

## DRAFT BASIC ASSESSMENT REPORT

# The Proposed Establishment of Residential Units and Hospitality Facilities, on Portion 3 of the Farm Umgethu No. 14830 (The Old Mushroom Farm), Karkloof, KwaZulu-Natal

GDE PROJECT NO.: GDE330

REFERENCE NO.: DC22/0021/2023

APPLICANT: 11 on Karkloof (Pty) Ltd

DATE: 19 July 2023

VERSION: Revision 2



**GREENDOOR**  
ENVIRONMENTAL

**Postal:** PO Box 1170, Hilton, 3245  
**Physical:** Block H, Quarry Office Park,  
400 Old Howick Road, Hilton, 3245  
KwaZulu-Natal, South Africa  
**Phone:** +27(0) 33 343 4176  
**Email:** [info@greendoorgroup.co.za](mailto:info@greendoorgroup.co.za)  
**Website:** [www.greendoorgroup.co.za](http://www.greendoorgroup.co.za)

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# DOCUMENT CONTROL

ACTION	NAME	DATE	SIGNATURE
Report Compiled By	Hannah Markham	25 May 2023	
Report Reviewed By	Roxanne van Rooyen	25 May 2023	
Report Reviewed and Approved By	Dr Rebecca Bowd	25 May 2023	
Report Amended	Roxanne van Rooyen	17 July 2023	
Report Reviewed and Approved By	Dr Rebecca Bowd	18 July 2023	

# CONTACT DETAILS

Table 1: Contact Details of Applicant and Environmental Assessment Practitioner (EAP).

APPLICANT	
<b>Company / Department</b>	11 on Karkloof (Pty) Ltd
<b>Contact Person</b>	Nick Crooks
<b>Postal Address</b>	PO Box 306 Howick 3290
<b>Cell Number</b>	083 324 5283
<b>Email Address</b>	nixcrooks@gmail.com
ENVIRONMENTAL ASSESSMENT PRACTITIONER	
<b>Name</b>	Dr Rebecca Bowd
<b>Company</b>	Green Door Environmental
<b>Postal Address</b>	PO Box 1170 Hilton 3245
<b>Tel number</b>	033 343 4176
<b>Fax number</b>	033 343 4201
<b>Cell number</b>	072 181 4236
<b>Email address</b>	rebecca@greendoorgroup.co.za
<b>Professional Affiliations</b>	EAPASA, IAIA, SAIIEA, IWMSA, WISA, SSAG, Pr. Sci. Nat.
ENVIRONMENTAL CONSULTANTS	
<b>Name</b>	Hannah Markham
<b>Company</b>	Green Door Environmental
<b>Postal Address</b>	PO Box 1170 Hilton 3245
<b>Tel number</b>	033 343 4176
<b>Fax number</b>	033 343 4201
<b>Email address</b>	hannah@greendoorgroup.co.za
<b>Professional Affiliations</b>	IAIA (6656), EAPASA (2022/5719)

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# EXECUTIVE SUMMARY

The Applicant, 11 on Karkloof (Pty) Ltd, wishes to obtain Environmental Authorisation for the proposed establishment of residential units and hospitality facilities, on Portion 3 of the Farm Umgethu No. 14830 (The Old Mushroom Farm), Karkloof, KwaZulu-Natal. The property is currently zoned as 'Agriculture and Medium Intensity Tourism'. The site is located at GPS coordinates 29° 25' 45.33" S and 30° 14' 46.81" E and is approximately 21,43 hectares in extent.

The property is commonly referred to as The Old Mushroom Farm. The Old Mushroom Farm consists of a variety of shops, cafes, a bakery and a gym which are located inside pre-existing mushroom growing tunnels, which have been converted into a retail space that is open to the public. The Old Mushroom Farm also offers a variety of accommodation options that were once used as accommodation for staff.

The existing infrastructure being converted / upgraded comprises:

- 9 x commercial spaces (as built) (T1 – T9).
- Conference / events facility (existing) (CC1 – CC3).
- 5 x existing cottages (C1 – C5).
- Old workshop – to be converted into two (2) terrace houses (O6 & O7).
- 4 x mushroom tunnels to be converted into apartments (R1 – R4).
- Round house.
- Falls house.
- Boutique apartments (9 units x 4 beds = 36 sleeper) – under construction (B1 – B9 and associated garages).
- Storage facilities (S1 – S7).

New proposed infrastructure:

- 17 Free-standing Sectional Title Houses and associated services (P1 – P17).
- Security gatehouse.
- Farm shed and garages.
- Manager's cottage to be demolished and 3 x cottages to be built (M1 – M3).

The proposed development incorporates the following floor areas:

- 17 proposed residential units with site size approximately 2 000 m<sup>2</sup> with units varying between 230 m<sup>2</sup> and 350 m<sup>2</sup>.
- 2 812 m<sup>2</sup> of existing buildings used for B&B, guest house, overnight accommodation, and multi-unit development units.
- 1 255 m<sup>2</sup> existing buildings used for arts and crafts, workshop, home activity, agriculture industry, restaurant and home business.
- 529 m<sup>2</sup> existing buildings used for conference facility, arts and crafts, workshop, agriculture industry, home business and overnight accommodation on upper floor.
- 1 012 m<sup>2</sup> existing buildings used for storage, arts and crafts, workshop, agriculture industry, small scale tourism, home business and accommodation on upper floor.
- 356 m<sup>2</sup> alterations to existing buildings.
- Infrastructure services for roads, parking, water, stormwater, sanitation and electricity.
- Security gatehouse.

In terms of the National Environmental Management Act (NEMA, Act No. 107 of 1998) and the Environmental Impact Assessment (EIA) Regulations of 2014 (as amended 2017 and 2021), published in Government Notices No. R (GNR) 327, 325 and 324 of 2014 (as amended 2017 and 2021), the proposed project requires a Basic Assessment Process to be conducted.

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The main issues raised to date during the Public Participation Process (PPP) for the proposed development are:

- Concerns about the state of the vegetation on the property which must be assessed.
- The development could alter the sense of place of the area.
- Has the property been released from Subdivision of Agricultural Land Act (SALA)?
- The proposed 22 houses will be built on green field sites, thereby destroying the biodiversity.
- This development will set a precedent for the rest of the Karkloof Valley.
- Concern about the types of building materials to be used.
- Noise related impacts.
- Concern about public affecting the horse-riding business.
- Sewage and pollution of watercourse concerns.
- Potential traffic related impacts.

The following Specialist Studies have been undertaken for the proposed development:

- Biodiversity Assessment
- Wetland Assessment
- Geotechnical Assessment
- Engineering Report
- Storm Water Management Plan
- Heritage Impact Assessment and Phase 1 Palaeontological Impact Assessment

The findings from the Specialist Studies and the Impact Assessment support the proposed development, provided mitigation measures contained in this Report and the Environmental Management Programme (EMPr) are implemented.

The Environmental Assessment Practitioner (EAP) concludes that no fatal-flaws have been identified during the Basic Assessment Process, and, provided the Environmental Management Programme (EMPr) and recommendations made in this report are strictly adhered to, there should be no significant, detrimental impacts on the environment.

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Appendix H1: Option 2 – Alternative 1

Appendix H2: Option 3 – Alternative 2

## LIST OF ACRONYMS & ABBREVIATIONS

BA	Basic Assessment
BAR	Basic Assessment Report
BID	Background Information Document
CA	Competent Authority
CBD	Central Business District
CER	Centre for Environmental Rights
DAFF	Department of Agriculture, Forestry and Fisheries
DARD	Department of Agriculture and Rural Development
DBAR	Draft Basic Assessment Report
DEA	Department of Environmental Affairs
DEA & DP	Department of Environmental Affairs and Development Planning
DEDTEA	KwaZulu-Natal Department of Economic Development, Tourism and Environmental Affairs
DEG	Digital Elevation Model
DoE	Department of Energy
DOJCD	Department of Justice and Constitutional Development
DoT	Department of Transport
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EAPASA	Environmental Assessment Practitioners Association of South Africa
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMF	Environmental Management Framework
EMPr	Environmental Management Programme
FBAR	Final Basic Assessment Report
GIS	Geographic Information Systems
GNR	Government Notice Regulation
HIA	Heritage Impact Assessment
I&AP	Interested and Affected Parties
IAIA	International Association for Impact Assessment
IDP	Integrated Development Plan
IEM	Integrated Environmental Management
IWMSA	Institute of Waste Management of Southern Africa
KZN	KwaZulu-Natal
MDGs	Millennium Development Goals
MPRDA	Mineral and Petroleum Resources Development Act
NDP	National Development Plan
NEMA	National Environmental Management Act
NEM:BA	National Environmental Management Biodiversity Act
NAM:PAA	National Environmental Management Protected Areas Act
NEM:WA	National Environmental Management Waste Act
NEM:WAA	National Environmental Management: Waste Amendment Act
NEM:AQA	National Environmental Management Air Quality Act
NFA	National Forests Act
NHRA	National Heritage Resources Act
NSDF	National Spatial Development Framework
NWA	National Water Act
OHSA	Occupational Health and Safety Act

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PGDS	Provincial Growth and Development Strategy
PIS	Public Information Session
POPIA	Protection of Personal Information Act
PP	Public Participation
Pr.Sci.Nat.	Professional Natural Scientist
PSDP	Provincial Spatial Development Perspective
SAHRA	South African Heritage Resources Agency
SAIIEA	The South African Institute of International Affairs
SANBI	South African National Biodiversity Institute
SANS	South African National Standards
SDF	Spatial Development Framework
SIP	Strategic Integrated Project
SSAG	The Society of South African Geographers
UC	Urban Core
WISA	The Water Institute of Southern Africa
WUL	Water Use Licence

## TERMINOLOGY

Term	Definition
Activity (Development)	An action either planned or existing that may result in environmental impacts through pollution or resource use. For the purpose of this report, the terms 'activity' and 'development' are freely interchanged.
Alternative	A possible course of action, in place of another, of achieving the same desired goal of the proposed project. Alternatives can refer to any of the following but are not limited to: site alternatives, site layout alternatives, design or technology alternatives, process alternatives or a no-go alternative.
Applicant	The project proponent or developer responsible for submitting an environmental application to the relevant environmental authority for environmental authorisation.
Biodiversity	The diversity of animals, plants and other organisms found within and between ecosystems, habitats, and the ecological complexes.
Construction	means the building, erection or establishment of a facility, structure or infrastructure that is necessary for the undertaking of a listed or specified activity but excludes any modification, alteration or expansion of such a facility, structure or infrastructure and excluding the reconstruction of the same facility in the same location, with the same capacity and footprint.
Cumulative Impacts	Impacts that result from the incremental impact of the proposed activity on a common resource when added to the impacts of other past, present or reasonably foreseeable future activities to produce a greater impact or different impacts.
Direct impacts	Impacts that are caused directly by the activity and generally occur at the same time and at the same place of the activity. These impacts are usually associated with the construction, operation or maintenance of an activity and are generally quantifiable.
Ecological Reserve	The Ecological Reserve specifies both the quantity and quality of water that must be left in the national water resource. The Ecological Reserve is determined for all major water resources in the different water management areas to ensure sustainable development. The water that is necessary to protect the water ecosystems of the water resource. It must be safeguarded and not used for other purposes.
Ecosystem	A dynamic system of plant, animal (including humans) and micro-organism communities and their non-living physical environment interacting as a functional unit. The basic structural unit of the biosphere, ecosystems are characterised by interdependent interaction between the component species and their physical surroundings. Each ecosystem occupies a space in which macro-scale conditions and interactions are relatively homogenous.
Environment	In terms of the National Environmental Management Act (NEMA) (Act No 107 of 1998) (as amended), "Environment" means the surroundings within which humans exist and that are made up of: <ul style="list-style-type: none"> <li>a) the land, water and atmosphere of the earth;</li> <li>b) micro-organisms, plants and animal life;</li> <li>c) any part or combination of (a) or (b) and the interrelationships among and between them; and</li> <li>d) the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and wellbeing.</li> </ul>

<b>Term</b>	<b>Definition</b>
Environmental Assessment	The generic term for all forms of environmental assessment for projects, plans, programmes or policies and includes methodologies or tools such as environmental impact assessments, strategic environmental assessments and risk assessments.
Environmental Authorisation	An authorisation issued by the competent authority in respect of a listed activity, or an activity which takes place within a sensitive environment.
Environmental Assessment Practitioner	The individual responsible for planning, management and coordination of environmental impact assessments, strategic environmental assessments, environmental management programmes or any other appropriate environmental instrument introduced through the EIA Regulations.
Environmental Impact	A change to the environment (biophysical, social and/ or economic), whether adverse or beneficial, wholly or partially, resulting from an organisation's activities, products or services.
Environmental Impact Assessment	The process of identifying, predicting, evaluating and mitigating the biophysical, social, and other relevant effects of development proposals prior to major decisions being taken and commitments made.
Environmental Issue	A concern raised by a stakeholder, interested or affected parties about an existing or perceived environmental impact of an activity.
Environmental Management	The inclusion of environmental concerns in all stages of the development, so that the development is sustainable and does not detrimentally impact the environment.
Environmental Management Programme	A detailed plan of action prepared to ensure that recommendations for enhancing or ensuring positive impacts and limiting or preventing negative environmental impacts are implemented during the life cycle of a project. The EMPr focuses on the construction phase, operation (maintenance) phase and decommissioning phase of the proposed project.
Expansion	Means the modification, extension, alteration or upgrading of a facility, structure or infrastructure at which an activity takes place in such a manner that the capacity of the facility or the footprint of the activity is increased.
Fatal Flaw	Issue or conflict (real or perceived) that could result in developments being rejected or stopped.
General Waste	Waste that does not pose an immediate hazard or threat to health or to the environment, and includes domestic waste, building and demolition waste, business waste, and inert waste.
Hazardous Waste	Waste that contains organic or inorganic elements or compounds that may, owing to the inherent physical, chemical or toxicological characteristics of that waste, have a detrimental impact on health and the environment.
Indirect impacts	Indirect or induced changes that may occur as a result of the activity. These types of impacts include all of the potential impacts that do not manifest immediately when the activity is undertaken or which occur at a different place as a result of the activity.
Integrated Environmental Management	A philosophy that prescribes a code of practice for ensuring that environmental considerations are fully integrated into all stages of the development and decision-making process. The IEM philosophy (and principles) is interpreted as applying to the planning, assessment, implementation and management of any proposal (project, plan,

Term	Definition
	programme or policy) or activity – at local, national and international level – that has a potentially significant effect on the environment. Implementation of this philosophy relies on the selection and application of appropriate tools for a particular proposal or activity. These may include environmental assessment tools (such as strategic environmental assessment and risk assessment), environmental management tools (such as monitoring, auditing and reporting) and decision-making tools (such as multi-criteria decision support systems or advisory councils).
Interested and Affected Party	For the purposes of Chapter 5 of the NEMA and in relation to the assessment of the environmental impact of a listed activity or related activity, means an interested and affected party contemplated in Section 24(4)(a)(v), and which includes – (a) any person, group of persons or organisation interested in or affected by such operation or activity; and (b) any organ of state that may have jurisdiction over any aspect of the operation or activity.
Mitigate	The implementation of practical measures designed to avoid, reduce or remedy adverse impacts or enhance beneficial impacts of an action.
No-Go Option	In this instance, the proposed activity would not take place, and the resulting environmental effects from taking no action are compared with the effects of permitting the proposed activity to go forward.
Rehabilitation	A measure aimed at reinstating an ecosystem to its original function and state (or as close as possible to its original function and state) following activities that have disrupted those functions.
Sensitive environment	Any environment identified as being sensitive to the impacts of the development.
Significance	Significance can be differentiated into impact magnitude and impact significance. Impact magnitude is the measurable change (i.e. magnitude, intensity, duration and likelihood). Impact significance is the value placed on the change by different affected parties (i.e. level of significance and acceptability). It is an anthropocentric concept, which makes use of value judgements and science-based criteria (i.e. biophysical, social and economic).
Stakeholder engagement	The process of engagement between stakeholders (the proponent, authorities and I&APs) during the planning, assessment, implementation and/or management of proposals or activities.
Sustainable Development	Development which meets the needs of current generations without hindering future generations from meeting their own needs.
Watercourse	Means: a) a river or spring; b) a natural channel or depression in which water flows regularly or intermittently; c) a wetland, lake or dam into which, or from which, water flows; and d) any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse as defined in the National Water Act, 1998 (Act No. 36 of 1998) and a reference to a watercourse includes, where relevant, its bed and banks.
Wetland	Means land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically

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Term	Definition
	adapted to life in saturated soil.

# THE PROPOSED ESTABLISHMENT OF RESIDENTIAL UNITS AND HOSPITALITY FACILITIES, ON PORTION 3 OF THE FARM UMGETHU NO. 14830 (THE OLD MUSHROOM FARM), KARKLOOF, KWAZULU-NATAL

## 1 PROJECT ACTIVITY AND DESCRIPTION

### 1.1 Project Title

The proposed establishment of residential units and hospitality facilities, on Portion 3 of the Farm Umgethu No. 14830 (The Old Mushroom Farm), Karkloof, KwaZulu-Natal.

### 1.2 Listed Activities

In terms of the National Environmental Management Act (NEMA), Act 107 of 1998, and the Environmental Impact Assessment (EIA) Regulations of 2014 (as amended 2017 & 2021), published in Government Notice Regulation (GNR) 324, 325 and 327 of 2014 (as amended 2017 & 2021), certain Listed Activities require either a Basic Assessment (BA) Process (GNR 324 and GNR 327) or a Scoping and EIA Process (GNR 325) to be undertaken for Environmental Authorisation (EA). The proposed activities trigger the following Listed Activities which requires a Basic Assessment Process to be undertaken (Table 2).

**Table 2: Applicable Listed Activities in terms of the NEMA: EIA Regulations, 2014 (as amended 2017 & 2021), for the proposed redevelopment activities.**

Indicate the number of the relevant Government Notice:	Activity No (s) (relevant notice): e.g. Listing notices 1, 2 or 3	Describe each listed activity as per the wording in the listing notices as well as per the proposed activity:
GNR 327	<p><b>Activity 12:</b> <i>“The development of—</i></p> <p style="padding-left: 20px;"><i>(i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres; or</i></p> <p style="padding-left: 20px;"><i>(ii) infrastructure or structures with a physical footprint of 100 square metres or more;</i></p> <p><i>where such development occurs—</i></p> <p style="padding-left: 20px;"><i>(a) within a watercourse;</i></p> <p style="padding-left: 20px;"><i>(b) in front of a development setback; or</i></p> <p style="padding-left: 20px;"><i>(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse; —</i></p> <p><i>excluding—</i></p> <p style="padding-left: 20px;"><i>(aa) the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour;</i></p> <p style="padding-left: 20px;"><i>(bb) where such development activities are related to the development of a port or harbour, in which case activity 26 in Listing</i></p>	<p><b>This activity is applicable for the rehabilitation of the watercourse area.</b></p>



	<p>Notice 2 of 2014 applies;</p> <p>(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;</p> <p>(dd) where such development occurs within an urban area;</p> <p>(ee) where such development occurs within existing roads, road reserves or railway line reserves; or</p> <p>(ff) the development of temporary infrastructure or structures where such infrastructure or structures will be removed within 6 weeks of the commencement of development and where indigenous vegetation will not be cleared.”</p>	
GNR 327	<p><b>Activity 19:</b> “The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse...”</p>	<p>This activity is applicable as the wetland area will be required to be rehabilitated and will entail the moving of soil in a watercourse.</p>
GNR 327	<p><b>Activity 28:</b> “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 1 hectare...”</p>	<p>The total footprint of the proposed development will exceed 1 ha in extent.</p>
GNR 324	<p><b>Activity 4:</b> “The development of a road wider than 4 metres with a reserve less than 13,5 metres. d. KwaZulu-Natal. xi. Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority. xii. Outside urban areas: (aa). Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any terrestrial protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve...”</p>	<p>It has been confirmed that the internal roads will vary between 3 – 6 metres in width, therefore this activity is applicable. Additionally, the site is located within 5 km and 10 km of protected areas.</p>
GNR 324	<p><b>Activity 6:</b> “The development of resorts, lodges, hotels, tourism or hospitality facilities that sleeps 15 people or more. d. KwaZulu-Natal. xii. Outside urban areas. (aa) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any terrestrial protected area identified in terms of NEMPAA or from the core area of a biosphere reserve; (bb) Areas seawards of the development setback line or within 1 kilometre from the high-water mark</p>	<p>This activity is applicable as the proposed boutique residence / apartments will sleep 36 people. The property is located within 5 km of the Umgeni Valley Nature Reserve and Kwawula Nature Reserve, and within 10 km of Midmar Nature Reserve, Beacon Hill Protected Environment,</p>

	<i>of the sea if no such development setback line is determined; or (cc) Areas within a watercourse or wetland; or within 100 metres from the edge of a watercourse or wetland...”</i>	<b>Hilton College Nature Reserve and the Albert Falls Public Resort Nature Reserve which are listed on the Protected Area Registry.</b>
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### 1.3 List of Legislation, Polices and / or Guidelines that are relevant to the Application

There are a number of significant sections of environmental and other legislation that need to be recognised and adhered to during this EA Process.

<b>Title of legislation, policy or guideline:</b>	<b>Administering authority:</b>	<b>Date:</b>
uMgungundlovu District Municipality Fifth Generation Integrated Development Plan (IDP)	uMgungundlovu District Municipality	2022/2023 – 2026/2027
Environmental Management Framework (EMF) for the uMgungundlovu District Municipality	uMgungundlovu District Municipality	2017
uMgungundlovu District Municipality Spatial Development Framework (SDF)	uMgungundlovu District Municipality	2014
uMngeni Local Municipality Draft Integrated Development Plan Review	uMngeni Local Municipality	2023/2024
Spatial Development Framework for UMngeni Municipality 2018/19 Review	uMngeni Local Municipality	2019
The Municipal Systems Act (Act No. 32 of 2000)	South African Government	2000
The National Environmental Management Act (NEMA, Act No. 107 of 1998)	Department of Environmental Affairs (DEA)	1998
The Constitution of South Africa (Act No. 108 of 1996)	Department of Justice and Constitutional Development (DOJCD)	1996
Environmental Impact Assessment (EIA) Regulations promulgated under the NEMA	DEA	2017
Integrated Environmental Management (IEM) Information Series	DEA	2010
The National Water Act (NWA, Act No. 36 of 1998)	Department of Water and Sanitation (DWS)	1998
Water Services Act (Act No. 108 of 1997)	DWS	1997
National Heritage Resources Act (NHRA, Act 25 of 1999)	South African Heritage Resources Authority (SAHRA)	1999
KwaZulu-Natal Heritage Resources Act (Act No. 10 of 1997)	SAHRA	1997
National Road Traffic Act (Act No. 93 of 1996)	Department of Transport (DoT)	1996
The National Environmental Management: Waste Act (NEM: WA, Act No. 59 of 2008)	DEA	2008
The National Environmental Management: Waste Amendment Act (NEM: WAA, Act No. 26 of 2014)	DEA	2014
The Hazardous Substances Act (Act No. 15 of 1973)	South African Government	1973
The Occupational Health and Safety Act (OHSA, Act No. 85 of 1993)	South African Government	1993
The Mineral and Petroleum Resources Development Act (Act No. 28 of 2002)	South African Government	2002

Title of legislation, policy or guideline:	Administering authority:	Date:
The South African National Standard (SANS, 10103:2008): The measurement and rating of environmental noise with respect to annoyance and speech communication	SANS	2008
The National Environmental Management: Air Quality Act (NEM:AQ, Act No. 39 of 2004)	DEA	2004
The National Environmental Management: Biodiversity Act (NEM:BA, Act No. 10 of 2004)	DEA	2004
The Biodiversity Policy	South African National Biodiversity Institute (SANBI)	2021
KwaZulu-Natal Nature Conservation Management Act (Act No. 9 of 1997)	Centre for Environmental Rights (CER)	1997
EIA Guideline and Information Document Series: Guideline on Alternatives	Provincial Government of the Western Cape: Department of Environmental Affairs and Development Planning (DEA&DP)	2010
EIA Guideline and Information Document Series: Guideline on Public Participation	Provincial Government of the Western Cape: DEA&DP	2011
EIA Guideline and Information Document Series: Guideline on Need and Desirability	Provincial Government of the Western Cape: DEA&DP	2010
EIA Guideline and Information Document Series: Information Document on Generic Terms of Reference for EAPs and Project Schedules	Provincial Government of the Western Cape: DEA&DP	2010
Integrated Environmental Guideline: Guideline on Need and Desirability	DEA	2017
Public Participation Guideline in terms of the NEMA (1998) and the EIA Regulations (2017)	DEA	2017
South African National Standard (SANS) 10 131 Section 5.	SABS	2004

#### 1.4 SG 21 Digit Code(s) of the Properties

N	0	F	T	0	0	0	0	0	0	0	0	1	4	8	3	0	0	0	0	0	3
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#### 1.5 Physical Address & Farm Name

<b>Address</b>	11 Karkloof Road, Howick, 3290
<b>Farm Name</b>	Portion 3 of the Farm Umgethu No. 14830 (The Old Mushroom Farm)
<b>Town</b>	Karkloof
<b>Postal Code</b>	3299

#### 1.6 Co-ordinates of the Property

Corner/Position	Latitude (S)	Longitude (E)
<b>Point 1</b>	29° 25' 43.42"	30° 14' 36.09"
<b>Point 2</b>	29° 25' 35.11"	30° 14' 59.60"
<b>Point 3</b>	29° 25' 37.46"	30° 14' 57.77"
<b>Point 4</b>	29° 25' 42.41"	30° 14' 59.31"
<b>Point 5</b>	29° 25' 48.70"	30° 14' 56.62"
<b>Point 6</b>	29° 25' 55.17"	30° 14' 38.59"

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## 1.7 Detailed Project Description of the Activities to be Undertaken

### 1.7.1. Site Description and Background

The Applicant, 11 on Karkloof (Pty) Ltd, wishes to obtain Environmental Authorisation to establish residential units / hospitality facilities on Portion 3 of the Farm Umgethu No. 14830 (The Old Mushroom Farm), Karkloof, uMngeni Local Municipality, KwaZulu-Natal. The site is located at GPS coordinates 29° 25' 45.33" S and 30° 14' 46.81" E.

The property is commonly referred to as The Old Mushroom Farm. The Old Mushroom Farm consists of a variety of shops, cafes, a bakery and a gym which are located inside pre-existing mushroom growing tunnels, which have been converted into a retail space that is open to the public. The Old Mushroom Farm also offers a variety of accommodation options that were once used as accommodation for staff.

The Old Mushroom Farm property is located directly next to the Karkloof Market and Le Petite France Café and farm which is to the south of the site. The property is surrounded by agricultural farms, with forestry to the west, north and east. The Amber Valley Retirement Village is located approximately 3.8 km south of the property, towards Howick. Kwawula Game Estate is located approximately 3 km south of the property. The Karkloof Country Club and associated facilities are situated approximately 5.5 km north along the Karkloof Road.

Refer to **Figure 5** below for the preferred layout. The existing infrastructure being converted / upgraded comprises:

- 9 x commercial spaces (as built) (T1 – T9).
- Conference / events facility (existing) (CC1 – CC3).
- 5 x existing cottages (C1 – C5).
- Old workshop – to be converted into two (2) terrace houses (O6 & O7).
- 4 x mushroom tunnels to be converted into apartments (R1 – R4).
- Round house.
- Falls house.
- Boutique apartments (9 units x 4 beds = 36 sleeper) – under construction (B1 – B9 and associated garages).
- Storage facilities (S1 – S7).

New proposed infrastructure:

- 17 Free-standing Sectional Title Houses and associated services (P1 – P17).
- Security gatehouse.
- Farm shed and garages.
- Manager's cottage to be demolished and 3 x cottages to be built (M1 – M3).

The proposed development incorporates the following floor areas:

- 17 proposed residential units with site size approximately 2 000 m<sup>2</sup> with units varying between 230 m<sup>2</sup> and 350 m<sup>2</sup>.
- 2 812 m<sup>2</sup> of existing buildings used for B&B, guest house, overnight accommodation and multi-unit development units.
- 1 255 m<sup>2</sup> existing buildings used for arts and crafts, workshop, home activity, agriculture industry, restaurant and home business.
- 529 m<sup>2</sup> existing buildings used for conference facility, arts and crafts, workshop, agriculture industry, home business and overnight accommodation on upper floor.
- 1 012 m<sup>2</sup> existing buildings used for storage, arts and crafts, workshop, agriculture industry, small scale tourism, home business and accommodation on upper floor.
- 356 m<sup>2</sup> alterations to existing buildings.
- Infrastructure services for roads, parking, water, stormwater, sanitation and electricity.

- Security gatehouse.

Under the uMngeni Municipality’s Town Planning Scheme, which has already been approved by the Planning Tribunal, Portion 3 of the Farm Umgethu No. 14830 is zoned “*Agriculture and Medium Intensity Tourism*”.

The Wetland Assessment identified four (4) wetlands on site (**Appendix D2**). However, Hydrogeomorphic (HGM) Units 1 – 4 will not be impacted due to the wetlands being situated over 90 m away from the proposed activities. The wetlands are deemed to be isolated systems.

The Biodiversity Assessment (**Appendix D1**) concluded that the site does not intercept any Critical Biodiversity Areas (CBA) or Ecologically Sensitive Areas on the property. The site is highly modified due to the built environment and historical agricultural activities which have made it unlikely that species of conservation concern could be supported on the property.

An Engineering Report (**Appendix D4**) has been compiled and concludes the following:

### 1.7.2. Bulk Road Network

The existing access to the property and development is located off the P141 which is shared with the neighbouring farm and located opposite another farm entrance. The intersection is 6.5 km from Howick, along the Karkloof Road. Although a formal application and comment must still be obtained from the Department of Transport, previous experience shows that the department will support a crossed intersection, but it is anticipated that the new access off the P141 would have to be upgraded to a Type B1 intersection as the majority of traffic will be towards Howick. A Type B1 Intersection has a 30 m taper in both directions. The main access road to the central business section on the property will be a hardened surface road, whilst all other internal roads will be unsurfaced with a good gravel wearing course to keep a farm style look.

Table 3 below shows the actual intersection sight distances in comparison to the required which is based on the *Neighbourhood Planning and Design Guide (Red Book) - Chapter: Roads: Geometric design and layout planning*.

**Table 3: Intersection sight distance for 80 km/hr (UPM).**

<b>Intersection Sight Distance for 80km/hr</b>		
	Turning Right (m)	Turning left (m)
<b>Actual</b>	535m	365m
<b>Required</b>	189m	227m

### **Trip Generation**

The proposed development has different zonings and land uses and therefore different trip generation modules. Due to the location of the proposed development in relation to the nearest town, Howick, it is expected that 90% of the traffic will be between the development and Howick and only 10% towards Karkloof. This is expected to be generated over weekends when visitors travel and visit other facilities along the Midlands Meander.

Residential sites normally generate 2.1 trips per site per day, with morning peak hours from 7 – 9 am and again in the afternoon from 4 – 6 pm. The traffic to the 22 residential sites will be light vehicles and based on the proposed layout will generate approximately 46 trips per day.

The existing buildings, used in its various form as arts and craft, restaurant and accommodation have a very different trip generation, where light delivery vehicles deliver goods during the week and although

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there is a steady flow of visitors during the week, the peaks occur over weekends, when the mixed-use facilities are used. This type of facility requires substantial parking for day visitors, cyclists and tourists. Based on the floor area of 5 964 m<sup>2</sup> for all buildings, excluding residential units, a total of 259 parking bays must be provided, considering the municipal guideline of 1 bay per 23 m<sup>2</sup>.

The proposed access and new security gatehouse is required to be set back at least 40 m past the turn-off to the neighbouring farm to allow for the safe stacking of vehicles to enter the development without blocking the entrance to the neighbouring farm.

The type of development, which provides a mixture of residential dwellings, combined with arts, crafts, overnight accommodation and other mixed uses are expected to generate a substantial amount of pedestrian traffic within the main node and therefore sidewalks and pedestrian crossing are required to be implemented in strategic places, where pedestrians are expected to converge. Public transport, such as tourist buses and other form of transport will have to be provided with dedicated parking facilities and drop-off zones.

The Preliminary Design Check (PDC) and geometric design of the new intersection off the P141 will only be undertaken after Department of Transport has provided their comments and confirmed the level of upgrades required.

### **Internal Roads**

The internal road from the proposed main security gatehouse to the mixed-use hub will carry all the traffic and is required to be designed as a local distributor which will vary between 3 – 6 m and the final layer works will be confirmed during the detail design to prepare a pavement design suitable for the access road, considering the existing and future generation of traffic. This road will be hardened in the form of asphalt, cobbles, pavers, or concrete.

The proposed internal roads within the new development to the residential sites will be a gravel wearing finish and constructed to suit the anticipated traffic flow through the development. The pavement design will be a combination of conventional municipal standards and the (Red Book Extract).

This will assess in further stages of design, including the following criteria:

- Internal Roads: 3 – 6 m wide roads depending on hierarchy
- Design Speed: 30 km/hr
- Cross Fall: 2.5%
- Min K-Value (Crest): 2
- Min K-Value (Sag): 8
- Min Vertical Length: 80 m
- Pavement Design (Main Access):
  - 30 mm Asphalt
  - 150 mm G2 Imported Crusher Run
  - 150 mm G5 Imported Selected Layer
  - 150 mm G7 Selected Subbase
  - 150 mm G9 In-situ Layer
- Alternative Road Pavement: Concrete, cobble, interlocking pavers, or gravel
- Internal Roads: Gravel wearing course on selected subbase layer

### **1.7.3. Sewage**

There is currently no municipal bulk sewer available within this area and all existing buildings, regardless of their usage, is functioning on a septic tank and soakaway system. number of existing septic tanks are present on the site and during the site inspection, it was noticed that the tanks are functioning well, including the soakaways.

The proposed development is expected to generate a sewerage flow of 61m<sup>3</sup>/day.

A Geotechnical Assessment (**Appendix D3**) was conducted by Gondwana Geosolutions during December 2022, Ref 22-119R01, and performed 7 percolation tests (PT1 – PT7) with the conclusion that the site is suitable for on-site sanitation recommending a rate of application of 60l/m<sup>2</sup>/day. PT7 did not pass the test, but it is possible that a suitable area could be found prior to construction, as the sites are far apart and there are large open areas. The rate of application will then be used to determine the length of each soak away. Where septic tanks serve individual dwellings, it should have a minimum capacity of 1,7m<sup>3</sup> or 3,5m<sup>3</sup> where it serves more than one unit. Commercial and other non-domestic septic tanks should be sized to have a capacity of one day's effluent generated.

**Internal Reticulation**

The internal sewer system will comprise of septic tanks and soakaways at each unit. The designs of these on-site sanitation shall be submitted to the municipal building inspector, as part of the building plans submissions and will comply with SANS 10400 Part P – Drainage. Septic tanks will be at least 1.7 m<sup>3</sup> and will have at least two chambers, although a 3-chamber tank will produce better quality effluent entering the soakaway, with the soakaway sized using the percolation test results. The septic tanks can be constructed from blocks/bricks and plastered, although prefabricated tanks, such as Rototank and Calcemite can also be used, subject to installation guidelines from the respective supplier.

Septic tanks must be located near the residential dwellings, with ease of access for maintenance, to receive raw sewage linked with 110 mm Ø uPVC pipes to the soakaway. The area around the soakaway can be vegetated but must be kept open to improve evapotranspiration and not be hardened.

Where septic tanks are servicing mixed use in the buildings, the septic tanks must be designed, based on the expected effluent generated from those usages, and kitchens must be provided with grease traps before waste enters the septic tank system. Each soakaway must be sized based on the prevailing soil conditions, as determined by the percolation tests undertaken by the geotechnical engineer's assessment. If the geotechnical findings yield certain areas not suited for on-site sanitation, the effluent must be piped to a location where percolation is acceptable, and a soakaway can be constructed.

Refer to Table 4 below for the sewer calculations for the development.

**Table 4: Sewer calculations (UPM).**

<b>MUSHROOM FARM DEVELOPMENT - SEWER DEMAND</b>		
<b>Description</b>	<b>RedBook Guide</b>	<b>Volume (kl/day)</b>
Total water demand (excl peak factor)	Calculated in water demand table	66
Sewage demand based on water demand	80%	53
Infiltration	15%	61
<b>Peak sewage demand according to Table k.8 from RedBook</b>	<b>1,5</b>	<b>91</b>
Q(peak)	l/s	<b>1,06</b>

The standards for the internal sewer reticulation to be installed with the proposed development can be summarized as follows:

- Pipe Material: uPVC
- Pipe class: Class 34 (300 kPa)
- Pipe diameters: 110 mm & 160 mm Ø
- Minimum Grade: 1:150
- Maximum Grade: 1:10
- Bedding: Flexible (SABS1200LB)
- Manholes: Precast Concrete Manholes (1 m Ø), max 80 m spacing
- Minimum Cover: 900 mm

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The internal sewer reticulation shall comprise a combination of 110 mm and 160 mm Ø uPVC Class 34 sewer pipes with circular precast concrete manholes placed at a maximum spacing of 80 m (if needed) or at a change in direction, including the necessary rodding eyes. The joints between manhole rings must be sealed with bitumen strips to prevent the ingress of stormwater and subsurface seepage. Grease traps, oil and fuel separators must be utilized at kitchens or restaurants where required.

#### **1.7.4. Water**

There is currently no potable, bulk water in the area and all the residential dwellings, farms and agricultural properties rely on stream/dam abstraction or boreholes for domestic and agricultural purposes, which makes them totally self-sufficient.

The Water Services Authority for this area is uMgungundlovu District Municipality (UMDM) who has an existing potable water line running adjacent to the P141 on the Amber Valley side of the carriageway, the aforementioned potable waterline terminates where KwaWula Game Estate's bulk water meter is located, but it is not financially feasible to extend this line.

In the absence of potable bulk water from uMgungundlovu District Municipality, potable water will be obtained from an existing borehole currently in use. Borehole abstraction will have to be stored in a reservoir, with a capacity of at least 48 hours, being 132 kL – this can be achieved with the installation of a SBS Reservoir ST11-3 with a height of 3.17 m and diameter of 7.51 m. In order to meet the daily demand of 66 kL /day at full development, the borehole will have to deliver water at a rate of 5 500 L/hour, assuming the borehole will only pump for 12 hours per day.

Based on the borehole step-drawdown test results facilitated by Dersal Consulting and conducted by Aquatec Pumps & Drilling, the borehole has a total depth of 60.53 m and an available drawdown of 44 m therefore yielding a daily abstraction rate of 99 kL per 24hr period and/or 8 250 L/hour per 12hour period, thus being adequate to deliver the required 5 500 L/hour per 12hour period. Seasonal change may influence the above results due to affected ground water tables.

The abovementioned capacity of 132 kL storage excludes firefighting storage which according to guidelines shall equate to an additional 54 kL of storage. The reservoir can be filled directly from the borehole which should be located at the high point of the development, the reservoir may need to be fitted with an inline booster pump to ensure the higher lying dwellings receive sufficient pressure, alternatively an elevated tank option may be investigated.

Talbot Laboratories conducted laboratory testing on the water samples in line with SANS 241:2015 guidelines for human consumption, the findings showed that no “*E. Coli*” was detected in the samples thus ruling out the presence of human and/or animal faecal matter contamination, however, there was a slight presence of “*coliforms*” yielding 18 MPN/100m<sup>l</sup> instead of the maximum permissible 10 MPN/100m<sup>l</sup> as stated in SANS241:2015 guideline. The presence of coliform bacteria can be eliminated by means of treatment such as chlorine and ultraviolet treatment systems making the borehole water acceptable for human consumption.

#### ***Internal Supply***

The daily water demand has been calculated scaling areas off the provided architectural layout, all consumption rates originate from Table J.2 & J.4 of the “*The Neighbourhood Planning and Design Guide*”. A summary of the water demand calculations can be seen in Table 5 below.



**Table 5: Water demand calculations (UPM).**

<b>MUSHROOM FARM DEVELOPMENT - WATER DEMAND</b>				
<b>Description of Service</b>	<b>Area/Units</b>	<b>Redbook Guide</b>	<b>Consumption</b>	<b>Volume (kl/day)</b>
<b>Existing Buildings:</b>				
Hospitality	28	0.9kl/100m <sup>2</sup>	0,9	25
Arts & Crafts	13	0.4kl/100m <sup>2</sup>	0,4	5
Conference Facilities	5	0.9kl/100m <sup>2</sup>	0,8	4
Small Scale Retail	10	0.4kl/100m <sup>2</sup>	0,4	4
Renovated existing Buildings	4	0.9kl/100m <sup>2</sup>	0,9	3
<b>Proposed Multi Unit:</b>				
New Houses	17	1.25kl/unit	1,25	21
Terrace Houses	3	1kl/unit	1	3
<b>Average Annual Daily Water Demand</b>				<b>66</b>
<b>Daily Peak Factor of 1.7 according to Table J.9 from the Redbook</b>				<b>112</b>

The internal water supply will comprise a combination of 75 mm Ø, 110 mm Ø & 160 mm uPVC pipes that will be fed from abovementioned reservoir and will have isolation valves at strategic points along with a bulk water meter to serve the development. Due to the steep topography and deficit in elevation, it is recommended that air valves are installed at high points along the water line and that scour valves placed at low points for maintenance purposes. The sizing of these water lines will be finalised during the detail design stage once all pressures are known, and layouts finalised.

In terms of firefighting regulations this development is classed as a Moderate Risk 4 site according to table J.17 & J.18 in the “*The Neighbourhood Planning and Design Guide*” and will require a flow of 15 L/sec for a duration of 1 hour. This demand is required to be incorporated into the designs once the volumes and pressures have been confirmed by the local municipality.

Each of the domestic and fire supply lines will require separate bulk meters, according to municipal standards.

**1.7.5. Storm Water Management**

The traditional design for storm water drainage systems has been to collect and convey storm water runoff as rapidly as possible to a suitable location where it can be discharged accordingly. The objective of a storm water management plan should be to manage the storm water resources of the collective watersheds to:

- Prevent Flood Damage
- Preserve the natural and beneficial functions of the natural drainage system and wetland
- Preserve and enhance storm water quality

Run-off from roofs should be captured in gutters and stored in rainwater tanks for the utilization of gardening and other domestic activities. The tank can be oversized so that the lower portion of the tank can be valved and utilized for irrigation purposes and have a non-valved outlet at the desired attenuation volume level.

Storm water from internal roads and roofs will be collected and retained on site through the installation of storm water attenuation measures, which will be done as part of a separate Storm Water Management Plan (SWMP). Outlets and overflows must be constructed to prevent scouring and erosion and release runoff into the two natural drainage areas. Storm water harvesting is advised for all roofed areas as the harvested rainwater could be used for the irrigation of the gardens and landscaped areas. The SWMP will discuss the introduction of attenuation and retention ponds incorporated into the civil engineering design and landscaping plan to create focal points within the development, but also to manage the increase in runoff between the pre and post development flows.

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#### **1.7.6. Refuse**

A refuse collection point will be provided at the main security entrance gate of the development, where the refuse can be collected weekly. Collection from each individual owner will be undertaken by the Homeowner's Association. It is recommended that the area is walled and covered with an outlet connected to a soakaway in order to wash and disinfect the storage area to prevent bad odours and vermin nuisances.

The implementation of recycling is encouraged and should be separated from general refuse, whilst the Homeowners Association will be responsible to contract with a recycling company to collect the recyclable material or deliver it to the nearest location.

#### **1.7.7. Electricity**

The property has an existing transformer with a capacity of 100 kVa, which serves all existing buildings. This is considered sufficient for its demand and the client/developer has indicated that all commercial roofs will be provided with solar panels and each residential dwelling will function off the grid by providing their own solar power supply system for their requirements.

The additional Green Design principles will include gas geysers and stoves, solar panels, LED lights and heat pumps – these will all be finalized by the architect in terms of preparing a building code for the development, once approved.

Refer to **Figure 1** for a locality map, **Figures 2 - 4** for an overview map, **Figure 5** for the layout plan. Refer to **Figure 6** For photographs of the site. Refer to **Appendix A** for high resolution versions of the maps.

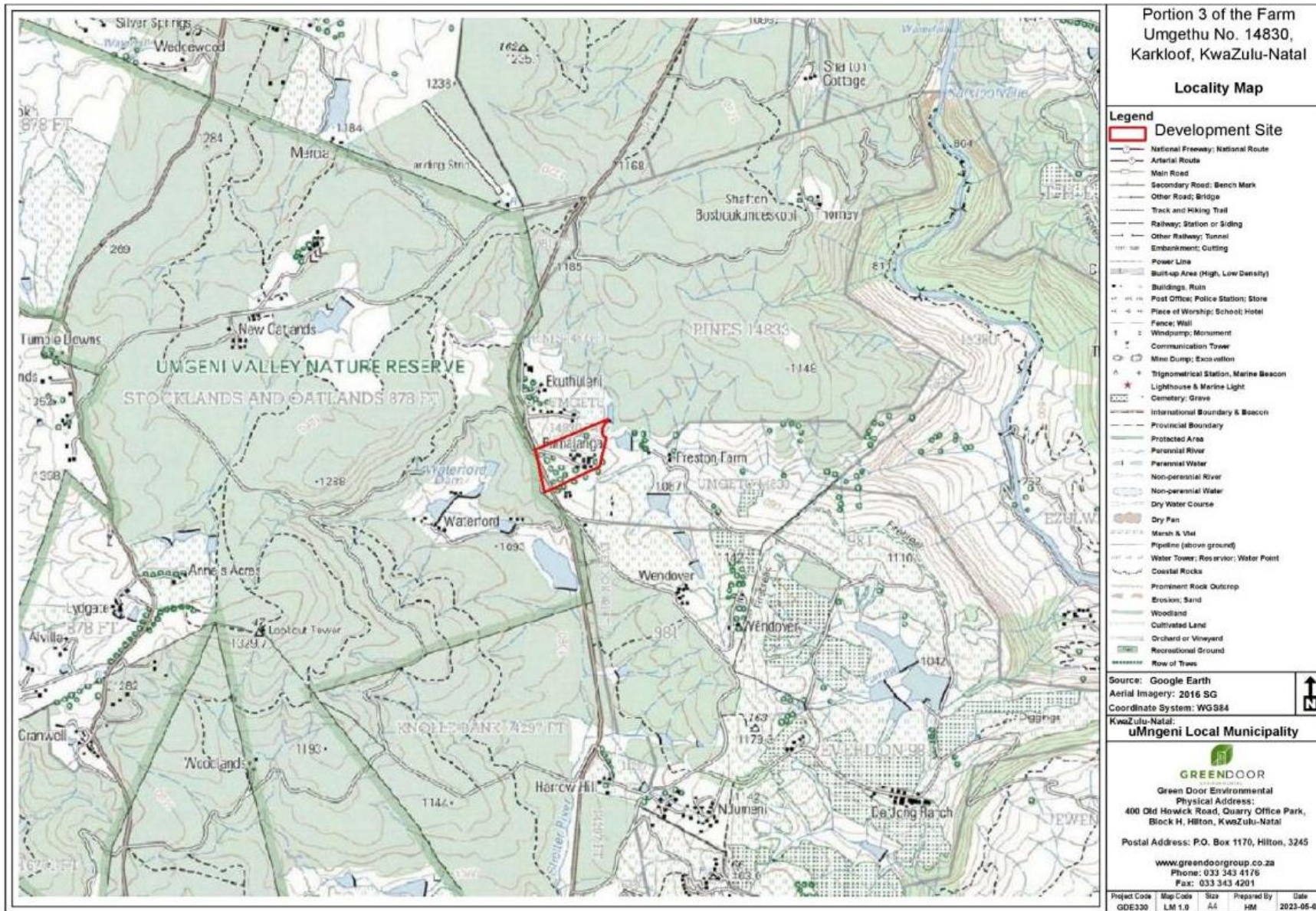


Figure 1: Locality Map of the proposed development site, Howick, KwaZulu-Natal.



Figure 2: Overview Map of the Old Mushroom Farm, Karkloof Road, Howick, KwaZulu-Natal.

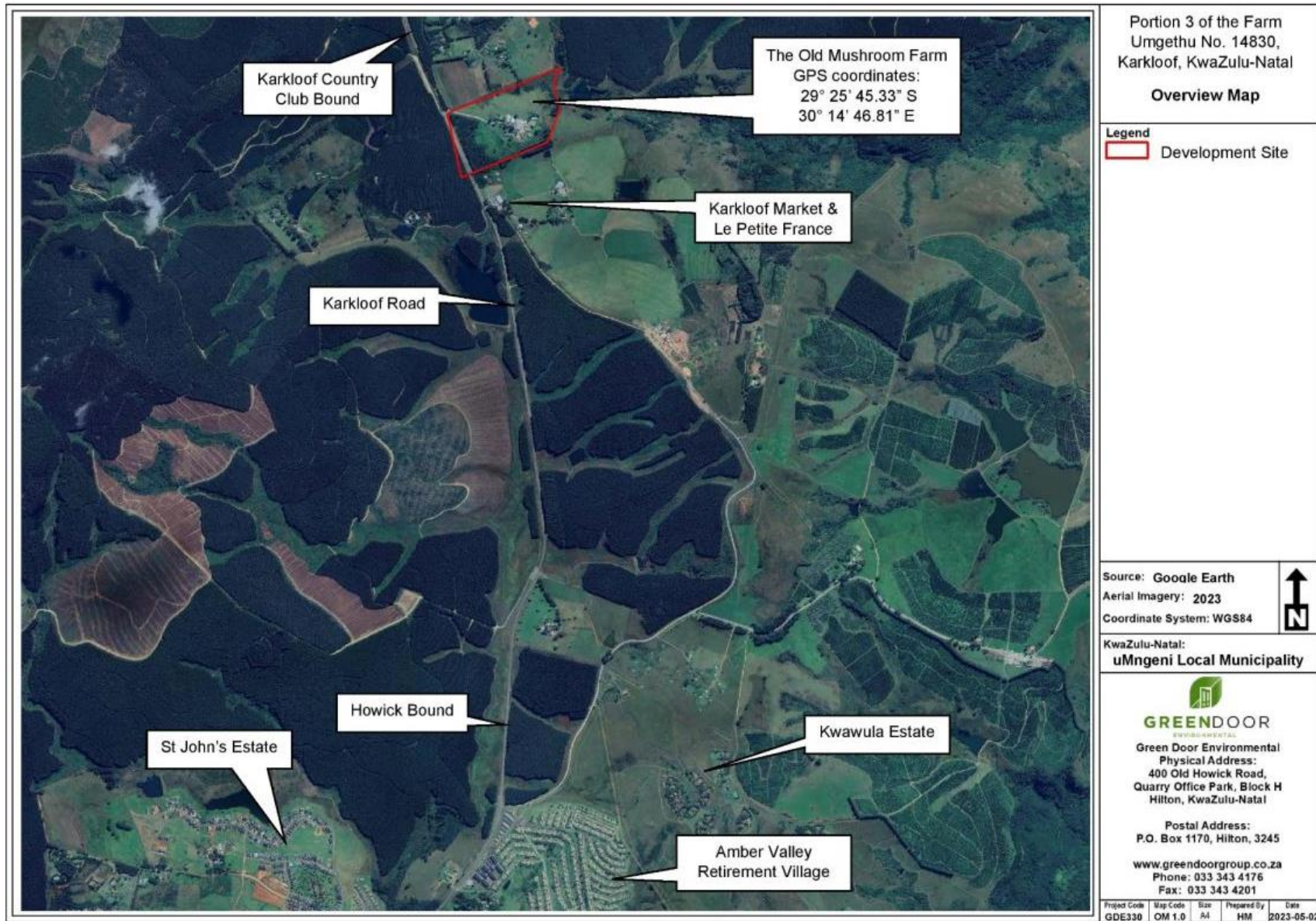


Figure 3: Overview Map of the Old Mushroom Farm, Karkloof Road, Howick, KwaZulu-Natal.



Figure 4: Overview Map of the Old Mushroom Farm, Karkloof Road, Howick, KwaZulu-Natal.

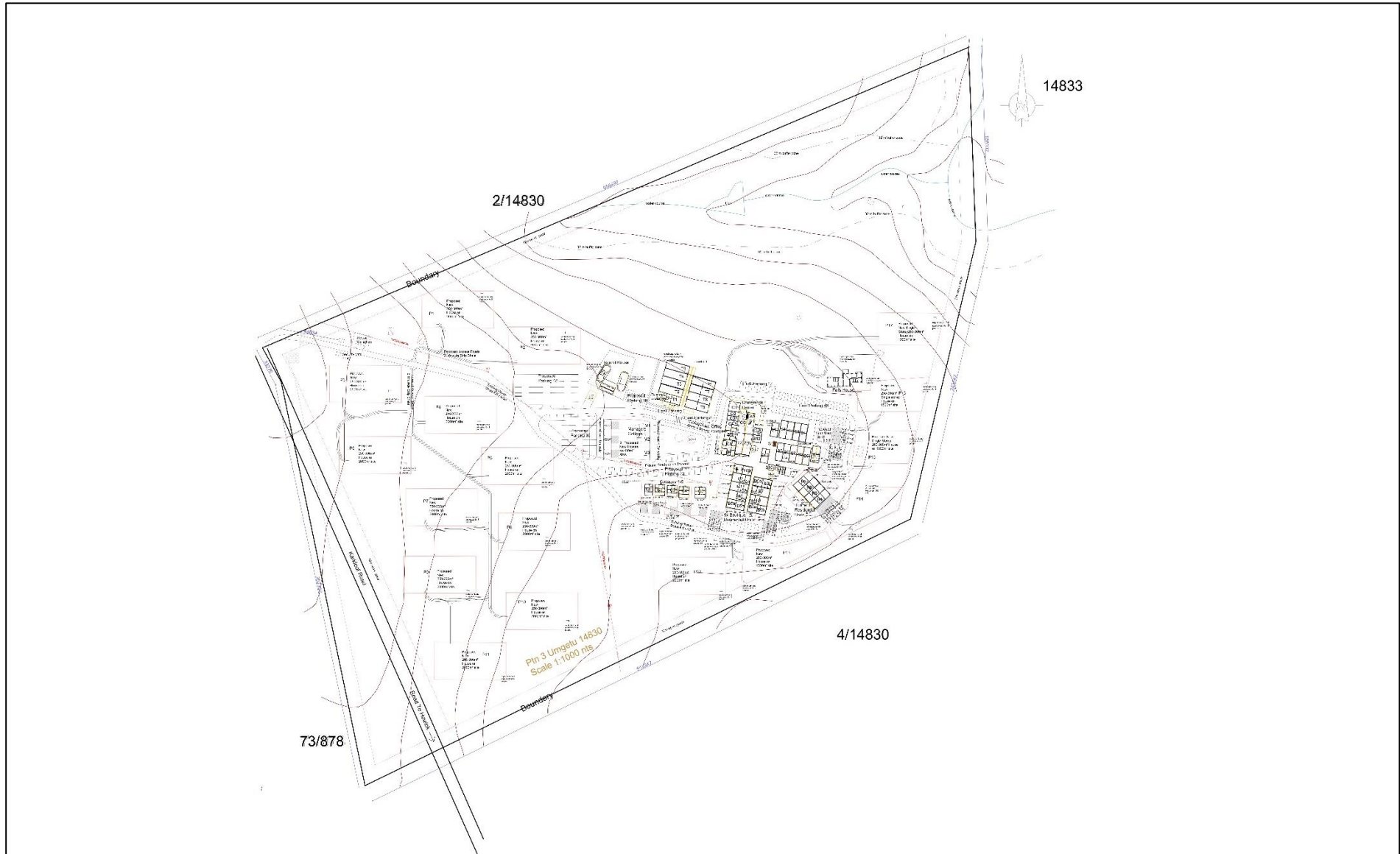


Figure 5: Proposed layout plan.



**Plate 1: View of the location of the proposed housing units.**



**Plate 2: View of the watercourse area.**



**Plate 3: View of the existing shop and retail area.**





**Plate 4: View of the watercourse area.**



**Plate 5: View of the borehole.**



**Plate 6: View of the existing accommodation.**

**Figure 6: Site photographs.**

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## 2 NEED AND DESIRABILITY

The following section makes use of the Western Cape Department of Environmental Affairs and Development Planning (DEA&DP) Guideline on Need and Desirability (August 2011) and the Department of Environmental Affairs (DEA) Pretoria, Integrated Environmental Management Guideline Series 9: Guideline on Need and Desirability (2014).

### 1. Is the activity permitted in terms of the property's existing land use rights?

No, the site is currently zoned as 'Agriculture Rural Tourism 2'. A Planning SPLUMA Application will be required. An application in terms of the Subdivision of Agricultural Land Act 70 of 70 (SPLUMA) was submitted by the planner responsible for this application; and subsequently approved (**Appendix G4**).

### 2. Will the activity be in line with the Provincial Spatial Development Framework (SDF)?

The National Spatial Development Framework (NSDF) promotes rapid economic growth that is sustained and inclusive and is a prerequisite for the achievement of other policy objectives, among which poverty alleviation is key. The vision of the Provincial Spatial Development Framework (SDF) is '*Optimal and responsible utilisation of human and environmental resources, building on addressing need and maximising opportunities toward greater spatial equity and sustainability in development*'. As such, the Provincial SDF takes as its starting point, this goal of sustainable development. Development is only acceptable and in the public interest if it is ecologically justifiable, socially equitable and economically viable i.e. environmentally sustainable. This means that the development needs of present generations should be met without compromising meeting the needs of future generations.

According to the SPLUMA Tribunal Decision (**Appendix G4**), the site is located along a secondary tourist route in an area designated as "Agriculture and Medium Intensity Tourism" which is in line with the UMngeni Municipality's SDF.

The proposed development at The Old Mushroom Farm has taken cognisance of the environmental features on the site through undertaking the relevant specialist assessments, which identified that no significant loss of environmental assets will occur. The proposed development will also respect the mitigation measures proposed by specialists to ensure protection of environmental features. Furthermore, sustainable management practices are to be adopted during operation, which promote activities such as recycling, energy efficiency and water use efficiency wherever possible. As such, the proposed activities are considered to be in line with the Provincial SDF and its goals relating to sustainable development (refer to **Figure 7** below). The proposed development will create job creation during the construction phase. It will also generate permanent employment opportunities during the operational phase, which will in turn result in income production, skills development and improved quality of life. As such, the proposed development is in line with the PSDF and its goals relating to sustainable development.

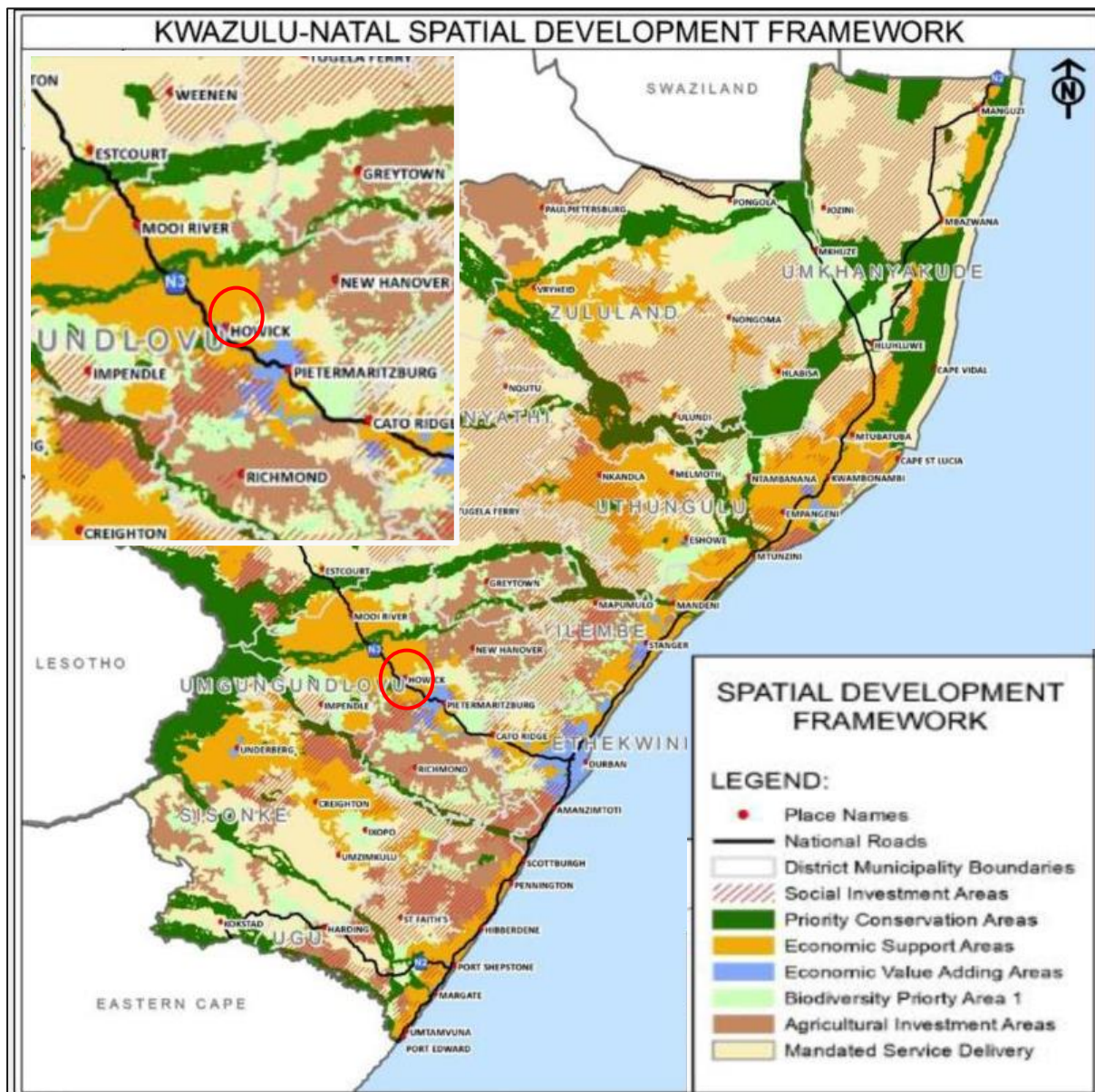


Figure 7: KwaZulu-Natal Spatial Development Framework (PSDF) (August 2011).

**3. Will the activity be in line with the Urban Edge / Edge of Built Environment for the area?**

The site is located on a secondary commercial corridor that links the uMshwathi and uMngeni Local Municipalities. The Karkloof Road will assist in the construction of the long-term future node proposed within Karkloof. Therefore, the proposed development is in line with the land uses for this area.

**4. Will the activity be in line with the Integrated Development Plan (IDP) and Spatial Development Framework (SDF) of the Local Municipality; would the approval of this application compromise the integrity of the existing approved and credible Municipal IDP and SDF?**

The proposed development will be in line with the Municipal Integrated Development Plan (IDP) and Spatial Development Framework (SDF) in terms of job creation, attracting investment and developing sectors in the local economy. There is a shortage of land for housing in KwaZulu-Natal and a high demand for secure housing estates.

The uMngeni Municipal development strategy has been designed to complement and give effect to the Intention of both the national and provincial development strategies. Planning and development in

uMngeni occur, within the context of national and provincial policy framework. As such, the IDP and SDF recognise and incorporate development principles and priorities in line with the principle of cooperative governance. The uMngeni Municipality shall deliver on nine strategic city-wide outcomes to achieve this vision as follows:

1. World class infrastructure investment that meets developmental needs.
2. Efficient, effective customer-centred revenue collection.
3. Reducing electricity theft through smart interventions.
4. Innovative organisational systems.
5. Improved and equitable access to land.
6. Improved human development index.
7. Collaborative and professional working relationship between political and administration.
8. Creating an enabling and conducive environment for economic growth and job opportunities.
9. Strengthened and accountable Inter Governmental Relationships (IGR).

The proposed development will contribute to achieving the vision and outcomes of the Municipal IDP, in that it will contribute to creating a clean, green, safe and economically prosperous place to live.

In addition, the uMngeni Municipality has the following goals outlined in its IDP and SDF:

- Quality living areas with low crime levels;
- Citizen access to affordable, quality health care;
- A financially viable, environmentally sustainable and healthy city;
- Local economic development through the creation of jobs and skills development;
- Service delivery and infrastructure investment; and
- A well governed, spatially integrated city underpinned by public participation.

Residential development is beneficial as it results in employment opportunities during the construction and operational phase, as well as additional property taxes and other revenue for local governments. The income that is generated recycles in the local economy and results in local economic development. The uMngeni Local Municipality SDF recognises the need to promote security of tenure and the provision of housing for a mixture of housing types in different areas; in this case, the proposed development will provide housing for middle to upper income buyers. As such, the establishment of the proposed development will help towards the majority of the Municipality's goals.

**5. Will the activity be in line with an approved Structure Plan of the Municipality?**

Yes. The proposed development is in line with the structure plan of the uMngeni Local Municipality and the uMgungundlovu District Municipality.

**6. Will the activity be in line with an Environmental Management Framework (EMF) adopted by the Department; would the approval of this application compromise the integrity of the existing environmental management priorities for the area and if so, can it be justified in terms of sustainability considerations?**

The Environmental Management Framework (EMF) Report for the site is attached at **Appendix G5**. Table 6 below presents the constraints identified by the EMF. The EMF concluded the following in terms of conservation significance:

**Table 6: EMF Constraints for the Site.**

<b>Constraint</b>	<b>Level</b>
Agricultural Potential	High
Biodiversity	Very High
Flood	-
Infrastructure	Low
LN3	UMDM EMF
Water Quality	High

Water Yield	High
Wetlands	500 m buffer 32 m buffer Wetlands present

The UMDM EMF noted a high agricultural potential constraint. An application in terms of the Subdivision of Agricultural Land Act 70 of 70 was submitted by the planner responsible for this application; and subsequently approved (**Appendix G4**). In terms of National Agriculture Norms and Standards, a farming unit is considered a viable and economically sustainable unit in the following circumstance:

- If it has minimum of 20 ha or arable land with an irrigation permit for 10 ha of land that must be used for intensive pastures, vegetables, herb or floriculture.
- If it is minimum of 100 ha of arable dry land suitable for annual cropping.
- If it has the capacity to provide the grazing for 60 large livestock units and their followers throughout the year.

Currently approximately 5 ha of the 21 ha are consumed by the buildings and a further 1.3 ha is lost to main road or is across the main road from the balance of the property. Thus, there are 17 ha remaining for agriculture, and as they are not arable and the property does not have irrigation rights, the property cannot be considered a viable agricultural unit.

The Wetland Assessment identified four (4) wetlands on site (**Appendix D2**). However, Hydrogeomorphic (HGM) Units 1 – 4 will not be impacted due to the wetlands being situated over 90 m from the proposed activities. The wetlands are deemed to be isolated systems.

The Biodiversity Assessment (**Appendix D1**) concluded that the site does not intercept any Critical Biodiversity Areas (CBA) or Ecologically Sensitive Areas. The site is highly modified due to the built environment and historical agricultural activities which have made it unlikely that species of conservation concern could be supported on the property.

**7. Will the activity be in line with any other plans (e.g., Guide Plan)?**

The proposed development is in line with the following:

- The uMngeni IDP.
- The uMgungundlovu IDP.
- The uMngeni SDF.
- The uMgungundlovu SDF.

**8. Is the land use (associated with the activity being applied for) considered within the timeframe intended by the existing approved SDF agreed to by the relevant environmental authority (i.e. is the proposed development in line with the projects and programmes identified as priorities within the credible IDP)?**

Yes, the proposed development is in line with the IDP and SDF timeframes / priority programmes for the uMngeni Local Municipal area. Refer to Point 4 above.

**9. Does the community / area need the activity and the associated land use concerned (is it a societal priority)? This refers to the strategic as well as local level (e.g., development is a national priority, but within a specific local context it could be inappropriate?)**

The proposed development will result in local economic growth and the creation of local employment and business opportunities and contribute to skills development. These activities will have direct and indirect benefits in the local area, and surrounds. These benefits will be realised both during the construction and operational phases.

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At a Provincial level the proposed development site is located within an Economic Support Area which is a key economic centre and area where all of the variety of economic sectors are prevalent and perceived to have good potential to be further expanded on. These areas are visibly linked to high accessibility areas with existing bulk infrastructure and relatively high population densities which would both contribute to the economic expansion and benefit from interventions in these areas. The provision of housing in such areas is necessary for the further development and growth of such key economic centres.

At the local Municipal level there is demand for housing, services, facilities and economic opportunities, particularly in the nodal areas of the Municipal area which include Nottingham Road, Lidgetton, Hilton, Howick and Merrivale areas. A growing middle- and upper-income group has resulted in an increased sale of residential properties and increasing demand for housing. There is a shortage of land for housing in KwaZulu-Natal, and a high demand for secure housing estates. The proposed development is therefore both in need (demanded) and appropriately located (desirable).

The development will result in job creation, income generation, skills development, local economic development as well as housing provision for upper income groups. During the construction phase, jobs will be created for the skilled, unskilled and semi-skilled. During the operational phase, semi-skilled and unskilled jobs will be created (e.g. domestic help, gardeners etc).

**10. Are the necessary services with adequate capacity currently available (at the time of application), or must additional capacity be created to cater for the development?**

Please refer to Section 1.8 for a detailed explanation of the current services, and the services required. All services have been addressed.

**11. Is this development provided for in the infrastructure planning of the Municipality, and if not, what will the implication be on the infrastructure planning of the Municipality (priority and placement of services and opportunity costs)?**

Please refer to Section 1.8 for a detailed explanation of the current and required services.

**12. Is this project part of a national programme to address an issue of national concern or importance?**

As the proposed development is a private sector development, the project is not part of a national programme to address an issue of national concern or importance. However, the development will help address the issue of unemployment during both the construction and operational phases as well as the lack of housing, which is addressing issues of national concern. There is a high consumer demand for housing within the Howick area. In addition, the proposed development will increase the GDP for the Howick area.

**13. Do location factors favour this land use (associated with the activity applied for) at this place? (This relates to the contextualisation of the proposed land use on this site within its broader context.)**

Yes, the site is considered to be favourable and suitable for the proposed development for the following reasons.

- It is located in close proximity to the existing Howick CBD.
- It is surrounded by similar existing land uses.
- It will bring additional business and employment opportunities, and subsequently economic growth to the region.
- It is well located in terms of access and visibility along major roads (Karkloof Road).
- It is suitably sized to accommodate the proposed land uses and their required supporting infrastructure, access and parking.
- It will provide much needed housing options, in a region where it is currently lacking.

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Additionally, the site is currently zoned Agriculture and Medium Intensity Tourism 2 and will be rezoned to Agriculture and Medium Intensity Tourism 1. A SPLUMA (Planning) process will be undertaken following the Environmental Authorisation Process.

An application in terms of the Subdivision of Agricultural Land Act 70 of 70 was submitted by the Planner responsible for this application; and subsequently approved (**Appendix G4**). In terms of National Agriculture Norms and Standards, a farming unit is considered a viable and economically sustainable unit in the following circumstance:

- If it has minimum of 20 ha or arable land with an irrigation permit for 10 ha of land that must be used for intensive pastures, vegetables, herb or floriculture.
- If it is minimum of 100 ha of arable dry land suitable for annual cropping.
- If it has the capacity to provide the grazing for 60 large livestock units and their followers throughout the year.

**The above parameters means that the property cannot be considered a viable agricultural unit.**

**14. Is the development the best practicable environmental option for this land / site?**

Yes, the proposed development has been considered as the preferred option after undertaking a detailed Alternatives Assessment (refer to Section 3). It was noted in the assessment that the proposed development will have the least environmental impact, whilst ensuring the desired socio-economic benefits are realised, provided the mitigation measures outlined in this Report and the Environmental Management Programme (EMPr) (**Appendix E**) are implemented.

**15. Will the benefits of the proposed land use / development outweigh the negative impacts of it?**

Yes. Refer to Point 14 above. The proposed development will have more benefits than adverse impacts, which outweigh the adverse impacts while ensuring continued conservation and management of the Estate, provided recommendations in this report and the EMPr are fully implemented.

**16. Will the proposed land use / development set a precedent for similar activities in the area (local Municipality)?**

There is a growing demand for low density secure housing estates on the outskirts of urban areas. As the property is located within an area that is characterised by agricultural, retail and conservation areas, it is a prime location for the development of low impact estates.

**17. Will any person's rights be negatively affected by the proposed activity/ies?**

No, based on the findings of the specialist studies, and the Impact Assessment, no person's rights will be negatively affected by the proposed activities, provided the mitigation measures outlined in this report and the EMPr, are implemented.

**18. Will the proposed activity/ies contribute to any of the 18 Strategic Integrated Projects (SIPS)?**

According to the Infrastructure Development Act, Act 23 of 2014, Strategic Integrated Projects (SIPs) constitute:

*"A public infrastructure project or group of projects contemplated in section 7 and may comprise of one or more installation, structure, facility, system, service or process relating to any matter specified in Schedule 1 or which had been added by the Council in terms of section 7(1)(a)."*

Given that the proposed development constitutes a private development, it does not contribute to any SIPs. However, it will contribute towards skills development, the creation of jobs and income generation, and the associated improved quality of life.

**19. What will the benefits be to society in general and to the local communities?**

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Residential development is beneficial as it results in employment opportunities during both the construction and operational phases, as well as additional property taxes and other revenue for local governments. The income that is generated recycles back into the local economy and results in local economic development. The uMngeni Municipality SDF recognises the need to promote security of tenure and the provision of housing for a mixture of housing types in different areas. In this case, the proposed development will provide housing for upper income buyers. There is a shortage of land for housing projects within KwaZulu-Natal. The proposed development has the potential to help towards addressing the housing backlog and will provide access to quality housing for upper income buyers. The proposed development will also increase the Gross Domestic Product (GDP) for the Howick area.

**20. Any other need and desirability considerations related to the proposed activity?**

Refer to point 19 above.

**21. How does the project fit into the National Development Plan for 2030?**

The National Development Plan (NDP) for 2030, highlights nine (9) primary challenges within South Africa, which need to be addressed:

1. Unemployment.
2. The quality of school education for black people is poor.
3. Infrastructure is poorly located, inadequate and under maintained.
4. Spatial divides hobble inclusive development.
5. The economy is unsustainably resource intensive.
6. The public health system cannot meet demand or sustain quality.
7. Public services are uneven and often of poor quality.
8. Corruption levels are high.
9. South Africa remains a divided society.

The proposed redevelopment addresses challenge 1 of the NDP for 2030, through the generation of employment opportunities.

**22. Please describe how the general objectives of Integrated Environmental Management as set out in section 23 of NEMA have been taken into account.**

According to Section 23 of NEMA,

*(2) The general objective of integrated environmental management is to-*

- (a) promote the integration of the principles of environmental management set out in section 2 into the making of all decisions which may have a significant effect on the environment;*
- (b) identify, predict and evaluate the actual and potential impact on the environment, socio-economic conditions and cultural heritage, the risks and consequences and alternatives and options for mitigation of activities, with a view to minimising negative impacts, maximising benefits, and promoting compliance with the principles of environmental management set out in section 2;*
- (c) ensure that the effects of activities on the environment receive adequate consideration before actions are taken in connection with them;*
- (d) ensure adequate and appropriate opportunity for public participation in decisions that may affect the environment;*
- (e) ensure the consideration of environmental attributes in management and decision-making which may have a significant effect on the environment; and*
- (f) identify and employ the modes of environmental management best suited to ensuring that a particular activity is pursued in accordance with the principles of environmental management set out in section 2.*

The objectives of Environmental Management have been considered by:

- Undertaking the Basic Assessment (BA) process which allows for identifying, predicting and evaluating impacts associated with the proposed development.



- 
- Undertaking specialist assessments as part of the BA process, which allows for a full understanding of the impact of the proposed development on the receiving environment.
  - Undertaking Public Participation processes in accordance with legislation and guidelines for the BA process.
  - Compiling of an EMPr, to guide management and mitigation of any foreseen and potential impacts.

**23. Please describe how the principles of environmental management as set out in Section 2 of NEMA have been taken into account.**

Section 2 of NEMA states, '(2) *Environmental management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural and social interests equitably.*'

Similarly, to the above question, the principles of environmental management have been considered by:

- Undertaking the BA Process which allows for identifying, predicting and evaluating impacts associated with the proposed redevelopment.
- Undertaking specialist assessments as part of the BA Process, which allows for a full understanding of the impact of the proposed development on the receiving environment.
- Undertaking public participation processes in accordance with legislation and guidelines for the BA Process.
- Compiling of an EMPr, to guide management and mitigation of any foreseen and potential impacts.

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### 3 ALTERNATIVES

#### 3.1 Alternatives Considered

“Alternatives”, in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to —

**(a) The property on which or location where it is proposed to undertake the activity:**

The property and location of the proposed establishment of residential units and hospitality facilities was considered to be suitable for the following reasons:

- It is located in close proximity to the existing Howick CBD.
- It is surrounded by similar existing land uses.
- It will bring additional business and employment opportunities, and subsequently economic growth to the region.
- It is well located in terms of access and visibility along major roads (Karkloof Road).
- It is suitably sized to accommodate the proposed land uses and their required supporting infrastructure, access and parking.
- It will provide much needed housing options, in a region where it is currently lacking.
- The site is already in a transformed and developed state, with various buildings to be converted to the proposed hospitality facilities.

No alternative properties or locations for the establishment of residential units and hospitality facilities have been identified or investigated as part of the project. The reason for this is that the Applicant owns the proposed development site which is well positioned for a development of this nature. As such, the establishment of the proposed development on an alternative property is not desirable or feasible for the Applicant.

**(b) The type of activity to be undertaken:**

Alternative types of activities in the form of other proposed land uses were not considered as the proposed residential units and hospitality facilities offers a land use which is best suited for the site, given that it is consistent with the current surrounding land uses. Additionally, an application in terms of the Subdivision of Agricultural Land Act 70 of 70 was submitted by the Planner responsible for this application; and subsequently approved (**Appendix G4**). It must also be noted that there are established businesses and hospitality enterprises on the property, and to propose and investigate an entirely different type of activity would be non-purposeful and a waste of resources. The EAP is of the opinion that the proposed activity is optimal for the site.

**(c) The design or layout of the activity:**

Refer to Appendix A4 for the Preferred layout plan, **Appendix H1** for Option 2 Alternative 1 and **Appendix H3** for Option 3 Alternative 2. These are high resolution maps.

**Layout**

Three (3) layout options have been assessed:

- 1) Option 1 (Preferred): This layout features 17 Free-standing sectional title houses and associated services (**Figure 7**). Site sizes are approximately 2 000 m<sup>2</sup> with units varying between 230 m<sup>2</sup> and 350 m<sup>2</sup>.

- 2) Option 2 (Alternative 1): This layout was proposed and presented for comment during the planning stage. 22 houses were proposed. No terrace houses are proposed within the existing built-up area in this layout.
- 3) Option 3 (Alternative 2): This layout features a total of 17 proposed new houses on 2 000 m<sup>2</sup> and 1 500 m<sup>2</sup> sites, and 3 proposed new houses on 400 m<sup>2</sup>. 155 parking's are proposed.

**1) Option 1 (Preferred)** (Appendix A4):

This layout features 17 Free-standing sectional title houses and associated services (Figure 7). Site sizes are approximately 2 000 m<sup>2</sup> with units varying between 230 m<sup>2</sup> and 350 m<sup>2</sup>. Refer to Table 7 below for the positives and negatives associated with the preferred layout plan.

**Table 7: Positives and negatives of the preferred layout plan.**

POSITIVE	NEGATIVE
All sites are located well outside of the 32 m wetland buffer.	
All sites will be north facing and thus desirable from an energy efficiency perspective (i.e. natural lighting to heat house) and sales perspective.	
It has a wide range of house sizes varying from 230 m <sup>2</sup> and 350 m <sup>2</sup> . Thus, accommodating a broader range of prospective property owners. As a result, it will be more marketable and will allow for more visual diversity.	
This layout plan utilises existing buildings.	
This layout is optimally designed to meet the needs and designs of the bulk internal services ( <b>Appendix D4</b> ).	



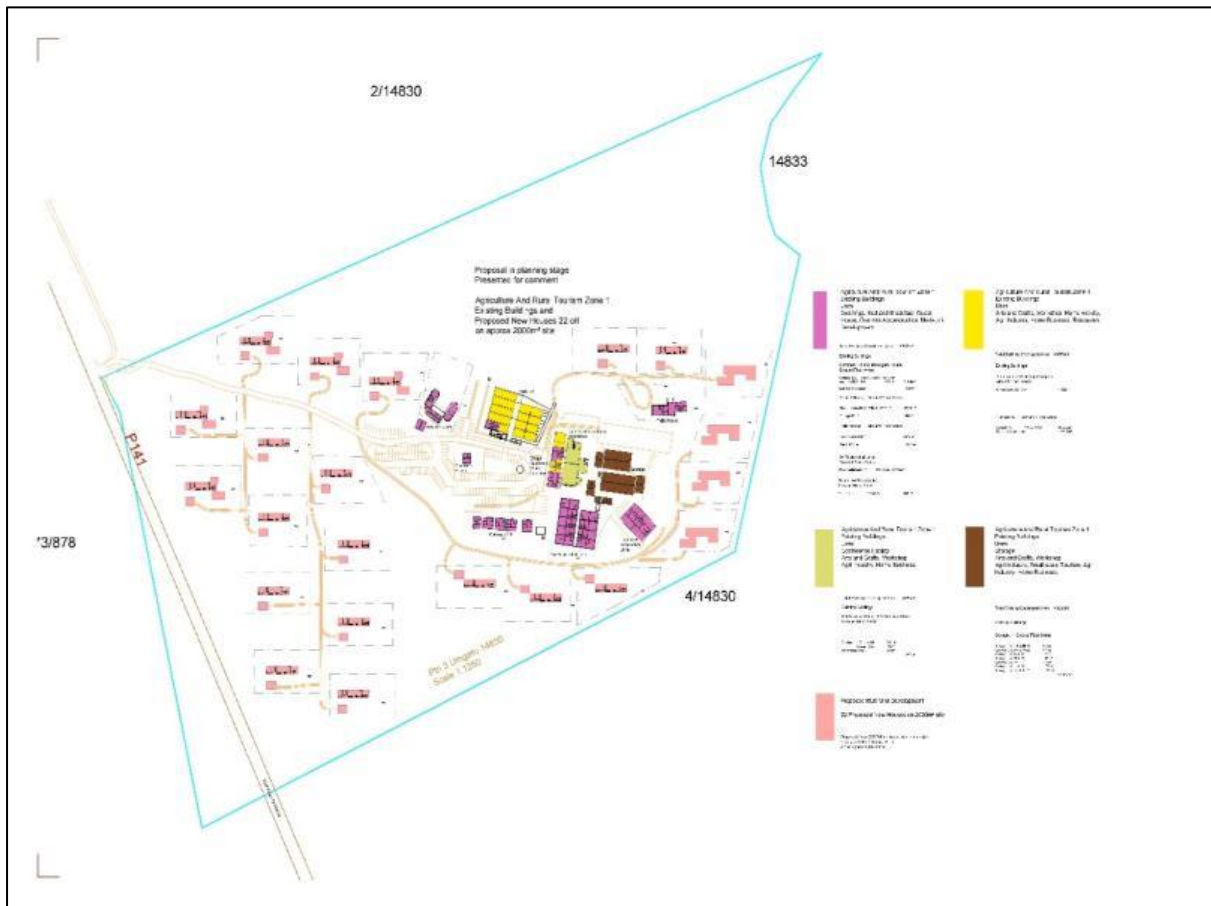
**Figure 8: Preferred layout plan.**

**2) Option 2 - Alternative 1** (Appendix H1):

This layout plan proposes 22 houses on 2 000 m<sup>2</sup> sites. No terrace houses are proposed within the existing built-up area in this layout. Refer to Table 8 below for the positives and negatives of Option 2 Alternative 1.

**Table 8: Positives and negatives of Option 2 Alternative 1 layout.**

<b>POSITIVE</b>	<b>NEGATIVE</b>
Reduced demand on services.	Omits the proposed 16 terraced houses within the existing built-up area.
All sites are located well outside of the 32 m wetland buffer.	Smaller range in house size, thus limiting marketability.
This layout plan utilises existing buildings.	Does not depict the additional required parking areas surrounding the residential tunnels.
	Layout was compiled prior to the specialist studies been conducted.



**Figure 9: Layout Option 2 - Alternative 1**

### 3) Option 3 – Alternative 2 (Appendix H2)

This layout plan proposes 17 houses on 2 000 m<sup>2</sup> and 1 500 m<sup>2</sup> sites, and 3 proposed houses on 400 m<sup>2</sup>. Refer to Table 9 below for the positives and negatives of Option 3 Alternative 2.

**Table 9: Positives and negatives of Option 3 Alternative 2 layout.**

POSITIVE	NEGATIVE
Reduce demand on services.	There is limited demand for the smaller plot sizes of 400 m <sup>2</sup> and 1 500 m <sup>2</sup> in the area as people want larger gardens and more space. The smaller plot size does not allow for this.
All sites are located well outside of the 32 m wetland buffer.	Does not show any details of where the house location will be on the plots.
This layout plan utilises existing buildings.	The proposed 400 m <sup>2</sup> plots are located near the existing commercial component, thus noise and lack of privacy could be an issue.

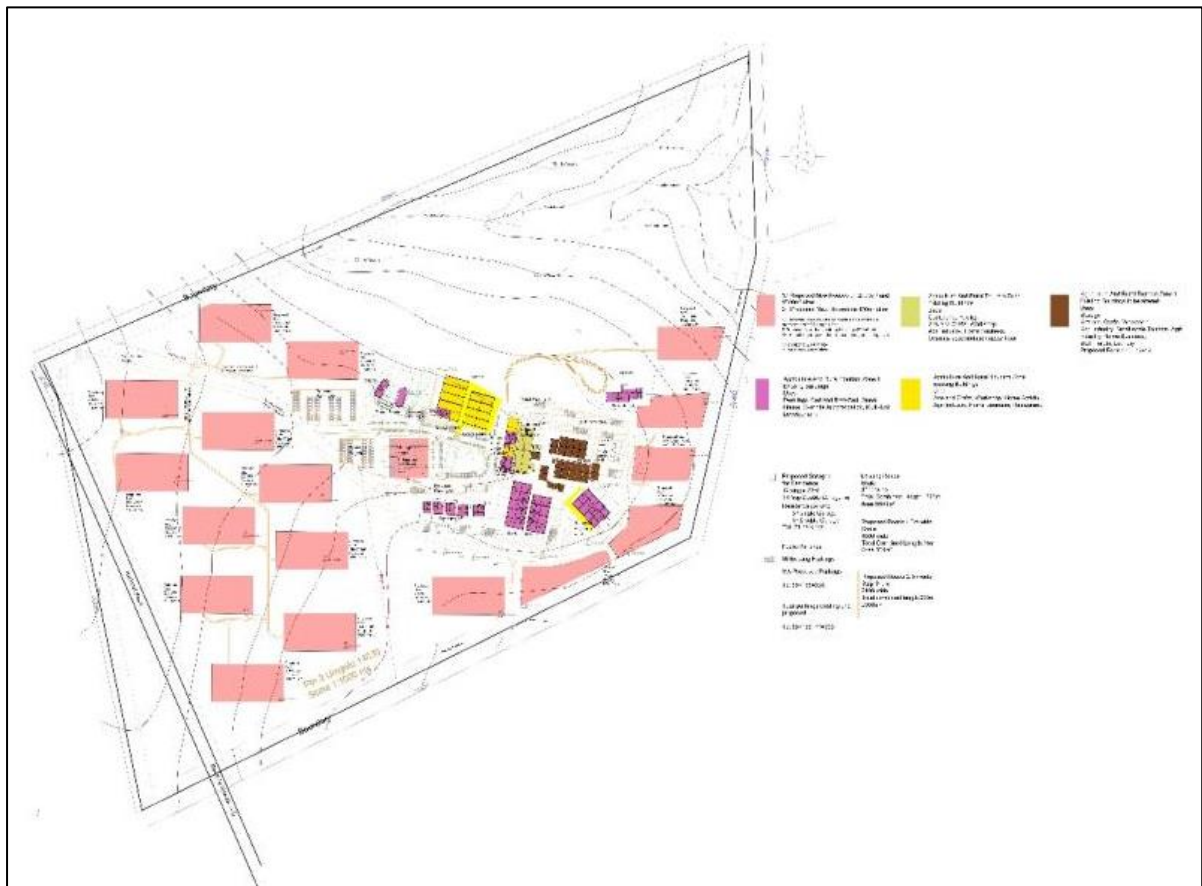


Figure 10: Option 3 - Alternative 2.

**(d) The technology to be used in the activity:**

Alternatives in terms of the technology to be used for the treatment and disposal of effluent at the proposed development were investigated as follows:

**SEWAGE DISPOSAL**

**1. Septic Tank and Soak Away System (Preferred)**

Seven percolation tests were undertaken and confirmed that the site is suitable for on-site sanitation for the disposal of wastewater and effluent via a septic tank and soak away system. The Geotechnical Assessment (Appendix D3) confirmed a recommended rate of application of 60 l/m<sup>2</sup>/day. Percolation Test 7 (PT7) did not pass the test, but it is possible that a suitable area could be found prior to construction, as the sites are far apart and there are large open areas. The rate of application will then be used to determine the length of each soakaway. Where septic tanks serve individual dwellings, it should have a minimum capacity of 1.7 m<sup>3</sup> or 3.5 m<sup>3</sup> where it serves more than one unit.

POSITIVE	NEGATIVE
Cost effective.	Possible water pollution / contamination.
Easy to maintain.	Expensive to clean out with vacuum tanker.

Soils are appropriate for septic tank and soakaways.	Can block if abused with non-biodegradable material.
Only affects one site if not functional/blocked.	

## 2. Sewage Package Plants

Sewage package plants are acceptable but not preferred. Package plants require regular maintenance and monitoring, which must be performed by a specialist supplier. Package plants also require periodic honey suckers. Due to the costs associated with these systems, this is not the preferred wastewater treatment. Thus, a sewage package plant is not desirable for a development of this size, nature and at this location.

POSITIVE	NEGATIVE
Risk of water pollution / contamination is low if maintained.	Expensive to implement and manage.
	Requires regular maintenance.
	Requires electricity to operate. Regular loadshedding occurring would require a backup generator which is expensive to run.
	Not well suited for low flows, can create smell nuisance.
	Requires stilling chamber before entering plant.

## 3. Conservancy Tanks

Conservancy tanks involve wastewater being collected in underground tanks on the site and this effluent being regularly sucked-out by honey sucker and transported by tanker to the nearest registered Waste Water Treatment Works (WWTW) for disposal. The installation of conservancy tanks is not considered economically feasible for this type and size of development due to the costs involved with the regular removal and disposal of waste.

POSITIVE	NEGATIVE
Risk of water pollution / contamination is low.	Expensive to manage.
Closed system with no outlet into ground.	Requires daily maintenance to empty the tank.

### (e) The 'do nothing' option of not implementing the activity:

The 'do nothing' approach will result in The Old Mushroom Farm being retained for its current use and remain in its present state. This option is considered unfeasible for the following reasons:

The proposed development is in line with the uMngeni Local Municipality's IDP and SDF in terms of job creation, attracting investment and developing sectors in the local economy. There is a shortage of land for housing in the province and a high demand for secure housing estates.

Residential development is beneficial as it results in employment opportunities during the construction and operational phase, as well as additional property taxes and other revenue for local government. The income that is generated recycles in the local economy and results in local economic development. The uMngeni Local Municipality SDF recognises the need to promote security of tenure and the provision of housing for a mixture of housing types in different areas; in this case, the proposed development will provide housing for upper income buyers. As such, the establishment of the proposed development will help towards the majority of the Municipality's goals. There is a high consumer demand for housing within the Howick area. The proposed development will also increase the GDP for Howick.

The positive and negative impacts associated with the do-nothing option are summarised in Table 10 below.

**Table 10: Positive and Negative Impacts Associated with the Do-Nothing Option.**

POSITIVE	NEGATIVE
No potential impacts associated with noise, dust, aesthetics and lighting would occur.	No job creation, skills development and income generation will be facilitated during the construction and operational phases.
No potential for accelerated deterioration of the Karkloof road resulting from traffic associated with the development.	Municipal goals and objectives by providing housing within the municipality (directly high income and indirectly low income) will not be contributed to.
No security impacts. However, the development could reduce the possibility of security impacts in the future. i.e. if left undeveloped there is potential of illegal land invasion.	No formal protection and management of sensitive habitats will be implemented on the site.
No potential for soil erosion resulting from the clearance of vegetation and stockpiling of material during the construction phase.	No additional property taxes and other revenue for local governments.
No potential for erosion and contamination of surface water resources from uncontrolled stormwater runoff from hardened surfaces.	Not in line with the Municipal SDF's and IDP's.
No increased risk for the spread of alien invasive vegetation if regular alien vegetation clearing is not implemented.	The site is too small to be economically viable for crop or livestock production. Furthermore, development pressure has raised the value of land in the area to where it cannot be economically used for livestock or crop production.

If the “do nothing” option is selected, none of the above benefits will be realised. In addition, there will continue to be a shortage of housing in the Howick area for those looking to reside in secure housing estates, and there will be no additional generation of employment opportunities and skills development, and the associated income generation and improved quality of life for those who could be potentially employed.

## 4 PUBLIC PARTICIPATION PROCESS

### 4.1 Protection of Personal Information Act (POPIA, Act No 14 of 2013)

The Protection of Personal Information Act (POPIA, Act No. 14 of 2013) came into effect on 01 July 2021 and aims to promote the protection of personal information. In terms of the POPIA, personal information refers to ‘*the name of the person if it appears with other personal information relating to the person or if the disclosure of the name itself would reveal information about the person*’. The EIA Regulations require, inter alia, transparent disclosure of registered Interested and Affected Parties (I&APs) and their comments. I&APs who submit comment, attend a Public Information Session or request registration in writing for the Basic Assessment Process are deemed registered I&APs who must be added to the list of I&APs. By registering, I&APs are deemed to give their consent for relevant information to be processed and disclosed, in fulfilment of the requirements of the EIA Regulations.

For the purposes of this BA Process and in terms of the requirements of the POPIA, only the names, affiliations and comments of I&APs have been included in this report. Should additional personal information be required by the DEDTEA, consent to share this personal information will be obtained from the I&AP prior to doing so.



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## 4.2 Interested and Affected Parties

A register of I&APs was compiled at the outset of the project. This includes names and contact details of Authorities, Government / Municipal Departments, NGOs, local interest groups, and neighbouring landowners. The list of I&APs has been continually updated to include persons responding to the adverts and site notice boards.

## 4.3 Notification of the Proposed Development

Notification of the proposed development was conducted through the publication of newspaper adverts in English in the Witness and Zulu in the Echo on 01 December 2022, in order to notify Interested and Affected Parties (I&APs) of the proposed development (**Appendix C1**).

Notice boards were placed on site to notify the public of the proposed development. The notice boards were in English and isiZulu and included details of the application, its nature and location, the assessment procedure in terms of the Regulations and details of the EAP. These were placed on 29 November 2022 (**Appendix C3**).

## 4.4 Background Information Document

Written notification in the form of Background Information Documents (BIDs) were circulated from 27 October 2022 (**Appendix C4**). The BID was circulated by e-mail, post, fax or hand delivery to relevant authorities. Comments received (**Appendix C4**) following circulation of the BID, adverts in the newspapers and the displaying of site posters are summarised and responded to in **Table 11** below.

**Table 11: Comments received following the newspaper adverts, placing of site notice boards, and circulation of the BID. Comments received following the newspaper adverts, placing of site notice boards, and circulation of the BID.**

I&AP	COMMENT	RESPONSE
<p>Brian Akkiah Eskom 27 October 2022</p>	<ul style="list-style-type: none"> <li>• Please see comments below, as per your request received by Eskom on 27th October 2022. We confirm that an investigation has been carried out with regard to the supply of electricity, as well as any encroachment into Eskom’s Servitudes, in respect to the application as set out above referring to KML file supplied by Greendoor.</li> <li>• Please note that there are Eskom infrastructure namely, Howick NB3 Overhead Line and Underground Cable within the area of interest. Please see attached drawing number ER_INV_792_2022 showing Eskom infrastructure in relation to the proposed area of interest. It is very important to note that Eskom’s LV data is not reflected on the drawing supplied. It is advisable you contact Eskom immediately, should you physically detect any conductors and/or underground cables on the ground and not reflected on the drawing. Eskom’s call centre number is 08600 37566. Please note that NO CONSTRUCTION close to any of Eskom’s infrastructure is permitted without a site inspection &amp; written permission resulting from consultation with Eskom’s Senior Supervisor Mr Allan Maher on 033 239 1102 / 082 374 8679 &amp; email MaherAT@eskom.co.za and Senior Supervisor of the Cabling Department, Mr Rakeen Bhoola on 082 859 9935, email BhoolaRa@eskom.co.za.</li> <li>• Eskom wishes to advise you that in the event of your client wanting to move any Eskom Infra-structure, it will be at the applicant’s / developer’s cost. Taking the above statements into consideration, Eskom has no objection to the proposed application as long as the conditions listed below are adhered to. Please direct all correspondence to the Lands &amp; Rights Manager Mr SS Nsele on email NseleSi@eskom.co.za</li> <li>• <u>Building Restrictions for 11-kV Overhead Power line</u></li> <li>• No building or structures may be erected or installed above or below the surface of the ground, neither may any material which might endanger the safety of this power line be place within 15 (sixteen) meters from the center line of this power line, on either side (overall servitude width 30 meters), without prior written confirmation from Eskom.</li> </ul>	<ul style="list-style-type: none"> <li>• Noted.</li> <li>• Noted, this will be done if applicable.</li> <li>• Noted, this will be done if applicable.</li> <li>• Noted, this will be adhered to if applicable.</li> </ul>

	<ul style="list-style-type: none"> <li>• <u>Building Restrictions for 11-kV Underground Cable</u></li> <li>• Eskom has maintained through the years that 'no excavations maybe effected within 1.5 metres from any of its underground electric cables'. Therefore, keeping servitude areas for underground cables at a minimum 3.00 metres wide is preferable. Where multiple cables are laid next to each other, 300mm spacing apart from each other is preferable.</li> <li>• Eskom shall retain unobstructed access at all times.</li> <li>• Changes in ground level may not infringe statutory ground to conductor clearances or statutory visibility clearances or on the depth levels at which Eskom underground cables are laid, usually 1- 1.2m. After any changes in ground level, the surface shall be rehabilitated and stabilised so as to prevent erosion. The measures taken shall be to Eskom's requirements.</li> <li>• Eskom's rights and duties in the Wayleave/Servitude area shall be accepted as having prior right at all times and shall not be obstructed or interfered with.</li> <li>• The clearances between Eskom's live electrical equipment and the proposed construction work shall be observed as stipulated by Regulation 15 of the Electrical Machinery Regulations of the Occupational Health and Safety Act, 1993 (Act 85 of 1993) (Annexure F). Eskom shall not be liable for the death of or injury to any person or for the loss of or damage to any property whether as a result of the encroachment or of the use of the stipulated area by the applicant, his/her agent, contractors, employees, successors in title, and assigns. The applicant indemnifies Eskom against loss, claims or damages including claims pertaining to consequential damages by third parties and whether as a result of damage to or interruption of or interference with Eskom's services or apparatus or otherwise.</li> <li>• Eskom will not be held responsible for damage to the applicant's equipment. The applicant's attention is drawn to the Electricity Act, 1987, (Act 41 of 1987, as amended in 1994), Section 27(3), which stipulates that the applicant can be fined and/or imprisoned as a result of damage to Eskom's apparatus.</li> <li>• No mechanical equipment, including mechanical excavators or high lifting machinery, shall be used in the vicinity of Eskom's apparatus and/or services, without prior written permission having been granted by Eskom. If such permission is granted the applicant must give at least seven working days prior notice of the commencement of work. This allows time for arrangements to be</li> </ul>	<ul style="list-style-type: none"> <li>• Noted, this will be adhered to if applicable.</li> <li>• Noted.</li> <li>• Noted, this will be adhered to if applicable.</li> <li>• Noted.</li> <li>• Noted.</li> <li>• Noted.</li> <li>• Noted.</li> <li>• Noted.</li> </ul>
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	<p>made for supervision and/or precautionary instructions to be issued.</p> <ul style="list-style-type: none"> <li>• The clearances between Eskom's live electrical equipment and the proposed construction work shall be observed as stipulated by Regulation 15 of the Electrical Machinery Regulations of the Occupational Health and Safety Act, 1993 (Act 85 of 1993). Equipment shall be always regarded electrically live and therefore dangerous.</li> <li>• A developer taking a new supply from Eskom, an increase of supply or line deviation is required to make an application to Eskom via the Eskom toll free number 0860037566. This application will be processed in terms of Eskom's standard customer connection tariffs, conditions and policies at the developers cost. There is an attached indemnity form that you are required to complete and return to Land Development as part of your acknowledgement.</li> <li>• The Data, Information and Drawings is made available to you by Eskom Holdings SOC Limited on an "AS IS" basis, without warranty of any kind, including without limitation, the warranties of fitness for a particular purpose. Availability of this data, information and drawings does not constitute scientific publication. The Data, information and drawings may contain errors, be incomplete or out-dated). Eskom Holdings SOC Limited and its employees make no representation or warranty, express or implied, including without limitation any warranty of fitness for a particular purpose or warranties as to the quality, accuracy, completeness or currency of the data, information, and drawings.</li> <li>• This approval is valid for 12 months only, after which the applicant must reapply if the work undertaken has not been completed. Any changes / deviations to the original application must be immediately communicated to this office together with a new application. All costs for damage/s to Eskom infrastructure during construction or any work carried out by the applicant shall be borne by the applicant.</li> </ul>	<ul style="list-style-type: none"> <li>• Noted.</li> <li>• Noted, this will be done if applicable.</li> <li>• Noted.</li> <li>• Noted.</li> </ul>
I&AP 28 October 2022	<ul style="list-style-type: none"> <li>• If we happy for it to go ahead, do we have to say anything?</li> </ul>	<ul style="list-style-type: none"> <li>• Your support for the proposed development is noted.</li> </ul>
Nandipha Sontangane DFFE 28 October 2022	<ul style="list-style-type: none"> <li>• The Department of Forestry, Fisheries and Environment (DFFE) appreciates the opportunity given to participate on the above-mentioned project. DFFE through the sub-directorate Forestry Regulations and Support is the authority mandated to implement the National Forests Act No. 84 of 1998 by regulating the use of natural</li> </ul>	<ul style="list-style-type: none"> <li>• Noted.</li> </ul>

	<p>forests and protected tree species in terms of the said Act. The purpose of this Act is to promote sustainable forest management and the development of forests for the benefit of all.</p> <ul style="list-style-type: none"> <li>• With reference to the BID received on 27 October 2022, the applicant proposes to establish residential units and hospitality facilities on Portion 3 of the Farm Umgethu No. 14830 (The Old Mushroom Farm), in Karkloof. Majority of the natural vegetation on site has been transformed due to previous activities. The serial image indicates that there is woody vegetation on the site, however, its type and condition is not clear at this stage. The department requests that a vegetation assessment should be conducted. This assessment should include the condition and type off all vegetation and species found within the site and indicate the extent of impact on the vegetation by the project as well as potential areas for re-vegetation. Substantial comments will be issued upon receipt and review of the basic assessment report.</li> <li>• This letter does not exempt you from considering other environmental legislations. Should any further information be required, please do not hesitate to contact this office.</li> </ul>	<ul style="list-style-type: none"> <li>• A Biodiversity Assessment has been conducted (<b>Appendix D1</b>) and concluded that the site does not intercept any Critical Biodiversity Areas (CBA) or Ecologically Sensitive Areas on the property. The site is highly modified due to the built environment and historical agricultural activities which have made it unlikely that species of conservation concern could be supported on the property.</li> <li>• Noted.</li> </ul>
<p>Judy Reddy Department of Transport 06 November 2022</p>	<ul style="list-style-type: none"> <li>• Please see attached checklist for development, please can you submit all relevant information in order for me to process your application.</li> </ul>	<ul style="list-style-type: none"> <li>• Noted, the DBAR was sent to your office for review and comment.</li> </ul>
<p>S.B. Thabede Department of Agriculture and Rural Development (DARD) 28 November 2022</p>	<ul style="list-style-type: none"> <li>• The Portion 3 of the Farm Umgethu No.14830 has some existing buildings that can roughly equates to 5ha but with the proposal there will be additional new developments.</li> <li>• As per agricultural point of view the proposed development might alter the area and the farm is having the marginal and acceptable hectars for a viable farming unit. We accept that it depends on many factors which are not limited to water availability and soils of the property.</li> </ul>	<ul style="list-style-type: none"> <li>• Noted, this is correct.</li> <li>• Noted. An application in terms of the Subdivision of Agricultural Land Act 70 of 70 was submitted by the planner responsible for this application and approved (<b>Appendix G4</b>). In terms of National Agriculture Norms and Standards, a farming unit is considered a viable and economically sustainable unit in the following circumstance:</li> </ul>

	<ul style="list-style-type: none"> <li>As per submitted layout plan this is a huge development and will definitely alter the whole property as there are 22 proposed new houses plus 16 proposed houses.</li> </ul>	<ol style="list-style-type: none"> <li>If it has minimum of 20 ha or arable land with an irrigation permit for 10 ha of land that must be used for intensive pastures, vegetables, herb or floriculture.</li> <li>If it is minimum of 100 ha of arable dry land suitable for annual cropping.</li> <li>If it has the capacity to provide the grazing for 60 large livestock units and their followers throughout the year.</li> </ol> <p>Currently 5 ha of the 21 ha are consumed by the commercial, tourism and office buildings, and a further 1.3 ha is lost to main road or is across the main road from the balance of the property. Thus 17 ha remains for agriculture. As this land is not arable and the property does not have irrigation rights, the property cannot be considered a viable agricultural unit. It is also pertinent to note that the area around the said site is significantly developed – Karkloof Farmers Market, Le Petite France, the Ambers residential developments (more than 1000 units), St. Johns residential development (more than 1 100 units), KwaWula (more than 20 units) towards Howick.</p> <ul style="list-style-type: none"> <li>Yes, only 22 new subdivisions are proposed. The other development will occur within / on the same footprint as</li> </ul>
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	<ul style="list-style-type: none"> <li>• The office acknowledges receipt of the application however Land management needs the following:</li> <li>• Clarity of SALA applicability of the Portion 3 of the Farm Umgethu No. 14830. This is very important as the office it is hard to comment on a development applications if they are on SALA applicable lands and that development is not supporting agriculture.</li> <li>• If the property has been exempted Land Use Management request detailed studies with associated specialist studies in trying to address the issue of protecting natural resources in the farm and at vicinity.</li> <li>• Please be advised that the Provincial Department of Agriculture and Rural Development: Land Use Management cannot provide recommendations on the submitted application; a detailed recommendation will be made once an issue in 3.4 above is addressed.</li> </ul>	<p>the current infrastructure on site.</p> <ul style="list-style-type: none"> <li>• Noted.</li> <li>• Refer to <b>Appendix G4</b>. An application in terms of the Subdivision of Agricultural Land Act 70 of 70 was submitted and approved.</li> <li>• Noted. An application in terms of the Subdivision of Agricultural Land Act 70 of 70 was submitted and approved (<b>Appendix G4</b>). A Biodiversity Assessment (<b>Appendix D1</b>) and Wetland Assessment (<b>Appendix D2</b>) have been conducted and included in the DBAR. An Environmental Management Programme (EMPr) (<b>Appendix E</b>) is also be included in the DBAR.</li> <li>• Noted. A copy of the DBAR was sent to the Department for review and comment.</li> </ul>
<p>Neil Burchell Neighbour 28 November 2022</p>	<ul style="list-style-type: none"> <li>• I am Neil Burchell and I live on Preston Farm, the southern neighbour of The Old Mushroom Farm (TOMF), at 9 Karkloof Road.</li> <li>• We are heading into the 6th Mass Extinction (<a href="https://xrb.link/TZ59j2i31b">https://xrb.link/TZ59j2i31b</a>) and the reasons are all anthropogenic. Almost all of them are potentially going to be involved in the proposed development at TOMF, unless you can specify conditions to protect what is still there. Specifically:</li> </ul>	<ul style="list-style-type: none"> <li>• Noted.</li> <li>• Noted, this is the opinion of the I&amp;AP. All potential environmental impacts have been assessed during the Environmental Authorization Process and appropriate mitigation measures have been recommended. Refer to Section 5 and 6 of this Report for potential impacts associated with the development and proposed mitigation</li> </ul>

	<ul style="list-style-type: none"> <li>• The trees at the west end of the property, to the south of the access road, will be cleared in order to make room for houses – there should be a condition that they (and others that I have not mentioned) are replaced by indigenous trees that will have at least the same biomass when mature, or left alone;</li> <li>• The 22 new houses are to be built on green-field sites (literally) and the increase in human presence on site will make it impossible for wildlife to make a home there, forever damaging biodiversity in the area; and</li> <li>• The 22 new houses are, if they are going to follow the architecture of the existing buildings on the site, going to be made of carbon-intensive concrete and bricks – there should be a condition that they are built out of enviro-sensitive materials (eg timber) and be net zero carbon emitters after 5 years (solar panels, heat-source pumps, proper insulation should be standard, and there should be no wood-burning or coal-burning or gas-burning appliances permitted).</li> <li>• I am not competent to talk about the proposed wastewater management scheme, and how it will affect the surface and sub-surface water qualities, but I guess there will be at least a monthly E. Coli and minerals monitoring scheme put in place.</li> </ul>	<p>measures.</p> <ul style="list-style-type: none"> <li>• The Environmental Management Programme (EMPr) (Appendix E) includes a condition that indigenous vegetation must be used for landscaping.</li> <li>• The EAP was informed that the houses will have fences around them; wildlife will be able to walk between the houses.</li> <li>• Noted. Green Design Principles will be incorporated into the architectural design.</li> <li>• Wastewater management has been assessed in the Engineering Report (Appendix D4) and in the Storm Water Management Plan (Appendix D5). At present, water samples of the ground water were sent to Talbot Laboratory for testing to determine whether the water is at an acceptable drinking level quality (Appendix G3). The water quality sample results all came back within the SANS 241-2015 parameters, except for a microbial bacteria. The water must be disinfected with a mild disinfectant to be suitable for human consumption. The water quality will meet the standards of SANS 241-2015.</li> </ul>
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	<ul style="list-style-type: none"><li>Any permissions, and suite of conditions, that are given for this development will be used as a precedent for the rest of the Karkloof valley, including the farm that I live on, so your decision does not just affect TOMF. As the environmental curator of our region, you have the singularly critical role for standing up for our natural world, which is an heirloom, not a resource, as nobody else can.</li></ul>	<ul style="list-style-type: none"><li>Noted. Please note that Green Door Environmental are NOT the decision makers, our role is to undertake an independent assessment of the proposed development and present this assessment to the Competent Authority for decision.</li></ul>
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#### 4.5 Public Information Session

A Public Information Session (Public Meeting) was held Tuesday, 06 December 2022, between 14h00 and 15h30, at The Old Mushroom Farm. The purpose of the Public Information Session was to:

- Provide background information to Interested and Affected Parties (I&APs) on the proposed project and the environmental process to be followed; and
- Give I&APs the opportunity to raise any concerns and issues which they feel should be addressed during the Environmental Basic Assessment Process.

All registered I&APs were invited by e-mail from 22 November 2022.

This meeting took place in the form of a Public Information Session whereby all available information on the proposed development and environmental process to be followed was displayed at the meeting venue in poster format. The meeting attendees were given the opportunity to view the information and then ask questions and provide comments to the Environmental Assessment Practitioners (EAPs).

The EAPs documented the issues and concerns raised by the I&APs regarding the proposed development during the meeting, and the meeting minutes were circulated to all registered I&APs.

The following Project Team members were present:

- Dr Rebecca Bowd – Principle Environmental Assessment Practitioner
- Roxanne van Rooyen – Environmental Consultant.

The meeting invitation, attendance register a copy of the presentation, the meeting minutes and photographs taken at the Public Information Session are included in **Appendix C5**. A summary of the queries and comments received and responses given at the Public Information Session are contained within Table 12 below. Additional information has also been provided in the response column, where it has become available since the meeting. Please note that we are not permitted to share the personal details of I&APs as required by the Protection of Personal Information Act (POPI).

**Table 12: Comments and Responses from the Public Information Session.**

COMMENT	RESPONSE
Is Sappi on the list – Andrew Pool is the local Sappi representative.	Noted, Mr. Pool was contacted and is a registered I&AP.
We are concerned about our access road which is a Sappi servitude road. Only Sappi and ourselves are permitted to use this road. We are concerned that this road will be utilized by the residents of the proposed development for motorbike riding, quad-biking, exercising, etc. There are negative impacts associated with this. We had a recent experience where a guest's child that was staying at the current accommodation at The Old Mushroom farm, was seen shooting birds along our road. It would be best if access by residents and patrons of the proposed development and hospitality facilities had restricted access to our road. Will the property be fenced off to prevent	Noted. This will be discussed with the neighbours and once agreement is in place, put into the rules of the estate.

this, and assist with security for the proposed development?	
Noise impacts are a concern.	Noted. The impact of noise associated with the proposed development has been investigated. Refer to Section 5.6 of this Report for potential impacts on noise. Construction activities onsite will require the use of heavy machinery for earthworks. The construction phase will generate noise from the use of construction machinery as well as increased traffic from construction vehicles and the resultant generation of dust. There will also be an increase in the number of people in the area due to the presence of construction labourer's onsite, as well as other potential job seekers. This impact; however, is only temporary, ending with the completion of the construction phase.
We are concerned about sewage pollution and contamination of watercourses.	Noted. A Geotechnical Assessment ( <b>Appendix D3</b> ) was conducted by Gondwana Geo Solutions during December 2022, Ref 22-119R01, and performed 7 percolation tests (PT1 – PT7) with the conclusion that the site is suitable for on-site sanitation recommending a rate of application of 60 l/m <sup>2</sup> /day. PT7 did not pass the test, but it is possible that a suitable area could be found prior to construction, as the sites are far apart and there are large open areas. The rate of application will then be used to determine the length of each soakaway. Where septic tanks serve individual dwellings, it should have a minimum capacity of 1.7 m <sup>3</sup> or 3.5 m <sup>3</sup> where it serves more than one unit. Commercial and other non-domestic septic tanks should be sized to have a capacity of one day's effluent generated.
Will they allow livestock in the new development?	This is a possibility.
I have a horse riding and trail business; is a restriction of trade possible?	We suggest the I&AP investigates this with the relevant professionals as this is not our field of expertise.
How much water will be abstracted or needed for the proposed development?	Refer to Appendix D4 for the Engineering Report. In order to meet the daily demand of 66 kL /day at full development, the borehole will have to deliver water at a rate of 5 500 L/hour, assuming the borehole will only pump for 12 hours per day. Based on the borehole step-drawdown test results facilitated by Dersal Consulting and conducted by Aquatec Pumps & Drilling, the borehole has a total depth of 60.53 m and an available drawdown of 44 m therefore yielding a daily abstraction rate of 99 kL per 24hr period and/or 8 250 L/hour per 12hour period, thus being adequate to deliver the required 5 500 L/hour per 12hour period. Seasonal change may influence the above results due to affected ground water tables. The abovementioned capacity of 132 kL storage excludes firefighting storage which according to guidelines shall equate to an additional 54 kL of storage. The reservoir can be filled directly from the borehole which should be located at the high point of the development, the reservoir may need to be fitted with an inline booster pump to ensure the higher lying dwellings receive sufficient pressure, alternatively an elevated tank option may be investigated. The presence of any coliform bacteria can be eliminated by means of treatment such as chlorine and ultraviolet treatment systems making the borehole water acceptable for human consumption.

Is the soil appropriate for sewage disposal?	A Geotechnical Assessment (Appendix D3) was conducted by Gondwana Geosolutions during December 2022, Ref 22-119R01, and performed 7 percolation tests (PT1 – PT7) with the conclusion that the site is suitable for on-site sanitation recommending a rate of application of 60 l/m <sup>2</sup> /day. PT7 did not pass the test, but it is possible that a suitable area could be found prior to construction, as the sites are far apart and there are large open areas. The rate of application will then be used to determine the length of each soakaway. Where septic tanks serve individual dwellings, it should have a minimum capacity of 1.7 m <sup>3</sup> or 3.5 m <sup>3</sup> where it serves more than one unit. Commercial and other non-domestic septic tanks should be sized to have a capacity of one day's effluent generated.
I am in the real estate business. There is a significant demand for sectional titles in rural type settings (country lifestyle).	Noted.
Traffic must be assessed in terms of volume and impacts from lights.	Noted. Traffic associated issues has been investigated as part of the Bulk Engineering Report ( <b>Appendix D4</b> ). It is proposed that the new access off the P141 would have to be upgraded to a Type B1 intersection. It is anticipated that the proposed layout will generate approximately 46 trips per day. In terms of the South African Traffic Impact and Site Traffic Assessment Manual (TMH 16), a Traffic Impact Assessment must be undertaken when " <i>The highest total additional hourly vehicular trip generation (including pass-by and diverted trips) as a result of the application exceeds 50 trips per hour</i> ". Therefore, a Traffic Impact Assessment is not required, as the trip generation is less than 50 vehicles per hour.
Mitigation measures must be provided for all potential negative impacts.	Noted, an Environmental Management Programme (EMPr) was compiled (Appendix E). An EMPr is a legally binding document which specifies who is responsible for specific actions during the lifetime of the project – for construction to operation and decommissioning. Its implementation is policed by independent consultants and government bodies.
The water table on this property is high.	According to the Geotechnical Assessment ( <b>Appendix D3</b> ), no ground water was observed on site.
Which department makes the decision for this application? Where are their offices located? Are they forward-thinking?	The Competent Authority for the environmental authorisation process for this development is the Department of Economic Development, Tourism and Environmental Affairs (DEDTEA). They are located at 8 Warwick Road, Pietermaritzburg. In our experience this office has some of the best government officials in the country.
Why did the current buildings and renovations do not need environmental authorization?	These did not require environmental authorisation as the activity of renovating and changing their purpose did not trigger any listed activity contained within GNR 327, 325 or 324 which are promulgated under the National Environmental Management Act (NEMA), 1998.
Where is the boutique hotel going to be located?	A part of the current infrastructure / buildings will be converted into boutique apartments / units.
Is this the only time we can comment during this process?	No, Interested and Affected Parties (I&APs) are able to comment at any time during the process. The Draft Basic Assessment Report, which includes all the specialist studies and

	recommendations, as well as a draft version of the Environmental Management Programme (EMPr), was circulated to I&APs for review and comment for 30 days. A Final Basic Assessment Report will be submitted to the DEDTEA which will contain all comments (and responses to) issues raised on the Draft Basic Assessment Report.
How long does this process take?	It takes approximately 6 – 9 months.
Are there conditions in the environmental authorization to ensure compliance?	Yes, the environmental authorisation will specify the details and frequency of the required Environmental Compliance Audits that will be required for the various phases of the development, i.e. construction phase, rehabilitation phase and operational phase.
Do you think there are any issues?	So far, we have not identified any “fatal flaws” associated with this development, however we will require the specialist assessments to confirm this.
Why have they gone for sectional titles? How will this impact in terms of compliance to the environmental authorisation? For example, KwaWula wanted to erect massive gates, tarring roads and want to allow pets in order to gain property values (in their opinion).	We cannot comment regarding the choice to go for sectional titles, as we are not Planners; this is a planning issue. Sectional title estates are generally run by a Homeowners Association (HoA). In our experience, due to the way a HoA operates and is managed, compliance with any environmental requirements are upheld.
Concerned about the cumulative impacts.	Cumulative impacts have been investigated as part of the Draft Basic Assessment. Refer to Section 8.1 of this Report.
The Karkloof road is a provincial road. The speed limit will need to be reduced as it is just a matter of time before an accident happens.	Noted. Traffic associated issues has been investigated as part of the Bulk Engineering Report ( <b>Appendix D4</b> ). It is proposed that the new access off the P141 would have to be upgraded to a Type B1 intersection. It is anticipated that the proposed layout will generate approximately 46 trips per day. In terms of the South African Traffic Impact and Site Traffic Assessment Manual (TMH 16), a Traffic Impact Assessment must be undertaken when “ <i>The highest total additional hourly vehicular trip generation (including pass-by and diverted trips) as a result of the application exceeds 50 trips per hour</i> ”. Therefore, a Traffic Impact Assessment is not required, as the trip generation is less than 50 vehicles per hour.
Umngeni Municipality requires a layout showing the wetland area with the proposed infrastructure.	Noted, refer to Figure 18 of this Report or the Wetland Assessment ( <b>Appendix D2</b> ).

#### 4.6 Consultation with Competent Authority

A Pre-Application Meeting was held on 17 November 2022 at 10h00 with the Department of Economic Development, Tourism and Environmental Affairs (DEDTEA) via Zoom. The agenda, attendance register and the meeting minutes from the Pre-Application Meeting are included in **Appendix C5**.

#### 4.7 Circulation of the Draft Basic Assessment Report

Copies of the DBAR have been circulated to the following key I&APs for review and comment within the 30-Day comment period:

- Department of Economic Development, Tourism and Environmental Affairs (DEDTEA) – Shawn Janneker
- Department of Water & Sanitation (DWS) – Zama Hadebe
- Department of Forestry, Fisheries and the Environment (DEFF) – Nandipha Sontangane
- Department of Agriculture and Rural Development (DARD) – Petrus Mans
- Department of Transport (DoT) – Chris du Plessis

- 
- uMngeni Local Municipality – Marc Hattingh
  - uMgungundlovu District Municipality – Mandisa Khomo
  - Ezemvelo KwaZulu-Natal Wildlife – Nerissa Pillay
  - AMAFA Heritage KwaZulu-Natal – Bernadet Pawandiwa
  - Eskom – Brian Akkiah
  - SANRAL – Judy Marx

All remaining I&APs have been notified of the availability of the DBAR for review and comment and are afforded 30 days to provide comments. Comments received and responses thereto will be provided in the FBAR.

#### **4.8 Summary of Issues Raised**

##### **Background Information Document, Newspaper Adverts, Site Posters and Public Information Session:**

- Concerns about the state of the vegetation on the property which must be assessed.
- The development could alter the sense of place of the area.
- Has the property been released from Subdivision of Agricultural Land Act (SALA)?
- The proposed 22 houses will be built on green field sites, thereby destroying the biodiversity.
- This development will set a precedent for the rest of the Karkloof Valley.
- Concern about the types of building materials to be used.
- Noise related impacts.
- Concern about public affecting the horse-riding business.
- Sewage and pollution of watercourse concerns.
- Potential traffic related impacts.

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## 5 POTENTIAL IMPACTS ON THE SOCIAL AND ECONOMIC ENVIRONMENTS

### 5.1 Local Economy and Employment Opportunities / Need and Desirability

#### Description

The uMngeni Municipality IDP lists the following in terms of sustainable economic growth:

- Human resource and skills development;
- Employment creation;
- Attracting investment;
- Development of all sectors in the local economy;
- Local economic development;
- Integrated human settlements; and
- Environmental sustainability.

Residential development is beneficial as it results in employment opportunities during both the construction and operational phases, as well as additional property taxes and other revenue for local governments. The income that is generated recycles back into the local economy and results in local economic development. The uMngeni Municipality SDF recognises the need to promote security of tenure and the provision of housing for a mixture of housing types in different areas. In this case, the proposed development will provide housing for upper income buyers.

There is a shortage of land for housing projects within KwaZulu-Natal. The proposed development has the potential to help towards addressing the housing backlog and will provide access to quality housing for upper income buyers. The proposed development will also increase the Gross Domestic Product (GDP) for Howick and the uMngeni Local Municipality.

#### Implication / Risk / Impact

- If approved, the proposed development will contribute positively to the local economy and the social environment through spending of capital at local businesses.
- The proposed development will provide employment opportunities and income generation during both the construction and operational phases.
- There will also be skills transferred during the construction phase, which will benefit employed people in the long term when they seek employment elsewhere.

#### Mitigation / Recommendations

- Local businesses and unemployed people in the immediate area must be considered first, before employing labour and services from further afield.

### 5.2 Planning Initiatives

#### **National Spatial Development Perspective (NSDP)**

The Policy Co-ordination and Advisory Services introduced a National Spatial Development Perspective (NSDP), which was then endorsed by the Cabinet in March 2003. The NSDP works in conjunction with different Departmental and Provincial spatial and development strategies. The four principles of the NSDP are as follows:

- Economic growth is a prerequisite for achievement of policy objectives;
- Government spending should concentrate on fixed investment, focusing on localities of economic growth and/or economic potential;
- Efforts to address the past and current inequalities should focus on people not on places; and
- To overcome spatial distortions of apartheid, future settlement and economic development

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opportunities should be channelled into nodes adjacent to the main growth centres.

In order to distinguish between localities, the NSDP uses two concepts as methodological tools, which are 'Potential' and 'Poverty Gap'. These two concepts will assist the NSDP in providing a coarse-grained analysis from a national perspective, which will be supplemented by a more finely, grained analysis at Provincial and Local Government level.

In defining potential, the NSDP has drawn on recent tradition of 'institutional economics' a field that has come to dominate both developmental economics and regional planning. The institutional approach suggests that beyond the usual sources of comparative advantage, the institutional adequacy of a locality will help determine whether development is sustainable or not. The NSDP therefore uses concepts of potential that rely strongly on the presence of institutional capacity to realize the developmental impact of other resources.

In summary, the NSDP will have a role to play as an instrument that informs the respective development plans of the three spheres of government i.e. IDP, PGDS and the Medium Term Strategic Framework (MTSF).

### **KZN Growth and Development Strategy (PGDS)**

Inequalities exist in our economy and there is a legacy of inequitable spatial development. This has had a negative impact on public sector investment as highlighted by the National Spatial Development Perspective (NSDP). This is evident in the lopsided economic and social costs for poor communities in locations far from employment and other opportunities. The PGDS is a vehicle to address the legacies of the apartheid space economy, to promote sustainable development and to ensure poverty eradication and employment creation.

Government has a mandate to restructure the process of development and service delivery in the province. This is to be achieved through the three spheres of government, the different government sectors and the various strategic frameworks. The key challenges it faces is to effectively align and harmonise these structures towards this end; and to harness and align fiscal, financial and human resources at its disposal towards eradicating poverty, creating employment and laying the foundations for accelerated economic growth.

The PGDS offers a tool through which provincial government can direct and articulate its strategy and similarly for local government to reflect the necessary human, financial and fiscal support it needs to achieve these outcomes. It facilitates proper coordination between different spheres of government and aims to prevent provincial departments from acting out of concert with local municipalities. It enables intergovernmental alignment and guides activities of various role players and agencies (provincial sector departments, parastatals, district and local municipalities). The PGDS will enhance service delivery.

It is a framework for public and private sector investment, indicating areas of opportunities and development priorities. It addresses key issues of implementation blockages whilst providing strategic direction. The PGDS implies a developmental approach to government. This implies a proactive and facilitative approach to development and not one based of formulating and applying regulations and restrictions. The PGDS on the one hand, involves preparing policies, strategies and guidelines and on the other hand, it involves preparing mechanisms to align and facilitate the implementation, monitoring and evaluation of key growth and development priorities.

### **Millennium Development Goals**

Looking to the future, the Municipality believes they can achieve the overarching goal: to put an end to poverty.



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The MDGs represent a global partnership that has grown from the commitments and targets established at the world summits of the 1990s. Responding to the world's main development challenges and to the calls of civil society, the MDGs promote poverty reduction, education, maternal health, gender equality, and aim at combating child mortality, AIDS and other diseases.

Set for this year, the MDGs are an agreed set of goals that can be achieved if all actors work together and do their part. Poor countries have pledged to govern better and invest in their people through health care and education. Rich countries have pledged to support them, through aid, debt relief, and fairer trade.

uMgungundlovu District Municipality, as part of the globalized community, is playing its part in ensuring that it provides the necessary infrastructure to help reduce poverty and hunger. Working together with all the relevant stakeholders the uMgungundlovu Municipality is committed to reaching the target as are the rest of the developing countries.

### **Alignment with Municipal Goals and Objectives**

Residential development is beneficial as it results in employment opportunities during the construction and operational phase, as well as additional property taxes and other revenue for local governments. The income that is generated recycles in the local economy and results in local economic development. The uMngeni Municipality SDF recognises the need to promote security of tenure and the provision of housing for a mixture of housing types in different areas. In this case, the proposed development will provide housing for upper income buyers. The proposed development has the potential to address the housing backlog and will provide access to quality housing for upper income buyers. The proposed development is expected to enhance income generation and employment opportunities and aims to provide an integrated approach to optimal land utilisation and development.

### **Implication / Risk / Impact**

- The proposed development is in line with the goals and objectives of the UMngeni Local Municipality IDP and the above mentioned National Provincial Strategies.
- An application in terms of the Subdivision of Agricultural Land Act 70 of 70 (SPLUMA) was submitted by the planner responsible for this application; and subsequently approved.

### **Mitigation / Recommendations**

- None.

## **5.3 Cultural, Historical and Archaeological Resources**

### **Description**

A Heritage Impact Assessment (HIA) and Phase 1 Palaeontological Impact Assessment (PIA) was undertaken for the proposed development to assess the potential impacts on cultural, heritage and archaeological resources (refer to **Appendix D6**).

### **Implication / Risk / Impact**

- No fossils or archaeological material were observed on site.
- No archaeological material in the form of pottery fragments or stone tools was observed in the shallow banks of the stream and none of the boulders displayed any evidence of fossil material.
- Farming activities have previously taken place on the property and the ground has already been extensively disturbed, so the area is no longer in a pristine, natural state.
- The heritage impact significance of the site is a Finding of No Significant Impact (FONSI) (refer to Table 13 below for the identified heritage resources).
- The small stream, footpath and dam noted on the property exposed sections of the upper soil surface, and this revealed that the upper soil profile comprised of unstratified archaeologically sterile sediment.

- Construction work required for the building of the housing units and other additional structures is unlikely to have a significant impact on heritage resources as nothing was observed during the ground survey.

**Table 13: Identified heritage resources (NHRA status) (Source: Gary Trower).**

<b>Formal protections</b>	
National Heritage site (Section 27)	none
Provincial Heritage site (Section 27)	none
Provisional Protection (Section 29)	none
Place listed in heritage register (Section 30)	none
<b>General protections</b>	
Palaeontological site or material (Section 35)	none

#### **Mitigation / Recommendations**

- Should construction or operational activities expose archaeological, palaeontological or historical remains, old graves or fossil material, activities must cease immediately, pending evaluation by the provincial heritage agency and the “chance find protocol” outlined in the PIA (**Appendix D6**) must be followed. This is in alignment with the South African Heritage Resources Act (SAHRA) (Act 25 of 1999) and the AMAFA Research Institute and Heritage Act (Act 5 of 2018).
- This is to ensure that developments comply with the law, and to ensure that a rare object / fossil stands a good chance of being recorded and / or relocated, before being damaged or destroyed by site activities.

#### **5.4 Surrounding Land Use and Aesthetics**

##### **Description**

The site is located approximately 5 km north of Howick on the Karkloof Road in Howick. The property is commonly referred to as The Old Mushroom Farm and is situated between Howick and Karkloof. The site is surrounded by agricultural land, commercial forestry, and rural tourist facilities. The property is located outside of an approved planning scheme area and is currently zoned as Agricultural land. The Old Mushroom Farm property is located directly next to the Karkloof Market and Le Petite France Café and farm which is to the south of the site. The property is surrounded by agricultural farms, with forestry to the west, north and east. The Amber Valley Retirement Village is located approximately 3.8 km south of the property, towards Howick. Kwawula Game Estate is located approximately 3 km south of the property. The Karkloof Country Club and associated facilities are situated approximately 5.5 km north along the Karkloof Road. The property is located along a secondary tourist route in an area designated as “Agriculture and Medium Intensity Tourism” in the uMngeni Municipality’s SDF. The proposed development site is 21.4330 ha in extent.

##### **Implication / Risk / Impact**

- The proposed land use change will be similar to the surrounding land uses listed above.
- The proposed development involves the conversion of a variety of existing buildings and mushroom tunnels into a conference facility and overnight accommodation and will not alter the sense of place of the immediate area. The proposed new houses will alter the sense of place marginally.
- The aesthetics of the area will be temporarily disturbed during the construction phase.

##### **Mitigation / Recommendation**

- The building designs are to comply with SANS standards.
- Screening is to be utilised where necessary to limit views of construction activities.
- Wherever possible, the proposed development must make use of natural building materials and architectural styles that blend into the surrounding landscape. An architectural code must be compiled for the development.
- The use of highly reflective building materials such as corrugated iron and glass must be minimised where possible.
- Only locally indigenous plant species are to be used for landscaping.
- An Alien Vegetation Control Programme must be implemented.
- The Environmental Management Programme (EMPr) (**Appendix E**) must be implemented.
- Noise and dust impacts must be controlled.
- All lighting must face downwards and inwards.

## 5.5 Traffic, Roads and Access

### Description

The site is accessed directly off the Karkloof Road and is approximately 5 km north of Howick. The entrance to the site will use the existing site access on the P141 / Karkloof Road. The intersection is shared with the neighbouring farm and is located directly opposite another farm entrance across the road.

The main entrance road onto the property will be a hardened road surface (asphalt) and all other internal roads will be unsurfaced, but with a good gravel wearing course to remain a farm style aesthetic. Implementation of dust control may be needed when the throughput of traffic on the property increases.

### Implication / Risk / Impact

- It is anticipated that the proposed layout will generate approximately 46 trips per day.
- In terms of the South African Traffic Impact and Site Traffic Assessment Manual (TMH 16), a Traffic Impact Assessment must be undertaken when “*The highest total additional hourly vehicular trip generation (including pass-by and diverted trips) as a result of the application exceeds 50 trips per hour*”. Therefore, a Traffic Impact Assessment is not required, as the trip generation is less than 50 vehicles per hour.
- The access off the P141 will need to be upgraded to a Type B1 intersection.
- Based on the proposed development, a total of 259 parking bays must be provided.
- The proposed development is expected to generate pedestrian traffic within the main node on the property.

### Mitigation / Recommendation

- Speed limits along the access roads and roads within the property must be adhered to at all times.
- Maintenance of the access and internal roads within the property must be undertaken.
- Vegetation along the access roads must be regularly removed to improve visibility.
- Sidewalks and pedestrian crossings must be implemented in strategic places.
- The proposed development will require a new B1 intersection off the P141, subject to approval from the KZN Department of Transport standards and regulations.

## 5.6 Operational Activities, Noise and Dust

### Description

Construction activities onsite will require the use of heavy machinery for earthworks. The construction phase will generate noise from the use of construction machinery as well as increased traffic from construction vehicles and the resultant generation of dust. There will also be an increase in the number of people in the area due to the presence of construction labourer’s onsite, as well as other potential job seekers. This impact; however, is only temporary, ending with the completion of the construction phase.

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### **Implication / Risk / Impact**

- Potential impacts on surrounding neighbours associated with noise, dust and air quality nuisances.
- There may be an increase in noisy activities during both the construction and operational phases.
- There may be an increase in dusty conditions during the construction phase.
- Noise nuisances may negatively impact surrounding properties surrounding the property if mitigation measures are not adequately implemented.

### **Mitigation / Recommendations**

- Speed limits within the estate must be adhered to at all times.
- Dust suppression measures, such as the spraying of water on bare soil, must be undertaken during dry and windy conditions.
- Dust control can be achieved on the access roads within the property through the application of “Dustex” which is an admixture to the gravel wearing course.
- Machinery and equipment must be maintained and regularly serviced to ensure that unnecessary noise is prevented.
- Workers on site must not create unnecessary noise such as hooting or shouting.
- Speed limits on the access roads and within the property must be adhered to at all times.

## **5.7 Safety and Security**

### **Description**

The construction phase will result in an increase in the number of people in the area due to the presence of construction labourers onsite, as well as other potential job seekers.

### **Implication / Risk / Impact**

- Management of construction labourers is often problematic. Potential exists for labourers to trespass onto adjoining properties.
- Crime in the area could increase during the construction phase, as a result of criminals posing as construction workers, or people seeking employment on the site.
- Crime in the area may also potentially increase during the operational phase, as a result of an influx of people making use of the facilities offered by the development.
- Criminals may target the facilities restaurant.

### **Mitigation / Recommendations**

- Construction labourers should be sourced from surrounding communities.
- All construction labourers must remain within the boundaries of the construction footprint at all times.
- Access onto and off the site during construction must be controlled by a register system. This includes visitors.
- All restricted areas of the property must be designated with appropriate warning signs.
- During the operational phase the facility operators must be responsible for employing a security firm to provide security on the property if deemed necessary.
- The approved EMPr must be strictly enforced. During the construction phase, the activities should be monitored on a monthly basis by an independent Environmental Control Officer (ECO).
- All restricted areas (e.g. conservation area) of the construction site must be designated with appropriate warning signs and hazard tape / orange fencing – where relevant.

## 6 POTENTIAL IMPACTS ON THE BIOPHYSICAL ENVIRONMENT

### 6.1 Topography

#### Description:

From the gently sloping central part of the site, the topography of the site slopes gently to moderately to the east, south and west and more steeply towards the north.

Indicate the general gradient of the site:

Flat	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5
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Indicate the landform(s) that best describes the site:

Ridgeline	Plateau	Side slope of hill/mountain	Closed valley	Open valley	Plain	Undulating plain/low hills	Dune	Sea-front
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Ground Cover:

Natural veld - good condition <sup>E</sup>	Natural veld with scattered aliens <sup>E</sup>	Natural veld with heavy alien infestation <sup>E</sup>	Veld dominated by alien species <sup>E</sup>	Gardens
Sport field	Cultivated land	Paved surface	Building or other structure	Bare soil

#### Implication / Risk / Impact:

- The site is considered suitable for the proposed development of additional housing.

#### Mitigation / Recommendations:

- The Storm Water Management Plan (**Appendix D5**) must incorporate a storm water management system, which must be designed to have minimal impact on the natural drainage areas and/or wetlands. Where possible, storm water must be collected into areas where it can be managed and released efficiently using techniques which will protect and preserve existing natural drainage areas.
- All nearby undisturbed slopes must be protected from erosion by demarcating the construction site. No vehicular or pedestrian access must be allowed beyond the demarcated area.
- Erosion control measures must be implemented along all roads and at storm water outlets which could be a combination of stone pitching, natural rock, vegetation, silt traps, gabion baskets, energy dissipaters and grass lined drains.
- Re-vegetation of exposed soil must take place as soon as possible.

### 6.2 Climate

#### Description:

Mean Annual Precipitation and Mean Annual Temperature in KwaZulu-Natal are illustrated in **Figure 11** and **Figure 12** below. The site receives a mean annual precipitation of 1 000 – 2 000 mm. The mean annual temperature is 16 - 17°C. The study area is characterised by a summer rainfall pattern with sporadic rainfall events in the winter months.

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**Implication / Risk / Impact:**

- Topsoil, which is stockpiled during the construction phase, has the potential to be wind-blown, causing dust.
- The proposed development will transform the existing undeveloped land surrounding the existing buildings and dwellings.
- The transformation of the undeveloped fields to hardened surfaces increases the surface runoff from the transformed areas, and in order to preserve natural drainage areas, the increase of volume has to be attenuated and managed.

**Mitigation / Recommendations:**

- The storm water system must be designed to have minimal impact on the natural drainage areas.
- Storm water must be collected into areas where it can be managed and released efficiently using techniques which will protect and preserve existing natural drainage areas.
- The grass lined swales and attenuation ponds must fit into the landscaping plan as focal points and serve as features for residents.
- The stormwater system must be kept separate from the proposed-on site sanitation system comprising septic tanks, soakaways and evapotranspiration areas which will be situated at the rear side of the site and any contamination of surface runoff must be avoided.
- The geometric design of the internal road network will be along the contours, with crossfalls that direct the run-off into open grass lined side swales and mitre drains into the open grass paddocks.

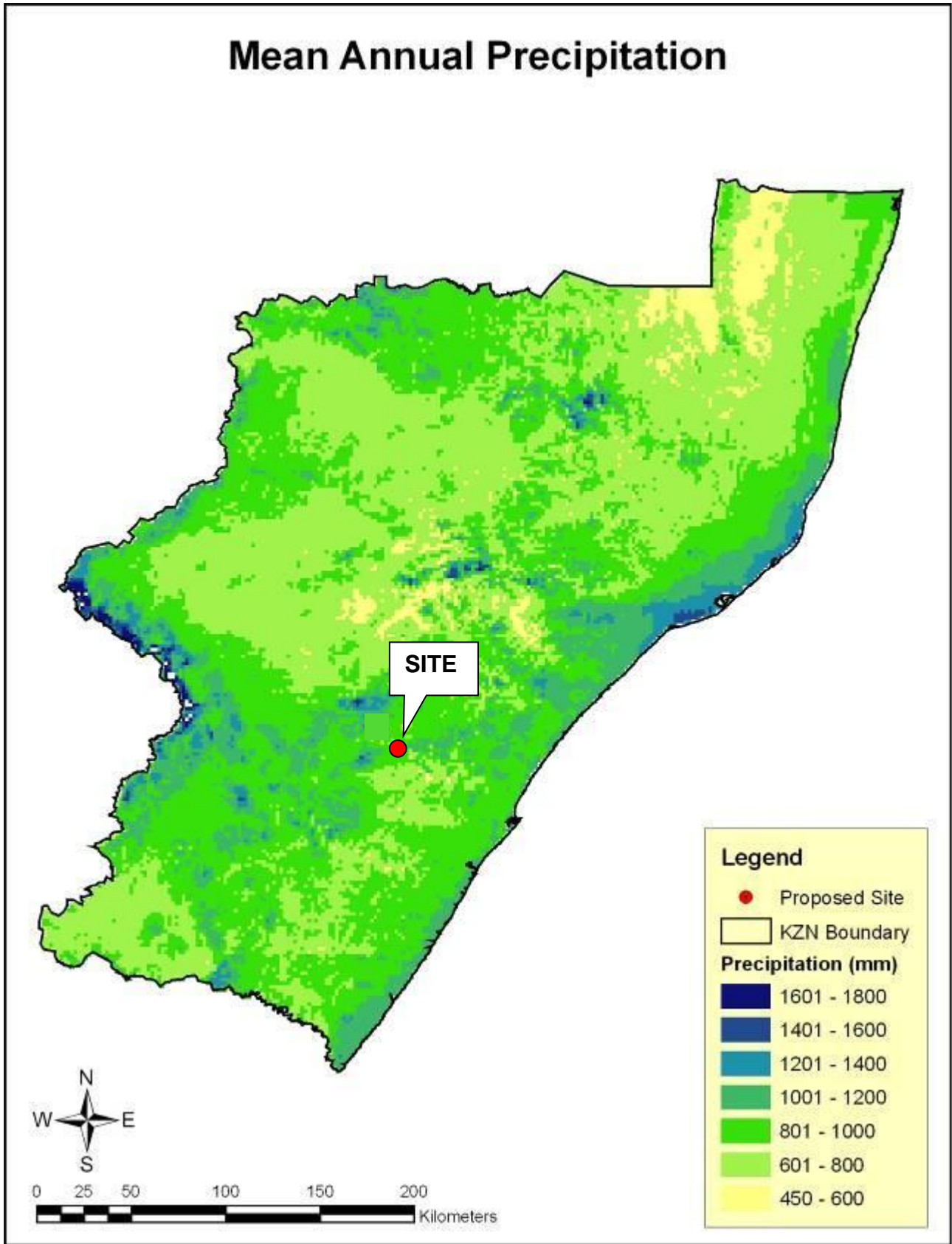


Figure 11: Mean Annual Precipitation for KwaZulu-Natal.

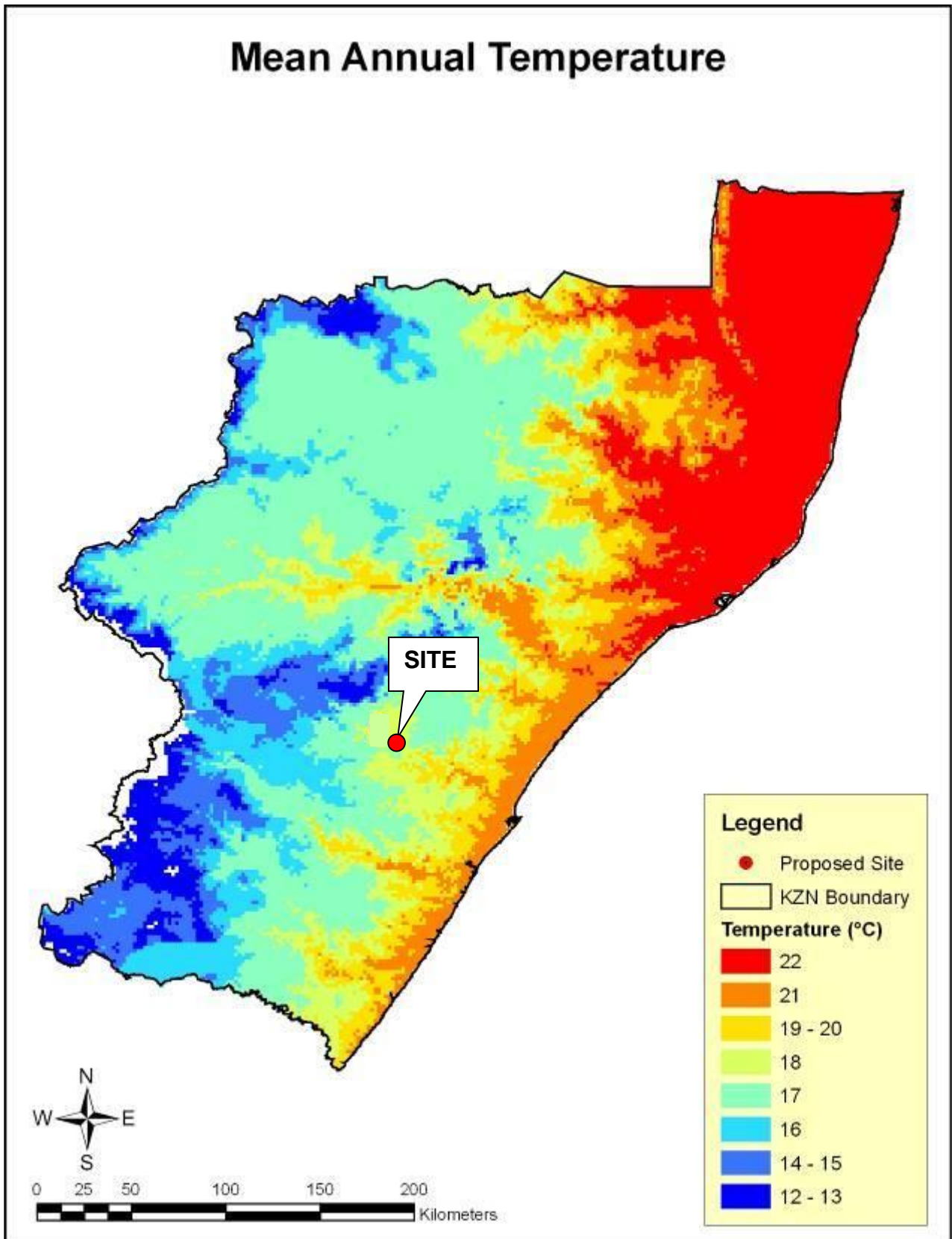


Figure 12: Mean Annual Temperature for KwaZulu-Natal.



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## 6.3 Climate Change

### Description

Developments and other human activities contribute to climate change and are also affected by the phenomenon. Climate change is a global challenge referring to the climatic variations over a long period of time that are affected by abiotic and biotic factors. The climate variations are the distinctive increases in the average temperature of the earth, its main surfaces, air and the ocean.

In South Africa, the effects of climate have become increasingly evident within the last decade. There has been a marked increase in the frequency and severity of heat waves, drought and flood events, and other extreme weather conditions. These natural disasters serve as an additional threat to the water scarcity and high fire danger situations in the country. Furthermore, these conditions contribute to the prevailing social challenges, including access to water and sanitation, food security, health and safety and energy supply.

One of the most influential factors in climate change in developing countries, such as South Africa, is the methods of development within Limits of Acceptable Change (LAC). When developments occur, commodities such as society, material, timeframes and affordability must be considered to bring about sustainability. In order to maintain the balance between the environment, social and economic, impact assessments like this one, act as a tool towards combatting the global challenge of climate change. It is imperative that all developments and activities take cognisance of climate change and responses include adapting to its effects and promoting developments and activities which allow the population to become more resilient to the impacts of climate change.

Having sustainable developments will enhance our growth towards having a net zero carbon emission by the 2050 deadline, which directly feeds into the decrease in Carbon Dioxide emissions and simultaneously global warming. The objective is that climate change must be relevant to Environmental Authorisation Processes when developments and activities will:

- Result in the direct or indirect release, or absorption of Green House Gas (GHG) emissions;
- Have impacts on ecological infrastructure;
- Be impacted by future climate change implications; and
- Increase or decrease vulnerabilities faced.

Although climate change may not always be relevant for all Environmental Authorisation Processes, the scope of work and mitigation measures that are implemented to reduce the carbon footprint and Green House Gas (GHG) emissions can have significant value as actions for climate change resilience. As such, there are several aspects that need to be considered for developments and activities to reduce vulnerability for future Environmental Authorisation Processes, namely:

- Impacts associated with agricultural activities;
- Impacts associated with urban developments and heat islands;
- Impacts associated with carbon tax, carbon border adjustments and fossil fuels;
- Operation of developments and activities during drought conditions may further exacerbate climate change issues;
- Impacts associated with reliance on energy intense and fossil fuel-dependent transport; and
- Impacts associated with household energy intensity.

To appropriately respond to climate change, all developments and activities must also consider the following:

### Policies and Strategies

#### *The Western Cape Climate Change Response Strategy (February 2014)*

The Western Cape Climate Change Response Strategy (WCCRS) came about due to the Western Cape Government's recognition of the urgency to reduce Greenhouse Gas (GHG) emissions and adapt to global climate change. Climate change is seen to be entering into an unprecedented period whereby there has

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been an increase in temperatures by 0.65 °C over the last 50 years. This increase in temperature is likely to have increased risks on environments, especially those along the coastal belt regions. Due to this, new opportunities to mitigating and adapting to these impacts need to be explored.

The WCCRS is thus directed towards climate change actions and issues where its main vision is to achieve climate change resilience and a net-zero GHG emission status within the Western Cape by 2050. It was established as a need to make better decision-based building strategies that focus on an equitable and inclusive economy and society. These strategies are needed to assist society to thrive despite stresses posed by climate change. Several guiding objectives are used to give structure to the overall vision of the WCCRS, namely:

- Responding to the climate change emergency;
- Ensuring that the transition of a climate response strategy in an equitable and inclusive manner;
- Development of a GHG emission inventory;
- Achieve net-zero GHS emissions by 2050;
- Reduce climate change risks an increase resilience; and
- Enable an equitable transition through cooperation with the public sector, private sector and civil society.

The WCCRS aims to better address climate change mitigation and adaption within the Western Cape. It takes a two-pronged approach to addressing climate change:

- Mitigation: To contribute towards national and global efforts to significantly reduce GHG emissions and build a sustainable low carbon economy, which addresses the need for economic growth, job creation and improving socio-economic conditions; and
- Adaption: To reduce climate change vulnerability and develop the adaptive capacity of the Western Cape's economy, its people, ecosystem and critical infrastructure in a way that addresses socio-economic and environmental goals.

### ***South African Climate Change Bill (2021)***

The main objective of the South African Climate Change Bill is to enable the development of an effective climate change response in the long-term and to transition to a low-carbon and climate-resilient economy and society for South Africa, in the context of sustainable development; and to provide for matters connected therewith. The purpose of the bill is to craft and implement an effective national climate change response, including mitigation and adaptation actions, that represents the republics fair contribution to the global climate change response.

Schedule 3 of the climate change bill (Interim National Greenhouse gas emissions trajectory) states that the republics greenhouse gas emissions will:

- Peak in the period 2020 to 2025.
- Plateau for up to 10 years after the peak.
- From 2036 onwards, decline in absolute terms by 2050.

### ***National Climate Change Response White Paper (2012)***

Climate change is already a measurable reality and along with other developing countries, South Africa is especially vulnerable to its impacts. This White Paper presents the South African Government's vision to build the climate resilience of the country, its economy and its people and manage the transition to a climate-resilient, equitable and internationally competitive lower-carbon economy and society in a manner that simultaneously addresses South Africa's over-riding national priorities for sustainable development, job creation, improved public and environmental health, poverty eradication, and social equality.

South Africa's response to climate change has two objectives:

- Effectively manage inevitable climate change impacts through interventions that build and sustain South Africa's social, economic and environmental resilience and emergency response capacity.

- 
- Make a fair contribution to the global effort to stabilise greenhouse gas (GHG) concentrations in the atmosphere at a level that avoids dangerous anthropogenic interference with the climate system within a timeframe that enables economic, social and environmental development to proceed in a sustainable manner.

The achievement of South Africa's climate change response objective is guided by the principles set out in the Constitution, the Bill of Rights, the National Environmental Management Act (NEMA), the MDGs and the UNFCCC.

The principles include, amongst others:

- **Common but differentiated responsibilities and respective capabilities** – aligning our domestic measures to reduce the country's GHG emissions and adapt to the adverse effects of climate change with our unique national circumstances, stage of development and capacity to act.
- **Equity** – ensuring a fair allocation of effort, cost and benefits in the context of the need to address disproportionate vulnerabilities, responsibilities, capabilities, disparities and inequalities.
- **Special needs and circumstances** – considering the special needs and circumstances of localities and people that are particularly vulnerable to the adverse effects of climate change, including vulnerable groups such as women, and especially poor and/or rural women; children, especially infants and child headed families; the aged; the sick; and the physically challenged.
- **Uplifting the poor and vulnerable** – climate change policies and measures should address the needs of the poor and vulnerable and ensure human dignity, whilst endeavouring to attain environmental, social and economic sustainability.
- **Intra- and Inter-generational sustainability** – managing our ecological, social and economic resources and capital responsibly for current and future generations.
- **The Precautionary Principle** – applying a risk-averse and cautious approach, which considers the limits of current knowledge about the consequences of decisions and actions.
- **The Polluter Pays Principle** – those responsible for harming the environment paying the costs of remedying pollution and environmental degradation and supporting any consequent adaptive response that may be required.
- **Informed participation** – enhancing public awareness and understanding of climate change causes and impacts to promote participation and action at all levels.
- **Economic, social and ecological pillars of sustainable development** – recognising that a robust and sustainable economy and a healthy society depends on the services that well-functioning ecosystems provide, and that enhancing the sustainability of the economic, social and ecological services is an integral component of an effective and efficient climate change response.

### ***National Climate Change Adaptation Strategy (October 2017)***

Climate change is intricately linked to almost all facets of our society, particularly socio-economic progression as resources such as water, feedstock in form on food, fibre, biodiversity, amongst others determine the production potential of many sectors of the economy, which in turn affect human development aspirations of the country. For South Africa, the observed rate of warming has been 2 °C per century or even higher - more than twice the global rate of temperature increases for the western parts and the northeast. However, the recorded trends in annual average and seasonal rainfall totals are largely statistically insignificant, even though the distribution may be changing. There is evidence that extreme weather events in South Africa are increasing, with heat wave conditions found to be more likely, dry spell durations lengthening slightly and rainfall intensity increasing. The associated impacts primarily have a bearing on economic and social aspects of our development. The National Adaptation strategy acts as a common reference point for climate change adaptation efforts in South Africa, and it provides a platform upon which national climate change adaptation objectives for the country can be articulated so as to provide overarching guidance to all sectors of the economy. The strategy help gauge the degree to which development initiatives at different levels of government and business integrate and reflect critical climate change adaptation, as such guides stronger coherence and coordination on climate change adaptation

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activities between different institutions and levels of government, particularly with regards to planning, implementation and reporting, as such provide inputs to the country's legal framework for adaptation. The strategy is the main vehicle for South Africa in meeting its international obligations under the UNFCCC as contained in the country's adaptation component of the Nationally Determined Contribution.

The South African economy is dependent on primary sectors such as agriculture, particularly mineral extractives which are natural resource dependent, and energy intensive, with the energy generation being very important as it is also subject to climate variability and change. The country seeks to transition the economy into industrial and service sectors, which are crucial to job creation and reducing inequality as they benefit better from economies of scale. The relationship of such industrial opportunities, with climate-dependent resources, needs to be considered and integrated in development planning, as the resources define the production possibilities for the economy as a whole.

***Integration of Climate Change Risk & Vulnerability Assessment into Environmental Impact Assessment Interim Policy Guideline (2022)***

The requirement for climate change risk & vulnerability considerations to be integral to environmental decision making is highlighted as being both critical and necessary in Section 24 of the Constitution; the relevant environmental legislation; and case law. Climate change impacts, mitigation and adaptation are relevant considerations in environmental and development decision making. This Interim Policy Guideline aims to promote and ensure the inclusion of climate change related impacts considerations into Environmental Authorisation processes.

**Implication / Risk / Impact**

- The proposed development may contribute to climate change to a minor extent through energy usage, water usage and waste generation during the construction and operational phases.
- The proposed development is not likely to be largely directly impacted by climate change as it is removed from coastal areas, watercourses and flood line areas and is not impacted by temperature changes.
- The proposed development may be indirectly affected by climate change where infrastructure traverses or is located in close proximity to watercourses.

**Mitigation / Recommendations**

- All development infrastructure must promote the efficient use of energy, water and limit wastage of resources.
- Waste generation must be minimised and waste must be managed in an environmentally responsible manner and in accordance with the waste management hierarchy. The EMP (Appendix E) outlines specific waste management mitigation measures which comply with the waste management hierarchy.
- The proposed development must be implemented in accordance with approved layout plans which have been planned and assessed to ensure that locations and layouts of least environmental impact and risk are utilised.
- The proposed development must ensure the protection of on-site environmental features which thereby protects ecological infrastructure important for building climate change resilience.

## 6.4 Geology and Soils

### Description

A Geotechnical Assessment (**Appendix D3**) was undertaken and concluded that the site encounters variable shallow soil horizons comprising topsoil, fill, colluvial (transported) and residual soils, overlying interlayered weathered shales of the Volkrust Formation of the Ecca Group. No shale bedrock was encountered, neither as outcrop nor within the shallow pits excavated in for the percolation tests. No groundwater was encountered on the site.

The fieldwork for the investigation comprised the following:

- Seven Percolation Tests (PT) (**Figure 13**).

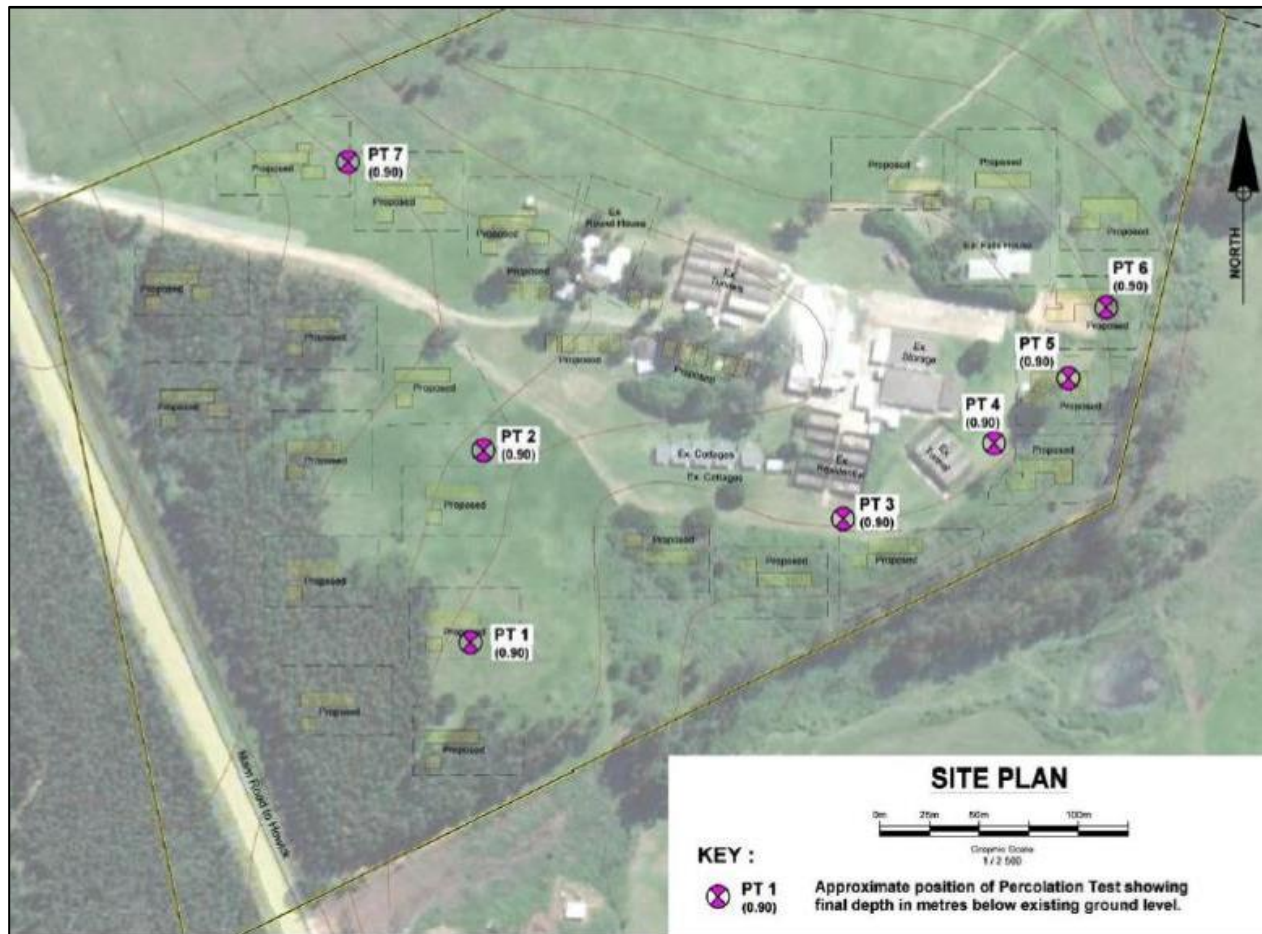


Figure 13: Location of the Percolation Tests (Source: Gondwana Geo Solutions).

### Implication / Risk / Impact

- The area within where the site falls is classified as a Minor Aquifer within a broader area of moderate yield potential of variable water quality and therefore is not considered to be part of an important groundwater supply aquifer on which this area is dependent on for general water supply.
- The site is naturally well draining towards the well-developed drainage lines. It can be expected that groundwater seepage will occur at the interface between the transported soils and the residual soils and/or bedrock, particularly during or after period of heavy rainfall, particularly along the defined valley lines.
- Both colluvial and residual soils will be suitable for use only as general fill for earthworks and common backfill for excavations or trenches, and landscaping purposes.
- It can be expected that during rainy periods these subgrade soils will become soft and boggy and impassable to traffic.

- Percolation test results indicate that the site is generally suitable for the use of septic tank soakaway systems, with the majority of test results showing that the insitu soils have relatively good percolation characteristics.
- The site has variable percolation rates, in the range of 36 to 312 mm/hour. It can be concluded that the majority of the site i.e. the area represented by the results of PT1 through PT6 is suitable for the disposal of wastewater and sewage effluent via normal subsoil percolation. i.e. conventional septic tank soakaway systems.
- Geotechnically, the site is generally suitable for the proposed development of additional housing. There are no fatal flaws from a geotechnical perspective which may significantly curtail or impact on the development of the site.

### **Mitigation / Recommendations**

- The excavation of all material must be at least 1.5 m deep will generally require Soft Excavation.
- All temporary excavations to a maximum depth of 1.50 m should be created with a batter slope not steeper than 1V:1.5H. Excavations deeper than this, or which are steeper sided, should be shored. Wet weather or groundwater seepage may cause stability problems and it will be important to review the temporary support requirements by carrying out daily inspections.
- It is recommended that site specific geotechnical investigations be carried out for new houses or development node areas to confirm founding conditions and suitability of septic tank soakaway systems.
- Given the large variability in results observed, a conservative value of application of effluent of 60 l/m<sup>2</sup>/day is recommended for design.
- In the area where poor percolation test results were recorded (TP7), septic tank-soakaway systems should not be entertained. Similar, localised areas with poor percolation rates are likely to be encountered elsewhere and it is recommended that additional percolation tests be done to verify areas designated for evapotranspiration.

## **6.5 Surface Water**

### **Description**

A Storm Water Management Plan (**Appendix D5**) was compiled for the proposed development. There are currently no stormwater attenuation measures in place, however, the existing buildings are equipped with rainwater downpipes which either discharge into rainwater harvesting tanks or onto roadways and/or parking areas from where the stormwater flows naturally to low points on site, through overland sheet flow.

The proposed storm water system must be designed to have minimal impact on the natural drainage areas. Where possible, storm water must be collected into areas where it can be managed and released efficiently using techniques which will protect and preserve existing natural drainage areas.

The objective of a storm water management plan are to manage storm water resources of the collective watersheds to:

- Prevent flood damage or concentration of run-off.
- Divert storm water and surface run-off from buildings, roads and parking areas into mitre drains, swales and attenuation ponds.
- Protect and ensure the functionality of the wetlands and dams.
- Preserve the natural and beneficial functions of the two natural drainage systems.
- Preserve and enhance storm water quality.
- Attenuate the difference between pre and post development flows.

### **Implication / Risk / Impact**

- Erosion may occur if stormwater measures are not in place to prevent such.
- If attenuation is not undertaken for the higher volumes of runoff from hardened surfaces, the site may become flooded.

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## Mitigation / Recommendations

- The storm water system must be monitored during construction at regular intervals.
- Rainwater harvesting must be implemented for the development.
- The operation and maintenance of the storm water system is essential to ensure it functions optimally to prevent damages or failures and must receive high priority from the development maintenance department.
- The storm water system must be kept separate from the sewerage system.
- All chemicals, cement, fuel and other hazardous material used during construction should be stored in controlled areas.
- Concentration of storm water must be prevented where possible, but energy dissipaters should be provided in areas of concentration.
- On completion of the construction of buildings, roads and parking areas, all remaining exposed embankments and open areas must be vegetated as soon as possible, including the use of 'Soilsaver' where necessary.
- The attenuation ponds must have some form of a silt trap mechanism.
- During the construction phase, the ECO must monitor the following:
  - Temporary berms and cut-off drains must be provided on site to collect run-off, especially until the attenuation ponds are complete and functional.
  - Silt screens must be provided at the grid inlets / splayed construction during road construction.
  - Topsoil must be conserved on site and prevented from entering the stormwater system.
  - Exposed embankments, cut/fill slopes and open areas must be vegetated as soon as possible to reduce runoff.
  - Dust control during construction must be applied at all times.
  - Excess spoil material from topsoil or bulk earthworks must be placed in areas or even removed entirely off site to minimise silt deposition, scouring and soil erosion.
  - Post construction, all exposed areas must be covered in vegetation, grass or landscaped.

## 6.6 Ground Water

### Description

According to the Geotechnical Assessment (**Appendix D3**), the site is naturally well draining towards the well-developed drainage lines. No ground water was observed; however, it can be expected that groundwater seepage will occur at the interface between the transported soils and the residual soils and / or bedrock, particularly during or after periods of heavy rainfall, particularly along the defined valley lines.

The Applicant has a borehole on the property. A Borehole Step Test and Constant Discharge and Recovery test was conducted (**Appendix G2**). The steps were conducted to determine a base line test. Water samples of the ground water was sent to Talbot Laboratory for testing to determine whether the water is at an acceptable drinking level quality (**Appendix G3**). Refer to **Appendix G4** for the summary report of the borehole data.

### Implication / Risk / Impact

- The borehole was pumped at a rate of 4 500 l/ph for 24 hours. The water level dropped to a level of 35.71 mbgl.
- The borehole has a depth of 60.53 m and an available draw down of 44 m, which is acceptable to authenticate a daily abstraction of 99 kL per 24-hour period.
- The water quality sample results all came back within the SANS 241-2015 parameters, except for a microbial bacteria.

### Mitigation / Recommendations

- The water must be disinfected with a mild disinfectant to be suitable for human consumption.

- The site-specific storm water management plan (**Appendix D5**) must be implemented.
- The water quality will meet the standards of SANS 241-2015.

## 6.7 Wetlands

### Description

A Wetland Impact Assessment (**Appendix D2**) was conducted on site. Wetlands were identified along the valley floor traversing the site. Due to the said activities and general disturbance occurring on site, some impacts have been imparted on the wetlands which has resulted in changes in the freshwater ecosystems hydrogeomorphic functioning and extent.

A total of thirty (30) hydrogeomorphic (HGM) Units were identified and within 500 m of the site boundaries (refer to **Figure 14** below). The following is noted regarding the identified HGM Units:

- Four (4) wetlands (**HGM Units 1 – 4**) were identified on site or intersected by the site boundaries. HGM Units 1 – 4 will not be impacted due to the wetlands being situated over 90 m away from the proposed activities and deemed to be isolated systems (**Table 14**).
- Twenty-six (26) wetlands (**HGM Units 5 – 30**) have been identified to exist outside the site boundaries but within the 500 m buffer of the site. These wetlands will not be impacted by the proposed site activities due to these systems either being isolated, hydrologically disjunct or will not be impacted upon.

**Table 14: HGM Units identified on-site with reference to each wetland HGM type (Source: Kinvig & Associates).**

HGM Unit	Hydrogeomorphic Type	Natural / Artificial	Area (ha)
1	Depression (Dam)	Artificial	0.264
2	Seep	Natural	0.138
3	Channeled Valley-Bottom	Natural (modified)	0.485
4	Seep	Natural (modified)	0.196
5	Depression (Dam)	Artificial	1.711
6	Depression (Dam)	Artificial	0.989
7	Depression (Dam)	Artificial	0.235
8	Seep	Natural (modified)	0.225
9	Channeled Valley-Bottom	Natural	0.997
10	Un-channeled Valley-Bottom	Natural	1.190
11	Seep	Natural	0.361
12	Seep	Natural	0.453
13	Seep	Natural	0.250
14	Un-channeled Valley-Bottom	Natural	2.231
15	Seep	Artificial	0.339
16	Seep	Natural	0.586
17	Seep	Natural	0.438
18	Seep	Natural	0.130
19	Depression (Dam)	Artificial	0.810
20	Seep	Natural	0.214
21	Seep	Natural	0.241
22	Seep	Natural (modified)	0.146
23	Seep	Natural	0.345
24	Seep	Natural	0.255
25	Seep	Natural	0.188
26	Un-channeled Valley-Bottom	Natural	0.472
27	Depression (Dam)	Artificial	1.024
28	Un-channeled Valley-Bottom	Natural	1.889
29	Depression (Dam)	Artificial	2.044
30	Depression (Dam)	Artificial	0.178



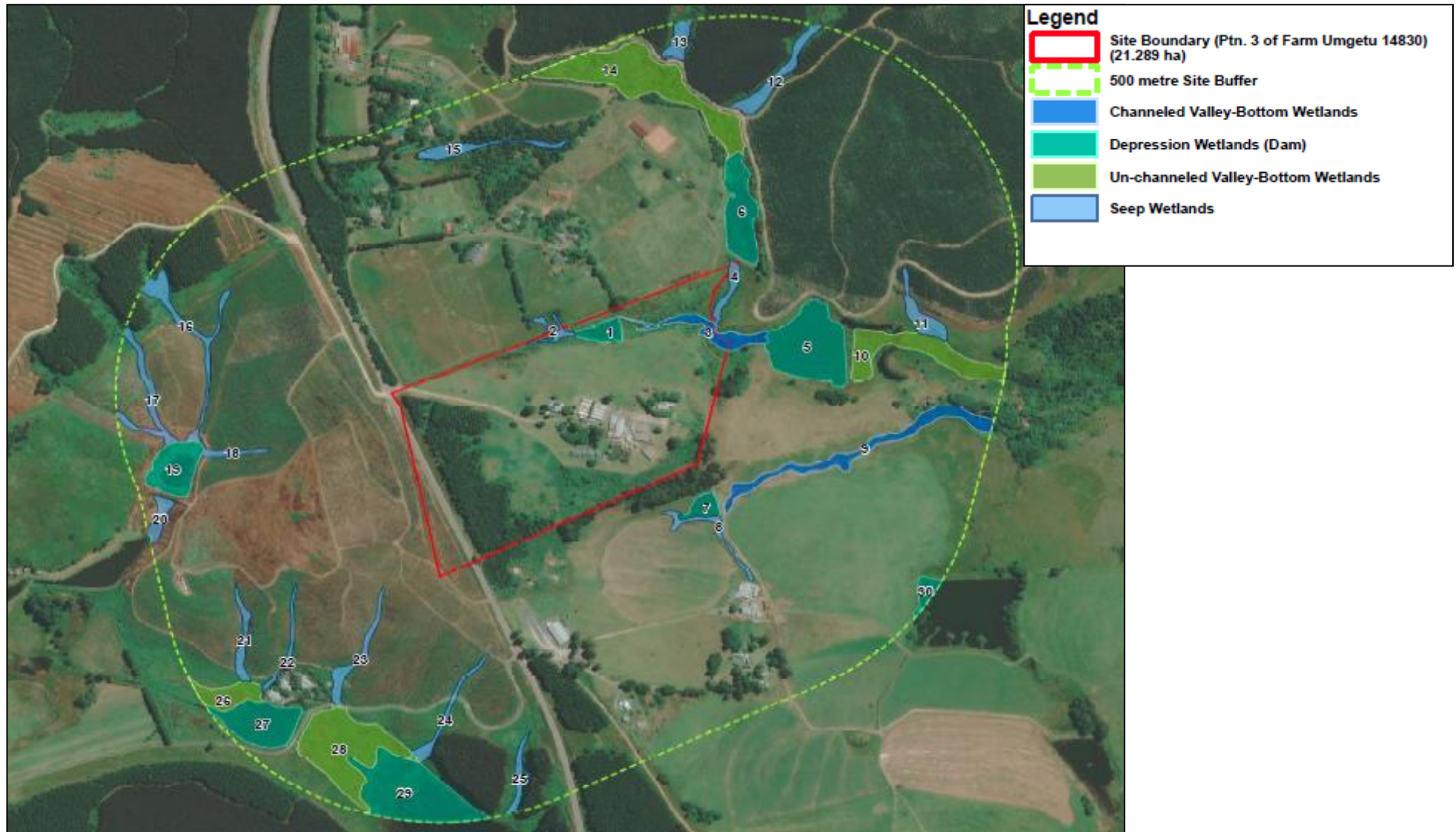


Figure 14: Wetland delineation of the site (Source: Kinvig & Associates).

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The **HGM Unit 1 – 4** have progressively become prominent features on site and in most cases, woodier and potential areas of increased biodiversity (currently low biodiversity) due to the current management of said systems on site. **HGM Units 1 – 4** have been valued for their contribution to the site activities and has been noted to be rehabilitated in the near future. All the wetlands on site are afforded a large, vegetated buffer.

- **HGM Unit 1**, being artificial dam, has been classified as a depression wetland to ensure its integrity and functionality can be assessed. The wetlands catchment is small where the main hydrological inputs are received via **HGM Unit 2** (spring fed). Additionally, stormwater run-off and groundwater recharge from the adjacent and surrounding slopes contributes to additional hydrological input. The wetland does consist of an open body of water that is frequented by aquatic bird life and is visually appealing to some degree as it forms part of the sites walking trail. The dam does have a marked abundance of alien invasive vegetation that includes *Rubus cuneifolius*, *Solanum mauritianum*, *Acacia mearnsii*, *Eucalyptus sp.* and *Cirsium vulgare*. The dam does require some rehabilitation due to impacts from livestock and incasement of the spillway.
- **HGM Unit 2**, being a seep wetland with channelled outflow, is situated in the valley floor area of the site and above **HGM Unit 1**. The wetland receives a majority of hydrological flows from two springs and seepage from the surrounding slopes and valley line via stormwater run-off. The wetland is an important system for hydrological input down through to other wetlands along the valley floor. Some scrub *Acacia mearnsii* and *Eucalyptus sp.* still reside within the wetland; however, clearing of *Rubus cuneifolius* and *Solanum mauritianum* has occurred recently.
- **HGM Unit 3**, a channelled valley bottom, is situated along the valley floor below **HGM Unit 2**. The wetland, historically, was larger in extent prior to the inception of **HGM Unit 2**. The wetland is currently intersected by a trail and access paths (historical access paths for cultivation pursuits) to areas outside the site. The wetland has had a drain inserted to ensure continued access to the trail and path that has resulted in a small draining effect on a portion of the wetland. This wetland does require some rehabilitation to ensure that the trails, and access to, remains. It is an important wetland along the valley floor area due to its connectivity to other downstream wetlands. The wetland does have an abundance of alien invasive plants that include and not limited to *Rubus cuneifolius*, *Solanum mauritianum*, *Acacia mearnsii*, *Eucalyptus sp.*, *Cirsium vulgare*, *Lantana camara*, *Verbena bonariensis* and *Cannabis sativa*.
- **HGM Unit 4**, being a seep wetland with channelled outflow, is situated below **HGM Unit 5** (dam) and cumulates into **HGM Unit 3**. This wetland does have a small depression area where a pumpstation (outside the site boundary) has been established for water extraction purposes of the site. The wetland is well vegetated with large stands of *Cyperus dives* and *Typha capensis*.

#### Implication / Risk / Impact

- The present ecological state (PES) HGM Units 1 and 2 are found to be **moderately modified (Category C)**. This translates into a moderate change in ecosystem processes and loss of natural habitats has taken place, although the natural habitat remains predominantly intact.
- The PES for HGM Units 3 and 4 are found to be **largely modified (Category D)**. This translates into a large change in ecosystem processes and loss of natural habitat and biota and has occurred.
- HGM Units 1 – 4 scored a **Class D (Low)** in terms of Ecological Importance and Sensitivity. These wetlands are not considered to be ecologically important and sensitive at any scale. The biodiversity of these wetlands is not usually sensitive to flow and habitat modifications. Although the wetlands do play a slight role in managing the quantity and quality of water onsite to some degree.
- The proposed site activities will not result in any impact to the wetlands identified.

#### Mitigation / Recommendations

- A standard thirty-two (32 m) metre buffer has been applied to the HGM Units identified on site. As the proposed activities do not impact the wetlands on site, a 32 m buffer has been applied to illustrate that no activities in terms of the Basic Assessment Process will intersect the 32 m wetland buffer zone (**Figure 15**).

- 
- The following is recommended be undertaken during the Water Use License Application (WULA) phase of the site:
    1. A wetland rehabilitation assessment be conducted to ensure the current identified impacts being imparted onto the wetlands are mitigated and the overall integrity and functionality of the wetlands is improved. This is an important component that is advised for all natural areas used for tourism or for the enjoyment of patrons. Additionally, it is a prerequisite for any proposed or current water uses occurring on site. The rehab plan should include, although not limited to:
      - a. Alien Invasive Plant Management Plan;
      - b. Maintenance Management Plan for **HGM Unit 1**;
      - c. Rectification of the drain inserted on **HGM Unit 3**;
      - d. Trial crossing solutions; and
      - e. Exclusionary measures for livestock.
    2. Recreational Management Plan (maintenance of recreational features such as trails, viewing points, wooden crossings, etc., that occur within the wetlands and associated buffers).

From an overarching perspective, the proposed site activities will not result in a consummate decline of **HGM Units 1 - 4** on site or pose a large threat to such features; however, the recommendations in this report should be considered should the development pursue a WULA. Should the layout change, this report and findings will need to be amended accordingly.



Figure 15: Wetland delineation and proposed site activities (Source: Kinvig & Associates).

## 6.8 Biodiversity

### Description

A Biodiversity Assessment was conducted for the proposed development (Appendix D1). The site does not intercept any Critical Biodiversity Areas (CBA) or Ecologically Sensitive Areas on the property. The vegetation type on the property is the Midlands Mistbelt Grassland.

### Implication / Risk / Impact

- The site is highly modified with infrastructure, pastures, alien plantations and cultivated land.
- Plants identified outside of the built infrastructure indicated significant disturbance of land across the property, with no remnants of Midlands Mistbelt Grassland.
- A few vegetation types were identified on site which consisted of alien tree plantation, pastures, cultivated land and wetland vegetation and a dam (refer to **Figure 16** below).
- The highly modified built environment and historical agricultural activities have made it unlikely that species of conservation concern could be supported on the property.
- The Screening Tool sensitivity indicated that a large proportion of the site as having High Sensitivity for Animal Species.
- Evidence of the Common Molerat, Large Grey Mongoose, Water Mongoose, Common Reedbuck, Scrub Hare, Wetland Rodents and Grassland Mice were seen or likely to occur on the property.

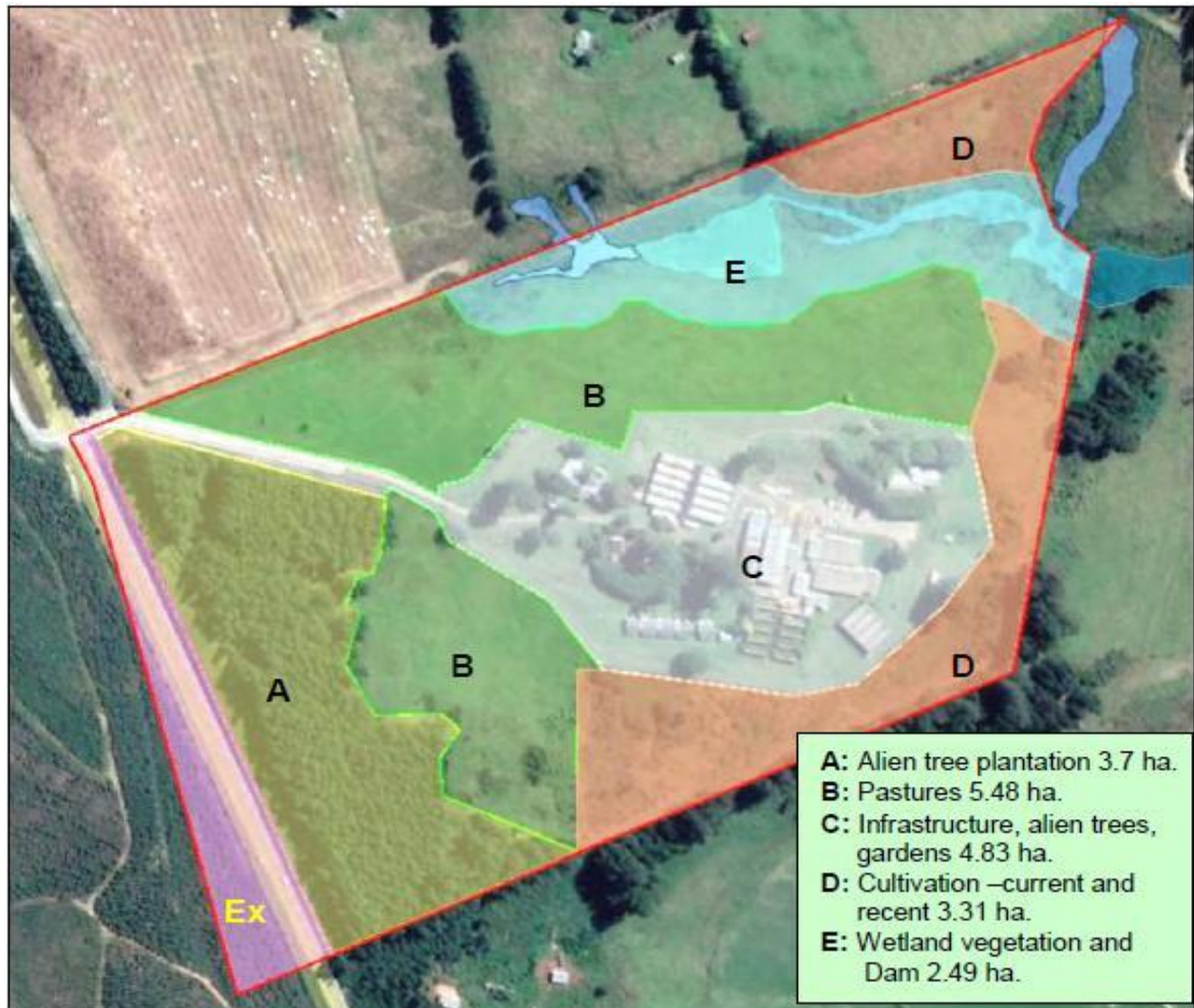


Figure 16: Vegetation types identified on site (Source: Peter le Roux).

- 
- **Area A:** Severely modified as a result of alien timber trees creating a sterile environment; no indigenous vegetation present.
  - **Area B:** Poor ecological condition, being a grass pasture dominated by Kikuyu and a few indigenous pasture species; no indigenous vegetation was present.
  - **Area C:** Poor ecological condition, with parts irreversibly modified and others severely modified; no indigenous vegetation was present.
  - **Area D:** Poor ecological condition, with existing or recent cultivation; some areas severely modified with ruderal weeds dominating; no indigenous vegetation.
  - **Area E:** Fair ecological condition, being a functional wetland with a dam and strong streamflow. Many alien plants occurred within the wetland.

#### **Mitigation / Recommendations**

- The Screening Tool Report identified the Plant Sensitivity for the site as '*Medium*'. However, the Biodiversity Specialist has recommended that this be categorised as '*Low*'.
- The wetland constraints identified by the Wetland Specialist must have a 32 m buffer applied, thus a total of 2.49 ha must be excluded from the development footprint.
- The proposed development layout does not encroach on the wetland or buffer area.
- With the highly modified site conditions and absence of suitable habitats, a site sensitivity ranking of '*Low*' would be more appropriate.
- Faunal diversity on the property was categorised as Low and does not support the status of High Sensitivity for Animal Species over the property.
- The importance of the wetland, although a small area, needs to be recognised and appropriate measures for its long-term protection need to be addressed in the EMPr (**Appendix E**).

## 7 SPECIALIST STUDIES: KEY FINDINGS AND RECOMMENDATIONS

The following specialist studies were undertaken for the proposed development as part of the Basic Assessment Process:

- Biodiversity Assessment
- Wetland Assessment
- Geotechnical Assessment
- Engineering Report
- Storm Water Management Plan
- Heritage Impact Assessment & Phase 1 Palaeontological Impact Assessment

### 7.1 Biodiversity Assessment

A Biodiversity Assessment was undertaken by Peter le Roux. The Biodiversity Assessment is attached at **Appendix D1**.

#### Key Findings

- The site is highly modified with infrastructure, pastures, alien plantations and cultivated land.
- Plants identified outside of the built infrastructure indicated significant disturbance of land across the property, with no remnants of Midlands Mistbelt Grassland.
- A few vegetation types were identified on site which consisted of alien tree plantation, pastures, cultivated land and wetland vegetation and a dam (refer to **Figure 17** below).
- The highly modified built environment and historical agricultural activities have made it unlikely that species of conservation concern could be supported on the property.
- The Screening Tool sensitivity indicated that a large proportion of the site as having High Sensitivity for Animal Species.
- Evidence of the Common Mole Rat, Large Grey Mongoose, Water Mongoose, Common Reedbuck, Scrub Hare, wetland rodents and grassland mice were seen or likely to occur on the property.

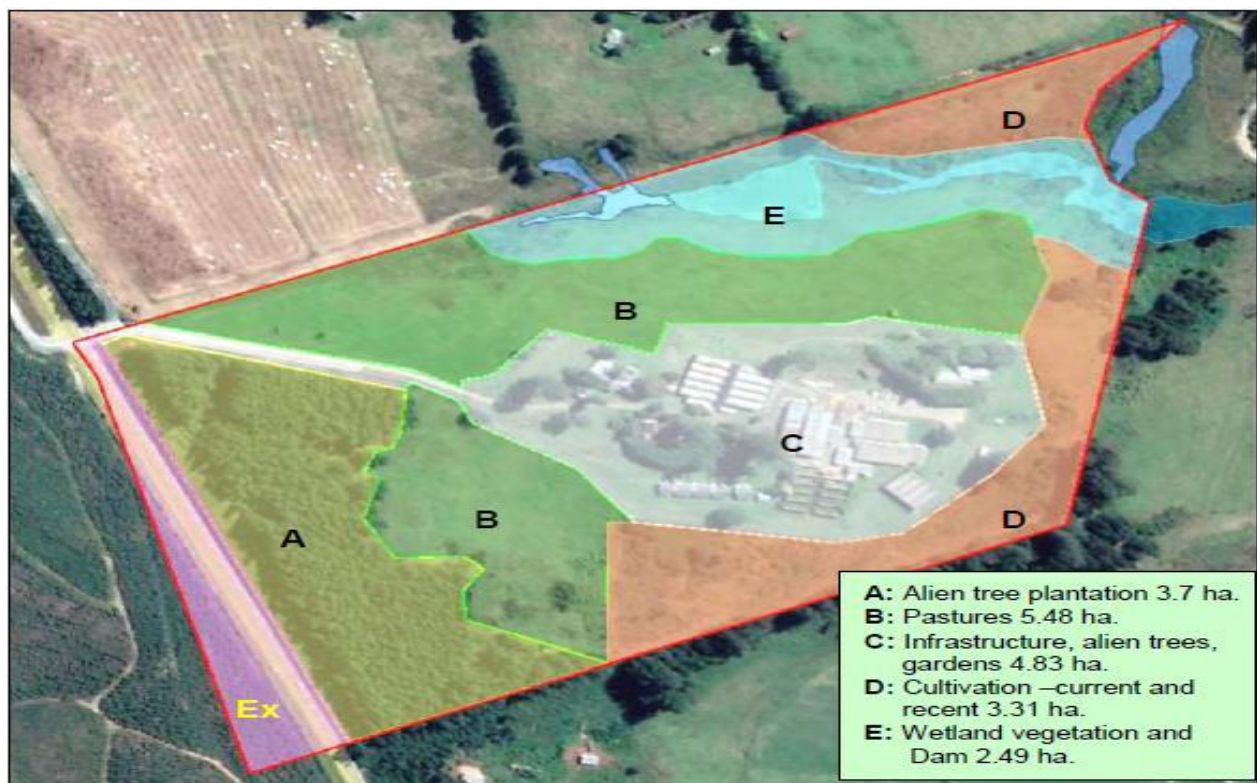


Figure 17: Vegetation types identified on site (Source: Peter le Roux).

- **Area A:** Severely modified as a result of alien timber trees creating a sterile environment; no indigenous vegetation present.
- **Area B:** Poor ecological condition, being a grass pasture dominated by Kikuyu and a few indigenous pasture species; no indigenous vegetation was present.
- **Area C:** Poor ecological condition, with parts irreversibly modified and others severely modified; no indigenous vegetation was present.
- **Area D:** Poor ecological condition, with existing or recent cultivation; some areas severely modified with ruderal weeds dominating; no indigenous vegetation.
- **Area E:** Fair ecological condition, being a functional wetland with a dam and strong streamflow. Many alien plants occurred within the wetland.

### Mitigation / Recommendations

- The Screening Tool Report identified the Plant Sensitivity for the site as 'Medium'. However, the Biodiversity Specialist has recommended that this be categorised as 'Low'.
- The wetland constraints identified by the Wetland Specialist must have a 32 m buffer applied, thus a total of 2.49 ha must be excluded from the development footprint.
- The proposed development layout does not encroach on the wetland or buffer area.
- With the highly modified site conditions and absence of suitable habitats, a site sensitivity ranking of 'Low' would be more appropriate.
- Faunal diversity on the property was categorised as Low and does not support the status of High Sensitivity for Animal Species over the property.
- The importance of the wetland, although a small area, needs to be recognised and appropriate measures for its long-term protection need to be addressed in the EMPr (**Appendix E**).

### 7.2 Wetland Assessment

A Wetland Assessment was undertaken by Kinvig & Associates. The Wetland Assessment is attached at **Appendix D2**.

### Key Findings

A total of thirty (30) hydrogeomorphic (HGM) Units were identified and within 500 m of the site boundaries. The following is noted regarding the identified HGM Units:

- Four (4) wetlands (**HGM Units 1 – 4**) were identified on site or intersected by the site boundaries. HGM Units 1 – 4 will not be impacted due to the wetlands being situated over 90 m away from the proposed activities and deemed to be isolated systems.
- Twenty-six (26) wetlands (**HGM Units 5 – 30**) have been identified to exist outside the site boundaries but within the 500 m buffer of the site. These wetlands will not be impacted by the proposed site activities due to these systems either being isolated, hydrologically disjunct or will not be impacted upon (**Figure 18**).
- The **HGM Unit 1 – 4** have progressively become prominent features on site and in most cases, woodier and potential areas of increased biodiversity (currently low biodiversity) due to the current management of said systems on site. **HGM Units 1 – 4** have been valued for their contribution to the site activities and has been noted to be rehabilitated in the near future. All the wetlands on site are afforded a large, vegetated buffer.
- **HGM Unit 1**, being artificial dam, has been classified as a depression wetland to ensure its integrity and functionality can be assessed. The wetlands catchment is small where the main hydrological inputs are received via **HGM Unit 2** (spring fed). Additionally, stormwater run-off and groundwater recharge from the adjacent and surrounding slopes contributes to additional hydrological input. The wetland does consist of an open body of water that is frequented by aquatic bird life and is visually appealing to some degree as it forms part of the sites walking trail. The dam does have a marked abundance of alien invasive vegetation that includes *Rubus cuneifolius*, *Solanum mauritanum*, *Acacia mearnsii*, *Eucalyptus sp.* and *Cirsium vulgare*. The dam does require some rehabilitation due to impacts from livestock and incasement of the spillway.



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- **HGM Unit 2**, being a seep wetland with channelled outflow, is situated in the valley floor area of the site and above **HGM Unit 1**. The wetland receives a majority of hydrological flows from two springs and seepage from the surrounding slopes and valley line via stormwater run-off. The wetland is an important system for hydrological input down through to other wetlands along the valley floor. Some scrub *Acacia mearnsii* and *Eucalyptus sp.* still reside within the wetland; however, clearing of *Rubus cuneifolius* and *Solanum mauritianum* has occurred recently.
  - **HGM Unit 3**, a channelled valley bottom, is situated along the valley floor below **HGM Unit 2**. The wetland, historically, was larger in extent prior to the inception of **HGM Unit 2**. The wetland is currently intersected by a trail and access paths (historical access paths for cultivation pursuits) to areas outside the site. The wetland has had a drain inserted to ensure continued access to the trail and path that has resulted in a small draining effect on a portion of the wetland. This wetland does require some rehabilitation to ensure that the trails, and access to, remains. It is an important wetland along the valley floor area due to its connectivity to other downstream wetlands. The wetland does have an abundance of alien invasive plants that include and not limited to *Rubus cuneifolius*, *Solanum mauritianum*, *Acacia mearnsii*, *Eucalyptus sp.*, *Cirsium vulgare*, *Lantana camara*, *Verbena bonariensis* and *Cannabis sativa*.
  - **HGM Unit 4**, being a seep wetland with channelled outflow, is situated below **HGM Unit 5** (dam) and cumulates into **HGM Unit 3**. This wetland does have a small depression area where a pumpstation (outside the site boundary) has been established for water extraction purposes of the site. The wetland is well vegetated with large stands of *Cyperus dives* and *Typha capensis*.

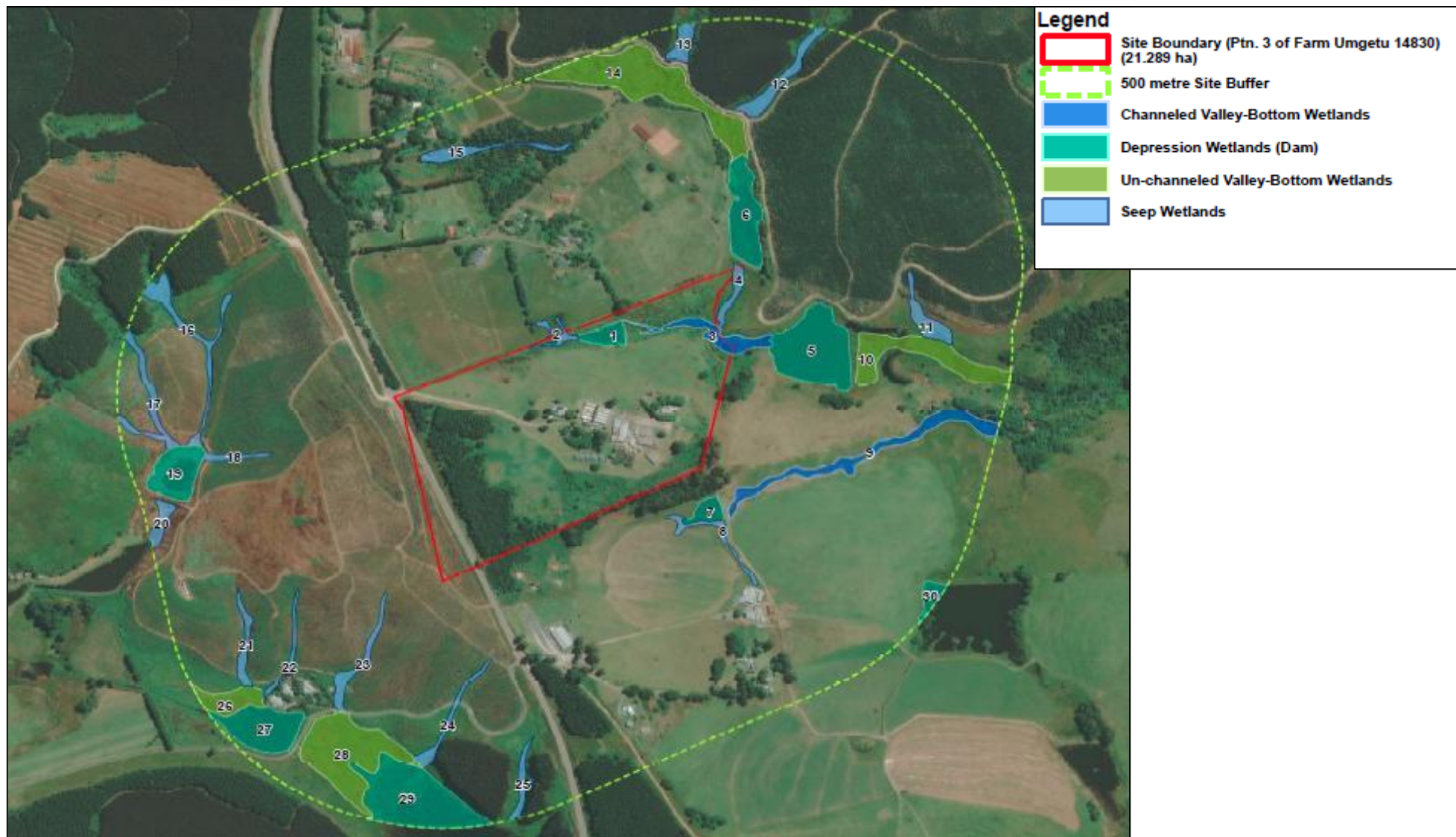


Figure 18: Wetland delineation of the site (Source: Kinvig & Associates).

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### Mitigation / Recommendations

- A standard thirty-two (32 m) metre buffer has been applied to the HGM Units identified on site. As the proposed activities do not impact the wetlands on site, a 32 m buffer has been applied to illustrate that no activities in terms of the Basic Assessment Process will intersect the 32 m wetland buffer zone (**Figure 19**).
- The following is recommended be undertaken during the Water Use License Application (WULA) phase of the site:
  1. A wetland rehabilitation assessment be conducted to ensure the current identified impacts being imparted onto the wetlands are mitigated and the overall integrity and functionality of the wetlands is improved. This is an important component that is advised for all natural areas used for tourism or for the enjoyment of patrons. Additionally, it is a prerequisite for any proposed or current water uses occurring on site. The rehab plan should include, although not limited to:
    - a. Alien Invasive Plant Management Plan;
    - b. Maintenance Management Plan for **HGM Unit 1**;
    - c. Rectification of the drain inserted on **HGM Unit 3**;
    - d. Trial crossing solutions; and
    - e. Exclusionary measures for livestock.
  2. Recreational Management Plan (maintenance of recreational features such as trails, viewing points, wooden crossings, etc., that occur within the wetlands and associated buffers).



Figure 19: Wetland delineation and proposed site activities (Source: Kinvig & Associates).

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### 7.3 Geotechnical Assessment

A Geotechnical Assessment was compiled by Gondwana Geo Solutions. The Geotechnical Assessment is attached at **Appendix D3**.

#### Key Findings

- The site encounters variable shallow soil horizons comprising topsoil, fill, colluvial (transported) and residual soils, overlying interlayered weathered shales of the Volkrust Formation of the Ecca Group. No shale bedrock was encountered, neither as outcrop nor within the shallow pits excavated in for the percolation tests.
- No groundwater was encountered on the site.
- The area within where the site falls is classified as a Minor Aquifer within a broader area of moderate yield potential of variable water quality and therefore is not considered to be part of an important groundwater supply aquifer on which this area is dependent on for general water supply.
- The site is naturally well draining towards the well-developed drainage lines. It can be expected that groundwater seepage will occur at the interface between the transported soils and the residual soils and/or bedrock, particularly during or after period of heavy rainfall, particularly along the defined valley lines.
- Both colluvial and residual soils will be suitable for use only as general fill for earthworks and common backfill for excavations or trenches, and landscaping purposes.
- It can be expected that during rainy periods these subgrade soils will become soft and boggy and impassable to traffic.
- Percolation test results indicate that the site is generally suitable for the use of septic tank soakaway systems, with the majority of test results showing that the insitu soils have relatively good percolation characteristics.
- The site has variable percolation rates, in the range of 36 to 312 mm/hour. It can be concluded that the majority of the site i.e. the area represented by the results of PT1 through PT6 is suitable for the disposal of wastewater and sewage effluent via normal subsoil percolation. i.e. conventional septic tank soakaway systems.
- Geotechnically, the site is generally suitable for the proposed development of additional housing. There are no fatal flaws from a geotechnical perspective which may significantly curtail or impact on the development of the site.

#### Mitigation / Recommendations

- The excavation of all material must be at least 1.5 m deep will generally require Soft Excavation.
- All temporary excavations to a maximum depth of 1.5 m should be created with a batter slope not steeper than 1V:1.5H. Excavations deeper than this, or which are steeper sided, should be shored. Wet weather or groundwater seepage may cause stability problems and it will be important to review the temporary support requirements by carrying out daily inspections.
- It is recommended that site specific geotechnical investigations be carried out for new houses or development node areas to confirm founding conditions and suitability of septic tank soakaway systems.
- Given the large variability in results observed, a conservative value of application of effluent of 60 l/m<sup>2</sup>/day is recommended for design.
- In the area where poor percolation test results were recorded (TP7), septic tank-soakaway systems should not be entertained. Similar, localised areas with poor percolation rates are likely to be encountered elsewhere and it is recommended that additional percolation tests be done to verify areas designated for evapotranspiration.

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## 7.4 Engineering Report

An Engineering Report was compiled by Umsunguli Project Management. The Engineering Report is attached at **Appendix D4**.

### Bulk Road Network

The existing access to the property and development is located off the P141 which is shared with the neighbouring farm and located opposite another farm entrance. The intersection is 6.5 km from Howick, along the Karkloof Road. Although a formal application and comment must still be obtained from the Department of Transport, previous experience shows that the department will support a crossed intersection, but it is anticipated that the new access off the P141 would have to be upgraded to a Type B1 intersection as the majority of traffic will be towards Howick. A Type B1 Intersection has a 30 m taper in both directions. The main access road to the central business section on the property will be a hardened surface road, whilst all other internal roads will be unsurfaced with a good gravel wearing course to keep a farm style look.

Table 3 below shows the actual intersection sight distances in comparison to the required which is based on the *Neighbourhood Planning and Design Guide (Red Book) - Chapter: Roads: Geometric design and layout planning*.

**Table 15: Intersection sight distance for 80 km/hr (UPM).**

<b>Intersection Sight Distance for 80km/hr</b>		
	Turning Right (m)	Turning left (m)
<b>Actual</b>	535m	365m
<b>Required</b>	189m	227m

### Trip Generation

The proposed development has different zonings and land uses and therefore different trip generation modules. Due to the location of the proposed development in relation to the nearest town, Howick, it is expected that 90% of the traffic will be between the development and Howick and only 10% towards Karkloof. This is expected to be generated over weekends when visitors travel and visit other facilities along the Midlands Meander.

Residential sites normally generate 2.1 trips per site per day, with morning peak hours from 7 – 9 am and again in the afternoon from 4 – 6 pm. The traffic to the 22 residential sites will be light vehicles and based on the proposed layout will generate approximately 46 trips per day.

The existing buildings, used in its various form as arts and craft, restaurant and accommodation have a very different trip generation, where light delivery vehicles deliver goods during the week and although there is a steady flow of visitors during the week, the peaks occur over weekends, when the mixed-use facilities are used. This type of facility requires substantial parking for day visitors, cyclists and tourists. Based on the floor area of 5 964 m<sup>2</sup> for all buildings, excluding residential units, a total of 259 parking bays must be provided, considering the municipal guideline of 1 bay per 23 m<sup>2</sup>.

The proposed access and new security gatehouse is required to be set back at least 40 m past the turn-off to the neighbouring farm to allow for the safe stacking of vehicles to enter the development without blocking the entrance to the neighbouring farm.

The type of development, which provides a mixture of residential dwellings, combined with arts, crafts, overnight accommodation and other mixed uses are expected to generate a substantial amount of pedestrian traffic within the main node and therefore sidewalks and pedestrian crossing are required to be

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implemented in strategic places, where pedestrians are expected to converge. Public transport, such as tourist buses and other form of transport will have to be provided with dedicated parking facilities and drop-off zones.

The Preliminary Design Check (PDC) and geometric design of the new intersection off the P141 will only be undertaken after Department of Transport has provided their comments and confirmed the level of upgrades required.

### **Internal Roads**

The internal road from the proposed main security gatehouse to the mixed-use hub will carry all the traffic and is required to be designed as a local distributor which will vary between 3 – 6 m and the final layer works will be confirmed during the detail design to prepare a pavement design suitable for the access road, considering the existing and future generation of traffic. This road will be hardened in the form of asphalt, cobbles, pavers, or concrete.

The proposed internal roads within the new development to the residential sites will be a gravel wearing finish and constructed to suit the anticipated traffic flow through the development. The pavement design will be a combination of conventional municipal standards and the (Red Book Extract).

This will assess in further stages of design, including the following criteria:

- Internal Roads: 3 – 6 m wide roads depending on hierarchy
- Design Speed: 30 km/hr
- Cross Fall: 2.5%
- Min K-Value (Crest): 2
- Min K-Value (Sag): 8
- Min Vertical Length: 80 m
- Pavement Design (Main Access):
  - 30 mm Asphalt
  - 150 mm G2 Imported Crusher Run
  - 150 mm G5 Imported Selected Layer
  - 150 mm G7 Selected Subbase
  - 150 mm G9 In-situ Layer
- Alternative Road Pavement: Concrete, cobble, interlocking pavers, or gravel
- Internal Roads: Gravel wearing course on selected subbase layer

### **Sewage**

There is currently no municipal bulk sewer available within this area and all existing buildings, regardless of their usage, is functioning on a septic tank and soakaway system. number of existing septic tanks are present on the site and during the site inspection, it was noticed that the tanks are functioning well, including the soakaways.

The proposed development is expected to generate a sewerage flow of 61m<sup>3</sup>/day.

A Geotechnical Assessment (**Appendix D3**) was conducted by Gondwana Geosolutions during December 2022, Ref 22-119R01, and performed 7 percolation tests (PT1 – PT7) with the conclusion that the site is suitable for on-site sanitation recommending a rate of application of 60 l/m<sup>2</sup>/day. PT7 did not pass the test, but it is possible that a suitable area could be found prior to construction, as the sites are far apart and there are large open areas. The rate of application will then be used to determine the length of each soak away. Where septic tanks serve individual dwellings, it should have a minimum capacity of 1,7m<sup>3</sup> or 3,5m<sup>3</sup> where it serves more than one unit. Commercial and other non-domestic septic tanks should be sized to have a capacity of one day's effluent generated.

### Internal Reticulation

The internal sewer system will comprise of septic tanks and soakaways at each unit. The designs of these on-site sanitation shall be submitted to the municipal building inspector, as part of the building plans submissions and will comply with SANS 10400 Part P – Drainage. Septic tanks will be at least 1.7 m<sup>3</sup> and will have at least two chambers, although a 3-chamber tank will produce better quality effluent entering the soakaway, with the soakaway sized using the percolation test results. The septic tanks can be constructed from blocks/bricks and plastered, although prefabricated tanks, such as Rototank and Calcemite can also be used, subject to installation guidelines from the respective supplier.

Septic tanks must be located near the residential dwellings, with ease of access for maintenance, to receive raw sewage linked with 110 mm Ø uPVC pipes to the soakaway. The area around the soakaway can be vegetated but must be kept open to improve evapotranspiration and not be hardened.

Where septic tanks are servicing mixed use in the buildings, the septic tanks must be designed, based on the expected effluent generated from those usages, and kitchens must be provided with grease traps before waste enters the septic tank system. Each soakaway must be sized based on the prevailing soil conditions, as determined by the percolation tests undertaken by the geotechnical engineer's assessment. If the geotechnical findings yield certain areas not suited for on-site sanitation, the effluent must be piped to a location where percolation is acceptable, and a soakaway can be constructed.

Refer to Table 4 below for the sewer calculations for the development.

**Table 16: Sewer calculations (UPM).**

<b>MUSHROOM FARM DEVELOPMENT - SEWER DEMAND</b>		
<b>Description</b>	<b>RedBook Guide</b>	<b>Volume (kl/day)</b>
Total water demand (excl peak factor)	Calculated in water demand table	66
Sewage demand based on water demand	80%	53
Infiltration	15%	61
<b>Peak sewage demand according to Table k.8 from RedBook</b>	<b>1,5</b>	<b>91</b>
<b>Q(peak)</b>	<b>l/s</b>	<b>1,06</b>

The standards for the internal sewer reticulation to be installed with the proposed development can be summarized as follows:

- Pipe Material: uPVC
- Pipe class: Class 34 (300 kPa)
- Pipe diameters: 110 mm & 160 mm Ø
- Minimum Grade: 1:150
- Maximum Grade: 1:10
- Bedding: Flexible (SABS1200LB)
- Manholes: Precast Concrete Manholes (1 m Ø), max 80 m spacing
- Minimum Cover: 900 mm

The internal sewer reticulation shall comprise a combination of 110 mm and 160 mm Ø uPVC Class 34 sewer pipes with circular precast concrete manholes placed at a maximum spacing of 80 m (if needed) or at a change in direction, including the necessary rodding eyes. The joints between manhole rings must be sealed with bitumen strips to prevent the ingress of stormwater and subsurface seepage. Grease traps, oil and fuel separators must be utilized at kitchens or restaurants where required.



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## Water

There is currently no potable, bulk water in the area and all the residential dwellings, farms and agricultural properties rely on stream/dam abstraction or boreholes for domestic and agricultural purposes, which makes them totally self-sufficient.

The Water Services Authority for this area is uMgungundlovu District Municipality (UMDM) who has an existing potable water line running adjacent to the P141 on the Amber Valley side of the carriageway, the aforementioned potable waterline terminates where KwaWula Game Estate's bulk water meter is located, but it is not financially feasible to extend this line.

In the absence of potable bulk water from uMgungundlovu District Municipality, potable water will be obtained from an existing borehole currently in use. Borehole abstraction will have to be stored in a reservoir, with a capacity of at least 48 hours, being 132 kL – this can be achieved with the installation of a SBS Reservoir ST11-3 with a height of 3.17 m and diameter of 7.51 m. In order to meet the daily demand of 66 kL /day at full development, the borehole will have to deliver water at a rate of 5 500 L/hour, assuming the borehole will only pump for 12 hours per day.

Based on the borehole step-drawdown test results facilitated by Dersal Consulting and conducted by Aquatec Pumps & Drilling, the borehole has a total depth of 60.53 m and an available drawdown of 44 m therefore yielding a daily abstraction rate of 99 kL per 24hr period and/or 8 250 L/hour per 12hour period, thus being adequate to deliver the required 5 500 L/hour per 12hour period. Seasonal change may influence the above results due to affected ground water tables.

The abovementioned capacity of 132 kL storage excludes firefighting storage which according to guidelines shall equate to an additional 54 kL of storage. The reservoir can be filled directly from the borehole which should be located at the high point of the development, the reservoir may need to be fitted with an inline booster pump to ensure the higher lying dwellings receive sufficient pressure, alternatively an elevated tank option may be investigated.

Talbot Laboratories conducted laboratory testing on the water samples in line with SANS 241:2015 guidelines for human consumption, the findings showed that no "*E.Coli*" was detected in the samples thus ruling out the presence of human and/or animal faecal matter contamination, however, there was a slight presence of "*coliforms*" yielding 18 MPN/100m<sup>l</sup> instead of the maximum permissible 10 MPN/100m<sup>l</sup> as stated in SANS241:2015 guideline. The presence of coliform bacteria can be eliminated by means of treatment such as chlorine and ultraviolet treatment systems making the borehole water acceptable for human consumption.

### **Internal Supply**

The daily water demand has been calculated scaling areas off the provided architectural layout, all consumption rates originate from Table J.2 & J.4 of the "*The Neighbourhood Planning and Design Guide*". A summary of the water demand calculations can be seen in Table 5 below.

**Table 17: Water demand calculations (UPM).**

<b>MUSHROOM FARM DEVELOPMENT - WATER DEMAND</b>				
<b>Description of Service</b>	<b>Area/Units</b>	<b>Redbook Guide</b>	<b>Consumption</b>	<b>Volume (kl/day)</b>
<b>Existing Buildings:</b>				
Hospitality	28	0.9kl/100m <sup>2</sup>	0,9	25
Arts & Crafts	13	0.4kl/100m <sup>2</sup>	0,4	5
Conference Facilities	5	0.9kl/100m <sup>2</sup>	0,8	4
Small Scale Retail	10	0.4kl/100m <sup>2</sup>	0,4	4
Renovated existing Buildings	4	0.9kl/100m <sup>2</sup>	0,9	3
<b>Proposed Multi Unit:</b>				
New Houses	17	1.25kl/unit	1,25	21
Terrace Houses	3	1kl/unit	1	3
<b>Average Annual Daily Water Demand</b>				<b>66</b>
<b>Daily Peak Factor of 1.7 according to Table J.9 from the Redbook</b>				<b>112</b>

The internal water supply will comprise a combination of 75 mm Ø, 110 mm Ø & 160 mm uPVC pipes that will be fed from abovementioned reservoir and will have isolation valves at strategic points along with a bulk water meter to serve the development. Due to the steep topography and deficit in elevation, it is recommended that air valves are installed at high points along the water line and that scour valves placed at low points for maintenance purposes. The sizing of these water lines will be finalised during the detail design stage once all pressures are known, and layouts finalised.

In terms of firefighting regulations this development is classed as a Moderate Risk 4 site according to table J.17 & J.18 in the “*The Neighbourhood Planning and Design Guide*” and will require a flow of 15 L/sec for a duration of 1 hour. This demand is required to be incorporated into the designs once the volumes and pressures have been confirmed by the local municipality.

Each of the domestic and fire supply lines will require separate bulk meters, according to municipal standards.

### **Storm Water Management**

The traditional design for storm water drainage systems has been to collect and convey storm water runoff as rapidly as possible to a suitable location where it can be discharged accordingly. The objective of a storm water management plan should be to manage the storm water resources of the collective watersheds to:

- Prevent Flood Damage
- Preserve the natural and beneficial functions of the natural drainage system and wetland
- Preserve and enhance storm water quality

Run-off from roofs should be captured in gutters and stored in rainwater tanks for the utilization of gardening and other domestic activities. The tank can be oversized so that the lower portion of the tank can be valved and utilized for irrigation purposes and have a non-valved outlet at the desired attenuation volume level.

Storm water from internal roads and roofs will be collected and retained on site through the installation of storm water attenuation measures, which will be done as part of a separate Storm Water Management Plan (SWMP). Outlets and overflows must be constructed to prevent scouring and erosion and release runoff into the two natural drainage areas. Storm water harvesting is advised for all roofed areas as the harvested rainwater could be used for the irrigation of the gardens and landscaped areas. The SWMP will discuss the introduction of attenuation and retention ponds incorporated into the civil engineering design and landscaping plan to create focal points within the development, but also to manage the increase in runoff between the pre and post development flows.

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## Refuse

A refuse collection point will be provided at the main security entrance gate of the development, where the refuse can be collected weekly. Collection from each individual owner will be undertaken by the Homeowner's Association. It is recommended that the area is walled and covered with an outlet connected to a soakaway in order to wash and disinfect the storage area to prevent bad odours and vermin nuisances.

The implementation of recycling is encouraged and should be separated from general refuse, whilst the Homeowners Association will be responsible to contract with a recycling company to collect the recyclable material or deliver it to the nearest location.

## Electricity

The property has an existing transformer with a capacity of 100 kVa, which serves all existing buildings. This is considered sufficient for its demand and the client/developer has indicated that all commercial roofs will be provided with solar panels and each residential dwelling will function off the grid by providing their own solar power supply system for their requirements.

The additional Green Design principles will include gas geysers and stoves, solar panels, LED lights and heat pumps – these will all be finalized by the architect in terms of preparing a building code for the development, once approved.

### 7.5 Storm Water Management Plan

A Storm Water Management Plan was compiled by Umsunguli Project Management. The Storm Water Management Plan is attached at **Appendix D5**.

The purpose of the Storm Water Management Plan is:

- The protection of development and public interests
- The preservation of the natural environment
- The preservation of the existing wetlands and drainage lines
- The management of the expected increase of surface runoff into natural drainage areas
- Protection of underground resources and water quality
- Conservation of water and making it available to public
- The desire to provide optimum methods of controlling runoff
- Striving for sustainable environment while pursuing economic development

### Key Findings

- The proposed storm water system must be designed to have minimal impact on the natural drainage areas and/or seep wetlands if any are identified during investigations. Where possible, storm water should be collected into areas where it can be managed and released efficiently using techniques which will protect and preserve existing natural drainage areas.
- The transformation of the undeveloped grass fields to hardened surfaces from roads and dwellings increases the surface runoff from the transformed areas, and in order to preserve natural drainage areas, the increase of volume has to be attenuated and managed. The collection of surface runoff will be diverted into earth embankment attenuation ponds releasing run-off at pre-development flow rates towards the eastern and southern boundaries of the site where two earth lined attenuation ponds shall be constructed.
- Two different methods of attenuation shall be adopted, majority of the site shall capture surface runoff using grass lined swales connecting into stormwater manholes where from the water shall gravitate via stormwater pipes and discharge through a headwall and flow into two attenuation ponds located at the low points of the site. The second form of attenuation shall utilise the parking areas and will be provided with inlet controls to attenuate the increase in run-off within the parking

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area, with an outlet into the two attenuation ponds.

- The grasslined swales and attenuation ponds should fit into the landscaping plan as focal points and serve as features for residents. This could further be improved with reeds and suitable vegetation to improve these features aesthetically.

### **Erosion Control**

The design of the storm water system must make provision for erosion protection, as the transformed area after construction of the development will have a greater surface runoff that will contribute to higher flows. It is therefore essential that erosion control measures be implemented along all roads and at storm water outlets, which could be a combination of stone pitching, natural rock, vegetation, silt traps, gabion baskets, energy dissipaters and grass lined drains.

Additional methods to minimise erosion within the development area include:

- Open exposed areas will be planted with grass or landscaped into gardens.
- Using natural rock and boulders to act as energy dissipaters.
- All exposed embankments should be covered in 100mm topsoil and planted with grass sods and staked to prevent washing away.
- Steep cut/fill embankments (> 1:2) should be covered in Soilsaver with sufficient overlaps, covered in 100mm topsoil and planted with grass.

### **Surface Run-off**

The Homeowners Association, Management Company and/or caretakers should encourage the use of rainwater harvesting as the tanks will act as the first form of attenuation, whilst it could also serve other uses. Run-off from roofs should be captured in gutters and stored in rainwater tanks for the utilization of gardening and other domestic activities. The aforementioned tank can be oversized so that the lower portion of the tank can be valved and utilised for irrigation purposes and have a non-valved outlet at the desired attenuation volume level. Overflow from the tanks or gutters will be directed overland into grass drains, roads, and side drains before being collected in swales and attenuation ponds with outlets dispersing into the two attenuation ponds. It is also important that attenuation ponds be positioned such that it does not flood natural drainage areas.

The stormwater system must be kept separate from the proposed-on site sanitation system comprising septic tanks, soakaways and evapotranspiration areas which will be situated at the rear side of the site and any contamination of surface runoff must be avoided.

### **Storm Water Flow Attenuation**

Each depressed area within the parking areas must be provided with a steel grid inlet and manhole (including a silt trap) for ease of maintenance. The steel grid will further prevent debris, grass, and other possible rubbish to obstruct and block the inlet, which could lead to localised flooding.

The attenuation ponds can vary in depth depending on site requirements, this report assumed a depth of 1.8 m, which allows a 300mm silt trap at the base of the attenuation pond and an effective storage depth of 1.5 m. A freeboard of at least 0.8 m should be allowed over and above the full water level to prevent overtopping.

Two types of ponds are available, being overflow and underflow types. The overflow type presents a retention pond, as it remains full, whilst the underflow type attenuates the flow and releases it at pre-development flows. Overflow type ponds are best suited for this type of commercial development, as it will create a feature in open space that can be incorporated into the landscaping plan. However, should this type be preferred, the storage capacity would have to be increased to accommodate this, which can be achieved by lowering the base below the outlet structure and increasing the silt trap. This way the attenuated volume is retained, but the pond will also have water to act as a feature. The outlet structure

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should be sized to allow the 1:50 year pre-development flow to be released, whereas the post development flow will be retained within the attenuation pond and slowly released over a period of time.

The two attenuation ponds have been positioned so as to blend in with the development and landscaped areas. The inside of the ponds will be natural gravel and earth cut/fill embankments will be grassed with cut and fill slopes of 1:2. Each pond should have a 1.5 m wide levelled section with erosion protection at all pipe outlets.

### **Mitigation / Recommendations**

- That the storm water design parameters used in the design of the storm water management system are accepted and approved by the local authorities once a final layout plan has been provided.
- The detail design of the storm water system includes recommendations of this plan.
- Rainwater harvesting should be encouraged for the development.
- The storm water system must be kept separate from the sewerage system.
- All chemicals, cement, fuel, and other hazardous material used during construction should be stored in controlled areas.
- Concentration of storm water should be prevented where possible, but energy dissipaters should be provided in areas of concentration.
- On completion of the construction of buildings, roads and parking areas, all remaining exposed embankments and open areas must be vegetated as soon as possible, including the use of "Soilsaver", where necessary.
- The attenuation ponds must have some form of a silt trap mechanism.
- During the construction phase, the following aspects should be closely monitored by the ECO to ensure the contractor complies:
  - Temporary berms and cut-off drains must be provided on site to collect run-off, especially until the attenuation ponds are complete and functional.
  - Silt screens must be provided at the grid inlets / splayed construction during road construction.
  - Topsoil must be conserved on site and prevented from entering the stormwater system.
  - Exposed embankments, cut/fill slopes and open areas must be vegetated as soon as possible to reduce runoff.
  - Dust control during construction must be applied at all times.
  - Excess spoil material from topsoil or bulk earthworks must be placed in areas or even removed entirely off site to minimise silt deposition, scouring and soil erosion.
  - Post construction, all exposed areas must be covered in vegetation, grass or landscaped.
- Temporary berms and cut-off drains must be provided on site to collect run-off, especially until the attenuation ponds are complete and functional.
- Silt screens must be provided at the grid inlets / splayed construction during road construction.
- Topsoil must be conserved on site and prevented from entering the stormwater system.
- Exposed embankments, cut/fill slopes and open areas must be vegetated as soon as possible to reduce runoff.
- Dust control during construction must be applied at all times.
- Excess spoil material from topsoil or bulk earthworks must be placed in areas or even removed entirely off site to minimise silt deposition, scouring and soil erosion.
- Post construction, all exposed areas must be covered in vegetation, grass or landscaped.

### **7.6 Heritage Impact Assessment and Phase 1 Palaeontological Impact Assessment**

A Heritage Impact Assessment (HIA) and Phase 1 Palaeontological Impact Assessment (PIA) was undertaken by Gary Trower. The HIA and Phase 1 PIA is attached at **Appendix D6**.

### **Key Findings**

- No fossils or archaeological material were observed on site.
- No archaeological material in the form of pottery fragments or stone tools was observed in the shallow banks of the stream and none of the boulders displayed any evidence of fossil material.
- Farming activities have previously taken place on the property and the ground has already been extensively disturbed, so the area is no longer in a pristine, natural state.
- The heritage impact significance of the site is a Finding of No Significant Impact (FONSI) (refer to **Table 18** below for the identified heritage resources).
- The small stream, footpath and dam noted on the property exposed sections of the upper soil surface, and this revealed that the upper soil profile comprised of unstratified archaeologically sterile sediment.
- Construction work required for the building of the housing units and other additional structures is unlikely to have a significant impact on heritage resources as nothing was observed during the ground survey.

**Table 18: Identified heritage resources (NHRA status) (Source: Gary Trower).**

Formal protections	
National Heritage site (Section 27)	none
Provincial Heritage site (Section 27)	none
Provisional Protection (Section 29)	none
Place listed in heritage register (Section 30)	none
General protections	
Palaeontological site or material (Section 35)	none

#### **Mitigation / Recommendations**

- Should construction or operational activities expose archaeological, palaeontological or historical remains, old graves or fossil material, activities must cease immediately, pending evaluation by the provincial heritage agency and the “chance find protocol” outlined in the PIA (**Appendix D6**) should be followed. This is in alignment with the South African Heritage Resources Act (SAHRA) (Act 25 of 1999) and the AMAFA Research Institute and Heritage Act (Act 5 of 2018). This is to ensure that developments comply with the law, and to ensure that a rare object / fossil stands a good chance of being recorded and / or relocated, before being damaged or destroyed by site activities.

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ASPECT	CLASS	CRITERIA
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## 8 ASSESSMENT OF ENVIRONMENTAL IMPACTS

In order to assess potential environmental issues associated with the proposed development, each aspect addressed in the two sections above and have been given a qualitative rating in relation to its environmental impact as per the table below. Each aspect has been divided into a number of different classes, each of which has been assigned various criteria (**Table 19**).

Where relevant, the following methods have been used to predict the characteristics of identified impacts:

- Professional judgement;
- Quantitative mathematical models;
- Experiments and physical models;
- Physical or visual simulations or maps (including GIS tools);
- Case studies; and
- Past experience.

<b>NATURE OF IMPACT</b>	Positive	The impact on the environment will be positive.
	Negative	The impact on the environment will be negative.
	Direct	The impact is caused directly by the activity and generally occurs at the same time and at the place of the activity.
	Indirect	The impact induces changes that may occur as a result of the activity.
	Cumulative	The impact is a result from the incremental impact of the proposed activity on a common resource when added to the impacts of other past, present or reasonably foreseeable future activities.
<b>OCCURRENCE OF IMPACT</b>	Construction	The impact will happen during construction.
	Operation	The impact will happen during operation.
	Decommissioning	The impact will happen during decommissioning.
	Immediate	The impact will happen immediately
	Delayed	There will be a delay in the impact occurring.
<b>PROBABILITY OF IMPACT OCCURRING (WITH MITIGATION)</b>	Definitely	The impact will definitely occur even with mitigation (100%).
	Likely	It is likely that the impact will occur (60%-99%).
	Fair	There is a fair chance that the impact will occur (30% -59%).
	Unlikely	It is unlikely that the impact will occur (0% - 29%)
<b>REVERSIBILITY (WITH MITIGATION)</b>	Possible	It is possible to reverse the impact.
	Partly	It is partly possible to reverse the impact.
	Not possible	It is not possible to reverse the impact.
<b>EXTENT OF IMPACT (WITH MITIGATION)</b>	Site	The impact will be limited to the site.
	Local	The impact will affect the local area (within a radius of 40km).
	Provincial	The impact will affect areas beyond the site but within the boundaries of KwaZulu-Natal.
	National	The impact will affect areas beyond the Province but within the boundaries of South Africa.
<b>DURATION (WITH MITIGATION)</b>	Short-term	0-5 years (construction phase).
	Medium-term	5-40 years (construction and operation).
	Long-term	(>40 years).
	Permanent	Permanent damage to the environment.
<b>SIGNIFICANCE OF IMPACT WITHOUT MITIGATION</b>	Low	Small impact / disturbance.
	Medium	Moderate impact / disturbance expected.
	High	Significant impact / disturbance expected.
<b>SIGNIFICANCE OF IMPACT POST-MITIGATION</b>	Low	Small impact / disturbance.
	Medium	Moderate impact / disturbance expected.
	High	Significant impact / disturbance expected.

**Table 19: Summary of aspects used for assessing environmental impacts.**

Table 20 lists potential impacts associated with the proposed development, and details what mitigation measures should be taken to minimize these impacts. Refer to Table 18 for the cumulative impacts.



**Table 20: Assessment of potential impacts associated with the development.**

DESCRIPTION OF IDENTIFIED ENVIRONMENTAL IMPACT	MITIGATION	NATURE OF IMPACT	DEGREE TO WHICH IMPACT CAN BE MITIGATED	PROBABILITY OF IMPACT OCCURRING		REVERSIBILITY OF IMPACT		EXTENT OF IMPACT		DURATION OF IMPACT		SIGNIFICANCE OF IMPACT WITHOUT MITIGATION	SIGNIFICANCE OF IMPACT WITH MITIGATION
				WITHOUT MITIGATION	WITH MITIGATION	WITHOUT MITIGATION	WITH MITIGATION	WITHOUT MITIGATION	WITH MITIGATION	WITHOUT MITIGATION	WITH MITIGATION		
<p><b>LOCAL ECONOMY AND EMPLOYMENT OPPORTUNITIES / NEED &amp; DESIRABILITY</b></p> <ul style="list-style-type: none"> <li>If approved, the proposed development will contribute positively to the local economy and the social environment through spending of capital at local businesses.</li> <li>The proposed development will provide employment opportunities and income generation during both the construction and operational phases.</li> <li>There will also be skills transferred during the construction phase, which will benefit employed people in the long term when they seek employment elsewhere.</li> </ul>	<ul style="list-style-type: none"> <li>Local businesses and unemployed people in the immediate area must be considered first, before employing labour and services from further afield.</li> </ul>	Positive	Partly	Definitely	Definitely	Partly	Partly	Site and Local	Site and Local	Short-term during construction and Permanent during Operation	Short-term during construction and Permanent during Operation	High (Positive)	High (Positive)
<p><b>PLANNING INITIATIVES</b></p> <ul style="list-style-type: none"> <li>The proposed development is in line with the goals and objectives of the UMngeni Local Municipality IDP and the above mentioned National Provincial Strategies.</li> <li>An application in terms of the Subdivision of Agricultural Land Act 70 of 70 (SPLUMA) was submitted by the planner responsible for this application; and subsequently approved.</li> </ul>	<ul style="list-style-type: none"> <li>None.</li> </ul>	Positive	Partly	Likely	Unlikely	Possible	Possible	Site and Local	Site and Local	Short-term	Long-term	High (Positive)	High (Positive)

DESCRIPTION OF IDENTIFIED ENVIRONMENTAL IMPACT	MITIGATION	NATURE OF IMPACT	DEGREE TO WHICH IMPACT CAN BE MITIGATED	PROBABILITY OF IMPACT OCCURRING		REVERSIBILITY OF IMPACT		EXTENT OF IMPACT		DURATION OF IMPACT		SIGNIFICANCE OF IMPACT WITHOUT MITIGATION	SIGNIFICANCE OF IMPACT WITH MITIGATION
				WITHOUT MITIGATION	WITH MITIGATION	WITHOUT MITIGATION	WITH MITIGATION	WITHOUT MITIGATION	WITH MITIGATION	WITHOUT MITIGATION	WITH MITIGATION		
<b>CULTURAL, HISTORICAL &amp; ARCHAEOLOGICAL RESOURCES</b> <ul style="list-style-type: none"> <li>No fossils or archaeological material were observed on site.</li> <li>No archaeological material in the form of pottery fragments or stone tools was observed in the shallow banks of the stream and none of the boulders displayed any evidence of fossil material.</li> <li>Farming activities have previously taken place on the property and the ground has already been extensively disturbed, so the area is no longer in a pristine, natural state.</li> <li>The heritage impact significance of the site is a Finding of No Significant Impact (FONSI) (refer to Table 10 below for the identified heritage resources).</li> <li>The small stream, footpath and dam noted on the property exposed sections of the upper soil surface, and this revealed that the upper soil profile comprised of unstratified archaeologically sterile sediment.</li> <li>Construction work required for the building of the housing units and other additional structures is unlikely to have a significant impact on heritage resources as nothing was observed during the ground survey.</li> </ul>	<ul style="list-style-type: none"> <li>Should construction or operational activities expose archaeological, palaeontological or historical remains, old graves or fossil material, activities must cease immediately, pending evaluation by the provincial heritage agency and the "chance find protocol" outlined in the PIA (Appendix D6) must be followed. This is in alignment with the South African Heritage Resources Act (SAHRA) (Act 25 of 1999) and the AMAFA Research Institute and Heritage Act (Act 5 of 2018).</li> <li>This is to ensure that developments comply with the law, and to ensure that a rare object / fossil stands a good chance of being recorded and / or relocated, before being damaged or destroyed by site activities.</li> </ul>	Negative, Direct	Highly Likely	Fair	Unlikely	Partly	Possible	Site	Site	Short-term	Short-term	Medium	Low

DESCRIPTION OF IDENTIFIED ENVIRONMENTAL IMPACT	MITIGATION	NATURE OF IMPACT	DEGREE TO WHICH IMPACT CAN BE MITIGATED	PROBABILITY OF IMPACT OCCURRING		REVERSIBILITY OF IMPACT		EXTENT OF IMPACT		DURATION OF IMPACT		SIGNIFICANCE OF IMPACT WITHOUT MITIGATION	SIGNIFICANCE OF IMPACT WITH MITIGATION
				WITHOUT MITIGATION	WITH MITIGATION	WITHOUT MITIGATION	WITH MITIGATION	WITHOUT MITIGATION	WITH MITIGATION	WITHOUT MITIGATION	WITH MITIGATION		
<b>SURROUNDING LAND USE AND AESTHETICS</b> <ul style="list-style-type: none"> <li>The proposed land use change will be similar to the surrounding land uses listed above.</li> <li>The proposed development involves the conversion of a variety of existing buildings and mushroom tunnels into a conference facility and overnight accommodation and will not alter the sense of place of the immediate area. The proposed new houses will alter the sense of place marginally.</li> <li>The aesthetics of the area will be temporarily disturbed during the construction phase.</li> </ul>	<ul style="list-style-type: none"> <li>The building designs are to comply with SANS standards.</li> <li>Screening is to be utilised where necessary to limit views of construction activities.</li> <li>Wherever possible, the proposed development must make use of natural building materials and architectural styles that blend into the surrounding landscape. An architectural code must be compiled for the development.</li> <li>The use of highly reflective building materials such as corrugated iron and glass must be minimised where possible.</li> <li>Only locally indigenous plant species are to be used for landscaping.</li> <li>An Alien Vegetation Control Programme must be implemented.</li> <li>The Environmental Management Programme (EMPr) (Appendix E) must be implemented.</li> <li>Noise and dust impacts must be controlled.</li> <li>All lighting must face downwards and inwards.</li> </ul>	Negative, Direct	Partly	Likely	Fair	Partly	Possible	Site	Site	Short-term	Short-term	Medium	Low

DESCRIPTION OF IDENTIFIED ENVIRONMENTAL IMPACT	MITIGATION	NATURE OF IMPACT	DEGREE TO WHICH IMPACT CAN BE MITIGATED	PROBABILITY OF IMPACT OCCURRING		REVERSIBILITY OF IMPACT		EXTENT OF IMPACT		DURATION OF IMPACT		SIGNIFICANCE OF IMPACT WITHOUT MITIGATION	SIGNIFICANCE OF IMPACT WITH MITIGATION
				WITHOUT MITIGATION	WITH MITIGATION	WITHOUT MITIGATION	WITH MITIGATION	WITHOUT MITIGATION	WITH MITIGATION	WITHOUT MITIGATION	WITH MITIGATION		
<b>TRAFFIC, ROADS AND ACCESS</b> <ul style="list-style-type: none"> <li>It is anticipated that the proposed layout will generate approximately 46 trips per day.</li> <li>In terms of the South African Traffic Impact and Site Traffic Assessment Manual (TMH 16), a Traffic Impact Assessment must be undertaken when "The highest total additional hourly vehicular trip generation (including pass-by and diverted trips) as a result of the application exceeds 50 trips per hour". Therefore, a Traffic Impact Assessment is not required, as the trip generation is less than 50 vehicles per hour.</li> <li>The access off the P141 will need to be upgraded to a Type B1 intersection.</li> <li>Based on the proposed development, a total of 259 parking bays must be provided.</li> <li>The proposed development is expected to generate pedestrian traffic within the main node on the property.</li> </ul>	<ul style="list-style-type: none"> <li>Speed limits along the access roads and roads within the property must be adhered to at all times.</li> <li>Maintenance of the access and internal roads within the property must be undertaken.</li> <li>Vegetation along the access roads must be regularly removed to improve visibility.</li> <li>Sidewalks and pedestrian crossings must be implemented in strategic places.</li> <li>The proposed development will require a new B1 intersection off the P141, subject to approval from the KZN Department of Transport standards and regulations.</li> </ul>	Negative, Direct	Possible, Likely	Likely	Fair	Not possible	Possible	Site	Site	Medium-term	Short-term	High	Low

DESCRIPTION OF IDENTIFIED ENVIRONMENTAL IMPACT	MITIGATION	NATURE OF IMPACT	DEGREE TO WHICH IMPACT CAN BE MITIGATED	PROBABILITY OF IMPACT OCCURRING		REVERSIBILITY OF IMPACT		EXTENT OF IMPACT		DURATION OF IMPACT		SIGNIFICANCE OF IMPACT WITHOUT MITIGATION	SIGNIFICANCE OF IMPACT WITH MITIGATION
				WITHOUT MITIGATION	WITH MITIGATION	WITHOUT MITIGATION	WITH MITIGATION	WITHOUT MITIGATION	WITH MITIGATION	WITHOUT MITIGATION	WITH MITIGATION		
<b>OPERATIONAL ACTIVITIES, NOISE AND DUST</b> <ul style="list-style-type: none"> <li>• Potential impacts on surrounding neighbours associated with noise, dust and air quality nuisances.</li> <li>• There may be an increase in noisy activities during both the construction and operational phases.</li> <li>• There may be an increase in dusty conditions during the construction phase.</li> <li>• Noise nuisances may negatively impact surrounding properties if mitigation measures are not adequately implemented.</li> </ul>	<ul style="list-style-type: none"> <li>• Speed limits within the estate must be adhered to at all times.</li> <li>• Dust suppression measures, such as the spraying of water on bare soil, must be undertaken during dry and windy conditions.</li> <li>• Dust control can be achieved on the access roads within the property through the application of "Dustex" which is an admixture to the gravel wearing course.</li> <li>• Machinery and equipment must be maintained and regularly serviced to ensure that unnecessary noise is prevented.</li> <li>• Workers on site must not create unnecessary noise such as hooting or shouting.</li> <li>• Speed limits on the access roads and within the property must be adhered to at all times..</li> </ul>	Negative, Direct	Partly	Definitely	Fair	Partly	Possible	Site	Site	Short-term and medium-term	Short-term	High	Low

DESCRIPTION OF IDENTIFIED ENVIRONMENTAL IMPACT	MITIGATION	NATURE OF IMPACT	DEGREE TO WHICH IMPACT CAN BE MITIGATED	PROBABILITY OF IMPACT OCCURRING		REVERSIBILITY OF IMPACT		EXTENT OF IMPACT		DURATION OF IMPACT		SIGNIFICANCE OF IMPACT WITHOUT MITIGATION	SIGNIFICANCE OF IMPACT WITH MITIGATION
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<b>SAFETY &amp; SECURITY</b> <ul style="list-style-type: none"> <li>Management of construction labourers is often problematic. Potential exists for labourers to trespass onto adjoining properties.</li> <li>Crime in the area could increase during the construction phase, as a result of criminals posing as construction workers, or people seeking employment on the site.</li> <li>Crime in the area may also potentially increase during the operational phase, as a result of an influx of people making use of the facilities offered by the development.</li> <li>Criminals may target the facilities restaurant.</li> </ul>	<ul style="list-style-type: none"> <li>Construction labourers should be sourced from surrounding communities.</li> <li>All construction labourers must remain within the boundaries of the construction footprint at all times.</li> <li>Access onto and off the site during construction must be controlled by a register system. This includes visitors.</li> <li>All restricted areas of the property must be designated with appropriate warning signs.</li> <li>During the operational phase the facility operators must be responsible for employing a security firm to provide security on the property if deemed necessary.</li> <li>The approved EMPr must be strictly enforced. During the construction phase, the activities should be monitored on a monthly basis by an independent Environmental Control Officer (ECO).</li> <li>All restricted areas (e.g. conservation area) of the construction site must be designated with appropriate warning signs and hazard tape / orange fencing – where relevant.</li> </ul>	Negative, Indirect	Partly	Definitely	Likely	Partly	Possible	Site and Local	Site	Long-term	Short-term to Medium-term	High	Low


DESCRIPTION OF IDENTIFIED ENVIRONMENTAL IMPACT	MITIGATION	NATURE OF IMPACT	DEGREE TO WHICH IMPACT CAN BE MITIGATED	PROBABILITY OF IMPACT OCCURRING		REVERSIBILITY OF IMPACT		EXTENT OF IMPACT		DURATION OF IMPACT		SIGNIFICANCE OF IMPACT WITHOUT MITIGATION	SIGNIFICANCE OF IMPACT WITH MITIGATION
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<b>TOPOGRAPHY</b> <ul style="list-style-type: none"> <li>The site is considered suitable for the proposed development of additional housing.</li> </ul>	<ul style="list-style-type: none"> <li>The Storm Water Management Plan (Appendix D5) must incorporate a storm water management system, which must be designed to have minimal impact on the natural drainage areas and/or wetlands. Where possible, storm water must be collected into areas where it can be managed and released efficiently using techniques which will protect and preserve existing natural drainage areas.</li> <li>All nearby undisturbed slopes must be protected from erosion by demarcating the construction site. No vehicular or pedestrian access must be allowed beyond the demarcated area.</li> <li>Erosion control measures must be implemented along all roads and at storm water outlets which could be a combination of stone pitching, natural rock, vegetation, silt traps, gabion baskets, energy dissipaters and grass lined drains.</li> <li>Re-vegetation of exposed soil must take place as soon as possible.</li> </ul>	Negative, Direct	Possible	Definitely	Fair	Partly	Partly	Site	Site	Short-term to Medium-term	Short-term to Medium-term	Medium	Low

DESCRIPTION OF IDENTIFIED ENVIRONMENTAL IMPACT	MITIGATION	NATURE OF IMPACT	DEGREE TO WHICH IMPACT CAN BE MITIGATED	PROBABILITY OF IMPACT OCCURRING		REVERSIBILITY OF IMPACT		EXTENT OF IMPACT		DURATION OF IMPACT		SIGNIFICANCE OF IMPACT WITHOUT MITIGATION	SIGNIFICANCE OF IMPACT WITH MITIGATION
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<b>CLIMATE</b> <ul style="list-style-type: none"> <li>• Topsoil, which is stockpiled during the construction phase, has the potential to be wind-blown, causing dust.</li> <li>• The proposed development will transform the existing undeveloped land surrounding the existing buildings and dwellings.</li> <li>• The transformation of the undeveloped fields to hardened surfaces increases the surface runoff from the transformed areas, and in order to preserve natural drainage areas, the increase of volume has to be attenuated and managed.</li> </ul>	<ul style="list-style-type: none"> <li>• The storm water system must be designed to have minimal impact on the natural drainage areas.</li> <li>• Storm water must be collected into areas where it can be managed and released efficiently using techniques which will protect and preserve existing natural drainage areas.</li> <li>• The grass lined swales and attenuation ponds must fit into the landscaping plan as focal points and serve as features for residents.</li> <li>• The stormwater system must be kept separate from the proposed-on site sanitation system comprising septic tanks, soakaways and evapotranspiration areas which will be situated at the rear side of the site and any contamination of surface runoff must be avoided.</li> <li>• The geometric design of the internal road network will be along the contours, with crossfalls that direct the run-off into open grass lined side swales and mitre drains into the open grass paddocks.</li> </ul>	Negative, Direct and Cumulative	Partly	Definitely	Likely	Partly	Partly	Site	Site	Short-term	Short-term	High	Low



DESCRIPTION OF IDENTIFIED ENVIRONMENTAL IMPACT	MITIGATION	NATURE OF IMPACT	DEGREE TO WHICH IMPACT CAN BE MITIGATED	PROBABILITY OF IMPACT OCCURRING		REVERSIBILITY OF IMPACT		EXTENT OF IMPACT		DURATION OF IMPACT		SIGNIFICANCE OF IMPACT WITHOUT MITIGATION	SIGNIFICANCE OF IMPACT WITH MITIGATION
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<p><b>CLIMATE CHANGE</b></p> <ul style="list-style-type: none"> <li>The proposed development may contribute to climate change to a minor extent through energy usage, water usage and waste generation during the construction and operational phases.</li> <li>The proposed development is not likely to be largely directly impacted by climate change as it is removed from coastal areas, watercourses and flood line areas and is not impacted by temperature changes.</li> <li>The proposed development may be indirectly affected by climate change where infrastructure traverses or is located in close proximity to watercourses.</li> </ul>	<ul style="list-style-type: none"> <li>All development infrastructure must promote the efficient use of energy, water and limit wastage of resources.</li> <li>Waste generation must be minimised and waste must be managed in an environmentally responsible manner and in accordance with the waste management hierarchy. The EMPr (Appendix E) outlines specific waste management mitigation measures which comply with the waste management hierarchy.</li> <li>The proposed development must be implemented in accordance with approved layout plans which have been planned and assessed to ensure that locations and layouts of least environmental impact and risk are utilised.</li> <li>The proposed development must ensure the protection of on-site environmental features which thereby protects ecological infrastructure important for building climate change resilience.</li> </ul>	Negative, Indirect	Partly	Likely	Likely	Partly	Partly	Local	Local	Permanent	Permanent	Medium	Low

DESCRIPTION OF IDENTIFIED ENVIRONMENTAL IMPACT	MITIGATION	NATURE OF IMPACT	DEGREE TO WHICH IMPACT CAN BE MITIGATED	PROBABILITY OF IMPACT OCCURRING		REVERSIBILITY OF IMPACT		EXTENT OF IMPACT		DURATION OF IMPACT		SIGNIFICANCE OF IMPACT WITHOUT MITIGATION	SIGNIFICANCE OF IMPACT WITH MITIGATION
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<p><b>GEOLOGY AND SOILS</b></p> <ul style="list-style-type: none"> <li>The area within where the site falls is classified as a Minor Aquifer within a broader area of moderate yield potential of variable water quality and therefore is not considered to be part of an important groundwater supply aquifer on which this area is dependent on for general water supply.</li> <li>The site is naturally well draining towards the well-developed drainage lines. It can be expected that groundwater seepage will occur at the interface between the transported soils and the residual soils and/or bedrock, particularly during or after period of heavy rainfall, particularly along the defined valley lines.</li> <li>Both colluvial and residual soils will be suitable for use only as general fill for earthworks and common backfill for excavations or trenches, and landscaping purposes.</li> <li>It can be expected that during rainy periods these subgrade soils will become soft and boggy and impassable to traffic.</li> <li>Percolation test results indicate that the site is generally suitable for the use of septic tank soakaway systems, with the majority of test results showing that the in situ soils have relatively good percolation characteristics.</li> <li>The site has variable percolation rates, in the range of 36 to 312 mm/hour. It can be concluded that the majority of</li> </ul>	<ul style="list-style-type: none"> <li>The excavation of all material must be at least 1.5 mbegl will generally require Soft Excavation.</li> <li>All temporary excavations to a maximum depth of 1.50 m should be created with a batter slope not steeper than 1V:1.5H. Excavations deeper than this, or which are steeper sided, should be shored. Wet weather or groundwater seepage may cause stability problems and it will be important to review the temporary support requirements by carrying out daily inspections.</li> <li>It is recommended that site specific geotechnical investigations be carried out for new houses or development node areas to confirm founding conditions and suitability of septic tank soakaway systems.</li> <li>Given the large variability in results observed, a conservative value of application of effluent of 60 l/m2/day is recommended for design.</li> <li>In the area where poor percolation test results were recorded (TP7), septic tank-soakaway systems should not be entertained. Similar, localised areas with poor percolation rates are likely to be encountered elsewhere and it is recommended that additional percolation tests be done to verify areas designated for evapotranspiration.</li> </ul>	Negative, Direct	Partly	Likely	Likely	Partly	Possible	Site	Site	Short-term to Medium-term	Short-term	Medium	Low
<p style="text-align: right;"><b>11 ON KARKLOOF (PTY) LTD</b></p> <p style="text-align: right;">The Old Mushroom Farm Draft Basic Assessment Report</p> <p style="text-align: right;">114</p>													

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				WITHOUT MITIGATION	WITH MITIGATION	WITHOUT MITIGATION	WITH MITIGATION	WITHOUT MITIGATION	WITH MITIGATION	WITHOUT MITIGATION	WITH MITIGATION		
<ul style="list-style-type: none"> <li>Erosion may occur if stormwater measures are not in place to prevent such.</li> <li>If attenuation is not undertaken for the higher volumes of runoff from hardened surfaces, the site may become flooded.</li> </ul>	<ul style="list-style-type: none"> <li>The storm water system must be monitored during construction at regular intervals.</li> <li>Rainwater harvesting must be implemented for the development.</li> <li>The operation and maintenance of the storm water system is essential to ensure it functions optimally to prevent damages or failures and must receive high priority from the development maintenance department.</li> <li>The storm water system must be kept separate from the sewerage system.</li> <li>All chemicals, cement, fuel and other hazardous material used during construction should be stored in controlled areas.</li> <li>Concentration of storm water must be prevented where possible, but energy dissipaters should be provided in areas of concentration.</li> <li>On completion of the construction of buildings, roads and parking areas, all remaining exposed embankments and open areas must be vegetated as soon as possible, including the use of 'Soilsaver' where necessary.</li> <li>The attenuation ponds must have some form of a silt trap mechanism.</li> <li>During the construction phase, the ECO must monitor the following:</li> <li>Temporary berms and cut-off drains must be provided on site to collect</li> </ul>	Negative, Direct	Partly	Definitely	Fair	Partly	Partly	Site, Local	Site, Local	Long-Term	Long-term	High	Low
		<ul style="list-style-type: none"> <li>run-off, especially until the attenuation ponds are complete and functional.</li> <li>Silt screens must be provided at the grid inlets / splayed construction during road construction.</li> <li>Topsoil must be conserved on site and prevented from entering the</li> </ul>											

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GROUND WATER	<ul style="list-style-type: none"> <li>The borehole was pumped at a rate of 4 500 l/ph for 24 hours. The water level dropped to a level of 35.71 mbgl.</li> <li>The borehole has a depth of 60.53 m and an available draw down of 44 m, which is acceptable to authenticate a daily abstraction of 99 kl per 24-hour period.</li> <li>The water quality sample results all came back within the SANS 241-2015 parameters, except for a microbial bacteria.</li> </ul>	<ul style="list-style-type: none"> <li>The water must be disinfected with a mild disinfectant to be suitable for human consumption.</li> <li>The site-specific storm water management plan (Appendix D5) must be implemented.</li> <li>The water quality will meet the standards of SANS 241-2015.</li> </ul>	Negative, Direct	Highly Likely	Definitely	Fair	Partly	Possible	Site	Site	Medium-term	Short-term	Medium	Low

DESCRIPTION OF IDENTIFIED ENVIRONMENTAL IMPACT	MITIGATION	NATURE OF IMPACT	DEGREE TO WHICH IMPACT CAN BE MITIGATED	PROBABILITY OF IMPACT OCCURRING		REVERSIBILITY OF IMPACT		EXTENT OF IMPACT		DURATION OF IMPACT		SIGNIFICANCE OF IMPACT WITHOUT MITIGATION	SIGNIFICANCE OF IMPACT WITH MITIGATION
				WITHOUT MITIGATION	WITH MITIGATION	WITHOUT MITIGATION	WITH MITIGATION	WITHOUT MITIGATION	WITH MITIGATION	WITHOUT MITIGATION	WITH MITIGATION		
<p><b>WETLANDS</b></p> <ul style="list-style-type: none"> <li>The present ecological state (PES) HGM Units 1 and 2 are found to be moderately modified (Category C). This translates into a moderate change in ecosystem processes and loss of natural habitats has taken place, although the natural habitat remains predominantly intact.</li> <li>The PES for HGM Units 3 and 4 are found to be largely modified (Category D). This translates into a large change in ecosystem processes and loss of natural habitat and biota and has occurred.</li> <li>HGM Units 1 – 4 scored a Class D (Low) in terms of Ecological Importance and Sensitivity. These wetlands are not considered to be ecologically important and sensitive at any scale. The biodiversity of these wetlands is not usually sensitive to flow and habitat modifications. Although the wetlands do play a slight role in managing the quantity and quality of water onsite to some degree.</li> <li>The proposed site activities will not result in any impact to the wetlands identified.</li> </ul>	<ul style="list-style-type: none"> <li>A standard thirty-two (32m) metre buffer has been applied to the HGM Units identified on site. As the proposed activities do not impact the wetlands on site, a 32 m buffer has been applied to illustrate that no activities in terms of the Basic Assessment Process will intersect the 32 m wetland buffer zone.</li> <li>The following is recommended be undertaken during the Water Use License Application (WULA) phase of the site:</li> <li>A wetland rehabilitation assessment be conducted to ensure the current identified impacts being imparted onto the wetlands are mitigated and the overall integrity and functionality of the wetlands is improved. This is an important component that is advised for all natural areas used for tourism or for the enjoyment of patrons. Additionally, it is a prerequisite for any proposed or current water uses occurring on site. The rehab plan should include, although not limited to: <ul style="list-style-type: none"> <li>Alien Invasive Plant Management Plan;</li> <li>Maintenance Management Plan for HGM Unit 1;</li> <li>Rectification of the drain inserted on HGM Unit 3;</li> <li>Trial crossing solutions; and</li> <li>Exclusionary measures for livestock.</li> </ul> </li> <li>Recreational Management Plan (maintenance of recreational features such as trails, viewing points, wooden crossings, etc., that occur within the wetlands and associated buffers).</li> </ul>	Negative, Direct	Highly Likely	Definitely	Fair	Partly	Possible	Site	Site	Medium-term	Short-term	Medium	Low
<p><b>GREENDOOR ENVIRONMENTAL</b></p>													<p><b>11 ON KARKLOOF (PTY) LTD</b> The Old Mushroom Farm Draft Basic Assessment Report 117</p>

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<b>BIODIVERSITY</b> <ul style="list-style-type: none"> <li>The site is highly modified with infrastructure, pastures, alien plantations and cultivated land.</li> <li>Plants identified outside of the built infrastructure indicated significant disturbance of land across the property, with no remnants of Midlands Mistbelt Grassland.</li> <li>A few vegetation types were identified on site which consisted of alien tree plantation, pastures, cultivated land and wetland vegetation and a dam.</li> <li>The highly modified built environment and historical agricultural activities have made it unlikely that species of conservation concern could be supported on the property.</li> <li>The Screening Tool sensitivity indicated that a large proportion of the site as having High Sensitivity for Animal Species.</li> <li>Evidence of the Common Molerat, Large Grey Mongoose, Water Mongoose, Common Reedbuck, Scrub Hare, Wetland Rodents and Grassland Mice were seen or likely to occur on the property.</li> </ul>	<ul style="list-style-type: none"> <li>The Screening Tool Report identified the Plant Sensitivity for the site as 'Medium'. However, the Biodiversity Specialist has recommended that this be categorised as 'Low'.</li> <li>The wetland constraints identified by the Wetland Specialist must have a 32 m buffer applied, thus a total of 2.49 ha must be excluded from the development footprint.</li> <li>The proposed development layout does not encroach on the wetland or buffer area.</li> <li>With the highly modified site conditions and absence of suitable habitats, a site sensitivity ranking of 'Low' would be more appropriate.</li> <li>Faunal diversity on the property was categorised as Low and does not support the status of High Sensitivity for Animal Species over the property.</li> <li>The importance of the wetland, although a small area, needs to be recognised and appropriate measures for its long-term protection need to be addressed in the EMPr (Appendix E).</li> </ul>	Negative, Direct	Highly likely	Likely	Fair	Partly	Possible	Site	Site	Medium-term	Short-term	Medium	Low

## 8.1 Assessment of Cumulative Impacts

Aspect	Impact Summary	Significance	Proposed Mitigation
LOCAL ECONOMY AND EMPLOYMENT OPPORTUNITIES	<p><b>Direct impacts:</b></p> <ul style="list-style-type: none"> <li>If approved, the proposed development will contribute positively to the local economy and the social environment through spending of capital at local businesses.</li> </ul> <p><b>Indirect impacts:</b></p> <ul style="list-style-type: none"> <li>There will also be skills transferred during the construction phase, which will benefit employed people in the long term when they seek employment elsewhere.</li> </ul> <p><b>Cumulative impacts:</b></p> <ul style="list-style-type: none"> <li>The proposed development will provide employment opportunities and income generation during both the construction and operational phases.</li> </ul>	HIGH POSITIVE	<ul style="list-style-type: none"> <li>Local businesses and unemployed people in the immediate area must be considered first, before employing labour and services from further afield.</li> </ul>
CULTURAL, HISTORICAL AND ARCHAEOLOGICAL RESOURCES	<p><b>Direct impacts:</b></p> <ul style="list-style-type: none"> <li>No fossils or archaeological material were observed on site.</li> </ul> <p><b>Indirect impacts:</b></p> <ul style="list-style-type: none"> <li>None.</li> </ul> <p><b>Cumulative impacts:</b></p> <ul style="list-style-type: none"> <li>Construction work required for the building of the housing units and other additional structures is unlikely to have a significant impact on heritage resources as nothing was observed during the ground survey.</li> </ul>	NEGATIVE DIRECT	<ul style="list-style-type: none"> <li>Should construction or operational activities expose archaeological, palaeontological or historical remains, old graves or fossil material, activities must cease immediately, pending evaluation by the provincial heritage agency and the "chance find protocol" outlined in the PIA (Appendix D6) must be followed. This is in alignment with the South African Heritage Resources Act (SAHRA) (Act 25 of 1999) and the AMAFA Research Institute and Heritage Act (Act 5 of 2018).</li> <li>This is to ensure that developments comply with the law, and to ensure that a rare object / fossil stands a good chance of being recorded and / or relocated, before being damaged or destroyed by site activities.</li> </ul>
VISUAL: SURROUNDING LANDUSE AND AESTHETICS	<p><b>Direct impacts:</b></p> <ul style="list-style-type: none"> <li>Lighting Impacts.</li> </ul> <p><b>Indirect impacts:</b></p> <ul style="list-style-type: none"> <li>Landscape Change: The proposed development could change the character and sense of place of the landscape setting.</li> </ul> <p><b>Cumulative impacts:</b></p> <ul style="list-style-type: none"> <li>Lighting Impacts.</li> </ul>	NEGATIVE DIRECT & INDIRECT	<ul style="list-style-type: none"> <li>The building designs are to comply with SANS standards.</li> <li>Screening is to be utilised where necessary to limit views of construction activities.</li> <li>Wherever possible, the proposed development must make use of natural building materials and architectural styles that blend into the surrounding landscape. An architectural code must be compiled for the development .</li> <li>The use of highly reflective building materials such as corrugated iron and glass must be minimised where possible.</li> <li>Only locally indigenous plant species are to be used for landscaping.</li> <li>An Alien Vegetation Control Programme must be implemented.</li> <li>The Environmental Management Programme (EMPr) (Appendix E) must be implemented.</li> <li>Noise and dust impacts must be controlled.</li> <li>All lighting must face downwards and inwards.</li> </ul>
TRAFFIC	<p><b>Direct impacts:</b></p> <ul style="list-style-type: none"> <li>It is anticipated that the proposed layout will generate approximately 46</li> </ul>	NEGATIVE DIRECT	<ul style="list-style-type: none"> <li>Speed limits along the access roads and roads within the property must be adhered to at all times.</li> </ul>

Aspect	Impact Summary	Significance	Proposed Mitigation
	<p>trips per day.</p> <ul style="list-style-type: none"> <li>In terms of the South African Traffic Impact and Site Traffic Assessment Manual (TMH 16), a Traffic Impact Assessment must be undertaken when "The highest total additional hourly vehicular trip generation (including pass-by and diverted trips) as a result of the application exceeds 50 trips per hour". Therefore, a Traffic Impact Assessment is not required, as the trip generation is less than 50 vehicles per hour.</li> <li>The access off the P141 will need to be upgraded to a Type B1 intersection.</li> <li>Based on the proposed development, a total of 259 parking bays must be provided.</li> <li>The proposed development is expected to generate pedestrian traffic within the main node on the property.</li> </ul> <p><b>Indirect impacts:</b></p> <ul style="list-style-type: none"> <li>None.</li> </ul> <p><b>Cumulative impacts:</b></p> <ul style="list-style-type: none"> <li>None.</li> </ul>		<ul style="list-style-type: none"> <li>Maintenance of the access and internal roads within the property must be undertaken.</li> <li>Vegetation along the access roads must be regularly removed to improve visibility.</li> <li>Sidewalks and pedestrian crossings must be implemented in strategic places.</li> <li>The proposed development will require a new B1 intersection off the P141, subject to approval from the KZN Department of Transport standards and regulations.</li> </ul>
<b>CONSTRUCTION ACTIVITIES, NOISE AND DUST</b>	<p><b>Direct impacts:</b></p> <ul style="list-style-type: none"> <li>Noise nuisances may negatively impact surrounding local residents within the area if mitigation measures are not adequately implemented.</li> <li>Potential impacts on surrounding neighbours associated with noise, dust and air quality nuisances.</li> <li>There may be an increase in noisy activities during both the construction and operational phases.</li> <li>There may be an increase in dusty conditions during the construction phase.</li> </ul> <p><b>Indirect impacts:</b></p> <ul style="list-style-type: none"> <li>None.</li> </ul> <p><b>Cumulative impacts:</b></p> <ul style="list-style-type: none"> <li>Noise nuisances may negatively impact surrounding properties surrounding the property if mitigation measures are not adequately implemented.</li> </ul>	<b>NEGATIVE DIRECT</b>	<ul style="list-style-type: none"> <li>Speed limits within the estate must be adhered to at all times.</li> <li>Dust suppression measures, such as the spraying of water on bare soil, must be undertaken during dry and windy conditions.</li> <li>Dust control can be achieved on the access roads within the property through the application of "Dustex" which is an admixture to the gravel wearing course.</li> <li>Machinery and equipment must be maintained and regularly serviced to ensure that unnecessary noise is prevented.</li> <li>Workers on site must not create unnecessary noise such as hooting or shouting.</li> <li>Speed limits on the access roads and within the property must be adhered to at all times.</li> </ul>
<b>SECURITY</b>	<p><b>Direct impacts:</b></p> <ul style="list-style-type: none"> <li>Security may be required during the construction phase, to manage staff and construction vehicles and materials.</li> <li>Management of construction labourers is often problematic. Potential exists for labourers to trespass onto adjoining properties.</li> <li>Crime in the area could increase during the construction phase, as a result of criminals posing as construction workers, or people seeking employment on the site.</li> <li>Crime in the area may also potentially increase during the operational</li> </ul>	<b>NEGATIVE DIRECT</b>	<ul style="list-style-type: none"> <li>Construction labourers must be sourced from surrounding communities, where possible.</li> <li>All labourers must remain within the boundaries of the construction footprint at all times.</li> <li>Access onto and off the site must be controlled by a register system, this includes visitors.</li> <li>All restricted areas near to and within building sites (i.e. sensitive areas such as wetlands) must be fenced off and demarcated with appropriate warning signage.</li> </ul>



Aspect	Impact Summary	Significance	Proposed Mitigation
	<p>phase, as a result of an influx of people making use of the facilities offered by the development.</p> <ul style="list-style-type: none"> <li>• Criminals may target the facilities restaurant.</li> </ul> <p><b>Indirect impacts:</b></p> <ul style="list-style-type: none"> <li>• Potential exists for labourers to trespass onto adjoining properties.</li> </ul> <p><b>Cumulative impacts:</b></p> <ul style="list-style-type: none"> <li>• Crime in the area may also potentially increase during the operational phase, as a result of the increase in people accessing the Estate including visitors, staff, and service provision contractors posing as people seeking employment onsite.</li> </ul>		
<b>CLIMATE CHANGE</b>	<p><b>Direct impacts:</b></p> <ul style="list-style-type: none"> <li>• The proposed development is not likely to be largely directly impacted by climate change as it is removed from coastal areas, watercourses and flood line areas and is not impacted by temperature changes.</li> </ul> <p><b>Indirect impacts:</b></p> <ul style="list-style-type: none"> <li>• The proposed development may be indirectly affected by climate change where infrastructure traverses or is located in close proximity to watercourses.</li> </ul> <p><b>Cumulative impacts:</b></p> <ul style="list-style-type: none"> <li>• The proposed development may contribute to climate change to a minor extent through energy usage, water usage and waste generation during the construction and operational phases.</li> </ul>	<b>NEGATIVE DIRECT AND INDIRECT</b>	<ul style="list-style-type: none"> <li>• All development infrastructure must promote the efficient use of energy, water and limit wastage of resources.</li> <li>• Waste generation must be minimised and waste must be managed in an environmentally responsible manner and in accordance with the waste management hierarchy . The EMPr (Appendix E) outlines specific waste management mitigation measures which comply with the waste management hierarchy.</li> <li>• The proposed development must be implemented in accordance with approved layout plans which have been planned and assessed to ensure that locations and layouts of least environmental impact and risk are utilised.</li> <li>• The proposed development must ensure the protection of on-site environmental features which thereby protects ecological infrastructure important for building climate change resilience.</li> </ul>
<b>GEOLOGY AND SOILS</b>	<p><b>Direct impacts:</b></p> <ul style="list-style-type: none"> <li>• The area within where the site falls is classified as a Minor Aquifer within a broader area of moderate yield potential of variable water quality and therefore is not considered to be part of an important groundwater supply aquifer on which this area is dependent on for general water supply.</li> <li>• The site is naturally well draining towards the well-developed drainage lines. It can be expected that groundwater seepage will occur at the interface between the transported soils and the residual soils and/or bedrock, particularly during or after period of heavy rainfall, particularly along the defined valley lines.</li> <li>• Both colluvial and residual soils will be suitable for use only as general fill for earthworks and common backfill for excavations or trenches, and landscaping purposes.</li> <li>• It can be expected that during rainy periods these subgrade soils will become soft and boggy and impassable to traffic.</li> <li>• Percolation test results indicate that the site is generally suitable for the</li> </ul>	<b>NEGATIVE DIRECT</b>	<ul style="list-style-type: none"> <li>• The excavation of all material must be at least 1.5 m b egl will generally require Soft Excavation.</li> <li>• All temporary excavations to a maximum depth of 1.50 m should be created with a batter slope not steeper than 1V:1.5H. Excavations deeper than this, or which are steeper sided, should be shored. Wet weather or groundwater seepage may cause stability problems and it will be important to review the temporary support requirements by carrying out daily inspections.</li> <li>• It is recommended that site specific geotechnical investigations be carried out for new houses or development node areas to confirm founding conditions and suitability of septic tank soakaway systems.</li> <li>• Given the large variability in results observed, a conservative value of application of effluent of 60 l/m<sup>2</sup>/day is recommended for design.</li> <li>• In the area where poor percolation test results were recorded (TP7), septic tank-soakaway systems should not be entertained. Similar, localised areas with poor percolation rates are likely to be encountered elsewhere and it is recommended that additional</li> </ul>

Aspect	Impact Summary	Significance	Proposed Mitigation
	<p>use of septic tank soakaway systems, with the majority of test results showing that the insitu soils have relatively good percolation characteristics.</p> <ul style="list-style-type: none"> <li>The site has variable percolation rates, in the range of 36 to 312 mm/hour. It can be concluded that the majority of the site i.e. the area represented by the results of PT1 through PT6 is suitable for the disposal of wastewater and sewage effluent via normal subsoil percolation. i.e. conventional septic tank soakaway systems.</li> <li>Geotechnically, the site is generally suitable for the proposed development of additional housing. There are no fatal flaws from a geotechnical perspective which may significantly curtail or impact on the development of the site.</li> </ul> <p><b>Indirect impacts:</b></p> <ul style="list-style-type: none"> <li>Sediment rich stormwater runoff may enter the surrounding watercourses impacting negatively on these systems.</li> </ul> <p><b>Cumulative impacts:</b></p> <ul style="list-style-type: none"> <li>None.</li> </ul>		<p>percolation tests be done to verify areas designated for evapotranspiration.</p>
SURFACE WATER	<p><b>Direct impacts:</b></p> <ul style="list-style-type: none"> <li>Erosion may occur if stormwater measures are not in place to prevent such.</li> <li>If attenuation is not undertaken for the higher volumes of runoff from hardened surfaces, the site may become flooded.</li> </ul> <p><b>Indirect impacts:</b></p> <ul style="list-style-type: none"> <li>All nearby undisturbed slopes must be protected from erosion by demarcating the construction site. No vehicular or pedestrian access should be allowed beyond the demarcated area.</li> <li>Erosion control measures must be implemented along all roads and at storm water outlets which could be a combination of stone pitching, natural rock, vegetation, silt traps, gabion baskets, energy dissipaters and grass lined drains.</li> </ul> <p><b>Cumulative impacts:</b></p> <ul style="list-style-type: none"> <li>Run-off from roofs should be captured in gutters and stored in rainwater tanks for the utilization of gardening and other domestic activities.</li> </ul>	NEGATIVE DIRECT AND INDIRECT	<ul style="list-style-type: none"> <li>The storm water system must be monitored during construction at regular intervals.</li> <li>Rainwater harvesting should be encouraged for the development.</li> <li>The operation and maintenance of the storm water system is essential to ensure it functions optimally to prevent damages or failures and must receive high priority from the development maintenance department.</li> <li>the storm water system must be kept separate from the sewerage system.</li> <li>All chemicals, cement, fuel and other hazardous material used during construction should be stored in controlled areas.</li> <li>Concentration of storm water should be prevented where possible, but energy dissipaters should be provided in areas of concentration.</li> <li>On completion of the construction of buildings, roads and parking areas, all remaining exposed embankments and open areas must be vegetated as soon as possible, including the use of 'Soilsaver' where necessary.</li> <li>The attenuation ponds must have some form of a silt trap mechanism.</li> <li>During the construction phase, the ECO must monitor the following:</li> <li>Temporary berms and cut-off drains must be provided on site to collect run-off, especially until the attenuation ponds are complete and functional.</li> <li>Silt screens must be provided at the grid inlets / splayed construction during road construction.</li> <li>Topsoil must be conserved on site and prevented from entering the stormwater system.</li> <li>Exposed embankments, cut/fill slopes and open areas must be vegetated as soon as possible to reduce runoff.</li> <li>Dust control during construction must be applied at all times.</li> <li>Excess spoil material from topsoil or bulk earthworks must be placed</li> </ul>

Aspect	Impact Summary	Significance	Proposed Mitigation
			<p>in areas or even removed entirely off site to minimise silt deposition, scouring and soil erosion.</p> <ul style="list-style-type: none"> <li>Post construction, all exposed areas must be covered in vegetation, grass or landscaped.</li> </ul>
WETLANDS	<p><b>Direct impacts:</b></p> <ul style="list-style-type: none"> <li>The present ecological state (PES) HGM Units 1 and 2 are found to be moderately modified (Category C). This translates into a moderate change in ecosystem processes and loss of natural habitats has taken place, although the natural habitat remains predominantly intact.</li> <li>The PES for HGM Units 3 and 4 are found to be largely modified (Category D). This translates into a large change in ecosystem processes and loss of natural habitat and biota and has occurred.</li> <li>HGM Units 1 – 4 scored a Class D (Low) in terms of Ecological Importance and Sensitivity. These wetlands are not considered to be ecologically important and sensitive at any scale. The biodiversity of these wetlands is not usually sensitive to flow and habitat modifications. Although the wetlands do play a slight role in managing the quantity and quality of water onsite to some degree.</li> <li>The proposed site activities will not result in any impact to the wetlands identified.</li> </ul>	NEGATIVE DIRECT	<ul style="list-style-type: none"> <li>A standard thirty-two (32 m) metre buffer has been applied to the HGM Units identified on site. As the proposed activities do not impact the wetlands on site, a 32 m buffer has been applied to illustrate that no activities in terms of the Basic Assessment Process will intersect the 32 m wetland buffer zone.</li> <li>The following is recommended be undertaken during the Water Use License Application (WULA) phase of the site:</li> <li>A wetland rehabilitation assessment be conducted to ensure the current identified impacts being imparted onto the wetlands are mitigated and the overall integrity and functionality of the wetlands is improved. This is an important component that is advised for all natural areas used for tourism or for the enjoyment of patrons. Additionally, it is a prerequisite for any proposed or current water uses occurring on site. The rehab plan should include, although not limited to: <ul style="list-style-type: none"> <li>Alien Invasive Plant Management Plan;</li> <li>Maintenance Management Plan for HGM Unit 1;</li> <li>Rectification of the drain inserted on HGM Unit 3;</li> <li>Trial crossing solutions; and</li> <li>Exclusionary measures for livestock.</li> </ul> </li> <li>Recreational Management Plan (maintenance of recreational features such as trails, viewing points, wooden crossings, etc., that occur within the wetlands and associated buffers).</li> </ul>
	<p><b>Indirect impacts:</b></p> <ul style="list-style-type: none"> <li>None.</li> </ul>		
	<p><b>Cumulative impacts:</b></p> <ul style="list-style-type: none"> <li>None.</li> </ul>		
BIODIVERSITY	<p><b>Direct impacts:</b></p> <ul style="list-style-type: none"> <li>The site is highly modified with infrastructure, pastures, alien plantations and cultivated land.</li> <li>Plants identified outside of the built infrastructure indicated significant disturbance of land across the property, with no remnants of Midlands Mistbelt Grassland.</li> <li>A few vegetation types were identified on site which consisted of alien tree plantation, pastures, cultivated land and wetland vegetation and a dam (refer to Figure 15 below).</li> <li>The highly modified built environment and historical agricultural activities have made it unlikely that species of conservation concern could be supported on the property.</li> <li>The Screening Tool sensitivity indicated that a large proportion of the site as having High Sensitivity for Animal Species.</li> <li>Evidence of the Common Molerat, Large Grey Mongoose, Water Mongoose, Common Reedbuck, Scrub Hare, wetland rodents and grassland mice were seen or likely to occur on the property.</li> </ul>	NEGATIVE DIRECT	<ul style="list-style-type: none"> <li>The Screening Tool Report identified the Plant Sensitivity for the site as 'Medium'. However, the Biodiversity Specialist has recommended that this be categorised as 'Low'.</li> <li>The wetland constraints identified by the Wetland Specialist must have a 32 m buffer applied, thus a total of 2.49 ha must be excluded from the development footprint.</li> <li>The proposed development layout does not encroach on the wetland or buffer area.</li> <li>With the highly modified site conditions and absence of suitable habitats, a site sensitivity ranking of 'Low' would be more appropriate.</li> <li>Faunal diversity on the property was categorised as Low and does not support the status of High Sensitivity for Animal Species over the property.</li> <li>The importance of the wetland, although a small area, needs to be recognised and appropriate measures for its long-term protection need to be addressed in the EMPr (Appendix E).</li> </ul>
	<p><b>Indirect impacts:</b></p>		

Aspect	Impact Summary	Significance	Proposed Mitigation
	<ul style="list-style-type: none"> <li>• None.</li> </ul> <hr/> <p><b><i>Cumulative impacts:</i></b></p> <ul style="list-style-type: none"> <li>• None.</li> </ul>		

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## 9 ENVIRONMENTAL MANAGEMENT PROGRAMME

In terms of the regulations stated in Appendix 4 of Chapter 8 of NEMA GNR 326, 2014 (as amended – 2017 & 2021) an Environmental Management Programme (EMPr) has been compiled (Refer to **Appendix E**), which contains guidelines for ensuring that all activities associated with the proposed development are carried out in an environmentally responsible and acceptable manner. Management objectives and mitigation measures have been specified for the entire duration of the development.

The EMPr is based on the principles of the NEMA as well as the recommendations made in this Report. It identifies roles and responsibilities of management personnel on site and will be used as a framework for environmental compliance monitoring and reporting, should the proposed activity(s) be authorised.

An EMPr is a legally binding document that contains guidelines with which landowners and contractors must comply, and which must be strictly implemented and regularly monitored. If this is done, it is likely that the majority of the potentially adverse impacts associated with proposed activities can be minimised or prevented. An Environmental Control Officer (ECO) should be appointed by the Applicant to ensure compliance with the EMPr during the construction and operational phases. Should non-compliance occur, this must be brought to the attention of the DEDTEA, who will conduct the required prosecution procedure.

Specific management objectives and mitigation measures are specified in the EMPr for the entire duration of the operation, including the following stages:

- Pre-Construction and Planning;
- Construction;
- Post Construction and Rehabilitation,
- Operational / Occupation, and;
- Closure (decommissioning), where relevant.

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## 10 POSITIVE AND NEGATIVE IMPLICATIONS OF THE PROPOSED ACTIVITY

### POSITIVE SUMMARY:

The proposed development:

- Will result in job creation, skills development and transfer and income generation during both the construction and operational phases.
- If approved, the proposed development will contribute positively to the local economy and the social environment through spending of capital at local businesses.
- The proposed development will provide employment opportunities and income generation during both the construction and operational phases.
- There will also be skills transferred during the construction phase, which will benefit employed people in the long term when they seek employment elsewhere.
- The proposed development is in line with the goals and objectives of the UMngeni Local Municipality IDP and the above mentioned national provincial strategies.
- An application in terms of the Subdivision of Agricultural Land Act 70 of 70 (SALA) was submitted by the planner responsible for this application; and subsequently approved.
- Will ensure ongoing protection and management of sensitive habitats on the site.
- Increased property taxes and other revenue for local governments.
- In line with the Municipal SDF's and IDP's.
- Is situated on a site which is too small to be economically viable for crop or livestock production. Thus, a more economically viable activity is being proposed.
- Will not result in a significant increase in traffic along the P141 road.
- No significant biodiversity or wetland impacts are anticipated.

### NEGATIVE SUMMARY:

The proposed development:

- Could result in nuisance impacts, which include noise, dust, aesthetics and lighting, if the mitigation measures are not implemented.
- Could cause security impacts if mitigation measures are not implemented.
- Could potentially cause erosion and contamination of surface water resources, from uncontrolled stormwater runoff from hardened surfaces, if mitigation measures are not implemented.
- Could result in increased spread of alien invasive vegetation if regular alien vegetation clearing is not implemented.
- Could potentially result in negative visual impacts if mitigation measures are not implemented.

### 10.1 Positive and Negative Implications of the Identified Alternatives

#### **(a) The property on which or location where it is proposed to undertake the activity:**

The property and location of the proposed establishment of residential units and hospitality facilities was considered to be suitable for the following reasons:

- It is located in close proximity to the existing Howick CBD.
- It is surrounded by similar existing land uses.
- It will bring additional business and employment opportunities, and subsequently economic growth to the region.
- It is well located in terms of access and visibility along major roads (Karkloof Road).
- It is suitably sized to accommodate the proposed land uses and their required supporting infrastructure, access and parking.
- It will provide much needed housing options, in a region where it is currently lacking.
- The site is already in a transformed and developed state, with various buildings to be converted to the proposed hospitality facilities.

No alternative properties or locations for the establishment of residential units and hospitality facilities have been identified or investigated as part of the project. The reason for this is that the Applicant owns the proposed development site which is well positioned for a development of this nature. As such, the establishment of the proposed development on an alternative property is not desirable or feasible for the Applicant.

**(b) The type of activity to be undertaken:**

Alternative types of activities in the form of other proposed land uses were not considered as the proposed residential units and hospitality facilities offers a land use which is best suited for the site, given that it is consistent with the current surrounding land uses. Additionally, an application in terms of the Subdivision of Agricultural Land Act 70 of 70 was submitted by the Planner responsible for this application; and subsequently approved (**Appendix G4**). It must also be noted that there are established businesses and hospitality enterprises on the property, and to propose and investigate an entirely different type of activity would be non-purposeful and a waste of resources. The EAP is of the opinion that the proposed activity is optimal for the site.

**(c) The design or layout of the activity:**

Refer to Appendix A4 for the Preferred layout plan, **Appendix H1** for Option 2 Alternative 1 and **Appendix H3** for Option 3 Alternative 2. These are high resolution maps.

**Layout**

Three (3) layout options have been assessed:

- 1) Option 1 (Preferred): This layout features 17 Free-standing sectional title houses and associated services (**Figure 7**). Site sizes are approximately 2 000 m<sup>2</sup> with units varying between 230 m<sup>2</sup> and 350 m<sup>2</sup>.
- 2) Option 2 (Alternative 1): This layout was proposed and presented for comment during the planning stage. 22 houses were proposed. No terrace houses are proposed within the existing built-up area in this layout.
- 3) Option 3 (Alternative 2): This layout features a total of 17 proposed new houses on 2 000 m<sup>2</sup> and 1 500 m<sup>2</sup> sites, and 3 proposed new houses on 400 m<sup>2</sup>. 155 parking's are proposed.

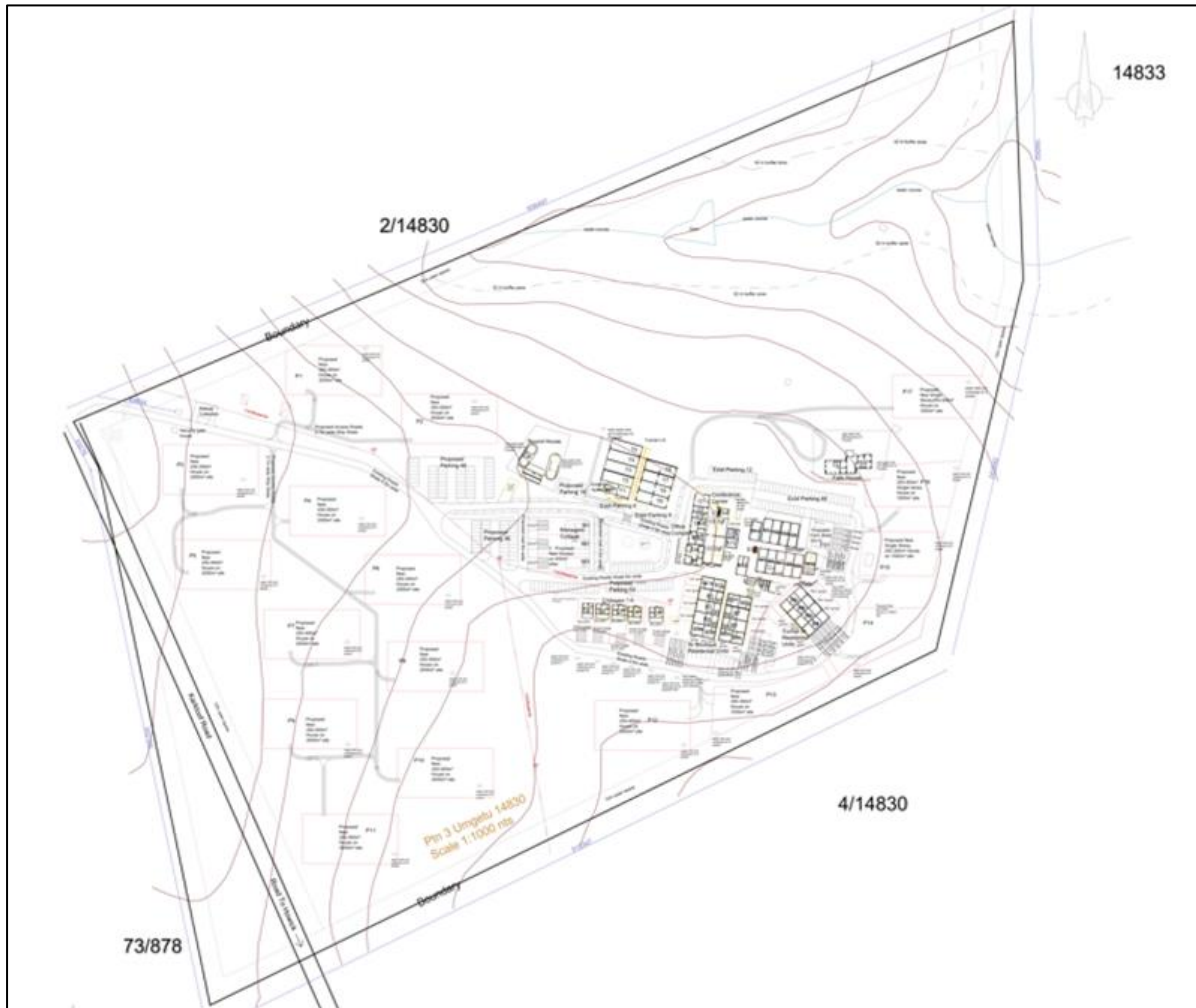
**1) *Option 1 (Preferred)*** (Appendix A4):

This layout features 17 Free-standing sectional title houses and associated services (Figure 7). Site sizes are approximately 2 000 m<sup>2</sup> with units varying between 230 m<sup>2</sup> and 350 m<sup>2</sup>. Refer to Table 7 below for the positives and negatives associated with the preferred layout plan.

**Table 21: Positives and negatives of the preferred layout plan.**

POSITIVE	NEGATIVE
All sites are located well outside of the 32 m wetland buffer.	
All sites will be north facing and thus desirable from an energy efficiency perspective (i.e. natural lighting to heat house) and sales perspective.	
It has a wide range of house sizes varying from 230 m <sup>2</sup> and 350 m <sup>2</sup> . Thus, accommodating a broader range of prospective property owners. As a result, it will be more marketable and will allow for more visual diversity.	
This layout plan utilises existing buildings.	
This layout is optimally designed to meet the needs and designs of the bulk internal services ( <b>Appendix</b>	

D4).



**Figure 20: Preferred layout plan.**

**2) Option 2 - Alternative 1** (Appendix H1):

This layout plan proposes 22 houses on 2 000 m<sup>2</sup> sites. No terrace houses are proposed within the existing built-up area in this layout. Refer to Table 8 below for the positives and negatives of Option 2 Alternative 1.

**Table 22: Positives and negatives of Option 2 Alternative 1 layout.**

POSITIVE	NEGATIVE
Reduced demand on services.	Omits the proposed 16 terraced houses within the existing built-up area.
All sites are located well outside of the 32 m wetland buffer.	Smaller range in house size, thus limiting marketability.
This layout plan utilises existing buildings.	Does not depict the additional required parking areas surrounding the residential tunnels.
	Layout was compiled prior to the specialist studies been conducted.



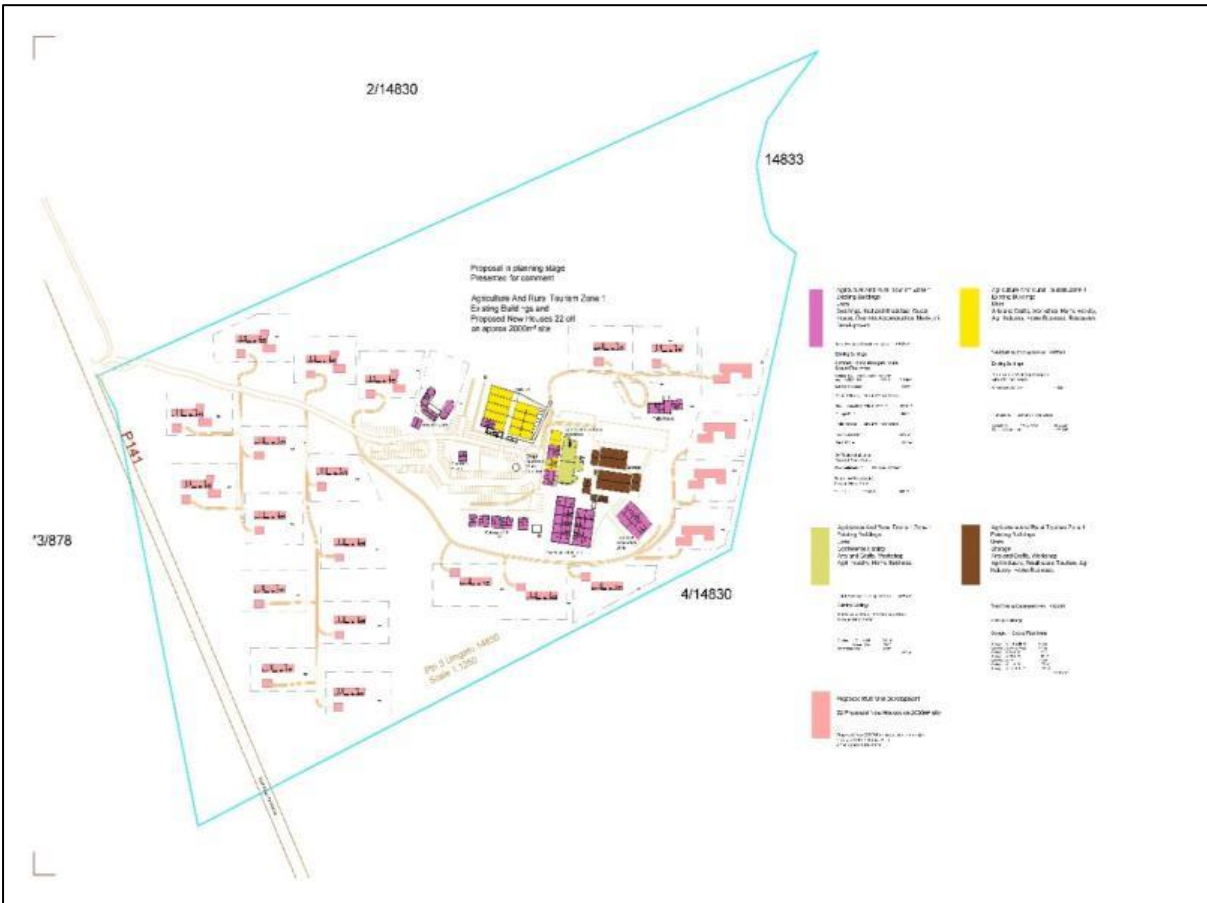


Figure 21: Layout Option 2 - Alternative 1

3) Option 3 – Alternative 2 (Appendix H2)

This layout plan proposes 17 houses on 2 000 m<sup>2</sup> and 1 500 m<sup>2</sup> sites, and 3 proposed houses on 400 m<sup>2</sup>. Refer to Table 9 below for the positives and negatives of Option 3 Alternative 2.

Table 23: Positives and negatives of Option 3 Alternative 2 layout.

POSITIVE	NEGATIVE
Reduce demand on services.	There is limited demand for the smaller plot sizes of 400 m <sup>2</sup> and 1 500 m <sup>2</sup> in the area as people want larger gardens and more space. The smaller plot size does not allow for this.
All sites are located well outside of the 32 m wetland buffer.	Does not show any details of where the house location will be on the plots.
This layout plan utilises existing buildings.	The proposed 400 m <sup>2</sup> plots are located near the existing commercial component, thus noise and lack of privacy could be an issue.

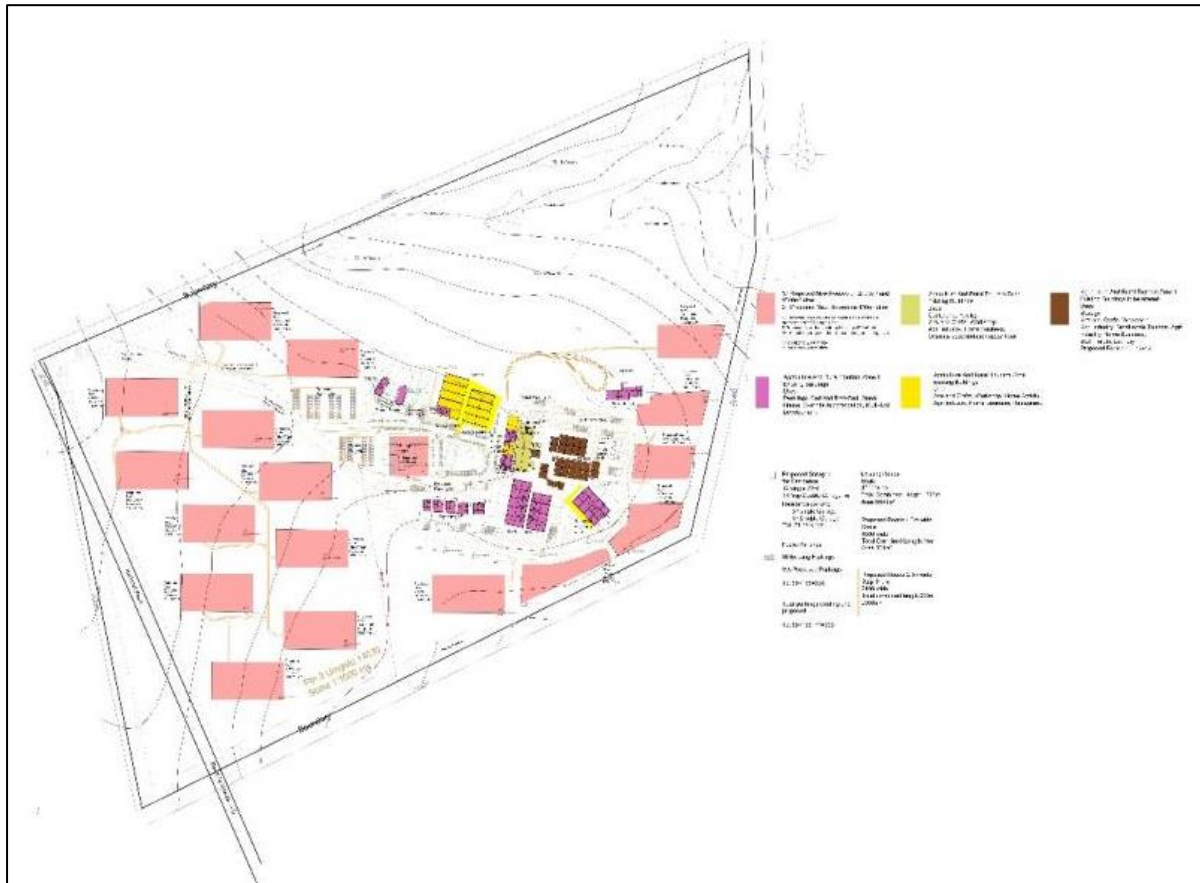


Figure 22: Option 3 - Alternative 2.

**(d) The technology to be used in the activity:**

Alternatives in terms of the technology to be used for the treatment and disposal of effluent at the proposed development were investigated as follows:

**SEWAGE DISPOSAL**

**1. Septic Tank and Soak Away System (Preferred)**

Seven percolation tests were undertaken and confirmed that the site is suitable for on-site sanitation for the disposal of wastewater and effluent via a septic tank and soak away system. The Geotechnical Assessment (Appendix D3) confirmed a recommended rate of application of 60 l/m<sup>2</sup>/day. Percolation Test 7 (PT7) did not pass the test, but it is possible that a suitable area could be found prior to construction, as the sites are far apart and there are large open areas. The rate of application will then be used to determine the length of each soakaway. Where septic tanks serve individual dwellings, it should have a minimum capacity of 1.7 m<sup>3</sup> or 3.5 m<sup>3</sup> where it serves more than one unit.

POSITIVE	NEGATIVE
Cost effective.	Possible water pollution / contamination.
Easy to maintain.	Expensive to clean out with vacuum tanker.
Soils are appropriate for septic tank and soakaways.	Can block if abused with non-biodegradable material.
Only affects one site if not functional/blocked.	

## 2. Sewage Package Plants

Sewage package plants are acceptable but not preferred. Package plants require regular maintenance and monitoring, which must be performed by a specialist supplier. Package plants also require periodic honey suckers. Due to the costs associated with these systems, this is not the preferred wastewater treatment. Thus, a sewage package plant is not desirable for a development of this size, nature and at this location.

POSITIVE	NEGATIVE
Risk of water pollution / contamination is low if maintained.	Expensive to implement and manage.
	Requires regular maintenance.
	Requires electricity to operate. Regular loadshedding occurring would require a backup generator which is expensive to run.
	Not well suited for low flows, can create smell nuisance.
	Requires stilling chamber before entering plant.

## 3. Conservancy Tanks

Conservancy tanks involve wastewater being collected in underground tanks on the site and this effluent being regularly sucked-out by honey sucker and transported by tanker to the nearest registered Wastewater Treatment Works (WWTW) for disposal. The installation of conservancy tanks is not considered economically feasible for this type and size of development due to the costs involved with the regular removal and disposal of waste.

POSITIVE	NEGATIVE
Risk of water pollution / contamination is low.	Expensive to manage.
Closed system with no outlet into ground.	Requires daily maintenance to empty the tank.

### (e) The 'do nothing' option of not implementing the activity:

The 'do nothing' approach will result in The Old Mushroom Farm being retained for its current use and remain in its present state. This option is considered unfeasible for the following reasons:

The proposed development is in line with the uMngeni Local Municipality's IDP and SDF in terms of job creation, attracting investment and developing sectors in the local economy. There is a shortage of land for housing in the province and a high demand for secure housing estates.

Residential development is beneficial as it results in employment opportunities during the construction and operational phase, as well as additional property taxes and other revenue for local government. The income that is generated recycles in the local economy and results in local economic development. The uMngeni Local Municipality SDF recognises the need to promote security of tenure and the provision of housing for a mixture of housing types in different areas; in this case, the proposed development will provide housing for upper income buyers. As such, the establishment of the proposed development will help towards the majority of the Municipality's goals. There is a high consumer demand for housing within the Howick area. The proposed development will also increase the GDP for Howick.

The positive and negative impacts associated with the do-nothing option are summarised in Table 24 below.

**Table 24: Positive and Negative Impacts Associated with the Do-Nothing Option.**

POSITIVE	NEGATIVE
No potential impacts associated with noise, dust, aesthetics and lighting would occur.	No job creation, skills development and income generation will be facilitated during the construction and operational phases.
No potential for accelerated deterioration of the Karkloof road resulting from traffic associated with the development.	Municipal goals and objectives by providing housing within the municipality (directly high income and indirectly low income) will not be contributed to.
No security impacts. However, the development could reduce the possibility of security impacts in the future. i.e. if left undeveloped there is potential of illegal land invasion.	No formal protection and management of sensitive habitats will be implemented on the site.
No potential for soil erosion resulting from the clearance of vegetation and stockpiling of material during the construction phase.	No additional property taxes and other revenue for local governments.
No potential for erosion and contamination of surface water resources from uncontrolled stormwater runoff from hardened surfaces.	Not in line with the Municipal SDF's and IDP's.
No increased risk for the spread of alien invasive vegetation if regular alien vegetation clearing is not implemented.	The site is too small to be economically viable for crop or livestock production. Furthermore, development pressure has raised the value of land in the area to where it cannot be economically used for livestock or crop production.

If the “do nothing” option is selected, none of the above benefits will be realised. In addition, there will continue to be a shortage of housing in the Howick area for those looking to reside in secure housing estates, and there will be no additional generation of employment opportunities and skills development, and the associated income generation and improved quality of life for those who could be potentially employed.

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## 11 EAP RECOMMENDATIONS & CONCLUSION

The EAP wishes to confirm that the information provided in this report is true and based on factual information provided by the specialists and EAP.

Signed:  Date: 25 May 2023

Signed:  Date: 18 July 2023

### Recommendations:

#### Safety

- Construction labourers should be sourced from surrounding communities.
- All construction labourers must remain within the boundaries of the construction footprint at all times.
- Access onto and off the site during construction must be controlled by a register system. This includes visitors.
- All restricted areas of the property must be designated with appropriate warning signs.
- During the operational phase the facility operators must be responsible for employing a security firm to provide security on the property if deemed necessary.
- The approved EMPr must be strictly enforced. During the construction phase, the activities should be monitored on a monthly basis by an independent Environmental Control Officer (ECO).
- All restricted areas (e.g. conservation area) of the construction site must be designated with appropriate warning signs and hazard tape / orange fencing – where relevant.

#### Construction of Infrastructure

- Construction areas must only be cleared of vegetation immediately prior to the commencement of construction, in order to reduce the period which soils are exposed.

#### Traffic

- Speed limits along the access roads and roads within the property must be adhered to at all times.
- Maintenance of the access and internal roads within the property must be undertaken.
- Vegetation along the access roads must be regularly removed to improve visibility.
- Sidewalks and pedestrian crossings must be implemented in strategic places.
- The proposed development will require a new B1 intersection off the P141, subject to approval from the KZN Department of Transport standards and regulations.

#### **Specialist Studies:**

All recommendations contained within the following specialist's reports must be adhered to, where relevant:

- Biodiversity Assessment (**Appendix D1**).
- Wetland Assessment (**Appendix D2**).
- Geotechnical Assessment (**Appendix D3**).
- Engineering Report (**Appendix D4**).
- Storm Water Management Plan (**Appendix D5**).
- Heritage Impact Assessment & Phase 1 Palaeontological Impact Assessment (**Appendix D6**).

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These are summarized in Section 7 of this report, and in the EMPr.

### **Biodiversity**

- The importance of the wetland, although a small area, needs to be recognised and appropriate measures for its long-term protection need to be addressed in the EMPr (**Appendix E**).
- An indigenous vegetation plan must be compiled and used for landscaping.

### **Wetland**

- The following is recommended be undertaken during the Water Use License Application (WULA) phase of the site:
- A wetland rehabilitation assessment be conducted to ensure the current identified impacts being imparted onto the wetlands are mitigated and the overall integrity and functionality of the wetlands is improved. This is an important component that is advised for all natural areas used for tourism or for the enjoyment of patrons. Additionally, it is a prerequisite for any proposed or current water uses occurring on site. The rehab plan should include, although not limited to:
  - Alien Invasive Plant Management Plan;
  - Maintenance Management Plan for HGM Unit 1;
  - Rectification of the drain inserted on HGM Unit 3;
  - Trial crossing solutions; and
  - Exclusionary measures for livestock.
- Recreational Management Plan (maintenance of recreational features such as trails, viewing points, wooden crossings, etc., that occur within the wetlands and associated buffers).

### **Heritage**

- Should construction or operational activities expose archaeological, palaeontological or historical remains, old graves or fossil material, activities must cease immediately, pending evaluation by the provincial heritage agency and the “chance find protocol” outlined in the PIA (Appendix D6) should be followed.

### **Geotechnical**

- All temporary excavations to a maximum depth of 1.5 m must be created with a batter slope not steeper than 1V:1.5H. Excavations deeper than this, or which are steeper sided, should be shored. Wet weather or groundwater seepage may cause stability problems and it will be important to review the temporary support requirements by carrying out daily inspections.
- Site specific geotechnical investigations must be carried out for new houses or development node areas to confirm founding conditions and suitability of septic tank soakaway systems.
- Given the large variability in results observed, a conservative value of application of effluent of 60 l/m<sup>2</sup>/day is recommended for design.
- In the area where poor percolation test results were recorded (TP7), septic tank-soakaway systems should not be entertained. Similar, localised areas with poor percolation rates are likely to be encountered elsewhere and it is recommended that additional percolation tests be done to verify areas designated for evapotranspiration.

### **Storm Water Management**

- The storm water system must be designed to have minimal impact on the natural drainage areas.
- Storm water should be collected into areas where it can be managed and released efficiently using techniques which will protect and preserve existing natural drainage areas.
- Rainwater harvesting must be implemented.
- The storm water system must be kept separate from the sewerage system.
- All chemicals, cement, fuel and other hazardous material used during construction should be

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stored in controlled areas.

- On completion of the construction of buildings, roads and parking areas, all remaining exposed embankments and open areas must be vegetated as soon as possible, including the use of “Soilsaver”, where necessary.
- The attenuation ponds must have some form of a silt trap mechanism.
- During the construction phase, the following aspects must be closely monitored by the ECO to ensure the contractor complies:
  - Temporary berms and cut-off drains must be provided on site to collect run-off, especially until the attenuation ponds are complete and functional.
  - Silt screens must be provided at the grid inlets / splayed construction during road construction.
  - Topsoil must be conserved on site and prevented from entering the stormwater system.
  - Exposed embankments, cut/fill slopes and open areas must be vegetated as soon as possible to reduce runoff.
  - Dust control during construction must be applied at all times.
  - Excess spoil material from topsoil or bulk earthworks must be placed in areas or even removed entirely off site to minimise silt deposition, scouring and soil erosion.

#### **Other**

- An Architectural Code must be compiled for the development which takes into consideration green design principles.

#### **CONCLUSION**

The proposed development does not feature major sensitive environmental features. The four identified wetlands on the property are located over 90 m away from the proposed activities and are deemed to be isolated systems. In terms of the biodiversity of the site, the site is highly modified due to the built environment and historical agricultural activities occurring on site. Additionally, the proposed development is in line with the municipal SDF and IDP. It has been confirmed that the site is too small to sustain profitable agricultural activities. Specialists have concluded that the site does not have any sensitive ecological features. Thorough mitigation measures have been included in this report, and the EAP is of the opinion that little to no negative impacts will occur if these measures are fully implemented.

The EAP concludes that no fatal flaws have been identified during the environmental process and, provided the EMPr and recommendations made in this report are strictly adhered to, there should be no significant, detrimental impacts on the environment. In fact, there are many positive ecological and socio-economic impacts associated with the approval of this development.