLUSTRATIONS

### APPENDIX C: FACILITY ILLUSTRATIONS

### APPENDIX D: PUBLIC PARTICIPATION REPORT

- APPENDIX D-1: EIA NOTICES
- APPENDIX D-2: IAP REGISTER & NOTIFICATIONS
- APPENDIX D-3: IAP COMMENTS & CONSULTATIONS
- APPENDIX D-4: COMMENTS & RESPONSE REPORT

### APPENDIX E: SPECIALIST REPORTS

- APPENDIX E-1: STORMWATER ASSESSMENT
- APPENDIX E-2: PES WATERCOURSE REPORT

### APPENDIX F: SUPPORTING DOCUMENTATION

### APPENDIX G: DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME

## **1. INTRODUCTION**

### **1.1 The EIA process**

Section 24 of the National Environmental Management Act (1998) requires that 'activities that require authorization or permission by law which may significantly affect the environment, must be considered, investigated and assessed prior to their implementation and reported to the organ of state charged by law with authorizing, permitting, or otherwise allowing the implementation of an activity.' The EIA process is the tool used to apply for authorization from the regulating authority for the relevant activities identified that may impact on the environment. In addition to the Environmental Impact Assessment (EIA) application this EIA and Public Participation Process (PPP) is also in support Water Use License Authorizations which may be required by the National Water Act (NWA) and is regulated by the Department of Water & Sanitation (DWS).

The provincial regulating authority is the Mpumalanga Department of Agriculture, Rural Development, Land & Environmental Affairs (DARDLEA), Directorate Environmental Impact Management. DARDLEA is commissioned to do the final decision making and authorization for this EIA application. The process is followed strictly according to the regulations as published in the Environmental Impact Assessment Regulations (2014). The official EIA process is preceded by a public and stakeholder participation process during which time interested and affected parties (IAPs) are notified and have the opportunity to register as IAPs and to comment on the proposed project. After the application for an EIA is submitted, the application is acknowledged by DARDLEA and a reference number is allocated that is used during the process for administration. The Basic EIA process entails a project description, evaluation of alternatives and impact assessment – and is aimed to address the following:

- Description of the project;
- Identification and description of alternatives;
- Identification of relevant legislation and authorities;
- Site and environment descriptions;
- Notification and participation of public and interested and affected parties (I&AP's);
- Identification and description of potential environmental issues and impacts;
- Identification and need of specialist studies to evaluate potential impacts;

The consultation Basic EIAR is distributed to all IAPs as well as the authorities for review and comment before the final basic EIAR (addressing all comments and issues received from the IAPs) is submitted to the regulating authority for review. The final basic EIA report aims to conclude all possible issues and to recommend the best possible alternative and activity to be authorized as well as recommending measures and activities to ensure the least impact on the environment.

## 1.2 This EIA application

The applicant, Collfin Projects (Pty) Ltd, propose a housing development on these properties. The Environmental Assessment Practitioner (EAP), Afrika Enviro & Biology (environmental and biodiversity consultants) was appointed to obtain authorization in terms of Chapter 5 of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended and the Environmental Impact Assessment Regulations as published in 2014 for regulated activities associated with this project. An application for a Basic Environmental Impact Assessment will be submitted with the regulating authority: Mpumalanga Department of Agriculture Rural, Development, Land & Environmental Affairs (DARDLEA) in order to obtain authorization for the regulated activities.

This document presents the Consultation Basic Environmental Impact Assessment Report (EIAR) as required by the EIA regulations. The document also outlines the methodology and results of the tasks performed by the consultant in order to prepare the Final Basic Environmental Impact Assessment Report. The Consultation Basic EIAR aims to provide information to stakeholders regarding the environmental issues and potential impacts identified related to the proposed development. The information contained in the Basic EIAR will enable the relevant authorities to make an informed decision concerning the proposed project. The regulated activities that are applied for are presented in Table 1.1.

Table 1.1 Regulated activities related to this project

Government Notice R983 Activity No.	Describe the relevant Basic Assessment Activity in writing as per Listing Notice	Describe the aspect of the development that relates to the listed activity
Notice R985 LN1 activity 9:	The development of infrastructure exceeding 1000m in length for the bulk transportation of water or storm water: (i) with an internal diameter of 0,36m or more; or (ii) with a peak throughput of 120L per second or more;	Infrastructure pipelines may exceed these specifications.
Notice R985 LN1 activity 12:	The development of (ii) infrastructure or structures with a physical footprint of 100m <sup>2</sup> or more; where such development occurs (a) within a watercourse; (c) if no development setback exists, within 32m of a watercourse, measured from the edge of a watercourse.	Road crossings will be constructed across watercourses and residential erven will encroach to within 32m of watercourses.
Notice R985 LN1 activity 19:	The infilling or depositing of any material of more than 10m <sup>3</sup> into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10m <sup>3</sup> from a watercourse;	Several erven will encroach into an ephemeral watercourse and will need infilling to create construction platforms.
Notice R985 LN1 activity 24:	The development of (ii) a road with a reserve wider than 13,5m, or where no reserve exists where the road is wider than 8m;	Road constructions will exceed these thresholds.
Notice R985 LN1 activity 27:	The clearance of an area of 1Ha or more, but less than 20Ha of indigenous vegetation.	Total development area is 19Ha.
Notice R985 LN1 activity 28:	Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such development: (ii) will occur outside an urban area, where the total land to be developed is bigger than 1Ha.	Total development area 19Ha. The zoning is agriculture.

## 2. THE ENVIRONMENTAL PRACTITIONER (EAP)

Afrika Enviro & Biology is the appointed EAP and conducted the EIA process for this project. The lead EAP has been practicing in environmental services since 2002 and details are as follows:

Danie van der Walt: M.Sc. Natural Sciences and has successfully completed EIA and SHEQ accredited courses as well as several accredited ecological, wetland and biodiversity orientated courses. Curriculum vitae of the lead EAP is included with Appendix F.

The contact details of the EAP are as follows:

Afrika Enviro & Biology, PO Box 2980, White River, 1240

Tel: 072 623 1845; Fax: 086 603 8875; E-mail: [danie.aeb@gmail.com](mailto:danie.aeb@gmail.com)

## 3. PROJECT DESCRIPTION

### 3.1 Particulars of proponent

The proponent is a well-known developer in the Nelspruit area:

Collfin Projects (Pty) Ltd, PO Box 30033, Nelspruit, 1213

Contact: Mr. Hugo van Coller

### 3.2 Description of proposed activity

The applicant proposes to construct much needed affordable housing on the properties. The development site is located to the north of Nelspruit and the Crocodile River, adjacent to the suburb known as Kamagugu. The site and its environment are described in detail in section 6 of this report. The objective of the activity will be to construct a new residential suburb with the following zones and land uses (Table 1.2):

Table 1.2 Proposed project specifications

Zoning	Land use	Erf number	Area (ha)	Number of erven
Residential 1	Residential	1-515	12.92	515
Residential 3	High density residential	516-518	0.99	3
Private open space	Park	520-527	7.97	8
Special	Bus stop	519	0.08	1
Roads and widenings	Public access road		4.56	
Total			26.52	527
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The actual phased activities that will take place during the project lifetime are summarized below:

- **Planning and design:** Conduct site investigations and specialist studies in order to provide recommendations and objectives for the construction and operational phases.
- **Pre-construction:** Vegetation clearing and site preparation, levelling, cut and fill activities in order to provide construction platforms.
- **Construction:** Excavating and instalment of series infrastructure, construction of roads and buildings.
- **Rehabilitation:** Removal of temporary structures, site clean-up, landscaping and establishing vegetation.
- **Operational:** Occupation, maintenance of infrastructure, erosion and alien invasive vegetation control.

### **3.3 Relevant legislation and policy**

Consultation of legislation and guidelines forms an important part of the EIA process. The following section includes legislation relevant to this application:

#### **i) Constitution of the Republic of South Africa (No 108 of 1996)**

The Constitution of the Republic of South Africa ("the Constitution") contains broad provisions concerning environmental rights and state obligations to enforce them. The environmental right provides that:

"Everyone has the right-

- to an environment that is not harmful to their health or well-being;
- to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that prevent pollution and ecological degradation; promote conservation; and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development."

#### **Relevance to this application**

This application and the operational phase comply with this Act and no additional authorizations or permits subject to this act are required for this project.

#### **ii) National Environmental Management Act (No 107 of 1998)**

To provide for co-operative, environmental governance by establishing principles for decision-making on matters affecting the environment, institutions that will promote co-operative governance and procedures for coordinating environmental functions exercised by organs of state; and to provide for matters connected therewith. Section 24 of the Act requires that 'activities that require authorization or permission by law which may significantly affect the environment, must be considered, investigated and assessed prior to their implementation and reported to the organ of state charged by law with authorizing, permitting, or otherwise allowing the implementation of an

activity.’ The EIA process is the tool used to apply for authorization from the regulating authority for the relevant activities identified that may impact on the environment.

**Relevance to this application**

As activities regulated by this Act forms part of the scope of this project, these activities as discussed in section 2 of this document have to be authorized by the regulating authority (DARDLEA) before project related activities may commence.

**iii) National Environmental Management: Waste Act (No 59 of 2008)**

To reform the law regulating waste management in order to protect health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development; to provide for institutional arrangements and planning matters; to provide for national norms and standards for regulating the management of waste by all spheres of government; to provide for specific waste management measures; to provide for the licensing and control of waste management activities; to provide for the remediation of contaminated land; to provide for the national waste information system; to provide for compliance and enforcement; and to provide for matters connected therewith.

**Relevance to this application**

No activities included with the scope of this application are regulated by this Act and no additional authorizations or permits subject to this Act are required for this project.

**iv) National Environmental Management: Air Quality Act (No 39 of 2004)**

To reform the law regulating air quality in order to protect the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development while promoting justifiable economic and social development; to provide for national norms and standards regulating air quality monitoring, management and control by all spheres of government; for specific air quality measures; and for matters incidental thereto.

**Relevance to this application**

No activities included with the scope of this application are regulated by this Act and no additional authorizations or permits subject to this Act are required for this project.

**v) National Environmental Management: Biodiversity Act (No 10 of 2004)**

To provide for the management and conservation of South Africa’s biodiversity within the framework of the National Environmental Management Act, 1998; the protection of species and ecosystems that warrant national protection; the sustainable use of indigenous biological resources; the fair and equitable sharing of benefits arising from bioprospecting involving indigenous biological resources; the establishment and functions of a South African National Biodiversity Institute; and for matters connected therewith.

**Relevance to this application**

No listed activities or geographical areas are applicable.

vi) **National Environmental Management: Protected Areas Act (No 31 of 2004)**

To provide for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes; for the establishment of a national register of all national, provincial and local protected areas; for the management of those areas in accordance with national norms and standards; for intergovernmental co-operation and public consultation in matters concerning protected areas; for the continued existence, governance and functions of South African National Parks; and for matters in connection therewith.

**Relevance to this application**

Not applicable.

vii) **National Water Act (Act No 36 of 1998)**

This Act is founded on the principle that National Government has overall responsibility for and authority over water resource management, including the equitable allocation and beneficial use of water in the public interest. A person can only be entitled to use water if the use is permissible under the Act. Water use is defined broadly, and includes taking and storing water, activities which reduce stream flow, waste discharges and disposals, controlled activities (activities which impact detrimentally on a water resource), altering a watercourse, removing water found underground for certain purposes, and recreation. In general a water use must be licensed unless it is listed in Schedule I, is an existing lawful use, is permissible under a general authorisation, or if a responsible authority waives the need for a license.

**Relevance to this application**

Water uses have to be authorised by the regulating authority, Department of Water & Sanitation (DWS) or the regional agency (IUCMA).

viii) **National Forests Act (No 84 of 1998)**

Everyone has the constitutional right to have the environment protected for the benefit of present and future generations. Natural forests and woodlands form an important part of that environment and need to be conserved and developed according to the principles of sustainable management. Plantation forests play an important role in the economy but plantation forests have an impact on the environment and need to be managed appropriately.

**Relevance to this application**

The clearance of indigenous woodland and/or destruction/damage of protected trees are regulated by this Act. If the abovementioned activities has to be employed it have to be authorized by the regulating authority (Department Agriculture, Forestry & Fisheries) before commencement of these activities.

ix) **Environmental Conservation Act (No 73 of 1989)**

This Act was created to provide for the effective protection and controlled utilization of the environment and for matters incidental thereto. The Environment Conservation Act

(ECA) was intended to be an overarching piece of legislation aimed at environmental management in the broadest sense. It has, to a large extent been repealed and replaced by NEMA.

**Relevance to this application**

As the regulations and authorizations subject to this Act has been replaced by NEMA and the amended EIA regulations (2014), ECA is no longer the Act that regulates the listed activities. These activities as discussed in section 2 of this document have to be authorized by the regulating authority (DARDLEA) subject to NEMA and the EIA Regulations (2014) before project related activities may commence.

x) **Conservation of Agricultural Resources Act (No 43 of 1983)**

This Act provides for control over the utilization of natural agricultural resources in order to promote the conservation of soil, water sources and vegetation, and the combatting of weeds and invader plants. The Directorate of Engineering and Resource Conservation is responsible for the enforcement thereof. The Conservation of Agricultural Resources Act, the new CARA regulations amend the existing regulations relating to weeds and invader plants. The effect of the regulations is to place a duty on land users to control weeds and invader plants in certain identified areas.

**Relevance to this application**

The applicant has to comply with this act regarding the conservation of soil and the management of weeds and invader plants. No authorizations or permits subject to this Act is relevant to this project.

xi) **National Heritage Resources Act (No 25 of 1999)**

This Act (NHRA) was created to protect all heritage resources, which are classified as national estate. The NHRA stipulates that any person, who intends to undertake a development, is subjected to the provisions of the Act.

**Section 34** states that: No person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by the relevant provincial heritage resources authority.

**Section 38** of the NHRA requires a Heritage Impact Assessment (HIA) to be conducted by an independent heritage management consultant, for:  
the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length; In addition, the EIA regulations promulgated in terms of NEMA determines that any environmental report will include cultural (heritage) issues.

- (a) the construction of a bridge or similar structure exceeding 50 m in length;
- (b) any development or other activity which will change the character of a site where the transformation exceed 5000m<sup>2</sup> in extent and for the rezoning of a site exceeding 10 000m<sup>2</sup> in extent.
- (c) the re-zoning of a site exceeding 10000m<sup>2</sup> in extent;

**Relevance to this application**

As the proposed site is >5000m<sup>2</sup> in extent a Heritage Impact Assessment is required and has been conducted.

**xii) Occupational Health and Safety Act (No 85 of 1993)**

To provide for the health and safety of persons at work and for the health and safety of persons in connection with the use of plant and machinery; the protection of persons other than persons at work against hazards to health and safety arising out of or in connection with the activities of persons at work; to establish an advisory council for occupational health and safety; and to provide for matters connected therewith. This includes a clean and safe working environment and the education of employees regarding environmental impacts and risks that they may be exposed to.

**Relevance to this application**

No authorizations or permits are required relevant to this act. However, the applicant and contractors will have to comply with the requirements of this Act in providing a safe and healthy working environment for employees. The EMP of this document contains an environmental awareness plan that describes the manner in which employees must be informed of any environmental risk which may result from their work or to which employees may be exposed.

**xiii) Promotion of Access to Information Act (2000)**

To give effect to the constitutional right of access to any information held by the State and any information that is held by another person and that is required for the exercise or protection of any rights; and to provide for matters connected therewith.

**xiv) Physical Planning Act (No 125 of 1991)**

To promote the orderly physical development of the Republic, and for that purpose to provide for the division of the Republic into regions, for the preparation of national development plans, regional development plans, regional structure plans and urban structure plans by the various authorities responsible for physical planning, and for matters connected therewith. In terms of this Act no person shall use any land in the area to which the regional structure plan or the urban structure plan, as the case may be, applies for a purpose other than the purpose for which it-

- (i) Was being used immediately before that date; or
- (ii) Is zoned in terms of a town planning scheme which is or may become binding in that area:

Provided that land to which no such scheme applies may with the consent of, in the case of the regional structure plan, the Administrator concerned or, in the case of the urban structure plan, the responsible authority be used for any purpose determined in the relevant plan or for any other purpose which in the opinion of that Administrator or responsible authority is consistent with the relevant plan;

**xv) Mpumalanga Nature Conservation Act (No 10 of 1998)**

This Act was created in order to consolidate and amend the laws relating to nature conservation within the Province and to provide for matters connected therewith. This Act provides terms for the conservation and management of fauna and flora in the Province and also provides lists of protected biota.

**Relevance to this application**

The destruction/damage of protected trees and fauna and Provincial Nature Reserves are regulated by this Act.

xvi) **Amended EIA regulations and listing notices (2014):**

The following Government Notices include the regulations along which the EIA process is conducted and lists the activities that is regulated and has to be authorized subject to NEMA (1998):

R. 982 Environmental Impact Assessment Regulations

R. 983 Listing notice 1; R. 984 Listing notice 2; R. 985 Listing notice 3

**Relevance to this application**

This EIA application is strictly conducted as required by the regulations. These regulated activities that are applied for authorization are listed and discussed in section 2 of this document have to be authorized by the regulating authority (DARDLEA) before project related activities may commence.

xvii) **Mpumalanga Biodiversity Sector Plan**

The Mpumalanga Tourism and Parks Agency (MTPA) and DARDLEA have jointly developed the Mpumalanga Biodiversity Sector Plan (MBSP). This Plan uses the Systematic Biodiversity Planning approach and it is intended to guide conservation and land-use decisions in support of sustainable development. It provides a basis for MTPA to review its biodiversity conservation policy and to focus its attention on high value areas for future protection initiatives. The plan, and in particular its land-use guidelines, are intended to supplement other spatial planning tools such as municipal Integrated Development Plans and Spatial Development Frameworks. The Biodiversity Sector Plan used for environmental management and planning by DARDLEA allocates values to biodiversity features and ecological areas - thereby enabling environmental planners to identify areas that are subject to Listing Notice 3 (LN3) of the EIA Regulations.

**Relevance to this application**

The MBSP for the biodiversity significance of the study site are given below:

- Terrestrial: *Other Natural Areas; Heavily or moderately modified*
- Freshwater: *Ecological Support Areas (Important sub catchment)*

One of the objectives of this report is to verify these ratings and to provide detailed information regarding the site status by way of specialist investigation. These aspects are discussed in more detail in section 6 of this report.

xviii) **Municipal Development Planning Frameworks**

These frameworks are consulted in order to determine the need and desirability of the project and compatibility of the project with the municipal planning for the relevant area (section 4.).

**Relevance to this application**

This project is in line with the spatial planning of the LM.

## 4. NEED & DESIRABILITY

In order to assess the 'need and desirability' alternatives of the project the following documents relevant to these two aspects that were consulted:

- Draft 2011-230 Mbombela Local Municipality Spatial Development Framework (SDF)
- EHLANZENI DISTRICT MUNICIPALITY FINAL IDP AND BUDGET REVIEW 2016/17
- 2016/17Draft guideline on the information requirements to describe need and desirability in the EIA process (June 6, 2008).

Development pressure over the years Mbombela has grown considerably due to its status as provincial capital seat, with Nelspruit as a regional service centre, growing tourism and major new infrastructural developments (i.e. Mbombela Stadium, N4 Northern Bypass, KMIA, R40 upgrade, improvements to the Lowveld Botanical Gardens etc.). This resulted in a demand for urban land around the main economic centres i.e. White River, Nelspruit and Hazyview with resultant higher land prizes. Development pressures characterising the Nelspruit-White River Development Corridor involve:

- Business and commercial development along the R40,
- The provision of affordable housing nearer to places of employment,
- The provision of roads and engineering infrastructure.

### *Spatial implications*

Topography • Slopes greater than 20% are generally considered too steep for conventional housing and urban development. • The provision of engineering services is expensive in areas with steep slopes. • Environmental legislation requires the protection of granite or rocky outcrops due to the diverse and sensitive vegetation types associated with these features. • Areas regarded not suitable for development due to topographical constraints should form part of a municipal open space system

### *Spatial implication of socio-economic environment*

There is a need for educational facilities, particularly post-matric training as well as accredited tertiary institutions that offer affordable and appropriate qualifications. High unemployment levels can be ascribed to the general low levels of education that is worsened by an economy that becomes more capital than labour intensive. The establishment of strategically located labour intensive industries could reverse this situation. The distance between live and work areas (east and west) must be decreased in order to decrease the resources spent on commuting and to increase the access of the unemployed to economic opportunities and thereby improve the ability of people to contribute to production. It is of utmost importance that mobility links be strengthened.

In the following sections this EAP attempts to make an objective assessment of the "need and desirability" of the project and makes a recommendation based on the available documents and information:

The “**need**” for the project:

- 1) A change of land use will be necessary and the project can be considered to be within the timeframe intended by the existing approved IDP / Spatial Development Framework (SDF).
- 2) The project is planned at a time and place in order to provide an essential service to the public of the LM.
- 3) The activity will render an essential service to the local municipality and will create employment opportunities.
- 4) Additional capacity for services does not have to be created by the LM to cater for the activity.
- 5) There is nationwide need for affordable housing and this need is even greater in the City of Mbombela which is seen as a major national development node.

The “**desirability**” of the project:

- 1) The project is planned to aid the LM and approval of this application would not compromise the integrity of the existing approved SDF / IDP but will meet the planning requirements of the IDP.
- 2) The approval of this application would not significantly compromise the integrity of the existing environmental management priorities for the area.
- 3) The location will not compromise the planning for the area but will in fact provide for additional residential expansion in the future.
- 4) The activity and the land use associated with the activity applied for will not impact significantly on sensitive natural and cultural areas.
- 5) The activity will be operated according to the required standards set by the authorities and should not impact on people’s health and wellbeing.
- 6) It is not anticipated that the activity will result in unacceptable opportunity costs as it has been included in the budget calculated by the LM.
- 7) The site location and activity is very desirable as it is located adjacent to present residential area as well as a tertiary educational institution (Appendix A-1).

It can thus be concluded that there is a definite need and desirability for the site location and operational activity - if no undesirable or unmanageable environmental impacts are identified which suggest that the activity and the site alternatives are undesirable/unsuitable and/or pose a risk to the local environment or resident people.



## **5. ALTERNATIVES**

### **5.1 Activity alternatives**

The objective of the enveloping project is to develop an affordable student housing facility with services infrastructure on this property. This is the only and preferred activity. There are no activity alternatives but the no-go alternative. The last mentioned is discussed in section 5.4.

### **5.2 Location and site alternatives**

The owner does not own alternative land that can be considered for development. The preferred site for the activity was selected with specialist advice during the planning phase with the objective to have minimal disturbance to the natural environment and private land. Therefore, possible alternative sites are very limited and the proposed site is regarded as the only viable alternative in order to achieve the objective of minimizing potential environmental impacts. Additional recommendations and mitigation that are given by the specialist investigations will also be considered.

### **5.3 Method and technological alternatives**

The development will trust on both proven as well as the latest approved materials and technologies for building, services and engineering purposes after evaluating alternatives by the appointed specialists. As such no substandard materials or technologies will be considered for the proposed activities. Specialist inputs will form an important part of deciding on the best alternatives for the methodology as well as technological alternatives.

### **5.4 Specialist recommendations**

The main environmental issues associated with the proposed activity are the constraints related to the geology, ecology and storm water management. For these reasons specific specialist investigations were commissioned:

- Bio-ecological Assessment.
- Geotechnical Investigation.
- Heritage Impact Assessment.

Alternatives and recommendations made by the specialists will be used in the planning and operational phases. The findings of the specialist reports are summarized in section 8 and the complete reports are included with Appendix E.

### **5.5 The no-go alternative**

The no-go alternative is the option not to go ahead with the activities. The no-go alternative is recommended if the impact assessment concludes that the project is fatally flawed and/or if it is found that the activity will result in serious environmental impacts that cannot be mitigated or managed to an acceptable level. *The no-go alternative is assessed in section 9.3.*

## **6. LOCAL ENVIRONMENT & SITE DESCRIPTIONS**

### **6.1 Description of the site**

These properties are located to the northeast of the town Nelspruit and to the south of the N4 ring road. The proposed development land on Portion 85 & 86/282JT is approximately 28Ha in size and access is gained from via the University Road across a servitude road. The main topographic feature is the deep ravine of the Friedenheim Stream aligned from north to the south east as well as several drainage lines leading into the ravine. The slope is very steep in places and rock outcrops are present within the natural areas (Appendix 1). The residential suburb of Kamagugu is located to the south and east and agriculture is located to the west. Islands of old agriculture lands have been established to conform to the natural topography of the site. These old lands can be described as transformed land and are the main recommended development areas (A; B; C; D; E) for the project (Figure 1) and comprises approximately 13.6Ha. The remainder of the site is largely undisturbed and natural vegetation consists of fragmented natural woodland with thickets. However, the development will encroach into the natural areas to the total of 5Ha in order to have 18.6Ha in total for development.

### **6.2 Description of the geographical and topographical features**

The property is located in the eastern part of Mpumalanga to the north of the town Nelspruit. The region is known as Lowveld due to the low elevation of the land. It is located in grid 2530BD / 2531AC. Historically, the natural environment consisted of the savanna biome with typical bushveld vegetation. The study area has since been totally transformed to a metropolitan area as well as agriculture lands along the fertile lands along the Crocodile River and its tributaries.

### **6.3 Description of the physical features**

#### **6.3.1 Geology**

The general geology of the area consists of granite and gneiss, mostly of the Nelspruit suite, forming hills with large boulders. Soils are shallow, coarse lithosols, comprised of Glenrosa or Mispah soil types. A geotechnical report is included (Appendix E-1).

#### **6.3.2 Climate**

A typical Lowveld climate prevails with seasonal summer-rainfall, warm temperatures and dry winters. MAP is 654mm, ranging between 600mm and 1100mm (increasing with altitude). Frost is infrequent to occasional at higher altitudes.

#### **6.3.3 Biology & Ecology**

Nationally, the site is situated within the Lowveld Sour Bushveld (A9) veld type according to Acocks (1988), or Sour Lowveld Bushveld according to Low & Rebelo (1998) and Schmidt et al (2002). However, these classifications are very broad and may include several sub veld types of importance. The more detailed vegetation

classification system of Mucina & Rutherford (2006) is used to classify the veld units on the veld unit on a regional scale into two distinct units:

Unit 1) **Pretoriuskop Sour Bushveld** is found mainly to the east of Hazyview and around Pretoriuskop (KNP) in Mpumalanga Province. The topography consists of plains and gentle slopes with intermittent drainage lines. The vegetation structure is open savannah with few low shrubs and a well-developed grass component. Pretoriuskop Sour Bushveld is rated as Least Threatened as almost 40% is conserved within the Kruger National Park according to the National Spatial Biodiversity Assessment (Driver *et al*, 2004) on a regional level. Southern section of the site.

Unit 2) **Legogote Sour Bushveld**. This ecosystem is found in Mpumalanga and Limpopo Provinces along the eastern foothills of the northeastern escarpment. Characteristic trees and shrubs are *Parinari curatellifolia* and *Bauhinia galpinii*. It may form a dense woodland with diverse shrubs to transitional forest where *Sterculia murex* and *Combretum molle* is commonly found. This veld type is not well protected (1% formally protected) and already 50% is transformed and as such is rated as Endangered (having lost more than 40% of its original extent). Northern section of the site. The Mpumalanga Biodiversity Sector Plan (MTPA, 2014) ratings for the site are summarized as follows (Appendix A-4):

Moderately / Heavily modified: (Terrestrial / Freshwater ecology):

The old lands on the properties are classified modified land. MTPA objectives for these areas are quoted as follows: Such areas offer the most flexibility regarding potential land-uses, but these should be managed in a biodiversity-sensitive manner, aiming to maximize ecological functionality and authorization is still required for high impact land uses.

Other Natural Areas (Terrestrial ecology):

The natural habitat on the properties is classified as Other Natural Areas (ONAs). These areas are not required to meet biodiversity targets, and so are not identified as a priority in the MBSP. They do, however, retain much of their natural character. The biodiversity in these non-priority landscapes may still be of value and contribute to maintenance of viable species populations and natural ecosystem functioning and Other Natural Areas may provide essential ecological infrastructure and ecosystem services. ONAs offer the greatest flexibility in terms of management objectives and permissible land-uses, and are generally recommended (along with Modified Areas) as the sites for higher-impact land uses. *Primary objectives:* An overall management objective should be to minimize habitat and species loss and ensure ecosystem functionality through strategic landscape planning. This classification is relevant to aquatic ecological importance of the northern section of the property.

Freshwater ecology: Ecological Support Area (Important sub-catchment)

This sub-category includes National Freshwater Ecosystems Priority Areas (FEPA) sub-catchments and Fish Support Areas. A river FEPA is the river reach that is required for

meeting biodiversity targets for river ecosystems and threatened fish species. In managing the condition of a river FEPA, it is important to manage not only the river itself, but also the network of streams and wetlands as well as land based activities in the sub-catchment that supports the river FEPA. A proportion of tributaries and wetlands need to remain healthy and functional in order for the river FEPA to be kept in a good ecological condition. This requires that management activities are focused on maintaining water quantity and quality and the integrity of natural habitat in the sub-catchment. A bio-ecological report elaborates on the ecological status of the site (Appendix E-2).

#### **6.3.4 Water resources**

There are four ephemeral drainage lines present, flow is roughly from west to east where these tribute to the Friedenheim Stream. The 1:100 year flood lines of these watercourses are projected in Appendix A-2. The largest of these is watercourse 1. Watercourse road crossings are proposed across watercourses 1; 2 and 3. Furthermore, several erven will encroach into watercourse 2 (WC 2); (Appendix A-4). This will require diversion of flow and altering the bed and banks as well as a loss of riparian vegetation. The localities of the activity sites within the watercourse are provided in section 3 (Table 1.3). The status of these watercourses will be determined by specialist investigation. Relevant section 21(c) & (i) water use license applications (WULA) will be submitted to the Department of Water and Sanitation for authorization of these crossings.

#### **6.3.5 Social and economic environment**

Presently there is a demand for affordable housing in the local municipality. This project is aimed to relieve this social issue in a positive manner. It is not anticipated that the proposed activities will have a negative effect on the socio-economic environment. It is expected that it will improve the living conditions and lessen the need for daily motorized transport of the working class.

#### **6.3.6 Cultural and heritage features**

As the proposed development land is >5000m<sup>2</sup> in extent a Heritage Impact Assessment is required. However, it can be stated that no heritage sites were identified on or near the proposed site by the Heritage Impact Assessment that was conducted for the township establishment EIA process (Appendix E-3).

## **7. PUBLIC PARTICIPATION PROCESS**

### **7.1 Identification and notification of Interested & Affected Parties**

A public participation process is followed in accordance with the EIA regulations (2014). Thereby all possible Interested & Affected parties is contacted and afforded an opportunity to participate in the process. Contact was made with adjacent property owners and key IAPs. This was achieved through telephone conversation, actual visits and the EIA notice was distributed to the IAPs. EIA notices were distributed to residences in Ingwenya Street in Kamagugu as this will be the main access road. Site notices was placed at strategic places (Appendix D-1) and an EIA notice was published in the local newspaper (*Lowvelder, 2020-01-10*) so as to ensure maximum exposure to the general public (Appendix D-1).

An IAP and distribution register was compiled (Appendix D-2) and the Draft Basic EIA Report (addressing issues and concerns and containing more information regarding the project) will be distributed to all IAPs as well as the authorities for comment. All relevant Authorities - notably the Local and District Municipalities, Council, DWS (IUCMA) and MTPA, was notified and invited to participate in the process. At present the councilor position for this ward is vacant.

### **7.2 Authorities Consultation**

Consultation with DARDLEA includes the following process:

- Submission of an application for authorization of the activities in terms of section 24 of the National Environmental Management Act of 1998 (DARDLEA acknowledgement included with Appendix D-3).
- A site inspection was conducted with the DARDLEA official (Ms. Millicent Masango) on 2020-03-23.
- Submission of the consultation Basic EIA Report for approval.

The following authorities have also been informed of the project and provided with background information and/or the draft reports:

- Ehlanzeni District Municipality; City of Mbombela Local Municipality
- Mpumalanga Tourism and Parks Agency (MTPA);

### **7.3 IAPs consultations and comments**

No comment has been received to date.

## 8. SUMMARY OF SPECIALIST REPORTS AND RECOMMENDATIONS

Alternatives related to site conditions and technology is considered upon review of the specialist reports. The specialist reports are summarized under the relevant headings in the following section:

### 8.1 Geotechnical Report (Appendix E-1)

An engineering geological investigation was conducted by Geo3 consultants on the applicant property. For the most part, the property is characterised by some 0,5m to 1,5m of compressible and potentially collapsible regolith, with thin hillwash/transported soils in the eastern rectangle and thick hillwash/transported soils in the western rectangle. Sub-outcropping granite was noted sporadically, while bouldery diabase is present along the east-ern boundary, and in an east-west band across the site, with a drainage line partially superimposed on it.

Those portions of the properties earmarked for development are mostly deemed geotechnically suitable for township development, with a suitable founding substrate typically present at depths shallower than 1m. Due consideration must be given to the anthropogenic activities - areas of fill etc. - for which mitigating measures are provided. Based on the investigation undertaken, "the Property" has been divided into seven zones, each with a characteristic soil profile and/or range of geotechnical constraints.

**The area designated C** is characterised by thin transported soil overlying competent residua with sporadic occurrences of shallow bedrock and sub-outcropping granite. The geotechnical characteristics for this area are summarized as follows:

- Approximately ½ of the pits excavated probed the regolith to at least 1,5m. However, undulating bedrock and sporadic sub-outcropping granite dictates that the Bill of Quantities (BoQ) for the installation of services make allowance for up to 40% hard rock excavation [6].
- Normal construction is applicable providing foundations are placed on the dense residua or bedrock granite throughout. Taking cognizance of the potentially collapsible surficial hillwash, and to prevent nominal settlement beneath the floor slabs, the subgrade must be inundated prior to these being cast.

**The areas designated C2** are characterised by thicker unconsolidated and potentially collapsible regolith, i.e. hillwash and/or reworked residual. The geotechnical characteristics for these areas are summarized as follows:

- The pits probed the regolith to depths deeper than 1,5m. As such, soft excavation [6] should prevail throughout greater than 90% of these zones, although allowance should be made in the Bill of Quantities for up to 10% hard rock excavation [6] to cater for the undulating bedrock typical of the granite.
- Since the fieldwork identified dense residua within 1,5m throughout these areas, with pedocrete development in the north western rectangle, these areas are deemed susceptible to the development of on a non-perennial, perched,

groundwater table. As such, damp proofing measures are recommended beneath all structures.

- In view of the potentially collapsible and compressible regolith it is recommended that deep strip footings be used with foundations placed on the dense residua, or pedocrete in the north western rectangle. Alternatively, compaction of insitu soils below individual footings or soil rafts will suffice, especially since the regolith is deemed potentially suitable for use in the required controlled layers for these solutions.

**Areas designated S2/P(m)** comprises those areas straddling/overlying the diabase/lineament and characterised by greater than 1,5m of bouldery and possibly cohesive alluvium. These areas display evidence of periodic inundation, with sporadic mounds of fill. The geotechnical characteristics for these areas are summarized as follows:

- Soft excavation [6] is envisaged to 1,5m throughout greater than 60% of these areas, although owing to the bouldery nature of the alluvium, with many longer than 1m, it is recommended that the BoQ make allowance for up to 40% boulder excavation [6] for the installation of services.
- As is typical of the recently deposited sediments, the regolith is highly variable, and will include sand, clay, gravelly/bouldery horizons. Overall, these soils are unlikely to prove suitable for construction purposes.
- Notwithstanding the thick unconsolidated alluvium, hydrophilic vegetation and the fact that these areas constitute a gully head, makes these areas susceptible to a shallow, perched groundwater table and perhaps marshy ground conditions following periods of prolonged precipitation. If development in these areas is to be pursued, although not recommended, it will be necessary to include measures to prevent marshy ground conditions developing. Storm water management, damp proofing measures and subsoil drains will be paramount throughout these areas.
- To counteract the predicted consolidation settlement stiffened strip footings, stiffened, or cellular rafts or soil rafts are recommended.

**Areas designated P(d)** include those areas below the 1:100-year floodline and areas susceptible to surface flow, or excessive seepage following periods of prolonged precipitation, i.e. upper reaches of the streams - delineated as a single line where scale dictates. The geotechnical characteristics are summarized as follows:

- As is typical of the recently deposited sediment, the regolith is potentially highly variable, and will include sand, clay, gravelly/bouldery horizons. Overall, these soils are unlikely to prove suitable for construction purposes.
- In view of the susceptibility of these areas to flowing/ponding of surface water and/or falling below the 1:100-year floodline, they have been Classified as P(d) [3]. Consequently, residential development is precluded, and these areas should be zoned as "Private Open Space".

**Areas designated Rg** are characterised by sub-outcropping granite, albeit with the potential for pockets of regolith like that encountered in Zone C. The geotechnical characteristics for these areas are summarized below:

- In view of the sub-outcropping bedrock, these areas are susceptible to the development of a perched, groundwater, table within 0,5m, with the added constraints of surface water ponding and seepage along the upslope regolith/bedrock contact. As such, damp proofing measures are recommended beneath all structures, with measures included to divert runoff from the upslope side of structures.
- Normal construction will suffice, with foundations placed on the bedrock granite. Of note, where foundations are exposed and/or present at shallow depth, the bedrock must be dowelled at regular intervals to prevent slight lateral movement. If foundations straddle the bedrock/residua contact, these will need to be designed to accommodate increased differential settlement, i.e. must include structure specific construction joints or reinforcing.

**Areas designated Rd/H1** includes lenticular bouldery diabase outcrops with the potential for pockets of unconsolidated residua with, or without, hard rock core stones. The geotechnical characteristics of these areas are summarized as follows:

- For the most part, these areas classify as Rd/H1 [1] and conventional foundations should mostly suffice providing these are placed on the bedrock diabase throughout. However, owing to the variability inherent in these rocks, and the potential for expansive residua, caution must be exercised to ensure that foundations do not straddle pockets of weathered and potentially expansive residua.

**The area designated P(f)** includes fill of variable thickness, dumped previously and on-going. Not included, are the sporadic fill mounds in Zones Rd/H1 and S2/P(m). Of concern with any form of unconsolidated fill is that it poses an unacceptable risk to residential structures).

- As such, these areas Classify as P(fill) [1]. For residential development in these areas, site-specific geotechnical investigations must be undertaken.

**General:** Slopes mostly fall in the range 6 to 15% suggesting that stands and roads will need to be terraced. Steeper slopes, i.e. greater than 15% were noted locally, but these are generally not earmarked for development. More gentle slopes of less than 6% are confined to the extreme western boundary.

## **8.2 Ecological Report** (Appendix E-2)

The applicant plans to establish a mixed use township on the property, specifically for the lower income group. The project area is approximately 30Ha in extent. Environmental authorization of regulated activities is required before commencement of the activity. As part of the EIA process a biodiversity assessment was recommended by the environmental consultant and Afrika Enviro & biology was appointed to do this assessment. The property is located along the Mpumalanga University road (D725) to



the north of Nelspruit near to the junction with the KaNyamazane road. No buildings or infrastructure except the entrance road are present. Tobacco farming used to be practiced on these properties but this has ceased in the past and the lands are fallow and vegetated by grasses. Natural vegetation is fragmented and limited to the ridge lines and drainage lines. Two low ridges with a higher elevation than the surrounding land are present. These ridges have not been developed into agriculture lands due to their topography and their vegetation assemblage remains natural. No prominent rock outcrops are present, although eroded rocks are present on the ridge lines and the vegetation on these ridges is largely natural as it has been relatively protected on the property for many years from negative external drivers.

The results of the biodiversity investigation indicate that the larger site area is largely transformed from its natural state and the ecological functions and the assemblage of natural biota have been negatively modified. The ecological importance and sensitivity index (based upon natural integrity, fauna potential and ecological functions) for the different ecological units is delineated and summarized in the following Table:

Habitat Description	Ecological Sensitivity	Total surface area		Development surface area	
		Ha	%	Ha	%
Modified land	Low	14.8	55.7	13.0	70.3
Degraded woodland	Low-medium	3.7	13.3	3.2	17.3
Legogote woodland & thicket	Medium	4.0	15.0	1.0	5.4
Pretoriuskop woodland	Medium	4.0	15.0	1.3	7.0
<b>Total</b>		<b>26.5</b>	<b>100</b>	<b>18.5</b>	<b>100</b>

Site preparation for the proposed activity will lead to significant changes to the natural environment and negative direct and indirect impacts such as the loss of natural vegetation and loss and fragmentation of natural habitats and fauna. However, by projecting the development footprint onto the least sensitive ecological areas and conserving the core areas of the natural habitats the potential impact on the natural environment is effectively mitigated to a low magnitude.

For this reason this report recommends that the development is concentrated on the modified land and degraded habitat but will also encroach slightly into the natural habitat where sensitivity is regarded to be of medium significance. By designing the development plan to accommodate / conserve the core habitats and representative biota of the local area the cumulative impact will be reduced significantly. The watercourses and core areas of the woodland habitats is of significant ecological importance as it provides refuge and a corridor that enables animals to move about the larger study area and to migrate in between adjacent terrestrial habitats that are connected by way of this corridor. These core areas will not be directly affected by the activities.

## **Conclusion & Recommendations**

The report concludes that development can be considered subject to conditions and measures to mitigate potential impacts on the natural environment. The following conditions and recommendations are relevant:

### **Site selection**

- The recommended development areas are projected on the development map.
- It is recommended that watercourse crossings for pipelines and roads are placed on or near to existing crossing sites to minimize potential impacts on the relevant habitat.
- Where existing crossing sites are not present, new sites can be considered but the distance and surface area of the activity footprint must be kept to the minimum.

### **General recommendations**

The development plan must accommodate the following:

- Use only the recommended development areas as projected in the development plan.
- Conserve as much of the natural habitats and minimize loss of large trees and sensitive biodiversity;
- Retain large indigenous trees on site where possible.
- Large trees that will be destroyed must be investigated for the presence of large bird's nests. If present these must be conserved for the time being (as per specialist advice).
- Improve the remaining habitat by conducting invasive vegetation control and bush encroachment management.
- Use only indigenous flora for landscaping and wind breaks.
- Implement an alien invader vegetation control program.
- Spoil material may not be pushed / stockpiled into the surrounding natural habitats, drainage lines or buffer zones.

### **Buffer zones**

- No buffer lines are applicable in the areas where the development encroaches into the natural habitat. However, any activities beyond the development line within the natural habitat are strictly forbidden.
- The 1:100 year flood lines of the watercourses are proposed as buffer lines as this will effectively include the riparian habitat as well as the watercourses.
- It is recommended that an Environmental Control Officer (ECO) is appointed who will be responsible to actually delineate the buffer zones on site (considering actual on site conditions and to ensure that large trees are not unnecessarily destroyed).
- Spoil material may not be pushed / stockpiled into the buffer zone or surrounding natural habitats.

### **8.3 Heritage Impact Assessment Report (Appendix E-3)**

A Phase 1 Heritage Impact Assessment (HIA) regarding archaeological and other cultural heritage resources was conducted on the footprint of portions 85 & 86 the farm FRIEDENHEIM 282JT, City of Mbombela (Nelspruit). The study area is situated on topographical map 1:50 000, 2531AC WITRIVIER. This area falls under the jurisdiction of the City of Mbombela Local Municipality, and the Ehlanzeni District Municipality, Mpumalanga Province. The applicant, COLLFIN PROJECTS (Pty) Ltd. is proposing to establish a township, the Friedenheim Housing Project. Most sections of the farm consist of previously disturbed agricultural lands, with only small natural sections, which will be included in the development. No heritage features were observed during the survey within the study area. A few concrete- and brick foundations were observed, but are recent and have no significance. From a cultural perspective the recent foundations will not impact the proposed development negatively. No graves were identified during the survey.

It is recommended that the applicant be made aware that distinct archaeological material or human remains may only be revealed during the development phase. Such sub-surface finds must be assessed by a qualified archaeologist after which an assessment can be made. Based on the survey and the findings in this report, Adansonia Heritage Consultants state that there are no compelling reasons which may prevent the proposed township development, within the study area, to continue..

### **8.4 Traffic Planning**

Endecon Ubuntu was requested by Collfin Group to conduct a Traffic Impact Study (hereafter referred to as TIS) for the proposed Friedenheim Residential Township Development located adjacent to the existing Kamagugu township, Mbombela. Considering the relevant analysis results, it is provisionally indicated that the following improvements would need to be implemented to bring the intersections to operate at an acceptable LOS in terms of the assumed background traffic growth:

D2296/Ingwenya St (Kamagugu main access intersection):

- On the D2296 northern approach (from Kanyamazane) convert the current shared left-through lane to a dedicated left-turn lane;
- On the D2296 northern approach (from Kanyamazane) provide a 120m additional through-lane with appropriate taper;
- On the Ingwenya St western approach provide a 60m additional right turn short-lane.

D2296/D725 (University of Mpumalanga main access road):

- As previously planned in support of the Mpumalanga University, signalize the intersection if SARTSM traffic signal warrants are met.
- On the D2296 northern approach (from Kanyamazane) provides a 30m additional dedicated left-turn short-lane with appropriate taper.

D2296/Dr Enos Mabuza Dr (Valencia main access road): ▪ Signalize the intersection if SARTSM traffic signal warrants are met.

- On the D2296 western approach (from Mbombela) provides a 60m additional through-lane with an accompanying downstream 150m short-lane along with appropriate tapers.

On the Dr Enos Mabuza Dr southern approach reconfigure and/or upgrade the left- turn slip-lane to be able to accommodate at least a 5m shared lane section to provide 2nd right-turn lane eastward (towards Kanyamazane).

Considering the relevant analysis results, it is provisionally indicated that the following improvements would need to be implemented to bring the intersections to operate at an acceptable LOS in terms of the impact of the development traffic:

Ingwenya St/Imbulu St (Kamagugu main internal intersection):

- Provide a circa 20m diameter single circulating lane mini-roundabout within the existing road surface.
- D2296/Ingwenya St (Kamagugu main access intersection):
- In the absence of the D2296 being doubled in capacity (dualization) as prescribed in the Mbombela Roads Master Plan, further localized upgrading of the signalized intersection will become too costly with limited effectiveness given the very high through-traffic volumes along the D2296.
- Rather it is to be considered to curtail the initial upgrades as proposed as part of the background traffic analysis and rather investigate the feasibility to convert the intersection to a 55m diameter double circulating lane roundabout. This may be considered a more pragmatic solution given increased recent load shedding as well as the high prevalence of cable theft along the D2296.

As agreed with CoMLM:

- Provision is made and space is reserved for the future proposed Friedenheim Link Road as proposed in the Mbombela Roads Master Plan.
- Access the western section of Phase C is provided at a position as far away as possible from the future N4 Friedenheim Rd interchange.
- A single access point is provided off the extension of Ingwenya St with provision made for a future T-junction should Ingwenya St eventually extend.

Given the high prevalence of public transport dependency in Kamagugu, provision is made for an internal bus route and bus bays to allow bus- and taxi operators easy access and easy turnaround around an internal 40m roundabout.

The proposed Friedenheim residential township development can be approved from a traffic engineering point of view subject to due consideration of the recommendations included in this report.

## **9. ENVIRONMENTAL ISSUES & POTENTIAL IMPACTS**

### **9.1 Environmental issues and concerns**

No issues or concerns have been identified that are not already addressed as part of the assessment.

### **9.2 Assessment of activity and site alternatives**

The proposed activity is the establishment of an affordable residential suburb. No viable activity alternatives are available and no alternative sites are available. The activity site was chosen with the objectives of being closest to available services links and to minimize the potential impact on the natural environment. The potential environmental aspects (geographical, physical, biological, social, economical, cultural and heritage) related to each activity site were assessed and specialist inputs were sourced where necessary.

### **9.3 Assessment of the no-go alternative**

The no-go alternative is the option not to go ahead with the development. If the no-go alternative is followed it will have a significant negative impact for the applicant and students in need of affordable accommodation. None of the specialist studies found that the proposed activity (and sites) will have a significant long term negative impact on the environment and do not recommend the no-go alternative. For these reasons the no-go alternative is not recommended by the EAP.

### **9.4 Impact Assessment Methodology**

So as to evaluate impacts, objectively rank and assign an order of priority for individual impacts, the following components of an impact are determined and investigated as set out in Table 2.1 on the following page.

### **9.5 Environmental impact assessment of the preferred alternative**

During the basic EIA process potential environmental impacts and/or risks were identified related to the following environmental aspects, associated with the preferred alternative for the different development phases:

#### **Planning and pre-construction phases**

- Topography and geology
- Biodiversity & ecology
- Soil and water resources
- Visual
- Heritage resources

#### **Construction and rehabilitation phases**

- Biodiversity & ecology
- Soil and water resources
- Atmosphere & sound

- Visual
- Heritage resources
- Social & Economic impacts
- Rehabilitation

### **Operational phase**

- Availability of municipal services

Aspects that are related to potential environmental impacts and consequences of the preferred alternative are discussed in the following sections and potential impacts are assessed in sequence of the development phases in Table 2.2.

#### **9.5.1 Geographical aspects**

The geographical sensitivity related to the natural environment is classified by the MBSP. The MBSP for the biodiversity significance of the study site are as follows:

Terrestrial: Other Natural Areas;

Freshwater: Ecological Support Area (Important sub catchment);

The freshwater ecological support area covers the extent of the catchment of the ridge line. It is unlikely that this ecological support area will be affected during any phase as no watercourses will be affected and pollution potential is low.

#### **9.5.2 Topography & geology**

The rocky ridge lines on site are prominent topographical features and the proposed activity will encroach into the foot slope thereof. Potential topographic or geological constraints are steep slopes and bedrock. Steep slopes will not be developed (>15%) and no roads are planned on steep slopes. The geotechnical report concludes that the site is suitable for development if specific recommendations and mitigation are employed (Appendix E-1). The design took cognizance of these constraints and recommendations.

One marginal area where the applicant wishes to develop is erven 453-457 and 464-468 as well as 472-482 (part of phase 3) which are located in geotechnical zone **S2/P(m)**. The geotechnical report states that this area may be seasonally wet or marshy. If development in this area is to be pursued, although not recommended, it will be necessary to include measures to prevent marshy ground conditions developing. Storm water management, damp proofing measures and subsoil drains will be paramount throughout these areas. Any additional mitigation measures proposed by the consulting engineer during the construction phase will be adhered to.

#### **9.5.3 Biodiversity & ecology**

The results of the biodiversity investigation indicate that the larger site area is largely transformed from its natural state and the ecological functions and the assemblage of natural biota have been negatively modified. Natural vegetation is fragmented and limited to the ridge lines and drainage lines. Two low ridges with a higher elevation than

the surrounding land are present. These ridges have not been developed into agriculture lands due to their topography and their vegetation assemblage remains natural. No prominent rock outcrops are present, (Appendix E-2).

Site preparation for the proposed activity will lead to significant changes to the natural environment and negative direct and indirect impacts such as the loss of natural vegetation and loss and fragmentation of natural habitats and fauna. However, by projecting the development footprint onto the least sensitive ecological areas and conserving the core areas of the natural habitats the potential impact on the natural environment is effectively mitigated to a low magnitude.

For this reason this report recommends that the development is concentrated on the modified land and degraded habitat but will also encroach slightly into the natural habitat where sensitivity is regarded to be of medium significance. By designing the development plan to accommodate / conserve the core habitats and representative biota of the local area the cumulative impact will be reduced significantly. The core areas of the woodland habitats is of significant ecological importance as it provides refuge and a corridor that enables animals to move about the larger study area and to migrate in between adjacent terrestrial habitats that are connected by way of this corridor. These core areas will not be directly affected by the activities and will be conserved as open spaces together with the drainage lines.

The report concludes that development can be considered subject to conditions and measures to mitigate potential impacts on the natural environment.

#### **9.5.4 Soil and water resources**

There are no permanent surface water courses, water resources or boreholes present on site. Water for the construction phase will be obtained from an external source. Potable water for the operational phase will be supplied by the local municipality.

Pollution of surface and groundwater is unlikely during the construction phase if efficient waste disposal and best practice construction methods are employed.

There are four ephemeral drainage lines present on site (Appendix A-2). These are indicated by their 1:100 year flood lines as they are first order, A-Section drainage lines without well-defined active channels or riparian vegetation (as assessed and explained in the Bio-Ecological Report, Appendix E-3). The abovementioned report recommends that the 1:100 year flood lines are used as a minimum buffer to protect these drainage lines as they are of low concern (ecologically). A larger buffer area will in fact be respected as a setback area as only a few erven is planned directly adjacent to the floodline. The drainage lines will be conserved as open spaces.

Storm water infrastructure will be provided by the applicant and storm water will be discharged of site into the open spaces with mitigation measures in place to reduce the

velocity and energy of the storm water. Storm water infrastructure and sewer must be maintained and monitored during the operational phase in order to prevent pollution of downstream soil and water resources. Proactive erosion control measures must be employed during construction and operational phases.

#### **9.5.5 Atmosphere & sound**

Dust and mechanical noise will be generated during the construction phase. Blasting will be required to create foundation platforms. The generation of noise, dust and vibrations must be monitored and actions must be taken to mitigate if it is determined that it is excessive or complaints is received. In case that blasting is required, a registered blaster must be employed to perform this task and to provide standard mitigation measures. Neighbours must be provided with adequate warning before blasting is done.

#### **9.5.6 Environmental pollution & waste management**

During construction and operational phases spillage of chemicals (e.g. lubricants, fuel, and paint) and inadequate waste disposal may result in environmental and water pollution. Strict precautions must be taken to prevent possibilities of pollution and the generated waste and refuse will require efficient waste management. Refuse bins should be conveniently located, and effort should be made to keep paper, plastic and bio- degradable materials separate for recycling. The anticipated consequences on the general environment of both these systems can be considered to be low.

#### **9.5.7 Visual and aesthetic impacts**

During construction phase poor site management and waste disposal will result in untidy and littered sites that will be an eyesore. Efficient construction management and waste disposal must be in place to prevent an untidy and littered environment. The completed (operational) facility will be aesthetically pleasing buildings, designed by an architect. One of the objectives of the design is to be visually attractive and the development will not break the horizon from any angle. The facilities and grounds will be maintained in good order to keep a neat and tidy appearance. The anticipated visual consequences on the general environment can be considered to be low.

#### **9.5.8 Heritage resources**

A Heritage Impact Assessment was conducted. No heritage sites are located on site or will be affected by the proposed activities (Appendix E-3).

#### **9.5.9 Social and economic impacts for the local area**

There is a demand for affordable housing in the municipality. This project is aimed to relieve this social issue in a positive manner. It is not anticipated that the proposed activities will have a negative effect on the socio-economic environment. It is expected that it will improve the living conditions and lessen the need for daily motorized transport of the working class.



#### **9.5.10 Availability of municipal services**

The Services Engineering Report (Appendix E-4) evaluated the demand for services and concludes that services will be provided by the local municipality. Infrastructure is located nearby the site that can be linked to (water, electricity and sewer).

#### **9.5.11 Access, traffic and parking**

Access will be gained from Ingwenya Street, Kamagugu until such time that the planned municipal main road is constructed that will interchange with the University Road to the north. Traffic aspects and impacts were assessed with a specialist report (Appendix E-5). The report conclude that the proposed Friedenheim residential township development can be approved from a traffic engineering point of view subject to due consideration of the recommendations included in this report.

## **10. STATEMENTS**

### **10.1 Assumptions and uncertainties**

In general (any and all) impact assessment process is based on a degree of uncertainties and assumptions that are made. The EAP trusted on the integrity and professional opinions of the specialists, officials and public that was consulted during the process to assess the potential impacts. Significant uncertainties that were encountered and assumptions that were made are discussed where appropriate. The EAP can conclude that an objective approach was followed throughout the EIA process and the conclusions and recommendations made are to best satisfy the needs and interests of all stakeholders as well as the environment.

### **10.2 Professional opinion**

The EIA process concludes that the proposed activities and associated infrastructure will not result in significant environmental impacts if the recommendations and formulated mitigation measures are adhered to. The environmental impacts that were assessed are largely of low magnitude and those impacts with a larger negative consequence can be mitigated or managed to achieve an acceptable level of significance/consequence. This ensures the best outcome for all stakeholders and the environment. The EAP therefore recommends a positive final decision on authorization of the activity. Conditions that should be considered by the competent authority and may be required for authorization are given in the following section as well as the Environmental Management Programme (Appendix G).

### **10.3 Environmental impact statement**

The assessment exercise, input from specialists, comments from relevant authorities and interested parties concludes that the proposed activities and preferred sites will not result in significant environmental impacts if the recommendations and formulated mitigation measures are adhered to. An environmental impact statement is included as Table 2.3 and presents a summary of the key findings and a statement of positive and negative implications of the proposed activity as well as alternatives and relevant mitigation measures where appropriate.

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