



Tsantsabane Local Municipality

Final EIA Report

Proposed integrated housing development on the Remainder of Erf 1, to the north east of Postmasburg (Greenfields Development)



Compiled by:

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EXECUTIVE SUMMARY

The applicant, namely the Tsantsabane Local Municipality, proposes an integrated housing development on a ±200 ha portion of the Remainder of Erf 1, Postmasburg (the site). The proposed development consists of residential (2 158 erven), business, education (primary school, secondary school and crèche), church, clinic and sport field components, as well as associated civil and electrical service and road infrastructure.

The development site is located to the north east of Postmasburg and south of the Postdene residential area. A railway line forms the northern boundary of the site.

The overall terms of reference for this assessment exercise are to:

- Conduct an in-depth investigation into biophysical and socio-economic aspects, focusing on key issues;
- Address the issues that were identified during the scoping process and investigation, which are associated with this planned project;
- Advise the applicant on the potential impacts (positive and negative impacts) of their planned development, as well as the implications for the design, construction and operational phases of the project;
- Facilitate public input on environmental and social matters;
- Identify possible measures to mitigate the potential impacts of the planned project;
- Address the cumulative impact of all aspects of the planned development as well as recommend possible mitigating measures.

The following potential issues were identified during the scoping phase:

- Destruction of natural vegetation
- Soil / geotechnical suitability
- Bulk service infrastructure, which includes:
 - Water provision
 - Electrical infrastructure
 - Roads
 - Sanitation
 - Solid waste disposal
- Visual impact

- Socio-economic impact

Specialist studies undertaken include:

- Biodiversity and Ecological Assessment
- Phase 1 Heritage Impact Assessment
- Geotechnical Report
- Bulk Civil Services Report
- Electrical Services Report
- Traffic Impact Study
- Economic Impact Assessment

Specialist input was obtained during the planning phase of the development and was incorporated into the site development plan. Dolomitic unstable and ecologically sensitive areas were excluded from the proposed site development plan.

The no-go alternative, i.e. keeping the site in its current state and not proceeding with the propose development, is not recommended, as the socio-economic benefits and need for housing in Postmasburg far outweigh any negative impacts, most of which can be mitigated. The impact that informal settlement may have on the site is far greater.

An Environmental Management Programme (EMPr) is required for the activity to minimize any negative impacts during the different phases of the development, especially the construction phase and is included in Annexure F of this report.

There is no obvious environmental reason for Environmental Authorisation to be denied.

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1. INTRODUCTION

1.1. PROJECT BACKGROUND

The applicant, namely the Tsantsabane Local Municipality, proposes an integrated housing development on a ±200 ha portion of the Remainder of Erf 1, Postmasburg (the site). The proposed development consists of residential, business, education (secondary school and crèche), church, clinic and sport field components, as well as associated civil and electrical service and road infrastructure.

The development site is located on the north east of Postmasburg and south of the Postdene residential area. A railway line forms the northern boundary of the site.

The site is relatively flat and is occasionally used for communal grazing.

1.2 OBJECTIVES OF THE EIA PROCESS

The objectives of the Environmental Impact Assessment process are described in Appendix 3 of the National Environmental Management Act (Act 107 of 1998) (NEMA): Environmental Impact Assessment Regulations No. R. 982 of December 2014:

- Determine the policy and legislative context within which the activity is located and document how the proposed activity complies with and responds to the policy and legislative context;
- Describe the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;
- Identify the location of the development footprint within the preferred site based on an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects of the environment;
- Determine the –
 - nature, significance, extent, duration and probability of the impacts occurring to inform identified preferred alternatives; and

- degree to which these impacts –
 - can be reversed;
 - may cause irreplaceable loss of resources, and
 - can be avoided, managed or mitigated;
- Identify the most ideal location for the activity within the preferred site based on the lowest level of environmental sensitivity identified during the assessment;
- Identify, assess, and rank the impacts the activity will impose on the preferred location through the life of the activity;
- Identify suitable measures to avoid, manage or mitigate identified impacts; and
- Identify residual risks that need to be managed and monitored.

1.3 APPLICABLE LEGISLATION AND GUIDELINES

This process has been conducted in terms of the relevant legislative requirements, namely:

- National Environmental Management Act (Act No 107 of 1999)
- National Biodiversity Act (Act No 10 of 2004)
- National Heritage Resources Act (Act No 25 of 1999)
- National Water Act (Act 36 of 1998)

The NEMA Environmental Impact Assessment Regulations, 2014 (Government Notices No. R. 982, 983, 984 and 985 of 4 December 2014) determine the Environmental Impact Assessment (EIA) process that should be followed for certain listed activities, which may have a detrimental effect on the environment.

The proposed development includes certain listed activities that require environmental authorization prior to commencement.

The relevant activities are listed below:

NEMA Regulations No. R. 983 of 4 December 2014 (Listing Notice 1):

Activity 12:

“The development of-

(i) canals exceeding 100 square metres in size;

- (ii) channels exceeding 100 square metres in size;**
- (iii) bridges exceeding 100 square metres in size;**
- (iv) dams, where the dam, including infrastructure and water surface area, exceeds 100 square metres in size;
- (v) weirs, where the weir, including infrastructure and water surface area, exceeds 100 square metres in size;
- (vi) bulk storm water outlet structures exceeding 100 square metres in size;**
- (vii) marinas exceeding 100 square metres in size;
- (viii) jetties exceeding 100 square metres in size;
- (ix) slipways exceeding 100 square metres in size;
- (x) buildings exceeding 100 square metres in size;**
- (xi) boardwalks exceeding 100 square metres in size; or
- (xii) infrastructure or structures with a physical footprint of 100 square metres or more;**

where such development occurs-

- (a) within a watercourse;
- (b) in front of the development setback line; or
- (c) if no development setback line exists, within 32 metres of a watercourse, measured from the edge of a watercourse;-

Excluding-

- (aa) the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour;
- (bb) where such development activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies;
- (cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies;
- (dd) where such development occurs within an urban area; or
- (ee) where such development occurs within existing roads or road reserves."

Activity 24:

"The development of –

- (i) a road for which an environmental authorisation was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Government Notice 545 of 2010; or
- (ii) a road with a road reserve wider than 13,5 meters, or where no road reserve exists where the road is wider than 8 meters;**

but excluding –

- (a) roads which are identified and included in activity 27 in Listing Notice 2 of 2014; or
- (b) roads where the entire road falls within an urban area."

Activity 28:

"Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture or afforestation on or after 01 April 1998 and where such development:

- (i) *will occur inside an urban area, where the total land to be developed is bigger than 5 hectares; or*
- (ii) ***will occur outside an urban area, where the total land to be developed is bigger than 1 hectare;***

excluding where such land has already been developed for residential, mixed, retail, commercial, industrial or institutional purposes.”

NEMA Regulations No. R. 984 of 4 December 2014 (Listing Notice 2) (Full EIA):

Activity 15:

“The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for-

- (i) *the undertaking of a linear activity; or*
- (ii) *maintenance purposes undertaken in accordance with a maintenance management plan.”*

Application for Scoping and EIA has therefore been made to the Northern Cape Department of Environment and Nature Conservation (DENC).

2. ENVIRONMENTAL ASSESSMENT PRACTITIONER

2.1 DETAILS OF ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP) WHO PREPARED THE REPORT

Marguerite Cronje
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2.2 EXPERTISE OF THE EAPS TO CARRY OUT THE SCOPING PROCEDURES

Me. Marguerite Cronje

Key qualifications:

- Key competencies and experience include environmental impact assessment, environmental management and monitoring (>10years).

Education:

- B.Sc. (Zoology), University of the Free State, SA, 2002
- B.Sc. Honours (Zoology), University of the Free State, SA, 2003
- M.Sc. Diploma (Equine Science), University of Edinburgh, UK, 2005
- Masters in Environmental Management, University of the Free State, SA, 2008.

Conferences:

- 10 years of Environmental Impact Assessments in South Africa – Somerset West (2008)
- Free State Provincial Waste Summit – Bloemfontein (2010)
- IAIA Conference – Thaba Nchu (2013)
- IAIA Conference – Port Elizabeth (2016)

3. PROJECT INFORMATION

3.1 PARTICULARS OF APPLICANT

Tsantsabane Local Municipality

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3.2 SITE DETAILS

The proposed development site is located north east of Postmasburg. The site measures **200.4846 ha** and is located on a portion of Erf 1, Postmasburg, which is currently zoned for agriculture. The details of the relevant property are listed below:

Table 1: Property details

Property Description	Size of property	SG 21 digit code
Erf 1, Postmasburg	± 8054 ha	F03100030000000100000

3.3 DESCRIPTION OF THE PROPOSED DEVELOPMENT

The proposed development consists of 2158 residential erven (subsidized housing), business erven, schools and day care, community facilities, churches, sports fields and public open spaces. The associated roads network, and the civil and electrical services required are also included in the proposed development.

The proposed development site is included within the urban edge of the Postmasburg Spatial Development Framework (SDF).

A site development plan is shown in Figure 1 and the details of proposed land uses are indicated in Table 2 below.



Figure 1: Site development plan of the proposed development (refer to Annexure B for a larger image).

Table 2: Land Use Table

LAND USE	NO. OF STANDS	AREA (HA)	% OF AREA
Residential (350m ² erven)	2158	86.5072	43.15
Business	2	2.0129	1.00
Bus stop / Taxi rank	2	1.1682	0.58
Secondary school	1	3.9512	1.97
Secondary / Primary school	1	5.5817	2.78
Primary school	1	3.3181	1.66
Daycare / Crèche	3	1.3062	0.65
Community facility	3	1.3184	0.66
Community facility / Clinic	1	1.2996	0.65
Church	4	1.9820	0.99

Municipal uses	2	1.9783	0.99
Public parks	28	9.6743	4.83
Rivers or river beds	6	29.7495	14.84
Sports fields	1	1.5884	0.79
Minor roads		5.4667	2.73
Public streets		43.8519	21.72
TOTAL	2213	200.4846	100

Refer to the proposed site development plan in **Annexure B**.

3.4 ENERGY EFFICIENCY

The following energy efficiency measures have been incorporated into the design of the development:

- Use of heat pumps and / or solar panels for water heating;
- Cooking with gas;
- Fuel cell technology;
- LED street lighting.

The average energy consumption by each household can also be reduced especially in winter time by designing units to allow natural heating of the households:

- Passive temperature measures by designing the units to face in the North direction;
- Insulation of the roofing space;
- Double glazing of the windows.

(Outline Scheme Report: Electrical Engineering Services, June 2017)

3.5 NEED AND DESIRABILITY

The following extract is from the Town Planning Memorandum prepared by Urban Dynamics for the proposed development's township establishment application:

It is the view of the applicant that the proposed development / township establishment of the proposed Greenfields will enhance the value of the land in the area due to the stabilizing effect that formal development of the Remainder of Erf 1, Postmasburg will have and that it will contribute to much needed economic growth and supply of affordable residential opportunities in this part of Postmasburg.

3.5.1 Establishment of a Sustainable Living Environment

The developer will strive to establish a sustainable living environment for the inhabitants of the proposed Greenfields by providing local social supportive facilities. The development will form part of a larger development area with supportive land uses such as primary schools, secondary schools, community facilities, business sites and parks. This will promote the principle of "Live, Work and Play" within the community.

3.5.2 Economic Upliftment

A project like this will create positive spin-offs in terms of job creation for at least the construction period of the project. This economic opportunity must also be structured in such a way that it can establish long-term sustainable economic growth, both in terms of skilled and unskilled labour. Further in terms of the establishment of permanent business and economic growth opportunities in the area.

3.5.3 Environmental Sustainability

The benefits of Open Space are far and wide reaching. Green spaces in urban areas provide substantial environmental benefits. Trees reduce air pollution and water pollution, they help keep neighbourhoods cooler and they are a more effective and less expensive way to manage stormwater runoff than building systems of concrete sewers and drainage ditches.

The parks will also produce important social and community development benefits. They will make the neighbourhoods liveable; they offer recreational opportunities for youth, children and families; and they will provide places in neighbourhoods where people can feel a sense of community.

Access to public parks and recreational facilities has been strongly linked to reductions in crime and in particular to reduced juvenile delinquency. Community gardens increase residents' sense of community ownership and stewardship, provide a focus for neighbourhood activities, expose youth to nature, connect people from diverse cultures, reduce crime by cleaning up vacant lots and build community leaders.

3.5.4 Housing Need

It is hereby stated that there is qualified need to address the housing issues in the area. The growing gap between income and the cost of housing does not affect only lower income households but also households with middle-range income whom struggle to find affordable housing.

There are a growing number of South African households that are willing and able to buy or rent a non-subsidised house. However, many of these families simply have nowhere to go as there is little suitable housing stock made available to them in good localities. Many of these families resort to subsidised housing as an alternative residential option thereby creating a shortage of subsidised housing supply. A need exists to create affordable housing for middle income households who are willing to purchase or rent non-subsidised housing and thereby participate in financed and bonded housing.

3.5.5 Economic Empowerment – Bridging the Gap

In the process of bridging the gap between high and low income areas, it is essential to ensure that employment opportunities are available to the poor in order for them to be able improve their economic status and partake in financial growth.

These employment opportunities should be located in close proximity to these lower income communities. In this case, the proposed Greenfields is situated in close proximity to the Postmasburg Node (within 5 minutes driving distance). The relatively short driving/travelling distance to this area of economic opportunity make this location suitable for residential development.

These employment opportunities can benefit the residents of this proposed development. Economically, this development will also bring new business opportunities in the area.

3.5.6 Variety of Housing Typologies

Through the formulation of the layout plan, provision was made for various housing typologies to provide for interest and variety. The housing typology varies in that variety of stands and unit sizes will be available. The value/cost of the houses constructed is linked to stand/unit sizes.

The proposed Greenfields project is a development that aims to promote a high quality, residential and mixed-use environment supported with public amenities. As such it could be argued that the proposed development will act as a key structuring feature in the area because it will encourage a range of housing options to meet different and changing needs of households in the area. The proposed development promotes mixed-uses by allowing appropriate services, supportive uses and social amenities to be intermingled with residential development.

3.5.7 Better Utilization of Land

The application is made to ensure the optimum utilization of the site without defeating any of the primary considerations in respect of environmental issues, compatibility, health, safety, orderliness, economics and the wellbeing of all persons and instances.

It is the intention of the developer to realize the development potential of the property by establishing a mixed income and mixed land uses

development in Greenfields, which is strategically located east of the R385 and R325 intersection. The proposed development will consist of an integrated, multifunctional neighbourhood offering residential, business, community and recreational facilities.

3.5.8 Impact on Surrounding Properties

The provision of new tenure options and housing typologies would generally enhance the area and accommodate a wide range of residents and income groups. The proposed development will protect the area from further land invasion thus having a lesser potential impact.

(Urban Dynamics, 2017)

3.6 DESCRIPTION OF FEASIBLE AND REASONABLE ALTERNATIVES

3.6.1 Site alternatives: Various sites were evaluated and eliminated through a dolomite stability assessment. The distance to Postmasburg, availability of services and underlying dolomitic conditions were therefore taken into consideration when selecting the site.

3.6.2 Activity alternatives: The proposed activity was identified by the Municipality to consist of an integrated housing development. The option of not proceeding with the development is the only activity alternative. No other activities were considered for the site due to the assessed need and feasibility of the proposed activity / development.

3.6.3 Design alternatives: Various layout and design alternatives were considered by the applicant, engineers and town planners, taking terrain and environmental constraints identified during the planning phase into account, with the preferred site development plan being the result. Refer to **Annexure B** for the preferred design option.

3.6.4 No-go option: The no-go option means keeping the status quo, i.e. not transforming the site for a housing development. Due to the locality of the site in relation to the town of Postmasburg, informal settlement may occur, which could be detrimental to the environment. Sensitive areas might also

be encroached upon if not formally protected within a controlled development. The economic benefits to the town and region and the need for housing, make the no-go option the least feasible alternative.

4. PUBLIC PARTICIPATION

4.1 INTRODUCTION AND OBJECTIVES

As an important component of the EIA process, the public participation process involves public inputs from Interested and Affected Parties (I & APs) according to Chapter 6 of the NEMA 2014 EIA Regulations (No. R. 982 of 4 December 2014). I & APs may comment during the EIA of the proposed project.

The key objectives of the public participation process are to:

- Identify a broad range of I & APs, and inform them about the proposed project.
- Understand and clearly document all issues, underlying concerns and suggestions raised by the I & APs, and
- Identify areas that require further specialist investigation.

4.2 METHODOLOGY

4.2.1 Identification of key I & AP's

Key I & AP's, are the following types of organizations:

- Surrounding landowners
- Environmental organizations
- Authorities
- GOs
- NGOs
- Business and civic organizations

See **Annexure D** for a list of I & AP's.

4.2.2 Notification of potential I & AP's of EIA:

i) Newspaper advertisements: (Annexure D)

<i>Kalahari Bulletin</i>	14 April 2016 & 6 April 2017
<i>Die Ghaap</i>	22 April 2016 & 31 March 2017

ii) **On site notices:** On site notices were also placed at prominent places at and near to the site on 4 April 2016 allowing 30 days for public response (**Annexure D**).

4.2.3 Public comments

The draft Scoping Report was circulated for comment from 25 April 2017 to 29 May 2017 and the draft EIA Report was circulated from 10 July 2017 to 10 August 2017. Comments received are included in **Annexure D**.

4.3 SUMMARY OF KEY ISSUES RAISED / COMMENTS BY THE I & AP's

Table 3: Summary of comments received during the public participation process

COMMENTS RECEIVED DURING THE PUPLIC PARTICIPATION PROCESS			
Inputs prior to draft Scoping Report circulation			
Correspondence date	Comment from:	Comment	Response
10 April 2017	M.T. Morole	The development site forms part of a lease portion to a mining area.	Confirmation was provided that the mining lease areas on Erf 1 Postmasburg were never registered and have never been mined.
Inputs on draft Scoping Report			
26 April 2017	Phillipp Coetzee (Transnet)	The proposed development is directly adjoining our railway line. No objection to proposed development, but a road or an 8m building restriction must be provided directly adjoining our property and special care should be taken on the flow of storm water to and from our railway lines.	Comments noted and incorporated into site development plan and stormwater management plan.

Inputs on draft EIA Report			
10 July 2017	P. Msimango (Department of Water & Sanitation)	<ol style="list-style-type: none"> 1. The area falls within the D73A quaternary catchment in the Lower Vaal Business Unit of the Vaal River Proto Catchment Management Agency. 2. No development should be done within 100m or 1:100 year flood line of any watercourse and 500m of wetlands without authorisation from our Department. 3. The construction camp shall not be located within the 1:100 year flood line. 4. Operation and storage of equipment within the riparian zone must be limited as far as possible. 5. Vehicles and other machinery must be serviced well above the 1:100 year flood line or within 100m from any watercourse or estuary. 6. Oils and other potential pollutants must be disposed of at an appropriate licensed site. 7. Any storm water must be diverted from the construction works and roads and must be managed in such a manner as to disperse runoff and to prevent the concentration of storm water flow. Increased runoff due to vegetation clearance and / or soil compaction must be managed. 8. Vegetation must be monitored and managed on an on-going basis during construction and operation. Alien vegetation must not be allowed to further colonise the area and all new alien vegetation must be eradicated. 9. A detailed layout plan needs to be submitted to our Department showing all the facilities in the proposed development, distance from watercourses and bathroom facilities. 	<ol style="list-style-type: none"> 1. Noted. 2. Development has been planned away from watercourses and not within the 1:100 year flood line. There are however roads and services that will need to cross / be close to watercourses. A Water Use Licence Application will be submitted to allow for this. 3. Noted. The Environmental Control Officer will ensure this before construction. 4. Noted and included in the EMPr. 5. Noted and included in the EMPr. 6. Noted and included in the EMPr. 7. A storm water management plan has been compiled. 8. Noted and included in the EMPr. 9. The layout plan is included in Annexure B.

		<p>10. Material with polluting generating potential must be limited in any construction activities. Hazardous substances must be handled according to relevant legislation. Any spillage of any hazardous materials, including diesel, must be reported to our Department.</p> <p>11. Rubbish bins and mobile toilets must be there and enough for people on site during construction.</p> <p>12. Compacted soils must be loosened to an appropriate depth to allow seed germination.</p> <p>13. Erosion prevention mechanisms must be employed.</p> <p>14. A Water Use application needs to be submitted.</p>	<p>10. Noted and included in the EMPr.</p> <p>11. Noted and included in the EMPr.</p> <p>12. Noted and included in the EMPr.</p> <p>13. Noted and included in the EMPr.</p> <p>14. A Water Use Licence application is in process for activities within or near to a watercourse and will be submitted to your Department in due course.</p>
16 August 2017	Natsha Higgitt (SAHRA)	Interim comment: all EIA appendices to be uploaded onto SAHRIS.	Done.

Refer to **Annexure D** for correspondence received.

5. ENVIRONMENTAL ASPECTS

5.1 DESCRIPTION OF THE ENVIRONMENT

5.1.1 Biophysical Environment

The altitude of the site varies from approximately 1325 to 1340 m.a.s.l. and consists of a plain sloping from north to south towards the Groenwater Spruit. Drainage lines traverse the site.

5.1.1.1 Climate

The area lies within a summer rainfall region with the highest rainfall generally recorded in January and February. The average annual rainfall is 400 mm. Maximum temperatures vary between 17°C and 30°C (November to March) and minimum temperatures vary between 1°C and 16°C (May to August). The predominant wind direction is north east.

5.1.1.2 Geology of area

The site is situated on the Maremane Dome consisting of carbonate rocks (predominantly stromatolitic and crinkle laminated dolomite and limestone) of the Campbell Rand Subgroup, Ghaap Group, Transvaal Supergroup.

5.1.1.3 Terrain forms & habitats

Table 4: Terrain form and habitats area on site

Terrain form		Habitat types	
Hill top		Grassland	X
Hill side		Karoo	
Flat	X	Karroid	
Valley		Natural forest	
River bank		Plantations	
Drainage line	X	Ploughed or fallow fields	
Foot slope		Riparian	
		Savanna	

		Shrub	X
		Wetland	
		Other	

5.1.1.4 Soils of area

The site has soils of the Hutton soil form, which are shallow soils with an orthic A/red apedal B/hard rock. This soil type is generally resistant to erosion.

5.1.1.5 Vegetation of area

According to Mucina & Rutherford (2006), the vegetation type on site is the Kuruman Thornveld (SVk9). The site consists mainly of natural vegetation, but communal grazing and adjacent residential activities have caused some disturbance in some areas.

An ecological assessment of the site has been undertaken and is included in the **Annexure E1**.

5.1.1.6 Animals (moths, butterflies, reptiles, fish, birds & mammals) of the area

Signs and tracks of mammal species were found on site. An overview of the terrestrial fauna and a list of mammals that could be found in the region are included in the ecological assessment that is included in **Annexure E1**.

5.1.2 Socio-economic Environment

The Tsantsabane Local Municipality, which comprises the town of Postmasburg, had a population of 35 093 in 2011. Mining is the single largest contributor of all industries to the GDP, contributing R 3.9 billion (74%) in 2012. The Beeshoek and Kolomela mines are located near to Postmasburg. Mining is also the largest employing sector (54.5%) employing 6 618 persons, with Community Services being the second largest, employing 15.2% of the population (1 850 persons). The unemployment status in Tsantsabane decreased from 45% unemployment rate in 2001 to 29% in 2011. The majority of households in the Tsantsabane have an annual income of R 9 601 – R38 200 (2011). (Aurecon, 2015)

5.1.2.1 Surrounding land uses

The site is situated to the south of the Postdene residential area, with a railway line separating the two. To the east, the rest of the Municipality's Greenfields area (Remainder of Erf 1) is located. The town of Postmasburg is to the west of the site. Mining activities and the Groenwater Spruit are located to the south. Also refer to the locality plan in **Annexure A**.

5.1.2.2 Historical, archaeological or cultural sites

No historically significant sites nor archaeological artefacts were found on site. A heritage impact assessment was done and is included in **Annexure E2**.

5.2 SUMMARY OF FINDINGS AND RECOMMENDATIONS OF SPECIALIST STUDIES

The necessary specialised studies and specialised processes were performed according to Appendix 6 of the NEMA 2014 Regulations (No. R. 982 of 4 December 2014). Specialised studies relevant to the project include:

5.2.1 Biodiversity & Ecological Assessment

An assessment of the fauna and flora that will be impacted on by the loss of habitat as a result of the proposed development. Please note that a much larger area (approximately 450ha) was initially assessed. The hill to the north east of the site no longer falls within the proposed development site.

Eko Environmental

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Dan Pienaar

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Tel: 051 444 4700

Email : info@ekogroup.co.za

Area of expertise: Ecological Specialists

Findings

- According to Mucina & Rutherford (2006), the area consists of Kuruman Thornveld (SVk 9). This vegetation type is listed as being

of Least Concern (LC) within the National List of Threatened Ecosystems (Notice 1477 of 2009) (NEM: Biodiversity Act, 2004).

- The site consists primarily of natural vegetation, although communal grazing and activities associated with the adjacent residential areas cause disturbance in some areas.
- The Groenwater Spruit is located to the south of the site and drainage lines on site are tributaries thereof and as such should be considered of significance to conservation.
- Protected succulent and bulb plant species occurring on site include: *Aloe hereroensis*, *A. claviflora*, *A. grandidentata*, *Pachypodium succulentum*, *Boscia albitrunca*, *Mestoklema tuberosum*, *Boophane distichia*, *Harpagophytum procumbens*, *Fockea angustifolia*, *Sarcostemma veminale*, *Nananthus aloides*, *Euphorbia crassipes*, *Anancampseros filamentosa* and *Nerine laticoma*.
- Protected tree species include the Camel Thorn (*Vachellia erioloba*) and the Shepherd Tree (*Boscia albitrunca*).
- Signs and tracks of mammal species are common on site and indicates a varied mammal population on site. A list of mammal species that could occur in the region is included in the Biodiversity & Ecological Assessment (**Annexure E1**).

Recommendations

- The two low hills (only one on the site) are considered to have a significant conservation value and should be excluded from development.
- The protected tree species should be incorporated into the development as far as possible and for those where this is not possible, the necessary permits should be obtained to remove them. Tree seedlings can be planted as part of the landscaping of the development.
- A walkthrough of the site should be done, by a suitably qualified ecologist / botanist, prior to construction to mark and map all protected plants on the site. Transplanting of succulent and bulb

species to areas excluded from the development should then be done. Monitoring of re-establishment should also be undertaken.

- The drainage line should be excluded from development and treated as a no-go area. A 30m buffer should be kept on either side of it.
- A storm water management plan is required to ensure runoff is managed in such a way as to prevent erosion of the drainage system and prevent polluted runoff from entering the system. Any crossings (roads, bridges and infrastructure) should be designed to cause minimal disturbance of the systems and should not significantly impact the flow and flooding regime.
- Where development occurs within 100m or within the floodplain of the drainage line, a Water Use Licence Application (WULA) should be lodged as required by the Department of Water and Sanitation.
- Although the Groenwater Spruit is not included in the site, any instance where development occurs within 100m of the spruit or within the 1:100 year flood line, a Water Use Licence Application (WULA) should be lodged.
- Alien weeds and invaders occurring on the site should be removed and monitored for re-establishment.
- The hunting, capturing and trapping of fauna should be prevented by making this a punishable offence during construction phase.
- After construction has ceased, all construction material should be removed from the area.

5.2.2 Phase 1 Heritage Impact Assessment

A Phase 1 Assessment to evaluate the palaeontological, heritage and historical significance of the site.

L. Rossouw

National Museum

P.O. Box 266

Bloemfontein

9300

Tel: 084 2505992

Email: lloyd@nasmus.co.za

Area of expertise: Palaeontology and Heritage Specialist

Findings & Recommendations

Palaeontology:

- No fossils were recorded within superficial Quaternary sediments as expected, because geologically recent superficial overburden is generally not expected to be fossiliferous in the absence of rock shelters, pans, springs or well-developed alluvial deposits.
- Small, isolated and horizontally exposed dolomite exposures observed during the foot survey revealed no visible stromatolite structures, although it is expected that excavations into fresh dolomites at the site will most likely affect intact stromatolitic structures and associated micro-fossil bearing strata.
- Any excavations within the development footprint larger than 1m² that exceeds depths of >1m into unweathered / fresh bedrock, will need monitoring by a professional palaeontologist.
- A professional palaeontologist should monitor unweathered / fresh sedimentary bedrock where large scale excavations into unweathered / fresh sedimentary bedrock are to be conducted during the construction phase of the development.
- The palaeontologist must apply for a valid collection / removal permit from SAHRA if fossil material is found during the construction phase.

Archaeology:

- Except for a number of modern man-made concrete structures, no indication of in situ Stone Age archaeological material was observed.
- There are also no indications of rock art (engravings), prehistoric mining sites, graves or historically significant buildings older than 60 years within the boundaries of the study area.
- The terrain in general is regarded as of low archaeological significance and is assigned a rating of Generally Protected C (GP.C).
- As far as archaeological heritage is concerned, the proposed development may proceed provided that all excavation activities are restricted within the boundaries of the development footprint.

5.2.3 Soil Suitability / Geotechnical Assessment

It is important to note that VGIconsult also undertook a Dolomite Stability Investigation dated September 2016 to advise on which sites within the Postmasburg area are suitable for development. This report was used during the planning phase of the proposed development and is available on request.

An evaluation of the soils and geotechnical conditions of the site and their suitability for different land uses was undertaken by:

VGIconsult Projects

P.O. Box 604

Fourways

2055

Tel: 011 4690854

Email: jhb@vgiconsult.co.za

Area of expertise: Consulting Geologists and Engineers

Findings and Recommendations

- Refusal of the TLB was encountered at 0.1m to 1.9m on very dense honeycomb tending to hardpan calcrete and at 1.2m to 1.9m on soft rock banded iron formation. Excavability problems are therefore anticipated to a depth of 1.5m over most of the site (with the exception of the eastern portion of the site) with the use of a TLB or an excavator for the placing of wet services.
- A complete stormwater design plan that shows drainage, as well as the provision of drainage to control runoff from major stormwater events, will need to be maintained at the site, according to the requirements of the Municipality.
- Soils were classified into 15 zones. The Greenfields site can be described in terms of seven of these soil zones.
- Foundation recommendations for each of the soil zones are provided. See **Annexure E3** for more detail.
- Provision against shoring should be made for excavations deeper than 1.5m.
- Excavability problems (with the use of a TLB or excavator) to a depth of 1.5m for the placing of wet services are anticipated.

- An experienced geotechnical engineer or engineering geologist inspect the foundation excavations prior to the placing of foundations.
- All wet service materials should be HDPE butt-welded pipes in Dolomite Designated D3 Areas.

Refer to **Annexure E3** for the Geotechnical Report.

5.2.4 Bulk Civil Services Report

A report on the bulk civil services to demonstrate the provision of infrastructure required for the proposed development is included in **Annexure E4**.

Bigen Africa Services (Pty) Ltd

Allan Cormack Street

The Innovation Hub

Pretoria

Tel: 021 842 8700

Email : dieter.storbeck@bigenafrica.co.za

Area of expertise: Consulting civil and structural engineers

Findings & Recommendations

Water Supply:

- The water demand for the entire Postmasburg area is currently supplied from 12 boreholes within a 10km radius and three connections to the Vaal Gamagara (VGG) pipeline.
- The new development of Greenfields will fall into the Postdene Tower supply zone.
- Due to insufficient capacity in the existing infrastructure upgrading is required.
- A dedicated link pipeline will run from the Beeshoek Reservoir through to the Postdene Reservoir, supplying the Newtown and Koppies Reservoirs along the way.
- The storage capacity of the municipal reservoirs and towers will have to be upgraded in order to accommodate the future demand, since a number of the reservoirs already fail to meet the minimum requirements for storage capacity with the current demand.

- The Postdene and Greenfields have a peak water demand of 6 733.16kℓ/day with a peak flow of 297.27ℓ/s.
- The upgrading of link infrastructure will be required for the project. MIG and RBIG grant funding as well as own funding will be used to fund these works.
- For the Greenfields development, the extension of the link water supply line to the Postdene Reservoir as well as the upgrading of the storage capacity at the Postdene Reservoir, are required.
- Two bulk water meters will also be provided.

Sanitation:

- The Postmasburg existing sewerage system consists of 118km sewage pipes and six pump stations that ultimately conveys all the flow to an existing 4.8ML/day waste water treatment plant.
- The existing waste water treatment plant has insufficient capacity to cater for the proposed development.
- The total sanitation demand calculated for all the new developments and upgrades in Postmasburg is approximately 56.64ℓ/s.
- A waterborne sanitation network is proposed.
- A new 10ML/day waste water treatment plant is planned in the area south west of the Postmasburg CBD.
- Various link pipe installations are also required.

Stormwater Management:

- The stormwater will be drained along the road reserve, mainly in open V-drain channels, with underground / pipe systems only where surface drainage is not possible or deemed to be impractical.
- Lined open-channels along road reserves as well as the construction of dish crossings (splash-drains) for the accommodation of stormwater traversing intersections. Culvert crossings are proposed in areas where natural streams traverse certain roads.

5.2.5 Electrical Services Report

A report on the electrical services to demonstrate the capacity demand and provision of electricity required for the proposed development was compiled and is included in **Annexure E5**.

Bigen Africa Services (Pty) Ltd

Allan Cormack Street

The Innovation Hub

Pretoria

Tel: 021 842 8700

Email : pretoria@bigenafrica.co.za

Area of expertise: Electrical engineers

Findings & Recommendations

- The electrical supply authority for the area is both Eskom and Tsantsabane Local Municipality.
- The electrical network of the Tsantsabane Local Municipality is supplied by Eskom at two main infeed substations, namely the Hillside Substation and the Traction Substation. The electrical infrastructure distributes the supply by means of an 11kV network.
- The existing 11kV infrastructure is very old and due to the lack of regular maintenance, much of the infrastructure is in desperate need of repair or replacement.
- The total demand forecast for the Greenfields development was calculated as 10 922kVA.
- The existing infrastructure will not have enough spare capacity to supply the proposed development.
- Eskom initially said that they will not be able to supply the required bulk, but have subsequently indicated that they will be able to supply once upgrades currently underway on the transmission network in the area have been completed.
- Eskom are planning to construct a new 132kV/11kV substation, namely Boichoko Substation, to strengthen networks in the Postmasburg area. This substation will be energized from the 132/22kV Vaalbos Substation by means of a new 132kV overhead line that is to be constructed.

- The MV network for the proposed development will be fed from the new substation.
- From the new substation, a new internal electrical reticulation, inclusive of service connections and street lighting, will be installed.
- The internal networks will be taken over by the Tsantsabane Local Municipality for maintenance and billing purposes.

5.2.6 Traffic Impact Study

An assessment to determine the traffic impact of the proposed development was undertaken and is included in **Annexure E6**.

ITS Engineers

Pro Park Building 1
29 De Havilland Crescent
Persequor
Pretoria
0020
Tel: 012 349 1664
Email: elma@itsglobal.co.za

Area of expertise: Consulting traffic engineers

Findings & Recommendations

- The R385 and R325 roads are located south and west of the Greenfields development respectively.
- It is proposed that CAM Street will serve as the primary access route to the proposed development. CAM Street is a direct link between the proposed development and the R385.
- A future north-south link road is proposed on the eastern boundary of the proposed development. This link will also serve as a second access route.
- A pedestrian access across the railway line is planned.
- It is proposed to construct two taxi ranks in the Greenfields development.
- Pedestrian sidewalks of at least 2.5m wide will be constructed along the internal Class 4 roads in the development, to ensure pedestrian safety.

- The expected trip generation for the proposed Greenfields development during the AM Peak Hour is 2253 vehicles per hour and 1807 vehicles per hour during the PM Peak Hour.
- Proposed upgrades include the R325 / Plein Street intersection, the R385 / CAM Street intersection, the R385 / Gravel Road intersection and the R325 / Shone Street intersection.
- The proposed development will not have a negative impact on the external road network if all the upgrades are in place.

5.2.7 Socio-economic Impact Study

An assessment to determine the socio-economic impact of the proposed development was undertaken by:

Demacon Market Studies

P.O. Box 95530

Waterkloof

0145

Tel: 012 460 7009

Email: hein@demacon.co.za

Area of expertise: Economic and real estate research

Findings & Recommendations

- The total capital investment (including buildings, land and infrastructure) for the Greenfields development was calculated to be R 794.5 million.
- The estimated total annual operational expenditure will be approximately R 399.7 million.
- 3 893 jobs (of which 2 466 direct) will be created during the construction phase of the Greenfields development.
- 1 492 (of which 823 direct) employment opportunities will be created during the operational phase.
- The proposed Greenfields development could also contribute a total of R 2.9 million in property rates per annum.
- If the proposed Greenfields development were not to occur, the economic benefits in terms of additional business sales, GGP,

employment, as well as property rates, would be lost to the local, district and provincial economies.

Refer to **Annexure E7** for the Economic Impact Assessment.

6. IMPACT ASSESSMENT

6.1 METHODOLOGY

Impact assessment must take into account the nature, scale and duration of effects on the environment and whether such effects are positive (beneficial) or negative (detrimental). Each issue / impact is also assessed according to the project stages from planning, through construction and operation to the decommissioning phase (if applicable). Where necessary, the proposal for mitigation or optimisation of an impact is noted.

A rating system is applied to the potential impact on the receiving environment and includes an objective evaluation of the mitigation of the impact. In assessing the significance of each issue the following criteria was used:

Nature	A brief description of the environmental aspect being impacted upon by a particular action or activity is presented.								
Extent (Scale)	<p>Considering the area over which the impact will be expressed. Typically, the severity and significance of an impact have different scales and as such bracketing ranges are often required. This is often useful during the detailed assessment phase of a project in terms of further defining the determined significance or intensity of an impact.</p> <table> <tr> <td>Site</td> <td>Within the construction site</td> </tr> <tr> <td>Local</td> <td>Within a radius of 2 km of the construction site</td> </tr> <tr> <td>Regional</td> <td>Between 2 and 30 km from the site</td> </tr> <tr> <td>National</td> <td>The whole of South Africa</td> </tr> </table>	Site	Within the construction site	Local	Within a radius of 2 km of the construction site	Regional	Between 2 and 30 km from the site	National	The whole of South Africa
Site	Within the construction site								
Local	Within a radius of 2 km of the construction site								
Regional	Between 2 and 30 km from the site								
National	The whole of South Africa								
Duration	<p>Indicates what the lifetime of the impact will be.</p> <table> <tr> <td>Short-term</td> <td>The impact will either disappear with mitigation or will be mitigated through natural processes in a span shorter than the construction phase</td> </tr> <tr> <td>Medium-term</td> <td>The impact will last for the period of the construction phase, where after it will be entirely negated</td> </tr> <tr> <td>Long-term</td> <td>The impact will continue or last for the entire operational life of the development, but will be mitigated by direct human action or by natural processes thereafter</td> </tr> <tr> <td>Permanent</td> <td>The only class of impact which will be non-transitory. Mitigation either by man or natural process will not occur in such a way or in such a time span that the impact can be considered transient</td> </tr> </table>	Short-term	The impact will either disappear with mitigation or will be mitigated through natural processes in a span shorter than the construction phase	Medium-term	The impact will last for the period of the construction phase, where after it will be entirely negated	Long-term	The impact will continue or last for the entire operational life of the development, but will be mitigated by direct human action or by natural processes thereafter	Permanent	The only class of impact which will be non-transitory. Mitigation either by man or natural process will not occur in such a way or in such a time span that the impact can be considered transient
Short-term	The impact will either disappear with mitigation or will be mitigated through natural processes in a span shorter than the construction phase								
Medium-term	The impact will last for the period of the construction phase, where after it will be entirely negated								
Long-term	The impact will continue or last for the entire operational life of the development, but will be mitigated by direct human action or by natural processes thereafter								
Permanent	The only class of impact which will be non-transitory. Mitigation either by man or natural process will not occur in such a way or in such a time span that the impact can be considered transient								
Intensity	<p>Describes whether an impact is destructive or benign.</p> <table> <tr> <td>Low</td> <td>Impact affects the environment in such a way that natural, cultural and social functions and processes are not affected.</td> </tr> <tr> <td>Medium</td> <td>Effected environment is altered, but natural, cultural and social functions and processes continue albeit in a modified way.</td> </tr> <tr> <td>High</td> <td>Natural, cultural and social functions and processes are altered to extent that they temporarily cease.</td> </tr> <tr> <td>Very high</td> <td>Natural, cultural and social functions and processes are altered to extent that they permanently cease.</td> </tr> </table>	Low	Impact affects the environment in such a way that natural, cultural and social functions and processes are not affected.	Medium	Effected environment is altered, but natural, cultural and social functions and processes continue albeit in a modified way.	High	Natural, cultural and social functions and processes are altered to extent that they temporarily cease.	Very high	Natural, cultural and social functions and processes are altered to extent that they permanently cease.
Low	Impact affects the environment in such a way that natural, cultural and social functions and processes are not affected.								
Medium	Effected environment is altered, but natural, cultural and social functions and processes continue albeit in a modified way.								
High	Natural, cultural and social functions and processes are altered to extent that they temporarily cease.								
Very high	Natural, cultural and social functions and processes are altered to extent that they permanently cease.								

Probability	Describes the likelihood of an impact actually occurring. Improbable Likelihood of the impact materializing is very low. Possible The impact may occur. Highly probable Most likely that the impact will occur. Definite Impact will certainly occur.
Significance	Significance is determined through a synthesis of impact characteristics. It is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. Low impact No permanent impact of significance. Mitigatory measures are feasible and are readily instituted as part of a standing design, construction or operating procedure. Medium impact Mitigation is possible with additional design and construction inputs. High impact The design of the site may be affected. Mitigation and possible remediation are needed during the construction and/or operational phases. The effects of the impact may affect the broader environment. Very high impact The design of the site may be affected. Intensive remediation as needed during construction and/or operational phases. Any activity which results in a "very high impact" (negative) is likely to be a fatal flaw.
Status	Denotes the perceived effect of the impact on the affected area. Positive (+) Beneficial impact Negative (-) Deleterious or adverse impact Neutral Impact is neither beneficial nor adverse. It is important to note that the status of an impact is assigned based on the <i>status quo</i> – i.e. should the project not proceed. Therefore not all negative impacts are equally significant.

6.2 VEGETATION DESTRUCTION

Assessment: Vegetation Destruction						
Nature	Most of the natural vegetation on the site (80%) will be transformed by the development of erven and subsidiary infrastructure, thereby resulting in loss of animal life too.					
	Extent	Duration	Intensity	Probability	Significance	Status
Without Mitigation	Local	Permanent	Very high	Highly probable	High	Negative
With Mitigation	Site	Long term	Medium	Highly probable	Medium	Negative

Mitigation Recommendations

See specialist report recommendations in Section 5.2.1.

Planning phase

- The hill has been excluded from the development.
- Protected tree species should be incorporated into the development as far as possible and permits obtained for trees that need to be removed.
- A walkthrough of the site should be done prior to construction, to mark and map all protected plant species and transplanting succulent and bulb species to areas excluded from the development.
- The drainage lines have been excluded from the development line, with a 30m buffer zone.
- Necessary Water Use Licences should be obtained for roads and infrastructure transecting the drainage lines or within the 1:100-year floodline.
- The sensitive areas should be demarcated before construction commences so that unnecessary destruction of natural vegetation is prevented.

Construction phase

- Alien weeds and invaders on site should be removed and monitored for re-establishment.
- The hunting, capturing and trapping of fauna should be prevented.
- All human movement and activities must be contained within designated construction areas in order to prevent peripheral impacts on surrounding natural habitat.

Post Construction phase

- All construction material should be removed.
- Protected tree seedlings can be planted as part of the landscaping of the development.
- An alien control and monitoring programme must be developed starting during the construction phase and to be carried over into the operational phase.

6.3 GEOLOGICAL / GEOTECHNEICAL SUITABILITY

Assessment: Geological / Geotechnical Suitability						
Nature	Due to the presence of dolomite in the region, negative impacts may result from foundations built on unstable sub-soil conditions.					
	Extent	Duration	Intensity	Probability	Significance	Status
Without Mitigation	Local	Long term	Very high	Highly probable	High	Negative
With Mitigation	Site	Medium term	Medium	Possible	Low	Neutral

Mitigation Recommendations

See specialist report recommendations in Section 5.2.3.

Planning phase

- A dolomite stability investigation assisted in the screening of sites suitable for development.
- Foundation recommendations have been incorporated into the design of the development.
- A stormwater design plan has been compiled.

Construction phase

- Provision against shoring should be made for excavations deeper than 1.5m.
- An experienced geotechnical engineer or engineering geologist should inspect the foundation excavations prior to the placing of foundations.
- All wet service material should be HDPE butt-welded pipes in Dolomite Designed D3 Areas.

Post Construction phase

- None

6.4 BULK INFRASTRUCTURE

The proposed development will include the following infrastructure that could have possible impacts on the environment. These include:

- Water provision
- Storm water drainage
- Electrical infrastructure
- Roads
- Sanitation
- Solid waste disposal

Bulk civil services and electrical services reports for the proposed development have been compiled and are included in **Annexures E4** and **E5**.

Assessment: Bulk Infrastructure						
Nature	Increase in load on the available bulk services.					
	Extent	Duration	Intensity	Probability	Significance	Status
Without Mitigation	Regional	Permanent	High	Definite	Very high	Negative
With Mitigation	Local	Long term	Medium	Possible	Medium	Neutral / Positive

Mitigation Recommendations

Planning phase

- Necessary Water Use Licenses need to be obtained for infrastructure planned within drainage lines and below the 1:100-year floodline.
- A link water pipeline will run from the Beeshoek Reservoir through to the Postdene Reservoir.
- The storage capacity of the municipal reservoirs will be upgraded.
- Link water infrastructure will need to be constructed.
- A new 10ML/day waste water treatment and various sewerage link pipe installations are required.
- Stormwater management plan has been compiled.

- A new 132kV/11kV substation will be constructed by Eskom.
- Internal electrical reticulation inclusive of service connections and street lighting will be installed.

Construction phase

- All human movement and activities must be contained within designated construction areas in order to prevent peripheral impacts on surrounding natural habitat;
- Topsoil should be removed where trenches are to be excavated and used for rehabilitation once services have been installed.
- Erosion must be prevented at all times.

Post Construction phase

- Species, especially grasses, trees and shrubs occurring in the region must be used to rehabilitate disturbed areas.
- Weed eradication is required until vegetation has established, where applicable.
- Pipe leaks should be attended to immediately.
- The Municipality will be responsible for the collection of solid waste on a weekly basis during the operational phase of the development.

6.5 VISUAL IMPACT

The visual impact of the proposed development in the landscape is the function of several factors of which the viewing distance, visual absorption capacity and landform are measurable. Other factors are difficult to categorize because they are subjective viewpoints.

The visual impact for the proposed development is largely due to:

- The extent of the proposed development.
- Distance from roads.
- The visual absorption capacity of the surrounding landscape.

The critical viewpoints for this development would be surrounding residences of Postdene.

A visual impact assessment was not deemed necessary as the proposed development is a residential development within the urban edge of Postmasburg and has been designed to be aesthetically pleasing.

Assessment: Visual Impact						
Nature	The landscape will be altered by the development.					
	Extent	Duration	Intensity	Probability	Significance	Status
Without Mitigation	Regional	Long term	Medium	Definite	High	Negative
With Mitigation	Regional	Long term	Medium	Highly probable	Low	Neutral

Mitigation Recommendations

Planning phase

- The hills are left undeveloped.
- Aesthetically pleasing designs and visual integrity principles have been incorporated into the site development plan.

Construction phase

- Construction sites must be kept neat and tidy at all times.
- All human movement and activities must be contained within designated construction areas.
- No dumping of construction debris is allowed, especially within the open space areas.

Post Construction phase

- A landscaping plan needs to be implemented.

6.6 TRAFFIC IMPACT

Due to the extent of, and the increase of trips anticipated as a result of the proposed development, a traffic impact study has been undertaken. This study has been undertaken and is included in **Annexure E6**.

Assessment: Traffic Impact						
Nature	Increase in traffic on surrounding roads.					
	Extent	Duration	Intensity	Probability	Significance	Status
Without Mitigation	Regional	Permanent	Medium	Definite	High	Negative
With Mitigation	Local	Long term	Low	Possible	Low	Neutral

Mitigation Recommendations

See specialist report recommendations in Section 5.2.6.

Planning phase

- CAM Street will serve as the primary access route.
- A pedestrian access across the railway line is proposed.
- The construction of two taxi ranks is planned within the development.
- Pedestrian sidewalks will be at least 2.5m wide to ensure pedestrian safety.
- Various intersections will be upgraded.

Construction phase

- Not applicable.

Post Construction phase

- Not applicable.

6.7 SOCIO-ECONOMIC IMPACT

The proposed development will have an effect on different levels of economic activity in the area and benefit the economy by creating jobs, generating business sales, improving quality of life and increasing disposable income. Refer to the Report in **Annexure E7**.

Assessment: Socio-economic impact						
Nature	Effects on the level of economic activity in the area due to a new development and infrastructure.					
	Extent	Duration	Intensity	Probability	Significance	Status
	National	Long term	Medium	Highly probable	High	Positive

Mitigation Recommendations

Not applicable

7. ENVIRONMENTAL IMPACT STATEMENT

7.1 SUMMARY OF KEY FINDINGS

- Sensitive areas were identified and are accommodated in the site development plan.
- Large areas (approximately 40ha) will be maintained for conservation and as open spaces.
- It is unlikely that the proposed development will affect palaeontological heritage resources, nor result in any archaeological impacts.
- The geotechnical conditions of the site have been taken into consideration.
- Necessary engineering services can be provided.
- Traffic can be accommodated with necessary intersection upgradings.
- Employment (3 893 jobs during construction and 1 492 during the operational phase), additional business sales, GGP growth and property rates income are anticipated.
- 2158 subsidised houses and other amenities will be available for the Postmasburg community.

7.2 SUMMARY OF POSITIVE & NEGATIVE IMPACTS

Table 5: List of positive and negative impacts

Positive	Negative
Socio-economic boost to the region.	Destruction of natural vegetation within the development footprint, including protected species.
Upgrade of bulk services.	Possible damage to drainage line / floodline areas due to construction activities.
The demand for sustainable and adequate housing will partially be met.	Possible secondary impacts like erosion if soil type is not suited to development and installation of services.
	Increase in load on available bulk services.
	Visual impact due to landscape being altered.
	Increase in traffic.

Refer to the draft EMP in **Annexure F** for recommended mitigation measures.

7.3 ASSUMPTIONS AND LIMITATIONS

7.3.1 Assumptions

The information obtained from all the specialist studies is accurate.

7.3.2 Limitations

Vegetation cover at the site may have limited a complete inspection of the ground for surface remnants of archaeological or historical material.

8. CONCLUSION & EAP DECLARATION

The preferred development alternative is planned on an approximately 200 ha site on a portion of the Remainder of Erf 1, located to the north east of Postmasburg. The proposed development consists of 2 158 residential erven (subsidized housing), business erven, schools and day care, community facilities, churches, sports fields and public open spaces. The associated roads network, and the civil and electrical services required are also included in the proposed development.

The following potential impacts were identified during the scoping phase:

- Destruction of natural vegetation
- Soil and geotechnical suitability
- Bulk service infrastructure, which includes:
 - Water provision
 - Electrical infrastructure
 - Roads
 - Sanitation
 - Solid waste disposal
- Visual impact
- Socio-economic impact

The Tsantsabane Local Municipality needs to address the demand for housing within Postmasburg. Most specialist input was obtained during the planning phase of the development and was incorporated into the site development plan. Dolomitic unstable and ecologically sensitive areas were excluded from the proposed site development plan. The no-go alternative, i.e. keeping the site in its current state and not proceeding with the proposed development, is not recommended, as the socio-economic benefits and need for housing in Postmasburg far outweigh any negative impacts, most of which can be mitigated. The impact that informal settlement may have on the site is far greater.

An Environmental Management Programme (EMPr) was compiled and is required to minimize any negative impacts during the different phases of the proposed development, especially the construction phase. The EMPr contains guidelines and recommendations for minimizing the impacts identified during the EIA as well as address the rehabilitation of

disturbed areas. The draft EMPr is included in Annexure F of this report. With responsible construction and rehabilitation practices, most negative impacts anticipated can be mitigated.

A well planned and very professionally designed development is proposed for a site which already lies within the Municipality's Spatial Development Framework (SDF). The proposed development's expected economic boost to the area will be beneficial and is seen as a positive impact.

Sustainable development and best environmental practices should be driving forces behind this proposed development and it is therefore essential that the construction phase is undertaken by competent project managers and any non-compliance issues that may arise are attended to adequately.

In light of the above and in the view of the Environmental Assessment Practitioner (EAP), the information contained in this report and the documentation attached hereto are sufficient to make a decision in respect of the activity applied for. There is no obvious environmental reason for Environmental Authorisation to be denied.

The EAP declares that the EIA process was conducted objectively and the information provided in this report is correct. All comments and inputs from I&AP's received to date have been included. Specialist input and recommendations have been included.

Marguerite Cronje

Date

9. REFERENCES

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