



**Client
Project**

MLANGENI FAMILY TRUST
BELFAST MALL AND MIXED USE
DEVELOPMENT - DRAFT EIAR
FEBRUARY 2019

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MLANGENI FAMILY TRUST
BELFAST MALL AND MIXED USE DEVELOPMENT
DRAFT ENVIRONMENTAL IMPACT ASSESSMENT
REPORT
EIA Ref No. 1/3/1/16/1N-121

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DEFINITIONS

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 the-

- a) property on which or location where the activity is proposed to be undertaken;
 - b) type of activity to be undertaken;
 - c) design or layout of the activity;
 - d) technology to be used in the activity; or
 - e) operational aspects of the activity;
- and includes the option of not implementing the activity.

Application

An application for an Environmental Authorisation (EA).

Buffer Area

Unless specifically defined, means an area extending 10 kilometres from the proclaimed boundary of a world heritage site or national park and 5 kilometres from the proclaimed boundary of a nature reserve, respectively, or that defined as such for a biosphere.

Cumulative Impact

In relation to an activity, means the past, current and reasonably foreseeable future impact of an activity, considered together with the impact of activities associated with that activity, that in itself may not be significant, but may become significant when added to the existing and reasonably foreseeable impacts eventuating from similar or diverse activities.

Development

The building, erection, construction or establishment of a facility, structure or infrastructure, including associated earthworks or borrow pits, that is necessary for the undertaking of a listed or specified activity, including any associated post development monitoring, but excludes any modification, alteration or expansion of such a facility, structure or infrastructure, including associated earthworks or borrow pits, and excluding the redevelopment of the same facility in the same location, with the same capacity and footprint.

Development footprint

Any evidence of physical alteration as a result of the undertaking of any activity.

EAP

An environmental assessment practitioner as defined in section 1 of NEMA.

EMPr

An environmental management programme contemplated in regulations 19 and 23 of the EIA Regulations, 2014.

Environment

The surroundings (biophysical, social and economic) within which humans exist and that are made up of:

- (i) the land, water and atmosphere of the earth;
- (ii) micro-organisms, plant and animal life;
- (iii) any part or combination of (i) and (ii) and the interrelationships among and between them; and

- (iv) the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and wellbeing.

Environmental Impact Assessment

A systematic process of identifying, assessing and reporting environmental impacts associated with an activity and includes Basic Assessment and Scoping and Environmental Impact Reporting processes.

Environmental Impact Assessment Report

A report contemplated in regulation 23 of the EIA Regulations, 2014.

Independent

In relation to an EAP, a specialist or the person responsible for the preparation of an environmental audit report, means-

- a) that such EAP, specialist or person has no business, financial, personal or other interest in the activity or application in respect of which that EAP, specialist or person is appointed in terms of the EIA Regulations; or
- b) that there are no circumstances that may compromise the objectivity of that EAP, specialist or person in performing such work;

excluding -

- (i) normal remuneration for a specialist permanently employed by the EAP; or
- (ii) fair remuneration for work performed in connection with that activity, application or environmental audit.

Indigenous Vegetation

Vegetation consisting of indigenous plant species occurring naturally in an area, regardless of the level of alien infestation and where the topsoil has not been lawfully disturbed during the preceding ten years.

Industrial Complex

An area used or zoned for industrial purposes, including bulk storage, manufacturing, processing or packaging purposes.

Mitigation

To anticipate and prevent negative impacts and risks, then to minimise them, rehabilitate or repair impacts to the extent feasible.

Phased Activities

An activity that is developed in phases over time on the same or adjacent properties to create a single or linked entity.

Plan of Study for Environmental Impact Assessment

A study contemplated in regulation 22 of the EIA Regulations that forms part of a Scoping Report and sets out how an Environmental Impact Assessment will be conducted.

Registered Interested and Affected Party

In relation to an application, means an Interested and Affected Party whose name is recorded in the register opened for that application in terms of regulation 42 of the EIA Regulations, 2014.

Scoping Report

A report contemplated in regulation 21 of the EIA Regulations, 2014.

S&EIR

The scoping and environmental impact reporting process contemplated in regulation 21 to regulation 24 of the EIA Regulations, 2014.

Significant Impact

An impact that may have a notable effect on one or more aspects of the environment or may result in non-compliance with accepted environmental quality standards, thresholds or targets and is determined through rating the positive and negative effects of an impact on the environment based on criteria such as duration, magnitude, intensity and probability of occurrence.

Specialist

A person that is generally recognised within the scientific community as having the capability of undertaking, in conformance with generally recognised scientific principles, specialist studies or preparing specialist reports, including due diligence studies and socio-economic studies.

Systematic Biodiversity Plan

A plan that identifies important areas for biodiversity conservation, taking into account biodiversity patterns (i.e. the principle of representation) and the ecological and evolutionary processes that sustain them (i.e. the principle of persistence). A systematic biodiversity plan must set quantitative targets/thresholds for aquatic and terrestrial biodiversity features in order to conserve a representative sample of biodiversity pattern and ecological processes.

Watercourse

- (a) a river or spring;
 - (b) a natural channel in which water flows regularly or intermittently;
 - (c) a wetland, pan, lake or dam into which, or from which, water flows; and
- 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

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 adapted to life in saturated soil.

ABBREVIATIONS

BID	-	Background Information Document
CRR	-	Comments and Response Report
DWS	-	Department of Water and Sanitation
EA	-	Environmental Authorisation
EAP	-	Environmental Assessment Practitioner
EIA	-	Environmental Impact Assessment
EIR	-	Environmental Impact Report
EMF	-	Environmental Management Framework
EMP	-	Environmental Management Programme
GN	-	Government Notice
I&AP	-	Interested and Affected Party
IWULA	-	Integrated Water Use Licence Application
NEMA	-	National Environmental Management Act, Act No. 107 of 1998, as amended
NEM:WA	-	National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)
NHRA	-	National Heritage Resources Act, Act No. 25 of 1999
MDARDLEA	-	Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs, Mpumalanga
R	-	Regulation
SAHRA	-	South African Heritage Resources Agency
S&EIR	-	Scoping and Environmental Impact Reporting

1. PROJECT TITLE

Belfast Mall and Mixed Use Development.

2. APPLICANT DETAILS

Applicant Name	Mlangeni Family Trust
Contact Person	Mr Oscar Nkosi
Postal Address	PO Box 571, Belfast, 1100
Telephone Number	013 697 5322
Fax Number	013 253 1884
Email Address	onnkosi35@gmail.com

3. ENVIRONMENTAL ASSESSMENT PRACTITIONER DETAILS

Environmental Assessment Practitioner Company	Labesh (Pty) Ltd
Contact Person	Lourens de Villiers
Postal Address	Postnet Box 469, Private Bag X504, Sinoville, 0129
Telephone Number	082 789 6525
Fax Number	086 552 6837
Email Address	admin@labesh.co.za and lourens@labesh.co.za
Qualifications	B.Sc Earth Science (North West University) Hons B.Sc Geography and Environmental Studies (North West University) M.Sc Water Resource Management (University of Pretoria)
Relevant experience	More than 15 years' experience conducting Environmental Impact Assessment processes

The EAP's Curriculum Vitae is attached to this report under Appendix E.

4. LOCATION OF THE DEVELOPMENT FOOTPRINT

The properties for the proposed development and its associated activities are as follows:

Property/Land Parcel	21 digit Surveyor General Code
The Remainder of the Farm Bergendal 981, J.T.	T0JT00000000098100000
The Remainder of Portion 12 of the Farm Wemmershuis 379, J.T.	T0JT00000000037900012

The project location is 3km to the South-east of Belfast, in the Emakhazeni Local Municipality, Nkangala District Municipality, Mpumalanga Province. Access to the project properties is from the R33 (South of the N4). The GPS coordinates for the project site are as follows:

25°43'1.42"S; 30° 4'15.71"E

A locality map, provided on the next page, shows the location of the two project properties, at an appropriate scale.

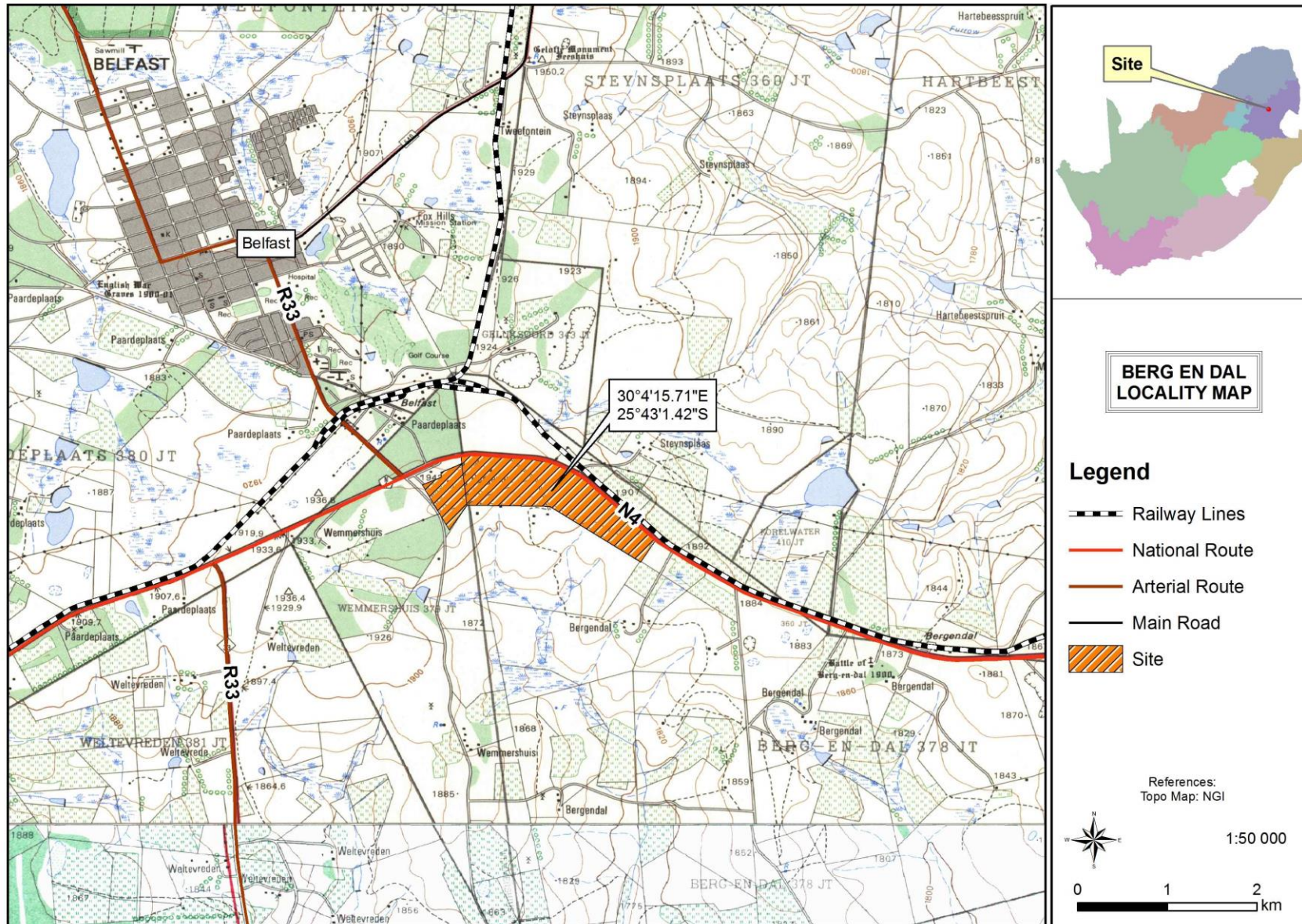


Figure 1: Site locality map

The following photos give an indication of the current status of the project properties. More photographs are given under Appendix B.



5. SCOPE OF THE PROPOSED DEVELOPMENT AND ACTIVITIES

5.1 Description of the activities to be undertaken

Agriculturally related buildings are currently present at the project site and agricultural activities, such as livestock grazing, take place on site. The proposed project will entail an upmarket, mixed land use development for the promotion of tourism and economic growth on the following properties:

- Remainder of the Farm Bergendal 981, Registration Division J.T., Province of Mpumalanga; and
- Remainder of Portion 12 of the Farm Wemmershuis 379, Registration Division J.T., Province of Mpumalanga.

The two project properties are 117.5729ha in extent. Of this land, 11.4324ha will be kept as “open space”. 52.2357ha will remain as “agricultural” land. The area of land that will be developed is therefore 53.9048ha.

The proposed development will consist of the following land uses and the allocation towards the different land uses is given in *Table 1*:

- Medium density residential;
- High density residential;
- Agriculture;
- Institutional;
- Mixed use;
- Industrial;
- Open space;
- Utilities; and
- Streets/public roads.

Table 1: Land use differentiation and density units per hectare of the proposed development

Proposed uses	Number of Erven	Size (ha)	Height	Coverage	FAR
Medium Density Residential	161	8.5008	2 storeys	50%	0.5
High Density Residential	2	9.6774	2 storeys	50%	0.5
Agriculture	6	52.2357	As approved by Council	As approved by Council	As approved by Council
Institutional	7	1.4025	As approved by Council The norm is 2 storeys	Institutional uses: 70% Education facilities: 40%	Institutional uses: 1.2 Education facilities: 0.6
Mixed Use	36	18.9075	2 storeys or as approved by Council	50%	0.8
Industrial	9	2.3753	2 storeys	40%	0.6
Open Space	6	11.4324	As approved by Council	As approved by Council	As approved by Council
Utilities	1	0.1915	As approved by Council	As approved by Council	As approved by Council
Street		12.8498	N/A	N/A	N/A

The following specific land uses have been identified as part of the proposed development:

- A business node, consisting of a shopping centre/mall that will host various shops, restaurants and general stores. Services like a clinic and doctor's rooms will be accommodated directly across from the shopping centre. The area to the north of the shopping centre will cater for other small businesses and/or office buildings;
- A small industrial centre;
- An Industrial Park with two access points to make the movement of trucks easy and practical. The Industrial Park is recommended for use as a distribution depot, as Belfast is centrally situated within Mpumalanga;
- A Disaster Management Centre (within the Industrial Park), with good road access. The only other Disaster Management Centre is in Nelspruit. This proposed centre will provide additional support and is also strategically located between Emalahleni/Steve Tshwete and Nelspruit. A Public and Private Partnership is proposed for the centre;
- Within the Medium Density Residential area, it is proposed for the street portion to function as an activity street, in order to promote walking or biking instead of relying on vehicle transportation. The land uses that will feature along this activity spine will be focussed on attracting tourists to the area by featuring various cultural and heritage related shops and kiosks, restaurants and coffee shops, parks with trout dams and picnic areas, general stores, a wedding venue, chapel and lodge;
- The two agriculturally zoned properties central in the development will be utilised for a nursery and farmyard, respectively. The farmyard will primarily be an attraction for kids where they can learn about smaller farm animals and have an opportunity to feed and touch them, while the nursery will have various native plants, trees and some vegetables for sale;
- Erf 218, which is situated east of the residential area and directly north of the "High Density Residential" erven, will feature a park site with various entertainment functions, a trout dam and coffee shop, playgrounds and picnic areas. This area is proposed as a large 'get-together' area for residents as well as tourists and families traveling through Belfast and promotes walking or biking instead of being reliant on vehicle transportation;
- South of the ring road are two "Higher Density Residential" erven that will accommodate higher density flats or sectional title dwelling units;
- To the east thereof are agricultural holdings that will be utilised for small scale agricultural activities in the form of grazing for horses or developed as urban agricultural units; and
- East of the proposed farm yard and residential development a "Lekgotla" (Meeting Place) Convention Centre is proposed. The proposed centre will cater for conference facilities and events such as cultural gatherings, meetings, training, functions and workshops with low-key high-tech support.

Ultimately, the proposed township can be regarded as sustainable as it provides various job opportunities as well as housing options, all situated in close proximity and within walking distance of each other. This development also promotes tourism development and growth within Emakhazeni town and the greater municipal area as it is situated along the Maputo Corridor, which is earmarked for tourism development according to the Emakhazeni Spatial Development Framework, 2015, and would be visible to passers-by while providing easy access from the N4 and D1477 off-ramp.

The following was identified within the Breaking New Ground Policy as having high importance in developing sustainable human settlements and has been taken into account for this proposed development:

- Citizens should live in safe and secure environments and have adequate access to economic opportunities, a mix of safe and secure housing and tenure types, reliable and affordable basic services, educational, entertainment and cultural activities, and health, welfare and police services;
- Ensure that low-income housing is provided in close proximity to areas of opportunity;
- Ensure the development of compact, mixed land use, diverse, life-enhancing environments;
- Ensure the development of more integrated, functional and environmentally sustainable human settlements, towns and cities; and

- A multi-purpose cluster concept should be applied to ensure the sustainable provision of primary municipal facilities, such as parks, playgrounds, sports fields, crèches, community halls, taxi ranks, satellite police stations, municipal clinics and informal trading facilities.

It is proposed for the development to be a country style development, similar to that shown in the figure below:



Figure 2: Illustrative building style of the proposed development

The following were taken into consideration with regard to the design of the layout plan and buildings to be incorporated into the proposed development:

Creating a sense of place

"A sense of place is a unique collection of qualities and characteristics – visual, cultural, social, and environmental – that provide meaning to a location. Sense of place is what makes one city or town different from another, but sense of place is also what makes our physical surroundings worth caring about."

McMahon argues that planners need to concentrate less time focused on facts and figures and more attention on defining and developing the distinct characteristics and quirks that make a city its own. Joseph Cortright, a leading economic development authority says that "the unique characteristics of place may be the only truly defensible source of competitive advantage for communities."

Existing buildings on site

The existing buildings on site are uniquely characteristic to buildings commonly found within the country side and the character of these buildings will be incorporated in the proposed design of the structures. Some of these structures will be kept, modified and renovated to house various land uses and contribute to the cultural and aesthetic nature of the proposed development.

Adjacent to the project property are the following land uses:

- North: Agricultural land, the Belfast train station and Emakhazeni town;
- East: Agricultural Land;
- South: Agricultural Land; and
- West: Agricultural Land.

5.1.1 Roads and Storm Water

Access

It is proposed that access to the proposed development will be granted directly opposite the R33. The access is situated approximately 350m from the southern terminal of the N4 and R33/Road D1477 interchange. It was requested that the intersection layout be a “butterfly” configuration with free flow movement on R33/Road D1477. In addition, it was agreed that the southern leg of R33/Road D1477 (gravel road) will be closed. The proposed access will be the only access to the development. Refer to the Traffic Impact Assessment, attached under Appendix D, for more information.

Services like storm water, sewerage and water, as well as telecommunication and electricity will be accommodated in the road servitudes. These services will be accommodated according to the protocol set by Emakhazeni Local Municipality in terms of positioning in the servitudes.

Surface Drainage

The road layout of the development lends itself to an adequate drainage system, as sufficient material slopes exist. There is a watershed running through the site, dividing the area into one small area (western) and one large area (eastern). The storm water from the western area will be taken to the national road reserve and the storm water from the remaining eastern area will be taken to a retention pond and be distributed to the agricultural holdings.

Storm water will be able to drain freely from erven via streets to curb inlets that will be provided on all internal roads and spaced according to topography and catchment size. Storm water lines are accommodated mostly in road reserves and these lines will be designed to also accommodate water runoff from higher lying adjacent townships.

It is not foreseen that any problems will be encountered to accommodate the 1:2 (residential) and 1:5 year (business) return period storms on the roads and sub-surface conduits. Street levels will be designed in such a way that streets act as storm water collectors. Storm water inlets will be placed in such a way that access to the stands is not compromised.

Storm Water Routing

The safe routing of storm water within the development will receive special attention. A retention pond will be considered for this development and the collected water distributed to the agricultural holdings. This requirement for a retention pond shall be in accordance with the bylaws of the Local Authority and shall be provided at the detail design phase. The Emakhazeni Local Municipality’s requirements will be adhered to during the construction of roads and storm water infrastructure.

5.1.2 Water Services

Bulk Water Availability

The impact of this development on the existing bulk water infrastructure will be quantified once the Design Engineer has been appointed for the detail design phase of both the bulk and network water services. The reservoir that supplies Belfast is situated approximately 1.6km north of the proposed development. After liaising with the Local Authority the following information was made available:

Table 2: Available water capacity of the reservoir

Technical Parameter	Estimated value
Capacity of reservoir	4Mℓ/day
Current daily output	3.5 Mℓ/d
Available capacity for the proposed development	0.5 Mℓ/d

It is estimated that the proposed development will require the following demand of water:

Table 3: Required water capacity

Technical Parameter	Estimated value
Estimated total daily demand	0.427 Mℓ/d
Estimated peak flow rate based on a peak factor of 8	39 ℓ/s

It is therefore clear that the existing capacity will meet the demand of the proposed development.

A new pump line will be designed and installed in the existing servitude from the reservoir to the proposed development. The water will be pumped from the main reservoirs by means of a submersible pump that will be installed in the reservoir. The approximate length of the new pipe line is 1.6 km.

The construction of a new reservoir of approximately 1.3Mℓ will be considered on the property to ensure a three day supply of potable and fire water. It was indicated by the Emakhazeni Local Municipality that the intention is to construct a new reservoir site for the possible future High Altitude Training Centre. The reservoir site will be situated at a higher level and closer to the proposed development site, which will enable Emakhazeni Local Municipality to connect the water supply to the new reservoirs site. The current situation in terms of water is, however, adequate for the proposed development.

Internal Water Layout

The layout of the proposed development provides sufficient servitudes for an internal water network. The network will be designed and constructed according to municipal and national standards. All stands will be equipped with separate connections that will allow for internal fire systems as well. Fire water will also be accommodated according to national and municipal standards.

5.1.3 Sewerage

Bulk Sewer Conveying Availability

Taking the contours and watershed into account, the internal water reticulation will be determined. Pump stations will be considered during the detailed design phase to pump sewage to the Municipal Sewage Treatment Works. An onsite sewage package plant will no longer be utilised.

5.1.4 Electricity

The proposed development lies within the Eskom distribution area and therefore does not require the provision of electricity from the Local Authority. The appointed Electrical Engineers, RDV Consulting, submitted an application to Eskom for the interim MV load of 1 200 kVA, which is currently available on the Eskom distribution network in the area.

If additional load is required, it would require the upgrade of the Eskom substation in Belfast. RDV Consulting discussed this with Eskom and accepted the offer to take the available 1 200 kVA until such time that the additional capacity is required. When the additional capacity becomes necessary an additional application will be lodged to Eskom. The estimated demand of Phase 1 of the proposed development is calculated as follow:

Table 4: Electricity Load Estimate - Phase 1

Proposed use	Area	Units	Loading
Shopping Centre	3.6493 Ha	1	500 kVA
Mixed use (50 kVA each)	4.3082 Ha	7	350 kVA
Medium Density Residential (5 kVA each)	1.6251 Ha	31	155 kVA
TOTAL	9.5826 Ha	39	1 005 kVA

The estimated demand for Phase 2 of the proposed development will be calculated and an application submitted to Eskom, as mentioned previously.

Once the proposed development is approved, a service report will be prepared in order to allow the finalisation of the services agreement. Electrical Contractors will then be appointed to supply and install the municipal and consumer's electrical networks. The Electrical Engineering Report is attached under Appendix D.

5.1.5 Traffic

WSP SA Civil and Structural Engineers (Pty) Ltd was appointed to conduct the Traffic Impact Study. Based on the traffic count, a common peak hour (busiest hour) was determined for each counted period and was found to be the following:

- Friday AM peak hour: 08h00 – 09h00
- Friday PM peak hour: 16h00 – 17h00

The estimated trip generation for the proposed development is summarised below:

Table 5: Estimated Trip Generation

Land Use	Weekday AM peak	Weekday PM peak
Industrial	0.80 trips per 100 m ² GLA	0.80 trips per 100 m ² GLA
Single Dwelling	1.00 trip per dwelling	1.00 trip per dwelling
Apartment / Flat	0.65 trips per unit	0.65 trips per unit
Pre-school	1.00 trip per pupil	0.80 trips per pupil
Business Centre	1.5 trips per 100 m ² GLA	1.5 trips per 100 m ² GLA

Land Use	Weekday AM peak	Friday PM peak	Saturday Peak
Shopping Centre	0.60 trips per 100m ² GLA	3.4 trips per 100m ² GLA	4.5 trips per 100 m ² GLA

The proposed development is estimated to generate a maximum of 1 052 trips during the Friday AM peak hour and a maximum of 1 887 trips during the Friday PM peak hour.

The Traffic Impact Assessment has detailed the following required upgrades to certain intersections in the vicinity of the site:

- Road D1477 and N4 off-ramp: This intersection needs to be signalised;
- Belfast 1 Stop: This intersection needs to be signalised;
- Road D1477 and R33: This intersection will form the main access to the proposed development and it is proposed that the intersection should be traffic circle controlled; and
- Road D1477 and Site Access 2: This intersection will form the secondary access to the proposed development and it is proposed that it will be priority stop controlled.

It is also recommended that a pair of lay-bys be positioned along Road D1477 at the main access. Furthermore, it is proposed that surfaced pedestrian sidewalks should be provided along the site frontage to facilitate pedestrian movement to and from the site. An on-site multi-modal public transport facility and paved sidewalks along R33/Road D1477 and pedestrian crossings at the N4/R33/Road D1477 and N4/Belfast One-Stop interchange are also proposed. The Traffic Impact Study is attached under Appendix D.

5.1.6 Layout Plan

The proposed Layout Plan is given as *Figure 4* below. The original layout plan is given as *Figure 3*, also below. The layout plan was amended based on SANRAL's requirements in terms of access to the site.



Figure 3: Original layout plan for the proposed development

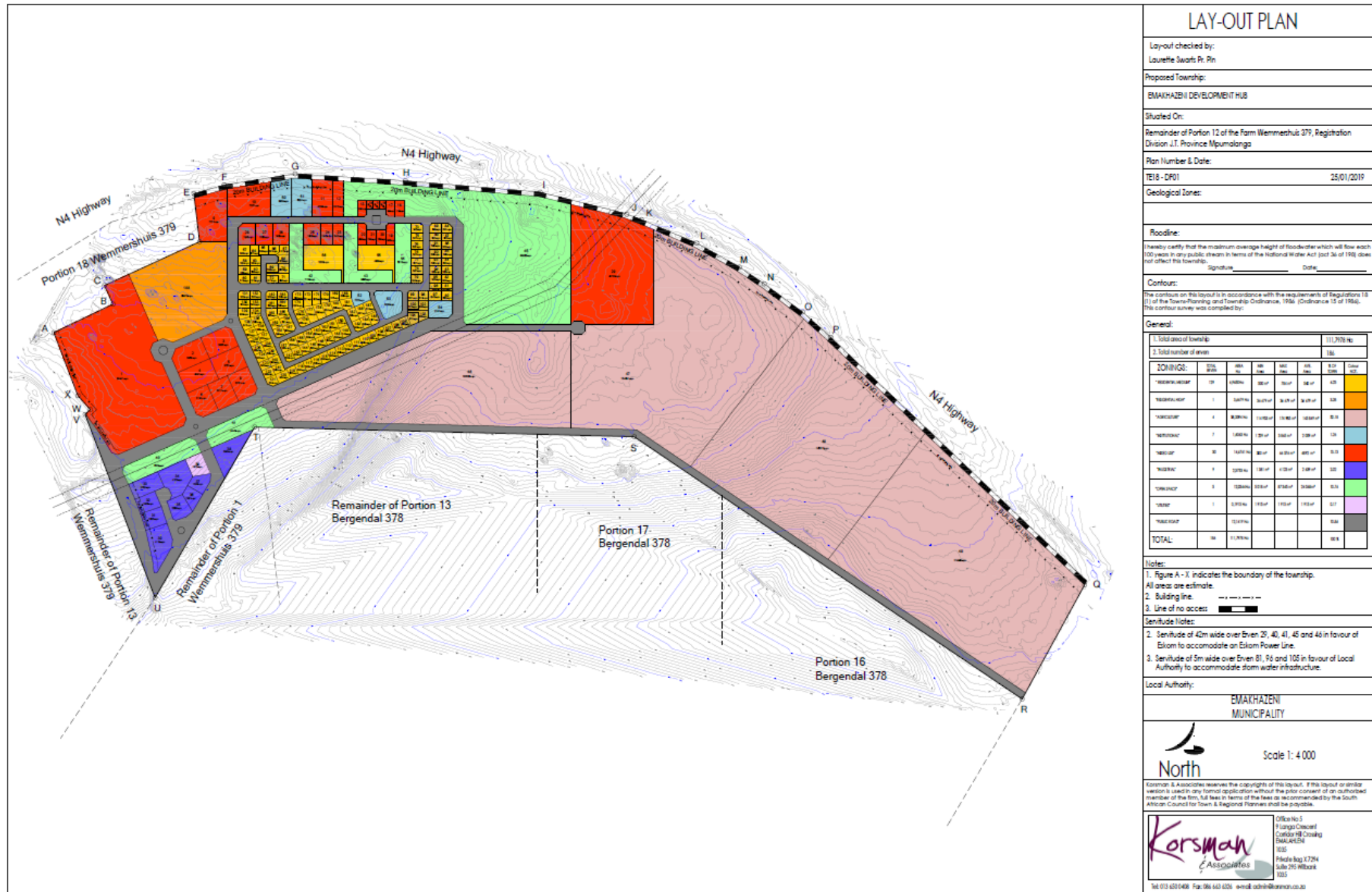


Figure 4: Proposed (current) layout plan for the proposed development

5.2 Listed Activities triggered by the proposed development

The following listed activities are triggered by the proposed development and therefore require Environmental Authorisation, in terms of the Environmental Impact Assessment Regulations of 4 December 2014:

Table 6: Listed activities triggered by the proposed development

Government Notice and Activity Number	Wording as per the Listing Notice	Description as per the project description relating to each listed activity
Government Notice R983 (Listing Notice 1) Activity No. 12	<p>The development of-</p> <p>(i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres; or</p> <p>(ii) infrastructure or structures with a physical footprint of 100 square metres or more;</p> <p>where such development occurs-</p> <p>(a) within a watercourse;</p> <p>(b) in front of a development setback; or</p> <p>(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse;-</p> <p>excluding-</p> <p>(aa) the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour;</p> <p>(bb) where such development activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies;</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>	<p>As part of the proposed development, one or more of the following will be developed within/across a watercourse, in front of a development setback and/or within 32 metres of a watercourse:</p> <ul style="list-style-type: none"> • canals exceeding 100 square metres in size; • channels exceeding 100 square metres in size; • bridges exceeding 100 square metres in size; • dams, where the dam, including infrastructure and water surface area, exceeds 100 square metres in size; • weirs, where the weir, including infrastructure and water surface area, exceeds 100 square metres in size; • bulk storm water outlet structures exceeding 100 square metres in size; • buildings exceeding 100 square metres in size; • boardwalks exceeding 100 square metres in size; and • infrastructure or structures with a physical footprint of 100 square metres or more. <p>The detailed architectural designs for the development will stipulate the structures or infrastructure that will be built within/across or within 32 metres of the dams and valley head seep wetlands onsite.</p>
Government Notice R983 (Listing	The development of a road-	The development of an access road to the development, as well as internal roads. The roads will vary between 5.5m and 10m in width, with

Government Notice and Activity Number	Wording as per the Listing Notice	Description as per the project description relating to each listed activity
Notice 1) Activity No. 24	<p>(i) for which an environmental authorisation was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Government Notice 545 of 2010; or</p> <p>(ii) with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres; but excluding a road-</p> <p>(a) which is identified and included in activity 27 in Listing Notice 2 of 2014;</p> <p>(b) where the entire road falls within an urban area; or</p> <p>(c) which is 1 kilometre or shorter.</p>	<p>street reserves of between 10.5m and 30m in width. It is expected that the roads will be longer than 1km in total.</p>
Government Notice R983 (Listing Notice 1) Activity No. 28	<p>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:</p> <p>(i) will occur inside an urban area, where the total land to be developed is bigger than 5 hectares; or</p> <p>(ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare; excluding where such land has already been developed for residential, mixed, retail, commercial, industrial or institutional purposes.</p>	<p>Residential, mixed use, retail, commercial, industrial and institutional erven will form part of the proposed development. Part of the proposed development will be built on land that was used for agricultural activities. More than 1ha of such land will be used and the project properties are situated outside of an urban area.</p>
Government Notice R983 (Listing Notice 1) Activity No. 45	<p>The expansion of infrastructure for the bulk transportation of water or storm water where the existing infrastructure-</p> <p>(i) has an internal diameter of 0,36 metres or more; or</p> <p>(ii) has a peak throughput of 120 litres per second or more; and</p> <p>(a) where the facility or infrastructure is expanded by more than 1 000 metres in length; or</p> <p>(b) where the throughput capacity of the facility or infrastructure will be increased by 10% or more; excluding where such expansion-</p>	<p>Existing bulk water and storm water infrastructure to the project properties will be expanded upon by more than 1 000 metres. It is likely that the existing bulk infrastructure has an internal diameter of 0.36 metres or more and/or a peak throughput of 120 litres per second or more.</p>

Government Notice and Activity Number	Wording as per the Listing Notice	Description as per the project description relating to each listed activity
	<p>(aa) relates to transportation of water or storm water within a road reserve or railway line reserve; or (bb) will occur within an urban area.</p>	
<p>Government Notice R983 (Listing Notice 1) Activity No. 46</p>	<p>The expansion and related operation of infrastructure for the bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes where the existing infrastructure-</p> <p>(i) has an internal diameter of 0,36 metres or more; or (ii) has a peak throughput of 120 litres per second or more; and</p> <p>(a) where the facility or infrastructure is expanded by more than 1 000 metres in length; or (b) where the throughput capacity of the facility or infrastructure will be increased by 10% or more;</p> <p>excluding where such expansion-</p> <p>(aa) relates to the bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes within a road reserve or railway line reserve; or (bb) will occur within an urban area.</p>	<p>Existing bulk sewage infrastructure to the project properties will be expanded upon by more than 1 000 metres. It is likely that the existing bulk infrastructure has an internal diameter of 0.36 metres or more and/or a peak throughput of 120 litres per second or more.</p>
<p>Government Notice R983 (Listing Notice 1) Activity No. 48</p>	<p>The expansion of-</p> <p>(i) infrastructure or structures where the physical footprint is expanded by 100 square metres or more; or (ii) dams or weirs, where the dam or weir, including infrastructure and water surface area, is expanded by 100 square metres or more;</p> <p>where such expansion occurs-</p> <p>(a) within a watercourse; (b) in front of a development setback; or (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse;</p> <p>excluding-</p>	<p>As part of the proposed development, one or more of the following may be expanded upon by 100m² or more, within/across a watercourse, in front of a development setback and/or within 32 metres of a watercourse:</p> <ul style="list-style-type: none"> • canals; • channels; • bridges; • dams; • weirs; and • bulk storm water outlet structures.

Government Notice and Activity Number	Wording as per the Listing Notice	Description as per the project description relating to each listed activity
	<p>(aa) the expansion of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour;</p> <p>(bb) where such expansion activities are related to the development of a port or harbour, in which case activity 26 in Listing 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 expansion occurs within an urban area; or</p> <p>(ee) where such expansion occurs within existing roads, road reserves or railway line reserves.</p>	<p>The detailed architectural designs for the development will stipulate the structures or infrastructure that will be expanded upon within/across or within 32 metres of the dams and valley head seep wetlands onsite.</p>
<p>Government Notice R983 (Listing Notice 1) Activity No. 56</p>	<p>The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre-</p> <p>(i) where the existing reserve is wider than 13,5 meters; or</p> <p>(ii) where no reserve exists, where the existing road is wider than 8 metres; excluding where widening or lengthening occur inside urban areas.</p>	<p>Existing gravel roads on the project properties will be widened by more than 6 metres and lengthened by more than 1 kilometre. The roads will vary between 5.5m and 10m in width, with street reserves of between 10.5m and 30m in width.</p>
<p>Government Notice R983 (Listing Notice 1) Activity No. 67</p>	<p>Phased activities for all activities-</p> <p>(i) listed in this Notice, which commenced on or after the effective date of this Notice or similarly listed in any of the previous NEMA notices, which commenced on or after the effective date of such previous NEMA Notices; excluding the following activities listed in this Notice- 17(i)(a-d); 17(ii)(a-d); 17(iii)(a-d); 17(iv)(a-d); 17(v)(a-d); 20; 21; 22; 24(i); 29; 30; 31; 32; 34; 54(i)(a-d); 54(ii)(a-d); 54(iii)(a-d); 54(iv)(a-d); 54(v)(a-d); 55; 61; 64; and 65; or</p> <p>(ii) listed as activities 5, 7, 8(ii), 11, 13, 16, 27(i) or 27(ii) in Listing Notice 2 of 2014 or similarly listed in any of the previous NEMA notices, which commenced on or after the effective date of such previous NEMA Notices; where any phase of the activity was below a threshold but where a combination of the phases, including expansions or extensions, will exceed a specified threshold.</p>	<p>The proposed development will be undertaken in two phases.</p>

Government Notice and Activity Number	Wording as per the Listing Notice	Description as per the project description relating to each listed activity
Government Notice R984 (Listing Notice 2) Activity No. 6	<p>The development of facilities or infrastructure for any process or activity which requires a permit or licence or an amended permit or licence in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent, excluding-</p> <p>(i) activities which are identified and included in Listing Notice 1 of 2014;</p> <p>(ii) activities which are included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case the National Environmental Management: Waste Act, 2008 applies;</p> <p>(iii) the development of facilities or infrastructure for the treatment of effluent, polluted water, wastewater or sewage where such facilities have a daily throughput capacity of 2 000 cubic metres or less; or</p> <p>(iv) where the development is directly related to aquaculture facilities or infrastructure where the wastewater discharge capacity will not exceed 50 cubic metres per day.</p>	<p>The proposed development will require a Water Use Licence application, in terms of the National Water Act, 1998, for one or more of the following proposed water use activities:</p> <ul style="list-style-type: none"> • Section 21(a); • Section 21(b); • Section 21(c); and • Section 21(i).
Government Notice R984 (Listing Notice 2) Activity No. 15	<p>The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for-</p> <p>(i) the undertaking of a linear activity; or</p> <p>(ii) maintenance purposes undertaken in accordance with a maintenance management plan.</p>	53.9048ha of vegetation will be cleared for the proposed development.
Government Notice R985 (Listing Notice 3) Activity No. 2	<p>The development of reservoirs, excluding dams, with a capacity of more than 250 cubic metres.</p> <p>f. Mpumalanga</p> <p>ii. Outside urban areas:</p> <p>(dd) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans.</p>	<p>A new 1 300m³ water reservoir will be built.</p> <p>The project properties are outside of an urban area. According to the Mpumalanga Biodiversity Sector Plan, the project properties lie in an area that is designated as a "Critical Biodiversity Area (CBA) Optimal".</p>

Government Notice and Activity Number	Wording as per the Listing Notice	Description as per the project description relating to each listed activity
Government Notice R985 (Listing Notice 3) Activity No. 4	<p>The development of a road wider than 4 metres with a reserve less than 13,5 metres.</p> <p>f. Mpumalanga</p> <p>i. Outside urban areas:</p> <p>(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans.</p>	<p>The development of an access road to the development, as well as internal roads. The roads will vary between 5.5m and 10m in width, with street reserves of between 10.5m and 30m in width.</p> <p>The project properties are outside of an urban area. According to the Mpumalanga Biodiversity Sector Plan, the project properties lie in an area that is designated as a "Critical Biodiversity Area (CBA) Optimal".</p>
Government Notice R985 (Listing Notice 3) Activity No. 6	<p>The development of resorts, lodges, hotels, tourism or hospitality facilities that sleeps 15 people or more.</p> <p>f. Mpumalanga</p> <p>i. Outside urban areas:</p> <p>(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;</p> <p>(hh) Areas within a watercourse or wetland, or within 100 metres of a watercourse or wetland.</p>	<p>A lodge will form part of the proposed development and will be able to accommodate more than 15 people.</p> <p>The project properties are outside of an urban area. According to the Mpumalanga Biodiversity Sector Plan, the project properties lie in an area that is designated as a "Critical Biodiversity Area (CBA) Optimal".</p> <p>The proposed lodge may be located within 100 metres of watercourses (wetlands) onsite.</p>
Government Notice R985 (Listing Notice 3) Activity No. 12	<p>The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.</p> <p>f. Mpumalanga</p> <p>ii. Within critical biodiversity areas identified in bioregional plans.</p>	<p>53.9048ha of vegetation will be cleared for the proposed development.</p> <p>The project properties are outside of an urban area. According to the Mpumalanga Biodiversity Sector Plan, the project properties lie in an area that is designated as a "Critical Biodiversity Area (CBA) Optimal".</p>
Government Notice R985 (Listing Notice 3) Activity No. 14	<p>The development of-</p> <p>(i) dams or weirs, where the dam or weir, including infrastructure and water surface area exceeds 10 square metres; or</p> <p>(ii) infrastructure or structures with a physical footprint of 10 square metres or more;</p> <p>where such development occurs-</p> <p>(a) within a watercourse;</p>	<p>As part of the proposed development, one or more of the following will be developed within/across a watercourse, in front of a development setback and/or within 32 metres of a watercourse:</p> <ul style="list-style-type: none"> • canals exceeding 10 square metres in size; • channels exceeding 10 square metres in size; • bridges exceeding 10 square metres in size;

Government Notice and Activity Number	Wording as per the Listing Notice	Description as per the project description relating to each listed activity
	<p>(b) in front of a development setback; or (c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse; excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour.</p> <p>f. Mpumalanga i. Outside urban areas: (ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans.</p>	<ul style="list-style-type: none"> • dams, where the dam, including infrastructure and water surface area, exceeds 10 square metres in size; • weirs, where the weir, including infrastructure and water surface area, exceeds 10 square metres in size; • bulk storm water outlet structures exceeding 10 square metres in size; • buildings exceeding 10 square metres in size; • boardwalks exceeding 10 square metres in size; and • infrastructure or structures with a physical footprint of 10 square metres or more. <p>The detailed architectural designs for the development will stipulate the structures or infrastructure that will be built within/across or within 32 metres of the dams and valley head seep wetlands onsite.</p> <p>The project properties are outside of an urban area. According to the Mpumalanga Biodiversity Sector Plan, the project properties lie in an area that is designated as a "Critical Biodiversity Area (CBA) Optimal".</p>
<p>Government Notice R985 (Listing Notice 3) Activity No. 18</p>	<p>The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre.</p> <p>f. Mpumalanga i. Outside urban areas: (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans.</p>	<p>Existing gravel roads on the project properties will be widened by more than 4 metres and lengthened by more than 1 kilometre. The roads will vary between 5.5m and 10m in width, with street reserves of between 10.5m and 30m in width.</p> <p>The project properties are outside of an urban area. According to the Mpumalanga Biodiversity Sector Plan, the project properties lie in an area that is designated as a "Critical Biodiversity Area (CBA) Optimal".</p>
<p>Government Notice R985 (Listing</p>	<p>The expansion of- (i) dams or weirs where the dam or weir is expanded by 10 square metres or more; or</p>	<p>As part of the proposed development, one or more of the following may be expanded upon by 10m² or more, within/across a watercourse, in</p>

Government Notice and Activity Number	Wording as per the Listing Notice	Description as per the project description relating to each listed activity
Notice 3) Activity No. 23	<p>(ii) infrastructure or structures where the physical footprint is expanded by 10 square metres or more; where such expansion occurs-</p> <p>(a) within a watercourse;</p> <p>(b) in front of a development setback adopted in the prescribed manner; or</p> <p>(c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse; excluding the expansion of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour.</p> <p>f. Mpumalanga</p> <p>i. Outside urban areas:</p> <p>(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans.</p>	<p>front of a development setback and/or within 32 metres of a watercourse:</p> <ul style="list-style-type: none"> • canals; • channels; • bridges; • dams; • weirs; • bulk storm water outlet structures; • buildings; • boardwalks; and • infrastructure or structures. <p>The detailed architectural designs for the development will stipulate the structures or infrastructure that will be expanded upon within/across or within 32 metres of the dams and valley head seep wetlands onsite. The project properties are outside of an urban area. According to the Mpumalanga Biodiversity Sector Plan, the project properties lie in an area that is designated as a "Critical Biodiversity Area (CBA) Optimal".</p>
Government Notice R985 (Listing Notice 3) Activity No. 26	<p>Phased activities for all activities -</p> <p>i. listed in this Notice and as it applies to a specific geographical area, which commenced on or after the effective date of this Notice; or</p> <p>ii. similarly listed in any of the previous NEMA notices, and as it applies to a specific geographical area, which commenced on or after the effective date of such previous NEMA Notices- where any phase of the activity was below a threshold but where a combination of the phases, including expansions or extensions, will exceed a specified threshold;- excluding the following activities listed in this Notice- 7; 8; 11; 13; 20; 21; and 24.</p>	<p>The proposed development will be undertaken in two phases.</p>

5.3 Water Use Licence Activities

The following proposed water uses require Water Use Registration and/or Licence applications in terms of Chapter 4 of the National Water Act, 1998 (Act No. 36 of 1998):

- Section 21(a): Taking water from a water resource – potential abstraction of groundwater from boreholes;
- Section 21(b): Storage of water – the storage of clean water in a 1.3Mℓ reservoir;
- Section 21(c): Impeding or diverting the flow of water in a watercourse – development/construction within 500m from the boundary of one or both of the two wetlands; and
- Section 21(i): Altering the bed, banks, course or characteristics of a watercourse - development/construction within 500m from the boundary of one or both of the two wetlands.

The required Water Use Registration and/or Licence application will be submitted to the Department of Water and Sanitation in due course.

6. POLICY AND LEGISLATIVE CONTEXT OF THE APPLICATION

The following legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments are applicable to the proposed development and have or will be considered in this full Scoping and Environmental Impact Assessment process.

Legislation

- The Constitution of South Africa, 1996 (Act No. 108 of 1996), as amended
- The National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended
- The Environmental Impact Assessment Regulations of 4 December 2014
- The National Water Act, 1998 (Act No. 36 of 1998), as amended
- The National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004), as amended
- The National Heritage Resources Act, 1999 (Act No. 25 of 1999), as amended
- The National Appeal Regulations – Government Notice No. R.993 of 8 December 2014

Plans

- The Mpumalanga Biodiversity Conservation Plan

Guidelines

- Guideline on Need and Desirability in terms of the Environmental Impact Assessment (EIA) Regulations, 2010

Spatial tools

- SANBI Biodiversity GIS Database

Municipal development planning frameworks

- Emakhazeni Local Municipality – Spatial Development Framework Final Report - January 2015
- Environmental Management Framework for Emakhazeni Local Municipality in terms of Section 24(3) of NEMA and NEMA EIA Regulations 69 to 72 - 2009
- Emakhazeni Local Municipality – Reviewed Integrated Development Plan 2016/2017

7. MOTIVATION FOR THE NEED AND DESIRABILITY OF THE PROPOSED DEVELOPMENT

7.1 Need and desirability of the development in the context of the preferred location

Belfast is the highest order settlement/town in the Emakhazeni Municipal area and functions as the regional service centre to the rest of Emakhazeni. Belfast is also known for various cultural heritage sites throughout the town and has been growing steadily over the last few years with design guidelines to especially protect the rich cultural heritage and historic elements.

Belfast has experienced growth over the last couple of years in the form of a townhouse development to the western border of the town as well as an upmarket residential estate to the northern end of Belfast. The proposed development will contribute to the growth of Belfast as a “tourist town”.

With the proposed development situated to the south of Belfast and directly south of the N4 Maputo Corridor it is ideally situated to act as an attraction point for tourists traveling from the Kruger National Park and surrounds towards Gauteng, and vice versa. The proposed development will focus on tourism attractions and promote tourism within Belfast and Emakhazeni as well as along the tourism spine identified as the N4 Maputo Corridor.

3 000 permanent work opportunities will be provided by this proposed development during the operational phase and a number of work opportunities will also be created in the construction phase. The micro economy of the Emakhazeni Municipality area will benefit from this as the area could provide the development with the required workers and products. Where possible, local people will be employed as maintenance staff, cleaning staff, security personal, etc., which in turn will enrich and benefit the local community.

The greater area is under-utilised in terms of the actual tourism capabilities and attributes. The proposed mall development and residential estate is located favourably in relation to major access routes and major activities in the region and will form an integral part thereof. It can be noted from a regional point of view that the development of the mall and related uses along with the industrial park that will function as a distribution depo for chain stores will be an attribute to the whole of the Mpumalanga Province.

According to the Spatial Development Framework, *Tourism Development* forms one of the six pillars of strategic development identified for Emakhazeni Local Municipality. Tourism is defined as the “*temporary movement of people to destinations outside their normal places of work and residence, the activities undertaken during their stay in those destinations and the facilities creased to cater to their needs*” (Emakhazeni Local Municipality, 2015). Emphasis is placed on the imperative need that exists to develop this pillar to its full potential within Emakhazeni.

The proposed township development will have a positive contribution to the economy of Belfast and offer growth opportunities within various sectors of development. The development phases of the proposed township will create numerous new employment opportunities in the short, medium and long term that will have direct influence on the economy of Belfast.

Visual and Physical Influence

The proposed development will host various land uses, including agricultural, residential, businesses and shopping centres. It will diversify the existing character of the area by promoting development and growth of the N4 Maputo Corridor. The proposed development will have a positive contribution to Emakhazeni as a whole since it will focus on the tourism

pillar of the strategic development areas identified within Emakhazeni. The buildings will promote the existing countryside architecture by upgrading some of the existing buildings and structures to accommodate the various proposed land uses.

Influence on the Surrounding Area

One of the aims of the Emakhazeni Spatial Development Framework is to increase and promote tourism within Emakhazeni as there are numerous heritage and cultural sites within Emakhazeni Municipal Area and especially within Belfast. By developing the proposed site directly adjacent and south of the N4 highway, the development will create a tourist attraction visible to tourists traveling from Gauteng to the Kruger National Park and surrounds. Belfast is situated directly north of the N4 highway and by feeding off of this passing traffic it will increase the probability of tourists visiting Belfast and its attractions more often, therefore having a positive contribution and influence on Belfast and Emakhazeni at the same time.

Infrastructure

The proposed development is situated within the Emakhazeni Municipal Area and will be serviced with water, sewerage reticulation and storm water from the Local Authority. An application has been submitted to Eskom with confirmation of sufficient electricity capacity to accommodate Phase 1 of the proposed development. An additional application for the upgrading of electricity will be submitted when required for Phase 2 of the proposed development.

Accessibility

The proposed development is situated directly south of the N4 Maputo Corridor and east of the R33 regional road and could therefore be regarded as easily accessible from both Belfast and the N4 highway via the N4/D1477 off-ramp. It is proposed that access to the proposed development will be granted directly opposite the R33. The access is situated approximately 350m from the southern terminal of the N4 and R33/Road D1477 interchange.

The following points are addressed in terms of agricultural land and the development thereof:

(a) Agricultural potential land should be protected -

The protection of agricultural land for agricultural production to ensure food security in the Republic of South Africa should be acknowledged. This is an aspect that should be emphasised on land suitable for agricultural production. Local and national representatives of the relevant Agricultural Departments have visited the proposed development and agreed that the proposed property is no longer suitable for farming activities. More than 40% of the project area will, however, remain "Agricultural" and will be used for urban agricultural purposes.

(b) Limited agricultural potential -

The land of the project area does not have good agricultural potential, for various reasons as stipulated under Section 8 of this report, and the conclusion is therefore that the land has alternative utilisation potential (as promoted in this application). Alternative uses need to be accommodated in less suitable agricultural land.

(c) Support of areas with high agricultural potential -

There is support for the protection of areas where sustainable farming can be promoted, specifically where prime and unique agricultural potential exists. The project properties are not deemed to be such areas.

(d) Influence on Gross National Product (GDP) of the Country -

There is acknowledgement that the agricultural contribution to the GDP in South Africa is relatively small, but there should be an opportunity to improve agricultural opportunities of this country, so as to increase the sector's status within the GDP. Tourism also contributes to the GDP of South Africa and where there is sustainability in an area with a high potential for agriculture, this improves stability all over.

Employment options in infrastructure other than agriculture allows for a more stable workforce. A more stable workforce in the agricultural sector can allow for increased production on surrounding medium to high potential agricultural land, thereby also improving the GDP of South Africa.

(e) Agricultural employment versus other alternatives –

The agricultural industry is the largest employer compared to any other commodity, but this does not imply that other commodities need not be encouraged to also provide employment to bring more sustainability in the country. The proposed project will contribute to employment opportunities.

(f) Pressures on land for development -

It is accepted that agricultural land is under extreme pressure for developments other than agriculture. This is a sign of growth in a country and the National Department of Agriculture should promote policy that protects certain prime and unique agricultural areas, but still allows for alternative areas to be subjected to growth patterns in terms of other forms of settlement needed in the country. This does not only relate to residential occupation, but also to industrial facilities, leisure activities, mining activities, etc.

Micro Economy

The micro economy of especially the Emakhazeni area will benefit significantly from the proposed development. The construction phase will positively affect the micro economy as most of the required building material, labour force, etc. will be obtained from the Emakhazeni area and environs. The facility itself will provide long-term employment opportunities for the local community. Furthermore, the provision of back-up services such as for maintenance and daily necessities will ensure that the proposed development has a long term positive effect on the micro economy of the Emakhazeni region. The development proposal can be seen as an “energy boost” for the area.

Provision of Essential Services (Civil)

Due to the proposed development being situated in a rural area, the developer and consultants will be attending to the provision of essential services, at standards acceptable to the local authority and related service provision authorities. Once the application is approved, and development proposals can proceed, arrangements can be made to provide services to the satisfaction of the authorities, as well as having the proposed service agreements signed.

The minimum standards in respect of service provision are to be adhered to. This is not only to the benefit of the authorities having to exercise control, but also to the benefit of the proposed development, as the development is to *inter alia* cater for high profile visitors from abroad. This implies that the quality of service expected would have to be high and on satisfactory levels.

Relationship between the proposed recreational amenities/facilities and the natural environment

The government structures in South Africa are under increasing financial pressure to protect natural areas. It is therefore of utmost importance that the private sector and private developers take initiative to provide and protect such areas. This proposed development will fulfil this task in the Emakhazeni area. This will, in turn, bring economic investment into the area.

7.2 Need and Desirability in terms of the Guideline on Need and Desirability

The Department of Environmental Affairs published a Guideline on Need and Desirability in terms of the Environmental Impact Assessment (EIA) Regulations, 2010, in Government Notice 891 of 2014 (20 October 2014).

The table below indicates how the guideline requirements have been addressed.

Table 7: Need and desirability of the proposed project, in terms of the Guideline on Need and Desirability

Requirement	Part where requirement is addressed/response
<p>1. How will this development (and its separate elements/aspects) impact on the ecological integrity of the area?¹</p>	<p>The proposed development will take place on land that is currently disturbed/developed (the western part of the project site) and land that is currently used for the grazing of livestock.</p> <p>The impact of the proposed development on the ecological integrity of the project property has been evaluated in further detail in this report. Please refer to Sections 9.6 and 9.7 of this report.</p>
<p>1.1. How were the following ecological integrity considerations taken into account?</p>	
<p>1.1.1 <i>Threatened Ecosystems.</i>²</p>	<p>To take into consideration any threatened ecosystems that may be present on the project site, the following specialist studies were commissioned as part of this Environmental Impact Assessment process:</p> <ul style="list-style-type: none"> • A Wetland/Riparian Delineation and Functional Assessment; and • A Fauna and Flora Assessment. <p>These studies identified the risks and impacts of the proposed project. These have been evaluated in further detail in this report.</p>
<p>1.1.2 <i>Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries, wetlands, and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure.</i>³</p>	<p>To take into consideration any sensitive, vulnerable, highly dynamic or stressed ecosystems that may be present on the project site, the following specialist studies were commissioned as part of this Environmental Impact Assessment process:</p> <ul style="list-style-type: none"> • A Wetland/Riparian Delineation and Functional Assessment; and • A Fauna and Flora Assessment. <p>These studies identified the risks and impacts of the proposed project. These have been evaluated in further detail in this report.</p>

¹ Section 24 of the Constitution and section 2(4)(a)(vi) of NEMA refer.

² Must consider the latest information including the notice published on 9 December 2011 (Government Notice No. 1002 in Government Gazette No. 34809 of 9 December 2011 refers) listing threatened ecosystems in terms of Section 52 of National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004).

³ Section 2(4)(r) of NEMA refers.

Requirement	Part where requirement is addressed/response
1.1.3 <i>Critical Biodiversity Areas ("CBAs") and Ecological Support Areas ("ESAs").</i>	A Fauna and Flora Assessment was conducted for the project site. According to the Fauna and Flora Assessment and the Mpumalanga Biodiversity Sector Plan, the majority of the project site is listed as "Least Concern". The western part of the site is listed as "No Natural Habitat Remaining".
1.1.4 <i>Conservation targets.</i>	The conservation target for the Lydenburg Montane Grassland is 27% (Mucina & Rutherford, 2006).
1.1.5 <i>Ecological drivers of the ecosystem.</i>	Mitigation measures have been incorporated into the Environmental Impact Assessment Report and Environmental Management Programme for this project. The measures aim to mitigate the influence of ecological drivers such as the influence of uncontrolled fires, human activity and alien invasive plant species.
1.1.6 <i>Environmental Management Framework.</i>	<p>According to the Emakhazeni Local Municipality Environmental Management Framework, Figure 2 (Management Zones), the project site is situated within Management Zone D: Tourism Focus Area. In this zone, all preferred land uses should be aimed at optimising growth of the tourism industry. The land uses include:</p> <ul style="list-style-type: none"> • Tourism oriented land uses; and • Tourism facilities, where strong linkages with existing tourism initiatives and projects can be demonstrated and there is a proven market demand for such facilities. <p>As the proposed project is specifically tourism related, the project is in line with the Emakhazeni Local Municipality EMF.</p>
1.1.7 <i>Spatial Development Framework.</i>	<p>According to the Emakhazeni Local Municipality Spatial Development Framework (SDF), Tourism Development forms one of the six pillars of strategic development identified for the municipality. The proposed site is situated within the Maputo Corridor, which is earmarked for tourism development. According to the SDF, the N4 Maputo Corridor has been identified as one of the priority projects/areas where growth and development should be focussed and promoted by "<i>capitalizing on the opportunities associated with the N4 Maputo Corridor</i>" (Emakhazeni, 2015). The proposed project is therefore in line with the Emakhazeni Local Municipality SDF and will contribute towards the future short term spatial vision of Emakhazeni in the following ways:</p> <p>Vision: The strengthening and enhanced branding of the area as a tourism destination.</p>

Requirement	Part where requirement is addressed/response
	<p>Proposed development: The proposed development will complement and contribute to the tourism character of Emakhazeni by adding value through development and attracting road users traveling on the Maputo Corridor (N4), to and from the Gauteng area.</p> <p>Vision: Consolidation of the spatial structure of existing towns and settlements and the establishment of a nodal hierarchy in order to achieve physical, social and economic integration of communities and to enhance cost-efficient and sustainable service delivery.</p> <p>Proposed development: The proposed development will contribute to the existing nodal hierarchy within Emakhazeni as well as establish a new development node along the growing Maputo Corridor within the municipal area as a whole.</p> <p>Vision: Promoting agro-industry development along the N4 development corridor.</p> <p>Proposed development: Small scale agricultural activities are promoted within the proposed development and will complement the existing small scale agricultural activities in the area and provide an opportunity for growth.</p> <p>Vision: Making sufficient provision for upgrading of informal settlements and development of sustainable human settlements in general.</p> <p>Proposed development: The proposed development entails the development of sustainable human settlements that will be situated in close proximity to all major amenities and will lessen the dependency of residents on vehicular transportation to amenities for fulfilling their basic needs.</p>
<p>1.1.8 <i>Global and international responsibilities relating to the environment (e.g. RAMSAR sites, Climate Change, etc.).⁴</i></p>	<p>The proposed activities do not have significant contributions towards, or effects upon, global and international responsibilities.</p>
<p>1.2 How will this development disturb or enhance ecosystems and/or result in the loss or protection of biological diversity? What measures were explored to firstly avoid these negative impacts, and where these negative impacts could not be avoided altogether, what measures were explored</p>	<p>A Fauna and Flora Assessment was conducted for the proposed project site. The purpose of the study was to determine the current status of the project site and the impact that the proposed development will have on fauna and flora assemblages. The findings of the assessment are presented under Section 8.3.3 of this report. The majority of the development has been placed on the Western, disturbed part of the project site, to minimise the disturbance of more natural areas on the central and Eastern parts of the site.</p>

⁴ Section 2(4)(n) of NEMA refers.

Requirement	Part where requirement is addressed/response
<p>to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?⁵</p>	<p>The proposed agricultural activities and open spaces will occupy the majority of the central and Eastern parts of the site. Refer also to Section 8.4 of this report.</p> <p>Mitigation measures have been further identified and recommended in the EMPr to mitigate negative environmental impacts.</p>
<p>1.3 How will this development pollute and/or degrade the biophysical environment? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?⁶</p>	<p>Negative environmental impacts associated with the proposed development have been identified and assessed in Sections 9.6 and 9.7 of this report. Mitigation measures have also been identified and recommended in the Environmental Impact Assessment Report and EMPr to mitigate negative environmental impacts.</p> <p>The main positive impacts of the proposed development are the generation of job opportunities and the stimulation of the economy and tourism sector. To enhance the positive impacts, local people will be employed during the construction and operational phases of the development, as far as possible.</p>
<p>1.4 What waste will be generated by this development? What measures were explored to firstly avoid waste, and where waste could not be avoided altogether, what measures were explored to minimise, reuse and/or recycle the waste? What measures have been explored to safely treat and/or dispose of unavoidable waste?⁷</p>	<p>During the construction phase of the proposed development, general waste, such as building rubble and domestic waste, will be generated. Some hazardous waste, such as spilt oil or diesel may also be generated. Mitigation measures to minimise, reuse and/or recycle the waste have been recommended in the Environmental Impact Assessment Report and EMPr for the project.</p>
<p>1.5 How will this development disturb or enhance landscapes and/or sites that constitute the nation's cultural heritage? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and</p>	<p>A Phase 1 Heritage Impact Assessment was conducted for the project site. The assessment found the following heritage artefacts or resources at the site:</p> <ul style="list-style-type: none"> • A stone-built farm house that is most likely older than 60 years of age. The site is of low-medium cultural significance and should be recorded through a Phase 2 Heritage Impact Assessment;

⁵ Section 24 of the Constitution and Sections 2(4)(a)(i) and 2(4)(b) of NEMA refer.

⁶ Section 24 of the Constitution and Sections 2(4)(a)(ii) and 2(4)(b) of NEMA refer.

⁷ Section 24 of the Constitution and Sections 2(4)(a)(iv) and 2(4)(b) of NEMA refer.

Requirement	Part where requirement is addressed/response
<p>remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?⁸</p>	<ul style="list-style-type: none"> • Trenches and packed stones that are more than likely associated with the Anglo-Boer War battle of Berg-en-Dal. The cultural significance of the trenches and packed stones is medium-high. The sites should be mapped in detail and drawn if they are to be disturbed by the development; and • Old wagon trails relating to transport routes that traversed the area. The cultural significance of these trails is low-medium. The sites should be mapped in detail and drawn if they are to be disturbed by the development. <p>The proposed development will avoid the cultural heritage sites as far as possible. Where this is not possible, detailed Phase 2 Heritage Impact Assessments, including mapping and drawing, will be done and Destruction Permits obtained from SAHRA before any sites are disturbed or destroyed. A Phase 2 HIA is required for the stone-built farm house in either event.</p>
<p>1.6 How will this development use and/or impact on non-renewable natural resources? What measures were explored to ensure responsible and equitable use of the resources? How have the consequences of the depletion of the non-renewable natural resources been considered? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?⁹</p>	<p>The proposed development will likely use one or more of the following non-renewable natural resources: diesel, petrol, LPG and/or coal. This includes, for example, diesel and petrol used in construction vehicles and LPG that will potentially be used in residential homes for cooking and heating.</p> <p>Mitigation measures have been recommended in the Environmental Management Programme for this proposed development, to minimise the usage of non-renewable natural resources.</p>
<p>1.7 How will this development use and/or impact on renewable natural resources and the ecosystem of which they are part? Will the use of the resources and/or impact on the ecosystem jeopardise the integrity of the resource and/or system taking into account carrying capacity restrictions, limits of acceptable change, and thresholds? What</p>	<p>The proposed development will not use or impact upon any renewable natural resources.</p>

⁸ Section 24 of the Constitution and Sections 2(4)(a)(iii) and 2(4)(b) of NEMA refer.

⁹ Section 24 of the Constitution and Sections 2(4)(a)(v) and 2(4)(b) of NEMA refer.

Requirement	Part where requirement is addressed/response
<p>measures were explored to firstly avoid the use of resources, or if avoidance is not possible, to minimise the use of resources? What measures were taken to ensure responsible and equitable use of the resources? What measures were explored to enhance positive impacts?¹⁰</p>	
<p>1.7.1 <i>Does the proposed development exacerbate the increased dependency on increased use of resources to maintain economic growth or does it reduce resource dependency (i.e. de-materialised growth)? (note: sustainability requires that settlements reduce their ecological footprint by using less material and energy demands and reduce the amount of waste they generate, without compromising their quest to improve their quality of life)</i></p>	<p>The proposed development should decrease the dependency on the use of resources. By situating residences in close proximity to amenities such as shops, the proposed project will promote travelling on foot, as opposed to using vehicles that run on diesel or petrol.</p>
<p>1.7.2 <i>Does the proposed use of natural resources constitute the best use thereof? Is the use justifiable when considering intra- and intergenerational equity, and are there more important priorities for which the resources should be used (i.e. what are the opportunity costs of using these resources this the proposed development alternative?)</i></p>	<p>The resource use is justifiable and should not affect intra- and intergenerational equity. Mitigation measures will also be recommended in the Environmental Management Programme for this proposed development, to minimise the usage of resources.</p>
<p>1.7.3 <i>Do the proposed location, type and scale of development promote a reduced dependency on resources?</i></p>	<p>Yes. By situating residences in close proximity to amenities such as shops, the proposed project will promote travelling on foot, as opposed to using vehicles that run on diesel or petrol.</p>
<p>1.8 How were a risk-averse and cautious approach applied in terms of ecological impacts?¹¹</p>	<p>The majority of the development has been placed on the Western, disturbed part of the project site, to minimise the disturbance of more natural areas on the central and Eastern parts of the site. The proposed agricultural activities and open spaces will occupy the majority of the central and Eastern parts of the site. Refer also to Sections 9.6 and 9.7 of this report.</p>

¹⁰ Section 24 of the Constitution and Sections 2(4)(a)(vi) and 2(4)(b) of NEMA refer.

¹¹ Section 24 of the Constitution and Section 2(4)(a)(vii) of NEMA refer.

Requirement	Part where requirement is addressed/response
<p>1.8.1 <i>What are the limits of current knowledge (note: the gaps, uncertainties and assumptions must be clearly stated)?</i></p>	<p>It is recommended that a Phase 2 Heritage Impact Assessment be conducted for the stone-built farm house, as well as the rest of the site, should wagon trails, trenches or packed stones need to be disturbed or destroyed to allow the proposed development to take place. If this is the case, a Destruction Permit will also need to be obtained from SAHRA.</p> <p>Cumulative impacts have been further assessed in this report and further mitigation measures have been provided as part of the EMPr.</p> <p>The following assumptions have been made:</p> <ul style="list-style-type: none"> • That all research and reference sources or material is accurate and up to date; • That the project information, as provided by the applicant and project manager, is correct; and • That the specialist opinions are scientifically grounded and accurate.
<p>1.8.2 <i>What is the level of risk associated with the limits of current knowledge?</i></p>	<p>It is Labesh's opinion that the level of risk associated with the limits of current knowledge is <i>low</i>.</p>
<p>1.8.3 <i>Based on the limits of knowledge and the level of risk, how and to what extent was a risk-averse and cautious approach applied to the development?</i></p>	<p>A risk-averse and cautious approach was applied to the Scoping- and Environmental Impact Assessment Phases by keeping in mind the gaps in knowledge and limitations, such as time constraints for the specialist studies that have been conducted.</p>
<p>1.9 How will the ecological impacts resulting from this development impact on people's environmental right in terms following:¹²</p>	
<p>1.9.1 <i>Negative impacts: e.g. access to resources, opportunity costs, loss of amenity (e.g. open space), air and water quality impacts, nuisance (noise, odour, etc.), health impacts, visual impacts, etc. What measures were taken to firstly avoid negative impacts, but if avoidance is not possible, to minimise, manage and remedy negative impacts?</i></p>	<p>Section 9.6 of this report provides a list of the anticipated impacts from the proposed development. Section 9.10 provides some mitigation measures for these impacts and the Environmental Management Programme for the proposed development has more detailed mitigation measures that should be applied to minimise the impacts on the environment from the development.</p>

¹² Section 24 of the Constitution and Sections 2(4)(a)(viii) and 2(4)(b) of NEMA refer.

Requirement	Part where requirement is addressed/response
1.9.2 <i>Positive impacts: e.g. improved access to resources, improved amenity, improved air or water quality, etc. What measures were taken to enhance positive impacts?</i>	The main positive impacts of the proposed development are the generation of job opportunities and the stimulation of the economy and tourism sector. To enhance the positive impacts, local people will be employed during the construction and operational phases of the development, as far as possible.
1.10 Describe the linkages and dependencies between human wellbeing, livelihoods and ecosystem services applicable to the area in question and how the development's ecological impacts will result in socio-economic impacts (e.g. on livelihoods, loss of heritage site, opportunity costs, etc.)?	Refer to Sections 9.6 and 9.7 of this report.
1.11 Based on all of the above, how will this development positively or negatively impact on ecological integrity objectives/targets/considerations of the area?	Refer to Sections 9.6 and 9.7 of this report.
1.12 Considering the need to secure ecological integrity and a healthy biophysical environment, describe how the alternatives identified (in terms of all the different elements of the development and all the different impacts being proposed), resulted in the selection of the "best practicable environmental option" in terms of ecological considerations? ¹³	Refer to Section 8.1 of this report.
1.13 Describe the positive and negative cumulative ecological/biophysical impacts bearing in mind the size, scale, scope and nature of the project in relation to its location and existing and other planned developments in the area? ¹⁴	Refer to Sections 9.6 and 9.7 of this report.
2.1 What is the socio-economic context of the area, based on, amongst other considerations, the following considerations?	

¹³ Section 2(4)(b) of NEMA refer.

¹⁴ Regulations 22(2)(i)(j), 28(1)(g) and 31(2)(1) in Government Notice No. R. 543 refer.

Requirement	Part where requirement is addressed/response
2.1.1 <i>The IDP (and its sector plans' vision, objectives, strategies, indicators and targets) and any other strategic plans, frameworks of policies applicable to the area,</i>	The Emakhazeni Local Municipality Integrated Development Plan identifies the need for <i>accelerated housing delivery, an improved property market and faster and inclusive growth</i> (such as by creating an enabling environment for investment). The proposed development is in line with these needs, as identified in the IDP.
2.1.2 <i>Spatial priorities and desired spatial patterns (e.g. need for integrated of segregated communities, need to upgrade informal settlements, need for densification, etc.),</i>	The Emakhazeni Local Municipality Integrated Development Plan identifies the need for <i>accelerated housing delivery, an improved property market and faster and inclusive growth</i> (such as by creating an enabling environment for investment). The proposed development is in line with these needs, as identified in the IDP.
2.1.3 <i>Spatial characteristics (e.g. existing land uses, planned land uses, cultural landscapes, etc.), and</i>	The proposed development is in line with the Emakhazeni Local Municipality Spatial Development Framework (SDF), as discussed previously under point 1.1.7.
2.1.4 <i>Municipal Economic Development Strategy ("LED Strategy").</i>	The Emakhazeni Local Municipality is in the process of developing an LED Strategy (Emakhazeni Local Municipality IDP, 2016).
2.2 Considering the socio-economic context, what will the socio-economic impacts be of the development (and its separate elements/aspects), and specifically also on the socio-economic objectives of the area?	<p>The following socio-economic impacts of the proposed development have been identified at this stage:</p> <ul style="list-style-type: none"> ● Generation of a large number of job opportunities; and ● Potential increase in crime due to the influx of workers, especially during the construction phase. <p>Job creation is a socio-economic objective of the area.</p>
2.2.1 <i>Will the development complement the local socio-economic initiatives (such as local economic development (LED) initiatives), or skills development programs?</i>	The Emakhazeni Local Municipality is in the process of developing an LED Strategy (Emakhazeni Local Municipality IDP, 2016). Job creation is a socio-economic objective of the area and the proposed development will create a large number of job opportunities.
2.3 How will this development address the specific physical, psychological, developmental, cultural and social needs and interests of the relevant communities? ¹⁵	<p>The proposed development will address a number of specific needs of the community, namely the provision of:</p> <ul style="list-style-type: none"> ● Housing; ● Amenities; ● Open spaces; ● Job opportunities;

¹⁵ Section 2(2) of NEMA refers.

Requirement	Part where requirement is addressed/response
	<ul style="list-style-type: none"> • Meeting places; and • Clinics and doctor's rooms.
<p>2.4 Will the development result in equitable (intra- and inter-generational) impact distribution, in the short- and long-term? ¹⁶ Will the impact be socially and economically sustainable in the short- and long-term?</p>	<p>It is expected for the proposed development to result in equitable impact distributions in the short- and long-term as well as being socially and economically sustainable in the short- and long-term.</p>
<p>2.5 In terms of location, describe how the placement of the proposed development will:¹⁷</p>	
<p>2.5.1 <i>result in the creation of residential and employment opportunities in close proximity to or integrated with each other,</i></p>	<p>It is estimated that the proposed development will generate a total of 3 000 job opportunities, over the construction and operational phases. This will include job opportunities for local labourers.</p>
<p>2.5.2 <i>reduce the need for transport of people and goods,</i></p>	<p>By situating residences in close proximity to amenities such as shops, the proposed project will promote travelling on foot, as opposed to using vehicles that run on diesel or petrol.</p>
<p>2.5.3 <i>result in access to public transport or enable non-motorised and pedestrian transport (e.g. will the development result in densification and the achievement of thresholds in terms public transport),</i></p>	<p>The proposed development will result in densification by situating residences in close proximity to amenities such as shops. Specific lay-bys for public transport will be positioned along Road D1477 at the main access and it is also proposed that surfaced pedestrian sidewalks be provided along the development frontage to facilitate pedestrian movement to and from the development.</p>
<p>2.5.4 <i>compliment other uses in the area,</i></p>	<p>The predominant land uses in the area are agricultural land uses. A large portion of the project site (52.2ha) will be kept for agricultural use.</p>
<p>2.5.5 <i>be in line with the planning for the area,</i></p>	<p>The proposed development is in line with the development goals of the Emakhazeni Local Municipality.</p>
<p>2.5.6 <i>for urban related development, make use of underutilised land available with the urban edge,</i></p>	<p>The proposed development is not situated within the urban edge.</p>

¹⁶ Sections 2(2) and 2(4)(c) of NEMA refers.

¹⁷ Section 3 of the Development Facilitation Act, 1995 (Act No. 67 of 1995) ("DFA") and the National Development Plan refer.

Requirement	Part where requirement is addressed/response
2.5.7 <i>optimise the use of existing resources and infrastructure,</i>	The proposed development will make use of existing road infrastructure to the project site, as well as existing electricity supplies to the site and existing water supplies to the Engen 1-Stop, in excess of the current needs of the listed infrastructure.
2.5.8 <i>opportunity costs in terms of bulk infrastructure expansions in non-priority areas (e.g. not aligned with the bulk infrastructure planning for the settlement that reflects the spatial reconstruction priorities of the settlement),</i>	The proposed development will make use of existing road infrastructure to the project site, as well as existing electricity supplies to the site and existing water supplies to the Engen 1-Stop, in excess of the current needs of the listed infrastructure.
2.5.9 <i>discourage "urban sprawl" and contribute to compaction/densification,</i>	The proposed project, by providing residential erven in close proximity to Belfast, will discourage "urban sprawl" and contribute to compaction/densification.
2.5.10 <i>contribute to the correction of the historically distorted spatial patterns of settlements and to the optimum use of existing infrastructure in excess of current needs,</i>	The proposed development will make use of existing road infrastructure to the project site, as well as existing electricity supplies to the site and existing water supplies to the Engen 1-Stop, in excess of the current needs of the listed infrastructure. It is not expected for the proposed development to contribute towards the correction of historically distorted settlement spatial patterns.
2.5.11 <i>encourage environmentally sustainable land development practices and processes,</i>	Environmentally sustainable land development practices and processes will be encouraged through specific mitigation measures that have been included in the Environmental Management Programme for this project. Open spaces have been incorporated into the proposed development's layout to ensure that the environment is retained within the development.
2.5.12 <i>take into account special locational factors that might favour the specific location (e.g. the location of a strategic mineral resource, access to the port, access to rail, etc.),</i>	<p>The location for the proposed development is strategically ideal for the following reasons:</p> <ul style="list-style-type: none"> • The site is situated directly to the South of the N4 highway and off-ramps from this highway; • The site has existing access roads to it; • The site is situated in close proximity to Emakhazeni (Belfast); and • The site is situated within the Maputo Corridor, which is earmarked for tourism development.
2.5.13 <i>the investment in the settlement or area in question will generate the highest socio-economic returns (i.e. an area with high economic potential),</i>	Investment in the proposed development will result in high socio-economic returns for the area. It is estimated that the development will generate a total of 3 000 job opportunities, over the construction and operational phases.

Requirement	Part where requirement is addressed/response
<p>2.5.14 <i>impact on the sense of history, sense of place and heritage of the area and the socio-cultural and cultural-historic characteristics and sensitivities of the area, and</i></p>	<p>A Phase 1 Heritage Impact Assessment was conducted for the project site. The assessment found the following heritage artefacts or resources at the site:</p> <ul style="list-style-type: none"> • A stone-built farm house that is most likely older than 60 years of age. The site is of low-medium cultural significance and should be recorded through a Phase 2 Heritage Impact Assessment; • Trenches and packed stones that are more than likely associated with the Anglo-Boer War battle of Berg-en-Dal. The cultural significance of the trenches and packed stones is medium-high. The sites should be mapped in detail and drawn if they are to be disturbed by the development; and • Old wagon trails relating to transport routes that traversed the area. The cultural significance of these trails is low-medium. The sites should be mapped in detail and drawn if they are to be disturbed by the development. <p>The proposed development will avoid the cultural heritage sites as far as possible. Where this is not possible, detailed Phase 2 Heritage Impact Assessments, including mapping and drawing, will be done and Destruction Permits obtained from SAHRA before any sites are disturbed or destroyed. A Phase 2 HIA is required for the stone-built farm house in either event.</p>
<p>2.5.15 <i>in terms of the nature, scale and location of the development promote or act as a catalyst to create a more integrated settlement?</i></p>	<p>It is expected for the proposed development to create a more integrated settlement, by situating residences in close proximity to amenities such as shops</p>
<p>2.6 How were a risk-averse and cautious approach applied in terms of socio-economic impacts?:¹⁸</p>	<p>A risk-averse and cautious approach was applied to the Scoping- and Environmental Impact Assessment Phases by keeping in mind the gaps in knowledge and limitations, such as time constraints for the specialist studies that have been conducted.</p>
<p>2.6.1 <i>What are the limits of current knowledge (note: the gaps, uncertainties and assumptions must be clearly stated)?¹⁹</i></p>	<p>It is recommended that a Phase 2 Heritage Impact Assessment be conducted for the stone-built farm house, as well as the rest of the site, should wagon trails, trenches or packed stones need to be disturbed or destroyed to allow the proposed development to take place. If this is the case, a Destruction Permit will also need to be obtained from SAHRA.</p>

¹⁸ Section 2(4)(a)(vii) of NEMA refers.

¹⁹ Section 24(4) of NEMA refers.

Requirement	Part where requirement is addressed/response
	<p>Cumulative impacts have been further assessed in this report and further mitigation measures have been provided as part of the EMPr.</p> <p>The following assumptions have been made:</p> <ul style="list-style-type: none"> • That all research and reference sources or material is accurate and up to date; • That the project information, as provided by the applicant and project manager, is correct; and • That the specialist opinions are scientifically grounded and accurate.
<p>2.6.2 <i>What is the level of risk (note: related to inequality, social fabric, livelihoods, vulnerable communities, critical resources, economic vulnerability and sustainability) associated with the limits of current knowledge?</i></p>	<p>It is Labesh's opinion that the level of risk associated with the limits of current knowledge is <i>low</i>.</p>
<p>2.6.3 <i>Based on the limits of knowledge and the level of risk, how and to what extent was a risk-averse and cautious approach applied to the development?</i></p>	<p>A risk-averse and cautious approach was applied to the Scoping- and Environmental Impact Assessment Phases by keeping in mind the gaps in knowledge and limitations, such as time constraints for the specialist studies that have been conducted.</p>
<p>2.7 How will the socio-economic impacts resulting from this development impact on people's environmental right in terms following:</p>	
<p>2.7.1 <i>Negative impacts: e.g. health (e.g. HIV-Aids), safety, social ills, etc. What measures were taken to firstly avoid negative impacts, but if avoidance is not possible, to minimise, manage and remedy negative impacts?</i></p>	<p>It is not expected for the proposed development to impact significantly on people's health, safety and social ills.</p>
<p>2.7.2 <i>Positive impacts. What measures were taken to enhance positive impacts?</i></p>	<p>The main positive impacts of the proposed development are the generation of job opportunities and the stimulation of the economy and tourism sector. To enhance the positive impacts, local people will be employed during the construction and operational phases of the development, as far as possible.</p>
<p>2.8 Considering the linkages and dependencies between human wellbeing, livelihoods and ecosystem services, describe the linkages and dependencies applicable to the area in question and how the development's socioeconomic impacts will result in ecological impacts (e.g. over utilisation of natural resources, etc.)?</p>	<p>The development's socio-economic impacts will indirectly result in the consumption of natural resources, such as water. However, the usage of the resources is not considered to be an over-utilisation and some resources would have been utilised in any event, albeit at a different locality. For example, people moving to the residential area of the proposed development will use water, but would also have used water at their previous residences, or alternative residences.</p>

Requirement	Part where requirement is addressed/response
2.9 What measures were taken to pursue the selection of the "best practicable environmental option" in terms of socio-economic considerations? ²⁰	Refer to Section 8.1 of this report.
2.10 What measures were taken to pursue environmental justice so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons (who are the beneficiaries and is the development located appropriately)? ²¹ Considering the need for social equity and justice, do the alternatives identified, allow the "best practicable environmental option" to be selected, or is there a need for other alternatives to be considered?	Refer to Section 8.1 of this report. The alternatives considered allow for the "best practicable environmental option" to be selected.
2.11 What measures were taken to pursue equitable access to environmental resources, benefits and services to meet basic human needs and ensure human wellbeing, and what special measures were taken to ensure access thereto by categories of persons disadvantaged by unfair discrimination? ²²	Local labourers will be employed, as far as possible and up to certain skill levels, depending on the work involved.
2.12 What measures were taken to ensure that the responsibility for the environmental health and safety consequences of the development has been addressed throughout the development's life cycle? ²³	To ensure that responsibility for the environmental health and safety consequences of the development has been addressed, mitigation measures have been identified in this report and the EMP. The responsibility for implementing the mitigation measures lies with the applicant.
2.13 What measures were taken to:	

²⁰ Section 2(4)(b) of NEMA refers.

²¹ Section 2(4)(c) of NEMA refers.

²² Section 2(4)(d) of NEMA refers.

²³ Section 2(4)(e) of NEMA refers.

Requirement	Part where requirement is addressed/response
2.13.1 ensure the participation of all interested and affected parties,	<p>A public participation process was conducted, in accordance with the EIA Regulations, 2014, and also taking the following into consideration</p> <ul style="list-style-type: none"> • GN 807 - Public Participation Guideline in the Environmental Impact Assessment Process, 2012; and • The Promotion of Access to Information Act (PAIA), 2000.
2.13.2 provide all people with an opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation, ²⁴	<p>The public participation process for this project is open to all parties. Site notices and a newspaper advertisement were placed to encourage participation from a wider audience than simply the adjacent land owners.</p>
2.13.3 ensure participation by vulnerable and disadvantaged persons, ²⁵	<p>The public participation processes were open to all individuals, also to vulnerable and disadvantaged persons.</p>
2.13.4 promote community wellbeing and empowerment through environmental education, the raising of environmental awareness, the sharing of knowledge and experience and other appropriate means, ²⁶	<p>All employees, contractors and sub-contractors will be required to attend environmental awareness inductions (training).</p>
2.13.5 ensure openness and transparency, and access to information in terms of the process, ²⁷	<p>A public participation process was conducted, in accordance with the EIA Regulations, 2014, and also taking the following into consideration</p> <ul style="list-style-type: none"> • GN 807 - Public Participation Guideline in the Environmental Impact Assessment Process, 2012; and • The Promotion of Access to Information Act (PAIA), 2000. <p>The public participation process was open to participation from any members of the public and was a fully transparent process. All comments received from Interested and Affected Parties have been included in the reports for this project and have also been responded to/addressed. The reports were available to any person wishing to review and comment upon the documents.</p>

²⁴ Section 2(4)(f) of NEMA refers.

²⁵ Section 2(4)(f) of NEMA refers.

²⁶ Section 2(4)(h) of NEMA refers.

²⁷ Section 2(4)(k) of NEMA refers.

Requirement	Part where requirement is addressed/response
<p>2.13.6 <i>ensure that the interests, needs and values of all interested and affected parties were taken into account, and that adequate recognition were given to all forms of knowledge, including traditional and ordinary knowledge²⁸, and</i></p>	<p>A public participation process was conducted, in accordance with the EIA Regulations, 2014, and also taking the following into consideration</p> <ul style="list-style-type: none"> • GN 807 - Public Participation Guideline in the Environmental Impact Assessment Process, 2012; and • The Promotion of Access to Information Act (PAIA), 2000.
<p>2.13.7 <i>ensure that the vital role of women and youth in environmental management and development were recognised and their full participation therein were be promoted?²⁹</i></p>	<p>A public participation process was conducted, in accordance with the EIA Regulations, 2014, and also taking the following into consideration</p> <ul style="list-style-type: none"> • GN 807 - Public Participation Guideline in the Environmental Impact Assessment Process, 2012; and • The Promotion of Access to Information Act (PAIA), 2000.
<p>2.14 Considering the interests, needs and values of all the interested and affected parties, describe how the development will allow for opportunities for all the segments of the community (e.g. a mixture of low-, middle-, and high-income housing opportunities) that is consistent with the priority needs of the local area (or that is proportional to the needs of an area)?³⁰</p>	<p>Local labourers will be employed, as far as possible and up to certain skill levels, depending on the work involved.</p>
<p>2.15 What measures have been taken to ensure that current and/or future workers will be informed of work that potentially might be harmful to human health or the environment or of dangers associated with the work, and what measures have been taken to ensure that the right of workers to refuse such work will be respected and protected?³¹</p>	<p>All employees, contractors and sub-contractors will be required to attend environmental awareness inductions (training). This will include informing workers that they have the right to refuse work should the work be harmful to human health or the environment.</p>

²⁸ Section 2(4)(g) of NEMA refers.

²⁹ Section 2(4)(q) of NEMA refers.

³⁰ x

³¹ Section 2(4)(j) of NEMA refers.

Requirement	Part where requirement is addressed/response
2.16 Describe how the development will impact on job creation in terms of, amongst other aspects:	
2.16.1 <i>the number of temporary versus permanent jobs that will be created,</i>	It is estimated that the proposed development will generate a total of 3 000 job opportunities, over the construction and operational phases.
2.16.2 <i>whether the labour available in the area will be able to take up the job opportunities (i.e. do the required skills match the skills available in the area),</i>	Local labourers will be employed, as far as possible and up to certain skill levels, depending on the work involved.
2.16.3 <i>the distance from where labourers will have to travel,</i>	Labourers will be transported to and from the construction site. Using local labourers (as far as possible) will decrease travel distances.
2.16.4 <i>the location of jobs opportunities versus the location of impacts (i.e. equitable distribution of costs and benefits), and</i>	Job opportunities will be created at the proposed development site.
2.16.5 <i>the opportunity costs in terms of job creation (e.g. a mine might create 100 jobs, but impact on 1000 agricultural jobs, etc.).</i>	The proposed development will create job opportunities and should not impact upon employment opportunities in other sectors.
2.17 What measures were taken to ensure:	
2.17.1 <i>that there were intergovernmental coordination and harmonisation of policies, legislation and actions relating to the environment, and</i>	Relevant environmental and town planning legislation was considered and adhered to during the Environmental Impact Assessment- and Land Use Rights- processes. Also refer to Chapter 6 of this report.
2.17.2 <i>that actual or potential conflicts of interest between organs of state were resolved through conflict resolution procedures?</i>	A public participation process was conducted, in accordance with the EIA Regulations, 2014, and also taking the following into consideration <ul style="list-style-type: none"> • GN 807 - Public Participation Guideline in the Environmental Impact Assessment Process, 2012; and • The Promotion of Access to Information Act (PAIA), 2000.
2.18 What measures were taken to ensure that the environment will be held in public trust for the people, that the beneficial use of environmental resources will serve the public	Open spaces have been incorporated into the proposed development's layout to ensure that the environment is retained within the development together with people's beneficial use of this amenity.

Requirement	Part where requirement is addressed/response
interest, and that the environment will be protected as the people's common heritage? ³²	Mitigation measures have been included in the Environmental Management Programme for this development to minimise the impacts of the proposed development on the environment.
2.19 Are the mitigation measures proposed realistic and what long-term environmental legacy and managed burden will be left? ³³	The mitigation measures have been elaborated in the EMPr for this project. Any long-term environmental legacy or burden will also be discussed in the Environmental Impact Assessment Report.
2.20 What measures were taken to ensure that the costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects will be paid for by those responsible for harming the environment? ³⁴	The applicant will be responsible for any costs associated with the remediation of pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects.
2.21 Considering the need to secure ecological integrity and a healthy bio-physical environment, describe how the alternatives identified (in terms of all the different elements of the development and all the different impacts being proposed), resulted in the selection of the best practicable environmental option in terms of socio-economic considerations? ³⁵	Refer to Section 8.1 of this report.
2.22 Describe the positive and negative cumulative socio-economic impacts bearing in mind the size, scale, scope and nature of the project in relation to its location and other planned developments in the area? ³⁶	Cumulative impacts have been described in Sections 9.6 and 9.7 of this report.

³² Section 2(4)(o) of NEMA refers.

³³ Section 240(1)(b)(iii) of NEMA and the National Development Plan refer.

³⁴ Section 2(4)(p) of NEMA refers.

³⁵ Section 2(4)(b) of NEMA refers.

³⁶ Regulations 22(2)(i)(j), 28(1)(g) and 31(2)(1) in Government Notice No. R. 543 refer.

7.3 Need and Desirability: Motivation for the preferred development footprint within the approved site as contemplated in the accepted Scoping Report

Please refer to Section 8 below for the motivation for the preferred development footprints within the approved site (as contemplated in the accepted Scoping Report).

8. PROCESS FOLLOWED TO REACH THE PROPOSED DEVELOPMENT FOOTPRINT WITHIN THE APPROVED SITE

8.1 Alternatives considered

According to the Western Cape Department of Environmental Affairs and Development Planning's Guideline on Alternatives (2010), the following alternatives can be assessed:

Table 8: Alternative Types

Alternative Type	Explanation/Examples
Location	Refers to both alternative properties as well as alternative sites on the same property.
Activity	Incineration of waste rather than disposal at a landfill site/Provision of public transport rather than increasing the capacity of roads.
Design or Layout	Design: e.g. Different architectural and/or engineering designs. Site Layout: Consideration of different spatial configurations of an activity on a particular site (e.g. siting of a noisy plant away from residences).
Technological	Consideration of such alternatives is to include the option of achieving the same goal by using a different method or process (e.g. 1 000 megawatt of energy could be generated using a coal-fired power station or wind turbines).
Demand	Arises when a demand for a certain product or service can be met by some alternative means (e.g. the demand for electricity could be met by supplying more energy or using energy more efficiently by managing demand).
Input	Input alternatives are applicable to applications that may use different raw materials or energy sources in their process (e.g. industry may consider using either high sulphur coal or natural gas as a fuel source).
Routing	Consideration of alternative routes generally applies to linear developments such as power line servitudes, transportation and pipeline routes.
Scheduling and Timing	Where a number of measures might play a part in an overall programme, but the order in which they are scheduled will contribute to the overall effectiveness of the end result.
Scale and Magnitude	Activities that can be broken down into smaller units and can be undertaken on different scales (e.g. for a housing development there could be the option of 10, 15 or 20 housing units. Each of these alternatives may have different impacts).
"No-Go Option"	This is the option of not implementing the proposed activity.

Alternative Assessments must always include the "No-Go Option" as the baseline against which all other alternatives must be measured. The following alternatives could be considered for the proposed project:

- Location – Alternative properties and alternative sites on the same property;
- Design/Layout;
- Scale and Magnitude; and
- "No-Go Option".

Alternatives were considered in a qualitative manner.

8.1.1 Location

Alternative properties

As the applicant only owns the two properties relevant to this application, and also only wishes to develop these two properties, no property alternatives could be considered. The suitability and feasibility of the two project properties for the proposed project is demonstrated by the following:

- The properties are situated directly south of the N4 Maputo Corridor and east of the R33 regional road and could therefore be regarded as easily accessible from both Belfast as well as the N4 highway via the N4/D1477 off-ramp;
- The properties are situated within the Maputo Corridor, which is earmarked for tourism development;
- The properties are strategically situated between Emalahleni/Steve Tshwete and Nelspruit; and
- The properties are situated in close proximity to Emakhazeni (Belfast).

Alternative sites on the same property

A Site Sensitivity Mapping Exercise and Matrix was used to identify the most suitable site(s) on the project properties for the proposed development. This also identified unsuitable sites where environmental constraints prohibit development activities. Sensitivity maps were developed from each of the following specialist studies: Fauna and Flora Assessments, Wetland/Riparian Delineation and Functional Assessment, Phase 1 Heritage Impact Assessment and a Palaeontological Desktop Assessment. The maps were then integrated into combined sensitivity maps, as given in the figures below. The maps were used to identify sensitive areas that should be avoided and protected as part of the proposed development, or where further mitigation measures would be required to address specific impacts that could not be avoided.

The very high palaeontological sensitivity of the site cannot be avoided (refer to *Figure 6*), but specific mitigation measures have been recommended by the palaeontologist in this regard. From a heritage point of view, a number of sites have been identified (refer to *Figure 6*) and a Phase 2 Heritage Impact Assessment is required for the stone-built farm house that is most likely older than 60 years of age. Where the development will impact upon the wagon trails, trenches and/or packed stones, Phase 2 mapping and drawing work will also be required, together with an application for a Destruction Permit from SAHRA. This is, however, not considered to be a fatal flaw and the heritage specialist has indicated that the proposed development should be allowed to continue.

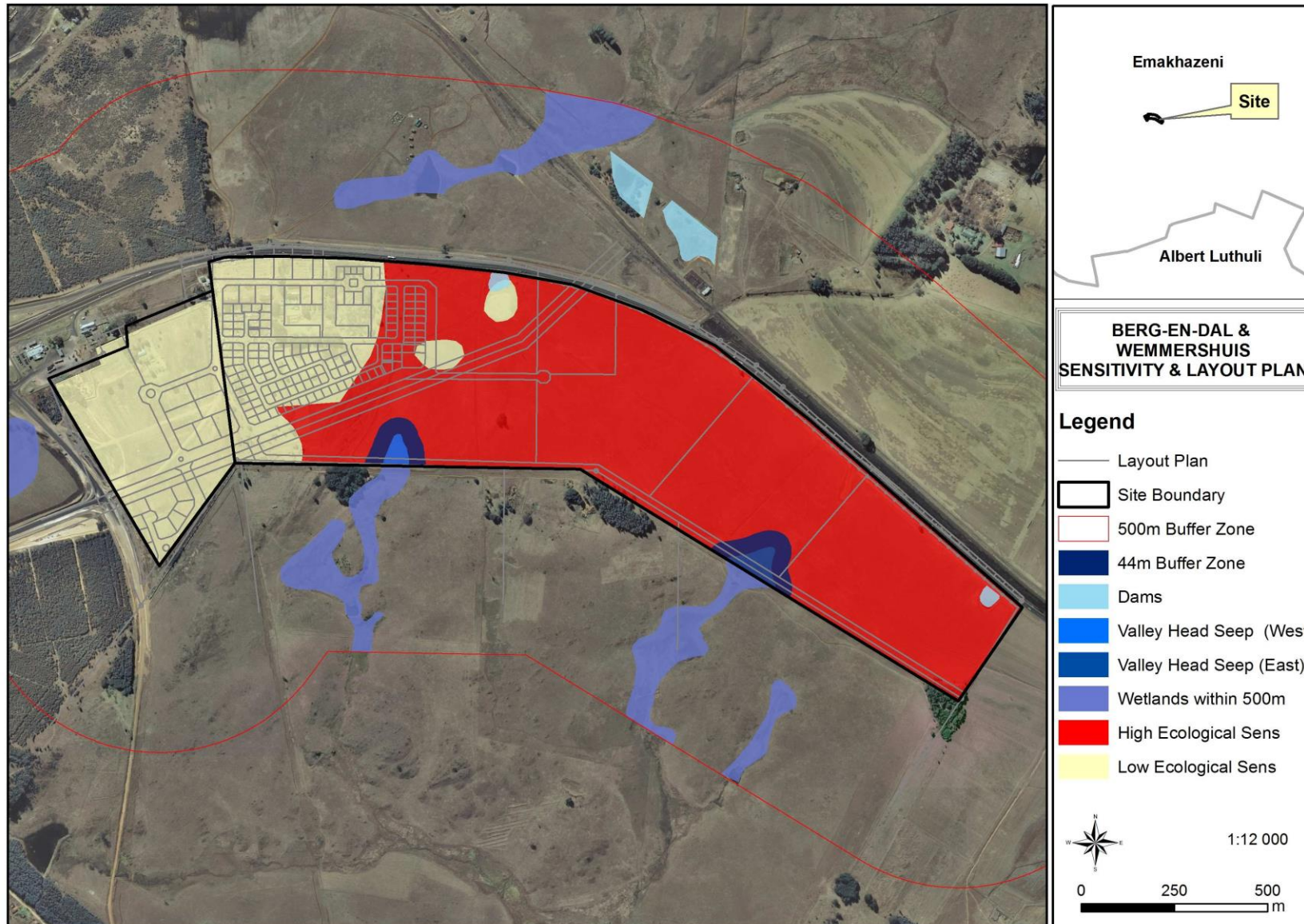


Figure 5: Ecological sensitivity map

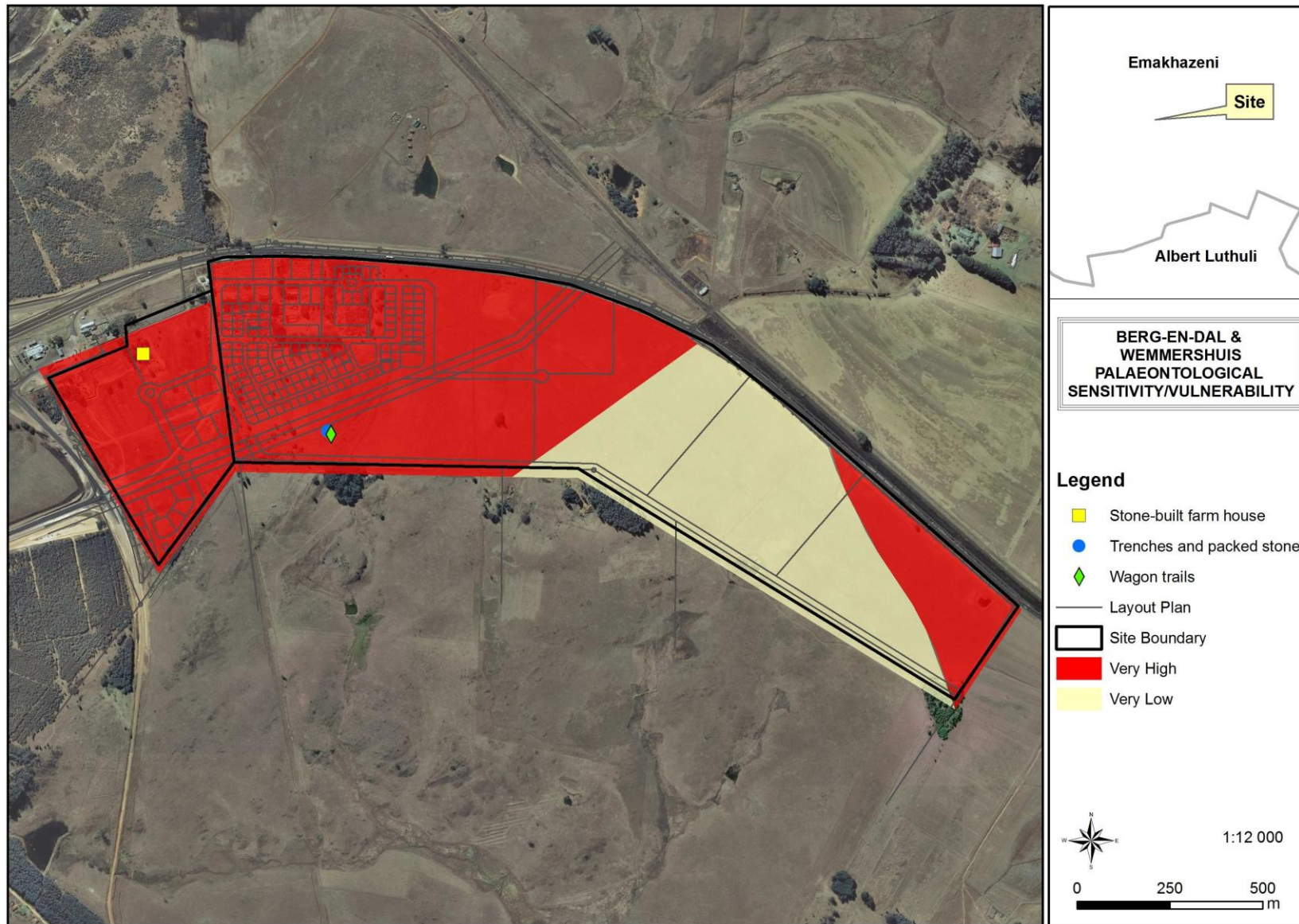


Figure 6: Heritage and Palaeontological sensitivity map

8.1.2 Design/Layout

The layout plan for the proposed development was influenced by the following factors:

- There is a servitude registered over the Remainder of the Farm Bergendal 981, JT in favour of an Eskom power line;
- The best location in terms of accessibility for the proposed Mall Erf;
- Ensuring adequate surface storm water drainage;
- The layout plan makes provision for residential erven of a minimum of 500m² and an average of 528m², as well as other mix land use erven;
- Access to the site, as approved by SANRAL; and
- Adequate community facilities and educational erven had to be designed taking into account the number of residential erven.

The following was considered when compiling the site layout plan:

- The site is laid out in a free flowing, attractive and interesting manner, incorporating higher order business land uses with cultural and tourism related activities and sites. It lends privacy to the majority of the residential properties by placing the focus on the surrounding socio-economic activities promoting tourism at the same time;
- The location and arrangement of buildings and structures will be in accordance to the existing natural characteristics of the site by promoting walking and biking instead of relying on vehicle transportation within the development area;
- Aspects, such as the visual effects, climate, topography, geology, surface drainage, noise pollution, archaeological aspects and hydrological aspects, have been taken into consideration; and
- Provision is to be made to allow for the buildings and structures, to harmonise with each other, and to blend with the environment.

8.1.3 Scale and Magnitude

In terms of scale and magnitude, two alternatives have been considered for the proposed development, as discussed below:

First alternative considered

As the two project properties are 117.5729ha in size, one alternative would have been to propose the development of the entire 117.5729ha for the proposed mixed use development. From a purely economic point of view, this alternative could have been promoted as it would have allowed a larger development to be constructed, which could have potentially resulted in higher economic returns for the developer. However, this approach would not have been in line with the requirement for sustainable development, as detailed in the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended. The NEMA, 1998, states that “sustainable development requires the integration of social, economic and environmental factors in the planning, implementation and evaluation of decisions to ensure that development serves present and future generations” (NEMA, 1998). Planning to develop the entire extent of the two properties would not have taken the environmental factors of the properties into account and this alternative has therefore been deemed to be unreasonable as it would have destroyed the more natural areas of the site (the eastern parts of the site) in their entirety.

Second alternative considered

The second alternative in terms of scale and magnitude is the preferred alternative (the development option) where the disturbed, western part of the project site will be developed and the majority of the eastern part (more natural) will be left for agricultural activities. The proposed layout plan will include 11.4324ha of open spaces and 52.2357ha for agricultural uses. In total, 54.15% of the project site will therefore not be developed through construction activities. This is shown visually in the figure below. The proposed layout plan takes into account the environmental attributes of the site, especially

sensitive and more natural areas, such as wetland areas, on the eastern parts of the project site and is therefore a layout that is in line with the requirement for sustainable development, as detailed in the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended.

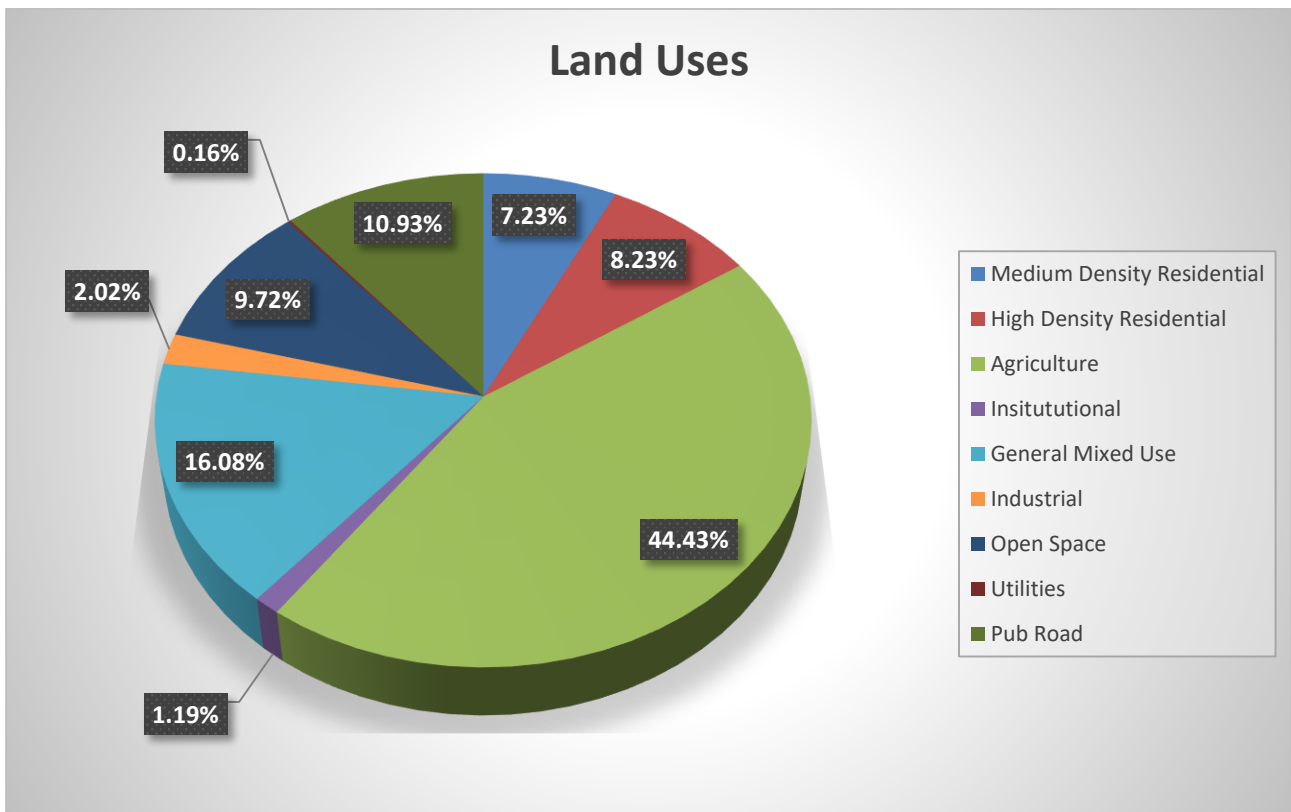


Figure 7: Percentage allocations of the various land uses that form part of the proposed development

8.1.4 “No-Go Option”

The No-Go Option would be where the project site is not developed and remains as vacant- and grazing- land. The No-Go Option is not considered to be a reasonable alternative as this would mean that the land is under-utilised in terms of its potential for a mixed use development and in particular, for tourism related development. The project site is situated within the Maputo Corridor, which is earmarked for tourism development according to the Emakhazeni Spatial Development Framework, 2015.

8.2 Public Participation Process undertaken in terms of Section 41 of the EIA Regulations, 2014

The following potentially Interested and Affected Parties were identified as part of the proposed development’s Environmental Impact Assessment process:

- Mpumalanga Department of Community Safety, Security and Liaison
- Mpumalanga Department of Public Works, Roads and Transport
- Nkangala District Municipality
- Emakhazeni Local Municipality
- Department of Water and Sanitation
- Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs

- Mpumalanga Department of Co-operative Governance and Traditional Affairs
- Mpumalanga Department of Health
- Mpumalanga Department of Social Development
- Mpumalanga Department of Human Settlements
- Mpumalanga Department of Education
- Mpumalanga Department of Finance
- Mpumalanga Department of Culture, Sport and Recreation
- South African Heritage Resources Agency (SAHRA)
- Department of Mineral Resources
- Eskom
- South African National Road Agency Limited (SANRAL)
- Trans African Concession (TRAC) N4
- Transnet
- Telkom SA Ltd
- Vodacom
- Endangered Wildlife Trust
- Engen 1 Stop
- Wimpy Belfast 1 Stop
- Adjacent land owner: Remainder of Portion 3 of the farm Berg-en-Dal 378 JT
- Adjacent land owner: Portion 5 of the farm Berg-en-Dal 378 JT
- Adjacent land owner: Portion 10 of the farm Berg-en-Dal 378 JT
- Adjacent land owner: Portion 13 of the farm Berg-en-Dal 378 JT
- Adjacent land owner: Portion 15 of the farm Berg-en-Dal 378 JT
- Adjacent land owner: Portion 16 of the farm Berg-en-Dal 378 JT
- Adjacent land owner: Portion 17 of the farm Berg-en-Dal 378 JT
- Adjacent land owner: Portion 20 of the farm Berg-en-Dal 378 JT
- Adjacent land owner: Remainder of the farm Wemmershuis 379 JT
- Adjacent land owner: Portion 1 of the farm Wemmershuis 379 JT
- Adjacent land owner: Remainder of Portion 4 of the farm Wemmershuis 379 JT
- Adjacent land owner: Remainder of Portion 5 of the farm Wemmershuis 379 JT
- Adjacent land owner: Remainder of Portion 6 of the farm Wemmershuis 379 JT
- Adjacent land owner: Remainder of Portion 11 of the farm Wemmershuis 379 JT
- Adjacent land owner: Remainder of Portion 13 of the farm Wemmershuis 379 JT
- Adjacent land owner: Portion 16 of the farm Wemmershuis 379 JT
- Adjacent land owner: Portion 18 of the farm Wemmershuis 379 JT
- Adjacent land owner: Portion 19 of the farm Wemmershuis 379 JT
- Adjacent land owner: Portion 25 of the farm Wemmershuis 379 JT
- Adjacent land owner: Portion 27 of the farm Wemmershuis 379 JT
- Adjacent land owner: Portion 28 of the farm Wemmershuis 379 JT
- Adjacent land owner: Portion 29 of the farm Wemmershuis 379 JT
- Adjacent land owner: Portion 1 of the farm Bergendal 981 JT
- Adjacent land owner: Portion 10 of the farm Steynsplaas 360 JT

For the initial Public Participation Process (notification of potentially Interested and Affected Parties), written notifications and Background Information Documents were distributed to the above mentioned list of identified Interested and Affected

Parties. The notifications were sent via email, fax or registered post, or hand delivered. Site notices were placed on the boundary of the project properties as well as at the Engen 1 Stop adjacent to the project properties. A newspaper advertisement was placed in the Middelburg Observer on the 28th of October 2016.

Proof of the above mentioned initial Public Participation Process is attached under Appendix C.

8.2.1 Public Review of the Draft Scoping Report

As required by the Environmental Impact Assessment Regulations, 2014, the Scoping Report (draft) was circulated for public review and commenting, for a period of at least 30 days. The review period was from the 21st of April 2017 to the 2nd of June 2017. Interested and Affected Parties were notified of the availability of the Scoping Report and the review period via email, courier and registered post. Proof hereof is attached under Appendix C. Comments received from Interested and Affected Parties during this review period have been included in *Table 9* below.

8.2.2 Summary of the issues raised by the Interested and Affected Parties and how the issues were addressed or incorporated into the Environmental Impact Assessment process

Comments received from Interested and Affected Parties are summarised in the following table:

Table 9: Comments and Responses Report

Entity represented	Name and Surname	Date comment was received	Comment submitted via	Comment(s) raised	Response to comment(s) raised
South African Heritage Resources Agency (SAHRA)	Nokukhanya Khumalo	22-11-2016	SAHRIS website	<p>CaseID: 10345</p> <p>Response to NID (Notification of Intent to Develop)</p> <p>In terms of Section 38(8) of the National Heritage Resources Act (Act 25 of 1999)</p> <p>Environmental Authorisation and Water Use Licence Applications for the following project: Belfast Mall and Mixed Use Development</p> <p>Labesh (Pty) Ltd has been appointed by Mlangeni Family Trust to draw up a Background Information Document for the construction of a mixed use development in order to obtain Environmental Authorisation in terms of the National Environmental Management Act, 107 of 1998 (NEMA) and the NEMA Environmental Impact Assessment (EIA) 2014 Regulations. The development is proposed to be 117.6ha, of which 53 ha will be the development footprint. It will be located on the remainder of the farm Bergendal 981 JT and remainder of Portion 12 of the farm Wemmershuis 379 JT, 3 km south east of the town Belfast, in the Emakhazeni Local Municipality of the Mpumalanga Province.</p> <p>In terms of the National Heritage Resources Act, no 25 of 1999, heritage resources, including archaeological or palaeontological sites over 100 years old, graves older than 60 years, structures older than 60 years are protected. They may not be disturbed without a permit from the relevant heritage resources authority. This means that before such sites are</p>	The Phase 1 Heritage Impact Assessment Report and the Desktop Palaeontological Impact Assessment have been uploaded to SAHRIS.

Entity represented	Name and Surname	Date comment was received	Comment submitted via	Comment(s) raised	Response to comment(s) raised
				<p>disturbed by development it is incumbent on the developer to ensure that a Heritage Impact Assessment is done. This must include the archaeological component (Phase 1) any other applicable heritage components. Appropriate (Phase 2) mitigation, which involves recording, sampling and dating sites that are to be destroyed, must be done as required.</p> <p>In your application received by SAHRA, provides no indication that an assessment of heritage resources including palaeontological resources was conducted. As such SAHRA requires a Heritage Impact Assessment (HIA) and a Palaeontological Impact Assessment (PIA) for the proposed development. These specialists' studies can only be conducted by suitably qualified Archaeologist and Palaeontologist for the respective assessments. If you are unaware of any archaeologists and palaeontologists a list of them working within Heritage Resources Management field are provided in the following websites: (see www.asapa.org.za) and (see www.palaeontologicalsociety.co.za).</p> <p>SAHRA will comment further on this proposed development once the requested reports are submitted to the case.</p> <p>Should you have any further queries, please contact the designated official using the case number quoted above in the case header.</p>	
Private Capacity	Mr. Chris McNamara	15-11-2016	Email	All meetings and comments please.	Noted.
Private Capacity	Mr. Hannes Kruger	15-11-2016	Email	All comments and objections.	Noted.

Entity represented	Name and Surname	Date comment was received	Comment submitted via	Comment(s) raised	Response to comment(s) raised
South African Heritage Resources Agency (SAHRA)	Nokukhanya Khumalo	13-06-2017	SAHRIS website	<p>Interim Comment In terms of Section 38(8) of the National Heritage Resources Act (Act 25 of 1999) Environmental Authorisation and Water Use Licence Applications for the following project: Belfast Mall and Mixed Use Development</p> <p>APelser Archaeological Consulting cc and Dr Gideon Groenewald were appointed by Labesh (Pty) Ltd on behalf of Mlangeni Family Trust to conduct a Heritage Impact Assessment and a Palaeontological Desktop Study for the proposed Belfast mall and mixed use development. These studies are in support of an Environmental Authorisation application in terms of the National Environmental Management Act, no. 107 of 1998 (NEMA) and NEMA Environmental Impact Assessment (EIA) Regulations, 2014. The proposed development is located on Portion 12 of Wemmershuis 379 JT and the remainder of Berg-en-dal 981 JT in the Emakhazeni Local Municipality of Mpumalanga Province. The extent of the proposed development footprint will be 53.90 ha a total of 117.57 ha of the project area, construction will consist of medium and high density housing units, access roads, utilities infrastructure and mixed use buildings among other infrastructure plans.</p> <p><i>Pelser, A.J. April 2016. Phase 1 HIA Report for Proposed Residential and Commercial Development on the Remainder of Portion 12 of the farm Wemmershuis 379 JT and the remainder of Berg-en Dal 981 JT near Belfast, Mpumalanga Province.</i></p>	<p>Comments noted. The mitigation measures, as stipulated in SAHRA's Interim Comments, have been included in the Environmental Management Programme for this proposed development. The draft Environmental Impact Assessment Report, as well as the accompanying Environmental Management Programme will also be provided to SAHRA, via uploading onto the SAHRIS website, for review and commenting, for a period of at least 30 days.</p> <p>A .kml map of the development has been uploaded to the GISLayer section in the case edits tab, on the SAHRIS website.</p>

Entity represented	Name and Surname	Date comment was received	Comment submitted via	Comment(s) raised	Response to comment(s) raised
				<p>The study area is partially located within the Anglo-Boer War battlefield of the Battle of Berg-en-dal. The battlefield is now used as agricultural crop fields and grazing fields and a coal mine conveyor belt rollers have been dumped on portions of the project area. Other features relating to the Battle of Berg-en-dal include some trenches identifiable by the remains of stone walling, and an old wagon route that passed 50 m away from the N4 motorway, in previous years an old coach house was excavated which was located close to the wagon route. The route is listed as low to medium significance. A farmstead house is located on the farm Wemmershuis, the house is partially stone built and with modern alterations using clay bricks, this site is listed as medium to high significance. All these identified heritage resources are located within the proposed house areas and will be impacted by the development. The author recommends the following:</p> <p>A Phase 2 HIA for the recording and mapping of the old wagon route, the farmstead house and the trenches that may be related to the battle of Berg-en-dal.</p> <p>The proposed development will directly impact on all the identified heritage resource, when comparing the development plans with the map showing the distribution of the sites. All the above recommendations will apply.</p> <p><i>Groenewald, G. April 2016. Palaeontological desktop study for the Proposed Development on PTN 12 of Wemmershuis 379 JT and the Remainder Van Bergendal 981 JT, Emakhazeni</i></p>	

Entity represented	Name and Surname	Date comment was received	Comment submitted via	Comment(s) raised	Response to comment(s) raised
				<p><i>Local Municipality, Nkangala District Municipality, Mpumalanga Province.</i></p> <p>The project area is underlain by Vaalian aged dolerite and Permian aged coarse grained sandstone and shale with coal beds of the Vryheid Formation, Ecca Group, Karoo Supergroup. This formation is very highly sensitive to the occurrence of fossiliferous plant impressions in the shale and sandstone rocks. From the desktop survey and analysis of Google Earth images the proposed development area is covered by deep sandy soil with no exposed rock outcrops. The author recommends the following:</p> <ol style="list-style-type: none"> 1. The EAP as well as the ECO for this project must be made aware of the fact that the Vryheid Formation of the Ecca Group is Highly significant for fossil remains of plant and trace fossils, albeit mostly where good outcrops are available for inspection. 2. In areas that are allocated a Very High Palaeontological sensitivity and specifically where deep excavation into bedrock is envisaged (>1.5m, following the geotechnical investigation), or where fossils are recorded during the geotechnical investigations, a qualified palaeontologist must be appointed to assess and record fossils at specific footprints of infrastructure developments (Phase 1 PIA). 3. These recommendations should form part of the EMP of the project. 	

Entity represented	Name and Surname	Date comment was received	Comment submitted via	Comment(s) raised	Response to comment(s) raised
				<p>Interim Comment</p> <p>SAHRA Archaeology, Palaeontology and Meteorites (APM) Unit accepts and endorses the recommendations within the Heritage Impact Assessment (HIA) and Palaeontological Desktop Study. The recommendations within the HIA Report must be implemented as the heritage sites will be impacted, and the following mitigation measures must be included within the EMPr for compliance.</p> <ul style="list-style-type: none"> • A report of the geotechnical investigation must be provided to a palaeontologist to determine whether further monitoring by a palaeontologist should be carried out during construction phase of the development. • If the findings of the palaeontologist supports monitoring by a palaeontologist during construction, then the appointed palaeontologist must apply for a section 35 permit for the collection of any fossils uncovered during construction. The frequency of the monitoring must be agreed upon with Mlangeni Family Trust, the ECO and the palaeontologist. • The Anglo Boer War trenches are older than a 100 years old and require a section 35 permit for Phase 2 HIA for the recording and mapping and mitigation consisting of test pits to find out if there is any archaeological deposit. • An archaeologist must be appointed to monitor all ground clearance and excavation activities during the construction phase. A report of the monitoring must be submitted to the case for comments. 	

Entity represented	Name and Surname	Date comment was received	Comment submitted via	Comment(s) raised	Response to comment(s) raised
				<ul style="list-style-type: none"> A sign post on the property needs to be erected which will also be visible to public, the sign post must contain the history of the battle of Berg-en-dal and also a map of the battlefield which the proposed development lies partially on. The signpost must also contain directions to the Berg-en-daal memorial down the road. All the other identified heritage resources within the HIA report (farmhouse and require comments and permits from the Mpumalanga Provincial Heritage Resources Authority (MPHRA), as they are generally protected under section 34 which it has competency to assess. The contact details of MPHRA are Mr Benjamin Moduka: 013 766 5196 bmoduka@mpg.gov.za. <p>SAHRA will issue Final Comments on this case once the EIA report is submitted to this case and the conditions listed above are incorporated into the EMP. The extent of the development must be mapped in detail on the SAHRIS Location Information map, a point will not suffice. A .kml map of the development can be uploaded to the GISLayer section in the case edits tab.</p> <p>Should you have any further queries, please contact the designated official using the case number quoted above in the case header.</p>	
Comments on the draft Scoping Report					
Tshilidzi Mavulwana	Transnet SOC Ltd	07-07-2017	Email	PROPOSED BELFAST MALL AND MIXED USE DEVELOPMENT ON THE REMAINDER OF THE FARM BERGENDAL 981, J.T AND THE REMAINDER OF PORTION 12 OF THE FARM WEMMERSHUIS 379, J.T, WITHIN THE	Comments noted.

Entity represented	Name and Surname	Date comment was received	Comment submitted via	Comment(s) raised	Response to comment(s) raised
				<p>EMAKHAZENI LOCAL MUNICIPALITY IN THE MPUMALANGA PROVINCE.</p> <p>With reference to the draft scoping report submitted by Labesh Environmental Consultants and a site meeting held on the 13th of June 2017 for the above mentioned project, Transnet Freight Rail's railway line and its associated infrastructure will not be impacted by the proposed development.</p>	
Private Capacity	Mr. Hannes Kruger	17-11-2017	Email	<p>Hi</p> <p>Any new about the Development - Belfast Mall ? Are there a plans available for the new mall (Fase 1) - can forward it to me please. Are there Tendants interseted yet.</p> <p>Kind regards Hannes</p>	<p>The Environmental Impact Assessment for this proposed development is proceeding.</p> <p>Layout plans have been attached to the Environmental Impact Assessment Report for your perusal.</p> <p>We are not privy to any information regarding tenants.</p>
Private Capacity	Mr. Hannes Kruger	06-02-2018	Email	<p>Good day</p> <p>Any new Info about Belfast Mall and Residential area.</p> <p>Regards Hannes</p>	<p>Good day Mr Kruger</p> <p>The Environmental Impact Assessment for this proposed development is proceeding. We will circulate the draft Environmental Impact</p>

Entity represented	Name and Surname	Date comment was received	Comment submitted via	Comment(s) raised	Response to comment(s) raised
					<p>Assessment Report to you and the other registered Interested and Affected Parties for review and commenting in due course. The review period will be for a period of 30 days.</p> <p>Please do not hesitate to contact us should you have any further queries in this regard.</p>

8.3 Environmental attributes associated with the alternatives considered – Environmental attributes of the proposed, project properties (the preferred alternative)

8.3.1 Geographical

A Phase 1 Geotechnical Investigation (Engineering Geological Investigation) was conducted for the project site by Engeolab in September 2015 (report dated December 2015). The full report is attached under Appendix D. The following are the main findings of the investigation:

Geology

The western and eastern portions of the site are underlain by sediments of the Vryheid Formation, Karoo Sequence, with the central portion underlain by older, intrusive diabase. The test pitting did, however, show the following discrepancies when compared to the published geological map, Sheet 2530 Barberton:

- Tillite of the Dwyka Formation and older quartzite of the Lakensvlei Formation, Transvaal Sequence were exposed in the central portion of the site; and
- The aerial distribution of the Vryheid Formation sediments on the site seemingly cover larger areas than originally mapped (Engeolab, 2015).

Soil

The average soil and bedrock profile of the site is given in the table below:

Table 10: Soil and bedrock profile of the project site (Engeolab, 2015)

Soil/bedrock profile	Origin	Average thickness range (m)	Average depth range (m)	Comments
Imported material	Various origins	Surface to 0.6	Surface to 1.5	None
Colluvium	Transported material	Surface to 0.6	Surface to 1.8	The site is predominantly blanketed by transported silty sand (colluvium). These soils consist of slightly moist, brown, loose to medium dense, silt-clay-sand mixes with a fissured structure. Grass roots appear in the upper 0.1 to 0.2m portion of the soil profile.
Pebble marker	Transported material	0.25	0.1 - 2.1	The colluvium is sequentially underlain by a pebble marker, comprising sub-rounded ferricrete nodules and quartz gravels mixed with fine to medium grained silty sand. The pebble marker is well developed.
Pedogenic material (hardpan ferricrete)	Pedogenic material	0.45	0.7 - 1.7	The transported materials (the colluvial horizon and pebble marker) are underlain by low active, partially to well cemented, ferruginised residuum. The latter occurs in some 15 test pits from as shallow as 0.7m to an average depth of 1.7m. The pedogenic material consists of soft powdery ferricrete concretions and nodules with soft ferruginised zones in a matrix of clayey, silty sand. Well cemented, honeycomb hardpan ferricrete was observed in sixteen test pits.
Residual Sandstone	<i>In situ</i> decomposed	1.0	0.9 - 1.9	Moist light beige becoming ivory-beige with depth, medium dense, intact, medium grained silty sand

Soil/bedrock profile	Origin	Average thickness range (m)	Average depth range (m)	Comments
				<p>derived from <i>in situ</i> decomposed sandstone of the Vryheid Formation was recorded in test pits along the eastern boundary of the site.</p> <p>Sandstone bedrock: Ivory-white and white yellowish beige, highly weathered to slightly weathered with scattered decomposed zones, widely bedded and jointed, medium grained, very soft to moderate hard sandstone rock of the Vryheid Formation was recorded in three test pits excavated within the eastern portion of the site (test pits TP52, TP54 and TP65). The sandstone pinches out further westwards – Test pit TP51.</p>
Residual Shale	<i>In situ</i> decomposed	0.85	0.9 - 3.2	<p>Slightly moist to moist, mottled yellowish, ivory creamy, orange brown, firm, intact and slickensided, fine grained, sandy, clayey silt with scattered flaky shale chips and in some test pits shale gravels with a snuff-box structure, within a depth range of between 0.9m to 3.2m below surface. The shale residual soils were excavated within nineteen test pits and occur in the western, northern and eastern portions of the site.</p> <p>Shale bedrock: Shale bedrock of the Vryheid Formation occurs in the western, northern and eastern portions of the terrain. The shale can easily be recognised by its beige colour with dark brown and light greyish stains, its thin and horizontally disposed bedding and medium spaced jointing. The depth to bedrock generally ranges between 0.7m to 2m below surface and the moderately weathered bedrock was generally soft to intermediately excavatable.</p>
Residual Diabase	<i>In situ</i> decomposed	1.65	0.1 - 3.4	<p>The profile of the residual diabase with its predominantly maroon colour comprises soft to firm, intact, fine slickensided and pin-holed, fine to medium grained, sugary textured sandy, clayey silt. Widely scattered to abundant spheroidal to sub-angular diabase gravels, cobbles and boulders occur within the profile and also tend to form prominent north trending ridges. The residual diabase occurs from surface to depths in excess of 3.4m – the maximum reach of the TLB's boom.</p>

Soil/bedrock profile	Origin	Average thickness range (m)	Average depth range (m)	Comments
				Diabase bedrock: Fractured diabase was encountered in eight test pits, namely TP5, TP18, TP28, TP29, TP43, TP44, TP49 and TP53. However, as mentioned above, some boulders also occur on the surface at these localities. Fractured diabase is generally intermediate to hard excavatable, even at a shallow depth of 0.8m.
Residual Quartzite	<i>In situ</i> decomposed	1.75	1.4 - 1.8	Moist, maroon-orange-brown stained pink and streaked yellowish, medium dense, intact, fine grained, silty sand was encountered in test pits TP8, TP13 and TP25, at an average depth of 1.6m below surface. The residual quartzite was excavated near the western boundary and central portion of the site. Quartzite bedrock: Dull ivory with maroon and orange brown relict stained fracture surfaces, thinly bedded and close to medium jointed, very soft to moderate hard quartzitic bedrock was encountered in the central portion and within the north-western corner of the site. The soft to intermediately excavatable bedrock ranges between 1.4m to 1.8m below surface.
Residual Tillite	<i>In situ</i> decomposed	>1.2	>2.2	Tillite of the Dwyka Formation was encountered at an average depth of 0.9m in three test pits, namely TP23, TP35 and TP55 – two in the western portion and a single test pit (TP55) in the eastern portion, close to the boundary. The Tillite comprises scattered, hard, angular and sub-angular black stained clayey quartzite gravels and pebbles in a matrix of slightly moist to moist, ivory streaked dull grey and light yellowish brown, firm, intact, sandy clay.
Sandstone of the Vryheid Formation	Weathered Sandstone	N/A	>0.6 - 2.0	None
Shale of the Vryheid Formation	Weathered Shale	N/A	>0.9 - 2.6	None
Quartzite of the Lakensvlei Formation	Weathered Quartzite	N/A	>1.95	None

Soil/bedrock profile	Origin	Average thickness range (m)	Average depth range (m)	Comments
Tillite of the Dwyka Formation	Weathered Tillite	N/A	>2.2	None
Diabase	Weathered Diabase	N/A	>0.5 - 1.8	None

Hydraulic conductivity

Permeability is expected to be high in the overburden materials due to the high sand fraction and fine gravel content. Any contamination is likely to move fairly rapidly within the colluvial cover soils and pebble marker, while the partially cemented pedogenic zones and sedimentary residuum will be less permeable (Engeolab, 2015).

Undermining

The site is not undermined and the nearest, non-operational open cast mine is situated approximately 800m north of the site on the farm Geluksoord 343 (Engeolab, 2015).

Agricultural Potential

A Soil and Land Capability study was undertaken for the project site by Earth Science Solution. The full report is attached under Appendix D. During the study, the soils were mapped, the land capability was rated and a scale of agricultural potential/suitability was determined using the soil and geomorphological aspects of the project site.

The majority of the site returned soils that classify as poorly productive for agricultural use, with various depth limiting materials, including saprolite, ferricrete and wetness hazards. The soils are considered shallow and the surface roughness too rocky for practical cultivation.

The soil's effective rooting depths are on average between 400mm and 600mm, with surface rock an added hindrance to any form of mechanised agriculture of large portions of the site. Other problems that render the soils as marginal to poor are the inherently low macro- and micro-nutrient supply characteristics, de-nitrification problems and the leaching hazard in the shallower soils. Erosion is also a hazard that will need to be well managed.

In conclusion:

- There are very limited areas of good productive soils (physical and chemical) that render the site of good agricultural production under dryland conditions;
- Approximately 51ha (44%) of the area is considered to be poor or unsuitable for agricultural production of any sort and should be left to conservation or as wetland status, as applicable;
- Only 59ha (51%) of the area is considered to be of a land capability rating of "moderate grazing" potential that could be cropped to grasses for animal food production. A mere 4ha (3.6%) is of a quality that could potentially be used for "moderate arable" production; and
- Soil salinity/sodicity is considered a potential problem (Earth Science Solution, 2015). The Agricultural Potential and Land Capability Maps are given in the two figures below (*Figure 8* and *Figure 9*).

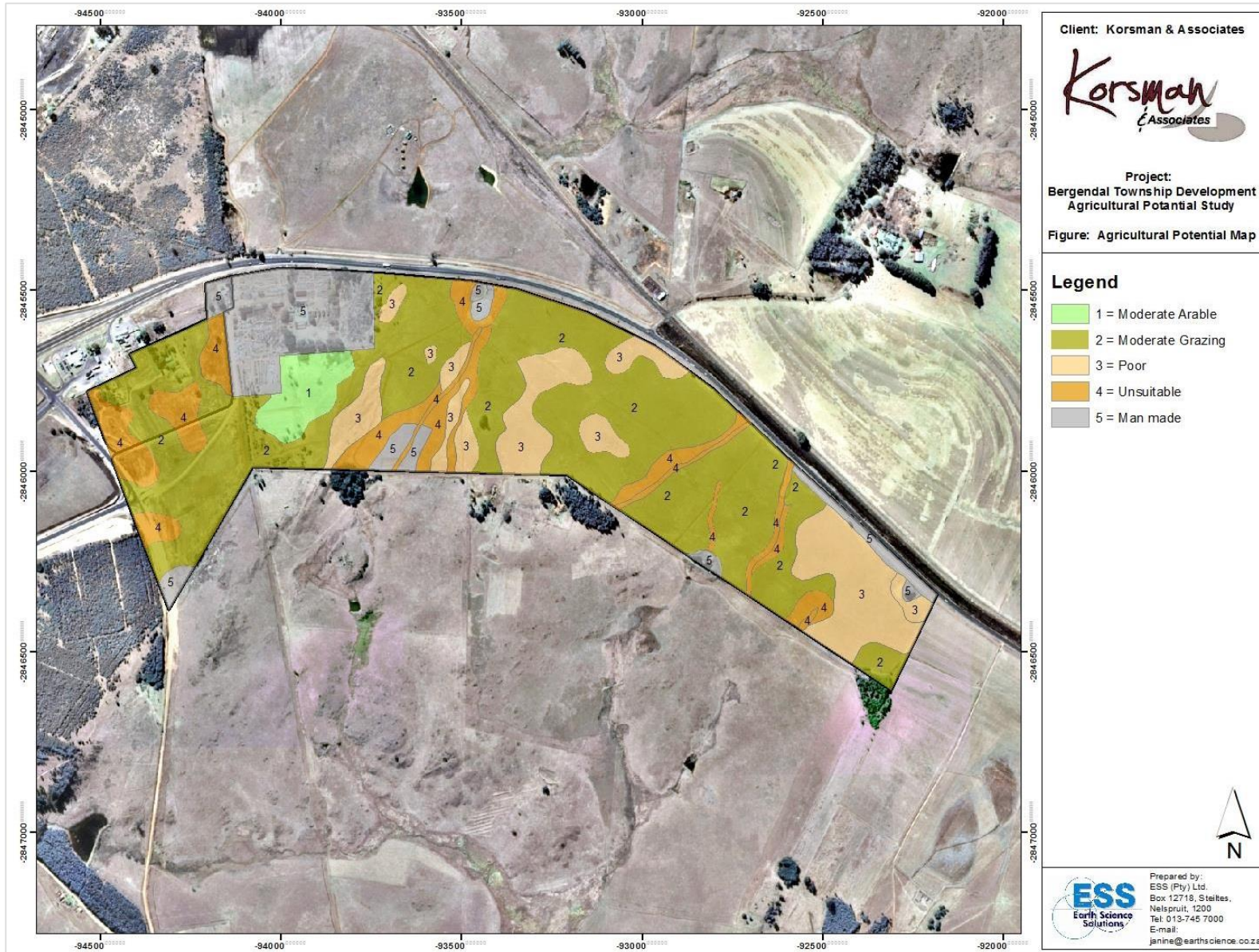


Figure 8: Agricultural Potential Map

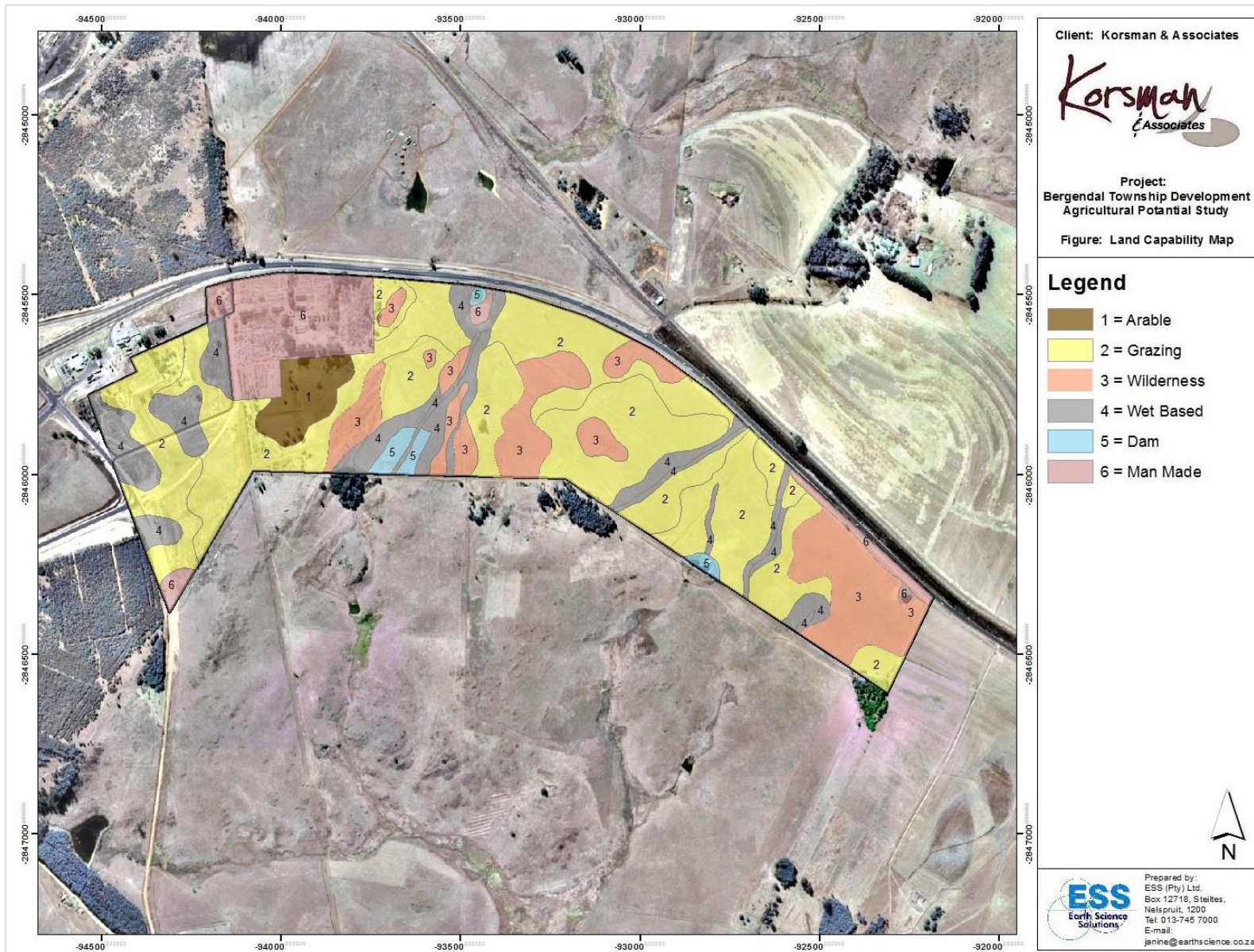


Figure 9: Land Capability Map

8.3.2 Physical

Rainfall

The project site lies within a summer rainfall area. The mean annual rainfall for the area is 601 - 800mm/annum. The Mean Annual Evaporation (MAE) rate for the area is 1 601 - 1 800mm/annum (AGIS, 2007).

Temperature

The mean maximum annual temperature for the project area is $\leq 25^{\circ}\text{C}$ and the mean minimum annual temperature is 0°C to $\leq 2^{\circ}\text{C}$ (AGIS, 2007).

Wind

According to www.windfinder.com, the prevailing wind direction for Belfast is East-northeast, as indicated by the figure below. The prevailing wind direction has been determined from yearly wind direction data from November 2011 to May 2016.



Figure 10: Prevailing wind direction for Belfast (www.windfinder.com/windstatistics/belfast_emakhazeni)

Topography

The project site slopes downwards from West to East, with the elevation for the western and central parts of the site lying at elevations of between 1 910 and 1 950.43masl (metres above sea level) and the eastern part of the site lying at elevations of between 1 880 and 1 910masl. This is also shown in the figure below.

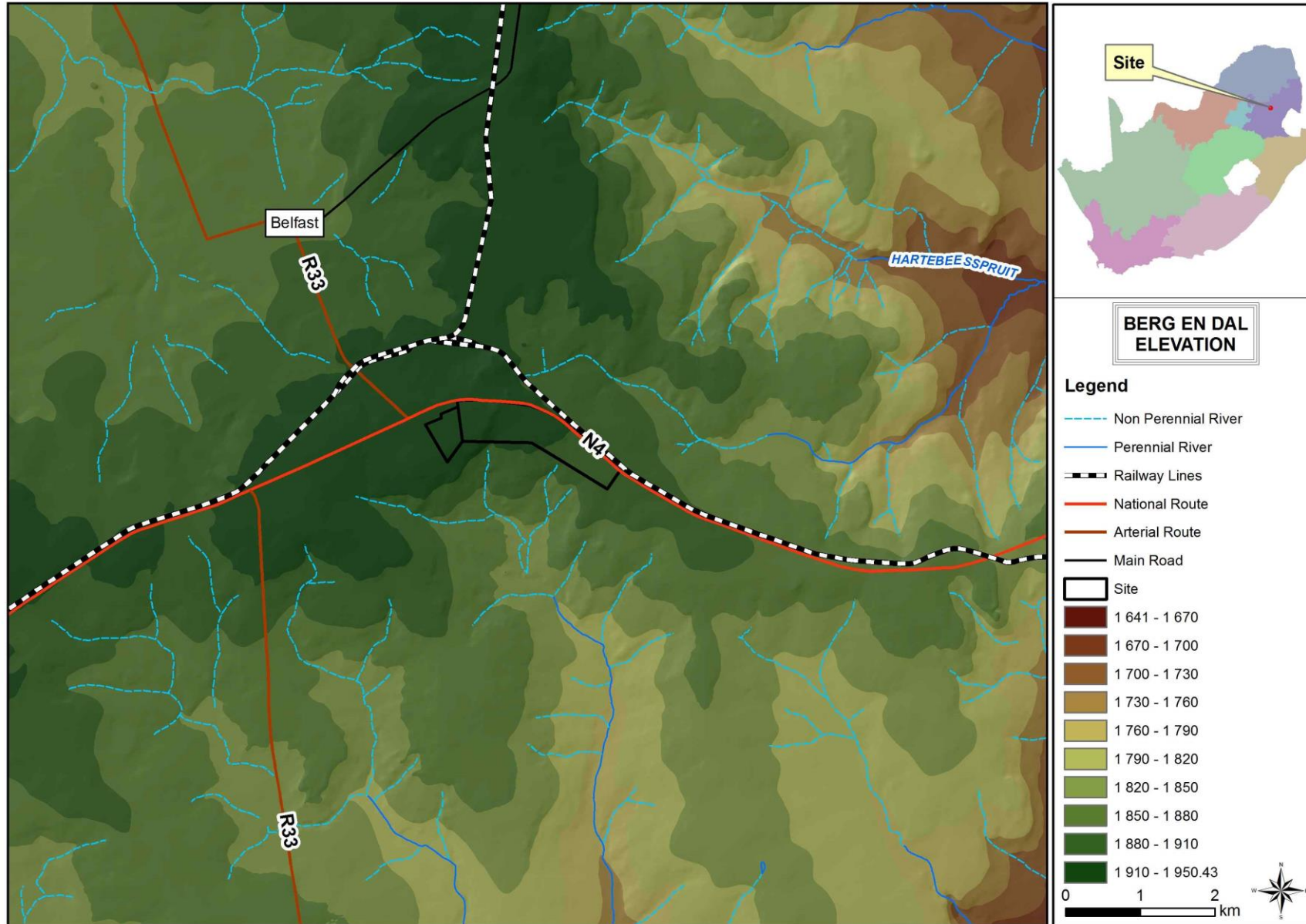


Figure 11: Elevation of the project site

8.3.3 Biological

Fauna

A Fauna and Flora Assessment was undertaken for the project site. The full report is attached under Appendix D.

Two main habitat types are present at the project site, namely terrestrial habitat and, to a lesser extent, rupicolous habitat. The terrestrial habitat predominates in the form of high altitude sour grassland. The quality of ground cover varies between dense stands of sour grass and areas where the grass has been overgrazed and/or displaced by the dense and vigorous alien creeper *Richardia braziliensis*. Most terrestrial, small mammals select for good cover providing both refuge and nourishment. Scrub hares have a predilection for short grass cover and are assumed to favour areas dominated by the creeper. Most of the arboreal habitat consists of exotic tree species, or, to a lesser degree, of planted endemics that were established outside of their natural distributional ranges. However, it can be expected that, irrespective of its origin, alien trees serve as perches and nesting sites for birds. Common reptiles most likely invaded established homesteads. No termitaria were recorded and this could be the reason why aardvarks were not noted as present. The coiled razor fence is regarded as impairment to connectivity for medium-sized mammals such as black-backed jackal, duiker and steenbok, but these are still regarded as occupants given access under the fence. The rocky outcrops at the upper reaches of undulating plains do not provide prime rupicolous habitat, but applying the precautionary principle robust rupicolous species such as Namaqua rock rats, rock rabbits and rock elephant shrews are presumed to be residents. Species such as dassies are definitely absent.

The species richness is very low for such an extensive area. That is ascribed to the fact that Highveld grasslands do not have the species richness of savannahs and also as only two habitats are present. The overall quality of conservation is ranked as varying between poor and fairly good (Bredenkamp *et al.*, 2016).

Mammals

The following species were observed or deduced to occupy the study site:

- Scrub hare - *Lepus* – confirmed based on observed faecal pellets
- African mole rat - *Cryptomys hottentotus* – confirmed based on observed tunnel systems
- Cape serotine bat - *Neoromicia capensis*
- African yellow house bat - *Scotophilus dinganii*
- Greenish yellow house bat - *Scotophilus viridis*
- Highveld gerbil - *G. brantsii* – confirmed based on observed tunnel systems

There is a medium probability that the following Data Deficient mammal species occur at the project site:

- Reddish-grey musk shrew - *Crocidura cyanea*
- Lesser red musk shrew - *Crocidura hirta*
- African weasel - *Poecilogale albinucha*

These species are not necessarily endangered, but have not been adequately studied to provide quantitative field data to accurately assign a conservation ranking. As a precaution they are therefore considered as 'Data Deficient'. No other Red Data or sensitive species are deemed present on the site, either since the site is too disturbed, falls outside the distributional ranges of some species, or does not offer suitable habitat(s) (Bredenkamp *et al.*, 2016).

Birds

The site of the proposed development falls within the Steenkampsberg Important Bird and Biodiversity Area (IBA) (Marnewick *et al.*, 2015). This IBA includes a number of highly significant sites for avian conservation, such as the Middelpunt wetland between Belfast and Dullstroom (Marnewick *et al.*, 2015).

Avian habitats at the site of the proposed development can be categorised as follows:

- Short grassland on rocky substrate: The eastern portion of the site consists predominantly of short grassland with extensive rocky outcrops. These grasslands are being used for grazing;
- Highly disturbed grasslands interspersed with stands of alien trees, buildings and livestock paddocks. This habitat type is characteristic of the western portion of the site; and
- Small dams: There are a number of small dams on the property. One of these (located along the southern edge of the site at 25°24'15.5"S; 30°04'29"E) differs from the others by being lined with reeds and other aquatic vegetation.

The areas surrounding the site are characterised by similar grassland habitats, also used for grazing, and plantations.

The avian community at the site is typical of mid- to high-altitude grasslands in Mpumalanga, in transformed rural landscapes. The disturbed grasslands in the western parts of the property host species such as Zitting Cisticola, Bokmakierie, Amur Falcon and Malachite Sunbird. The areas around the buildings and stands of alien trees host species such as Dark-capped Bulbul, Speckled Pigeon, Common Fiscal, Hadedda Ibis and Laughing Dove. The rocky grassland areas in the central and eastern sections of the property host a more diverse community that, in addition to the species listed above, includes Ant-eating Chat, Buff-streaked Chat, African Stonechat, Cloud Cisticola, Cape Longclaw and Black-shouldered Kite. Few birds were present at the dams, with the exception of the vegetation-lined dam, where Reed Cormorant and Levillant's Cisticola were present. This dam likely also hosts species such as Red-knobbed Coot and Yellow-billed Duck from time to time.

A total of 32 species were confirmed to be present at the site and the occurrence of an additional 38 species is considered likely.

No less than 30 Near Threatened or Threatened bird species have been recorded in the area considered during the desktop survey. The potential presence of such a large number of species of conservation concern (including two *Critically Endangered* species) is highly pertinent and calls for very careful evaluation of whether any of these species are likely to be present at the site, even if their presence is occasional.

One red-listed species, the *Vulnerable* Southern Bald Ibis, was recorded at the site during the survey. This southern African endemic occurs in mid- to high-altitude grasslands and breeds colonially on cliffs. The species is threatened by theft of eggs and young, poisoning and habitat destruction and transformation (Henderson, 2015). The individuals seen at the site were foraging, and in view of the specialised cliff-nesting habits of the species, there is virtually zero likelihood that these birds breed at the site.

Besides the Southern Bald Ibis, several other red-listed species may be expected to occur at the site from time to time, although it is doubtful that it represents critical breeding habitat for any of them. Secretary bird and Denham's Bustard are both *Vulnerable* grassland specialists that have been recorded in the area considered for the desktop survey and could occur at the site. Lanner Falcon (also *Vulnerable*) generally avoid transformed rural landscapes, but could conceivably occur here occasionally. The *Near Threatened* Red-footed Falcon may also occur here from time to time, but the site is outside the usual range for this species.

Finally, two *Critically Endangered* species have been recorded in the area considered for the desktop survey, specifically Wattled Crane and White-winged Flufftail. Both are unlikely to occur at this site. White-winged Flufftails are restricted to permanently flooded marshes, such as those at Middelpunt between Belfast and Dullstroom (Evans *et al.*, 2015), and are therefore extremely unlikely to ever occur at this site. Wattled Cranes breed in permanently inundated wetlands, but may venture into drier grasslands (Smith, 2015). There is therefore a small chance that these birds could visit the area periodically.

From an avifaunal perspective, most of the site can be considered of medium-high sensitivity, on account of the remaining natural grassland vegetation in the eastern portion of the site, the confirmed presence of one red-listed species, and the possible presence from time to time of several others. Designation of the site as being of medium-high sensitivity is further justified by its location within the Steenkampsberg Important Bird and Biodiversity Area (IBA) (Marnewick *et al.*, 2015). The contribution of the proposed development to cumulative avian habitat loss in the Steenkampsberg IBA also cannot be ignored. The loss of habitat will be mitigated to some extent by the zoning of several parts of the site for open space and agriculture, as per the layout plan provided. In the area surrounding the buildings, the degree of human disturbance is far greater than in the remainder of the site and is of lower sensitivity than the rocky grassland areas further east. Another factor that should be considered is the potential for negative impacts over a larger area of the IBA through pollution associated with construction and/or agricultural activities. The possibility exists, for instance, that the careless use of toxic chemicals at the site could reach areas of major conservation significance (e.g. the Middelpunt wetland) via run-off and/or groundwater. For this reason, the location of this site within the IBA must be borne in mind throughout the construction and operational phases of this project (Bredenkamp *et al.*, 2016).

Herpetofauna

From a herpetological habitat perspective, it was established that three of the four major habitats are naturally present on the project site, namely terrestrial, rupicolous and wetland-associated vegetation cover.

Most of the project site consists of plateau and moist grassland. The natural grassland has been transformed in some parts for agricultural purposes like grazing and by anthropogenic influences such as buildings, roads, fences and invasive plants. The project site is therefore ecologically disturbed in places. No moribund termitaria were recorded. These structures are good indicators of the occurrence of small herpetofauna. Accordingly, it is estimated that the reptile and amphibian population density for the project site is lower. At the time of the site visit, the basal cover was good in many places, despite grazing by cattle, horses and donkeys, and would provide adequate cover for small terrestrial herpetofauna. The grasslands on the project site have not been severely transformed and prey is probably widely distributed, so foraging grounds would not need to be so extensive to support the different populations of herpetofauna.

On the central part of the project site there are many small rocky outcrops in the grassveld, which provide excellent rupicolous habitat. Due to the presence of natural rupicolous habitat, some species like common girdled lizard, common crag lizard and rock agama were added to the species list. There are several artificial surrogates for rupicolous habitat, such as buildings. Only common reptiles like the speckled rock skink will benefit from these structures.

There are a few manmade dams/burrow pits on the project site. Some of the dams are in drainage lines and hold water either temporarily or permanently. These water sources would provide habitat for common water-dependent herpetofauna.

Noticeable absentees from the study site are indigenous trees. Arboreal habitat is therefore absent in a functional sense. Due to the absence of natural arboreal habitat, some species such as tree agamas and flap-neck chameleons were omitted from the species list. Most of the trees present on the project site are exotics. There are several dead logs that provide shelter and food for some herpetofauna.

Of the 46 reptile species that may occur on the project site, four were confirmed during the site visit, and of the possible 20 amphibian species that may occur on the project site, two were confirmed during the site visit.

A total of 66 herpetofauna species are recorded as potential occupants of the project site. Many of these herpetofauna species are robust generalists with the ability to capitalise on disturbed environments. It should be noted that potential occurrence is interpreted as being possible over a period of time, as a result of expansions and contractions of population densities and ranges that stimulate migration. The species assemblage is typical of what can be expected in extensive natural areas with sufficient habitat to sustain populations. Most of the species of the resident diversity are fairly common and widespread (viz. brown house snake, mole snake, common egg eater, rinkhals, speckled rock skink, common platanna, common river frog, Boettger's caco, bubbling kassina, guttural toad and common river frog).

The occurrence of speckled rock skink, variable skink, common crag lizard, Van Son's gecko, guttural toad and common river frog was confirmed during the site visit (sight records). These species should be abundant or common on the study site and elsewhere in its range.

The study site falls outside the natural range of giant bullfrog, plain stream frog, spotted shovel-nosed frog, whistling rain frog, giant dragon lizard (sungazer), Fitzsimons' flat lizard, Breyer's long-tailed seps, striped harlequin snake, Southern African python and the Nile crocodile. None of these Red-listed species should occur on the study site. The coppery grass lizard has been recorded on this quarter degree square 2530CA (Belfast) [Transvaal or Ditsong Museum of Natural History records], and large parts of the study site consist of fairly pristine grassveld. Therefore there is a good possibility that this species may occur on the study site. The study site has suitable habitat for the large-scaled grass lizard (*Chamaejasura macrolepis*) and there is a small possibility that this species may occur on the site (Bredenkamp *et al.*, 2016).

Flora

Most of the project site is undeveloped and currently used as land for the grazing of livestock. Even though the site is mostly in an ecologically unaltered state, no areas of the site have extraordinary conservation status.

The project site lies within the Lydenburg Montane Grassland (Gm18) vegetation type. This vegetation type has a status of "Vulnerable" and is typical of an inland high-altitude plateau, with mostly dense and short sour grass. Apart from a farmstead enclosure that consists of houses, sheds and kraals, the site is undeveloped and varies between light and heavily grazed by cattle and equids. Unusually, the entire property is security-fenced with high wire strands and attached razor coils. This represents a connectivity impairment for medium and larger terrestrial mammals.

Six vegetation mapping units were identified at the project site, as shown in *Figure 12* and *Table 11* below. The largest part of the site is covered with natural primary grassland, although it has been grazed. Rocky areas with boulders occur scattered throughout the area. Two small drainage areas with moist grassland are present on the southern boundary of the property. In the south western corner is degraded grassland and the farmstead development covers the north western corner. The ecological sensitivity of the project site is given in *Figure 13*.

Table 11: Vegetation mapping units of the project site

Mapping Unit	Ecological Sensitivity
1. Grassland	High
2. Moist Grassland	High
3. Rocky Outcrops	High
4. Degraded Grassland	Low
5. Highly Disturbed Areas	Low
6. Developed Area	Low

Grassland

Primary grassland occurs on the slightly undulating terrain on the larger eastern part of the site. Although grazed, the grass layer has a high cover and is in a good condition, often with *Eragrostis curvula* dominant. Although never dominant, several forb species occur scattered within the grassland. As the grassland is in a primary state, it is considered to have a high ecological sensitivity. The conservation status is considered to be vulnerable, mainly due to expansion of alien plantations. One Red Data Forb species and three protected Forb species were recorded. The proposed development can be supported in the western area of the project site, but the veld earmarked for agriculture should be carefully managed.

Table 12: Grassland summary

Grassland characteristics	
Status	Primary grassland vegetation
Soil	Reddish brown loam
Conservation value	High
Agricultural potential	Medium
Dominant spp.	<i>Eragrostis plana</i> , <i>Eragrostis curvula</i>
Rockiness	0-5%
Ecological sensitivity	High
Need for rehabilitation	Low

Moist grassland and dams

Moist primary grassland has a very limited distribution within the project site and is restricted to the small catchments of the two small dams on the southern boundary of the site. Although grazed, the grass layer has a high cover and is in a fair to good condition, often with *Eragrostis curvula* and *Eragrostis plana* dominant. The grassland vegetation is not much different from the surrounding grassland, but a few hygrophilous plant species occur at the dams. As it is primary grassland that feeds into a shallow drainage valley, this vegetation type is considered to have a high ecological sensitivity. No Red Data species were recorded. One protected plant species (a forb) was recorded. It is suggested that the drainage areas be kept as natural open space.

Table 13: Moist grassland and dams' summary

Moist grassland and dams' characteristics	
Status	Primary grassland vegetation, with dams
Soil	Reddish brown loam
Conservation value	High
Agricultural potential	Low
Dominant spp.	<i>Eragrostis plana</i> , <i>Eragrostis curvula</i>
Rockiness	0%
Ecological sensitivity	High
Need for rehabilitation	Low

Rocky outcrops

Rocky outcrops occur scattered within the undulating grassland and provide special habitat to a great number of plant species, including rare and threatened species of conservation concern. The rocky outcrops are a special habitat in the primary grassland and are therefore considered to have a high ecological sensitivity. Two Red Data and four protected plant species (all forbs) were recorded. It is suggested that the rocky areas be protected as natural habitats in open space areas and not be destroyed by the proposed development.

Table 14: Rocky outcrops' summary

Rocky outcrops' characteristics	
Status	Primary grassland vegetation
Soil	Reddish brown loam
Conservation value	High
Agricultural potential	Medium
Dominant spp.	<i>Eragrostis plana</i> , <i>Eragrostis curvula</i>
Rockiness	0-5%
Ecological sensitivity	High
Need for rehabilitation	Low

Degraded grassland

The area in the south-western corner at the current entrance gate of the site has been highly disturbed and transformed. Some *Eucalyptus* and *Acacia mearnsii* occur here. The area is quite weedy while the tall-growing grasses like *Hyparrhenia hirta*, *Hyparrhenia dregeana*, *Eragrostis curvula* and also *Eragrostis plana* are locally prominent. These are patches within the grassland that have been highly disturbed and transformed, e.g. the borrow pit area on the northern boundary of the site. These areas have no plant species of any conservation concern and have a low sensitivity. Development in this area can be supported.

Table 15: Degraded grassland summary

Degraded grassland characteristics	
Status	Transformed vegetation
Soil	Reddish brown loam
Conservation value	Low
Agricultural potential	Medium
Dominant spp.	<i>Eragrostis plana</i> , <i>Eragrostis curvula</i>
Rockiness	0%
Ecological sensitivity	Low
Need for rehabilitation	Medium

Highly disturbed areas

Highly disturbed and transformed areas occur in the western part of the project site, such as at the borrow pit on the northern boundary. These areas have no plant species of concern and have low conservation value and low sensitivity.

Developed areas

This includes the farmstead and associated infrastructure in the north-western corner of the project site. Alien trees such as *Pinus*, *Eucalyptus* and *Quercus* were planted in this area. Old field and planted pastures are also present. These areas have no plant species of concern; have a low conservation value; and a low sensitivity.

Red Data Listed Plant Species

Eucomis montana Compton (Declining) and *Khadia carolinensis* (L. Bolus) L. Bolus (Vulnerable) was found on the rocky outcrops. A further species, namely *Boophone disticha* (L.f.) Herb (Declining) was also present on the rocky outcrops. The localities of these plants are given in the table below.

Table 16: Approximate localities of Red-listed plant species

Plant species	Latitude	Longitude
<i>Eucomis montana</i>	25°43'08"S	30° 04'22"E
<i>Boophone disticha</i>	25°43'10"S	30° 04'27"E
	25°43'20"S	30° 04'37"E
<i>Khadia carolinensis</i>	25°43'11"S	30° 04'39"E
	25°42'59"S	30° 04'04"E

Provincially Protected Plants

The following Provincially Protected plant species were observed at the project site:

Table 17: Provincially protected plant species confirmed to occur at the project site

Plant species	Habitat
<i>Aloe ecklonis</i>	Rocky outcrops
<i>Aloe graciliflora</i>	Rocky outcrops
<i>Gladiolus crassifolius</i>	Grassland
<i>Watsonia latifolia</i>	Grassland
<i>Zantheschia rehmannii</i>	Rocky outcrops

No Provincially Protected plants are to be removed, damaged or destroyed without a permit from MTPA (Bredenkamp *et al.*, 2016).

Alien Invasive Plant Species

The following Category 2 alien invader plant species are present at the project site:

- *Eucalyptus* sp.; and
- *Acacia mearnsii* / *Acacia dealbata*.

Category 2 plants are declared invaders. They are plants with commercial application and may only be cultivated in demarcated areas (such as biological control reserves); otherwise they must be controlled (Bredenkamp *et al.*, 2016).

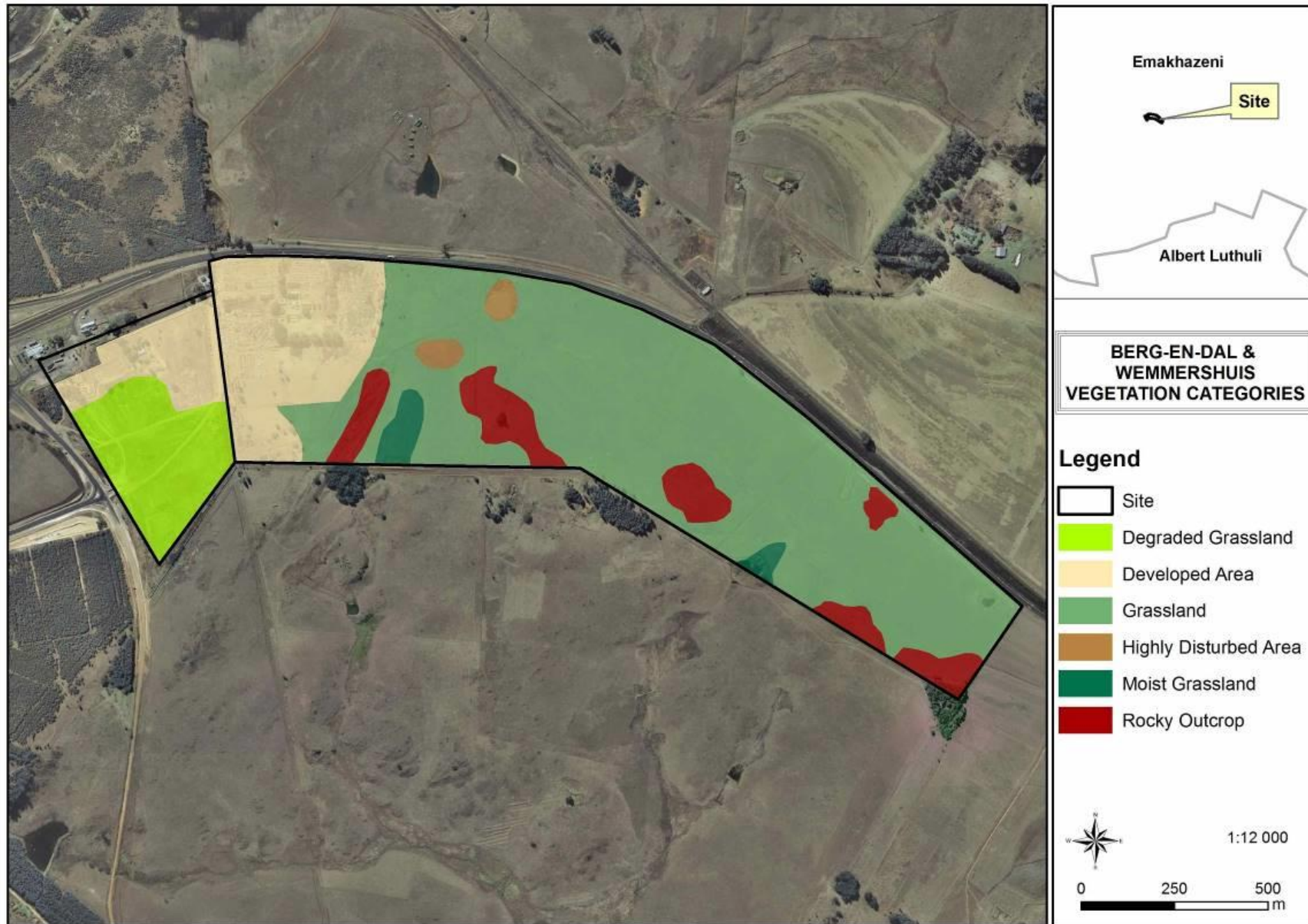


Figure 12: Vegetation mapping units of the project site

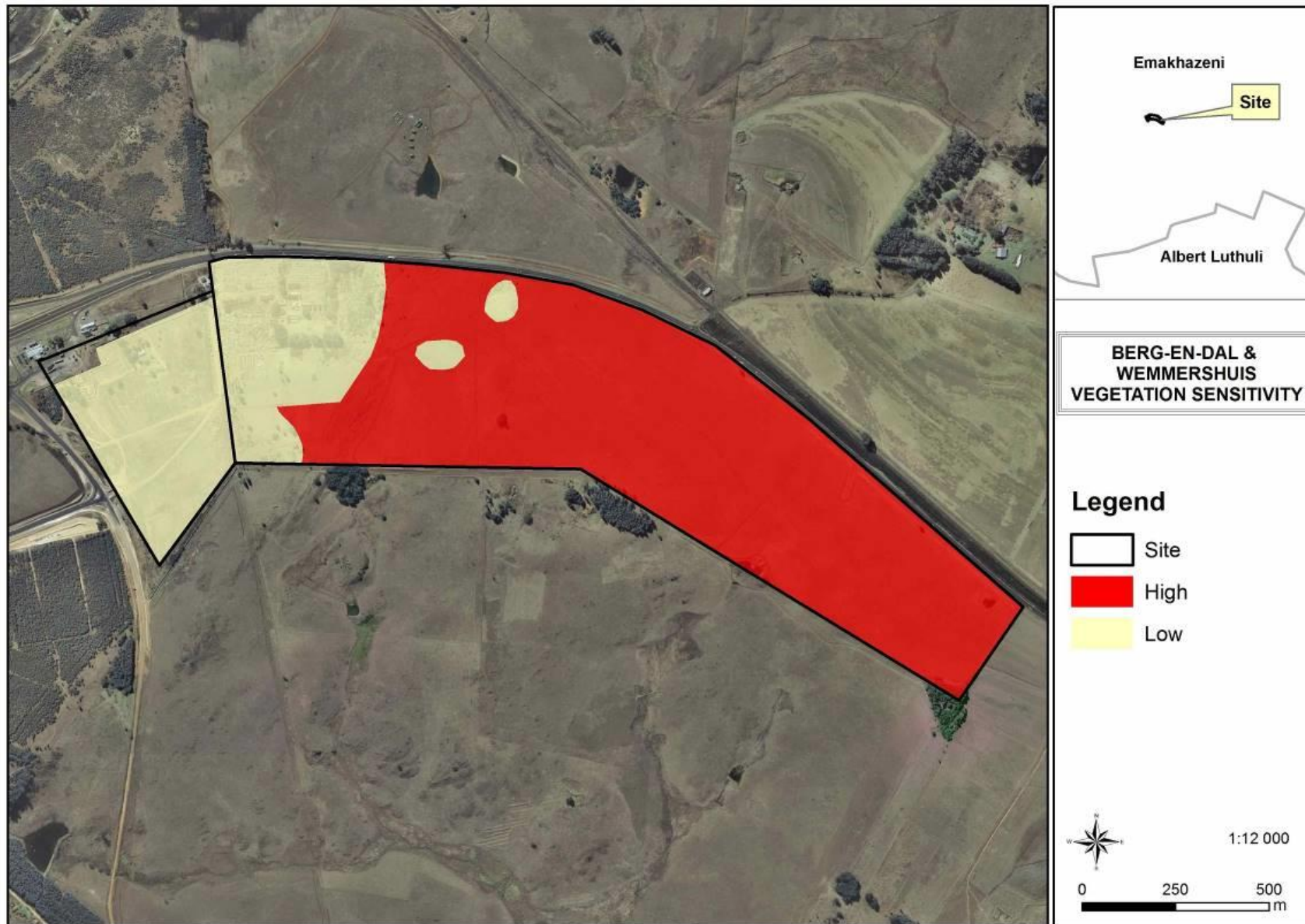


Figure 13: Ecological sensitivity of the project site

Wetlands and watercourses

A Wetland/Riparian Delineation and Functional Assessment was conducted for the project site by Limosella Consulting. The full report is attached under Appendix D.

As shown on *Figure 14*, the project site is mostly situated within the X11D quaternary catchment, with a small, northern part of the site situated within the X21F quaternary catchment. The depth to the groundwater is 12.9 metres below ground level and the recharge is 14mm/annum (DWA, 2010). The aquifers below the site are classified as minor aquifers (DWA, 2012).

Based on the National Freshwater Ecosystem Priority Areas (NFEPA) Wetland Types for South Africa (SANBI, 2010), no watercourses are located on the project site. Some perineal rivers and non-perineal rivers and wetlands are located in close association to the study site. This is shown in *Figure 14* below. According to the NFEPA layer, the project site is situated within an area characterised by wetland clusters and is classified as mesic Highveld Grassland Group 6.

Two wetland sections and two dams were recorded at the project site. The wetland sections are classified as two sections of headwaters of one large unchannelled valley bottom wetland system. 44m buffer zones are recommended around these two wetland sections. The majority of the wetland is not located on the project site (it extends south of the project site). The wetland sections are shown in *Figure 15* below. The onsite wetlands are only slightly disturbed with the main impacts being the dams within the wetlands and some grazing animals. The Present Ecological State (PES) for both wetlands is "C – Moderately Modified". This implies that a moderate change in ecosystem processes and loss of natural habitats has taken place, but the natural habitat remains predominantly intact.

The Ecological Importance and Sensitivity (EIS) scores of **2.7** and **2.5**, for the two wetlands, fall within the "High" Ecological Importance and Sensitivity category. Wetlands in this category are considered to be ecologically important and sensitive. The biodiversity of the wetlands may be sensitive to flow and habitat modifications and they play a role in moderating the quantity and quality of water of major rivers. The recommended Ecological Management Class for the wetlands is a "B". The combined EIS score for the wetland systems on the project site is **2.5** (Limosella, 2016).

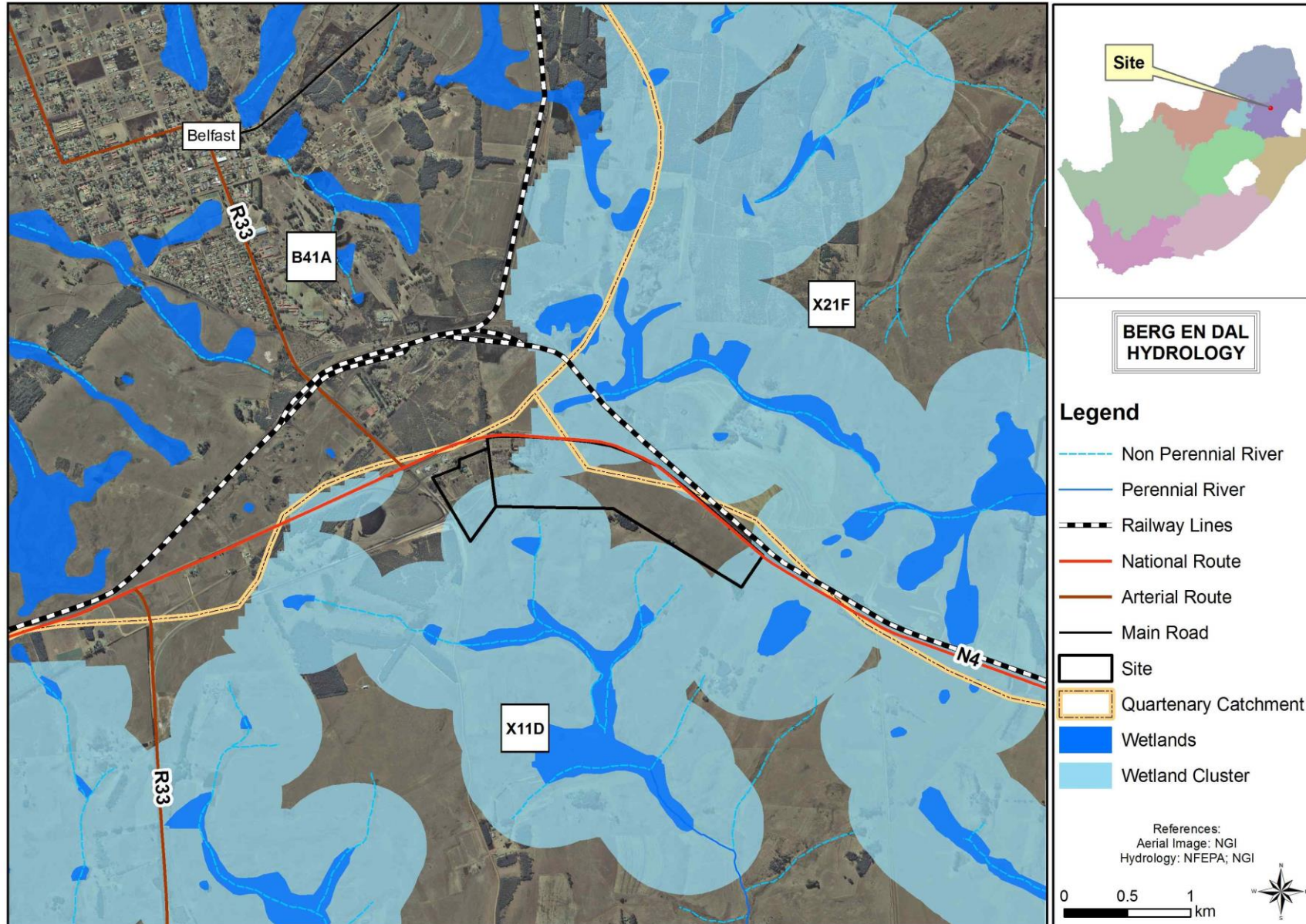


Figure 14: High level hydrology of the project site and surrounding areas

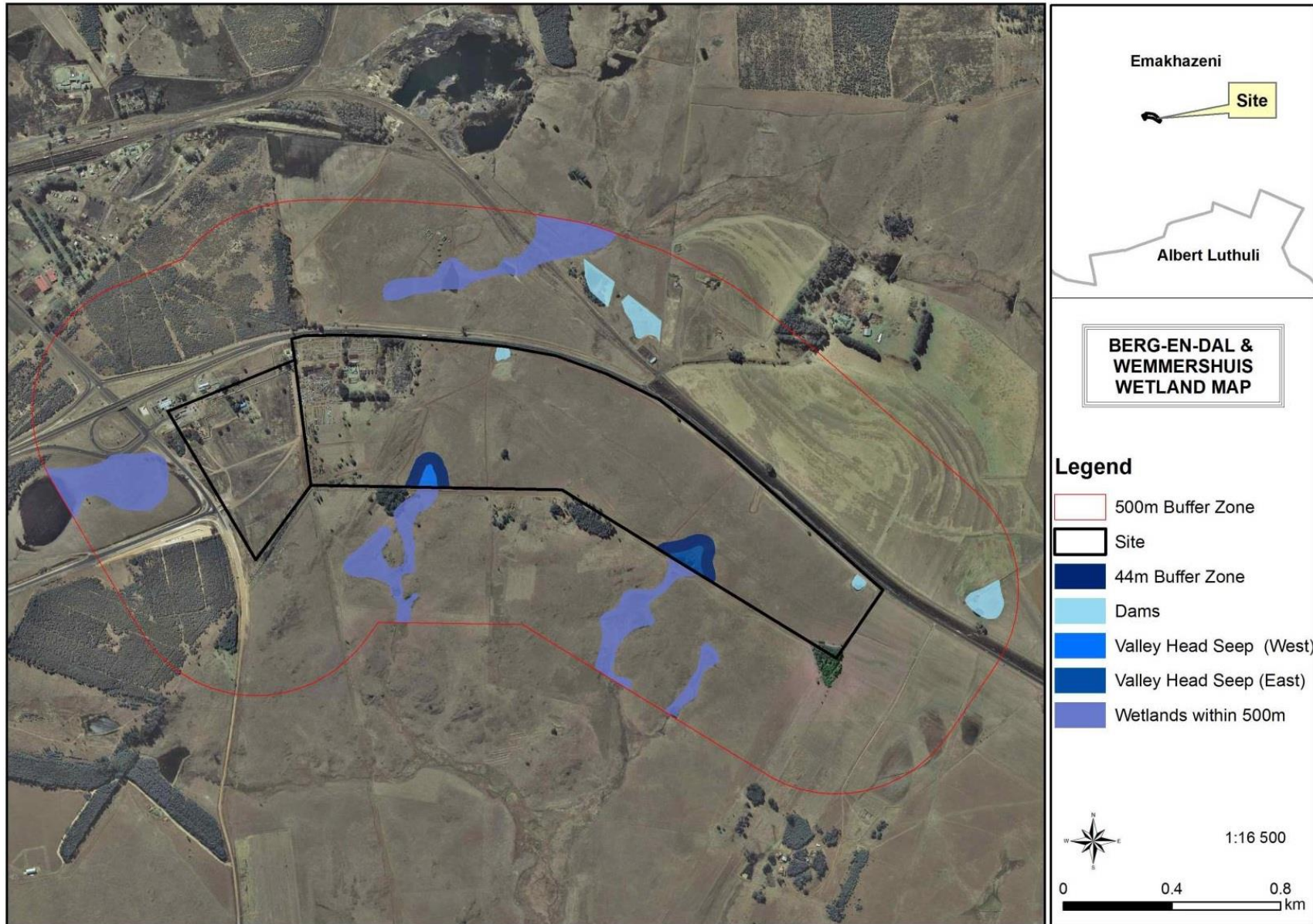


Figure 15: Wetlands associated with the project site

8.3.4 Social

The project site is situated within the Emakhazeni Local Municipality. According to the 2011 Census, the municipality had a population of 47 216 people, distributed between 13 722 households. There were therefore 3.4 persons per household in 2011.

The age structure of the municipal area was as follows:

- <15 years of age: 28%;
- 15-64 years of age: 66.2%; and
- 65+ years of age: 5.8%.

The dependency ratio was 51 persons per 100 persons and there were 104.2 men per 100 women in 2011. The official employment rate was 25.9% and the youth unemployment rate (15-34 years of age) was 34.2% (Statistics South Africa, 2011).

8.3.5 Economic

According to the Local Government Handbook, the main economic sectors within the Emakhazeni Local Municipality are as follows:

- Mining - 28.7%;
- Transport – 25.1%;
- Community services – 14.2%;
- Finance – 8.5%;
- Trade – 7.7%;
- Manufacturing – 6.9%;
- Agriculture – 3.8%; and
- Other – 5.1% (www.localgovernment.co.za/locals/view/156/Emakhazeni-Local-Municipality).

The Emakhazeni Local Municipality is strategically located in the provincial context, between the Pretoria/Johannesburg complex in Gauteng and Nelspruit in Mpumalanga. It is furthermore situated on the N4 Maputo Corridor, the main link between the Gauteng Province, the Mpumalanga Province and Mozambique. Road P81-1 (R540) that runs in a northern direction from the N4 Freeway through Belfast and Dullstroom, provides an important link to Lydenburg and other centres in the Lowveld.

The Emakhazeni Local Municipality is situated between two major towns in Mpumalanga Province, namely Middelburg (Steve Tshwete Local Municipality) and Nelspruit (Mbombela Local Municipality) and is connected to both these centres via the N4 Freeway. The N4 and Road P81-1 provide links from Gauteng to the major tourism centres in Mpumalanga, especially the Kruger National Park to the east and Pilgrim's Rest, Graskop, Lydenburg, Sabie and Hoedspruit to the north-east. Emakhazeni can therefore be called the gateway to the major tourism attraction points in Mpumalanga and the eastern parts of Limpopo Province (Emakhazeni Local Municipality, 2015a).

Emakhazeni (Belfast) has the opportunity to serve as a tourism gateway, due to the fact that tourists underway to the Kruger National Park along the N4 or Dullstroom/Pilgrims Rest/Hoedspruit along the R540 (P81-1) have to travel through Belfast. This centre could therefore be used to promote tourism opportunities in the Tourism Belt and the entire District.

The Bambi bypass route (R36) from Emgwenya (Waterval Boven) towards Montrose Falls in the Mbombela Municipal area is already a very popular tourism route in the NDM area. Dullstroom is a major attraction point to tourists and is

expanding rapidly. The major attractions to this area are the rural character and scenic qualities and these should be protected from over-exposure and commercialisation. Associated with Dullstroom is the development of the R540 tourism corridor between Belfast, Dullstroom and Lydenburg towards the north. Further to the southeast, it is important to enhance the Entokozweni (Machadodorp)-Badplaas-Mkhondo tourism corridor, which forms part of the SDF of the adjacent Gert Sibande Municipality (R541) (Emakhazeni Local Municipality, 2015b).

8.3.6 Archaeological and Cultural Heritage

A Phase 1 Heritage Impact Assessment was conducted for the project site by APelser Archaeological Consulting. The full report is attached under Appendix D.

There are a number of cultural heritage (archaeological and historical) sites and features in the larger area, including the Anglo-Boer War (1899-1902) Battle of Berg-en Dal/Dalmanutha that was fought across the Berg-en-dal and Wemmershuis farms during the time, and the old wagon route that passed through the area.

The site encompasses a section of the Battle of Berg-en Dal/Dalmanutha battlefield. Sections of the area have been disturbed by agricultural and industrial activities, as well as ploughing and the presence of domestic animals (grazing). ESKOM power lines running across a section of the study area have also impacted on the area, while the dumping of residential refuse and rolls of conveyor belts has occurred. Some farming related buildings and other modern structures are present in the wider area and have also impacted on the original landscape.

A number of sites, features and structures were identified on the study site during the Phase 1 Heritage Impact Assessment. Some are related to the Anglo-Boer War Battle of Berg-en Dal/Dalmanutha, as well as the earlier wagon routes that passed through the area. Others are related to modern farming and other activities in the larger area.

On the western side of the site there are fairly modern buildings relating to farming and agricultural activities, as well as some small-scale industrial activities. There are modern farm labour houses; the steel frame of a factory building; a modern house behind the Engen garage, a steel-made cluster of buildings that appear to be a modern transport business; a farmhouse that is a combination of old stone-built and fairly modern material; a recent stone kraal behind the house; and a modern stone-built pub. The only occupied structures are the farm labour houses. Most of these structures and features are modern (younger than 60 years of age) and therefore have no heritage significance.

The old stone-built farm house with the modern additions and alterations is the only buildings with historical heritage significance. The original farmhouse is typical of these kinds of structures on the Eastern Highveld and is most likely older than 60 years of age.

A unique stone architectural heritage was established in the Eastern Highveld during the second half of the 19th century and well into the early 20th century. During this time period, stone was used to build farmsteads and dwellings, both in urban and rural areas. Although a contemporary stone architecture also existed in the Karoo and Eastern Free State Province of South Africa, a wider variety of stone types were used on the Eastern Highveld. These included sandstone, ferricrete ('oukclip'), dolerite ('bloukclip'), granite, shale and slate.

Farm homesteads with outbuildings that date from the more recent past occur throughout the Eastern Highveld. Many of these farm homesteads hold little historical significance. However, buildings and other infrastructure that is part of these homesteads may be older than sixty years or may approach this age. All structures and buildings older than sixty years are protected by Section 34 of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (Pistorius, 2007).

Many of these farm homesteads are associated with formal and informal graveyards. Dwellings that have been used by farm labourers and which have disintegrated over time are in many instances associated with informal graves and sometimes with informal cemeteries. These informal graves and cemeteries may occur in the most unexpected places, such as in maize fields that have not been ploughed for a period of time (Pistorius 2007:18). Although no graves were recorded during the assessment, the possibility of the presence of unmarked, unknown or low stone-packed graves remains.

Stone-built homestead

The modern alterations and additions that have been made in recent years have diminished the significance of the stone-built homestead to a fair degree.

GPS Location: Approximately S25°42'57.14"; E30°03'37.19"

Cultural Significance: Low - Medium

Heritage Significance: Grade III: Other heritage resources of local importance and therefore worthy of conservation

Field Ratings: General protection B (IV B): The site should be recorded before destruction (medium significance)



Figure 16: The old stone-built farm house with modern additions clearly visible

On the eastern side of the farmhouse fence is a small hill that looks down over the plain towards the railway line in the north, and across the grassy plains to the east and the south-east. Located all around this low hill are trenches and packed stones that were used to create an elevated position here. These trenches are more than likely associated with the Anglo-Boer War Battle of Berg-en Dal and although it could not be determined at the time of the assessment, they could have formed part of the Boer entrenchments before and during the Battle. Due to the thick grass and vegetation cover it was impossible to identify any cultural material.

GPS Location: Approximately S25.717740; E30.064795

Cultural Significance: Medium - High

Heritage Significance: Grade II: Heritage resources with qualities giving it provincial or regional importance although it may form part of the National Estate

Field Ratings: Local Grade IIIB: should be included in the heritage register and may be mitigated (high/medium significance)



Figure 17: One of the trenches located around the small hill. The packed stones are also visible.



Figure 18: Another view of the trenches. Grass and other plants grow along the edges and inside the trenches and make these features quite distinctive.

The existence of British fortifications (blockhouses) is also known on other portions of Wemmershuis. These features are, however, not located close to the proposed development and will not be impacted upon.

Across the site, running from east to west and about 50m from the N4 motorway, are old wagon trails relating to the transport routes that traversed the area. Some of the trails are lined on each side with large rocks and they run around the base of the low hill heading towards Wemmershuis, where the old coach house is situated (beyond the study site). No cultural material is visible in the thick, low growth, but a worked stone relating to the wagon trails was found. Although the section has been disturbed by ESKOM pylons/power lines and possibly agricultural activities in the past, the site is still significant from a historical heritage point of view.

GPS Location: Approximately S25.717817; E30.064868

Cultural Significance: Low - Medium

Heritage Significance: Grade III: Other heritage resources of local importance and therefore worthy of conservation

Field Ratings: General protection B (IV B): site should be recorded before destruction (medium significance)



Figure 19: A section of the old wagon route



Figure 20: Another section of the wagon route, with the ESKOM pylon visible.



Figure 21: A stone found close to the edge of a section of the wagon route. The cutting on the stone could have been caused by the wagon wheels that ran over the stones

No Iron Age artefacts were identified onsite during the Phase 1 Heritage Impact Assessment (APelser Archaeological Consulting, 2016).

8.3.7 Palaeontological

A Desktop Palaeontological Impact Assessment was conducted for the project site by Gideon Groenewald. The full report is attached under Appendix D.

The project site is underlain by Permian aged sandstone and shale, with coal beds of the Vryheid Formation, Ecca Group, Karoo Supergroup, and Vaalian aged Diabase.

The Vryheid Formation is well-known for the occurrence of coal beds that were created through the accumulation of plant material over long periods of time. Plant fossils described by Bamford (2011) from the Vryheid Formation are: *Azaniodendron fertile*, *Cyclodendron leslii*, *Sphenophyllum hammanskraalensis*, *Annularia sp.*, *Raniganjia sp.*, *Asterotheca spp.*, *Liknopetalon enigmata*, *Glossopteris > 20 species*, *Hirsutum 4 spp.*, *Scutum 4 spp.*, *Ottokaria 3 spp.*, *Estcourtia sp.*, *Arberia 4 spp.*, *Lidgettonia sp.*, *Noeggerathiopsis sp.* and *Podocarpidites sp.*

According to Bamford (2011), "Little data have been published on these potentially fossiliferous deposits. Around the coal mines there is most likely to be good material and yet in other areas the exposures may be too poor to be of interest. When they do occur, fossil plants are usually abundant and it would not be feasible to preserve and maintain all the sites. However, in the interests of heritage and science such sites should be well recorded, sampled and the fossils kept in a suitable institution".

Although no vertebrate fossils have been recorded from the Vryheid Formation, invertebrate trace fossils have been described in some detail by Mason and Christie (1985). It should be noted, however, that the aquatic reptile, *Mesosaurus*, which is the earliest known reptile from the Karoo Basin, as well as fish (*Palaeoniscus capensis*), have been recorded in equivalent-aged strata in the Whitehill Formation in the southern part of the basin (MacRae, 1999; Modesto, 2006). Indications are that the Whitehill Formation in the main basin might be correlated with the mid-Vryheid Formation. If this assumption proves correct, there is a possibility that *Mesosaurus* could be found in the Vryheid Formation.

Following a desktop analysis, a Very High Palaeontological Sensitivity was allocated to the areas underlain by the Vryheid Formation. This is due to the potential presence of significant plant remains in the Formation.

The fossils associated with the sedimentary rocks of the Ecca Groups are normally exposed in natural outcrops where the rocks have been exposed to natural weathering for some time, or in recently excavated material where the sedimentary rock samples are available for close inspection. Interpretation of the Google images for the site indicates that the site is most probably covered in deep sandy soil and exposure of rock samples will only result from relatively deep (>1.5m) excavation into bedrock. If deep excavation is envisaged from Geotechnical reports for the construction procedures, the excavation material will potentially contain significant fossil rich material (Groenewald, 2016).

9. ENVIRONMENTAL IMPACT ASSESSMENT PROCESS (PROCESS UNDERTAKEN TO IDENTIFY, ASSESS AND RANK THE IMPACTS THAT THE PROPOSED ACTIVITY AND ASSOCIATED STRUCTURES AND INFRASTRUCTURE WILL IMPOSE ON THE PREFERRED DEVELOPMENT FOOTPRINT)

9.1 Objectives of the EIA process

According to the Environmental Impact Assessment Regulations, 2014, the objective of the environmental impact assessment process is to, through a consultative process-

- (a) determine the policy and legislative context within which the activity is located and document how the proposed activity complies with and responds to the policy and legislative context;
- (b) describe the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;
- (c) identify the location of the development footprint within the preferred site based on an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects of the environment;
- (d) determine the--
 - (i) nature, significance, consequence, extent, duration and probability of the impacts occurring to inform identified preferred alternatives; and
 - (ii) degree to which these impacts-
 - (aa) can be reversed;
 - (bb) may cause irreplaceable loss of resources, and
 - (cc) can be avoided, managed or mitigated;
- (e) identify the most ideal location for the activity within the preferred site based on the lowest level of environmental sensitivity identified during the assessment;
- (f) identify, assess, and rank the impacts the activity will impose on the preferred location through the life of the activity;
- (g) identify suitable measures to avoid, manage or mitigate identified impacts; and
- (h) identify residual risks that need to be managed and monitored.

9.2 Description of alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity

The alternatives that have been considered have been discussed under Section 8.1 of this report.

9.3 Description of the aspects that have been assessed as part of the EIA process

The following aspects have been assessed as part of the Environmental Impact Assessment process:

- Fauna and Flora;
- Sensitive environments (wetlands);

- Surface water and groundwater;
- Geology;
- Soils;
- Land use and land capability;
- Cultural and heritage resources;
- Palaeontological resources;
- Socio-economic; and
- Traffic.

9.4 Aspects assessed by specialists

The following specialist studies have been conducted and incorporated into the Environmental Impact Assessment Report for this project:

- Wetland/Riparian Delineation and Functional Assessment;
- Fauna and Flora Assessment;
- Phase 1 Heritage Impact Assessment;
- Desktop Palaeontological Impact Assessment;
- Agricultural Potential Study;
- Geotechnical Investigation; and
- Traffic Impact Study.

The specialist investigations covered the following aspects and were conducted in line with the requirements of Appendix 6 of the Environmental Impact Assessment Regulations, 2014:

Wetland/Riparian Delineation and Functional Assessment

- To delineate the wetland/riparian areas;
- To classify the watercourse according to the system proposed in the national wetlands inventory, if possible;
- To undertake the functional assessment of wetlands and/or riparian areas within the project site; and
- To discuss potential impacts, mitigation and management procedures relevant to the conservation of wetland areas on the project site.

Fauna and Flora Assessment

- To define and describe vertebrate habitat types identified on the project site;
- To provide a list of mammal, bird, reptile and frog species that occur or might occur on site and to identify species of conservation importance (Red Data species); and
- To highlight potential impacts of the proposed development on the vertebrate species.

Phase 1 Heritage Impact Assessment

- To identify all objects, sites, occurrences and structures of an archaeological or historical nature (cultural heritage sites) located on the project site (land that will be impacted upon by the proposed development);
- To assess the significance of the cultural resources in terms of their archaeological, historical, scientific, social, religious, aesthetic and tourism value;
- To describe the possible impact of the proposed development on these cultural remains, according to a standard set of conventions;
- To propose suitable mitigation measures to minimise possible negative impacts on the cultural resources; and

- To review applicable legislative requirements.

Desktop Palaeontological Impact Assessment

- To identify exposed and subsurface rock formations that are considered to be paleontologically significant;
- To assess the level of palaeontological significance of these formations;
- To comment on the impact of the development on these exposed and/or potential fossil resources; and
- To make recommendations as to how the developer should conserve or mitigate damage to these resources.

Agricultural Potential Study

- To determine the agricultural potential of the project site;
- To identify and classify the soil profiles of the site;
- To determine the soil's effective rooting depth; and
- To identify other factors that may render the soils as marginal to poor for agricultural productivity.

Geotechnical Investigation

- To investigate and identify areas that are suitable for the proposed development;
- To determine the soil and rock profile across the site and to evaluate its engineering properties and influence on the design of light, single story structures;
- To establish depth to bedrock, where not exposed;
- To evaluate the workability of the site materials with regard to their excavatability and compactability;
- To assess the groundwater conditions, including surface run-off, ponding, seepage and perched or permanent water tables; and
- To demarcate the site into various geotechnical zones with applicable NHBRC site classes and building procedures.

Traffic Impact Study

- To illustrate the proposed development's impact on the surrounding road network and possible mitigation of the anticipated traffic impact; and
- To comment on the proposed site accesses and non-motorised and public transport aspects.

9.5 Description of the method of assessing the environmental aspects and impacts

Elements of the proposed development that can interact with the environment are deemed to be environmental aspects. These have been identified during the Environmental Impact Assessment, for each phase of the proposed development. Thereafter, the potential impacts that can result from the development's aspects were identified. The impacts, whether positive or negative, are defined as any change to the environment resulting from the identified environmental aspects.

Assessing the significance of the potential impacts has been conducted using the parameters below. Direct, indirect and cumulative impacts have been assessed.

The **nature** of the impact: This will include a qualitative description of what caused the impact and how it will affect the environment;

The **extent** of the impact: The size (physical/geographical) that will be affected by the impact. The following weighting will be used:

- Onsite: Weighting value **1**: The impact is confined to the project site/property
- Local: Weighting value **2**: The impact is confined to the project site/property and a 10km radius around the project site/property
- Regional: Weighting value **3**: The impact extends further than a 10km radius around the project site/property

The **duration** of the impact: The length of time over which the impact will persist. The following weighting will be used:

- Short term: Weighting value **1**: The impact will persist for up to one year
- Medium term: Weighting value **2**: The impact will persist for longer than one year, but shorter than five years
- Long term: Weighting value **3**: The impact will persist for longer than five years

The **magnitude** of the impact: The intensity of the impact on the environment. The following weighting will be used:

- Low: Weighting value **1**: Natural processes continue, albeit in an altered manner
- Medium: Weighting value **2**: Natural processes cease temporarily
- High: Weighting value **3**: Natural processes cease indefinitely

The **probability** of the impact: How likely it is that the impact will happen. The following weighting will be used:

- Improbable: Weighting value **1**: It is unlikely that the impact will occur
- Probable: Weighting value **2**: There is a chance that the impact will occur
- Definite: Weighting value **3**: The impact will most certainly occur

The **status** of the impact: This will include a qualitative description of the following:

- Whether the impact is **positive** or **negative** in nature
- The degree to which the impact can be reversed
- The degree to which the impact can be mitigated
- The degree to which the impact may cause irreplaceable loss of resources

The **significance** of the impact: This will be calculated using the formula below:

Significance = (Duration + Extent + Magnitude) x Probability

The significance of the impact will be divided into the following classes, based on the result of the above given equation:

- **Low Impact: Weighting value: 1-9**
- **Medium Impact: Weighting value: 10-18**
- **High Impact: Weighting value: 19-27**

The aspects to be assessed by specialists have been listed under Section 9.4. The impacts of the proposed project will be assessed by each specialist, mostly also using the following formula:

Significance = (Duration + Extent + Magnitude) x Probability

The specialist's impact assessments are contained in each individual specialist report.

9.6 Environmental Impacts (Issues) and Risks identified during the Environmental Impact Assessment process

The following impacts and risks have been identified for the preferred alternative:

Wetlands

Construction and Operational Phases

- Changing the quantity and fluctuation properties of the watercourse by, for example, storm water input, or restricting water flow. The sources of this impacts include:
 - Development within watercourse, thereby diverting or impeding flow;
 - Vehicles driving in/through the watercourse; and
 - Lack of adequate rehabilitation resulting in invasion by invasive plants.
- Changing the amount of sediment entering the water resource and associated change in turbidity (increasing or decreasing the amount). Construction, operational and decommissioning activities will result in earthworks and soil disturbance as well as the removal of natural vegetation. This could result in the loss of topsoil, sedimentation of the wetland and increase the turbidity of the water. Possible sources of the impacts include:
 - Earthwork activities when constructing;
 - Clearing of surface vegetation will expose the soils, which in rainy events would wash through the watercourse, causing sedimentation. In addition, indigenous vegetation communities are unlikely to colonise eroded soils successfully and seeds from proximate alien invasive trees can spread easily into these eroded soil;
 - Disturbance of soil surface;
 - Disturbance of slopes through the creation of roads and tracks adjacent to the watercourse; and
 - Erosion (e.g. gully formation, bank collapse).
- Invasions of alien plants can impact on hydrology, by reducing the quantity of water entering a wetland, and outcompeting natural vegetation, decreasing the natural biodiversity. Once in a system, alien invasive plants can spread through the catchment. If allowed to seed before control measures are implemented, alien plants can easily colonise and impact on downstream users.
- Loss and disturbance of wetland habitat and fringe vegetation due to direct development on the wetland as well as changes in management, fire regime and habitat fragmentation.
- Construction, operational and decommissioning activities may result in the discharge of solvents and other industrial chemicals, leakage of fuel/oil from vehicles and the disposal of sewage resulting in the loss of sensitive biota in the wetlands and a reduction in wetland function as well as human and animal waste. This could possibly impact on groundwater.

Surface and Groundwater

Construction Phase

- Pollution of surface and/or groundwater resources due to the incorrect management of concrete mixing.

Construction and Operational Phases

- Pollution of surface and/or groundwater resources due to the incorrect management and potential release of pollutants, such as chemical substances and dangerous goods.
- Pollution of surface and/or groundwater resources due to poor waste management (general waste).
- Pollution of surface and/or groundwater resources due to poor waste management (hazardous waste).
- Pollution of surface and/or groundwater resources due to runoff of contaminated stormwater.

Operational Phase

- Pollution of surface and/or groundwater resources due to the potential release of wastewater (sewage and wash water).

Fauna

Construction Phase

- Avian habitat loss associated with construction activities: Avian habitats will be lost in the areas cleared for buildings, roads and other infrastructure associated with the proposed project. This impact will mainly affect the western portion of the site, which is of lower sensitivity than the rocky grasslands to the east. The footprint of this impact will presumably be greater than the area occupied by the development itself, on account of additional areas cleared for access, vehicle parking, construction activities and housing construction workers.
- Disturbance associated with construction activities: The presence of vehicles and construction workers will cause disturbance to avifauna, with the movement and activities of personnel on site and the associated noise, pollution and litter all having a negative effect on birds. In addition, the presence of construction workers will increase the probability of activities such as the illegal hunting of birds.
- Pollution associated with construction activities: Pollution associated with construction activities (e.g. fuel spills, the use of cleaning chemicals) could have serious negative impacts on avifauna if such chemicals were to enter the dams on the site, and/or make their way into the drainage lines and wetlands located immediately to the north or south of the site. Given the importance of this area for threatened birds associated with wetland habitats, this impact needs to be taken very seriously and carefully mitigated.

Construction and Operational Phases

- Habitat loss: Avian habitats in the areas where buildings, roads and other infrastructure, as well as agricultural activities are located will be permanently lost.
- Disturbance associated with increased human presence in the area: The permanent presence of a much larger number of people than presently occur at the site will result in greater disturbance of birds that use the area for foraging and breeding. This impact will be manifested, for example, by residents and their pets walking in the area.
- Collision risk associated with vehicular traffic: Higher numbers of vehicles driving on the site, together with an increase in their average speed on account of the presence of surfaced roads, will lead to an increase in the risk of birds being killed or injured via collisions. However, this impact will remain very minor compared to the mortality risk associated with vehicles travelling at high speed on the adjacent N4 highway.
- Disturbance or death of herpetofauna species.

Operational Phase

- Electrocution and collision hazards: Electrical infrastructure such as transmission lines, as well as electric fences, pose a potential collision risk to flying birds, and a potential electrocution risk to perching birds. The magnitudes of these risks are much lower than the corresponding risks associated with large overhead transmission lines.

Flora

Construction Phase

- Loss of vegetation from the following vegetation units/ecosystems:
 - Transformed vegetation;
 - Primary Grassland (western part of the project site);
 - Primary Grassland (eastern part of the project site);
 - Rocky Outcrops;
 - Indigenous species; and

- Alien plant species.

Operational Phase

- Invasion by alien invasive plant species.

Heritage Resources

Construction and Operational Phases

- Disturbance or destruction of cultural and heritage resources.

Palaeontological Resources

Construction Phase

- There is a very high possibility that significant fossil assemblages will be present in all outcrops of the site. If deep excavation is envisaged for the construction procedures, the excavation material will potentially contain significant fossil rich material and the development will most likely have a very significant impact on the Palaeontological Heritage of the region.

Air Quality and Noise

Construction Phase

- Generation of dust.
- Release of vehicle emissions from construction vehicles.
- Generation of nuisance and noise.

Land and land use

Construction and Operational Phases

The disturbance of potentially productive agricultural land, including arable and grazing land, through the establishment of the proposed development. This could render the potentially productive agricultural land permanently unsuitable for agricultural production and could thereby decrease the food production potential of the area. This has a negative implication for food security in South Africa.

Soil

Construction Phase

- Soil erosion due to the clearance of vegetation.
- Soil compaction to create foundations for buildings and other associated infrastructure.
- Soil pollution due to the potential spillages from chemical toilets.
- Soil pollution due to the incorrect management of concrete mixing.

Construction and Operational Phases

- Soil pollution due to the incorrect management of chemical substances and dangerous goods.
- Soil pollution due to poor waste management (general waste).
- Soil pollution due to poor waste management (hazardous waste).
- Soil pollution due to the runoff of contaminated stormwater.

Post-construction and Rehabilitation Phase

- Soil erosion due to inefficient rehabilitation of construction areas.

Socio-economic

Construction Phase

- Potential increase in crime due to the influx of workers, especially during the construction phase.

Construction and Operational Phases

- Generation of a large number of job opportunities.
- Stimulation of the local economy, especially the tourism sector.

Traffic

Construction and Operational Phases

- Increase in traffic volumes to the site.

Post-construction and Rehabilitation Phase

- Increase in traffic volumes to the site.

Cumulative Impacts

Wetlands

- The upgrade of the wetland system is likely to improve some aspects of the wetland system.
- Should mitigation measures not be implemented, changes made to the bed or banks of watercourse channels will cause unstable channel conditions leading to erosion, meandering, increased potential for flooding and movement of bed material that will result in property damage adjacent to and downstream of the site.

Fauna

- The potential contribution of the proposed development to cumulative avian habitat loss in the Steenkampsberg Important Bird and Biodiversity Area (IBA).

Heritage Resources

- Disturbance or destruction of cultural and heritage resources onsite resulting in a decline in the overall cultural and heritage value of the greater area.

Palaeontological Resources

- Disturbance or destruction of significant fossil assemblages onsite resulting in a decline in the palaeontological value of the greater area.

9.7 Impact Assessment [Assessment of the significance of each impact (issue) and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures]

The following tables discuss the impacts and risks identified for each alternative, including the nature, significance, consequences, extent, duration and probability of the impacts, including the degree to which the impacts can be reversed; may cause irreplaceable loss of resources; and can be avoided, managed or mitigated, based on the information available at this stage of the process.

Preferred Alternative

Wetlands

Aspect	Changing the quantity and fluctuation properties of the watercourse.	
Impact and Nature	Changing the quantity and fluctuation properties of the watercourse by, for example, storm water input, or restricting water flow. The sources of this impacts include: <ul style="list-style-type: none"> • Development within watercourse, thereby diverting or impeding flow; • Vehicles driving in/through the watercourse; and • Lack of adequate rehabilitation resulting in invasion by invasive plants. 	
Impact Rating - Construction and Operational Phase	Before mitigation	After mitigation
Extent	Rating as provided in specialist report and methodology	Rating as provided in specialist report and methodology
Duration		
Magnitude		
Probability		
Significance - Construction and Operational Phase	High (as per specialist report)	Medium (as per specialist report)
Consequence	Negative	
Status of Impact		
Degree to which impact can be reversed	Medium degree	
Degree to which impact may cause irreplaceable loss of resources	Low degree	
Degree to which impact can be avoided, managed or mitigated	None	
Aspect	Changes in sediment entering and exiting the system.	
Impact and Nature	Changing the amount of sediment entering water resource and associated change in turbidity (increasing or decreasing the amount). Construction, operational and decommissioning activities will result in earthworks and soil disturbance as well as the removal of natural vegetation. This could result in the loss of topsoil, sedimentation of the wetland and increase the turbidity of the water. Possible sources of the impacts include: <ul style="list-style-type: none"> • Earthwork activities when constructing; • Clearing of surface vegetation will expose the soils, which in rainy events would wash through the watercourse, causing sedimentation. In addition, indigenous vegetation communities are unlikely to colonise eroded soils successfully and seeds from proximate alien invasive trees can spread easily into these eroded soil; • Disturbance of soil surface; • Disturbance of slopes through the creation of roads and tracks adjacent to the watercourse; and • Erosion (e.g. gully formation, bank collapse). 	
Impact Rating - Construction and Operational Phase	Before mitigation	After mitigation
Extent	Rating as provided in specialist report and methodology	Rating as provided in specialist report and methodology
Duration		
Magnitude		
Probability		
Significance - Construction and Operational Phase	High (as per specialist report)	Medium (as per specialist report)
Status of Impact		

Consequence	Negative
Degree to which impact can be reversed	Medium degree
Degree to which impact may cause irreplaceable loss of resources	Low degree
Degree to which impact can be avoided, managed or mitigated	Medium degree

Aspect	Introduction and spread of alien vegetation.
Impact and Nature	Invasions of alien plants can impact on hydrology, by reducing the quantity of water entering a wetland, and outcompeting natural vegetation, decreasing the natural biodiversity. Once in a system, alien invasive plants can spread through the catchment. If allowed to seed before control measures are implemented, alien plants can easily colonise and impact on downstream users.

Impact Rating	Before mitigation	After mitigation
Extent	Rating as provided in specialist report and methodology	Rating as provided in specialist report and methodology
Duration		
Magnitude		
Probability		
Significance – Construction Phase	Medium (as per specialist report)	Medium (as per specialist report)
Extent	Rating as provided in specialist report and methodology	Rating as provided in specialist report and methodology
Duration		
Magnitude		
Probability		
Significance – Operational Phase	Medium (as per specialist report)	Low (as per specialist report)

Status of Impact

Consequence	Negative
Degree to which impact can be reversed	Medium degree
Degree to which impact may cause irreplaceable loss of resources	Low degree
Degree to which impact can be avoided, managed or mitigated	Medium degree

Aspect	Loss and disturbance of wetland habitat and fringe vegetation/changing the physical structure of the wetland.
Impact and Nature	Loss and disturbance of wetland habitat and fringe vegetation due to direct development on the wetland as well as changes in management, fire regime and habitat fragmentation.

Impact Rating	Before mitigation	After mitigation
Extent	Rating as provided in specialist report and methodology	Rating as provided in specialist report and methodology
Duration		
Magnitude		
Probability		
Significance – Construction Phase	High (as per specialist report)	Medium (as per specialist report)
Extent	Rating as provided in specialist report and methodology	Rating as provided in specialist report and methodology
Duration		
Magnitude		
Probability		
Significance – Operational Phase	Medium (as per specialist report)	Low (as per specialist report)

Status of Impact	
Consequence	Negative
Degree to which impact can be reversed	Medium degree
Degree to which impact may cause irreplaceable loss of resources	Medium degree
Degree to which impact can be avoided, managed or mitigated	Medium degree

Aspect	Changes in water quality due to toxic contaminants and increased nutrient levels.	
Impact and Nature	Construction, operational and decommissioning activities may result in the discharge of solvents and other industrial chemicals, leakage of fuel/oil from vehicles and the disposal of sewage resulting in the loss of sensitive biota in the wetlands and a reduction in wetland function as well as human and animal waste. This could possibly impact on groundwater.	
Impact Rating - Construction and Operational Phase	Before mitigation	After mitigation
Extent	Rating as provided in specialist report and methodology	Rating as provided in specialist report and methodology
Duration		
Magnitude		
Probability		
Significance - Construction and Operational Phase	High (as per specialist report)	Medium (as per specialist report)

Status of Impact	
Consequence	Negative
Degree to which impact can be reversed	Medium degree
Degree to which impact may cause irreplaceable loss of resources	Medium degree
Degree to which impact can be avoided, managed or mitigated	Medium degree

Surface and Groundwater

Aspect	Construction activities.	
Impact and Nature	Pollution of surface and/or groundwater resources due to the incorrect management of concrete mixing.	
Impact Rating – Construction Phase	Before mitigation	After mitigation
Extent	2	1
Duration	2	1
Magnitude	3	3
Probability	2	1
Significance – Construction Phase	14 - Medium	5 - Low

Status of Impact

Consequence	Negative
Degree to which impact can be reversed	Medium degree
Degree to which impact may cause irreplaceable loss of resources	Medium degree
Degree to which impact can be avoided, managed or mitigated	High degree

Aspect	Construction and operational activities.
Impact and Nature	Pollution of surface and/or groundwater resources due to the incorrect management and potential release of pollutants, such as chemical substances and dangerous goods.

Construction Phase

Impact Rating	Before mitigation	After mitigation
Extent	2	1
Duration	2	2
Magnitude	3	3
Probability	2	1
Significance – Construction Phase	14 – Medium	6 – Low

Operational Phase

Extent	2	1
Duration	2	2
Magnitude	2	2
Probability	2	1
Significance – Operational Phase	12 – Medium	5 – Low

Status of Impact

Consequence	Negative
Degree to which impact can be reversed	Medium degree
Degree to which impact may cause irreplaceable loss of resources	Medium degree
Degree to which impact can be avoided, managed or mitigated	Medium degree

Aspect	Construction and operational activities.
Impact and Nature	Pollution of surface and/or groundwater resources due to poor waste management (general waste).

Construction Phase

Impact Rating	Before mitigation	After mitigation
Extent	2	1
Duration	1	1
Magnitude	2	1
Probability	2	1

Significance – Construction Phase	10 - Medium	3 - Low
Operational Phase		
Extent	2	1
Duration	1	1
Magnitude	2	1
Probability	2	1
Significance – Operational Phase	10 - Medium	3 - Low
Status of Impact		
Consequence	Negative	
Degree to which impact can be reversed	Medium degree	
Degree to which impact may cause irreplaceable loss of resources	Low degree	
Degree to which impact can be avoided, managed or mitigated	High degree	
Aspect	Construction and operational activities.	
Impact and Nature	Pollution of surface and/or groundwater resources due to poor waste management (hazardous waste).	
Construction Phase		
Impact Rating	Before mitigation	After mitigation
Extent	2	1
Duration	2	2
Magnitude	3	3
Probability	3	2
Significance – Construction Phase	21 - High	12 - Medium
Operational Phase		
Extent	2	2
Duration	2	2
Magnitude	3	3
Probability	2	1
Significance – Operational Phase	14 – Medium	7 – Low
Status of Impact		
Consequence	Negative	
Degree to which impact can be reversed	Medium degree	
Degree to which impact may cause irreplaceable loss of resources	Medium degree	
Degree to which impact can be avoided, managed or mitigated	High degree	
Aspect	Construction and operational activities.	
Impact and Nature	Pollution of surface and/or groundwater resources due to runoff of contaminated stormwater.	
Construction Phase		
Impact Rating	Before mitigation	After mitigation
Extent	2	1
Duration	2	1
Magnitude	3	3
Probability	2	1
Significance – Construction Phase	14 - Medium	5 - Low
Operational Phase		
Extent	2	1
Duration	2	1

Magnitude	2	2
Probability	2	1
Significance – Operational Phase	12 - Medium	4 - Low
Status of Impact		
Consequence	Negative	
Degree to which impact can be reversed	Medium degree	
Degree to which impact may cause irreplaceable loss of resources	Medium degree	
Degree to which impact can be avoided, managed or mitigated	Medium degree	
Aspect	Operational activities.	
Impact and Nature	Pollution of surface and/or groundwater resources due to the potential release of wastewater (sewage and wash water).	
Impact Rating – Operational Phase	Before mitigation	After mitigation
Extent	2	1
Duration	2	2
Magnitude	3	3
Probability	2	1
Significance – Operational Phase	14 - Medium	6 - Low
Status of Impact		
Consequence	Negative	
Degree to which impact can be reversed	Medium degree	
Degree to which impact may cause irreplaceable loss of resources	Medium degree	
Degree to which impact can be avoided, managed or mitigated	High degree	

Fauna

Aspect	Avian habitat loss associated with construction activities.	
Impact and Nature	Avian habitats will be lost in the areas cleared for buildings, roads and other infrastructure associated with the proposed project. This impact will mainly affect the western portion of the site, which is of lower sensitivity than the rocky grasslands to the east. The footprint of this impact will presumably be greater than the area occupied by the development itself, on account of additional areas cleared for access, vehicle parking, construction activities and housing construction workers.	
Impact Rating - Construction Phase	Before mitigation	After mitigation
Extent	Rating as provided in specialist report and methodology	
Duration		
Magnitude		
Probability		
Significance - Construction Phase	Low (as per specialist report)	Low
Status of Impact		
Consequence	Negative	
Degree to which impact can be reversed	Low degree	
Degree to which impact may cause irreplaceable loss of resources	Low degree	
Degree to which impact can be avoided, managed or mitigated	Low degree	
Aspect	Disturbance associated with construction activities.	
Impact and Nature	The presence of vehicles and construction workers will cause disturbance to avifauna, with the movement and activities of personnel on site and the associated noise, pollution and litter all having a negative effect on birds. In addition, the presence of construction workers will increase the probability of activities such as illegal hunting of birds.	
Impact Rating - Construction Phase	Before mitigation	After mitigation
Extent	Rating as provided in specialist report and methodology	
Duration		
Magnitude		
Probability		
Significance - Construction Phase	Low (as per specialist report)	Low
Status of Impact		
Consequence	Negative	
Degree to which impact can be reversed	High degree	
Degree to which impact may cause irreplaceable loss of resources	Low degree	
Degree to which impact can be avoided, managed or mitigated	Low degree	
Aspect	Pollution associated with construction activities.	
Impact and Nature	Pollution associated with construction activities (e.g. fuel spills, the use of cleaning chemicals) could have serious negative impacts on avifauna if such chemicals were to enter the dams on the site, and/or make their way into the drainage lines and wetlands located immediately to the north or south of the site. Given the importance of this area for threatened birds associated with wetland habitats, this impact needs to be taken very seriously, and carefully mitigated.	
Impact Rating - Construction Phase	Before mitigation	After mitigation

Extent	Rating as provided in specialist report and methodology	
Duration		
Magnitude		
Probability		
Significance - Construction Phase	Medium (as per specialist report)	Low
Status of Impact		
Consequence	Negative	
Degree to which impact can be reversed	Low degree	
Degree to which impact may cause irreplaceable loss of resources	Low degree	
Degree to which impact can be avoided, managed or mitigated	Medium degree	
Aspect	Habitat loss.	
Impact and Nature	Avian habitats in the areas where buildings, roads and other infrastructure, as well as agricultural activities are located will be permanently lost.	
Impact Rating - Construction and Operational Phase	Before mitigation	After mitigation
Extent	Rating as provided in specialist report and methodology	
Duration		
Magnitude		
Probability		
Significance - Construction and Operational Phase	Medium (as per specialist report)	Low
Status of Impact		
Consequence	Negative	
Degree to which impact can be reversed	Low degree	
Degree to which impact may cause irreplaceable loss of resources	Low degree	
Degree to which impact can be avoided, managed or mitigated	Medium degree	
Aspect	Disturbance associated with increased human presence in the area.	
Impact and Nature	The permanent presence of a much larger number of people than presently occur at the site will result in greater disturbance of birds that use the area for foraging and breeding. This impact will be manifested, for example, by residents and their pets walking in the area.	
Impact Rating - Construction and Operational Phase	Before mitigation	After mitigation
Extent	Rating as provided in specialist report and methodology	
Duration		
Magnitude		
Probability		
Significance - Construction and Operational Phase	Low (as per specialist report)	Low
Status of Impact		
Consequence	Negative	
Degree to which impact can be reversed	High degree	

Degree to which impact may cause irreplaceable loss of resources	Low degree
Degree to which impact can be avoided, managed or mitigated	Low degree

Aspect	Electrocution and collision hazards.	
Impact and Nature	Electrical infrastructure such as transmission lines, as well as electric fences, pose a potential collision risk to flying birds, and a potential electrocution risk to perching birds. The magnitudes of these risks are much lower than the corresponding risks associated with large overhead transmission lines.	
Impact Rating - Operational Phase	Before mitigation	After mitigation
Extent	Rating as provided in specialist report and methodology	
Duration		
Magnitude		
Probability		
Significance - Operational Phase	Low (as per specialist report)	Low
Status of Impact		
Consequence	Negative	
Degree to which impact can be reversed	High degree	
Degree to which impact may cause irreplaceable loss of resources	Low degree	
Degree to which impact can be avoided, managed or mitigated	Low degree	

Aspect	Collision risk associated with vehicular traffic.	
Impact and Nature	Higher numbers of vehicles driving on the site, together with an increase in their average speed on account of the presence of surfaced roads, will lead to an increase in the risk of birds being killed or injured via collisions. However, this impact will remain very minor compared to the mortality risk associated with vehicles travelling at high speed on the adjacent N4 highway.	
Impact Rating - Construction and Operational Phase	Before mitigation	After mitigation
Extent	Rating as provided in specialist report and methodology	
Duration		
Magnitude		
Probability		
Significance - Construction and Operational Phase	Low (as per specialist report)	Low
Status of Impact		
Consequence	Negative	
Degree to which impact can be reversed	High degree	
Degree to which impact may cause irreplaceable loss of resources	Low degree	
Degree to which impact can be avoided, managed or mitigated	Low degree	

Aspect	Construction and operational activities.	
Impact and Nature	Disturbance or death of herpetofauna species.	
Impact Rating - Construction and Operational Phase	Before mitigation	After mitigation
Extent	1	1
Duration	2	2
Magnitude	2	1
Probability	2	1
Significance - Construction and Operational Phase	10 - Medium	4 - Low
Status of Impact		
Consequence	Negative	
Degree to which impact can be reversed	High degree	
Degree to which impact may cause irreplaceable loss of resources	Low degree	
Degree to which impact can be avoided, managed or mitigated	Low degree	

Flora

Aspect	Site clearance for the proposed development.	
Impact and Nature	Loss of vegetation from the following vegetation unit/ecosystem: Transformed vegetation.	
Impact Rating - Construction Phase	Before mitigation	After mitigation
Extent	Rating as provided in specialist report and methodology	
Duration		
Magnitude		
Probability		
Significance - Construction Phase	Low (as per specialist report)	Low
Status of Impact		
Consequence	Negative (slightly)	
Degree to which impact can be reversed	Low degree	
Degree to which impact may cause irreplaceable loss of resources	Low degree	
Degree to which impact can be avoided, managed or mitigated	Low degree	
Aspect	Site clearance for the proposed development.	
Impact and Nature	Loss of vegetation from the following vegetation unit/ecosystem: Primary Grassland (western part of the project site).	
Impact Rating - Construction Phase	Before mitigation	After mitigation
Extent	Rating as provided in specialist report and methodology	
Duration		
Magnitude		
Probability		
Significance - Construction Phase	High (as per specialist report)	Medium
Status of Impact		
Consequence	Negative	
Degree to which impact can be reversed	Low degree	
Degree to which impact may cause irreplaceable loss of resources	High degree	
Degree to which impact can be avoided, managed or mitigated	Medium degree	
Aspect	Site clearance for the proposed development.	
Impact and Nature	Loss of vegetation from the following vegetation unit/ecosystem: Primary Grassland (eastern part of the project site).	
Impact Rating - Construction Phase	Before mitigation	After mitigation
Extent	Rating as provided in specialist report and methodology	
Duration		
Magnitude		
Probability		
Significance - Construction Phase	Low (as per specialist report)	Low
Status of Impact		
Consequence	Negative	
Degree to which impact can be reversed	Low degree	
Degree to which impact may cause irreplaceable loss of resources	Low degree	
Degree to which impact can be avoided, managed or mitigated	Low degree	

Aspect	Site clearance for the proposed development.	
Impact and Nature	Loss of vegetation from the following vegetation unit/ecosystem: Rocky Outcrops.	
Impact Rating - Construction Phase	Before mitigation	After mitigation
Extent	Rating as provided in specialist report and methodology	
Duration		
Magnitude		
Probability		
Significance - Construction Phase	Low (as per specialist report)	Low
Status of Impact		
Consequence	Negative	
Degree to which impact can be reversed	Low degree	
Degree to which impact may cause irreplaceable loss of resources	High degree	
Degree to which impact can be avoided, managed or mitigated	Low degree	
Aspect	Site clearance for the proposed development.	
Impact and Nature	Loss of vegetation from the following vegetation unit/ecosystem: Indigenous species.	
Impact Rating - Construction Phase	Before mitigation	After mitigation
Extent	Rating as provided in specialist report and methodology	
Duration		
Magnitude		
Probability		
Significance - Construction Phase	High (as per specialist report)	Medium
Status of Impact		
Consequence	Negative	
Degree to which impact can be reversed	Low degree	
Degree to which impact may cause irreplaceable loss of resources	High degree	
Degree to which impact can be avoided, managed or mitigated	Medium degree	
Aspect	Site clearance for the proposed development.	
Impact and Nature	Loss of vegetation from the following vegetation unit/ecosystem: Alien plant species.	
Impact Rating - Construction Phase	Before mitigation	After mitigation
Extent		
Duration		
Magnitude		
Probability		
Significance - Construction Phase	Positive impact	No mitigation required – positive impact
Status of Impact		
Consequence	Positive	
Degree to which impact can be reversed	High degree	
Degree to which impact may cause irreplaceable loss of resources	Low degree	
Degree to which impact can be avoided, managed or mitigated	Low degree	

Aspect	Operational activities	
Impact and Nature	Invasion by alien invasive plant species.	
Impact Rating - Operational Phase	Before mitigation	After mitigation
Extent	2	1
Duration	2	2
Magnitude	2	1
Probability	2	1
Significance - Operational Phase	12 - Medium	4 - Low
Status of Impact		
Consequence	Negative	
Degree to which impact can be reversed	High degree	
Degree to which impact may cause irreplaceable loss of resources	Medium degree	
Degree to which impact can be avoided, managed or mitigated	High degree	

Heritage Resources

Aspect	Construction and operational activities.	
Impact and Nature	Disturbance or destruction of cultural and heritage resources – old stone-built farm house.	
Impact Rating - Construction and Operational Phase	Before mitigation	After mitigation
Extent	Rating as provided in specialist report and methodology	
Duration		
Magnitude		
Probability		
Significance - Construction and Operational Phase	Medium (as per specialist report)	Low
Status of Impact		
Consequence	Negative	
Degree to which impact can be reversed	Low degree	
Degree to which impact may cause irreplaceable loss of resources	High degree	
Degree to which impact can be avoided, managed or mitigated	Medium degree	

Aspect	Construction and operational activities.	
Impact and Nature	Disturbance or destruction of cultural and heritage resources – trenches and packed stones likely associated with the Anglo-Boer War Battle of Berg-en-Dal.	
Impact Rating - Construction and Operational Phase	Before mitigation	After mitigation
Extent	Rating as provided in specialist report and methodology	
Duration		
Magnitude		
Probability		
Significance - Construction and Operational Phase	High (as per specialist report)	Low
Status of Impact		
Consequence	Negative	
Degree to which impact can be reversed	Low degree	

Degree to which impact may cause irreplaceable loss of resources	High degree	
Degree to which impact can be avoided, managed or mitigated	Medium degree	
Aspect	Construction and operational activities.	
Impact and Nature	Disturbance or destruction of cultural and heritage resources – old wagon trails.	
Impact Rating - Construction and Operational Phase	Before mitigation	After mitigation
Extent	Rating as provided in specialist report and methodology	
Duration		
Magnitude		
Probability		
Significance - Construction and Operational Phase	Medium (as per specialist report)	Low
Status of Impact		
Consequence	Negative	
Degree to which impact can be reversed	Low degree	
Degree to which impact may cause irreplaceable loss of resources	High degree	
Degree to which impact can be avoided, managed or mitigated	Medium degree	

Palaeontological resources

Aspect	Construction activities, if deep excavation is envisaged.	
Impact and Nature	There is a very high possibility that significant fossil assemblages will be present in all outcrops of the site. If deep excavation is envisaged for the construction procedures, the excavation material will potentially contain significant fossil rich material and the development will most likely have a very significant impact on the Palaeontological Heritage of the region.	
Impact Rating - Construction Phase	Before mitigation	After mitigation
Extent	Rating as provided in specialist report and methodology	
Duration		
Magnitude		
Probability		
Significance - Construction Phase	High (as per specialist report)	Medium
Status of Impact		
Consequence	Negative	
Degree to which impact can be reversed	Low degree	
Degree to which impact may cause irreplaceable loss of resources	High degree	
Degree to which impact can be avoided, managed or mitigated	Low degree	

Air Quality and Noise

Aspect	Construction activities.	
Impact and Nature	Generation of dust.	
Impact Rating - Construction Phase	Before mitigation	After mitigation
Extent	2	2
Duration	1	1
Magnitude	2	1
Probability	3	2
Significance - Construction Phase	15 - Medium	8 - Low

Status of Impact

Consequence	Negative
Degree to which impact can be reversed	Medium degree
Degree to which impact may cause irreplaceable loss of resources	Low degree
Degree to which impact can be avoided, managed or mitigated	Medium degree

Aspect	Construction activities.	
Impact and Nature	Release of vehicle emissions from construction vehicles	
Impact Rating - Construction Phase	Before mitigation	After mitigation
Extent	3	3
Duration	1	1
Magnitude	2	2
Probability	3	1
Significance - Construction Phase	18 - Medium	6 - Low

Status of Impact

Consequence	Negative
Degree to which impact can be reversed	Low degree
Degree to which impact may cause irreplaceable loss of resources	Low degree
Degree to which impact can be avoided, managed or mitigated	Low degree

Aspect	Construction activities.	
Impact and Nature	Generation of nuisance and noise.	
Impact Rating - Construction Phase	Before mitigation	After mitigation
Extent	2	1
Duration	2	2
Magnitude	2	1
Probability	3	2
Significance - Construction Phase	18 - Medium	8 - Low

Status of Impact

Consequence	Negative
Degree to which impact can be reversed	Low degree
Degree to which impact may cause irreplaceable loss of resources	Low degree
Degree to which impact can be avoided, managed or mitigated	Medium degree

Land and land use

Aspect	Establishment of the proposed development on mainly poorly productive agricultural land and moderate potential grazing potential land.	
Impact and Nature	The disturbance of potentially productive agricultural land, including arable and grazing land, through the establishment of the proposed development. This could render the potentially productive agricultural land permanently unsuitable for agricultural production and could thereby decrease the food production potential of the area. This has a negative implication for food security in South Africa.	
Impact Rating - Construction Phase	Before mitigation	After mitigation
Extent	1	1
Duration	3	3
Magnitude	1	1
Probability	2	1
Significance - Construction Phase	10 - Medium	5 - Low
Status of Impact		
Consequence	Negative	
Degree to which impact can be reversed	Low degree	
Degree to which impact may cause irreplaceable loss of resources	Low degree	
Degree to which impact can be avoided, managed or mitigated	Medium degree	

Soil

Aspect	Site clearance during the construction phase.	
Impact and Nature	Soil erosion due to the clearance of vegetation.	
Impact Rating - Construction Phase	Before mitigation	After mitigation
Extent	1	1
Duration	2	1
Magnitude	3	2
Probability	2	1
Significance - Construction Phase	12 - Medium	4 - Low
Status of Impact		
Consequence	Negative	
Degree to which impact can be reversed	Medium degree	
Degree to which impact may cause irreplaceable loss of resources	Medium degree	
Degree to which impact can be avoided, managed or mitigated	Medium degree	

Aspect	Construction activities.	
Impact and Nature	Soil compaction to create foundations for buildings and other associated infrastructure.	
Impact Rating - Construction Phase	Before mitigation	After mitigation
Extent	1	1
Duration	2	1
Magnitude	2	1
Probability	3	2
Significance - Construction Phase	15 - Medium	6 - Low
Status of Impact		

Consequence	Negative
Degree to which impact can be reversed	High degree
Degree to which impact may cause irreplaceable loss of resources	Low degree
Degree to which impact can be avoided, managed or mitigated	Medium degree

Aspect	Construction and operational activities.
Impact and Nature	Soil pollution due to the incorrect management of chemical substances and dangerous goods.

Impact Rating	Before mitigation	After mitigation
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Construction Phase

Extent	2	1
Duration	2	2
Magnitude	3	3
Probability	3	2
Significance - Construction Phase	21 - High	12 - Medium

Operational Phase

Extent	1	1
Duration	2	2
Magnitude	3	3
Probability	2	1
Significance - Operational Phase	12 - Medium	6 - Low

Status of Impact

Consequence	Negative
Degree to which impact can be reversed	Medium degree
Degree to which impact may cause irreplaceable loss of resources	Medium degree
Degree to which impact can be avoided, managed or mitigated	Medium degree

Aspect	Construction and operational activities.
Impact and Nature	Soil pollution due to poor waste management (general waste).

Impact Rating	Before mitigation	After mitigation
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Construction Phase

Extent	2	1
Duration	1	1
Magnitude	2	1
Probability	2	1
Significance - Construction Phase	10 - Medium	3 - Low

Operational Phase

Extent	2	1
Duration	1	1
Magnitude	2	1
Probability	2	1
Significance - Operational Phase	10 - Medium	3 - Low

Status of Impact

Consequence	Negative
Degree to which impact can be reversed	Medium degree
Degree to which impact may cause irreplaceable loss of resources	Low degree

Degree to which impact can be avoided, managed or mitigated	High degree	
Aspect	Construction and operational activities.	
Impact and Nature	Soil pollution due to poor waste management (hazardous waste).	
Impact Rating	Before mitigation	After mitigation
Construction Phase		
Extent	2	1
Duration	2	2
Magnitude	3	3
Probability	3	2
Significance - Construction Phase	21 - High	12 - Medium
Operational Phase		
Extent	2	2
Duration	2	2
Magnitude	3	3
Probability	2	1
Significance - Operational Phase	14 – Medium	7 – Low
Status of Impact		
Consequence	Negative	
Degree to which impact can be reversed	Medium degree	
Degree to which impact may cause irreplaceable loss of resources	Medium degree	
Degree to which impact can be avoided, managed or mitigated	High degree	
Aspect	Construction activities.	
Impact and Nature	Soil pollution due to potential spillages from chemical toilets.	
Impact Rating – Construction Phase	Before mitigation	After mitigation
Construction Phase		
Extent	2	2
Duration	2	2
Magnitude	3	3
Probability	2	1
Significance – Construction Phase	14 – Medium	7 – Low
Status of Impact		
Consequence	Negative	
Degree to which impact can be reversed	Medium degree	
Degree to which impact may cause irreplaceable loss of resources	Medium degree	
Degree to which impact can be avoided, managed or mitigated	High degree	

Aspect	Mixing of concrete.	
Impact and Nature	Soil pollution due to the incorrect management of concrete mixing.	
Impact Rating – Construction Phase	Before mitigation	After mitigation
Construction Phase		
Extent	2	2
Duration	2	2
Magnitude	2	2
Probability	2	1
Significance – Construction Phase	12 – Medium	6 – Low
Status of Impact		
Consequence	Negative	
Degree to which impact can be reversed	Medium degree	
Degree to which impact may cause irreplaceable loss of resources	Medium degree	
Degree to which impact can be avoided, managed or mitigated	High degree	
Aspect	Runoff of contaminated stormwater.	
Impact and Nature	Soil pollution.	
Impact Rating	Before mitigation	After mitigation
Construction Phase		
Extent	2	2
Duration	2	2
Magnitude	2	2
Probability	2	1
Significance – Construction Phase	12 – Medium	6 – Low
Operational Phase		
Extent	2	2
Duration	2	2
Magnitude	2	2
Probability	2	1
Significance – Operational Phase	12 – Medium	6 – Low
Status of Impact		
Consequence	Negative	
Degree to which impact can be reversed	Medium degree	
Degree to which impact may cause irreplaceable loss of resources	Medium degree	
Degree to which impact can be avoided, managed or mitigated	High degree	
Aspect	Rehabilitation activities.	
Impact and Nature	Soil erosion due to inefficient rehabilitation of construction areas.	
Impact Rating - Post-construction and Rehabilitation Phase	Before mitigation	After mitigation
Extent	2	1
Duration	2	2
Magnitude	3	2
Probability	2	1
Significance – Post-construction and Rehabilitation Phase	14 - Medium	5 - Low
Status of Impact		
Consequence	Negative	

Degree to which impact can be reversed	Medium degree
Degree to which impact may cause irreplaceable loss of resources	Medium degree
Degree to which impact can be avoided, managed or mitigated	High degree

Socio-economic

Aspect	Construction and operational activities.	
Impact and Nature	Generation of a large number of job opportunities.	
Impact Rating - Construction and Operational Phase	Before mitigation	After mitigation
Extent		
Duration		
Magnitude		
Probability		
Significance - Construction and Operational Phase	Positive impact	No mitigation required – positive impact

Status of Impact

Consequence	Positive
Degree to which impact can be reversed	N/A – positive impact
Degree to which impact may cause irreplaceable loss of resources	N/A – positive impact
Degree to which impact can be avoided, managed or mitigated	N/A – positive impact

Aspect	Operational activities.	
Impact and Nature	Stimulation of the local economy, especially the tourism sector.	
Impact Rating - Operational Phase	Before mitigation	After mitigation
Extent		
Duration		
Magnitude		
Probability		
Significance - Operational Phase	Positive impact	No mitigation required – positive impact

Status of Impact

Consequence	Positive
Degree to which impact can be reversed	N/A – positive impact
Degree to which impact may cause irreplaceable loss of resources	N/A – positive impact
Degree to which impact can be avoided, managed or mitigated	N/A – positive impact

Aspect	Construction activities.	
Impact and Nature	Potential increase in crime due to the influx of workers, especially during the construction phase	
Impact Rating- Construction Phase	Before mitigation	After mitigation
Extent	2	2
Duration	2	2
Magnitude	3	1
Probability	2	1
Significance - Construction Phase	14 - Medium	5 - Low

Status of Impact

Consequence	Negative
Degree to which impact can be reversed	High degree
Degree to which impact may cause irreplaceable loss of resources	Medium degree
Degree to which impact can be avoided, managed or mitigated	High degree

Traffic

Aspect	Construction and operational activities.	
Impact and Nature	Increase in traffic volumes to the site in both the construction and operational phases.	
Impact Rating	Before mitigation	After mitigation
Construction Phase		
Extent	3	3
Duration	2	2
Magnitude	2	1
Probability	3	3
Significance - Construction Phase	21 - High	18 - Medium
Operational Phase		
Extent	3	3
Duration	3	3
Magnitude	2	1
Probability	3	3
Significance - Operational Phase	24 - High	21 - High
Status of Impact		
Consequence	Negative	
Degree to which impact can be reversed	Medium degree	
Degree to which impact may cause irreplaceable loss of resources	Medium degree	
Degree to which impact can be avoided, managed or mitigated	Low degree	
Aspect	Post-construction and Rehabilitation activities.	
Impact and Nature	Increase in traffic volumes to the site.	
Impact Rating - Post-construction and Rehabilitation Phase	Before mitigation	After mitigation
Construction Phase		
Extent	3	3
Duration	1	1
Magnitude	2	1
Probability	3	3
Significance - Post-construction and Rehabilitation Phase	18 - Medium	15 - Medium
Status of Impact		
Consequence	Negative	
Degree to which impact can be reversed	Medium degree	
Degree to which impact may cause irreplaceable loss of resources	Medium degree	
Degree to which impact can be avoided, managed or mitigated	Low degree	

No-Go Option

The No-Go option would entail no further development on the project site and the continued use of the site for agricultural activities, such as livestock grazing. Whilst there will be no disturbance of the site, the potential utilisation of the site for more sustainable land uses associated with the proposed development, especially in the western parts of the site, will not be realised. The site has been earmarked for tourism related development and not developing the site will therefore be

opposed to the high level planning for the area. The contributions to the local and regional economy and the provision of many new job opportunities will also not be fulfilled should the No-Go option prevail.

9.8 Methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives

Please refer to Section 9.7 of this report.

9.9 Positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected

As detailed under Sections 9.6 and 9.7 above.

9.10 Possible mitigation measures that could be applied and level of residual risk

Detailed mitigation measures have been included in the Environmental Management Programme (EMPr) that forms part of this Environmental Impact Assessment Report. The following table contains possible mitigation measures (as identified in the Scoping Phase and upon which the mitigation measures have been elaborated in the EMPr).

Table 18: Possible mitigation measures

Impact	Possible mitigation measures
<p>Wetlands</p> <p>Changing the quantity and fluctuation properties of the watercourse by, for example, storm water input, or restricting water flow. The sources of this impacts include:</p> <ul style="list-style-type: none"> • Development within the watercourse, thereby diverting or impeding flow; • Vehicles driving in/through the watercourse; and • Lack of adequate rehabilitation resulting in invasion by invasive plants. <p>Residual Impacts: Permanent changes, including positive impacts, are likely to be permanent.</p>	<ul style="list-style-type: none"> • No activities should take place in the watercourses and associated buffer zone. Where the above is unavoidable, only the construction footprint and no access roads can be considered. This is subjected to authorisation by means of a Water Use License. • Construction must be restricted to the dryer winter months. • A temporary fence or demarcation must be erected around the works area to prevent access to the adjacent portions of the watercourse. The works areas generally include the servitude, construction camps, areas where material is stored and the actual footprint of proposed development. • Prevent pedestrian and vehicular access into the watercourse and buffer areas.
<p>Changing the amount of sediment entering the water resource and associated change in turbidity (increasing or decreasing the amount). Construction, operational and decommissioning activities will result in earthworks and soil disturbance as well as the removal of natural vegetation. This could result in the loss of topsoil, sedimentation of the wetland and increase the turbidity of the water. Possible sources of the impacts include:</p> <ul style="list-style-type: none"> • Earthwork activities when constructing; • Clearing of surface vegetation will expose the soils, which in rainy events would wash through the watercourse, causing sedimentation. In addition, indigenous vegetation communities are unlikely to colonise eroded soils successfully and seeds from proximate alien invasive trees can spread easily into these eroded soil; • Disturbance of the soil surface; • Disturbance of slopes through the creation of roads and tracks adjacent to the watercourse; and • Erosion (e.g. gully formation, bank collapse). <p>Residual Impacts: Expected to be limited provided that the mitigation measures are implemented correctly and rehabilitation of the site is undertaken.</p>	<ul style="list-style-type: none"> • Water is expected to seep into any area of trenching and earthworks. It is likely that water will be contaminated within these earthworks and should thus be cleaned or dissipated into a structure that allows for additional sediment input and slows down the velocity of the water, thereby reducing the risk of erosion. Structures such as boulder weirs should be considered for their ability to absorb excess sediment as well as dissipating the water over a larger area. • Construction in and around watercourses must be restricted to the dryer winter months. • A temporary fence or demarcation must be erected around the works area to prevent water runoff and erosion of the disturbed or heaped soils into watercourse areas. • Formalise access roads and make use of existing roads and tracks where feasible, rather than creating new routes through naturally vegetated areas. • Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction/earthworks in that area (DWAf, 2005). • A vegetation rehabilitation plan should be implemented. Grassland can be removed as sods and stored within transformed vegetation. The sods must preferably be removed during the winter months and be replanted by latest springtime. The sods should not be stacked on top of each other or within sensitive environs. Once construction is completed, these sods

Impact	Possible mitigation measures
	<p>should be used to rehabilitate the disturbed areas from where they have been removed. In the absence of timely rainfall, the sods should be watered well after planting and at least twice more over the next 2 weeks.</p> <ul style="list-style-type: none"> ● Remove only the vegetation where essential for construction and do not allow any disturbance to the adjoining natural vegetation cover. ● Rehabilitation plans must be submitted and approved for rehabilitation of damage during construction and that plan must be implemented immediately upon completion of construction. ● Cordon off areas that are under rehabilitation as no-go areas using danger tape and steel droppers. If necessary, these areas should be fenced off to prevent vehicular, pedestrian and livestock access. ● During the construction phase, measures must be put in place to control the flow of excess water so that it does not impact on the surface vegetation. ● Protect all areas susceptible to erosion and ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction camp and work areas. ● Runoff from the construction area must be managed to avoid erosion and pollution problems. ● Implementation of best management practices. ● Source-directed controls. ● Buffer zones to trap sediments. ● Active rehabilitation.
<p>Invasions of alien plants can impact on hydrology, by reducing the quantity of water entering a wetland, and by outcompeting natural vegetation, decreasing the natural biodiversity. Once in a system, alien invasive plants can spread through the catchment. If allowed to seed before control measures are implemented, alien plants can easily colonise and impact on downstream users.</p> <p>Residual Impacts: None anticipated provided that the mitigation measures are implemented correctly and rehabilitation of the site is undertaken.</p>	<ul style="list-style-type: none"> ● Weed control. ● Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction/earthworks in that area and returning it where possible afterwards. ● Monitor the establishment of alien invasive species within the areas affected by the construction and maintenance and take immediate corrective action where invasive species are observed to establish. ● Rehabilitate or re-vegetate disturbed areas.
<p>Loss and disturbance of wetland habitat and fringe vegetation due to direct development on the wetland as well as changes in management, fire regime and habitat fragmentation.</p>	<ul style="list-style-type: none"> ● The development footprint should be designed around current wetlands and wetland buffers.

Impact	Possible mitigation measures
<p>Residual Impacts: None anticipated provided that the mitigation measures are implemented correctly and rehabilitation of the site is undertaken.</p> <p>Construction, operational and decommissioning activities may result in the discharge of solvents and other industrial chemicals, leakage of fuel/oil from vehicles and the disposal of sewage resulting in the loss of sensitive biota in the wetlands and a reduction in wetland function as well as human and animal waste. This could possibly impact on groundwater.</p> <p>Residual Impacts: None anticipated provided that the mitigation measures are implemented correctly and rehabilitation of the site is undertaken.</p>	<ul style="list-style-type: none"> • Where construction occurs in the demarcated wetlands and buffer areas, extra precautions should be implemented to so as to minimise wetland loss. • Where wetlands are lost, compensation should be made to protect the remaining wetlands and their catchments, increase their buffers and rehabilitate their condition and functionality. • Other than approved and authorised structures, no other development or maintenance infrastructure is allowed within the delineated watercourse or associated buffer zones. • Demarcate the watercourse areas and buffer zones to limit disturbance, clearly mark these areas as no-go areas. • Weed control in buffer zone. • Monitor rehabilitation and the occurrence of erosion twice during the rainy season for at least two years and take immediate corrective action where needed. • Monitor the establishment of alien invasive species within the areas affected by the construction and take immediate corrective action where invasive species are observed to establish. • Operational activities should not take place within watercourses or buffer zones, nor should edge effects impact on these areas. • Operational activities should not impact on rehabilitated or naturally vegetated areas. • Rehabilitate the functioning of disturbed wetlands.
Surface and Groundwater	
<p>Pollution of surface and/or groundwater resources due to the incorrect management of concrete mixing.</p> <p>Residual Impacts: None anticipated provided that the mitigation measures are implemented correctly and rehabilitation of the site is undertaken.</p>	<ul style="list-style-type: none"> • Concrete should ideally be mixed on an impermeable surface such as a concrete slab. • Cement bags (new and used) must be stored under roof or in closed containers where they will not be exposed to rain. • Dry concrete must be removed and disposed of together with other building rubble. • Ready-mix concrete trucks may clean chutes into foundations, but not elsewhere onsite.
<p>Pollution of surface and/or groundwater resources due to the incorrect management and potential release of pollutants, such as chemical substances and dangerous goods.</p>	<ul style="list-style-type: none"> • A register must be compiled of all chemical substances and dangerous goods used onsite. • MSDS' (Material Safety Data Sheets) must be maintained for all chemical substances and dangerous goods. The MSDS' must also be displayed onsite. • The chemical substances and dangerous goods must be stored safely and as per the requirements of the

Impact	Possible mitigation measures
<p>Residual Impacts: None anticipated provided that the mitigation measures are implemented correctly and rehabilitation of the site is undertaken.</p>	<p>MSDS for each chemical substances and dangerous goods. Locked storage areas are preferable.</p> <ul style="list-style-type: none"> • Drip trays must be readily available onsite and used for any repair work, maintenance work of refuelling undertaken onsite. • Spill kits must be readily available onsite and personnel must be trained on the appropriate procedures to clean hydrocarbon spillages. • Vehicles should regularly be inspected to ensure that any fuel or oil leaks are repaired. • No wastewater or wash water may be released into the environment from construction activities.
<p>Pollution of surface and/or groundwater resources due to poor waste management.</p> <p>Residual Impacts: None anticipated provided that the mitigation measures are implemented correctly and rehabilitation of the site is undertaken.</p>	<ul style="list-style-type: none"> • Waste must be managed according to its hazard classification (i.e. general vs. hazardous waste) and general and hazardous waste streams should not be mixed. • Waste stored onsite must be kept in appropriate containers with lids that can be closed. • Waste must be taken to appropriately licensed facilities for reuse, recycling, recovery or disposal. • No waste may be stored on open soil or within wetlands and/or watercourses.
<p>Pollution of surface and/or groundwater resources due to runoff of contaminated stormwater.</p> <p>Residual Impacts: None anticipated provided that the mitigation measures are implemented correctly and rehabilitation of the site is undertaken.</p>	<ul style="list-style-type: none"> • Storm water must be diverted around areas where there are pollution sources. • Storm water drainage infrastructure must be regularly inspected for obstructions. • No contaminated storm water may be released into the environment from the construction activities. • Washing or cleaning of equipment or machinery must occur in a designated area and the contaminated wash water must be contained. Such an area could be a plastic drum, a container or a plastic lined pit.
<p>Pollution of surface and/or groundwater resources due to the potential release of wastewater (sewage and wash water).</p> <p>Residual Impacts: None anticipated provided that the mitigation measures are implemented correctly and rehabilitation of the site is undertaken.</p>	<ul style="list-style-type: none"> • All wastewater (sewage and wash water) must be collected in appropriate sumps/holding tanks/conservancy tanks and may not come into contact with the environment prior to being pumped to the Municipal Sewage Treatment Works. • The integrity of the sewage conveyance system components, such as tanks and pumps, must be checked at a frequency as determined by the suppliers. Inspection and maintenance must also be conducted on sewage pipelines. • Any leaking pipelines must immediately be repaired.

Fauna

Impact	Possible mitigation measures
<p>Avian habitat loss associated with construction activities: Avian habitats will be lost in the areas cleared for buildings, roads and other infrastructure associated with the proposed project. This impact will mainly affect the western portion of the site, which is of lower sensitivity than the rocky grasslands to the east. The footprint of this impact will presumably be greater than the area occupied by the development itself, on account of additional areas cleared for access, vehicle parking, construction activities and housing construction workers.</p> <p>Residual Impacts: None anticipated provided that the mitigation measures are implemented correctly and rehabilitation of the site is undertaken.</p>	<p>The spatial extent of construction activities must be minimised, and as far as possible must be restricted to the areas on which buildings, roads etc. will actually be located. Particular care must be taken to minimise activities in the areas of natural grasslands in the eastern half of the site.</p>
<p>Disturbance associated with construction activities: The presence of vehicles and construction workers will cause disturbance to avifauna, with the movement and activities of personnel on site and the associated noise, pollution and litter all having a negative effect on birds. In addition, the presence of construction workers will increase the probability of activities such as illegal hunting of birds.</p> <p>Residual Impacts: None anticipated provided that the mitigation measures are implemented correctly and rehabilitation of the site is undertaken.</p>	<p>Movement of construction vehicles and workers in the natural grasslands in the eastern part of the site must be minimised. In addition, workers must be instructed to minimise disturbance of birds at all times and steps must be taken to ensure that no illegal hunting occurs.</p>
<p>Pollution associated with construction activities: Pollution associated with construction activities (e.g. fuel spills and the use of cleaning chemicals) could have serious negative impacts on avifauna if such chemicals were to enter the dams on the site and/or make their way into the drainage lines and wetlands located immediately to the north or south of the site. Given the importance of this area for threatened birds associated with wetland habitats, this impact needs to be taken very seriously and carefully mitigated.</p> <p>Residual Impacts: None anticipated provided that the mitigation measures are implemented correctly and rehabilitation of the site is undertaken.</p>	<p>Great care must be taken that no pollutants enter local water systems during the construction phase. Measures to rapidly deal with spills of fuel, cleaning chemicals or any other potential pollutants must be put in place before construction commences. Construction workers must be suitably trained to deal with any such spills.</p>
<p>Habitat loss: Avian habitats in the areas where buildings, roads and other infrastructure, as well as agricultural activities are located will be permanently lost.</p> <p>Residual Impacts: None anticipated provided that the mitigation measures are implemented correctly and rehabilitation of the site is undertaken.</p>	<p>The area cleared for the proposed project must be kept to a minimum. The eastern portion of the site is currently zoned for agriculture. However, given the presence of the natural grasslands and the obstacles to agriculture posed by the rocky nature of this area, it is recommended that it be left in its current state. As noted elsewhere, the cumulative impact of avian habitat losses in this Important Bird and Biodiversity Area must be borne in mind.</p>

Impact	Possible mitigation measures
	Furthermore, every effort should be made to retain the linear integrity, flow dynamics and water quality of the drainage lines and dams. Storm water from the new township must be managed in such a way that it simulates natural flow patterns.
<p>Disturbance associated with increased human presence in the area:</p> <p>The permanent presence of a much larger number of people than presently occur at the site will result in greater disturbance of birds that use the area for foraging and breeding. This impact will be manifested, for example, by residents and their pets walking in the area.</p> <p>Residual Impacts: None anticipated provided that the mitigation measures are implemented correctly and rehabilitation of the site is undertaken.</p>	Disturbance of birds breeding and foraging in the area should be minimised. For instance, residents walking in the area should be required to keep dogs on leashes at all times. The use of noisy vehicles (e.g. off-road motorcycles) should be prohibited. Given the current trend for so-called “eco-estates”, one possibility worth considering is designating the eastern portion of the site as a green zone and emphasising its ecological and conservation value to residents. Activities such as illegal hunting must be strictly prohibited.
<p>Electrocution and collision hazards:</p> <p>Electrical infrastructure such as transmission lines, as well as electric fences, pose a potential collision risk to flying birds and a potential electrocution risk to perching birds. The magnitudes of these risks are much lower than the corresponding risks associated with large overhead transmission lines.</p> <p>Residual Impacts: None anticipated provided that the mitigation measures are implemented correctly and rehabilitation of the site is undertaken.</p>	Assuming that the electrical infrastructure comprising part of the proposed development is typical of residential estates and business parks, no specific mitigation measures are required.
<p>Collision risk associated with vehicular traffic:</p> <p>Higher numbers of vehicles driving on the site, together with an increase in their average speed on account of the presence of surfaced roads, will lead to an increase in the risk of birds being killed or injured via collisions. However, this impact will remain very minor compared to the mortality risk associated with vehicles travelling at high speed on the adjacent N4 highway.</p> <p>Residual Impacts: None anticipated provided that the mitigation measures are implemented correctly and rehabilitation of the site is undertaken.</p>	No specific mitigation measures are required, beyond enforcement of speed limits appropriate for residential areas.
<p>Disturbance or death of herpetofauna species.</p> <p>Residual Impacts: None anticipated provided that the mitigation measures are implemented correctly and rehabilitation of the site is undertaken.</p>	<ul style="list-style-type: none"> • If the coppery grass lizard, large-scaled grass lizard or any herpetological species are encountered or exposed during the construction phase, they should be removed and relocated to natural areas in the vicinity. This remediation requires the employment of a herpetologist to oversee the removal of any herpetofauna during the initial ground clearing phase

Impact	Possible mitigation measures
	<p>of construction (i.e. initial ground-breaking by earthmoving equipment). The contractor must ensure that no herpetofauna species are disturbed, trapped, hunted or killed during the construction phase. Any herpetofauna that are inadvertently killed during earthmoving operations should be preserved as museum voucher specimens. Conservation-orientated clauses should be built into contracts for construction personnel, complete with penalty clauses for non-compliance.</p> <ul style="list-style-type: none"> • Alien and invasive plants must be removed. • When holes or trenches are dug, construction must be completed as quickly as possible; otherwise such holes may act as death traps for herpetofauna. • During the construction phase there will be increased surface water runoff and a decreased water quality (with increased silt load and pollution). Completing construction during the winter months would mitigate the environmental impact.
Flora	
<p>Loss of vegetation from the following vegetation units/ecosystems:</p> <ul style="list-style-type: none"> • Transformed vegetation; • Primary Grassland (western part of the project site); • Primary Grassland (eastern part of the project site); • Rocky Outcrops; • Indigenous species; and • Alien plant species. <p>Residual Impacts: None anticipated provided that the mitigation measures are implemented correctly and rehabilitation of the site is undertaken.</p>	<ul style="list-style-type: none"> • Restrict the planned agricultural practice in the eastern grassland to grazing, based on an ecologically based management plan. • Keep the major rocky outcrops natural and protected in open space areas. • Avoid any form of erosion and rehabilitate where needed. • Use only indigenous plant species for gardens and rehabilitation. • Remove all alien woody species. • If needed, rescue red data listed and protected species, and replant at suitable places (e.g. gardens) within the development.
<p>Invasion by alien invasive plant species.</p> <p>Residual Impacts: None anticipated provided that the mitigation measures are implemented correctly and rehabilitation of the site is undertaken.</p>	<ul style="list-style-type: none"> • All alien seedlings and saplings must be removed as they become evident. • Manual/mechanical removal is preferred to chemical control. • Dispose of eradicated plant material at an approved solid waste disposal site.
Heritage Resources	
<p>Disturbance or destruction of cultural and heritage resources.</p>	<ul style="list-style-type: none"> • For the old farm house built in stone with modern alterations, a Phase 2 HIA and recording should be undertaken and should the site be impacted on by the development, a demolition permit should be applied for.

Impact	Possible mitigation measures
<p>Residual Impacts: None anticipated provided that the mitigation measures are implemented correctly and rehabilitation of the site is undertaken.</p>	<ul style="list-style-type: none"> • For the trenches located around the small hill, and most likely related to the Anglo-Boer War (1899-1902) Battle of Berg-en Dal/Dalmanutha: Should the site be impacted on by the proposed development, it should be mitigated by detailed mapping and drawing and also historical-archaeological excavations before destruction. • For the sections of the old wagon route identified: Mapping and drawing should be done before destruction, should the site be impacted upon by the proposed development.
Palaeontological Resources	
<p>Very high possibility that significant fossil assemblages will be present in all outcrops of the site. If deep excavation is envisaged for the construction procedures, the excavation material will potentially contain significant fossil rich material and the development will most likely have a very significant impact on the Palaeontological Heritage of the region.</p> <p>Residual Impacts: None anticipated provided that the mitigation measures are implemented correctly and rehabilitation of the site is undertaken.</p>	<ul style="list-style-type: none"> • The EAP as well as the ECO for this project must be made aware of the fact that the Vryheid Formation of the Ecca Group is Highly significant for fossil remains of plant and trace fossils, albeit mostly where good outcrops are available for inspection. • In areas that are allocated a Very High Palaeontological sensitivity and specifically where deep excavation into bedrock is envisaged (>1.5m, following the geotechnical investigation), or where fossils are recorded during the geotechnical investigations, a qualified palaeontologist must be appointed to assess and record fossils at specific footprints of infrastructure developments (Phase 1 PIA).
Air Quality and Noise	
<p>Generation of dust.</p> <p>Residual Impacts: None anticipated provided that the mitigation measures are implemented correctly and rehabilitation of the site is undertaken.</p>	<ul style="list-style-type: none"> • Implement dust suppression techniques. • Limit vegetation clearance until it is necessary for soil stripping.
<p>Release of vehicle emissions from construction vehicles.</p> <p>Residual Impacts: None anticipated provided that the mitigation measures are implemented correctly and rehabilitation of the site is undertaken.</p>	<ul style="list-style-type: none"> • Regular maintenance of vehicles to minimise the release of emissions.
<p>Generation of nuisance and noise.</p> <p>Residual Impacts: None anticipated provided that the mitigation measures are implemented correctly and rehabilitation of the site is undertaken.</p>	<ul style="list-style-type: none"> • Noisy activities must be scheduled during times of the day that will result in the least disturbance to adjacent sensitive receptors. • Noisy work must be avoided on weekends and public holidays.
Land Use and Land Capability	
<p>The disturbance of potentially productive agricultural land, including arable and grazing land, through the</p>	<p>Sites with an agricultural potential greater than “moderate” are not present at the project site. The area is</p>

Impact	Possible mitigation measures
<p>establishment of the proposed development. This could render the potentially productive agricultural land permanently unsuitable for agricultural production and could thereby decrease the food production potential of the area. This has a negative implication for food security in South Africa.</p> <p>Residual Impacts: None anticipated provided that the mitigation measures are implemented correctly and rehabilitation of the site is undertaken.</p>	<p>therefore not economically viable for the production of anything other than low intensity grazing. It is further believed that an economically successful agricultural development would not be viable under dryland conditions. The land that is designated as “poor” or “unsuitable” for agricultural production (51ha) should be left for conservation or as wetlands (where relevant). The areas that have a land capability of “moderate grazing” could be cropped to grasses for animal food production. This should be used as a guideline and is subject to the relative economic merits of the different cropping systems with respect to limited size of the area.</p> <p>Soil salinity/sodicity is a potential problem. Sites that have restricted drainage should be monitored on a regular basis, particularly on the grey/pale and darker clay rich soils, if they are to be developed. All sensitive and/or hazardous soils must be excluded from the development, as far as possible.</p> <p>All sensitive sites should be excluded from any development, as far as possible.</p>
Soil	
<p>Soil erosion due to the clearance of vegetation.</p> <p>Residual Impacts: None anticipated provided that the mitigation measures are implemented correctly and rehabilitation of the site is undertaken.</p>	<ul style="list-style-type: none"> • Limiting vegetation clearance until it is necessary for soil stripping. • Implement adequate erosion prevention measures, such as measures to dissipate runoff water velocities. • Implement adequate storm water management measures.
<p>Soil compaction to create foundations for buildings and other associated infrastructure.</p> <p>Residual Impacts: None anticipated provided that the mitigation measures are implemented correctly and rehabilitation of the site is undertaken.</p>	<p>The development footprint must be optimised and minimised to minimise the area that will be compacted during the construction activities.</p>
<p>Soil pollution due to the incorrect management of chemical substances and dangerous goods.</p> <p>Residual Impacts: None anticipated provided that the mitigation measures are implemented correctly and rehabilitation of the site is undertaken.</p>	<ul style="list-style-type: none"> • Use drip trays for any machinery and/or vehicle repair work. • Immediately repair any leaking machinery or vehicles. • Place oil drums on impermeable surfaces or plastic liners. • Immediately clean any hydrocarbon spillages and dispose of as hazardous waste.
<p>Soil pollution due to poor waste management.</p>	<ul style="list-style-type: none"> • Waste must be managed according to its hazard classification (i.e. general vs. hazardous waste) and

Impact	Possible mitigation measures
<p>Residual Impacts: None anticipated provided that the mitigation measures are implemented correctly.</p>	<p>general and hazardous waste streams should not be mixed.</p> <ul style="list-style-type: none"> ● Waste stored onsite must be kept in appropriate containers with lids that must be kept closed. ● Waste must be taken to appropriately licensed facilities for reuse, recycling, recovery or disposal. ● No waste may be stored on open soil or within wetlands and/or watercourses.
<p>Soil pollution due to potential spillages from chemical toilets.</p> <p>Residual Impacts: None anticipated provided that the mitigation measures are implemented correctly.</p>	<ul style="list-style-type: none"> ● Sufficient ablution facilities must be provided. ● Chemical toilets must be serviced regularly. ● Any spillages from the chemical toilets must immediately be cleaned and the contaminated soil disposed of as hazardous waste. Safe Disposal Certificates must be obtained and kept on record.
<p>Soil pollution due to the incorrect management of concrete mixing.</p> <p>Residual Impacts: None anticipated provided that the mitigation measures are implemented correctly.</p>	<ul style="list-style-type: none"> ● Concrete should ideally be mixed on an impermeable surface such as a concrete slab. ● Cement bags (new and used) must be stored under roof or in closed containers where they will not be exposed to rain. ● Dry concrete must be removed and disposed of together with other building rubble. ● Ready-mix concrete trucks may clean chutes into foundations, but not elsewhere onsite.
<p>Soil pollution due to runoff of contaminated stormwater.</p> <p>Residual Impacts: None anticipated provided that the mitigation measures are implemented correctly.</p>	<ul style="list-style-type: none"> ● Storm water must be diverted around areas where there are pollution sources. ● Storm water drainage infrastructure must be regularly inspected for obstructions. ● No contaminated storm water may be released into the environment from the construction activities. ● Washing or cleaning of equipment or machinery must occur in a designated area and the contaminated wash water must be contained. Such an area could be a plastic drum, a container or a plastic lined pit.
<p>Soil erosion due to inefficient rehabilitation of construction areas.</p> <p>Residual Impacts: None anticipated provided that the mitigation measures are implemented correctly and rehabilitation of the site is undertaken.</p>	<ul style="list-style-type: none"> ● Areas under rehabilitation must be cordoned off to prevent pedestrian and vehicular access. ● Re-vegetation must be undertaken using indigenous species, as far as possible. ● Areas under rehabilitation must be monitored to ensure successful vegetation establishment. Organic fertilizers and topsoil should be added to areas where vegetation establishment is not effective.
Socio-economic	
<p>Generation of a large number of job opportunities.</p> <p>Residual Impacts: Permanent, positive impact.</p>	<p>This is a positive impact and no mitigation measures are therefore required.</p>

Impact	Possible mitigation measures
Stimulation of the local economy, especially the tourism sector.	This is a positive impact and no mitigation measures are therefore required.
Residual Impacts: Permanent, positive impact.	
Potential increase in crime due to the influx of workers, especially during the construction phase.	<ul style="list-style-type: none"> • Reference checks should be conducted on all workers before they are appointed. • Workers should not be allowed to leave the construction site during the day and should be transported to and from the site on a daily basis.
Residual Impacts: None anticipated provided that the mitigation measures are implemented correctly and rehabilitation of the site is undertaken.	
Traffic	
Increase in traffic volumes to the site.	<ul style="list-style-type: none"> • Drivers must adhere to all speed restrictions and road rules. • Routing of vehicles must take other road users into account. • Load restrictions must be adhered to.
Residual Impacts: Higher traffic volumes.	

9.11 Outcome of the site selection matrix

The outcome of the site selection matrix was discussed under Section 8.1.1 of this report.

9.12 Motivation for not considering alternatives (including development footprint alternatives)

The motivation for not considering certain alternatives was discussed under Section 8.1 of this report.

9.13 Concluding statement

The preferred alternative development footprint is the proposed project/development (the Belfast Mall and Residential Development) and the preferred location for the development is the two project properties, as detailed under Section 4 of this report.

9.14 Summary of the findings and recommendations of specialist reports complying with Appendix 6 of the EIA Regulations, 2014, and an indication as to how these findings and recommendations have been included in this Environmental Impact Assessment Report

Herewith a summary of the findings and recommendations of the various specialist reports:

Fauna Assessment

Two main habitat types are present at the project site, namely terrestrial habitat and, to a lesser extent, rupicolous habitat. The terrestrial habitat predominates in the form of high altitude sour grassland. The quality of ground cover varies between dense stands of sour grass and areas where the grass has been overgrazed and/or displaced by the dense and vigorous alien creeper *Richardia braziliensis*. Most terrestrial, small mammals select for good cover providing both refuge and nourishment. Scrub hares have a predilection for short grass cover and are assumed to favour areas dominated by the creeper. Most of the arboreal habitat consists of exotic tree species, or, to a lesser degree, of planted endemics that were established outside of their natural distributional ranges. However, it can be expected that, irrespective of its origin, alien trees serve as perches and nesting sites for birds. Common reptiles most likely invaded established homesteads. No

termitaria were recorded and this could be the reason why aardvarks were not noted as present. The coiled razor fence is regarded as impairment to connectivity for medium-sized mammals such as black-backed jackal, duiker and steenbok, but these are still regarded as occupants given access under the fence. The rocky outcrops at the upper reaches of undulating plains do not provide prime rupicolous habitat, but applying the precautionary principle robust rupicolous species such as Namaqua rock rats, rock rabbits and rock elephant shrews are presumed to be residents. Species such as dassies are definitely absent.

The species richness is very low for such an extensive area. That is ascribed to the fact that Highveld grasslands do not have the species richness of savannahs and also as only two habitats are present. The overall quality of conservation is ranked as varying between poor and fairly good.

From an avifaunal perspective, most of the site can be considered of medium-high sensitivity, on account of the remaining natural grassland vegetation in the eastern portion of the site, the confirmed presence of one red-listed species, and the possible presence from time to time of several others. Designation of the site as being of medium-high sensitivity is further justified by its location within the Steenkampsberg Important Bird and Biodiversity Area (IBA) (Marnewick *et al.*, 2015). The contribution of the proposed development to cumulative avian habitat loss in the Steenkampsberg IBA also cannot be ignored. The loss of habitat will be mitigated to some extent by the zoning of several parts of the site for open space and agriculture, as per the layout plan provided. In the area surrounding the buildings, the degree of human disturbance is far greater than in the remainder of the site and is of lower sensitivity than the rocky grassland areas further east. Another factor that should be considered is the potential for negative impacts over a larger area of the IBA through pollution associated with construction and/or agricultural activities. The possibility exists, for instance, that the careless use of toxic chemicals at the site could reach areas of major conservation significance (e.g. the Middelpunt wetland) via run-off and/or groundwater. For this reason, the location of this site within the IBA must be borne in mind throughout the construction and operational phases of this project.

From a herpetological habitat perspective, it was established that three of the four major habitats are naturally present on the project site, namely terrestrial, rupicolous and wetland-associated vegetation cover. Most of the project site consists of plateau and moist grassland. The natural grassland has been transformed in some parts for agricultural purposes like grazing and by anthropogenic influences such as buildings, roads, fences and invasive plants. The project site is therefore ecologically disturbed in places. No moribund termitaria were recorded. These structures are good indicators of the occurrence of small herpetofauna. Accordingly, it is estimated that the reptile and amphibian population density for the project site is lower. At the time of the site visit, the basal cover was good in many places, despite grazing by cattle, horses and donkeys, and would provide adequate cover for small terrestrial herpetofauna. The grasslands on the project site have not been severely transformed and prey is probably widely distributed, so foraging grounds would not need to be so extensive to support the different populations of herpetofauna.

On the central part of the project site there are many small rocky outcrops in the grassveld, which provide excellent rupicolous habitat. Due to the presence of natural rupicolous habitat, some species like common girdled lizard, common crag lizard and rock agama were added to the species list. There are several artificial surrogates for rupicolous habitat, such as buildings. Only common reptiles like the speckled rock skink will benefit from these structures. There are a few manmade dams/burrow pits on the project site. Some of the dams are in drainage lines and hold water either temporarily or permanently. These water sources would provide habitat for common water-dependent herpetofauna. Noticeable absentees from the study site are indigenous trees. Arboreal habitat is therefore absent in a functional sense. Due to the absence of natural arboreal habitat, some species such as tree agamas and flap-neck chameleons were omitted from the species list. Most of the trees present on the project site are exotics. There are several dead logs that provide shelter and food for some herpetofauna.

The study site falls outside the natural range of giant bullfrog, plain stream frog, spotted shovel-nosed frog, whistling rain frog, giant dragon lizard (sungazer), Fitzsimons' flat lizard, Breyer's long-tailed seps, striped harlequin snake, Southern African python and the Nile crocodile. None of these Red-listed species should occur on the study site. The coppery grass lizard has been recorded on this quarter degree square 2530CA (Belfast) [Transvaal or Ditsong Museum of Natural History records], and large parts of the study site consist of fairly pristine grassveld. There is therefore a good possibility that this species may occur on the study site. The study site has suitable habitat for the large-scaled grass lizard (*Chamaejasura macrolepis*) and there is a small possibility that this species may occur on the site (Bredenkamp *et al.*, 2016).

Recommendations: Herpetofauna (Protection of the Drainage lines and Dams):

- Every effort should be made to retain the linear integrity, flow dynamics and water quality of the drainage lines and dams.
- Storm water from the new township must be managed in such a way that it simulate natural flow patterns.
- If the coppery grass lizard, large-scaled grass lizard, or any herpetological species be encountered or exposed during the construction phase, they should be removed and relocated to natural areas in the vicinity. This remediation requires the employment of a herpetologist to oversee the removal of any herpetofauna during the initial ground clearing phase of construction (i.e. initial ground-breaking by earthmoving equipment). The contractor must ensure that no herpetofauna species are disturbed, trapped, hunted or killed during the construction phase. Any herpetofauna that are inadvertently killed during earthmoving operations should be preserved as museum voucher specimens. Conservation-orientated clauses should be built into contracts for construction personnel, complete with penalty clauses for non-compliance.
- Alien and invasive plants must be removed.
- When holes or trenches are dug, construction must be completed as quickly as possible, otherwise such holes may act as death traps for herpetofauna.
- During the construction phase there will be increased surface water runoff and a decreased water quality (with increased silt load and pollution). Completing construction during the winter months would mitigate the environmental impact.

Flora

Most of the project site is undeveloped and currently used as land for the grazing of livestock. Even though the site is mostly in an ecologically unaltered state, no areas of the site have extraordinary conservation status.

The project site lies within the Lydenburg Montane Grassland (Gm18) vegetation type. This vegetation type has a status of "Vulnerable" and is typical of an inland high-altitude plateau, with mostly dense and short sour grass. Apart from a farmstead enclosure that consists of houses, sheds and kraals, the site is undeveloped and varies between light and heavily grazed by cattle and equids. Unusually, the entire property is security-fenced with high wire strands and attached razor coils. This represents a connectivity impairment for medium and larger terrestrial mammals.

Six vegetation mapping units were identified at the project site. The largest part of the site is covered with natural primary grassland, although it has been grazed. Rocky areas with boulders occur scattered throughout the area. Two small drainage areas with moist grassland are present on the southern boundary of the property. In the south western corner is degraded grassland and the farmstead development covers the north western corner. The ecological sensitivity of the project site is given in *Figure 13*.

Primary grassland occurs on the slightly undulating terrain on the larger eastern part of the site. Although grazed, the grass layer has a high cover and is in a good condition, often with *Eragrostis curvula* dominant. Although never dominant, several forb species occur scattered within the grassland. As the grassland is in a primary state, it is considered to have a high ecological sensitivity. The conservation status is considered to be vulnerable, mainly due to expansion of alien plantations.

One Red Data Forb species and three protected Forb species were recorded. The proposed development can be supported in the western area of the project site, but the veld earmarked for agriculture should be carefully managed.

Moist primary grassland has a very limited distribution within the project site and is restricted to the small catchments of the two small dams on the southern boundary of the site. Although grazed, the grass layer has a high cover and is in a fair to good condition, often with *Eragrostis curvula* and *Eragrostis plana* dominant. The grassland vegetation is not much different from the surrounding grassland, but a few hygrophilous plant species occur at the dams. As it is primary grassland that feeds into a shallow drainage valley, this vegetation type is considered to have a high ecological sensitivity. No Red Data species were recorded. One protected plant species (a forb) was recorded. It is suggested that the drainage areas be kept as natural open space.

Rocky outcrops occur scattered within the undulating grassland and provide special habitat to a great number of plant species, including rare and threatened species of conservation concern. The rocky outcrops are a special habitat in the primary grassland and are therefore considered to have a high ecological sensitivity. Two Red Data and four protected plant species (all forbs) were recorded. It is suggested that the rocky areas be protected as natural habitats in open space areas and not be destroyed by the proposed development.

The area in the south-western corner at the current entrance gate of the site has been highly disturbed and transformed. Some *Eucalyptus* and *Acacia mearnsii* occur here. The area is quite weedy while the tall-growing grasses like *Hyparrhenia hirta*, *Hyparrhenia dregeana*, *Eragrostis curvula* and also *Eragrostis plana* are locally prominent. These are patches within the grassland that have been highly disturbed and transformed, e.g. the borrow pit area on the northern boundary of the site. These areas have no plant species of any conservation concern and have a low sensitivity. Development in this area can be supported.

Highly disturbed and transformed areas occur in the western part of the project site, such as at the borrow pit on the northern boundary. These areas have no plant species of concern and have low conservation value and low sensitivity. This includes the farmstead and associated infrastructure in the north-western corner of the project site. Alien trees such as *Pinus*, *Eucalyptus* and *Quercus* were planted in this area. Old field and planted pastures are also present. These areas have no plant species of concern; have a low conservation value; and a low sensitivity.

Recommendations: Vegetation and Flora:

- Restrict the planned agricultural practice in the eastern grassland to grazing, based on an ecologically based management plan.
- Keep the major rocky outcrops natural and protected in open space areas.
- Avoid any form of erosion, rehabilitate where needed.
- Use only indigenous plant species for gardens and rehabilitation.
- Remove all alien woody species.
- If needed, rescue red data listed and protected species, and replant at suitable places (e.g. gardens) within the development.

Wetlands and watercourses

Based on the National Freshwater Ecosystem Priority Areas (NFEPA) Wetland Types for South Africa (SANBI, 2010), no watercourses are located on the project site. Some perennial rivers and non-perennial rivers and wetlands are located in close association to the study site. According to the NFEPA layer, the project site is situated within an area characterised by wetland clusters and is classified as mesic Highveld Grassland Group 6.

Two wetland sections were recorded on the study site as well as two dams. The wetland sections are classified as two sections of headwaters of one large unchannelled valley bottom wetland system the sections of the larger wetland located on the study site is classified as valley head seeps buffer. Only small sections of these two headwater valley head seep wetlands are located on the study site with the majority of the wetland not located on the study site.

The proposed development is likely to lead to increased hardened surfaces and is thus likely to have negative effects such as sedimentation, erosion, increased flooding, increased flow peaks and the input of foreign material into the wetland areas. The wetland is summarised in the table below:

Table 19: Summary of wetland assessment findings (Limosella Consulting, 2016)

Wetland Types	Quaternary Catchment and WMA areas	Linked to an important river system	Coordinates and Relation to study area	Present Ecological Score (PES)	Recommended Ecological Management Class (EIS/REMC)	Buffers
Valley Head Seeps	A22C, Crocodile (West) and Marico (WMA)	No	25°43'6.11"S and 30°3'59.30"E & 25°43'15.27"S and 30°4'30.69"E	C	B	44 metres.
Does the specialist support the development?	Yes – From a wetland point of view only small sections of the wetlands are located on the study site and a suggested 44 meter buffer is likely enough (together with the mitigations in this report) to minimise any potential impacts on the wetlands. However from an ecological point of view the study area and surrounding wetlands are very sensitive and should be protected and development is thus not supported.					
Major concerns	Increased hardened surfaces thus increasing sedimentation, erosion, increased flooding, increased flow peaks and the input of foreign material into the wetland areas.					
Recommendations	Wetland buffers should be respected as well as adhere to the mitigations.					

Phase 1 Heritage Impact Assessment

The site encompasses a section of the Battle of Berg-en Dal/Dalmanutha battlefield. Sections of the area have been disturbed by agricultural and industrial activities, as well as ploughing and the presence of domestic animals (grazing). ESKOM power lines running across a section of the study area have also impacted on the area, while the dumping of residential refuse and rolls of conveyor belts has occurred. Some farming related buildings and other modern structures are present in the wider area and have also impacted on the original landscape.

A number of sites, features and structures were identified on the study site during the Phase 1 Heritage Impact Assessment. Some are related to the Anglo-Boer War Battle of Berg-en Dal/Dalmanutha, as well as the earlier wagon routes that passed through the area. Others are related to modern farming and other activities in the larger area.

The old stone-built farm house with the modern additions and alterations is the only buildings with historical heritage significance. The original farmhouse is typical of these kinds of structures on the Eastern Highveld and is most likely older than 60 years of age. Although no graves were recorded during the assessment, the possibility of the presence of unmarked, unknown or low stone-packed graves remains.

On the eastern side of the farmhouse fence is a small hill that looks down over the plain towards the railway line in the north, and across the grassy plains to the east and the south-east. Located all around this low hill are trenches and packed stones that were used to create an elevated position here. These trenches are more than likely associated with the Anglo-

Boer War Battle of Berg-en Dal and although it could not be determined at the time of the assessment, they could have formed part of the Boer entrenchments before and during the Battle. Due to the thick grass and vegetation cover it was impossible to identify any cultural material.

Across the site, running from east to west and about 50m from the N4 motorway, are old wagon trails relating to the transport routes that traversed the area. Some of the trails are lined on each side with large rocks and they run around the base of the low hill heading towards Wemmershuis, where the old coach house is situated (beyond the study site). No cultural material is visible in the thick, low growth, but a worked stone relating to the wagon trails was found. Although the section has been disturbed by ESKOM pylons/power lines and possibly agricultural activities in the past, the site is still significant from a historical heritage point of view.

Recommendations:

- For the old farm house built in stone with modern alterations a Phase 2 HIA and recording should be undertaken. Should the site be impacted on by the development, a demolition permit should be applied for.
- For the trenches located around the small hill, and most likely related to the Anglo-Boer War (1899-1902) Battle of Berg-en Dal/Dalmanutha: Should the site be impacted by the proposed development, it should be mitigated by detailed mapping and drawing and also historical-archaeological excavations before destruction.
- For the sections of the old wagon route identified: Mapping and drawing should the site be impacted by the proposed development, before destruction.
- From a cultural heritage point of view the development should be allowed to continue taking the above into consideration. Furthermore, the subterranean presence of archaeological or historical sites, features or objects is always a possibility. Should any be uncovered during the development process an archaeologist should be called in to investigate and recommend the best way forward. The presence of unmarked graves should also be kept in mind.

Desktop Palaeontological Impact Assessment

There is a very high fossiliferous potential of the Vryheid Formation as well as the important alert for fossiliferous coal beds associated with these rocks. The Very High Palaeontological sensitivity allocated to areas underlain by the Vryheid Formation refers to the potential presence of significant plant remains in the Formation. If deep excavation (>1.5m) is envisaged and exposure of bedrock is planned for the construction activities, the excavation material will potentially contain significant fossil rich material.

Recommendations:

- The EAP as well as the ECO for this project must be made aware of the fact that the Vryheid Formation of the Ecca Group is Highly significant for fossil remains of plant and trace fossils, albeit mostly where good outcrops are available for inspection.
- In areas that are allocated a Very High Palaeontological sensitivity and specifically where deep excavation into bedrock is envisaged (>1.5m, following the geotechnical investigation), or where fossils are recorded during the geotechnical investigations, a qualified palaeontologist must be appointed to inspect the excavated material and to collect a representative sample of the fossil rich rocks according to SAHRA specifications.
- If the HIA consultant reports any outcrops of sandstone and shale of the Vryheid Formation, a qualified Palaeontologist must be appointed to inspect, record and collect fossils according to SAHRA procedures and specifications.
- These recommendations should form part of the EMP of the project.

The findings and recommendations of the specialist reports have been incorporated in this Environmental Impact Assessment Report under Sections 8.3 and 9.10. The findings and recommendations have also been incorporated into Section 8.1 of the draft Environmental Management Programme that forms part of this report.

10. ENVIRONMENTAL IMPACT STATEMENT

10.1 Summary of the key findings of the Environmental Impact Assessment

The summary of the key findings of this Environmental Impact Assessment process are as follows:

- Two main habitat types are present at the project site, namely terrestrial habitat and, to a lesser extent, rupicolous habitat. The terrestrial habitat predominates in the form of high altitude sour grassland. The fauna species richness is very low for such an extensive area. That is ascribed to the fact that Highveld grasslands do not have the species richness of savannahs and also as only two habitats are present. The overall quality of conservation is ranked as varying between poor and fairly good.
- Avifaunal perspective: Most of the site can be considered of medium-high sensitivity, on account of the remaining natural grassland vegetation in the eastern portion of the site, the confirmed presence of one red-listed species, and the possible presence from time to time of several others. Designation of the site as being of medium-high sensitivity is further justified by its location within the Steenkampsberg Important Bird and Biodiversity Area (IBA) (Marnewick *et al.*, 2015).
- Herpetological habitat perspective: It was established that three of the four major habitats are naturally present on the project site, namely terrestrial, rupicolous and wetland-associated vegetation cover. Most of the project site consists of plateau and moist grassland. The natural grassland has been transformed in some parts for agricultural purposes like grazing and by anthropogenic influences such as buildings, roads, fences and invasive plants. The project site is therefore ecologically disturbed in places. No moribund termitaria were recorded. These structures are good indicators of the occurrence of small herpetofauna. Accordingly, it is estimated that the reptile and amphibian population density for the project site is lower.
- The study site falls outside the natural range of giant bullfrog, plain stream frog, spotted shovel-nosed frog, whistling rain frog, giant dragon lizard (sungazer), Fitzsimons' flat lizard, Breyer's long-tailed seps, striped harlequin snake, Southern African python and the Nile crocodile. None of these Red-listed species should occur on the study site. The coppery grass lizard has been recorded on this quarter degree square 2530CA (Belfast) [Transvaal or Ditsong Museum of Natural History records], and large parts of the study site consist of fairly pristine grassveld. Therefore there is a good possibility that this species may occur on the study site. The study site has suitable habitat for the large-scaled grass lizard (*Chamaejasura macrolepis*) and there is a small possibility that this species may occur on the site (Bredenkamp *et al.*, 2016).
- Most of the project site is undeveloped and currently used as land for the grazing of livestock. Even though the site is mostly in an ecologically unaltered state, no areas of the site have extraordinary conservation status.
- The project site lies within the Lydenburg Montane Grassland (Gm18) vegetation type. This vegetation type has a status of "Vulnerable" and is typical of an inland high-altitude plateau, with mostly dense and short sour grass. Apart from a farmstead enclosure that consists of houses, sheds and kraals, the site is undeveloped and varies between light and heavily grazed by cattle and equids. Six vegetation mapping units were identified at the project site. The largest part of the site is covered with natural primary grassland, although it has been grazed. Rocky areas with boulders occur scattered throughout the area. Two small drainage areas with moist grassland are present on the southern boundary of the property. In the south western corner is degraded grassland and the farmstead development covers the north western corner.
- Primary grassland occurs on the slightly undulating terrain on the larger eastern part of the site. Although grazed, the grass layer has a high cover and is in a good condition, often with *Eragrostis curvula* dominant. Although never dominant, several forb species occur scattered within the grassland. As the grassland is in a primary state, it is considered to have a high ecological sensitivity. The conservation status is considered to be vulnerable, mainly due to expansion of alien plantations. One Red Data Forb species and three protected Forb species were recorded. The proposed development can be supported in the western area of the project site, but the veld earmarked for agriculture should be carefully managed.

- Moist primary grassland has a very limited distribution within the project site and is restricted to the small catchments of the two small dams on the southern boundary of the site. Although grazed, the grass layer has a high cover and is in a fair to good condition, often with *Eragrostis curvula* and *Eragrostis plana* dominant. The grassland vegetation is not much different from the surrounding grassland, but a few hygrophilous plant species occur at the dams. As it is primary grassland that feeds into a shallow drainage valley, this vegetation type is considered to have a high ecological sensitivity. No Red Data species were recorded. One protected plant species (a forb) was recorded. It is suggested that the drainage areas be kept as natural open space.
- Rocky outcrops occur scattered within the undulating grassland and provide special habitat to a great number of plant species, including rare and threatened species of conservation concern. The rocky outcrops are a special habitat in the primary grassland and are therefore considered to have a high ecological sensitivity. Two Red Data and four protected plant species (all forbs) were recorded. It is suggested that the rocky areas be protected as natural habitats in open space areas and not be destroyed by the proposed development.
- The area in the south-western corner at the current entrance gate of the site has been highly disturbed and transformed. Some *Eucalyptus* and *Acacia mearnsii* occur here. The area is quite weedy while the tall-growing grasses like *Hyparrhenia hirta*, *Hyparrhenia dregeana*, *Eragrostis curvula* and also *Eragrostis plana* are locally prominent. These are patches within the grassland that have been highly disturbed and transformed, e.g. the borrow pit area on the northern boundary of the site. These areas have no plant species of any conservation concern and have a low sensitivity. Development in this area can be supported.
- Highly disturbed and transformed areas occur in the western part of the project site, such as at the borrow pit on the northern boundary. These areas have no plant species of concern and have low conservation value and low sensitivity. This includes the farmstead and associated infrastructure in the north-western corner of the project site. Alien trees such as *Pinus*, *Eucalyptus* and *Quercus* were planted in this area. Old field and planted pastures are also present. These areas have no plant species of concern; have a low conservation value; and a low sensitivity.
- Based on the National Freshwater Ecosystem Priority Areas (NFEPA) Wetland Types for South Africa (SANBI, 2010), no watercourses are located on the project site. Some perennial rivers and non-perennial rivers and wetlands are located in close association to the study site. According to the NFEPA layer, the project site is situated within an area characterised by wetland clusters and is classified as mesic Highveld Grassland Group 6.
- Two wetland sections were recorded on the study site as well as two dams. The wetland sections are classified as two sections of headwaters of one large unchannelled valley bottom wetland system the sections of the larger wetland located on the study site is classified as valley head seeps buffer. Only small sections of these two headwater valley head seep wetlands are located on the study site with the majority of the wetland not located on the study site.
- From a wetland point of view only small sections of the wetlands are located on the study site and a suggested 44 meter buffer is likely enough (together with the mitigations in this report) to minimise any potential impacts on the wetlands. However, from an ecological point of view the wetlands are very sensitive and should be protected.
- There is a very high possibility that significant fossil assemblages will be present in all outcrops of the site. If deep excavation is envisaged for the construction procedures, the excavation material will potentially contain significant fossil rich material and the development will most likely have a very significant impact on the Palaeontological Heritage of the region.
- Archaeological and Heritage Sites: A number of sites, features and structures were identified on the study site during the Phase 1 Heritage Impact Assessment. Some are related to the Anglo-Boer War Battle of Berg-en-Dal/Dalmanutha, as well as the earlier wagon routes that passed through the area. Others are related to modern farming and other activities in the larger area. The old stone-built farm house with the modern additions and alterations is the only buildings with historical heritage significance. The original farmhouse is typical of these kinds of structures on the Eastern Highveld and is most likely older than 60 years of age. Although no graves were recorded during the assessment, the possibility of the presence of unmarked, unknown or low stone-packed graves remains.
 - For the old farm house built in stone with modern alterations a Phase 2 HIA and recording should be undertaken. Should the site be impacted on by the development, a demolition permit should be applied for.

- For the trenches located around the small hill, and most likely related to the Anglo-Boer War (1899-1902) Battle of Berg-en Dal/Dalmanutha: Should the site be impacted by the proposed development, it should be mitigated by detailed mapping and drawing and also historical-archaeological excavations before destruction.
- For the sections of the old wagon route identified: Mapping and drawing should the site be impacted by the proposed development, before destruction.
- From a cultural heritage point of view the development should be allowed to continue taking the above into consideration. Furthermore, the subterranean presence of archaeological or historical sites, features or objects is always a possibility. Should any be uncovered during the development process an archaeologist should be called in to investigate and recommend the best way forward. The presence of unmarked graves should also be kept in mind
- The proposed development will result in a positive socio-economic impact through the generation of a large number of temporary and permanent job opportunities as well as the stimulation of the local economy.

The environmental impacts associated with the proposed development have been identified and assessed in terms of their significance in this report. The most significant impacts are as follows:

- Changing the quantity and fluctuation properties of the watercourse by, for example, storm water input, or restricting water flow.
- Changing the amount of sediment entering water resource and associated change in turbidity (increasing or decreasing the amount).
- Loss and disturbance of wetland habitat and fringe vegetation due to direct development on the wetland as well as changes in management, fire regime and habitat fragmentation.
- Changes in water quality due to toxic contaminants and increased nutrient levels.
- Loss of vegetation from the following vegetation unit/ecosystem: Primary Grassland (western part of the project site).
- Loss of vegetation from the following vegetation unit/ecosystem: Indigenous species.
- Disturbance or destruction of cultural and heritage resources – trenches and packed stones likely associated with the Anglo-Boer War Battle of Berg-en-Dal.
- There is a very high possibility that significant fossil assemblages will be present in all outcrops of the site. If deep excavation is envisaged for the construction procedures, the excavation material will potentially contain significant fossil rich material and the development will most likely have a very significant impact on the Palaeontological Heritage of the region.
- Soil pollution due to the incorrect management of chemical substances and dangerous goods. Soil pollution due to poor waste management (hazardous waste).
- Increase in traffic volumes to the site in both the construction and operational phases.
- The majority of the impacts are rated as having a “**Medium**” significance before mitigation, and a “**Low**” significance after mitigation.
- Mitigation measures have been incorporated into the Environmental Management Programme, as per the specialist studies’ recommendations.
- The layout for the proposed development is concentrated on the areas with Low Ecological Sensitivity (the western part of the site). The High Ecological Sensitivity areas (eastern part of the site) have been designated for agricultural purposes (small scale agricultural activities in the form of grazing for horses, urban agricultural units, a nursery and/or a farmyard).
- The heritage and palaeontological sensitivities will be mitigated as per the specialist’s recommendations.

10.2 Environmental sensitivity overlay maps

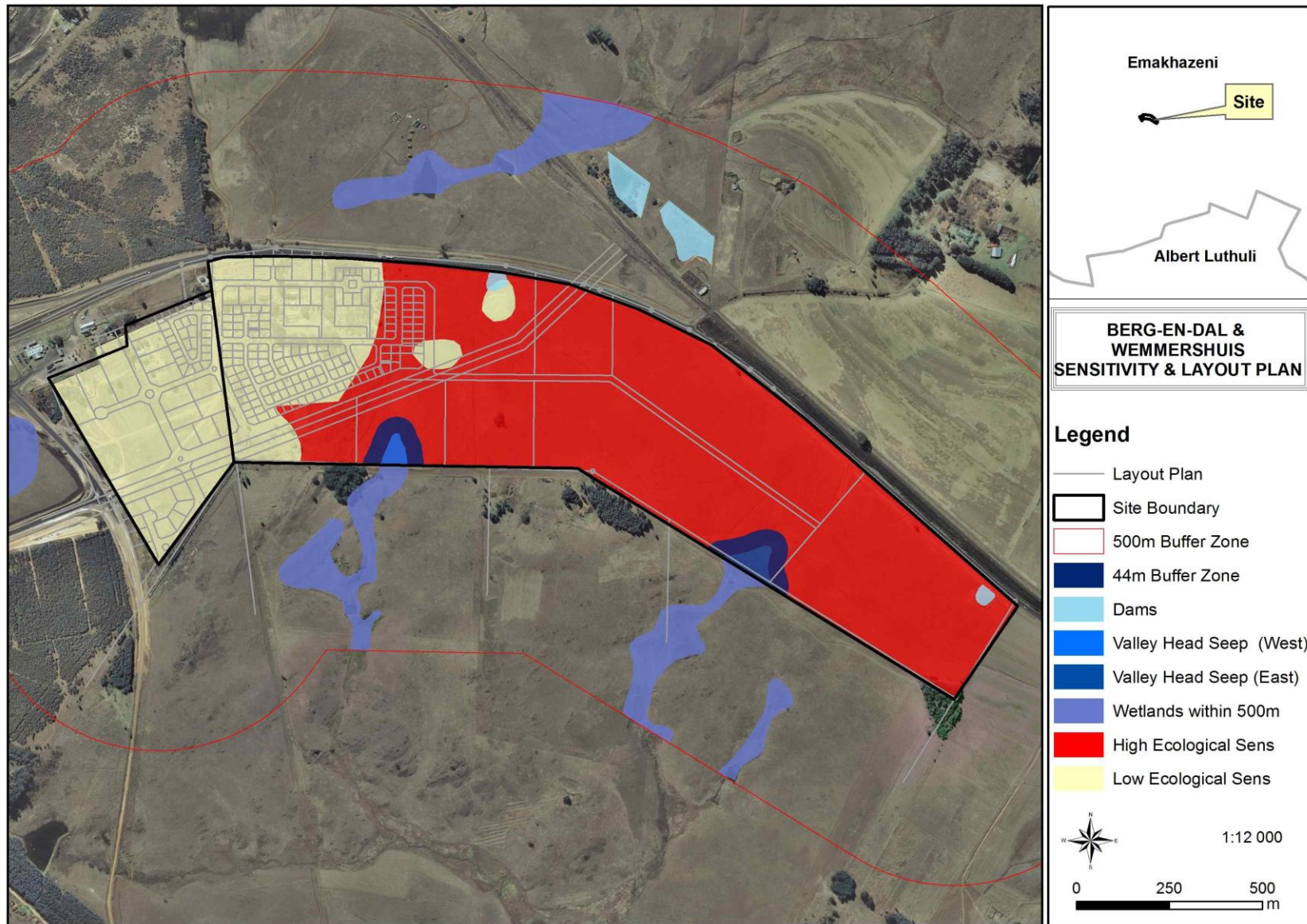


Figure 22: Ecological sensitivity map

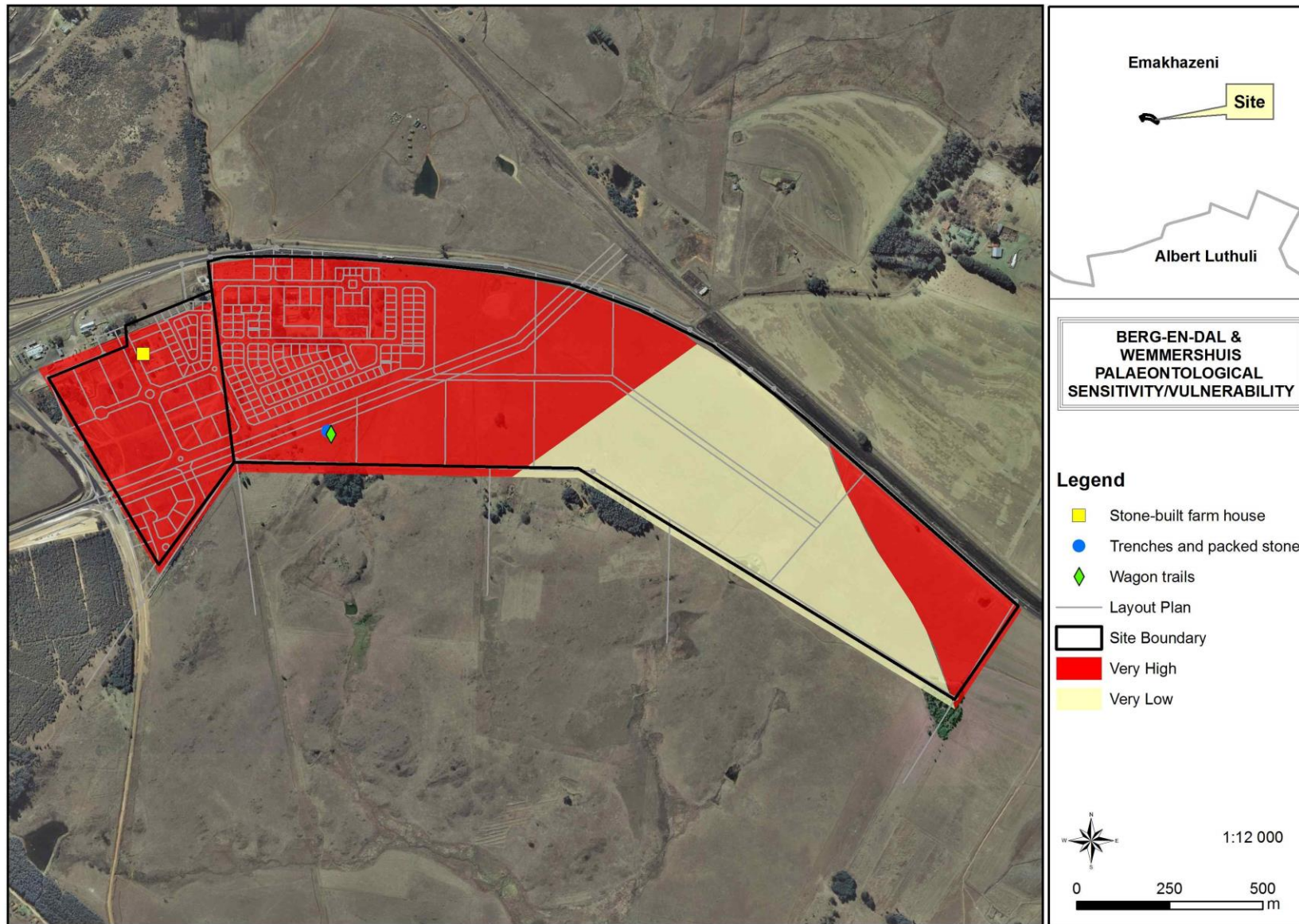


Figure 23: Heritage and Palaeontological sensitivity map

10.3 Summary of the positive and negative impacts and risks of the proposed activity and identified alternatives

The following main positive and potential negative impacts and risks have been identified for the proposed project:

Positive impacts

- Generation of a large number of job opportunities.
- Stimulation of the local economy, especially the tourism sector.

Negative impacts

- Changing the quantity and fluctuation properties of the watercourse by, for example, storm water input, or restricting water flow.
- Changing the amount of sediment entering water resource and associated change in turbidity (increasing or decreasing the amount).
- Invasions of alien plants can impact on hydrology, by reducing the quantity of water entering a wetland, and outcompeting natural vegetation, decreasing the natural biodiversity.
- Loss and disturbance of wetland habitat and fringe vegetation/changing the physical structure of the wetland.
- Changes in water quality due to toxic contaminants and increased nutrient levels.
- Pollution of surface and/or groundwater resources.
- Soil pollution.
- Soil erosion.
- Avian habitat loss associated with construction activities.
- Loss of vegetation from the vegetation units/ecosystems onsite.
- Disturbance or destruction of cultural and heritage resources.
- Very high possibility that that significant fossil assemblages will be present in all outcrops of the site.
- Generation of dust.
- Release of vehicle emissions from construction vehicles.
- Generation of nuisance and noise.
- Potential increase in crime.
- Increase in traffic volumes to the site.

10.4 Impact management measures from specialist reports and the recording of the proposed impact management outcomes for the development, for inclusion in the EMPr

The impact management measures that have been provided in the various specialist reports have been included under Section 9.10 of this report and have also been included under Section 8.1 of the Environmental Management Programme.

10.5 The final proposed alternatives which respond to the impact management measures, avoidance and mitigation measures identified through the assessment

The final property alternative for the Belfast Mall and Mixed Use Development is on the following properties (collectively known as the proposed development site): The Remainder of the Farm Bergendal 981, J.T.; and The Remainder of Portion 12 of the Farm Wemmershuis 379, J.T.

The final site-; layout-; routing; and scale and magnitude alternative for the proposed project is shown on the following figure (*Figure 24*) and also attached under Appendix A.

10.6 Aspects which were conditional to the findings of the assessment either by the EAP or specialists and which are to be included as conditions of authorisation

The following conditions must be included in the Environmental Authorisation, should the proposed development be authorised:

- The mitigation measures contained in the Environmental Management Programme must be implemented during each developmental phase of the proposed project.
- An independent Environmental Control Officer must be appointed to audit compliance to the Environmental Management Programme during the construction phase of the proposed development.
- In areas that are allocated a Very High Palaeontological sensitivity and specifically where deep excavation into bedrock is envisaged (>1.5m, following the geotechnical investigation), or where fossils are recorded during the geotechnical investigations, a qualified palaeontologist must be appointed to inspect the excavated material and to collect a representative sample of the fossil rich rocks according to SAHRA specifications.
- For the old farm house built in stone with modern alterations a Phase 2 HIA and recording should be undertaken. Should the site be impacted on by the development, a demolition permit should be applied for.
- For the trenches located around the small hill, and most likely related to the Anglo-Boer War (1899-1902) Battle of Berg-en Dal/Dalmanutha: Should the site be impacted by the proposed development, it should be mitigated by detailed mapping and drawing and also historical-archaeological excavations before destruction.
- For the sections of the old wagon route identified: Should the site be impacted by the proposed development, it should be mitigated by detailed mapping and drawing before destruction.
- 44m buffer zones are required around the two wetlands.

10.7 Description of assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed

The following assumptions were made during this Environmental Impact Assessment process:

- That all research and reference sources or material is accurate and up to date;
- That the project information, as provided by the applicant, is correct;
- That the specialist opinions are scientifically grounded and accurate; and
- That the proposed development will be operated according to the Environmental Management Programme and in a responsible manner.

10.8 Reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation

It is Labesh's independent and reasoned opinion that the identified and assessed environmental impacts can be mitigated and that an Environmental Authorisation should therefore be issued for the proposed Belfast Mall and Mixed Use Development project.

Please refer to Section 10.6 above for conditions that should be included in respect of the Environmental Authorisation.

10.9 Where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required, the date on which the activity will be concluded, and the post construction monitoring requirements finalised

Not applicable. The proposed activity does include operational aspects.

11. ENVIRONMENTAL ASSESSMENT PRACTITIONER UNDERTAKING

I, Lourens de Villiers, hereby confirm the following:

- The correctness of information provided in this Environmental Impact Assessment Report and the Environmental Management Programme;
- The inclusion of all comments and inputs from stakeholders and I&APs;
- The inclusion of inputs and recommendations from the specialist reports, where relevant; and
- Any information provided by the EAP to I&APs and any responses by the EAP to comments or inputs made by I&APs have been included in this report.

I further confirm that I have no business, financial, personal or other interest in the activity or application in respect of which I have been appointed as EAP, in terms of the EIA Regulations, other than fair remuneration for work performed in connection with this application for Environmental Authorisation.

12. DETAILS OF ANY FINANCIAL PROVISION FOR THE REHABILITATION, CLOSURE AND ONGOING POST DECOMMISSIONING MANAGEMENT OF NEGATIVE ENVIRONMENTAL IMPACTS

No financial provisioning applicable to the proposed project.

13. INDICATION OF ANY DEVIATION FROM THE APPROVED SCOPING REPORT, INCLUDING THE PLAN OF STUDY

There have been no deviations from the approved Scoping Report and Plan of Study.

14. SPECIFIC INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

No specific information has been required by the Competent Authority at this stage of the application process.

15. OTHER MATTERS REQUIRED IN TERMS OF SECTION 24(4)(A) AND (B) OF NEMA

At this stage, no other matters to address have been identified or required.