1. INTRODUCTION

The applicant, Jumbo van der Merwe Trust, plans to utilise a portion of Portion 55 of the farm Blesboklaagte 296 JS for commercial purposes (i.e. for the development of a shopping centre and associated infrastructure). The site is located in close proximity of the eMalahleni Central Business District and the railway station.

The Minister of Environmental and Water Affairs listed in terms of Sections 24(2), 24(5), 24D and 44, read with section 47A(1)(b) of the National Environmental Management Act, 1998 (Act No. 107 of 1998), a number of activities that require an environmental impact assessment (either a Basic Assessment or a full Environmental Impact Assessment) before undertaking these activities.

The proposed activity would involve the following listed activities as identified in terms of Section 24(2) and 24D of the National Environmental Management Act, 1998:

Listing	Activity
Listing Notice 1 (GN R327), Listed Activity 26:	Residential, retail, recreational, tourism, commercial or institutional developments of 1000 square metres or more, on land previously used for mining or heavy industrial purposes; excluding (i) where such land has been remediated in terms of part 8 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case the National Environmental Management: Waste Act, 2008 applies; or (ii) where an environmental authorisation has been obtained for the decommissioning of such a mine or industry in terms of this Notice or any previous NEMA notice; or (iii) where a closure certificate has been issued in terms of section 43 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) for such land.
Listing Notice 1 (GN R327), Listed Activity 27:	The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.

In order to obtain environmental authorisation, a Basic Assessment must be conducted as described in Regulations 19 and 20 of the Environmental Impact Assessment Regulations 2014 (as amended) as promulgated in terms of Section 24(5) and 44 of the National Environmental Management Act, 1998 (Act 107 of 1998).

The objective of the Basic 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) Identify the alternatives considered, including the activity, location, and technology alternatives;
c) Describe the need and desirability of the proposed alternatives;
d) Through the undertaking of an impact and risk assessment process inclusive of cumulative impacts which focused on determining the geographical, physical, biological, social, economic, heritage and cultural sensitivity of the sites and locations and the risk of impact of the proposed activity and technology alternatives on these aspects to determine: (i) the nature, significance, consequence, extent, duration and probability of the impacts occurring; 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) Through a ranking of the site sensitivities and possible impacts the activity and technology alternatives will impose on the sites and location identified through the life of the activity to: (i) identify and motivate a preferred site, activity and technology alternative; (ii) identify suitable measures to avoid, manage or mitigate identified impacts; and (iii) identify residual risks that need to be managed and monitored.

AdiEnvironmental cc. was appointed as independent environmental consultant to conduct the required Basic Assessment and compile the necessary documentation. This Basic Assessment Report (BAR) is compiled in accordance with Appendix 1 of the Environmental Impact Assessment Regulations, 2014 (as amended) and indicates the environmental outcomes, impacts and residual risks of the proposed activity.

Diagram 1 provides a schematic description of the Basic Assessment process followed. This process is strictly according to the above-mentioned Regulations. The aim of the process is to ensure that the environmental impacts are considered, the relevant I&APs are consulted and the decision making authorities are provided with sufficient information to make an informed decision.

The decision making authority is the Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs (DARDLEA). This Department will decide to grant or refuse the approval of the project. On approval, an Environmental Authorisation and Record of Decision will be issued in the name of the project applicant.

The project applicant will be responsible for complying with the conditions set in the Environmental Authorisation and Record of Decision.

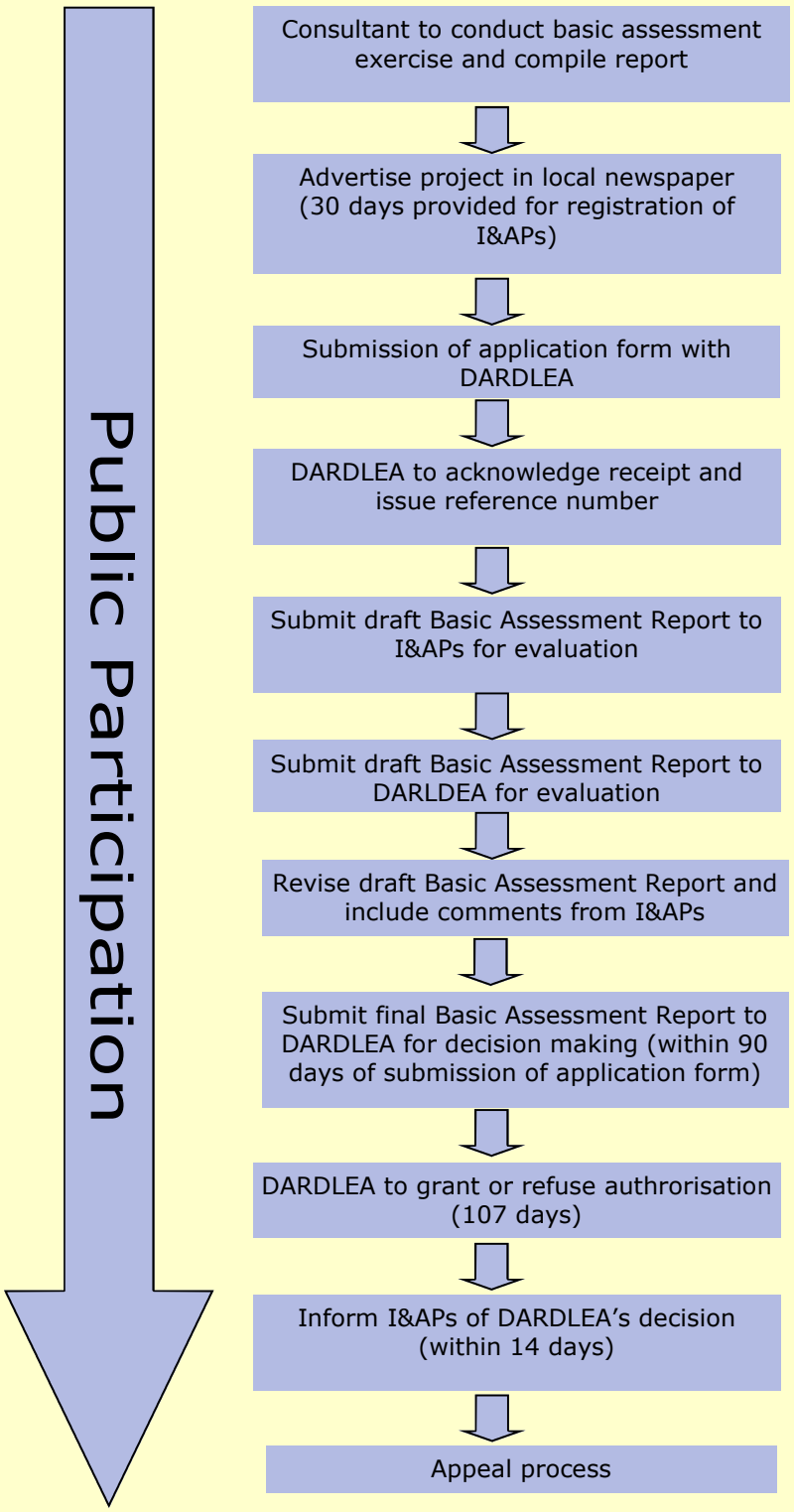

Diagram 1: Basic Assessment Process

2. DETAILS OF THE PROJECT APPLICANT AND ENVIRONMENTAL CONSULTANT

Name and address of applicant:	
Jumbo van der Merwe Trust P.O. Box 8626 Die Heuwel 1042	
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AdiEnvironmental cc P.O. Box 647 Witbank 1035	
Contact persons:	Mrs. A. Erasmus *Pr. Sci. Nat.* Ms. R. Janse van Rensburg
Cell number:	083 271 8260
Telephone number:	013-697 5021
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A copy of the application form and the declaration of independence by the applicant and environmental consultant are provided in Appendix 1.

Curriculum Vitae of both Mrs. A. Erasmus and Ms. R. Janse van Rensburg are provided in Appendix 2 together with a list of projects completed to date.

3. DESCRIPTION OF THE ACTIVITY

3.1 Description of the site, design, size and scale of the development

3.1.1 Introduction

The applicant, Jumbo van der Merwe Trust, plans to utilise a portion of Portion 55 of the farm Blesboklaagte 296 JS for commercial purposes (i.e. for the development of a shopping centre and associated infrastructure). The site is located in close proximity of the eMalahleni Central Business District and the railway station. Figure 5.1 indicates the location of the site.

The entire property is 42.1920 ha in extent. However, only 10.1104 ha will be developed. The remaining 32.0816 ha will remain vacant.

The intention is to subdivide the property into five (5) portions, which can then be rezoned for development as the need arises. The subdivision plan makes provision for the following (Figure 3.1):

Portion	Size (ha)	Use
Portion 270	5.8968 ha	proposed shopping centre
Portion 271	3.6815 ha	proposed shopping centre
Portion 268	0.1443 ha	right of way servitude to provide access to Portion 269 (i.e. the existing church)
Portion 269	0.3878 ha	to accommodate existing church
Remainder	32.0816 ha	not part of this application. Will not be developed.
Total:	**42.192 ha**	

A copy of the subdivision application compiled by Korsman & Associates (2016) is provided in Appendix 3.

3.1.2 Rezoning

After subdivision, Portion 270 and Portion 271 (Figure 3.1) will be rezoned from 'Agricultural' to 'Business 3' for the purposes of a shopping centre. A copy of the townplanning memorandum compiled by Korsman & Associates (2017) is provided in Appendix 3.

According to the eMalahleni Land Use Management Scheme (2010), the following primary land uses fall under the 'Business 3' zoning:

- Business - e.g. hair dressing, jewellery shop, key cutting;
- Club - private meeting place of people with a collective aim;
- Government, Municipal and Institution - e.g. hospital, old-age home;
- Hotel and residential buildings - e.g. hostel;
- Medical & veterinary consulting rooms;
- Motor dealership;
- Offices;
- Parking garage;
- Place of instruction - e.g. school, college, library;
- Shops and place of refreshment - e.g. restaurants;
- Place of worship - e.g. church;
- Social hall.

The 'Business 3' zoning therefore makes provision for shopping centre and associated uses.

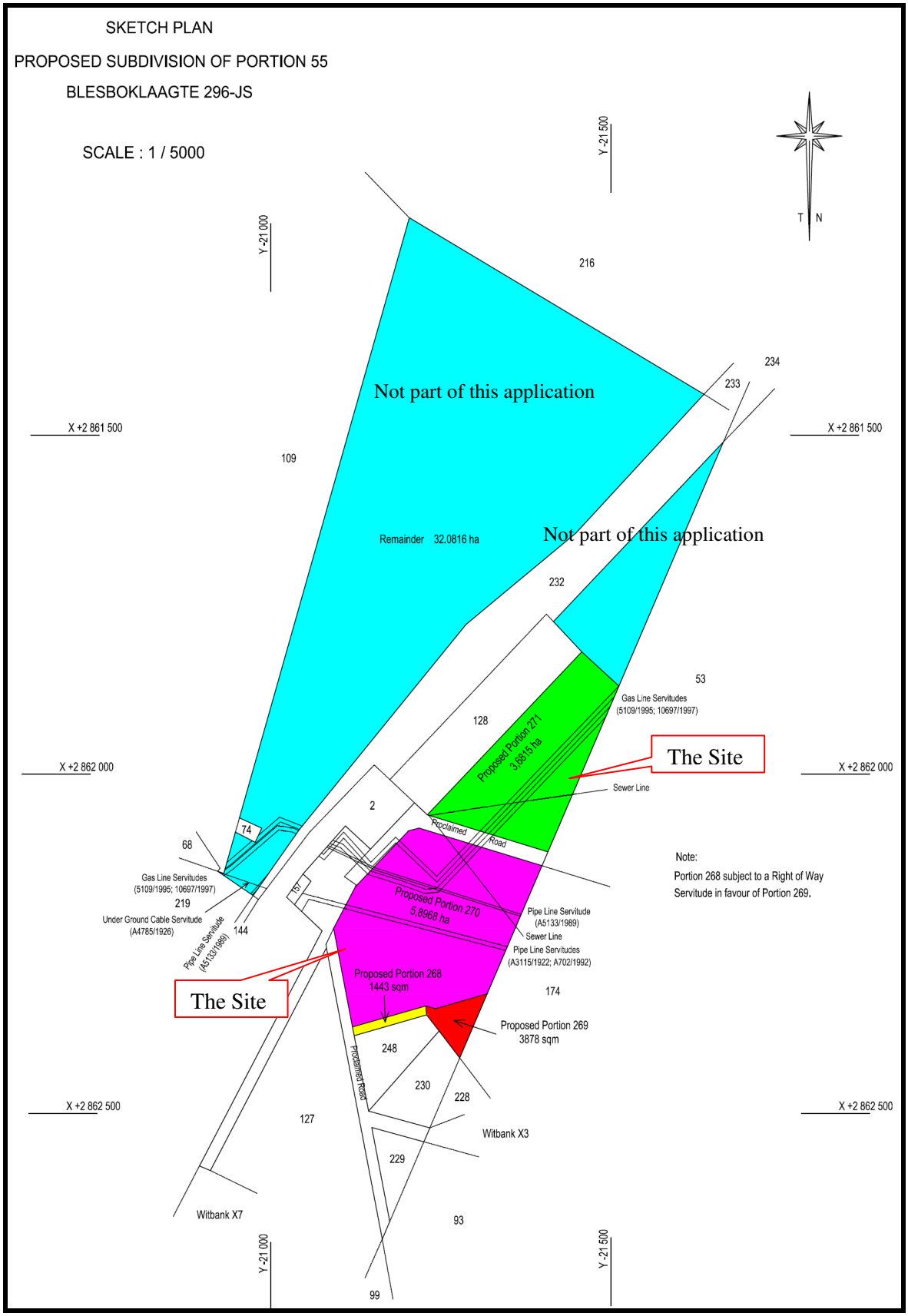

Figure 3.1: Proposed subdivision plan (taken from Korsman & Associates, 2016)

According to Korsman & Associates (2016), Portion 269 will ultimately be transferred to the existing church (Apostolic Mission Revival) on site. This portion will thus not be rezoned from Agricultural to Business 3.

Portion 268 will be consolidated with the adjacent Portion 248 (which also belongs to the applicant), after which a servitude will be registered across the property to provide access to the church (Korsman & Associates, 2016).

3.1.3 Layout plan

Figure 3.2 provides an indication of the proposed layout plan as designed by Korsman & Associates, 2017.

According to Korsman & Associates (2017), the following development conditions will apply to the proposed shopping centre as per the eMalahleni Land Use Management Scheme, 2010:

Use Zone VII	Business 3 allowed use	Proposed Development Plan
Height	2 storeys	1 storey
Coverage	40%	25.27%
Floor Area Ratio	0.4	0.25
Parking Ratio	4 per 100 m^2 for business purposes 2 per 100 m^2 for warehouses 825 parking bays required	863 parking bays
Building Lines	Street boundary: 5 m Rear boundary: 2 m Side boundary: 2 m	According to approved Site Development Plan

As indicated in Figure 3.2, the said site is divided into two sections due to the presence of Main Street in approximately the centre of the site. Portion 270 is located to the south of Main Street and Portion 271 to the north (Figure 3.2).

The main shopping centre complex will be located on Portion 270, which will comprise of a variety of shops and restaurants e.g. Woolworths, Wimpy, Shoprite, etc (Figure 3.2). Building coverage will be 17 055 m^2.

Parking will be provided in the northern portion of Portion 270 to allow for easy access from Main Street and the R544 provincial road (Figure 3.2). 621 Parking bays will be provided as well as 72 parking bays for taxis.

The intention is to allow for warehouse type developments (e.g. Cashbuild, tyre fitment centres, etc.) on Portion 271. Building coverage will be 7 512 m^2 and 180 parking bays will be provided on this portion (Figure 3.2).

The development plan was designed in such a way that no buildings will be constructed across the Sasol gas pipeline (blue line, Figure 3.2) or the water pipelines (orange lines, Figure 3.2). Two buildings are however, planned over the sewer line on Portion 270 (pink line; Figure 3.2).

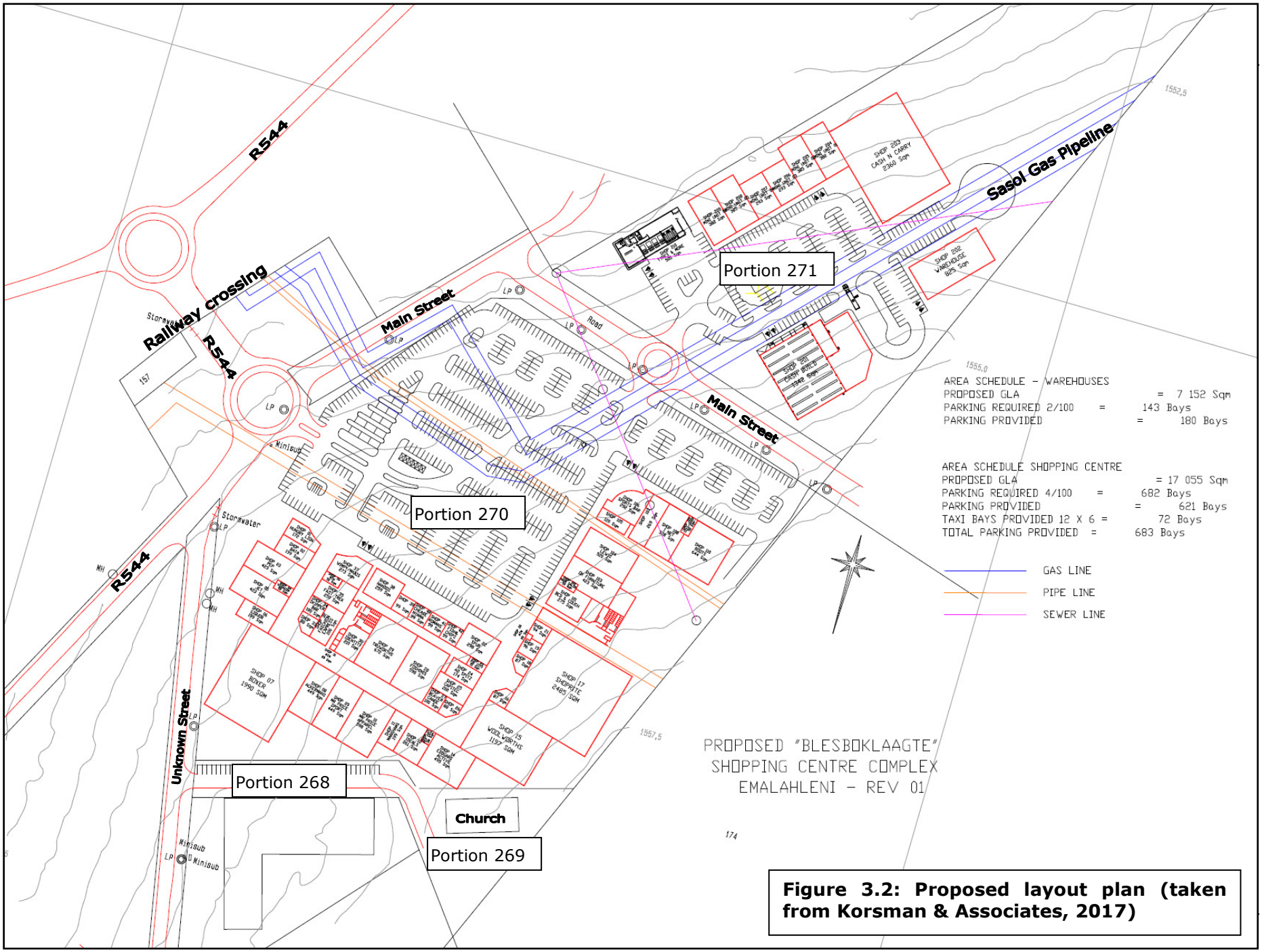

Figure 3.2: Proposed layout plan (taken from Korsman & Associates, 2017)

3.2 Services required

The said site is located within the eMalahleni Local Municipality (ELM) urban boundary and will therefore be serviced by the municipality.

The link services (roads and electricity) and the internal reticulation (water, sewer, electricity, streets and street lighting) of the development will be done by the developer to the satisfaction of the eMalahleni Local Municipality.

The applicant will be responsible for the installation of the services, where after the services will be handed to the municipality.

3.2.1 Water

Scip Engineering Group (referred to as Van As, 2016) investigated the availability of bulk services (water, sewer, stormwater, access) for the proposed development. A copy of the report is provided in Appendix 4.

During the construction phase, the various contractors would have to provide potable water to the site workers.

The proposed shopping centre will connect to the existing bulk water pipelines (orange lines, Figure 3.2) that currently cross the site. Potable water will thus be supplied by the ELM. As indicated in Figure 3.2, no buildings will be constructed over existing water servitudes.

The estimated water demand of the shopping centre is (Van As, 2016):

Average Annual Water Demand	400 l/d/100m^2
Estimated Total Daily Demand	28 kl/d
Estimated Peak Flow Rate	2 l/s
Estimated Fire Water Flow	10 l/s

Water usage will be limited and conform to Red Book Standards. No high volume water users are envisaged. According to Van As (2016), no upgrading of the bulk water supply is necessary.

In order to allow for water metering by the ELM, a single bulk water meter will be installed at the bulk water connection point. Internal water reticulation will be installed per tenant's requirements. Separate water meters will be placed at each premises.

It is also envisaged that water tanks will be provided on site to prevent water shortage during disruption of the water supply.

3.2.2 Electricity

Buro Tech Consulting Engineers cc (referred to as Pienaar, 2016) investigated the availability of electrical bulk supply for the proposed development. A copy of the report is provided in Appendix 4.

Currently, the surrounding properties obtain electricity from the eMalahleni Local Municipality (ELM). There is an existing underground cable along the western boundary of Portion 270 (Figure 3.2). This cable connects the Smuts Street Substation to the Klarinet Substation. According to Pienaar (2016), the ELM indicated that this cable is already utilised to full capacity.

On the opposite side of the road (i.e. located on the western boundary of the site) there are 2 underground feeder cables. These cables connect the Smuts Street Substation to the Klarinet and the Buffer Substations.

According to Pienaar (2016), the electricity demand of the proposed shopping centre will be 3 265 kVA. Capacity is not available at the Smuts Street Substation, which means that the substation would have to be upgraded from 5 MVA to 10 MVA before the development can be connected. The System Protection would also have to be upgraded.

According to Pienaar (2016), two options are available with regards to connecting the proposed shopping centre to the ELM grid, namely:

- Option 1 - Install a new additional 11 kV panel inside the Smuts Street Substation and lay a new cable to the proposed development;
- Option 2 - Cut into the existing cable and construct a substation at the proposed site.

Option 2 is regarded as not feasible due to cost implications.

An application to upgrade the current capacity was submitted to the ELM in July 2016. To date, no feedback has been received.

3.2.3 Sewage

During the construction phase, the contractor will provide chemical toilets on site.

During the operational phase, the shopping centre will connect to the existing sewer network and treatment will take place at the Klipspruit Sewage Works. A single connection point is envisaged. No alternatives to the bulk main are necessary (Van As, 2016).

The sewer outflow of the shopping centre is estimated at 10 kl/day (Van As, 2016).

An internal network will serve all tenants and public facilities and will conform to Red Book Standards (Van As, 2016).

3.2.4 Waste management

During the construction phase, building rubble and a small amount of domestic waste will be generated. The contractor will have to provide adequate containers for the collection of waste. The applicant will have to ensure that the contractors remove the said building rubble and domestic waste to the licenced Leeuwpoort Waste Disposal Site.

Any hazardous waste (e.g. soil contaminated with fuel/oil, paint tins, etc.) will have to be disposed at a Hazardous Waste Disposal Facility by a company dealing with such waste.

During the operational phase, domestic waste will be collected by the eMalahleni Local Municipality and disposed of at the licensed Leeuwpoort Waste Disposal Site.

It is recommended that recycling forms part of waste management at the shopping centre in order to reduce the amount of waste to be disposed of at the Leeuwpoort Waste Disposal Site. Items such as paper, cans and bottles

should be separated at source and either reused or collected by a recycling company.

It is not anticipated that any hazardous waste will be produced at the shopping centre, since no industrial activities will be allowed. However, should any hazardous waste be produced (e.g. grease/oil cans at a tyre fitment centre), the individual tenants will be responsible for the legal disposal thereof.

3.2.5 Storm water control measures

According to Van As (2016), the following storm water control measures will be implemented on site:

- The buildings will be placed in such a way that rainwater does not pond on site.
- Paving slopes will be created.
- No 'blackwater'/polluted water will be created at the shopping centre or released into the veld.
- All off-flow will be on the surface inside the premises, from where it will be released onto the adjacent streets and into the existing storm water drainage systems.
- The storm water system will be designed to a 1:5 year returning period storm.

The storm water system will be connected to that of the eMalahleni Local Municipality.

3.2.6 Access road

Figure 3.2 provides an indication of the proposed layout plan and access roads.

Main Street extends through approximately the centre of the site and the R544 provincial road is present on the western corner (Figure 3.2). An unknown street extends along the western boundary (Figure 3.2).

As indicated in the layout plan (Figure 3.2), the site will be accessed via a new traffic circle on the R544 (just south of the railway line) and a new traffic circle on Main Street. A delivery access will also be provided from the unknown street located on the western boundary.

3.2.7 Fire fighting

All fire-fighting controls will be in accordance with the National Building Regulations, the SANS Code of Practice (related to Community Protection against Fire) and with "Red Book" standards.

According to Van As (2016), water tanks will be placed on site to prevent water shortages during disruption of water supply. These tanks will have adequate capacity to also cater for fire water volumes. A pump system will ensure adequate water pressure. Fire hose reels and hydrants will be placed inside and outside of buildings and will conform to SANS standards. Separate pumps will be available for fire protection purposes.

3.3 Need and desirability of the activity

The owner is an existing developer in eMalahleni and identified the opportunity to develop a shopping centre on a portion of his property (Korsman & Associates, 2017).

The said site is located near the eMalahleni Central Business District (CBD) and adjacent to one of only two railway crossings connecting the north western parts of eMalahleni (e.g. Klarinet, Pine Ridge, Leeuwpoort Smallholdings) with the CBD. A high volume of commuters thus utilize this route on a daily basis travelling between work and home. The said site is easily accessed from the R544 provincial road as well as Main Street (which extends through the centre of the property).

A shopping centre near the railway crossing and the eMalahleni Central Business District will thus provide commuters and residents with a close-to-home, convenient place for shopping and social gatherings.

According to Korsman & Associates (2017), the proposed change in land use will have no negative impact on the surrounding properties or land uses as it is situated in close proximity to an established residential area, businesses and various other land use activities.

In addition, the said property is situated within the urban boundary of eMalahleni and is currently considered impractical for farming purposes. By rezoning the property for business purposes, the potential and usefulness of the property will be enhanced.

It is also believed that the development of the property will contribute positively to the area in terms of a visual and aesthetical upgrade.

The townplanning memorandum (Appendix 3) should be consulted for more information regarding the need and desirability of the proposed shopping centre.

3.4 Applicable legislation, policies and/or guidelines

Table 3.1 provides an indication of legislation, policies and/or guidelines applicable to the said project. The list below merely serves to highlight key legislation and obligations and is thus not definitive or exhaustive.

Table 3.1: Applicable legislation, policies and/or guidelines

Title of legislation, policy or guideline:	Administering authority:	Aim of legislation, policy or guideline
The Constitution of the Republic of South Africa, 1996 (Act 108 of 1996)	Department of Justice and Constitutional Development	To establish a Constitution with a Bill of Rights for the RSA. It sets out of a number of fundamental environmental rights (Section 24).
Development Facilitation Act, 1995 (Act 67 of 1995) and amendments	Department of Rural Development and Land Reform	To provide for planning and development.
Spatial Planning and Land Use Management Act, 16 of 2013	Department of Rural Development and Land Reform	To provide a framework for spatial planning and land use management
Environment Conservation Act, 1989 (Act 73 of 1989) and amendments	Department of Agriculture, Rural Development, Land and Environmental Affairs	To control environmental conservation.

Title of legislation, policy or guideline:	Administering authority:	Aim of legislation, policy or guideline
National Environmental Management Act, 1998 (Act 107 0f 1998) and amendments	Department of Agriculture, Rural Development, Land and Environmental Affairs	To provide for the integrated management of the environment.
National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004) and amendments	Department of Agriculture, Rural Development, Land and Environmental Affairs	To reform the law regulating air quality in order to protect the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development while promoting justifiable economic and social development; to provide for national norms and standards regulating air quality monitoring, management and control by all spheres of government; for specific air quality measures; and for matters incidental thereto.
National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004) and amendments	Department of Environmental Affairs	To provide for the management and conservation of South Africa's biodiversity within the framework of the National Environmental Management Act, 1998; the protection of species and ecosystems that warrant national protection; the sustainable use of indigenous biological resources; the fair and equitable sharing of benefits arising from bioprospecting involving indigenous biological resources; the establishment and functions of a South African Biodiversity Institute; and for matters connected therewith.
National Environmental Management: Waste Act, 2008 (Act 59 of 2008) and amendments	Department of Environmental Affairs and Department of Agriculture, Rural Development, Land and Environmental Affairs	To reform the law regulating waste management in order to protect health and the environment by providing for the prevention of pollution and ecological degradation and for securing ecologically sustainable development.
National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003) and amendments	Department of Environmental Affairs	To provide for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes; for the establishment of a national register of all national, provincial and local protected areas; for the management of those areas in accordance with national norms and standards; for intergovernmental co-operation and public consultation in matters concerning protected areas; and for matters in connection therewith.
Environmental Impact Assessment Regulations, 2014 (Government Gazette No. 33306 of 18 June 2010) and amendments	Department of Agriculture, Rural Development, Land and Environmental Affairs	Regulations pertaining to environmental impact assessments.
National Water Act, 1998 (Act 36 of 1998) and amendments	Department of Water and Sanitation	To control water management aspects.
National Veld and Forest Fire Act, 1998 (Act 101 of 1998) and amendments	Department of Agriculture, Forestry and Fisheries	To prevent and combat veld, forest and mountain fires throughout South Africa.
National Heritage Resources Act, 1999 (Act 25 of 1999) and amendments	South African Heritage Resources Agency	This legislation aims to promote good management of the national estate, and to enable and encourage communities to nurture and conserve their legacy so that it may be bequeathed to future generations.
Alien and Invasive Species Regulations, 1 August 2014	Department of Environmental Affairs	Regulations regarding alien and invasive species.
List of Protected Tree Species under the National Forests Act, 1998 (Act No. 84 of 1998)	Department of Agriculture, Forestry and Fisheries	Provides a list of protected tree species.
Promotion of Access to Information Act, 2000 (Act 2 of 2000) and amendments	Department of Justice and Constitutional Development	To give effect to the constitutional right of access to any information held by the State and any information that is held by another person and that is required for the exercise or

Title of legislation, policy or guideline:	Administering authority:	Aim of legislation, policy or guideline
		protection of any rights; and to provide for matters connected therewith.
Promotion of Administrative Justice Act, 2000 (Act 3 of 2000) and amendments	Department of Justice and Constitutional Development	The Act aims to make the administration (e.g. Government and Parastatals) effective and accountable to people for its actions.
Conservation of the Agricultural Resources Act, 1983 (Act 43 of 1989) and amendments	Department of Agriculture, Forestry and Fisheries	To provide control over the utilization of the natural resources of the Republic in order to promote the conservation of soil, the water sources and the vegetation and the combating of weeds and invader plants; and for matters connected therewith.
Occupational Health and Safety Act, 1993 (Act 85 of 1993) and amendments	Department of Labour	To provide for the health and safety of persons at work and for the health and safety of persons in connection with the activities of persons at work and to establish an advisory council for occupational health and safety.
Health Act, 1977 (Act 63 of 1977) and amendments	Department of Health	To promote public health.
Mpumalanga Nature Conservation Act, 1998 (Act 10 of 1998) and amendments	Mpumalanga Tourism and Parks Agency	To control nature conservation.
National Building Regulations and Standards Act, 1977 (Act 103 of 1977) and amendments	Department of Trade and Industry	To provide for the promotion of uniformity in the law relating to the erection of buildings in the areas of jurisdiction of local authorities; for the prescribing of building standards; and for matters connected therewith.
South African Bureau of Standards' SANS 10400 X and 10400 XA	Department of Trade and Industry	The application of the National Building Regulations in terms of environmental sustainability and energy usage in buildings.
Various by-laws of the eMalahleni Local Municipality, e.g.: ○ Inflammable liquids; ○ Refuse and solid waste; ○ Waste; ○ Noise; ○ Rates.	eMalahleni Local Municipality	To regulate land use with the eMalahleni Local Municipal area.
Integrated Development Plan for the eMalahleni Local Municipality	eMalahleni Local Municipality	Broad spatial framework guidelines for the eMalahleni Local Municipality.
Spatial Development Framework for the eMalahleni Local Municipality	eMalahleni Local Municipality	Spatially based policy guidelines whereby changes, needs and growth in the region can be managed to benefit the whole community.
Nkangala District Municipality Climate Change Response Strategy	Nkangala District Municipality	A strategy in response to climate change.
Nkangala District Municipality Integrated Waste Management Strategy	Nkangala District Municipality	A strategy dealing with waste.
Integrated Environmental Management Guideline Series (Guideline 5 – 10 October 2012) – Companion to the Environmental Impact Assessment Regulations, 2010	Department of Agriculture, Rural Development, Land and Environmental Affairs	To provide clarity on the processes to be followed when applying for an environmental authorisation in terms of the EIA Regulations and gives a comprehensive interpretation of the listed activities.
National Protected Areas Expansion Strategy (NPAES, 2008)	Department of Environmental Affairs	To achieve cost-effective expansion of the protected area network that enhances ecological sustainability and resilience to climate change
National Biodiversity Framework (NBF, 2008)	Department of Environmental Affairs	To co-ordinate and align the efforts of the organisations and individuals involved in conserving and managing South Africa's biodiversity

4. DESCRIPTION OF ALTERNATIVES

This section provides an indication of the alternatives investigated in terms of the site, layout plan and service provision.

4.1 Alternative sites

4.1.1 Proposed site

The owner is an existing developer in eMalahleni and identified the opportunity to develop a shopping centre on a portion of his property (Korsman & Associates, 2017).

The said site is located near the eMalahleni Central Business District (CBD) and adjacent to one of only two railway crossings connecting the north western parts of eMalahleni (e.g. Klarinet, Pine Ridge, Leeuwpoort Smallholdings) with the CBD. A high volume of commuters thus utilize this route on a daily basis travelling between work and home. The said site is easily accessed from the R544 provincial road as well as Main Street (which extends through the centre of the property).

It was decided to develop the said site due to the following:

- The property already belongs to the applicant.
- The property is large enough for the activity.
- The eMalahleni Central Business District is located near the site.
- The site is easily accessible from the R544 provincial road and Main Street.
- No other shopping centres are located in close proximity of the site.
- The proposed shopping centre would provide commuters and residents in this area with a close-to-home, convenient place for shopping and social gatherings.
- The topography of the site is suitable for the activity. It is relatively flat, which will minimize the need for earthworks.
- Currently, the site is not utilized for agricultural or residential purposes.
- Development of the site would improve the aesthetics of the area.
- The site is not located near a river or stream and is not subject to the 1:100 year floodline.
- No wetlands are present on site.
- Easy access to services (water, sewage, electricity, roads, stormwater, waste removal) as the site is located within the urban edge.
- Other businesses are located adjacent to the site. The proposed shopping centre will be compatible with the adjacent land uses.

4.1.2 Alternative site

No alternative sites were investigated since the said property belongs to the applicant. In addition, the said property is considered impractical for farming purposes. By rezoning the property for business purposes, the potential and usefulness of the property will be enhanced.

4.1.3 No project option

More information with regards to the implication of the 'no project option' is provided in Section 4.5.

4.2 Alternative subdivision plan

4.2.1 Subdivision Plan No. 1

Initially, the intention was to subdivide the property (i.e. Portion 55) into five (5) portions (Table 4.1 and Figure 4.1), which could be rezoned for development as the need arises.

Table 4.1: Initial subdivision of property (taken from Korsman & Associates, 2016)

Portion	Size (ha)	Use
Portion 270	5.8968 ha	proposed shopping centre
Portion 271	6.1582 ha	proposed shopping centre
Portion 268	0.1443 ha	right of way servitude to provide access to Portion 269 (i.e. the existing church)
Portion 269	0.3878 ha	to accommodate existing church
Remainder	29.6049 ha	not part of this application. Will not be developed.
Total:	**42.192 ha**	

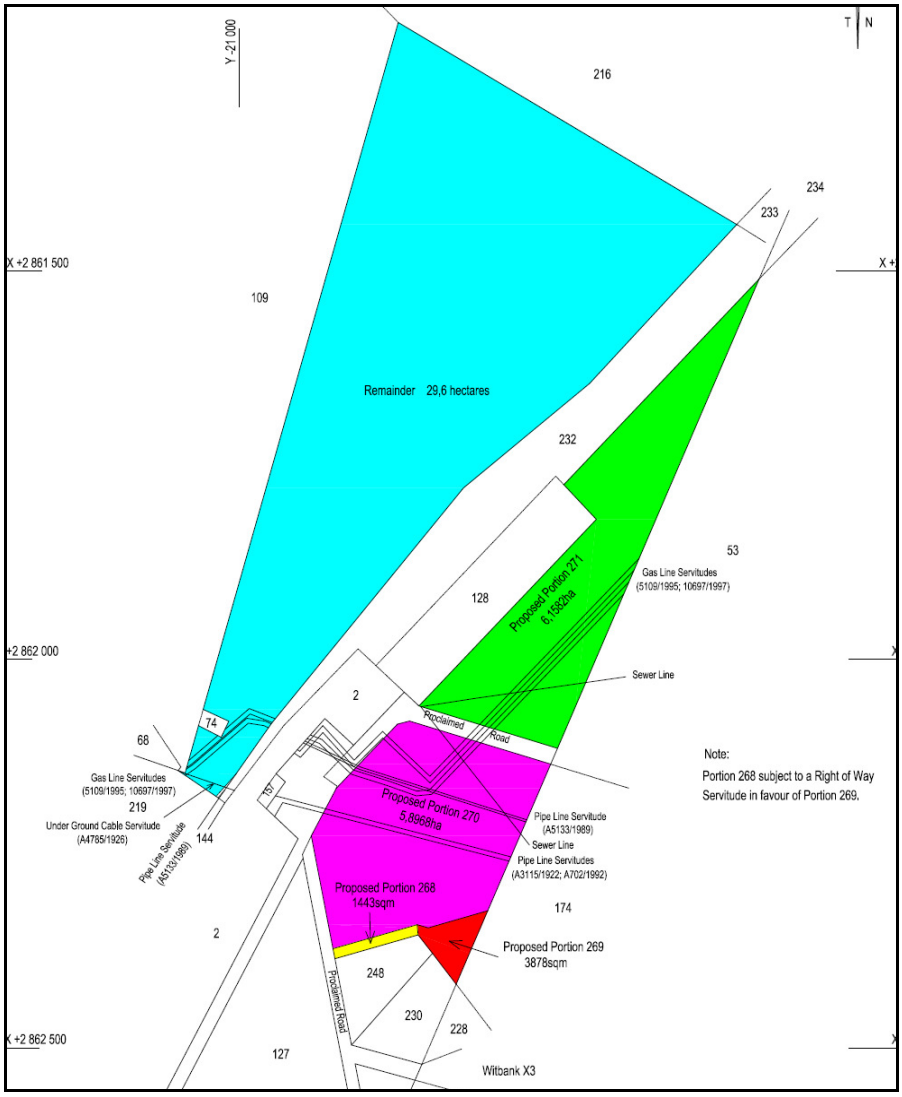

Figure 4.1: Subdivision Plan No. 1 (taken from Korsman & Associates, 2016)

4.2.2 Subdivision Plan No. 2 (preferred option)

It was subsequently decided to decrease the scale of the development, which entailed decreasing the size of Portion 271 (Table 4.2 and Figure 3.1) and increasing the area that would not be developed (Table 4.2 and Figure 3.1). Table 4.2 and Figure 3.1 provides an indication of the preferred subdivision sizes.

Table 4.2: Preferred subdivision of property (taken from Korsman & Associates, 2017)

Portion	Size (ha)	Use
Portion 270	5.8968 ha	proposed shopping centre
Portion 271	3.6815 ha	proposed shopping centre
Portion 268	0.1443 ha	right of way servitude to provide access to Portion 269 (i.e. the existing church)
Portion 269	0.3878 ha	to accommodate existing church
Remainder	32.0816 ha	not part of this application. Will not be developed.
Total:	**42.192 ha**	

As can be seen from Tables 4.1 and 4.2, the portion sizes were amended as follows:

- Portion 271 was reduced by 2.4767 ha;
- The Remainder (portion not to be developed) was increased by 2.4767 ha;
- Portions 270, 268 and 269 remained unchanged.

Table 4.2 and Figure 3.1 provide the preferred subdivision of the said property. An application for subdivision was submitted to the eMalahleni Local Municipality (letter dated: 8 April 2016; Appendix 3).

4.2.3 No project option

More information with regards to the implication of the 'no project option' is provided in Section 4.5.

4.3 Alternative layout plans

4.3.1 Concept layout plan (Figure 4.2)

Figure 4.2 provides an indication of the concept layout plan with regards to the proposed development drafted by Townscape Planning Solutions (2016).

An industrial type development (with a smaller business component) was proposed by the townplanners as indicated in Figure 4.2 and the table below.

Land Use	Number	Area
Business 2	1	1.6066 ha
Industrial 2	16	10.8981 ha
Road	-	3.2569 ha
Total	17	15.7616 ha

This concept layout was in accordance with the eMalahleni Local Municipality Spatial Development Framework (SDF; 2013/2014) which earmarked the site for industrial development.

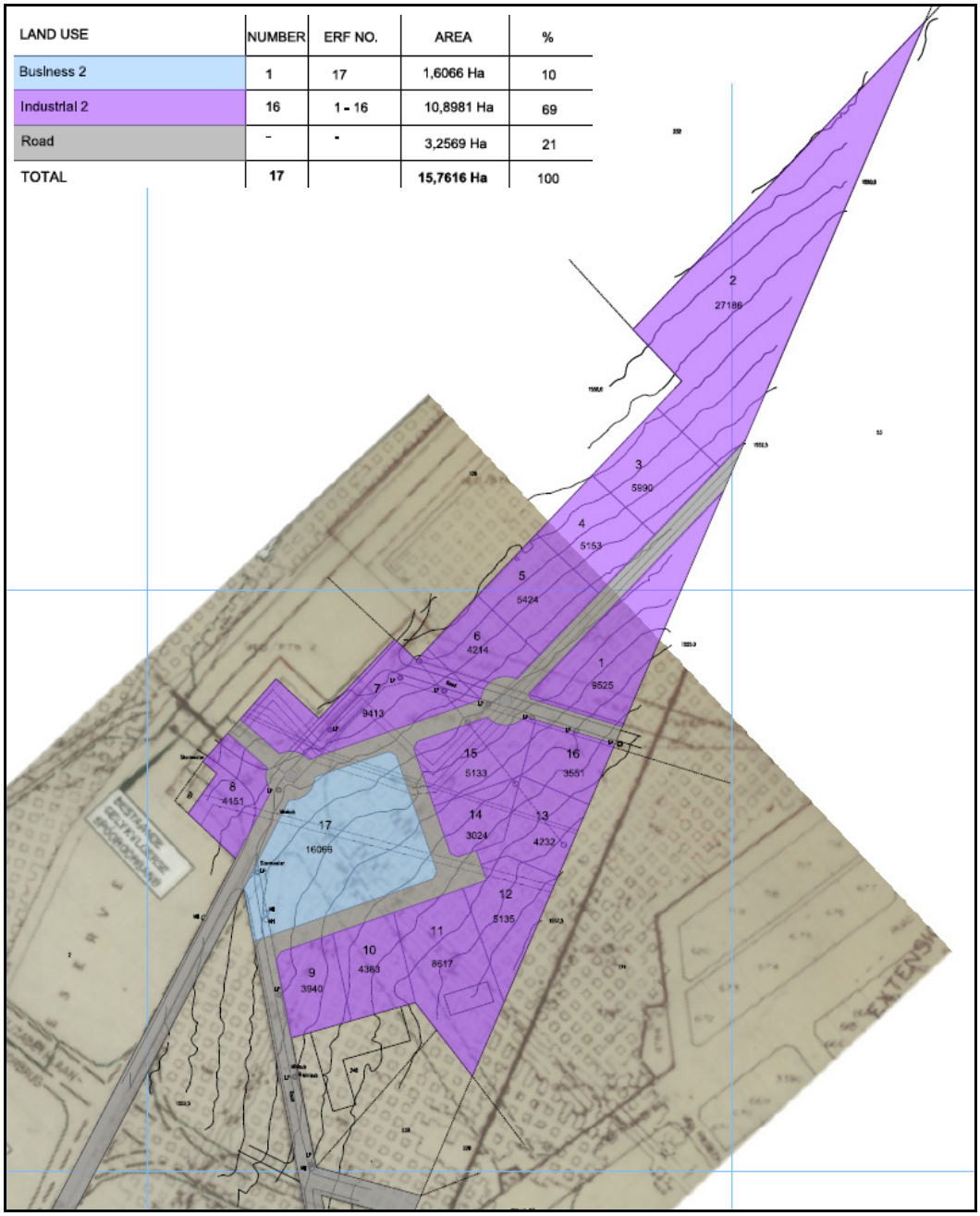

Figure 4.2: Concept layout plan (taken from Townscape Planning Solutions, 2016)

As indicated in Figure 4.2, the entire site south of the railway line was to be developed for Industrial 2 purposes (16 stands) and one stand for business purposes (Business 2; Figure 4.2). Access to the site was planned from Main Street and the R544/Main Street crossing via new traffic circles (Figure 4.2).

This layout plan was also based on Subdivision Plan No. 1, which was discarded as indicated in Section 4.2.2.

A feasibility/marketing study was subsequently conducted by the applicant which indicated that industrial stands are still available in the Ferrobank and Klarinet Industrial areas and that there was not a need for more industrial stands. In addition, the applicant could also not get investors for an industrial

type development. The townplanners subsequently recommended a commercial type development.

The concept layout plan for an industrial type development was thus discarded and a new layout plan was drafted by Korsman & Associates.

4.3.2 Proposed layout plan (Figure 4.3)

The ***proposed layout plan*** is indicated in Figure 4.3. A description of the components of this layout plan is presented in Section 3.3 of this report.

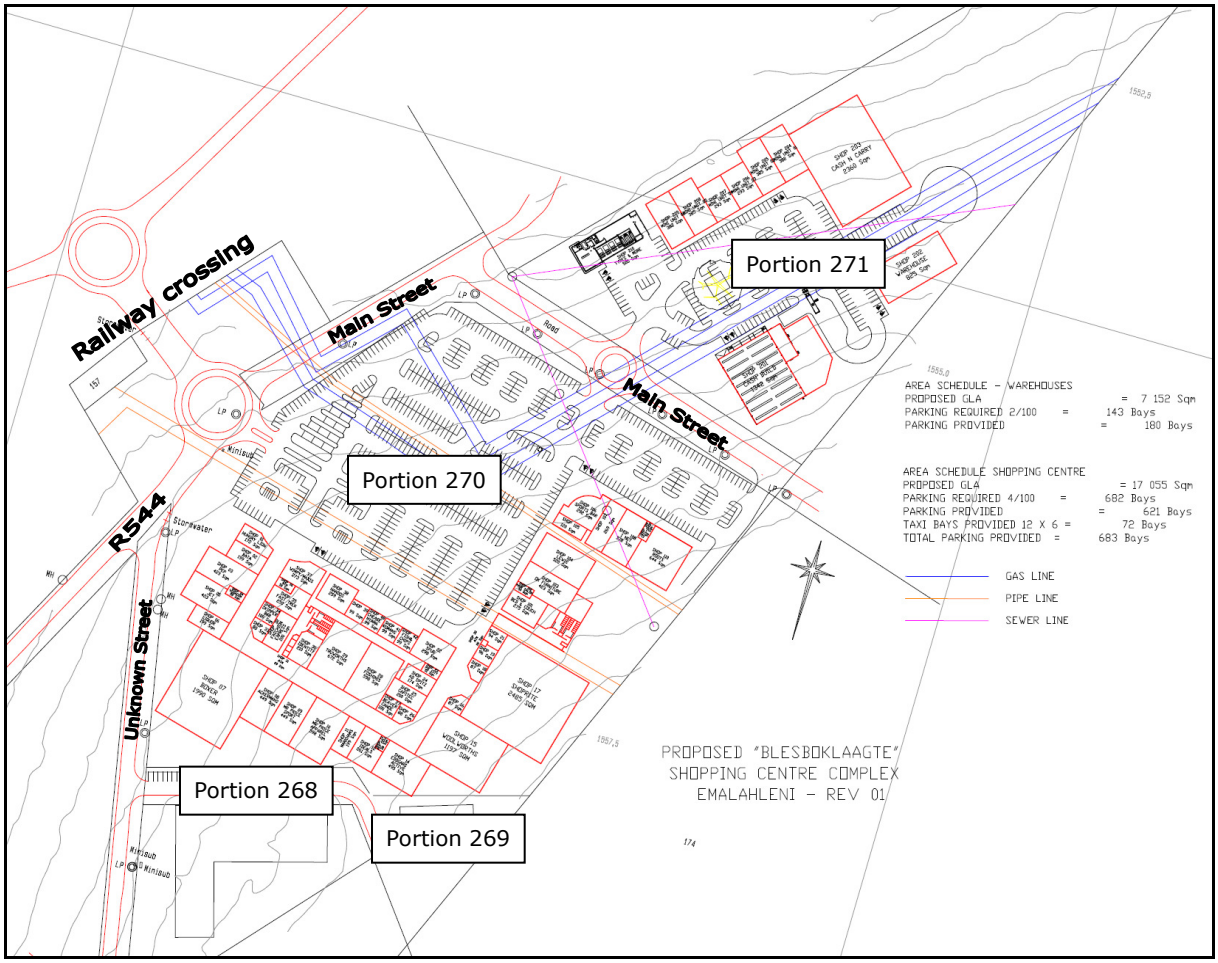

Figure 4.3: Proposed layout plan (taken from Korsman & Associates, 2017)

As indicated in Figure 4.3, the said site is divided into two sections due to the presence of Main Street in approximately the centre of the site. Proposed Portion 270 is located to the south of Main Street and proposed Portion 271 to the north (Figure 4.3).

The main shopping centre complex will be located on Portion 270 (Figure 4.3), which will comprise of a variety of shops and restaurants e.g. Woolworths, Wimpy, Shoprite, etc.

The intention is to allow for warehouse type developments (e.g. Cashbuild, tyre fitment centres, etc.) on Portion 271 (Figure 4.3).
The layout plan was designed in such a way that no buildings will be constructed across the Sasol gas pipeline (blue line, Figure 3.2) or the water

pipelines (orange lines, Figure 3.2). Two buildings are however, planned over the sewer line on Portion 270 (pink line; Figure 3.2).

According to Korsman & Associates (2017), a shopping centre would be better suited in this area since it can be viewed as an extension of the services and activities provided through the nearby CBD.

Portion 269 will be transferred to the existing church (Apostolic Mission Revival) on site. This portion will thus not be rezoned from Agricultural to Business 3.

Portion 268 will be consolidated with the adjacent Portion 248 (which also belongs to the applicant), after which a servitude will be registered across the property to provide access to the church (Korsman & Associates, 2016).

This is the preferred layout and is based on Subdivision Plan No. 2.

4.3.3 No project option

More information with regards to the implication of the 'no project option' is provided in Section 4.5.

4.4 Alternative services

Water:
Currently, the surrounding properties obtain water from the eMalahleni Local Municipality.

According to Van As (2016), the proposed shopping centre will connect to existing bulk water pipelines (orange lines, Figure 3.2) that currently cross the site. Potable water will thus be supplied by the ELM.

Further details regarding the water demand of the proposed development as well as the internal water reticulation network are provided in Section 3.2.1.

No boreholes are located on site and the said site is undermined. Groundwater (use of boreholes) as an alternative water source was thus not considered.

Electricity
Currently, the surrounding properties obtain electricity from the eMalahleni Local Municipality (ELM).

According to Pienaar (2016), two options are available with regards to connecting the proposed shopping centre to the ELM grid, namely:

- Option 1 - Install a new additional 11 kV panel inside the Smuts Street Substation and lay a new cable to the proposed development;
- Option 2 - Cut into the existing cable and construct a substation at the proposed site.

Option 2 is regarded as not feasible due to cost implications (Pienaar, 2016). Option 1 can be implemented if the application to upgrade the current capacity is approved by the eMalahleni Local Municipality.

Further details regarding electricity are provided in Section 3.2.2.

In view of the above-mentioned, no other potential sources of electricity (generators, solar, wind energy, etc.) were considered by the developer.

Sewage
Currently, the surrounding properties are serviced by the eMalahleni Local Municipality in terms of sewage disposal.

During the operational phase, the shopping centre will connect to the existing sewer network. A single connection point is envisaged. According to Van As (2016), no alternatives to the bulk main are necessary.

Further details regarding sewage treatment capacity required as well as the internal sewer reticulation network are provided in Section 3.2.3.

The installation of septic tanks/conservancy tanks and/or a sewage package plant were not deemed feasible for the development and therefore not considered.

Waste
During the operational phase, domestic waste will be collected by the eMalahleni Local Municipality and disposed of at the licensed Leeuwpoort Waste Disposal Site.

No other waste disposal options are available.

It is recommended that recycling forms part of waste management at the shopping centre in order to reduce the amount of waste to be disposed of at the Leeuwpoort Waste Disposal Site. Items such as paper, cans and bottles should be separated at source and either reused or collected by a recycling company.

Storm water control measures
The storm water system will be connected to that of the eMalahleni Local Municipality.

Storm water will be channelled on the surface inside the premises, from where it will be released onto the adjacent streets and into the existing storm water drainage systems. Further details regarding storm water control measures are provided in Section 3.2.5.

No surface water sources are located in close proximity of the property and therefore the stormwater cannot be discharged to a natural water course.

No other alternatives with regards to storm water management were investigated.

Access road
Figure 3.2 provides an indication of the proposed layout plan and access roads.

Main Street extends through approximately the centre of the site and the R544 provincial road is present on the western corner (Figure 3.2). An unknown street extends along the western boundary (Figure 3.2).

As indicated in the layout plan (Figure 4.3), the primary shopping centre (Portion 270) will be accessed via a new traffic circle on the R544 (just south

of the railway line). The R544/Main Street intersection is currently a bent T-intersection that is stop controlled. It is proposed to upgrade this intersection to a full double lane roundabout which would also provide access to the shopping centre.

Another access is proposed for both portions of the development (Portion 270 and Portion 271; Figure 4.3) from a new full four-legged roundabout intersection in Main Street (Figure 5.23).

A third access point (for deliveries) will be provided off the unknown street located on the western boundary of the site (Figure 5.23). No upgrades will be made to the unknown street.

Since the said site is located adjacent to existing roads, no other alternatives with regards to access were investigated.

4.5 The 'No Project Option'

The 'no project option' is the alternative of not going ahead with the proposed development. The 'no project option' is only considered if it is found that the development will have significant negative impacts on the environment, which cannot be mitigated or managed.

If the 'no project option' in terms of the proposed project was exercised, it would mean that:

- The applicant would have to investigate other land uses for the site;
- The site would remain vacant;
- The applicant would have to discard the proposed development plans;
- The applicant would have to investigate alternative sites for the proposed shopping centre;
- The applicant would have to sell the property;
- The people residing in the north western parts of eMalahleni would not have easy access to a shopping centre;
- The proposed project would also create job opportunities (construction phase: ±250 employees; operational phase: ±150 employees), which would be lost if the project does not go ahead.

5. BIOPHYSICAL DESCRIPTION OF THE SITE

5.1 Location of the site

The proposed shopping centre will be located on a portion of Portion 55 of the farm Blesboklaagte 296 JS, eMalahleni. The site is located in close proximity of the eMalahleni Central Business District and the railway station. Figure 5.1 indicates the location of the site.

The co-ordinates for the centre of the site are:

Site	Latitude (S):			Longitude (E):		
55/296	25°	51‘	59.22“S	29 °	12‘	44.80“E

The Surveyor-General 21 digit site reference number for the proposed project is:

T	O	J	S	0	0	0	0	0	0	0	0	0	2	9	6	0	0	5	5

The said property falls under the jurisdiction of the eMalahleni Local Municipality (MP312) and the Nkangala District Municipality.

5.2 Climate

The South African Weather Bureau has partitioned the country into 15 climatic regions. This division is based on:

- geographic considerations, more specifically the prominent mountain ranges (great escarpment) which constitute the main climatic divides, besides also other features such as rivers and political boundaries;
- the interior plateau - use has been made of the change from BW to BS and from BS to C climates according to the Köppen classification.

The proposed site falls within Climatic Region H – The Highveld.

The climate is typical of the Highveld, with warm summers and cold winters with occasional severe frosts. Rainfall typically occurs as high-intensity short duration thunderstorms. The average frost period is 111 days per annum. The mean annual temperature is 22.5°C, with recorded extremes of -11°C and 34°C.

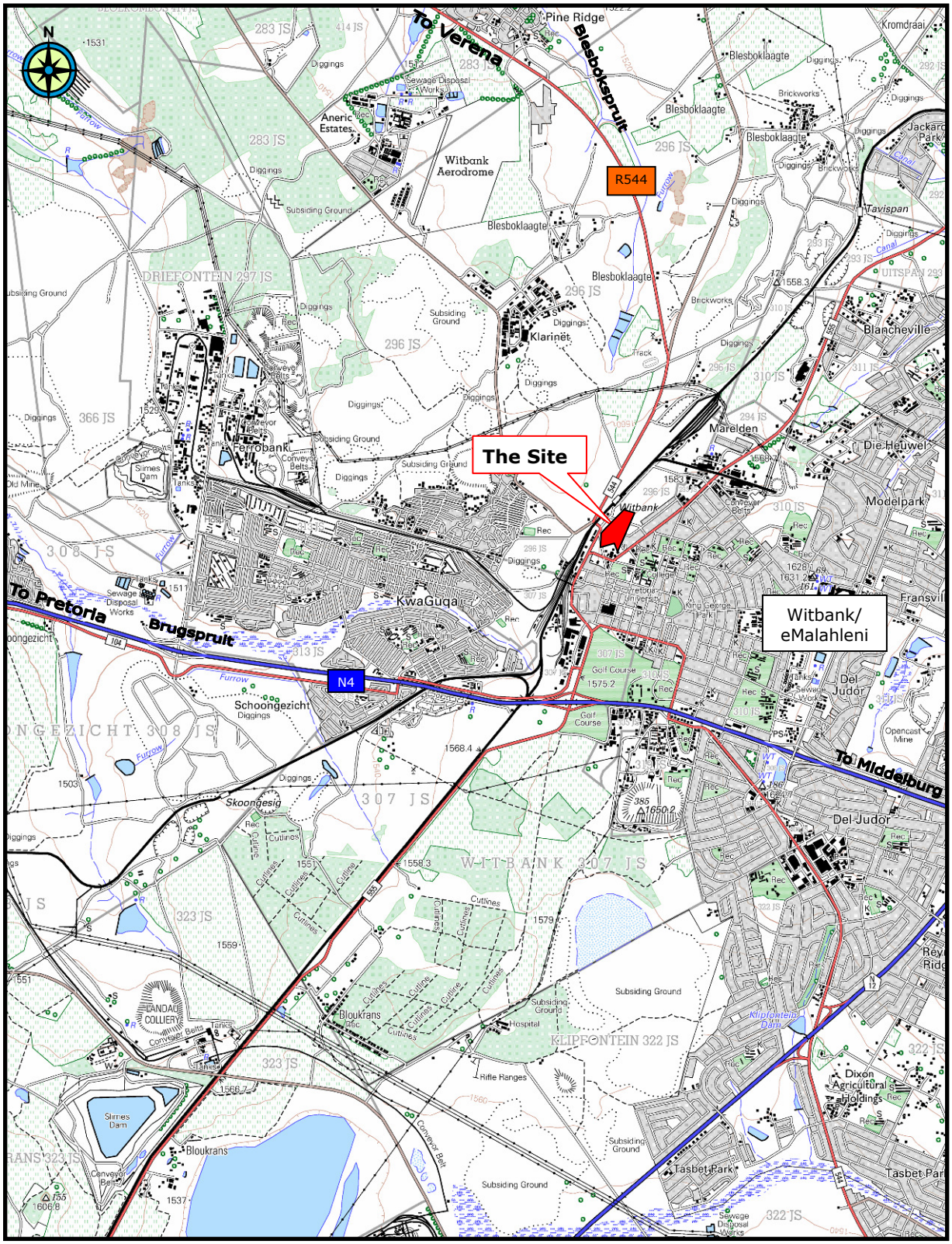

Figure 5.1: Location of site *(taken from 1: 50 000 2529 CC-not to scale)*

5.2.1 Temperature

An indication of the lowest and highest monthly mean ambient temperatures are presented in Figure 5.2a.

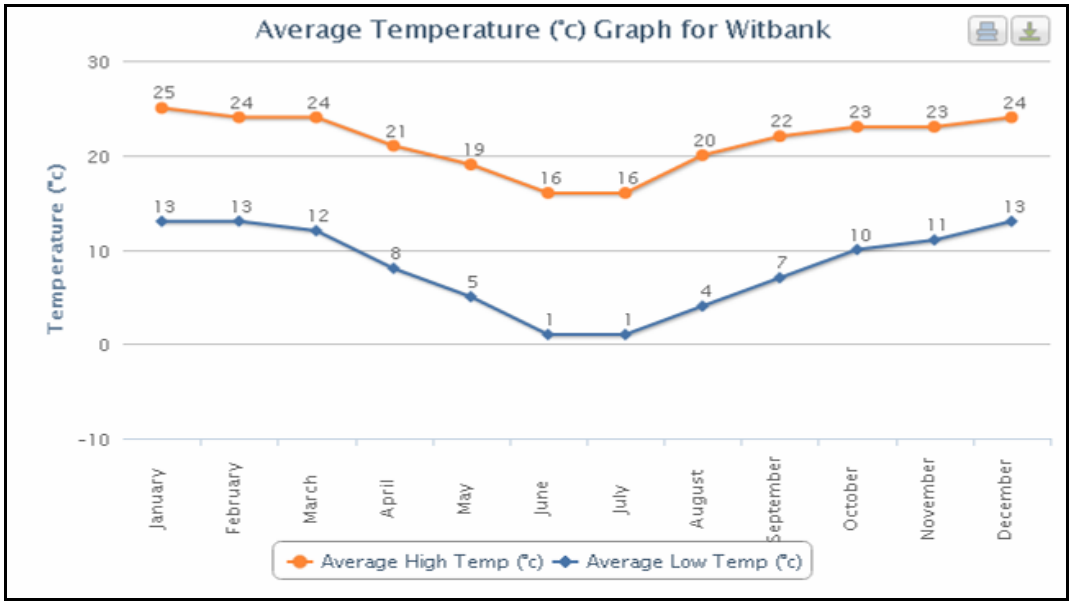

Figure 5.2a: Average temperature graph for eMalahleni (Witbank) (taken from www.worldweatheronline.com)

The highest temperatures are experienced during January and are usually recorded between 12:00 and 16:00. The mean temperature begins to rise slowly from a minimum between 05:00 – 06:00 to a mean maximum at 14:00. It then drops sharply after 16:00 –17:00.

5.2.2 Rainfall

The average rainfall and evaporation for eMalahleni are provided in Figure 5.2b. The highest rainfall months are November-January with the least rainfall during the winter months May-August.

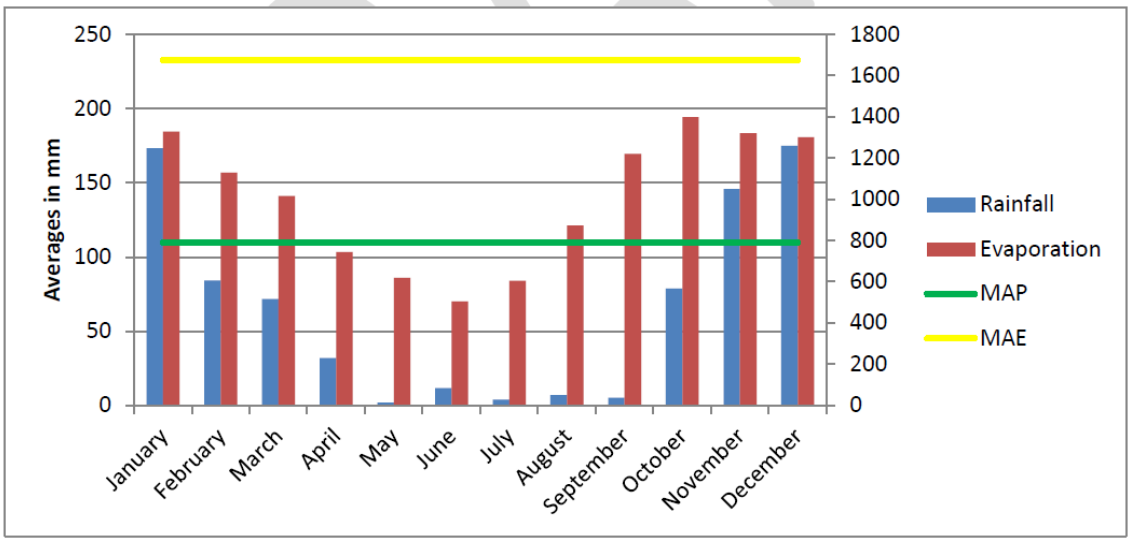

Figure 5.2b: Average rainfall and evaporation for eMalahleni (taken from Gouws, 2015)

Table 5.1 provides an indication of the Average Monthly Rainfall and Mean Monthly Evaporation measured over a period of 45 years at the Witbank Weather Station. The average annual precipitation is 702.7 mm.

Table 5.1: Average Monthly Rainfall and Mean Monthly Evaporation for eMalahleni (taken from Gouws, 2015)

Month	Average Monthly Rainfall (mm)	Mean Monthly Evaporation
January	131.5	184.5
February	91.8	156.9
March	73.8	141.4
April	39.3	103.3
May	13.4	85.9
June	7.0	70.1
July	2.9	83.9
August	7.9	121.1
September	20.7	169.5
October	78.3	194.1
November	123.8	183.5
December	116.6	180.7
Annual	702.7	1693.5

5.2.3 Wind

The wind rose for eMalahleni (Figure 5.2c) indicates that the area is characterized by easterly and northerly winds. The winds are mostly light and fall in the categories 1.80 – 3.34 m/s and 3.34 – 5.40 m/s (uMoya-NILU (Pty) Ltd., 2010).

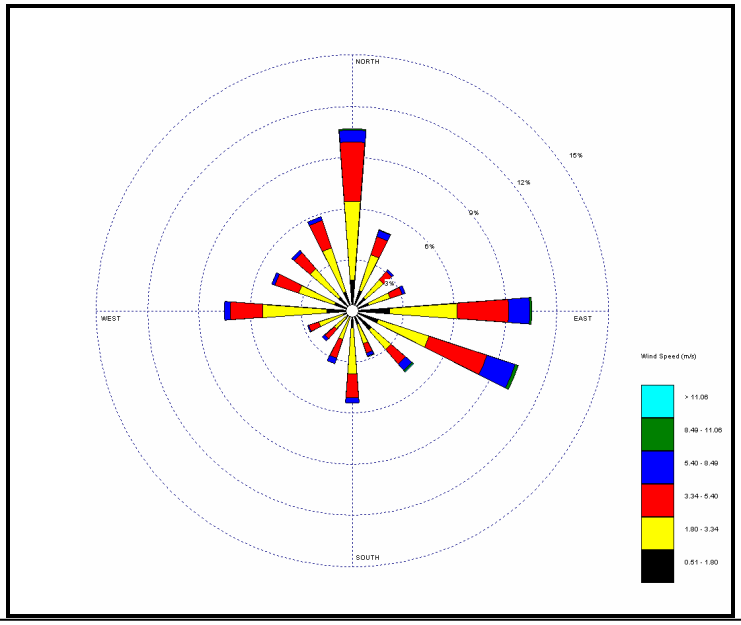

Figure 5.2c: Wind rose for Witbank (2004-2007)
(taken from uMoya-NILU Consulting (Pty) Ltd., 2010)

5.2.4 Climate change

According to the Mpumalanga Biodiversity Sector Plan Handbook (Lotter *et. al.*, 2014), there has already been notable shifts in climate in terms of increased average temperatures in Mpumalanga. Heat waves are becoming more frequent while cold days, nights and frost are becoming less frequent.

In addition, spring events such as flowering, bird migration and egg-laying are happening earlier in the year. Altitudinal range shifts for species such as the black mamba, red toad, black-bellied starling, yellow weaver, etc. have already been recorded.

Assuming moderate to high increases in greenhouse gas concentrations (e.g. carbon dioxide), regional modelling scenarios indicate that the north-eastern interior of South Africa will experience higher minimum, average and maximum temperatures over the next few decades (Lotter *et. al.*, 2014). Higher temperatures will be accompanied by increased incidents of drought, rainfall increases along the escarpment and a shift in rainfall pattern.

The Nkangala District Municipality drafted a Climate Change Mitigation and Response Strategy (CCMRS) in 2013. Table 5.2 provides a summary of the expected key potential climate changes for the district.

Table 5.2: Summary of key potential climatic changes for the Nkangala District Municipality (2036 - 2065 relative to 1961 - 2000) (taken from the CCMRS, 2013)

Variable	Projected change
Temperature	Average temperatures (minimum and maximum) are expected to increase by 1ºC to 3ºC.
Rainfall	Average rainfall is projected to decrease by 10 - 30%.
Extreme Events	Increases in the frequency and intensity of extreme events. This includes more severe storms and flooding, and more severe droughts. Temperature-related extremes such as increases in the number and intensity of very hot days (maximum temperatures > 35ºC) and extended very hot spells to increase.
Water resources	As temperatures and evaporation increase and rainfall decreases, already scarce water resources will become further depleted. Existing water quality problems will be exacerbated.

It is expected that the predicted climate change will mainly impact on the mining, energy, agriculture and tourism sectors (CCMRS, 2013).

5.3 Land use

5.3.1 Land ownership

Portion 55 of the farm Blesboklaagte 296 JS is registered to Jumbo van der Merwe Trust (i.e. the applicant). A copy of the Deeds Office Property report is provided in Appendix 1.

5.3.2 Zoning of the site

The property is currently zoned "Agricultural" in terms of the eMalahleni Land Use Management Scheme, 2010.

5.3.3 Size of the site

The entire property is 42.1920 ha in extent, of which approximately 10 ha will be utilized for the proposed development.

5.3.4 Servitudes

The following servitudes are present on site as indicated in Figure 5.3:

- Gas Line Servitude (Sasol Gas pipeline; 5109/1995; 10697/1997) - located in the centre of the site extending in a north-south direction;
- Pipeline Servitude (Municipal water pipeline; A5133/1989) - located in the southern portion of the site extending in an east-west direction;
- Pipeline Servitude (Municipal water pipeline; A3115/1922;A702/1992) - located in the southern portion of the site extending in an east-west direction;
- Sewer line - located in the central portion of the site;
- Proclaimed Road (Main Street) - extending through the centre of the site;
- Proclaimed Road - unknown street extending along the western boundary of the site.

Figure 5.3: Servitudes present on site

A right-of-way servitude (Portion 268; 1 443m^2) will be registered across the property to provide access to the church located on Portion 269 (Figure 5.3)

An underground cable servitude and pipeline servitude are also registered against the property (Figure 5.3). However, these servitudes are located west of the railway line and will not be affected by the proposed development.

The Transnet railway line located north west of the site will also not be affected by the proposed development.

5.3.5 Land use and existing infrastructure on site

Figure 5.4 provides an aerial view of the site indicating the existing on-site land uses and infrastructure.

The said site is vacant, except for a church (Apostolic Mission Revival) located in the southern corner (Photo 5.1) and an informal parking and business (hawker) area (Photo 5.2).

A cleared area in the southern portion of the site is used for church gatherings.

A sales office (consisting of a container) is present on the western boundary of the site at the three-way stop street near the railway crossing (Photo 5.3). This sales office is with regards to selling houses in Klarinet.

Photo 5.1: The church (Apostolic Mission Revival) located in the southern corner of the site.

Photo 5.2: The informal parking and business (hawker) area.

Photo 5.3: A view of the Klarinet sales office

Photo 5.4: One of the markers indicating the Sasol Gas Pipeline

Figure 5.4: Aerial view of the site and surrounds

Main Street extends through approximately the centre of the site and along the northern boundary (Figure 5.4). An unknown street is present on the western boundary.

Various informal gravel roads criss-cross the central and northern portions of the site (Figure 5.4). These gravel roads are used by learners practising for their Code 10 vehicles licenses, by people dumping waste on the property and as a shortcut between Main Street and the railway crossing.

Two water pipelines extend across the southern portion of the site (blue line; Figure 5.4) and a sewer line is present in the central and northern portions (brown line; Figure 5.4). Currently, the sewer line is blocked resulting in sewage overflowing from the manholes and ponding in the northern portion of the site.

A Sasol Gas Pipeline is located in the northern and central portions of the site. The presence of the gas pipeline is marked with cement pillars (Photo 5.4).

The said site was undermined in the 1930's and the now defunct mine is under care and maintenance of South32 (previously BHP Billiton). A shaft to the underground workings used to be present on site but was demolished and closed for security reasons.

No other infrastructure is known to be present on site.

5.3.6 Surrounding land uses

Figures 5.4 and 5.5 provide an indication of the surrounding land uses.

Various businesses and warehouses are located on the southern boundary of the site (Photo 5.6 and Figure 5.4). The eMalahleni Local Municipality (ELM) License Department is located on the south eastern boundary of the site (Figure 5.4).

Photo 5.5: Code 10 driving school located adjacent to the site

Photo 5.6: A view of some of the businesses located on the southern boundary of the site

An informal driving school is present north of the ELM License Department on the eastern boundary of the site (Photo 5.5 and Figure 5.4).

The Railway Station and associated infrastructure (railway line, railway crossing and Transnet houses) are located on the north western boundary of the site (Figure 5.4 and Photo 5.7).

Photo 5.7: A view of the Transnet Railway Station and offices

The R544 provincial road extends along the railway line (Figure 5.4) and connects Klarinet, Pine Ridge, Leeuwpoort Agricultural Holdings and farms to eMalahleni. Various informal businesses (hawkers) utilize the road reserve near the rail crossing.

The land north and west of the railway line forms part of Portion 55 of Blesboklaagte 296 JS (Figure 3.1) and is currently vacant. The property located north east of the site is also vacant. The vacant land is utilized by learner drivers and driving schools to practice for Code 10 driving tests (Photo 5.5).

The said site and surrounding properties are all undermined.

A formal residential area is located towards the east of the site (Figure 5.4). Earthen storm water trenches extend from the residential area towards the site.

In summary, surrounding land uses include the following (Figure 5.5):

- ELM License Department,
- Formal residential area;
- Informal driving school;
- Vacant land;
- Businesses (retail shops and warehouses buildings);
- Informal businesses (hawkers);
- Roads;
- Undermined areas;
- Railway Station and associated infrastructure;
- Municipal services (e.g. sewer lines, Telkom lines, power lines, etc.)

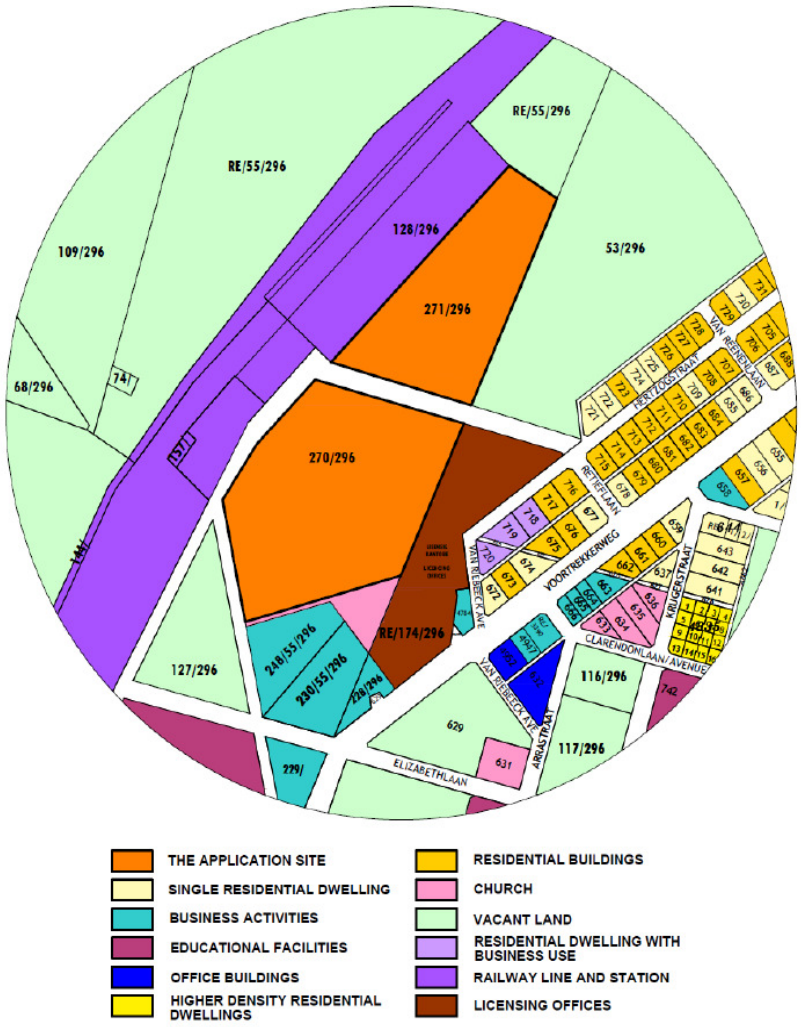

Figure 5.5: Land uses in the surrounding area (taken from Korsman & Associates, 2017)

5.4 Geology

A geotechnical study was undertaken by Geoset cc (hereafter referred to as Van der Merwe, 2016) to determine the suitability of the site for development purposes. A copy of the report is provided in Appendix 5.

According to the Van der Merwe (2016) and the 1:250 000 Geological Series (2528 Pretoria map; Figure 5.6), the said site is underlain by shale and shaly sandstone, grit, sandstone and conglomerate with coal of the Ecca Formation, Karoo Supergroup (Figure 5.6). Van der Merwe (2016) indicated that it weathers to sandy material and is underlain by moderately weathered mudstone, sandstone or shale.

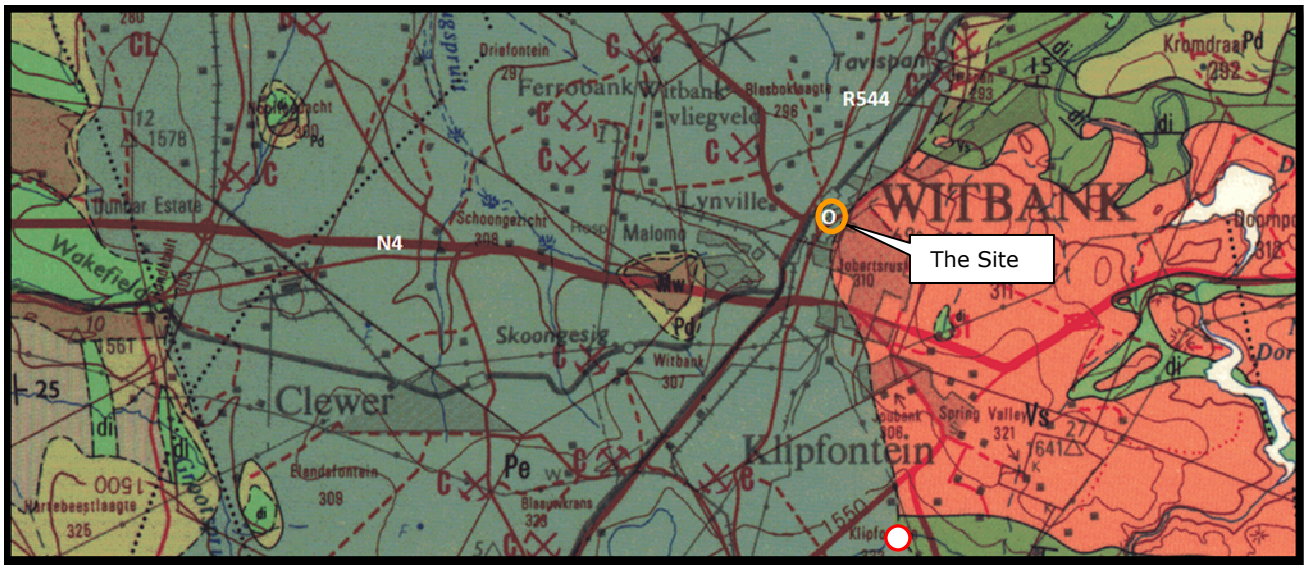

Figure 5.6: Geology of the site (taken from 2528 Pretoria 1:250 000 Geological Series)

It should be noted that the proposed development is situated on an undermined area (Witbank Colliery), which is a defunct mine under care and maintenance of South32 (previously BHP Billiton).

According to South32, the property was undermined in the early 1930's using drill and blast bord and pillar mining methods. The design was on a 40 feet centre (with 20 feet pillar width of ±6.1 m) and 20 feet bord width (with square pillars). The average depth from surface to floor seam is 28 m. Approximately 3 m of the 5 m thick seam was mined.

The area towards the north west of the site was also undermined (Middelburg Steam & Station Colliery; Figure 5.7) and is under care and maintenance of Anglo Operations (Pty) Ltd. The area is prone to sinkholes and subsiding ground. Anglo Operations (Pty) Ltd. has applied for a prospecting permit to determine if the remaining coal can be removed by means of open cast mining, thereby resolving the safety issues in terms of subsidence, illegal mining and burning coal.

According to Van As (2016), approximately 250 ha of eMalahleni (particularly the CBD, western sections and informal settlements) is undermined.

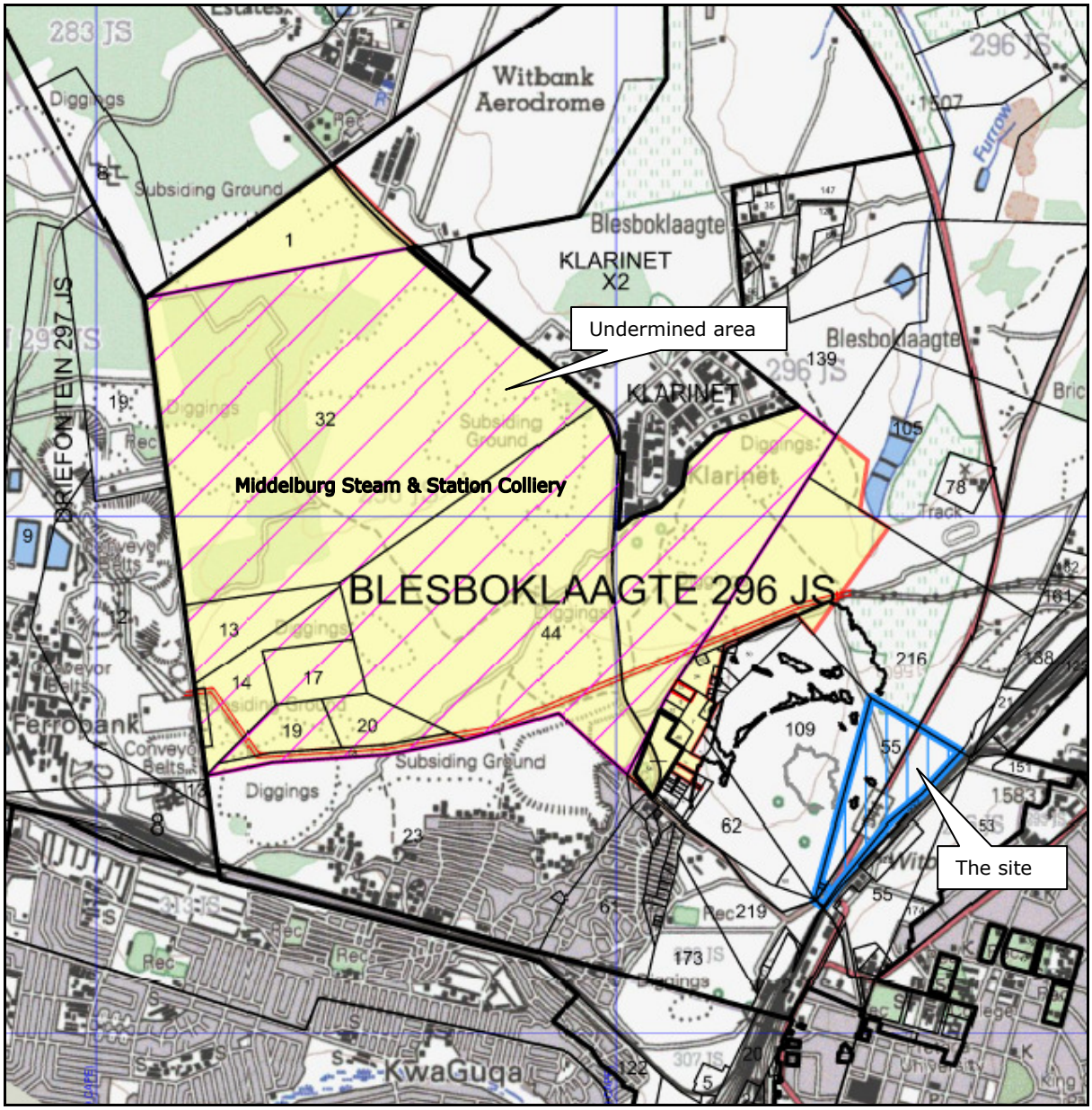

Figure 5.7: Undermined area (Middelburg Steam & Station Colliery) located north west of the site (taken from Anglo Operations (Pty) Ltd, 2017)

Since the said site is undermined, the property owner (Jumbo van der Merwe Trust) applied to the Department of Mineral Resources for permission to develop the said property. The application included an analysis of the risks involved in developing a shopping centre on an undermined area. A copy of the application and report compiled by SCIP Engineering Group (Pty) Ltd (hereafter referred to as Van As, 2015), are provided in Appendix 6. This report should be consulted with regards to methodology used.

Figure 5.8 indicates the approved layout plan overlaid on the undermined area.

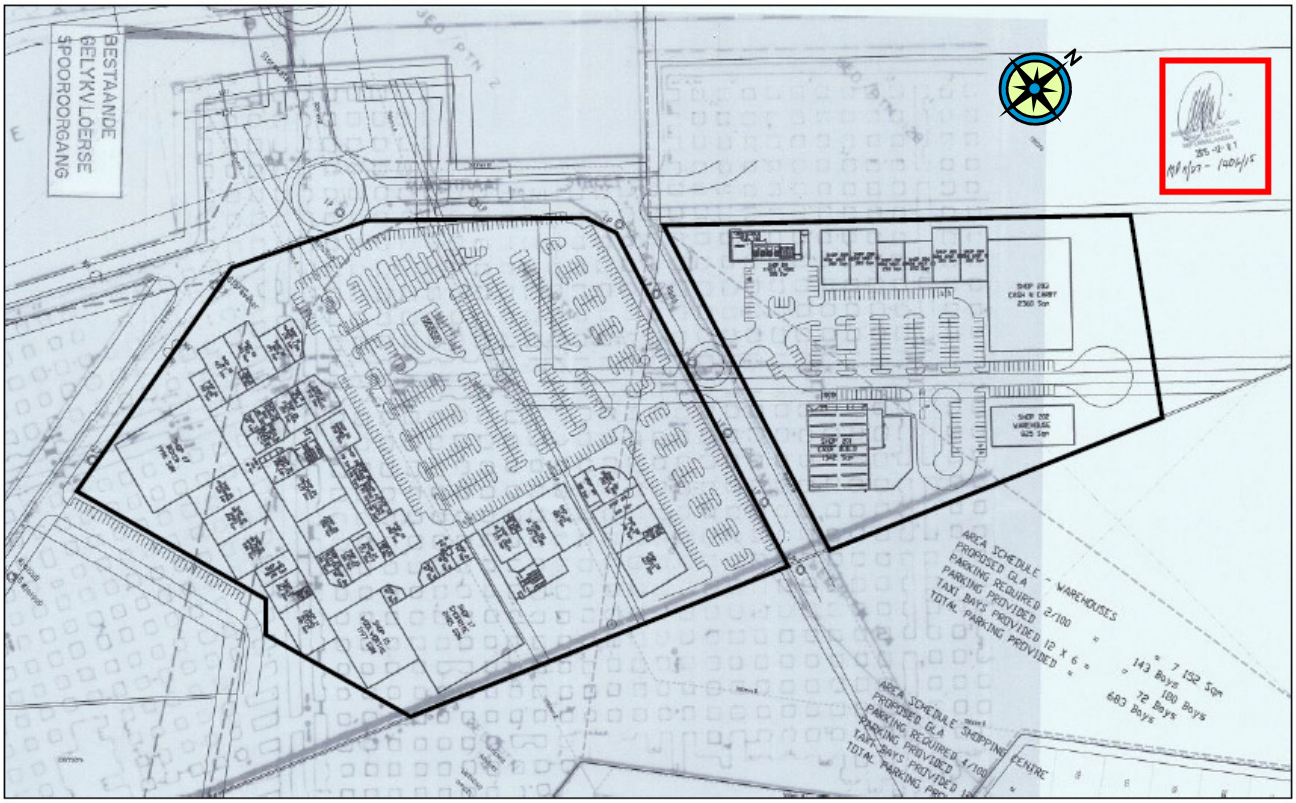

Figure 5.8: Layout plan indicating undermined area approved by the Department of Mineral Resources (taken from Korsman & Associates, 2017).

Van As (2015) indicated the following with regards to the undermining:

- The mine drawings in terms of the extent of the underground workings and location of bord and pillars are accurate.
- Water is present in only a few places and manifested as puddles.
- The underground workings are covered by a very dense, thick shale and a solid sandstone layer with a minimum width of 12 m.
- The characteristic compressive strength of the sandstone is 20MPa and compares quite favourably with concrete.
- The pillars appear to be geometrically consistent and showed no signs of serious erosion.
- No serious falls were visible. The mine floor was reasonably clean and the floor free of falls.
- There is no history of subsidence in the area. An unofficial shaft was filled up recently and mistakenly regarded as subsidence by the current owner of the underground workings.
- The possibility of subsidence is negligible due to the high resistance in shearing resistance.
- The bearing capacity of the ground was tested to be 400 kPa. However, a value of only 150 kPa will be applied for foundation design.

According to Van As (2015), the increase in weight due to the presence of buildings is <1% and therefore this risk is negligible. The single storey buildings will be designed in such a way as to minimize risk of injury to its occupants in the unlikely event of subsidence of the surface.

Van As (2015) recommended the proposed development with confidence based on certain specifications and mitigation measures that must be implemented as indicated in Section 8. It was also indicated that the paved surface and buildings will in fact improve the existing situation. The only risk pertains to an underground fire, which cannot be changed with the development of a shopping centre.

Permission was obtained from the Department of Mineral Resources and the proposed layout plan approved subject to certain conditions and restrictions (letter dated: 1 December 2015; Ref: MP 11/27 1406/15; Appendix 14) and included in Section 8.

5.5 Topography

The said site lies at approximately 1580 meters above mean sea level (mamsl). The site is fairly flat with a gentle slope in a westerly direction towards the railway line as graphically indicated in Figure 5.9.

According to the AGIS Comprehensive Atlas of the Department of Agriculture, Forestry and Fisheries, the terrain type is level plains with some relief as indicated in Figure 5.10.

Figure 5.9: Elevation profile of site (taken from Google Earth, 2017)

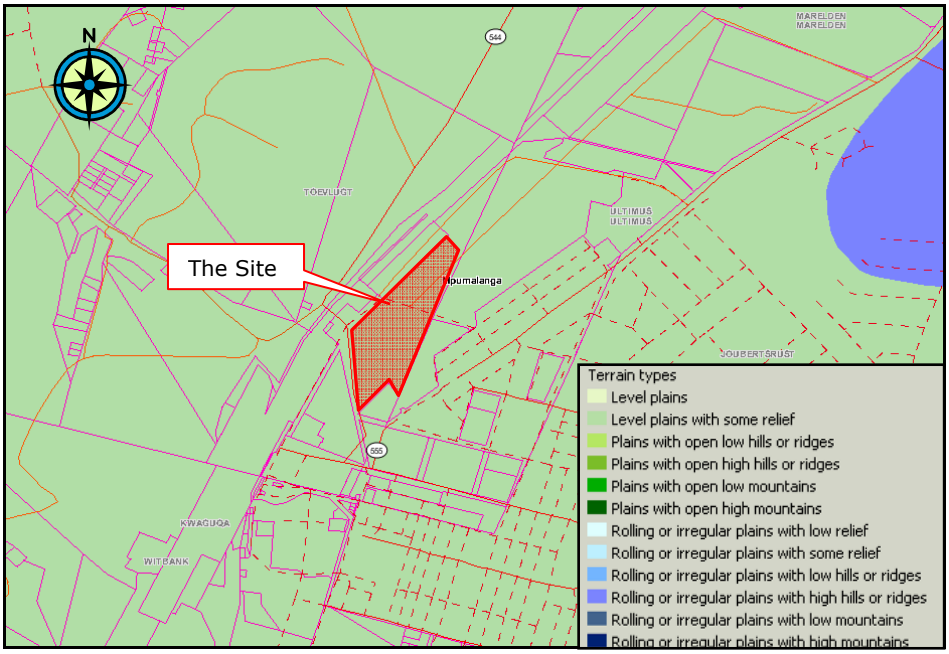

Figure 5.10: Terrain type of the proposed site (taken from Department of Agriculture, Forestry and Fisheries)

The topography of the immediate surroundings has been impacted by development (e.g. railway line, businesses, residential areas, roads, etc.).

The construction of a church, installation of pipelines (gas, water and sewer lines), construction of a road (Main Street), dumping of waste and building rubble, levelling and excavations have all impacted on the topography of the said site.

5.6 Soil

5.6.1 General

According to the AGIS Comprehensive Atlas of the Department of Agriculture, Forestry and Fisheries, the said site falls within the Bb13 land type (Figure 5.11), which is characterised by a plinthic catena where upland duplex and margalitic soils are rare. Red soils are not widespread.

According to Venter (2016), the first 50 cm comprises a yellow sandy soil, without any signs of prolonged wetness. No wetland soils were observed on site.

The construction of a church, installation of pipelines (gas, water and sewer lines), construction of a road (Main Street), dumping of waste and building rubble, leaking sewage and levelling and excavations have all impacted on the soil of the said site.

The soil of the immediate surrounding area has also been impacted by development (e.g. railway line, businesses, residential areas, roads, etc.).

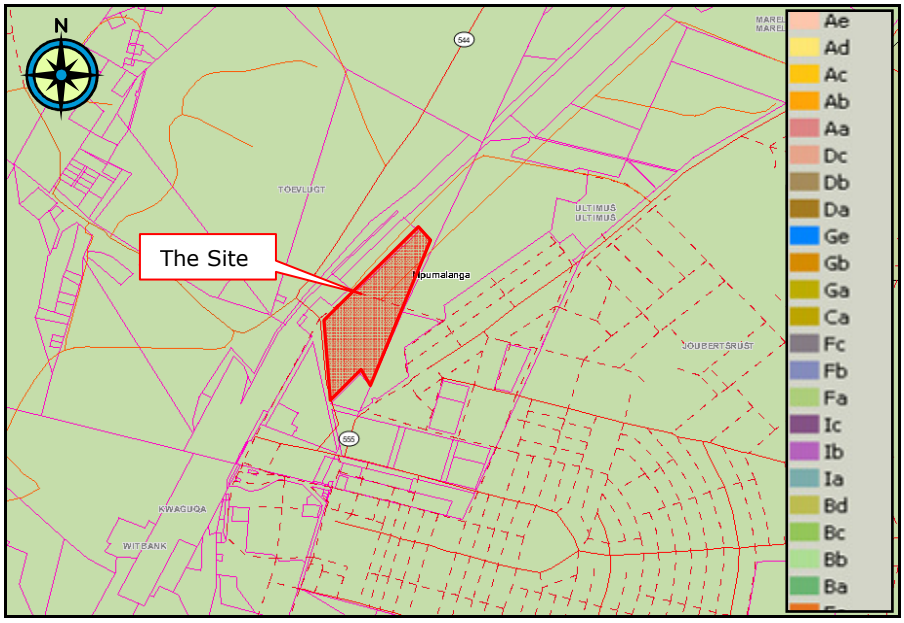

Figure 5.11: Land type of the proposed site (taken from Department of Agriculture, Forestry and Fisheries)

5.6.2 Agricultural potential/land capability

The site is currently vacant and has not been used for agricultural purposes for many years. The property is situated within the urban boundary of eMalahleni and is considered impractical for farming purposes.

In terms of land capability, the proposed site is indicated according to the Department of Agriculture, Fisheries and Forestry as moderate potential arable land (Figure 5.12). Looking at grazing capacity, Figure 5.13 indicates the site as transformed rangeland.

Figure 5.12: Land capability of the proposed site (taken from Department of Agriculture, Forestry and Fisheries)

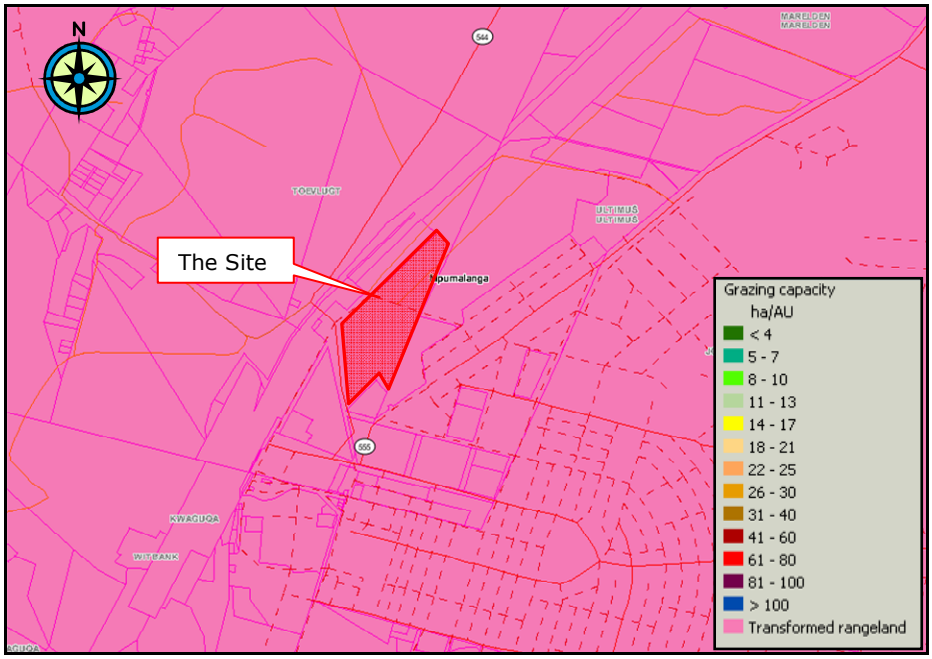

Figure 5.13: Grazing capacity of the proposed site (taken from Department of Agriculture, Forestry and Fisheries)

5.6.3 Geotechnical study

A geotechnical study was undertaken by Geoset cc. (hereafter referred to as Van der Merwe, 2016) to determine the suitability of the site for development purposes. Appendix 5 should be consulted for methodology used.

Soil properties

Six (6) test pits (W1 to W6) were excavated with a TLB to determine the soil properties. Figure 5.14 indicates the location of these test pits.

Van der Merwe (2016) encountered the following soil profile on site:

Depth	Description
0 - 0.3 up to 0.7 m	Slightly moist, dark brown, dense to loose, intact, clayey silty sand. Hillwash
0.4 - 1.2m	Slightly moist, orange brown mottled red speckled black, dense, intact, clayey sand with ferricrete nodules. Pebble marker.
1.2 - 2.3m	Slightly moist, orange mottled red, dense, intact, sandy gravel of hard pan ferricrete. Pedogenetic.

Geotechnical zones

Van der Merwe (2016) identified 3 geotechnical zones on site as indicated in Figure 5.14 and Table 5.3.

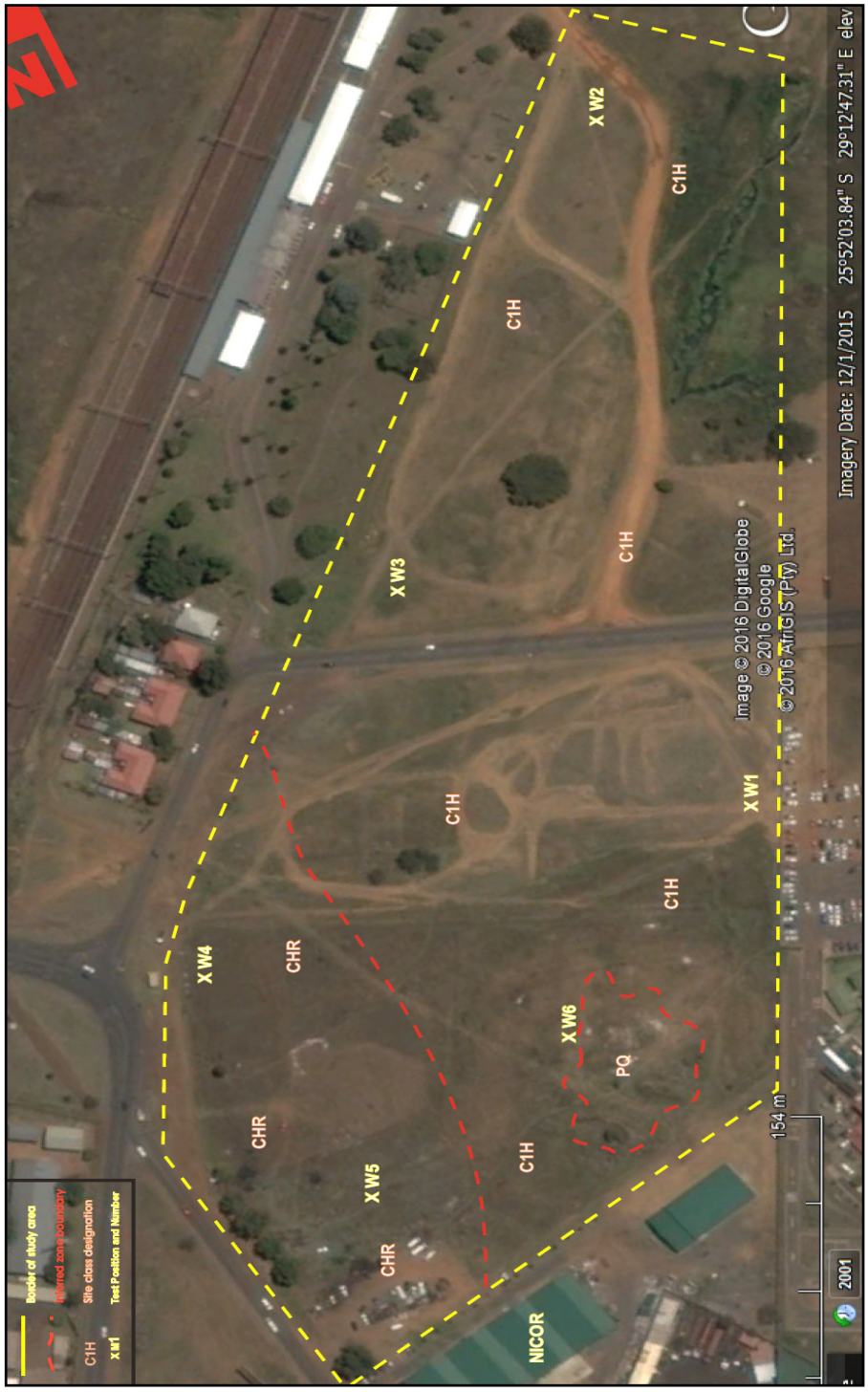

Figure 5.14: Geotechnical zones (taken from Van der Merwe, 2016)

Table 5.3: Geotechnical zones (Site Classes) identified by Van der Merwe 2016)

Site Class	Description
C1H/1A1C Modified Normal Development	Covers the majority of the proposed site (Figure 5.14). Comprises of a layer of hillwash (0.75 m thick) with slightly collapsible and compressible soil and low expansive properties. Expected range of <10mm total soil movement measured at surface. Underlain by a competent pebble marker. Foundations will require modified normal foundation techniques.

Site Class	Description
	Mitigation measures are indicated in Section 8 of this report.
CHR/1A1C Normal Development with Risk	Located in the south western portion of the site near the railway crossing (Figure 5.14). A pebble marker consisting of clayey sand and gravel. Low expansive and compressible or slightly collapsible soil of <750mm thick. Expected range of <7.5mm total soil movement measured at surface. Possibly contains hardpan ferricrete which will restrict excavations. Mitigation measures are indicated in Section 8 of this report.
PQ (Photo 5.8) Land not Ideally Suitable for Development	Located in the southern portion of the site near the existing church (Figure 5.14). Comprises a quarried area where spoil was dumped (Photo 5.8). Area would have to be rehabilitated before construction can take place. Mitigation measures are indicated in Section 8 of this report.

Photo 5.8: A view of Geotechnical Zone PQ, where excavations took place and spoil was dumped.

Van der Merwe (2016) concluded the following with regards to the geotechnical properties of the said site:

- The site is underlain by shale and shaly sandtone, grit, sandstone and conglomerate with coal of the Ecca Formation, Karoo Supergroup.'
- No problems regarding excavatability are expected for the majority of the site. Shallow rock shale, mudstone and quartzite may require blasting for service and foundation excavations exceeding 2 m.
- Although the exposed rock at depth should have adequate bearing capacities, the bedding planes within the quartzite, shale or mudstone must be inspected by a competent person during the placement of the foundations to ensure no failure occurs along these bedding planes.

In addition, Van der Merwe (2016) indicated the following:

- The site contains slightly problematic material due to the presence of slightly collapsible sandy soil. Special precautions with regards to services and structures will be required.
- Due to the moderate permeability of the material, special care must be taken against rising damp and adequate surface drainage must be provided.
- Retaining walls and slope stabilization measure are recommended on all constructed embankments exceeding 1.5m.
- Storm water diversion measures such as ponding pools are recommended to control peak flows during thunderstorms.
- All embankments must be adequately compacted and planted with grass to stop any excessive erosion and scouring of the landscape.

5.7 Natural vegetation

5.7.1 Regional vegetation and conservation status

According to 'The vegetation of South Africa, Lesotho and Swaziland', the study area falls within the Mesic Highveld Grassland Bioregion, specifically the **Eastern Highveld Grassland** (veld type Gm12; Figure 5.15) (Mucina & Rutherford, 2006). The vegetation type was previously referred to by Low and Rebelo (1998) as Moist Sandy Highveld Grassland (38) and Rocky Highveld Grassland (34) and by Acocks (1953) as Bankenveld (61).

This grassland extends from the eastern side of Johannesburg towards Belfast and then southwards to Bethal, Ermelo and Piet Retief.

This vegetation type is characterized by short dense grassland, dominated by the usual highveld grass composition (*Aristida, Digitaria, Eragrostis, Themeda, etc.)* and small, scattered rocky outcrops with wiry, sour grasses and some woody species (*Acacia caffra, Celtis africana, Parinari capensis*, etc.).

Approximately 44% of the Eastern Highveld Grassland has already been transformed by cultivation, urban sprawl, mining, plantations and dams. This vegetation type has been afforded the status of endangered with a conservation target of 24%.

The National List of Ecosystems that are Threatened and in need of protection (GN1002 of 2011), published under the National Environmental Management: Biodiversity Act (Act No. 10, 2004), lists this vegetation type as **Vulnerable**.

Vulnerable (VU) ecosystems - being ecosystems that have a high risk of undergoing significant degradation of ecological structure, function or composition as a result of human intervention, although they are not critically endangered ecosystems or endangered ecosystems.

The stated purpose of listing 'threatened ecosystems' is primarily to reduce the rate of ecosystem degradation and species extinction.

The study area is not situated within any of the South African centres of endemism recognised by Van Wyk and Smith (2001) nor does it fall within a nature reserve, conservancy or other protected area (Mpumalanga Biodiversity Sector Plan, 2013).

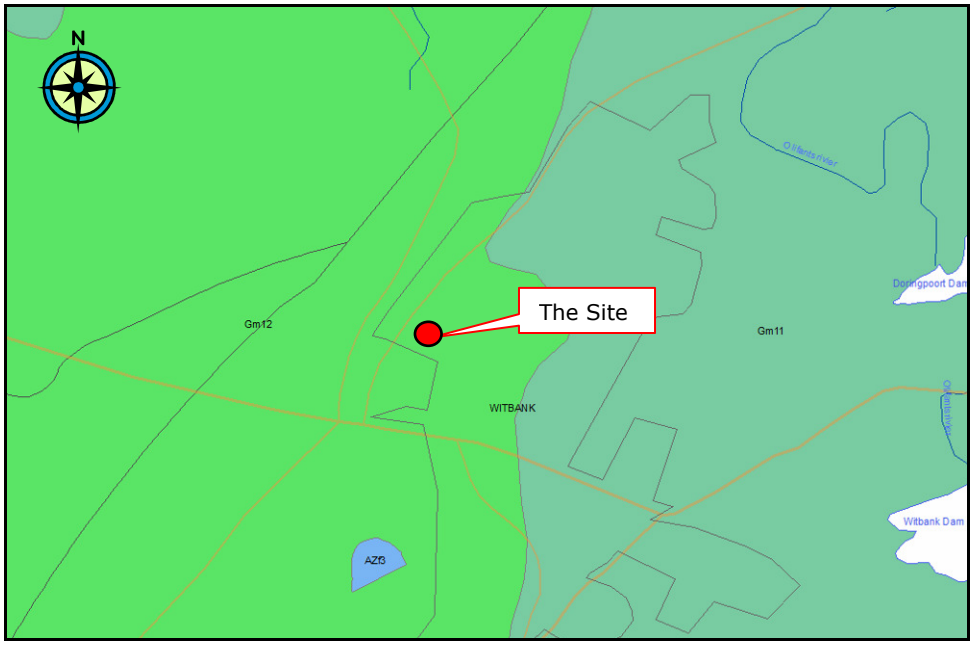

Figure 5.15: Vegetation type (taken from Mucina and Rutherford, 2006)

The majority of the site is indicated as **'No Natural Habitat Remaining'** (Figure 5.16a) in terms of the terrestrial biodiversity assessment of the Mpumalanga Biodiversity Conservation Plan (2006).

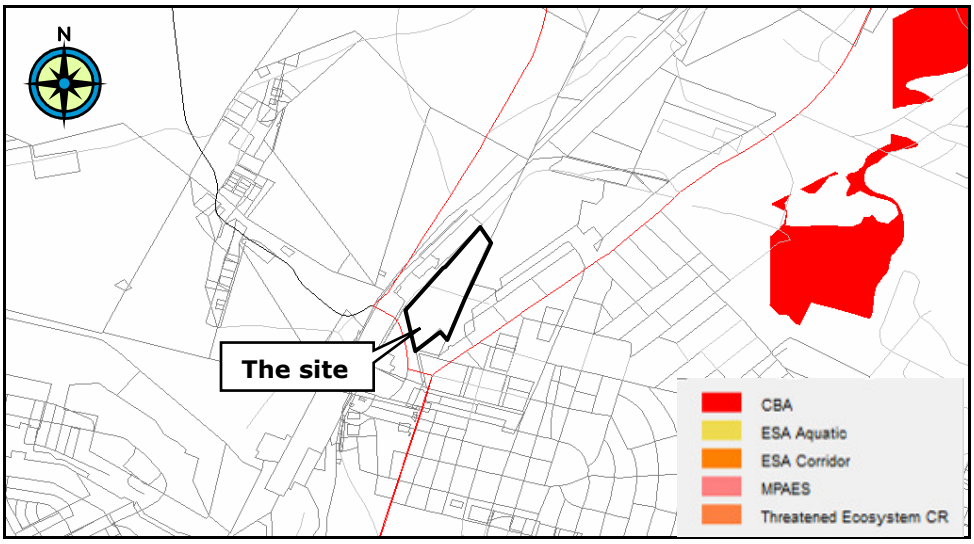

Figure 5.16a: Terrestrial biodiversity assessment - Mpumalanga Biodiversity Conservation Plan, 2006

Since the proposed site does not fall within a Critical Biodiversity Area (CBA) as identified in the Mpumalanga Conservation Plan (2006), no Listed activities in terms of Listing Notice 3 (GN R324) of the Environmental Impact Assessment Regulation (2014, as amended) are applicable.

Over the last few years (2007 – 2013), the Mpumalanga Tourism and Parks Agency reviewed and updated the Mpumalanga Biodiversity Conservation Plan (2006) in order to align the spatial data with the bioregional plan

requirements of the South African National Biodiversity Institute (SANBI) and surrounding provinces.

The Mpumalanga Biodiversity Sector Plan (MBSP, 2013) is a biodiversity planning tool that provides the most recent spatial biodiversity information to inform land-use and development planning (Lotter *et al*., 2014). The main mapping categories used in the MBSP (in descending order of importance in terms of meeting conservation targets), are:

- Protected Areas;
- Critical Biodiversity Areas (Irreplaceable and Optimal);
- Ecological Support Areas;
- Other Natural Areas;
- Modified (Heavily Modified and Moderately Modified-old lands).

According to the Mpumalanga Biodiversity Sector Plan (MBSP, 2013), most of the site and surrounding area are classified as **Heavily Modified** (Figure 5.13b). The northern portion of the site (Portion 271) is however, indicated as a **Critical Biodiversity Area (CBA): Optimal** (Figure 5.16b).

The reasons for indicating the site as a CBA: Optimal is unknown, since the site and surrounding area have been heavily modified as a result of human activities (e.g. clearing of site, driving across site, installation of gas, water and sewer pipelines, dumping of waste, etc.). According to Venter (2016), the classification of the site as a Critical Biodiversity Area in the Mpumalanga Biodiversity Sector Plan is therefore incorrect.

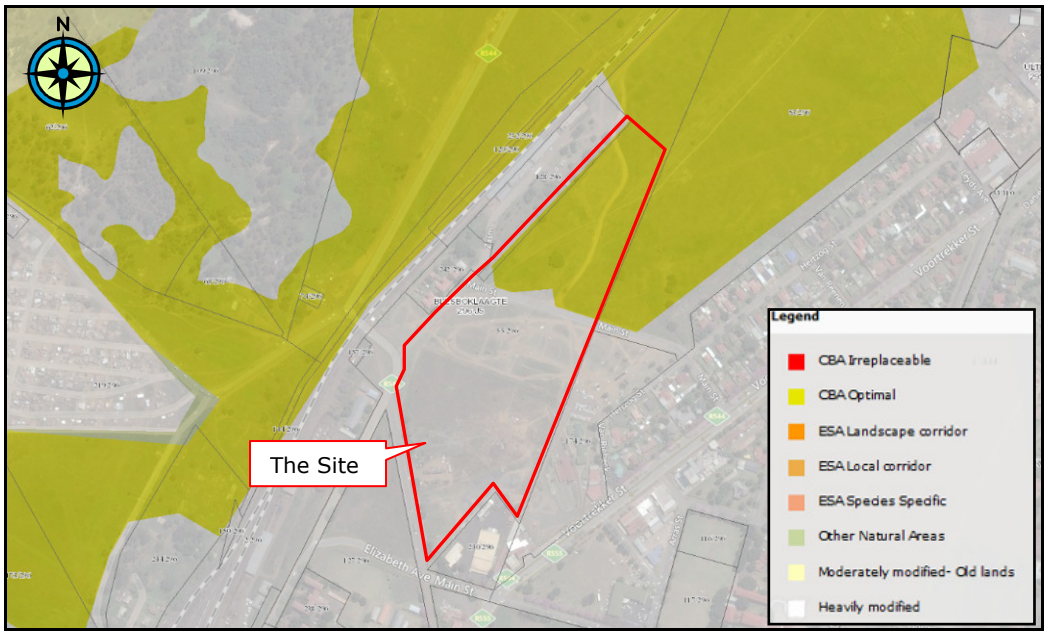

Figure 5.16b: Terrestrial biodiversity assessment - Mpumalanga Biodiversity Sector Plan, 2013

5.7.2 Vegetation found on site and surrounds

A vegetation and wetland specialist study was conducted for the site by Kyllinga Consulting (hereafter referred to as Venter, 2016). A copy of the report is provided in Appendix 7.

According to Venter (2016), the entire site falls within a single vegetation unit, namely **Disturbed Grassland** as indicated in Figure 5.17.

Impacts on the vegetation include the construction of a building (church), installation of infrastructure, removal of vegetation for an informal parking and hawker area, littering, excavations, etc. Some of the disturbances are already evident on the aerial photograph taken in 1943 (Appendix 7).

Figure 5.17: Vegetation units identified on site (taken from Venter, 2016)

In general, the vegetation on site is very weedy with several alien and invasive plant species (including Black Wattle - *Acacia mearnsii*) present. The site is mostly dominated by *Cynodon dactylon* (Couch Grass) and various *Eragrostis* species (Table 5.4). The species diversity is fairly low and only a few indigenous forb species were noted. A list of species noted by Venter (2016) is provided in Table 5.4.

In the southern and south eastern portions of the site, most of the vegetation was removed for the construction of the church, informal parking and hawker area, tracks and paths, etc (Bare area - Figure 5.17 and Photo 5.9). The remaining vegetation comprises weeds and alien invader species due to other impacts such as sand excavation and the dumping of building waste (Photo 5.10).

The north eastern portion of the site (Photo 5.11) is dominated by *Leonotis dysophylla* (Wild Dagga) with only a few other species noted (Table 5.4).

The north western portion of the site (located adjacent to the railway station and offices) is mowed on a regular basis and also very weedy (Photo 5.12)

From the aerial view (Figure 5.14), it is evident that sections of the northern portion of the site are wet. According to Venter, these artificially wet areas (Photo 5.13) were created as a result of leaking sewage and storm water runoff from the nearby residential area. No indications of wetness are evident on the aerial imagery from 1943. The species list for the artificially wet areas

and the grassland unit is very similar and indicate disturbed terrestrial conditions (Table 5.4).

A few species associated with wetland conditions (e.g. *Typha capensis, Arundo donax*) were observed adjacent to the residential area at the start of the storm water canals and adjacent to a leaking manhole (Venter, 2016). None were however, present in closer proximity to the site. No wetlands are therefore present on site.

Photo 5.9: A view of the southern portion of the site. Note the bare areas.

Photo 5.10: Another view of the southern portion of the site near the church indicating the weeds and invaders.

Photo 5.11: A view of the north eastern portion of the of site. Note the stand of *Leonotis* and bare soil

Photo 5.12: A view of the north western portion of the site indicating the mowed vegetation.

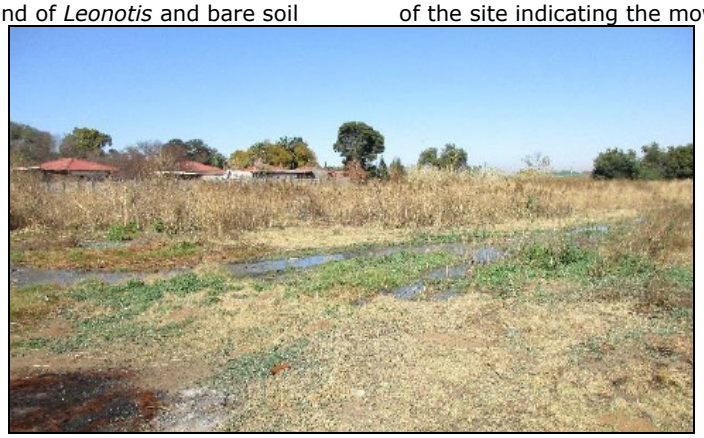

Photo 5.13: A view of the artificially wet area in the north eastern portion of the site (note the sewage and terrestrial vegetation)

Table 5.4: List of plant species observed on site by Venter (2016)

Species	Alien / Invasive category	Grassland	Artificial wetness
Acacia mearnsii	2	x	
Acacia melanoxylon	2	x	
Amaranthus hybridus	Alien	x	x
Arundo donax	1b		x
Bidens bipinnata	Alien	x	x
Bidens pilosa	Alien		x
Bulbostylis burchellii		x	
Chenopodium album	Alien	x	x
Conyza bonariensis	Alien	x	x
Crotalaria agatiflora	1b	x	x
Cymbopogon excavatus		x	x
Cynodon sp		x	x
Datura sp	1b		x
Datura stramonium	1b	x	
Dicoma anomala		x	
Eragrostis cf inamoena		x	
Eragrostis chloromelas		x	x
Eragrostis curvula			x
Eragrostis plana		x	
Eragrostis rigidior		x	x
Eragrostis sp		x	
Felicia muricata		x	x
Flaveria bidentis	1b	x	
Guilleminea densa	Alien	x	x
Hyparrhenia hirta		x	x
Hypoxis sp		x	x
Ipomoea cf purpurea	1b, not listed in urban areas		x
Leonotis dysophylla		x	x
Lopholaena coriifolia		x	
Melia azedarach	3	x	
Melinis repens		x	
Oldenlandia sp		x	
Opuntia ficus-indica	1b	x	
Parinari capensis		x	
Pennisetum clandestinum	Alien	x	x
Perotis patens		x	
Pogonarthria squarrosa		x	
Searsia pyroides		x	
Senecio coronatus		x	x
Senecio sp		x	
Sida coriifolia		x	
Sida dredgei		x	
Solanum mauritianum	1b	x	x
Solanum sisymbriifolium	1b	x	x
Species from Asclepidiaceae		x	x
Sporobolus africana		x	
Tagetus minuta	Alien	x	x
Themeda triandra		x	x
Thesium sp		x	
Vachellia sieberiana		x	
Vachellia tortillis		x	
Verbena aristigera	Alien	x	
Verbena bonariensis	1b	x	

5.7.3 Plant Species of Conservation Concern

The term 'Species of Conservation Concern' refers to the IUCN threatened and Near Threatened categories as well as the South African Red List categories (i.e. Critically Rare, Rare and Declining).

According to Venter (2016), no Plant Species of Conservation Concern is listed for the quarter degree grid in which the site is located. In addition, no species of conservation importance were observed on site due to the disturbed nature of the vegetation.

It is extremely unlikely that any species of conservation importance will occur on the site, since the site and surrounding area is very disturbed and therefore unlikely to support vulnerable/threatened plant populations.

5.7.4 Protected plant species

In addition to the IUCN categories, the following legislation affords protected status to selected indigenous plant species:

- National Forests Act (Act 84 of 1998),
- NEMA Biodiversity Act (Act 10 of 2004, as amended in 2007), and
- Mpumalanga Nature Conservation Act (No.10 of 1998).

National Forests Act (Act 84 of 1998)

The National Forests Act lists 47 tree species that may not be removed or damaged without a license from the National Department of Agriculture.

None of the 47 tree species listed in Schedule A of this Act occurs within the study area or its immediate surroundings.

NEMA Biodiversity Act (Act 10 of 2004, as amended in 2007)

The intention of the Biodiversity Act is to protect plant species (e.g. cycads, yellow arum lily, protea, etc.) that are directly threatened in terms of their utilisation. The destruction, collection or trading of any species listed in this Act requires a permit.

As indicated in Section 5.7.3, no habitat for plant species of conservation is present on site.

Mpumalanga Nature Conservation Act (No.10 of 1998)

A number of plant species are protected in the Mpumalanga Province under the Mpumalanga Nature Conservation Act, whether they are considered to be threatened or not. This includes, but is not limited to, the following common names: ferns, flame lilies, christmas bells, pineapple flowers, clivia, nerine, crinum, ground lily, fire lily, irises, all orchids. A permit has to be obtained prior to their removal.

No protected plant species or trees were noted on site.

5.7.5 Invader or exotic species

Declared Weeds and Invaders are subject to the Conservation of Agricultural Resources Act (Act 43 of 1983) as amended in 2001. In terms of this Act, landowners are legally responsible for the control of alien plant species on their properties.

In addition, a number of plant species are listed as alien invasive species in terms of the Alien Invasive Species (AIS) Regulations, as defined in the National Environmental Management Biodiversity Act (Act no. 10 of 2014).

The AIS regulations place each declared alien invasive plant species into one of four categories and stipulates measures for the eradication of plants in each of the four categories.

- *Category 1a: Invasive species which must be combated and eradicated. Any form of trade or planting is strictly prohibited.*
- *Category 1b: Invasive species which must be controlled and wherever possible, removed and destroyed. Any form of trade or planting is strictly prohibited.*
- *Category 2: Invasive species, or species deemed to be potentially invasive, in that a permit is required to carry out a restricted activity. Category 2 species include commercially important species such as pine, wattle and gum trees. Plants in riparian areas are Category 1b.*
- *Category 3: Invasive species, which may remain in prescribed areas or provinces. Further planting, propagation or trade, is however prohibited. Plants in riparian areas are Category 1b.*

Due to the disturbed nature of the site, many invasive plant species are present on site as indicated in Table 5.5.

Table 5.5: Invasive plant species recorded on site by Venter, 2016

Species	Alien / Invasive category	Grassland	Artificial wetness
Acacia mearnsii	2	x	
Acacia melanoxylon	2	x	
Arundo donax	1b		x
Crotalaria agatiflora	1b	x	x
Datura sp	1b		x
Datura stramonium	1b	x	
Flaveria bidentis	1b	x	
Ipomoea cf purpurea	1b, not listed in urban areas		x
Melia azedarach	3	x	
Opuntia ficus-indica	1b	x	
Solanum mauritianum	1b	x	x
Solanum sisymbriifolium	1b	x	x
Verbena bonariensis	1b	x	

5.7.6 Conclusion

In general, the vegetation on site is very weedy with several alien and invasive plant species present. The species diversity is fairly low and only a few indigenous forb species were noted.

According to Venter (2016), the entire site falls within a single vegetation unit, namely **Disturbed Grassland (**Figure 5.17). This vegetation unit is of low sensitivity and conservation importance.

No Plant Species of Conservation Concern or protected plant species are known to occur on site.

5.8 Animal life

5.8.1 Regional conservation status

According to the Mpumalanga Biodiversity Sector Plan (MBSP, 2013), most of the site and surrounding area are classified as **Heavily Modified** (Figure 5.13b). The northern portion of the site (Portion 271) is however, indicated as a **Critical Biodiversity Area (CBA): Optimal** (Figure 5.16b).

The reasons for indicating the site as a CBA: Optimal is unknown, since the site and surrounding area have been heavily modified as a result of human activities (e.g. clearing of site, driving across site, installation of gas, water and sewer pipelines, dumping of waste, etc.). According to Venter (2016), the classification of the site as a Critical Biodiversity Area in the Mpumalanga Biodiversity Sector Plan is therefore incorrect.

The southern portion of the site (Portion 270) is also classified as **Heavily Modified** and the northern portion (Potion 271) as **Other Natural Areas** in terms of the Freshwater Biodiversity Assessment (Figure 5.18).

Other Natural Areas (ONAs) are defined as:

> *Natural areas that are potentially available to changes in land-use, subject to environmental authorisation processes. Although they are not identified to support freshwater CBAs or ESAs, they still provide important ecosystem services. Freshwater ONAs are particularly important in buffers around rivers and wetlands to reduce siltation and improve water quality. Old lands were included under Freshwater ONAs because of their functional importance in supporting and maintaining freshwater CBAs.*

It should be noted that the MBSP freshwater assessment includes information obtained from the National Freshwater Ecosystem Priority Areas (NFEPA) and threatened freshwater ecosystems databases (National Biodiversity Assessment 2011).

Figure 5.18: Freshwater biodiversity assessment - Mpumalanga Biodiversity Sector Plan, 2013

No Critical Biodiversity Areas (CBA's) for aquatic species, Ecological Support Areas (ESA's) for fish, wetlands or wetland clusters are present on or near the site (Figure 5.18).

5.8.2 Animal life found on site and surrounds

No animal species were noted on site during the site visits. It is highly unlikely that large animal species would permanently inhabit the site due to all the activities taking place in the area (e.g. residential, traffic, business, railway line, church, driving school, etc.) and the very disturbed nature of the vegetation as indicated in Section 5.7.

Smaller species such as rodents, insects, reptiles, scrub hare, birds, etc. will however, utilize the remaining disturbed grassland vegetation on site. Amphibians may be present in the northern portion of the site near the storm water channels where ponding takes place but could also be impacted in terms of the leaking sewage.

5.8.3 Species of conservation concern

No species of conservation concern (e.g. Giant Bullfrog, Hedgehog, Serval, etc.) were noted on site during the site visits. It is unlikely that species of conservation concern will be present due to the disturbed nature of the vegetation and human activities taking place on site and in the surrounding area. The possibility that Red Data species may occur in the area is however, not excluded.

5.9 Surface water

5.9.1 Catchment

The proposed site is located within the Upper Olifants Water Management Area (WMA) and more specifically the B11K quaternary catchment. The catchment divide is located to the east of the site near Kragbron Primary School. The closest river/streams are located ± 1.5 km northwest (Blesbokspruit) and 1.5 km southwest (tributary of the Brugspruit) of the site (Figure 5.1).

The Minister has, in terms of section 12 of the National Water Act, Act No. 36 of 1998, prescribed a system for classifying water resources by promulgating Regulation 810 (Government Gazette 33541, dated: 17 September 2010).

The Water Resource Classification System is intended to ensure the ecological sustainability of all the significant water resources taking into consideration the social and economic needs of competing interests by all who rely on the water resource.

The proposed water resource classes for the Olifants catchment were published in Notice 619 of 2015 (Government Gazette 39004, dated: 20 July 2015). In terms of this notice, the proposed water resource class of the B11K quaternary catchment is a D (i.e. largely modified)**.**

The following Resource Quality Objectives (RQO) for the Olifants catchment applies:

- Low flows should be improved in order to maintain the river habitat for the ecosystem and ecotourism.
- Nutrient concentrations should be improved to prevent nuisance conditions for ecotourism.

- Instream habitat must be in a largely modified or better condition to support the ecosystem and for ecotourism users.
- Instream biota must be in a largely modified or better condition and at sustainable levels.
- Low and high flows must be suitable to maintain the river habitat for ecosystem condition and ecotourism.
- Salt concentrations must be maintained at levels where they do not render the ecosystem unsustainable.
- The riparian zone must be in a moderately modified or better condition to support the ecosystem and for ecotourism.
- Riparian vegetation must be in a moderately modified or better condition.
- Low and high flows must be in a largely modified or better condition to maintain the riparian habitat and for ecotourism.

The water quality of the Blesbokspruit and Brugspruit is known to be poor. The start of the Blesbokspruit is located to the north east of the defunct Station Colliery and has been highly impacted upon by acid mine water draining from the old mines.

The water quality of the Blesbokspruit and Brugspruit is also impacted by sewage, which flows into the rivers as a result of inadequate and old sewage infrastructure.

According to the Mpumalanga Biodiversity Sector Plan (MBSP, 2013), the southern portion of the site (Portion 270) is classified as **Heavily Modified** and the northern portion (Potion 271) as **Other Natural Areas** in terms of the Freshwater Biodiversity Assessment (Figure 5.18).

No Critical Biodiversity Areas (CBA's) for aquatic species, Ecological Support Areas (ESA's) for fish, wetlands or wetland clusters are present on or near the site (Figure 5.18).

It should be noted that the MBSP freshwater assessment includes information obtained from the National Freshwater Ecosystem Priority Areas (NFEPA) and threatened freshwater ecosystems databases (National Biodiversity Assessment 2011).

5.9.2 Floodline

No natural surface water environments (i.e. wetland, stream, drainage area, dam, pan, etc.) are present on site or near the site. The closest river/streams are located ± 1.5 km northwest (Blesbokspruit) and 1.5 km southwest (tributary of the Brugspruit) of the site (Figure 5.1).

The site will therefore not be affected by the 1:50 or 1:100 year floodlines.

5.9.3 Surface water runoff

The site is fairly flat with a gentle slope in a westerly direction towards the railway line as graphically indicated in Figure 5.9.

Earthen storm water canals channel storm water from the residential area located east of the site towards the said site (Figure 5.19). This water then ponds on site in depressions or spreads along tracks and paths (Figure 12).

Rain and storm water also drain as sheet wash across the property in a westerly direction towards the railway line.

5.9.4 Wetlands on site

The Mpumalanga Biodiversity Sector Plan (MBSP, 2013) does not indicate any important wetlands or wetland clusters on or near the site (Figure 5.18).

A vegetation and wetland specialist study was conducted for the site by Kyllinga Consulting (hereafter referred to as Venter, 2016). A copy of the report is provided in Appendix 7.

According to Venter (2016), no wetlands are present on site or within a 500m radius of the site. In addition, no signs of wetness are evident on the 1943 aerial photographs, which makes it highly unlikely that any wetland areas were present on site during this time.

Two artificially wet areas are however, present in the northern portion of the site (Portion 271) as indicated in Figure 5.20.

The small artificially wet area located in the north western portion (Figure 5.20) is the result of a leaking sewer manhole located just north of Main Street. Sewage overflows from the manhole and ponds on site (Photo 5.14).

A larger artificially wet area is present in the north eastern portion of the site as indicated in Figure 5.20. This is as a result of leaking sewage (Photo 5.15) and storm water (Photo 5.16). A leaking sewer manhole was noted adjacent to the residential area located east of the site. Due to the slope of the area, the sewage flows onto the proposed site where it ponds in depressions and flows along tracks and pathways. Storm water from the residential area is also channelled to the site through at least 3 storm water canals (Figures 5.19 and 5.20), resulting in additional water flows on site.

According to Venter (2016), the soil in the wet areas were sampled and no signs of prolonged wetness (i.e. mottling) were found. In addition, the vegetation present in the wet areas are mostly similar to that of the terrestrial areas. A few species associated with wetland conditions (e.g. *Typha capensis*) were observed adjacent to the residential area at the start of the storm water canals. However, none were present in closer proximity to the site.

Since no wetland indicators are present in the soil or the vegetation, the wet areas cannot be classified as watercourses or wetlands (Venter, 2016). It is expected that the artificially wet areas will return to terrestrial areas once the sewage system is repaired.

Figure 5.19: A view of the storm water canals present east of the site

Figure 5.20: Artificial wet areas present on site and adjacent to the site (taken from Venter, 2016)

Photo 5.14: A view of the artificial wet area located just north of Main Street near the Transnet houses. Note the sewage ponding on site.

Photo 5.15: A view of the artificially wet area in the north eastern portion of the site due to storm water ponding.

Photo 5.16: A view of the artificially wet area east of the site due to leaking sewage.

5.10 Groundwater

Perched water table

Van der Merwe (2016) did not encounter water seepage in any of the test pits. In addition, Venter (2016) did not identify any wetlands on site or within a 500 m radius of the site. No permanent or fluctuating water levels are thus present within the first 50 cm of the soil. However, Van der Merwe (2016) indicated that it is expected that shallow water tables may exist during high rainfall periods due to the underlying rock horizon.

Groundwater potential and quality

According to the Mpumalanga Groundwater Master Plan (2008), the said site falls within the Middelburg Basin Hydrogeological Region, which has a fractured aquifer with a low development potential. In terms of the pollution risk (risk = potential of a pollution event happening X impacts) this region seems to be a low risk area.

No information regarding groundwater quality is available since no boreholes are located on site.

In view of the fact that the said site has been undermined, it is anticipated that the underlying groundwater aquifers have been impacted upon.

5.11 Air quality

The eMalahleni area forms part of a national air pollution hotspot known as the Highveld Priority Area (HPA; Republic of South Africa, 2011). This Priority Area comprises the eastern part of Gauteng and the western part of Mpumalanga and covers an area of 31.106 km^2. This Priority Area was declared in terms of Section 18(1) of the National Environmental Management: Air Quality Act 2004 (Act 39 of 2004) due to poor air quality and associated health risks.

The proposed development site is located in the eMalahleni air quality hot spot, which extends to Arnot in the east. This is an area where measured or modelled concentrations exceed, or are predicted to exceed, ambient air quality standards as identified in the Air Quality Management Plan for the Highveld Priority Area.

Exceedances do not occur throughout the hotspot, but in three nodes. In the Middelburg node the modelled and monitored PM_{10} concentrations, as well as modelled SO_2 concentrations, exceed the ambient standard. Exceedances of the SO_2 standard occur in the Arnot node, but are few.

The air quality of the proposed development site is predominately governed by the various industrial and mining activities in and around eMalahleni. The following could impact upon the air quality of the proposed development site:

- Dust generated as a result of the Code 10 driving school utilizing the gravel roads in the northern portion of the site and the bare areas adjacent to the site.
- Emissions from vehicles travelling on the various roads in the area.
- Odours from sewage overflowing from manholes on site and in the area.
- Smokes emitted from veld fires on site and in the area.
- Smoke from cooking fires at the informal settlement (Coronation) located south west of the site.

5.12 Noise

The following existing activities could impact upon the ambient noise level of the site:

- Traffic (especially trucks) travelling on the tar roads in the area;
- Learner drivers practising with small trucks on the gravel roads on site;
- Business activities taking place south of the site;
- Residential activities taking place east of the site;
- Trains travelling along the railway line located east of the site;
- Aircraft flying to and from the Witbank Aerodrome (located ± 4 km north east of the site).

The major contributing factor to the ambient noise level of the site would however, be as a result of traffic.

5.13 Sites of archaeological and cultural interest

5.13.1 Cultural Heritage sensitivity

A Phase I Heritage Impact Assessment (HIA) as required in terms of Section 38 of the National Heritage Resources Act (Act 25 of 1999) was undertaken by Dr. A. van Vollenhoven, an accredited archaeologist of the company

Archaetnos (referred to as Van Vollenhoven, 2017). A copy of the report is provided in Appendix 8. For a description of the methodology used as well as an explanation of terminology used, please refer to Appendix 8.

Van Vollenhoven (2017) indicated that no Stone Age sites are indicated in an historical atlas of this area. The closest recorded site is that of rock art found close to the Olifants River, south of eMalahleni. **No Stone Age sites were noted** within the proposed development site.

In addition, no Iron Age sites are indicated for the area. The closest known Iron Age sites are located to the west of Bronkhorstspruit and near Bethal. **No Iron Age sites** were identified within the proposed development site.

Van Vollenhoven (2017) identified no sites from the **Historical Age (including graves)** on site.

Van Vollenhoven (2017) indicated that since **no sites of cultural heritage significance** are located on site, the development may continue (based on approval from SAHRA).

However, the applicant should be aware that the subterranean presence of archaeological and/or historical sites, features or artefacts is always a distinct possibility. Sites may also have been overlooked due to the dense vegetation. Operating controls and monitoring should therefore be aimed at the possible unearthing of features and mitigation measures would have to be implemented.

Conclusion
No sites of cultural heritage significance was noted on site by Van Vollenhoven (2017).

5.13.2 Palaeontological sensitivity

According to the palaeontological map supplied by the South African Heritage Resources Agency (SAHRA, 2014), the palaeontological sensitivity of the proposed site is deemed as very high (area indicated in red; Figure 5.21). In view of this, a field assessment and protocol for finds are required as indicated in Figure 5.21.

Dr. Heidi Fourie (Heidi Fourie Consulting) was appointed to conduct a Palaeontological Impact Assessment – Field Study (referred to as Fourie, 2017). A copy of the said report is provided in Appendix 9 and should be consulted with regards to the methodology used.

According to Fourie (2017), the proposed site is underlain by shale, shaly sandstone, grit and sandstone of the Vryheid Formation, Ecca Group, Karoo Supergroup.

The Vryheid Formation is known for its plant fossils and may contain assemblages of the Permian *Glossopteris* flora, rare fossil wood, diverse palynomorphs and abundant low diversity trace fossils (e.g. rare insects, non-marine bivalves, fish scales, etc.). The fossils are not very rare and also occur in other parts of the Karoo stratigraphy.

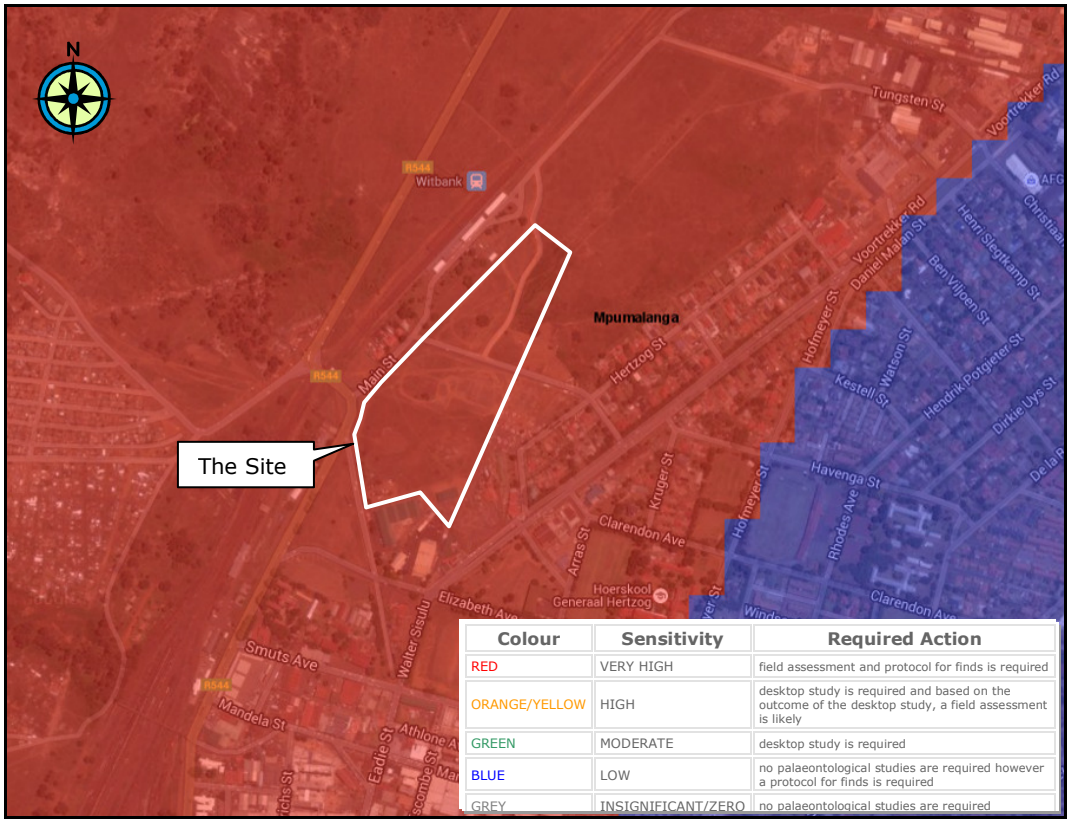

Figure 5.21: Requirement for palaeontological study (taken from SAHRA, 2014)

The palaeontological sensitivity for the **Vryheid Formation** is '**Very High**' as a result of the coal and shale layers. It should however, be noted that the said site is undermined (see Section 5.4) and the coal layers mostly removed.

Fourie (2017) raised no objection to the proposed development. A Phase 2 Palaeontological Impact Assessment is not required since no surface fossils were found during the walk through. A protocol for finds and management plan are provided in Appendix 9.

Conclusion
Fourie (2017) did not find any fossils on site during the walk through. However, the topsoil, subsoil and overburden must be surveyed for fossils during the construction phase.

5.14 Sensitive landscapes

No sensitive landscapes (e.g. watercourses, sites of cultural heritage significance, etc.) are known to be present on site.

5.15 Visual aspects

Due to the flat topography and developed nature of the area, the site is highly visible from surrounding properties, roads and the railway line.

The site is visible from the eMalahleni License Department, adjacent businesses, the church, adjacent vacant properties, the Transnet railway line

and station, Transnet houses, residences to the east, the R544 provincial road and Main Street (Figure 5.4).

5.16 Traffic

A traffic impact assessment was conducted by WSP Group Africa (Pty) Ltd. (hereafter referred to as Mamabolo, 2016) for the proposed development. A copy of the traffic impact assessment is provided in Appendix 10.

The objective of the traffic impact assessment was to:

- Investigate existing and future traffic flow conditions at several key intersections.
- Estimate the expected development traffic generation;
- Determine the anticipated traffic impact of the development on the surrounding road network;
- Determine and evaluate access arrangements, road/intersection upgrades, non-motorised and public transport and parking.

The methods used for the traffic impact assessment as well as the detailed results obtained are provided in the traffic impact report (Appendix 10).

5.16.1 Existing road network

R544 provincial road/Main Street (Figure 5.22):
The R544 provincial road links the north western portions of eMalahleni (i.e. Klarinet, Pine Ridge, Leeuwpoort Smallholdings, farms) with the CBD by means of a railway crossing. The R544 and railway crossing are located on the western corner of the site between Points 1 and 2 (Figure 5.22).

According to Mamabolo (2016), the R544 is a Class U2, single carriageway, major arterial road. Traffic volumes are in the order of 1 298 and 1 176 vehicles per hour (vph) (total for both directions) during typical weekday afternoon and Saturday peak hours respectively.

Photo 5.17: A view of the R544/Main Street intersection east of the railway line

Main Street (Figure 5.22):
Main Street extends through the centre of the site (between Point 6 and Point 5; Figure 5.22) until it merges with the R544 provincial road at Point 1 (Figure 5.22).

The section of Main Street extending through the site (between Point 6 and Point 5; Figure 5.22) is a Class U4b single carriageway, residential street.

Traffic volumes along Main street are in the order of 506 and 310 vph (total for both directions) during typical weekday afternoon and Saturday peak hours respectively.

Unknown street (Figure 5.22):
This street extends along the western boundary of the proposed site (Figure 5.22). It intersects with the R544 in the north (at Point 3) and Elizabeth Avenue in the south. According to Mamabolo (2016), the unknown street is a single carriageway, Class U4a commercial street.

Traffic volumes at the R544 intersection (Point 3; Figure 5.22) are in the order of 534 and 386 vhp (total for both directions) during typical weekday afternoon and Saturday peak hours respectively.

Elizabeth Avenue (Figure 5.22):
Elizabeth Avenue is located south west of the site and connects to the R544 (Point 4; Figure 5.22), the unknown street and Voortrekker Road (Figure 5.22). It is a Class U4a, single carriageway, commercial street.

According to Mamabolo (2016), Elizabeth Avenue carries traffic volumes of 479 and 307 vph during the weekday afternoon and Saturday peak hours respectively.

Hertzog Street (Figure 5.22):
Hertzog Street is located east of the proposed site (Figure 5.22). It is a Class U5b local residential street that provides access to the residential area and the ELM License Department. Hertzog Street is a single carriageway street from the Main Street crossing (Point 6; Figure 5.22) northwards and a one-way, two-lane street to the ELM License Department (Mamabolo, 2016).

Traffic volumes are low and in the order of 107 and 65 vph (total for both directions) during typical weekday afternoon and Saturday peak hours respectively (Mamabolo, 2016).

Figure 5.22: Existing road network near the site

5.16.2 Traffic impact

The estimated weekday afternoon and Saturday peak hour trip generations for the proposed development are summarized in Tables 5.6 and 5.7.

Table 5.6: Weekday afternoon peak hour trip generation (taken from Mamabolo, 2016)

Land-use	GLA (m^2)	Trip Generation Rate (/100 m^2 GLA)	Trip Generation Adjustment Factors		Directional Split		Peak Hour Trips		
			Low Vehicle Ownership	Transit Nodes or Corridors	IN	OUT	IN	OUT	TOTAL
Shopping Centre	17 055	3.40	30%	15%	50%	50%	349	349	698
						Primary Trips	233	233	467
						Diverted Trips	10	10	20
						Pass-by trips	105	105	211
						Total (Shopping Centre)	349	349	698
Warehouses	7 152	1.50	30%	15%	40%	60%	26	38	64
						Warehouses (Bulk Trade Centres)	26	38	64
						Total (Shopping Centre + Warehouses)	374	387	761

Table 5.7: Saturday peak hour trip generation (taken from Mamabolo, 2016)

Land-use	GLA (m^2)	Trip Generation Rate (/100 m^2 GLA)	Trip Generation Adjustment Factors		Directional Split		Peak Hour Trips		
			Low Vehicle Ownership	Transit Nodes or Corridors	IN	OUT	IN	OUT	TOTAL
Shopping Centre	17 055		30%	15%	50%	50%	462	462	923
						Primary Trips	371	371	741
						Diverted Trips	3	3	5
						Pass-by trips	88	88	177
						Total (Shopping Centre)	462	462	923
Warehouses	7 152		30%	15%	50%	50%	83	83	166
						Warehouses (Bulk Trade Centres)	83	83	166
						Total (Shopping Centre + Warehouses)	545	545	1 089

According to Mamabolo (2016), the proposed development would generate 761 combined trips during the weekday afternoon peak traffic (Table 5.6) and 1 089 during Saturday peak hour (Table 5.7).

The following trip generation adjustment factors were applied:

- Low vehicle ownership - It is expected that a large proportion of residents living in informal settlements near the proposed development will make use of mini-bus taxis, walk or cycle to the shopping centre.
- Transit nodes or corridors - The R544 provides all modes of public transport from mini-bus taxis to heavy commuter rail. It is expected that a large portion of employees and shoppers will utilize public transport.

In order to determine the expected traffic impact of the proposed shopping centre on the road network, a capacity analyses was carried out by Mamabolo (2016). Two scenarios were analysed for the key intersections namely an existing 2016 and projected 2021 traffic scenario.

The capacity analysis showed the following with regards to the 2016 scenario (Mamabolo, 2016):

- ⇒ R544/Main Street (Point 1; Figure 5.22) - The intersection operates over capacity (volume to capacity ratio >0.95) and at an unacceptable Level of Service (>D).
- ⇒ R544/unknown road to Coronation (Point 2; Figure 5.22) - The intersection experiences capacity and delay problems.
- ⇒ R544/unknown street (Point 3; Figure 5.22) - The intersection operates satisfactorily.
- ⇒ R544/Elizabeth Avenue (Point 4; Figure 5.22) - The intersection operates satisfactorily.
- ⇒ Main Street/Main Street (Point 5; Figure 5.22) - The intersection operates satisfactorily.
- ⇒ Main Street/Hertzog Street intersection (Point 6; Figure 5.22) - The intersection operates satisfactorily.

The capacity analysis for the 2021 scenario included the proposed road/intersection improvements as indicated in Section 5.16.4. The results indicated that all intersections will operate satisfactorily.

Based on the estimated traffic generation from the proposed development, as well as the capacity analyses and the gap analyses, it was found that the some of the existing intersections do require upgrading.

5.16.3 Proposed road/intersection improvements

Based on the estimated development traffic generation, capacity analyses and gap analysis, Mamabolo (2016) proposed the following intersection upgrades (Figure 5.23):

<u>R544/Main Street/Primary shopping centre access (Point A; Figure 5.23)</u>
This intersection is currently a bent T-intersection that is stop controlled. It is proposed to upgrade this intersection to a full double lane roundabout which would also provide access to the shopping centre. According to Mamabolo (2016), the roundabout will consist of the following geometric features:

- Number of circulating lanes: 2
- Circulating lane widths: 5 m
- Island diameter: 30 m

<u>R544/unknown road to Coronation (Point B; Figure 5.23)</u>
This intersection is currently an all-way stop controlled T-intersection with left turning slip lanes. According to Mamabolo (2016), the following upgrades will be required:

- The eastern approach going across the railway line will require an additional right turning lane.
- The southern approach to Coronation will require dedicated through and right turning lanes.
- The northern approach towards Klarinet will require an additional exit lane.
- The intersection will require traffic signals.

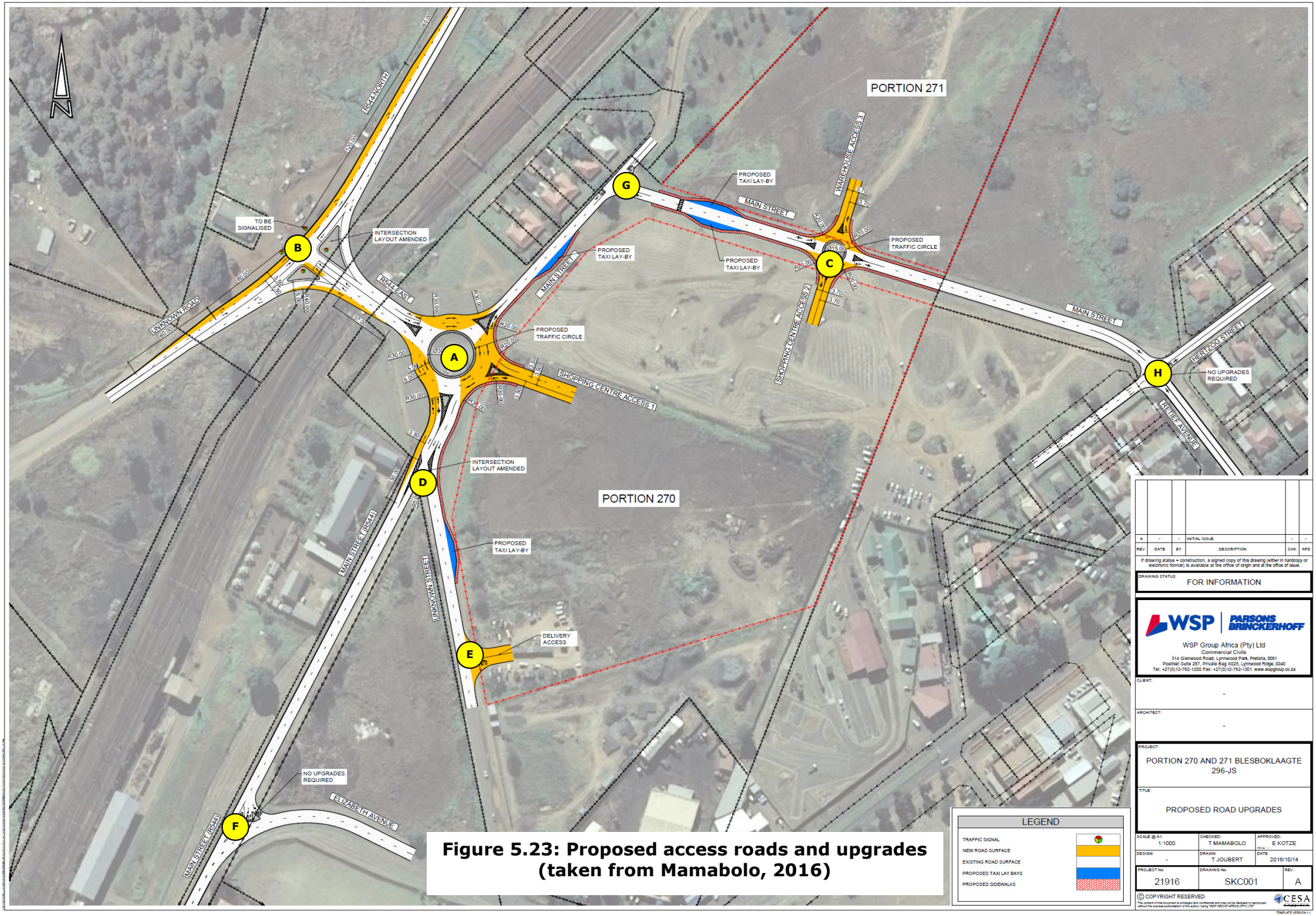

Figure 5.23: Proposed access roads and upgrades (taken from Mamabolo, 2016)

REV	DATE	BY	DESCRIPTION	CHK	APD
A	-	-	INITIAL ISSUE	-	-

If drawing status = construction, a signed copy of this drawing (either in hardcopy or electronic format) is available at the office of origin and at the office of issue.

DRAWING STATUS: FOR INFORMATION

WSP | PARSONS BRINCKERHOFF
WSP Group Africa (Pty) Ltd
Commercial Civils
314 Glenwood Road, Lynnwood Park, Pretoria, 0081
PostNet Suite 287, Private Bag X025, Lynnwood Ridge, 0040
Tel: +27(0)12-762-1200 Fax: +27(0)12-762-1301 www.wspgroup.co.za

CLIENT: -

ARCHITECT: -

PROJECT: PORTION 270 AND 271 BLESBOKLAAGTE 296-JS

TITLE: PROPOSED ROAD UPGRADES

SCALE @ A1:	CHECKED:	APPROVED:
1:1000	T MAMABOLO	E KOTZE
DESIGN: -	DRAWN: T JOUBERT	DATE: 2016/10/14
PROJECT No: 21916	DRAWING No: SKC001	REV: A

CESA

TEMPLATE VERSION 1.1

Main Street/Secondary shopping centre access (Point C; Figure 5.23)
As previously indicated, the secondary access to the shopping centre (Portion 270) and primary access to the warehouses (Portion 271) will be from the section of Main Street that extends across the site (Figure 5.23). According to Mamabolo (2016), a new full four-legged roundabout intersection will be provided at here.

The roundabout will consist of the following geometric features:
- Number of circulating lanes: 1
- Circulating lane widths: 5 m
- Island diameter: 15 m

Main Street/unknown street (Point D; Figure 5.23)
This intersection is currently a priority controlled T-intersection with no right turning movement permitted from the R544/Main Street onto the unknown street. This intersection will be converted to a butterfly intersection in order to reduce the number of conflicting movements for the vehicles turning from the unknown street onto the R544/Main Street (Mamabolo, 2016). An additional exit lane will be provided from the southern approach.

Delivery access to shopping centre (Point E; Figure 5.23)
A third access point (for deliveries) will be provided off the unknown street located on the western boundary of the site. No upgrades will be made to the unknown street.

R544 (Main Street)/Elizabeth Avenue (Point F; Figure 5.23)
According to Mamabolo (2016), no upgrades are required at this intersection.

Main Street/Main Street (Point G; Figure 5.23)
According to Mamabolo (2016), no upgrades are required at this intersection.

Main Street/Hertzog Road (Point H; Figure 5.23)
According to Mamabolo (2016), no upgrades are required at this intersection.

5.16.4 Proposed site access

As indicated in the layout plan (Figure 3.2), three accesses are proposed for the shopping centre namely:
- primary access to shopping centre (Portion 270) - a new traffic circle on the R544 just south of the railway crossing;
- secondary access to shopping centre (Portion 270) and primary access to warehouses (Portion 271) - a new traffic circle on Main Street in approximately the centre of the site; and
- the unknown street located on the western boundary.

These accesses are in line with the above-mentioned upgrades.

5.16.5 Non-motorised and public transport

In terms of Section 29 of the National Land Transport Transition Act 22 of 2000, a public transport assessment must be included as part of the traffic impact assessment.

According to Mamabolo (2016), the proposed development is located adjacent to the R544/Main Street, which is an activity road used by taxis and busses. The railway station is located near the site and the main taxi rank only approximately 1.1 km south of the site. However, no paved pedestrian walkways or public transport lay-byes are located in the vicinity of the site.

Mamabolo (2016) thus recommended that public transport lay-byes be provided as indicated in Figure 5.23. In addition, 12 on-site taxi bays to be provided, which should be able to accommodate 72 taxis.

In order to ease the movement of pedestrians, Mamabolo (2016) recommended that a paved pedestrian walkway of 1.5m wide be provided along the eastern side of the R544/Main Street, on the eastern side of the unknown street and on both sides of Main Street where it crosses the site.

5.16.6 Conclusion

Mamabolo (2016) indicated that the proposed development is supported from a traffic engineering point of view provided that:

- the proposed external road upgrades and site accesses are constructed to the relevant design standards of the local authority;
- the proposed pedestrian and public transport facilities are constructed to the relevant design standards of the local authority; and
- the minimum number of on-site parking bays as per the draft site layout plan are provided (i.e. 621 bays for the shopping centre and 180 bays for the warehouses).

5.17 Sense of place

The said site is located near the eMalahleni Central Business District (CBD) and adjacent to one of only two railway crossings connecting the western parts of eMalahleni (e.g. Klarinet, Pine Ridge, Leeuwpoort Smallholdings) with the CBD. A high volume of commuters thus utilize this route on a daily basis travelling between work and home. The said site is easily accessed from the R544 provincial road as well as Main Street (which extends through the centre of the property).

A shopping centre near the railway crossing and the eMalahleni Central Business District will thus provide commuters and residents with a close-to-home, convenient place for shopping and social gatherings.

According to Korsman & Associates (2017), the proposed change in land use will have no negative impact on the surrounding properties or land uses as it is situated in close proximity to an established residential area, businesses and various other land use activities.

It is also believed that the development of the property will contribute positively to the area in terms of a visual and aesthetical upgrade.
In addition, the said property is situated within the urban boundary of eMalahleni and is currently considered impractical for farming purposes. By rezoning the property for business purposes, the potential and usefulness of the property will be enhanced.

The proposed site is however, earmarked for industrial development in the eMalahleni Local Municipality Spatial Development Framework (SDF; 2013/2014) as indicated in Figure 5.24. According to Korsman & Associates (2017), a shopping centre would be better suited in this area since it can be viewed as an extension of the services and activities provided through the nearby CBD.

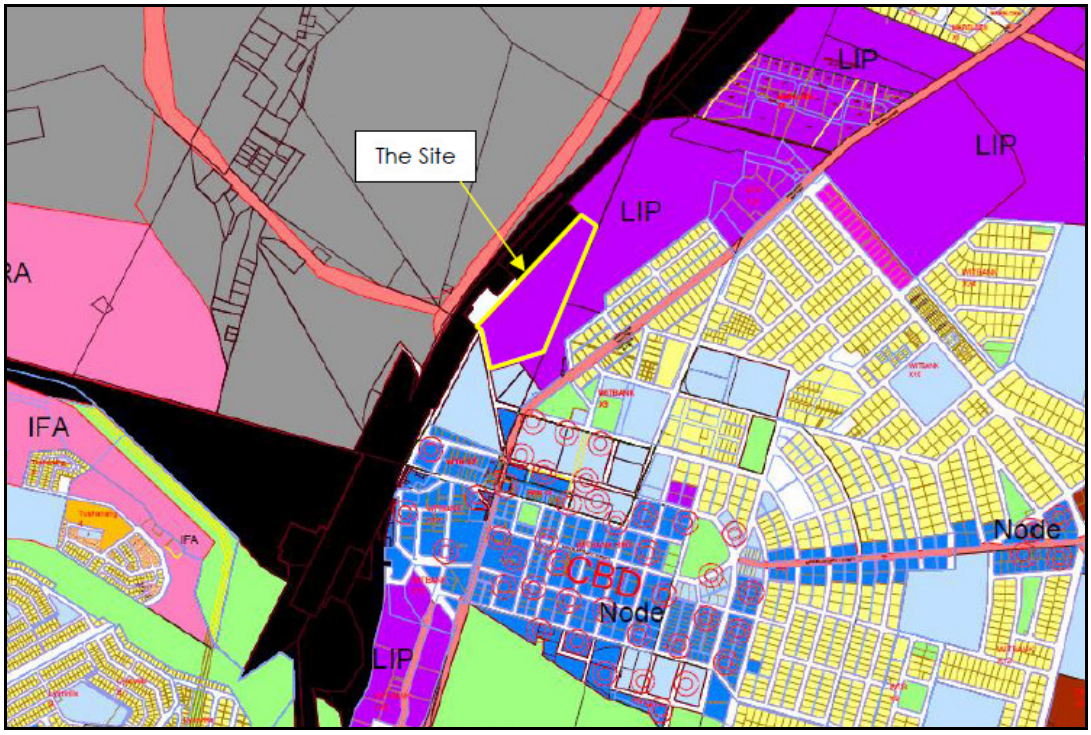

Figure 5.24: eMalahleni Local Municipality Spatial Development Framework (2013/2014) (taken from Korsman & Associates, 2017)

6. DESCRIPTION OF THE PUBLIC PARTICIPATION PROCESS

6.1 Advertising of the project

6.1.1 Press advertising

A block advert (150mm x 95mm), according to the Environmental Impact Assessment Regulations, 2014, was placed in the local newspaper, Witbank News, on Friday, 10 June 2016. A copy of the advert is provided in Appendix 11.

6.1.2 On-site advertising

Notices according to the Environmental Impact Assessment Regulations, 2014, were displayed at the following locations:

- On-site adjacent to Main Street near the railway line crossing (A1; Figure 6.1 - Photo 1);
- On-site adjacent to the access road to the Apostolic Mission Revival Church (A3; Figure 6.1 – Photo 2);
- On-site near the railway station (A3; Figure 6.1 – Photo 3);
- At the offices of Nicor Construction (i.e. the applicant) located adjacent to the site (A3; Figure 6.1 - Photo 4);
- On the notice board at the Witbank (eMalahleni) Public Library (A3; Figure 6.1 - Photo 5).

A copy of the notice was also loaded onto the company website: http://adienvironmental.co.za.

A copy of the notice is provided in Appendix 11. Figure 6.2 provides an aerial view of where the notices were displayed in relation to the site.

It should be noted that the A1 notice is 594 mm x 841 mm and the A3 notices 416mm x 295mm (A3) in size.

6.1.3 Informing I&APs via the internet

A copy of the following documentation was loaded onto the AdiEnvironmental cc website (http://adienvironmental.co.za):

- Copy of the notice;
- Background Information Document (BID; Appendix 12).

This information was available on the website for the duration of the basic assessment phase.

A copy of the webpage printouts is provided in Appendix 11.

6.1.4 Feedback from the advertising process

Only two (2) persons registered as interested and affected parties with regards to the advertising of the project, namely:

- Mr. J. Lourens on behalf of Anglo Operations Pty Ltd (e-mail dated: 15 June 2016; Appendix 14) - see Section 6.5 for further details;
- Ms. D. Wessels on behalf of Leads2Business (e-mail dated: 20 June 2016; Appendix 11). Leads2Business is an online company researching tenders and construction projects for potential business opportunities. No comment was received.

There was thus no need for a public meeting.

Photo 1: On-site notice near the railway crossing.

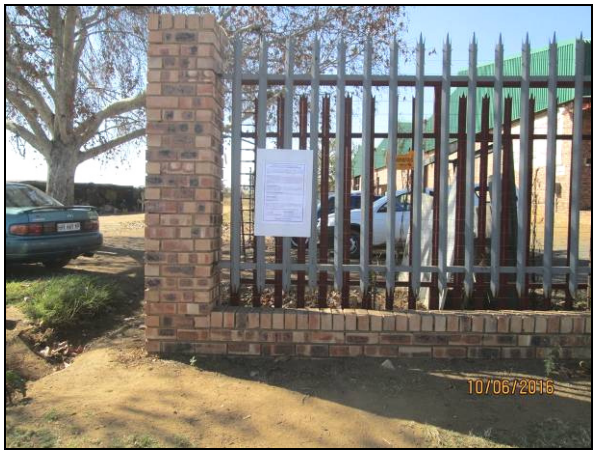

Photo 2: On-site notice adjacent to the access road to the church.

Photo 3: On-site notice near the railway station.

Photo 4: Notice displayed at the offices of Nicor Construction located adjacent to the site.

Photo 5: Notice displayed at the Witbank Public Library

Figure 6.1: A view of the notices displayed on site.

Figure 6.2: Aerial view of notice placements

6.2 Directly affected landowner/user

Jumbo van der Merwe Trust

The proposed development site is located on a portion of Portion 55 of the farm Blesboklaagte 296 JS (Figure 6.2) which is registered to Jumbo van der Merwe Trust. Since Jumbo van der Merwe Trust is also the applicant, no outside party will be directly impacted by the proposed project.

6.3 Identified local authorities/government departments and stakeholders

Table 6.1 provides an indication to which local authorities/government departments and stakeholders Background Information Documents (BIDs; Appendix 12) were forwarded in order to inform them of the proposed project and to obtain their issues of concern.

Table 6.1: Identified local authorities/government departments and stakeholders who received BIDs

AUTHORITY/ STAKEHOLDER	CONTACT PERSON	CORRESPONDENCE SENT	COMMENTS
Department of Agriculture, Forestry and Fisheries (DAFF)	F. Mashabela	Email (dated: 10 June 2016; Appendix 13) with BID forwarded.	None
Department of Agriculture, Rural Development, Land and Environmental Affairs (DARDLEA) - Directorate: Land Use and Soil Management – Ermelo	J. Venter	Email (dated: 10 June 2016; Appendix 13) with BID forwarded.	None
Department of Co-operative Governance and Traditional Affairs (COGTA)	M. Loock	Email (dated: 10 June 2016; Appendix 13) with BID forwarded.	None
Department of Mineral Resources	S. Mathavela	Email (dated: 10 June 2016; Appendix 13) with BID forwarded.	Yes. See Section 6.3.8
Department of Public Works, Roads and Transport	B. Viljoen	Email (dated: 10 June 2016; Appendix 13) with BID forwarded.	Yes. See Section 6.3.1
Department of Rural Development and Land Reform (Commission on Restitution of Land Rights)	N.D. Nkambule F. Ndaba	Emails (dated: 10 June 2016 and 22 June 2017; Appendix 13) requesting if any land claims registered against property.	Yes. See Section 6.3.7
Department of Water and Sanitation (DWS)	A. Rambuda	Email (dated: 10 June 2016; Appendix 13) with BID forwarded.	None
eMalahleni Local Municipality	M. Makgalemele	Email (dated: 10 June 2016; Appendix 13) with BID forwarded.	None
eMalahleni Local Municipality	E. Nkabinde	Email (dated: 10 June 2016; Appendix 13) with BID forwarded.	Yes. See Section 6.3.2
Eskom Distribution (Land & Rights)	T. Ludere	Email (dated: 31 May 2017; Appendix 13) with BID forwarded.	None

AUTHORITY/ STAKEHOLDER	CONTACT PERSON	CORRESPONDENCE SENT	COMMENTS
Eskom Transmission	L. Motsisi	Email (dated: 10 June 2016; Appendix 13) with BID forwarded.	Yes. Eskom Tx will not be affected. See Section 6.3.3
Mpumalanga Tourism and Parks Agency (MTPA) – Land Advisory Unit	K. Narasoo	Email (dated: 10 June 2016; Appendix 13) with BID forwarded.	None
Nkangala District Municipality	S. Links	Email (dated: 10 June 2016; Appendix 13) with BID forwarded.	None
Sasol Gas	S. Reyneke	Email (dated: 10 June 2016; Appendix 13) with BID forwarded.	Yes. See Section 6.3.4
South African Heritage Resources Agency (SAHRA)	SAHRA website	Loaded BID onto SAHRA website (print out from SAHRIS website dated: 10 June 2016; Appendix 13)	Yes. See Section 6.3.5
Telkom	J. Smit	Email (dated: 10 June 2016; Appendix 13) with BID forwarded.	None
Transnet	T. Mavulwana	Emails (dated: 10 June 2016 and 21 June 2017; Appendix 13) with BID forwarded.	None
Ward 20 councillor	R. Cronje	E-mail (dated: 10 June 2016; Appendix 13) with BID forwarded.	Yes. See Section 6.3.6
Ward 15 councillor	P. Mashiane	E-mail (dated: 10 June 2016; Appendix 13) with BID forwarded.	None

6.3.1 Department of Public Works, Roads and Transport

A completed comment sheet (dated: 30 June 2016; Appendix 14) was received from Mr. B. Viljoen (Department of Public Works, Roads and Transport). The following was indicated:

"Apply for an access/service within the road reserve (40m? reserve)."

Response from AdiEnvironmental cc

As indicated in Section 5.16, the proposed development would obtain access from the R544/Main Street (Figure 3.2 and Figure 5.23) and the necessary approval would have to be obtained from the Department of Public Works, Roads and Transport if required.

6.3.2 eMalahleni Local Municipality

A completed comment sheet (dated: 19 July 2016; Appendix 14) was received from Mr. E. Nkabinde (eMalahleni Local Municipality) indicating the following:

"The comments raised by South32 SA Holding in the letter dated 1 July 2016 raises a serious concern for the municipality about the development. It would therefore be appreciated if a meeting can be convened between the affected parties so that all concerns can be addressed before the process starts."

Response from AdiEnvironmental cc
As indicated in Section 6.4.1, AdiEnvironmental cc requested possible dates for a meeting to be provided by South32. To date, no feedback in this regard was provided.

Section 6.4 provides feedback in terms of communication between South32 and Scip Engineering. In addition, Section 5.4 and Appendix 6 provides information regarding the undermining of the site.

6.3.3 Eskom Transmission

Ms. L. Motsisi (Eskom Transmission) indicated per email (dated: 13 June 2016; Appendix 14) that Eskom Transmission services will not be affected by the proposed development.

Eskom Transmission was subsequently removed from the I&AP list.

6.3.4 Sasol Gas

Sasol (R. Mpofu) forwarded a letter (dated: 17 June 2016; Ref: SWM J0167; Appendix 14) to AdiEnvironmental cc indicating that Sasol Pipeline Operations is affected by the proposed development and that an official wayleave application would have to be submitted. The letter set out the process to be followed with regards to the wayleave application.

Subsequently, an e-mail (dated: 20 June 2016; Appendix 14) was received from Mr. S. Bracey indicating the following:

> "As our Mrs. Rachel Mpofu indicated, Sasol is affected by the proposed development. To enable a risk study on the proposed development we would need to understand the following:
> 1. The position & size of the buildings
> 2. Number of people that the building are designed for.
>
> Please note that the gas pipeline is a major hazard installation according to the MHI regulations in the OHSAct. The risk assessment defines a risk zone which has an effect on developments around the gas pipeline.
>
> Please distribute the Awareness letter too Developer, Design Engineers as well as the Land Owner."

The Sasol Satellite Operations Safety Awareness Information (letter dated: 13 July 2016; Appendix 14) was attached to the above-mentioned e-mail. The documentation received was forwarded to the project applicant.

Response from AdieEnvironmental cc
A letter (dated: 5 September 2016; Appendix 14) was forwarded to Sasol (S. Bracey) with the subdivision plan and site development plan attached. AdiEnvironmental cc enquired whether the proposed site development plan is acceptable and what mitigation measures would need to be implemented by the developer.

Response from Sasol Gas
Subsequently, an email (dated: 1 November 2016; Appendix 14) from S. Bracey (Sasol) was received, who indicated the following:

"I have done a generic assessment (see Figure 6.3) on the proposed area using the number of required parking areas as a measure to define the population density. The risk simulation below is not formal but indicate that the risk levels are not acceptable.

We therefore need to do a formal assessment on the proposed development as this pipeline is a Major Hazard Installation and the Local Authority will potentially reject the application due to the risk levels.

Please provide the proposed population densities that you plan to attract per facility in the development. It will also assist if you could define the localities.

Mitigation can bring probability levels down but we need to portray it formally. With more information and detail we will be able to give you better information."

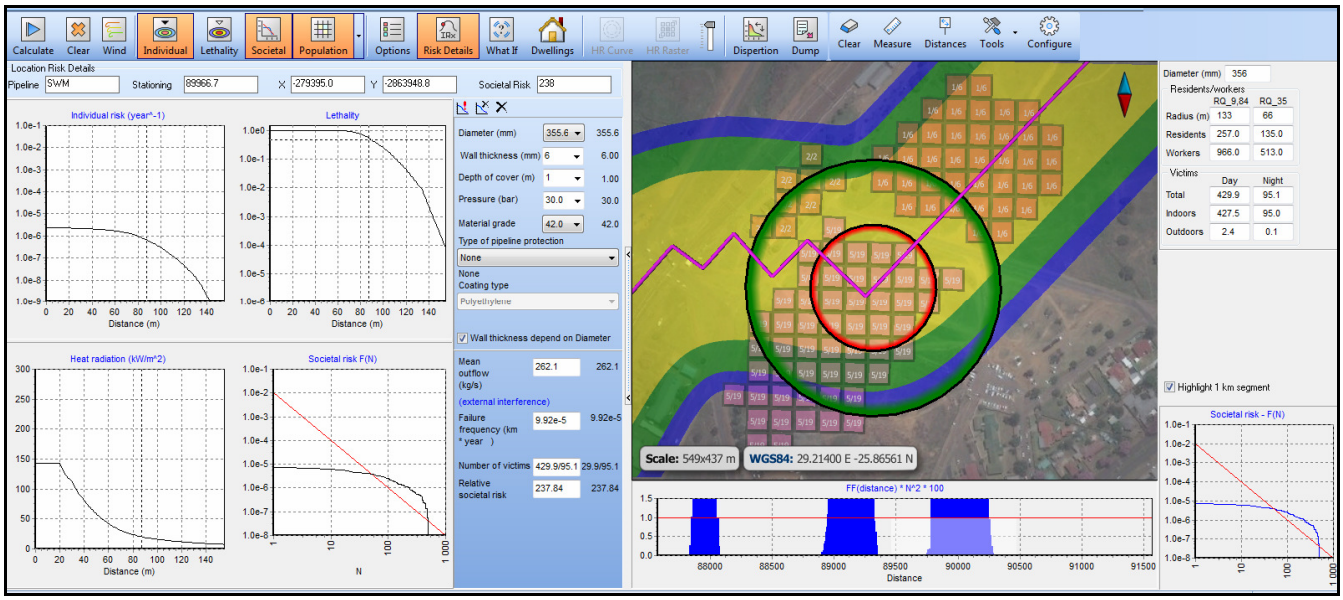

Figure 6.3: Generic Risk Assessment received from Sasol Gas

<u>Response from AdieEnvironmental cc</u>
The e-mail from Sasol (dated: 1 November 2016) was forwarded (e-mail dated: 2 November 2016) to the client, who was informed that Sasol Gas needs to do a formal assessment of the proposed development. In addition, the client was requested to provide the proposed population density that the development would attract. To date, no information has been received. .

The applicant would have to ensure that the requested information is provided to Sasol to enable them to conduct a formal risk assessment. In addition, a formal wayleave application would have to be submitted to Sasol.

Should the development obtain the go-ahead from Sasol, the applicant would have to implement the mitigation and safety measures as stipulated by Sasol. Some of the safety measures are provided in the EMP (Section 8 of this report).

6.3.5 South African Heritage Resources Agency (SAHRA)

A letter (dated: 12 July 2016; Appendix 14) was received from the South African Heritage Resources Agency (SAHRA). The following was indicated:

"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 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.

In your application received by SAHRA, there was no indication of an assessment of the archaeological and heritage resources. However a church that will be retained in situ has been mentioned in the BID document with no mention of its age. SAHRA requires that a suitably qualified archaeologist conducts a full Phase 1 Heritage Impact Assessment that will identify and assess their significance following the minimum standards for impact assessments guidelines. It should also make recommendations (as indicated in section 38) about the process to be followed. For example, there may need to be a mitigation phase (Phase 1) where the specialist will collect or excavate material and date the site. At the end of the process the heritage authority may give permission for destruction of the sites.

The proposed development is located in a zone where the underlying geology has a very high potential for fossiliferous superficial deposits. SAHRA requires for a Phase 1 Palaeontological Impact Assessment study must be undertaken to assess whether or not the development will impact upon palaeontological resources that should be conducted by a suitably qualified Palaeontologist.

SAHRA Archaeology, Palaeontology and Meteorites Unit will comment further on this development once the PIA and the Heritage Scoping Report is submitted to the case."

Response from AdiEnvironmental cc
As requested by SAHRA, a Phase 1 Heritage Impact Assessment and a Phase 1 Palaeontological Impact Assessment were commissioned. The results of the studies are detailed in Section 5.13 of this report and copies thereof provided in Appendices 8 and 9 respectively.

The said studies were also loaded (website printout dated: 19 June 2017; Appendix 14) on the SAHRIS website for evaluation. To date, no further comment has been received.

6.3.6 Ward 20 Councillor - R. Cronje

An e-mail (dated: 27 June 2016; Appendix 14) was received from the Ward 20 Councillor Mr. R. Cronje, requesting to be registered as an interested and affected party.

Response from AdiEnvironmental cc
An e-mail (dated: 28 June 2016; Appendix 14), was forwarded to Mr. Cronje indicating that he was registered as an I&AP and requesting comment. To date, no further correspondence has been received.

6.3.7 Department of Rural Development and Land Reform (Commission on Restitution of Land Rights)

According to the Commission on Restitution of Land Rights (F. Ndaba) (letter dated: 22 June 2017; Ref: 1107; Appendix 14), a claim has been lodged against the farm Blesboklaagte 296 JS with file number 1107. The claim is however, still in the research stage and has not been gazetted.

Response from AdiEnvironmental cc
Noted. The applicant has been informed of the potential land claim.

6.3.8 Department of Mineral Resources

SCIP Engineering Group (Pty) Ltd. submitted an application to the Department of Mineral Resources (DMR) for the construction of a shopping centre on Portion 55 of the farm Blesboklaagte 296 JS (which is undermined). A copy of the report and cover letter (dated: 11 November 2015) are provided in Appendix 6.

Subsequently, the DMR (M. Poultney) indicated the following in their letter (dated: 1 December 2015; Ref: MP 11/27/1406/15; Appendix 14):

"With reference to your application 098/487 and dated 11 November 2015, the risk assessment, the borehole logs and the appropriate plan, I hereby acknowledge your intention to construct a shopping centre over and within a horizontal distance of 100 m from undermined ground as set out in your letter and indicated on the attached plan signed HH Netshikweta, Senior Inspector over today' date.

With reference to your proposed restrictions and conditions, I wish to comment as follows:

1. Structures and objects that will be erected on the above-mentioned plan mean the shopping centre as described in the application letter and indicated on the attached plan.
2. These comments shall only apply to the erection of surface structures over the underground workings as depicted on the attached plan.
3. Only the shopping centre as described in your letter may be constructed within the proposed area on the above-mentioned plan.
4. The construction of the shopping centre must be controlled and all measures must be taken to ensure that the environment is not polluted.
5. The area must be effectively fenced off to prevent unauthorised access and to facilitate proper control.
6. The area must be completely rehabilitated to the satisfaction of this office once the construction of the above-mentioned surface structures has been completed.
7. Commenting on the proposed restrictions and conditions does not purport to absolve Jumbo van der Merwe Trust or SCIP Engineering Group (Pty) Ltd. or its successors in title from its common law obligations with respect to the freehold owners and holders of servitudes in the event of damage to property as a result of mining operations and no responsibility shall devolve on the State or its servants.
8. Your attention is drawn to the requirements of Regulations 17(6) and 17(6)(b) of the Mine Health and Safety Act, Act 29 of 2996.
9. All persons concerned must be made fully conversant with the terms of this letter, copies of which must be made readily available to them before commencement of the construction of abovementioned surface structures over and within a horizontal distance of 100 metres from undermined ground.

This letter together with the attached plan constitutes your authority to proceed with the work."

Response from AdiEnvironmental cc
The restrictions and conditions stipulated by the Department of Mineral Resources will be included in the EMP (Section 8 of this report) and will be adhered to by the applicant.

6.4 Mineral rights and defunct mines

6.4.1 South32 (formerly known as Ingwe Collieries Limited)

The said site is located on an undermined area, Witbank Colliery, of which the mineral rights were held by Ingwe Collieries Limited. Witbank Colliery is now a defunct mine under care and maintenance of South32 SA Coal Holdings (Pty) Ltd (referred to as South32).

An e-mail (dated: 10 June 2016; Appendix 13) and BID was forwarded to Mr. P. Lombard (Manager Closed Mines) and to Mr. D. Korff (Mining and Property Rights) (e-mail dated: 14 June 2016; Appendix 13) to inform them of the proposed development and to obtain comment.

Subsequently, a letter (dated: 1 July 2016; Ref: TNC/B/GEN/897; Appendix 14) was received from Mr. Korff informing the developer of the risks involved in developing on an undermined area. The following was indicated:

"With reference to the above matter and the proposed commercial development on a portion of portion 55 of the farm Blesboklaagte 296 JS, Witbank Emalahleni ('the Proposed Development'). The Proposed Development is situated on a mined out area situated over Witbank Colliery, which is a defunct mine under after care maintenance of this company.

We enclose herewith a copy of the following documents:
1. Background Information Document compiled by AdiEnvironmental cc, as 'Annexure 1', and
2. A plan showing the Proposed Development in relation to the mine-out underground working of Witbank Colliery, as 'Annexure 2'.

This company is of the opinion that the structures that the developer is planning to construct as part of the Proposed Development, will not be supported by the existing coal pillars of Witbank Colliery, and that there is a real and imminent risk of the Proposed Development on the land collapsing. Furthermore this company has filled in sinkholes in close proximity to the Proposed Development, and surroundings. The company herewith request that the developer set up a meeting in order for the company to inform it and its Trustees about the risks attendant upon the development.

If the relevant building plans have been approved for the development, this company was not consulted in relation thereto and this constitutes a serious omission in the approving of the building plans. The safety of the structures must be of paramount importance in taking a decision to approve a building plan and it is common knowledge that the area over which the development is being constructed is on top of undermined ground.

We hereby place on record that significant risks of cracking, subsidence and slipping exist should the project go ahead and this could lay the municipality open to significant claims for injury, death of persons or damage to property. The municipality in approving building plans has a duty of care to ensure that in granting such approvals, interested and affected parties are consulted and that all aspects relating to safety of the buildings are considered prior to any decision being taken to approve building plans. This duty arises both in terms of the municipal by-laws in terms of which the building plans are approved and in terms of the common law as the competent local authority over the relevant area.

We further record that failure to exercise your duty of care when approving building plans as with the approval of the building plans, results in you being responsible for any losses, injury or damages that may arise should such building over mined out areas be affected.

We would further welcome a meeting with the municipality and the relevant personnel within the municipality that deal with approvals of developments and building plans in order to vest the municipality with all of the requisite information in regard to the underground workings in the possession of this company so that the municipality is aware of the locality of such workings prior to considering the approval of any future building plans on areas overlying the old Witbank Colliery. Further to the above, we attach hereto a plan as 'Annexure 2' which plan clearly depicts the undermined areas over Witbank Colliery as well as other mined out areas of which we are aware of.

All of this company's rights in relation to the approval of the building plans for the said development, or should any future developments be approved by the municipality without taking into account the above consideration, are hereby reserved."

Response from AdiEnvironmental cc

A letter from AdiEnvironmental cc (dated: 12 September 2016; Appendix 14) was forwarded to Mr. D. Korff indicating that a risk analysis with regards to the undermining was conducted by SCIP Engineering Group (Pty) Ltd. A copy of the risk analysis was forwarded to South32 (Mr. D. Korff) for review and input.

AdiEnvironmental cc also requested that possible dates for a meeting be provided.

Response from South32

Subsequently, South32 forwarded a response (letter dated: 28 November 2016; Appendix 14) indicating the following:

Introduction -

The area earmarked for the proposed development is a portion of portion 55 of the farm Blesboklaagte 296 Js, Witbank Emalahleni ('the Property'). The Property was undermined in the early 1930's using drill and blast bord and pillar mining methods. The design was on a 40 (forty) feet centre with 20 (twenty) feet pillar width of approximately 6.1 (six comma one) metres and 20 (twenty) feet bord width with square pillars.

Approximately 3 (three) metres of the 5 (five) metre thick seam height, mined at an average depth of 28 (twenty eight) metres to the floor of the seam.

Discussion -
Any void created underground will eventually close over time. Those voids that are close to surface will modify the surface contours either by creating a subsidence trough with related slopes, or a series of sinkholes that eventually interlink. In the first instance the pillars collapse and the second instance, the bords and intersections collapse around the pillars. In either case, any structure built over the mining voids will be subject to the changes in surface elevations and tilts.

Until recently it has been difficult or near impossible to relate these inevitable consequences of mining to any timeframe. In the case of sinkholes, this is still true, though it is known that the cumulative number of sinkholes accelerates over time.

The Salamon and Munro database of stable and failed pillar areas used to create initial safety factor calculations (Salamon and Munro, 1967) following the 1960 Coalbrook disaster. Since that time, a database of stable and failed pillar cases have accumulated. Researchers have analyzed the combined databases representing over 120 years of South African coal mining and in doing so it has allowed long-term stability to be more clearly defined in terms of safety factor, probability of survival and pillar life index in years (van der Merwe and Mathey, 2013 and van der Merwe, 2016).

It is possible to investigate the Property and surrounding area by back analyzing the mining data using the latest understanding of long-term stability. The following table fulfils that function.

(refer to Table in Appendix 14)

As is evident from the above table the influence of roof scaling significantly destabilizes the pillar geometry even though the safety factor is relatively high. Van der Merwe suggests that any pillar system with a Pillar Life Index of less than 500 years should be considered unstable.

For a pillar system to be described as stable all 3 (three) parameters must be within acceptable values, these are considered as Safety Factor (vdM&M 2013) greater than 1.3, Pillar Life Index (vdMerwe 2016) greater than 500 years, and Probability of Survival greater than 95% by South32.

It is reasonable to expect that the immediate roof of the underground workings, which consists of 2 (two) metres of coal to delaminate in time and thus the height of the pillars to increase by the same amount. In addition, pillar side scaling takes place, reducing the load carrying core dimensions of the pillar. It is this time related deterioration that South32 is concerned about, when it comes to building over these workings which are already over 80 (eighty) years of age.

A recent pillar failure to the extent of 3.5 ha occurred in the mine workings of the same mine close to eMalahleni, these workings were of a similar age.

Conclusion -
South32 Coal Holdings Proprietary Limited, ('South32') respectfully contest the notion made by SCIP that there is no risk involved for either live/s or property with regards to the proposed development over the Property. South32 is concerned at the possibility of construction over these old mine

workings because there is a history of sinkholes and pillar collapses in the vicinity of eMalahleni and the back analysis indicates that the pillar system should not be considered stable.

It would be reckless not to bring own concerns to the attention of anyone considering building over the Property and the old mine workings in general.

Response from SCIP Engineering Group
SCIP Engineering Group forwarded a response letter (dated: 8 December 2016; Appendix 14) to South32 indicating the following:
"1. We are in complete agreement with the views of South32 regarding the long term stability of the structure above the undermining.

2. The presence of undermining of Witbank (now Emalahleni) is an unfortunate fact. It is a fact that at least some 250 hectare of the present town is undermined, yet informal settlement towards the west as well as the traditional business centre was built on it since the beginning of the previous century.

3. It is however also a fact that the strata of the undermined area differs from place to place. Writer has conducted many drill hole investigations which revealed the strata comprehensively.

4. The area under scrutiny here is not summarily labelled as being safe or without risk as suggested by the letter of Mr. Neal of South32.

Our risk analysis and views suggest the following:
4.1. There are hundreds of structures currently standing on the central business area.
4.2. No falls have known to occur in this particular area.
4.3. Writer attributes this to the presence of sound sandstone rock layers.
4.4. Falls have happened where these layers are missing.
4.5. Writer's risk assessment simply states that it is, in fact, better to build lightweight buildings because it eliminates:
- Storm water random intrusion into the mine.
- Vibration from traffic loads which is higher than building loads. Currently, heavy traffic (26 wheeler coal trucks) traverses the site. With this development, this will stop. Streets are re-routed to land on areas not undermined.
4.6 DMR has, in 2015, approved the building of a petrol/diesel station and a shopping centre on an area where the mine is full of water plus the strata structure is weak. This particular site was certified by SCIP as unsafe, leading to us being removed from the project.
4.7 Calculations show that the weight increase on the surface due to the buildings on this particular site is negligible, i.e. 0.5%.
4.8 The biggest risk of all is that of an underground fire. This is clearly stated in the risk assessment and cannot be curtailed.

5. It is plainly incorrect to suggest that SCIP Engineering ignores the risks associated with building over this particular area."

Response from South32
Subsequent to the reply from SCIP (letter dated: 25 January 2017; Appendix 14), South32 indicated that their legal team will forward a response.

Numerous phone calls were made and e-mails forwarded to South32 with regards to the response from the legal team. However, no further comment was received.

Response from AdiEnvironmental cc
The project applicant would have to obtain feedback from South32 with regards to the undermining issue before any construction takes place.

6.5 Adjacent landowners/users

Figure 6.4 provides an indication of the adjacent landowners/users in relation to the proposed site.

In order to determine the registered owners of the various properties, a Deeds Search was conducted via the WinDeed system of the Deeds Office of South Africa. The Deeds Search Template provides information pertaining to land ownership, size and land value of each of the properties.

The adjacent landowners were informed of the proposed development through the advertising process as indicated in Section 6.1 and the distribution of Background Information Documents. A copy of the Background Information Document is provided in Appendix 6.

Comments received from the adjacent landowners in response to the advertising and distribution of the Background Information Document are indicated below.

Table 6.2 provides an indication to which adjacent landowner/user Background Information Documents (BIDs; Appendix 6) were forwarded in order to inform them of the proposed project and to obtain their issues of concern. Figure 6.4 indicates the location of the various landowners as well as the closest homesteads.

Table 6.2: Identified adjacent land owners/users who received BIDs

PORTION OF BLESBOKLAAGTE (FIGURE 6.4)	LANDOWNER/ CONTACT PERSON	CORRESPONDENCE	COMMENTS
2, 127, 128, 144, 157, 232, 233, 234	Transnet - T. Mavulwana	E-mail (dated: 10 June 2016 and 21 June 2017; Appendix 13) with BID forwarded	None.
53, 109	Ingwe Surface Holdings Ltd (South32) - P. Lombard - D. Korff	E-mails (dated: 10 and 14 June 2016; Appendix 13) with BID forwarded.	Yes. See Section 6.4.2
55, 248	Jumbo van der Merwe Trust	N/A. The applicant.	N/A
74	Wolma Family Trust - C. Deiner	E-mail (dated: 8 June 2017; Appendix 13) with BID forwarded.	None.
174	eMalahleni Local Municipality - M. Makgalemele - E. Nkabinde	Email (dated: 10 June 2016; Appendix 13) with BID forwarded.	Yes. See Section 6.3.2
216	Sudden Impact Inv 76 (Pty) Ltd - P.R. Botha	E-mail (dated: 10 June 2016; Appendix 13) with BID forwarded.	None

PORTION OF BLESBOKLAAGTE (FIGURE 6.4)	LANDOWNER/ CONTACT PERSON	CORRESPONDENCE	COMMENTS
	- J. Vermeulen		
230	Willie Viviers Family Trust - M. Viviers Businesses located on property: - Witbank Panel Beaters (S. van der Merwe) - Always Towing (Pieter) - DM Services (S. van der Merwe	E-mail (dated: 12 June 2017; Appendix 13) with BID forwarded. BID hand delivered on 9 June 2017 and e-mail forwarded on 12 June 2017.	None None
1, 13, 14, 17, 19, 20 and 32	Anglo Operations Pty Ltd - J. Lourens	Registered as an Interested and Affected Party on behalf of Anglo Operations (Pty) Ltd on 15 June 2016	Yes. See Section 6.5.1

6.5.1 Anglo Operations Pty Ltd

Mr. J. Lourens registered as an Interested and Affected Party on behalf of Anglo Operations (Pty) Ltd on 15 June 2016 (Appendix 7). The following was indicated:

> "I want to register as an IAP for the planned development of a shopping centre on a portion of portion 55 of the farm Blesboklaagte 296 JS, as was advertised in the Witbank News of 19 June 2016. I am registering on behalf of Anglo Operations Pty Ltd, Geological Office.
>
> Anglo has interests in an area very close to the proposed development - refer to the attached map."

Response from AdiEnvironmental cc

An e-mail (dated: 15 June 2016; Appendix 7) was forwarded to Mr. Lourens indicating that he was registered as an I&AP. A Background Information Document was also forwarded. No further comment was received.

As indicated in Section 5.4, the defunct Anglo Operations Pty Ltd. mines are located approximately 1 km to the west of the proposed development site (i.e. towards the Klarinet industrial area). The proposed development will thus not have a direct impact on Anglo Operations Pty Ltd.

6.6 Department of Agriculture, Rural Development, Land and Environmental Affairs

The project was registered with the Department of Agriculture, Rural Development, Land and Environmental Affairs on 26 July 2017 (see cover letter and application dated: 26 July 2017; Appendix 1). In addition, a date for a meeting and site visit was requested.

Subsequently, a letter (dated: 8 August 2017; Ref: 1/3/1/16/1N-97; Appendix 1) was received from the Department acknowledging receipt of the application form. It was indicated that AdiEnvironmental cc may proceed with the Basic Assessment process.

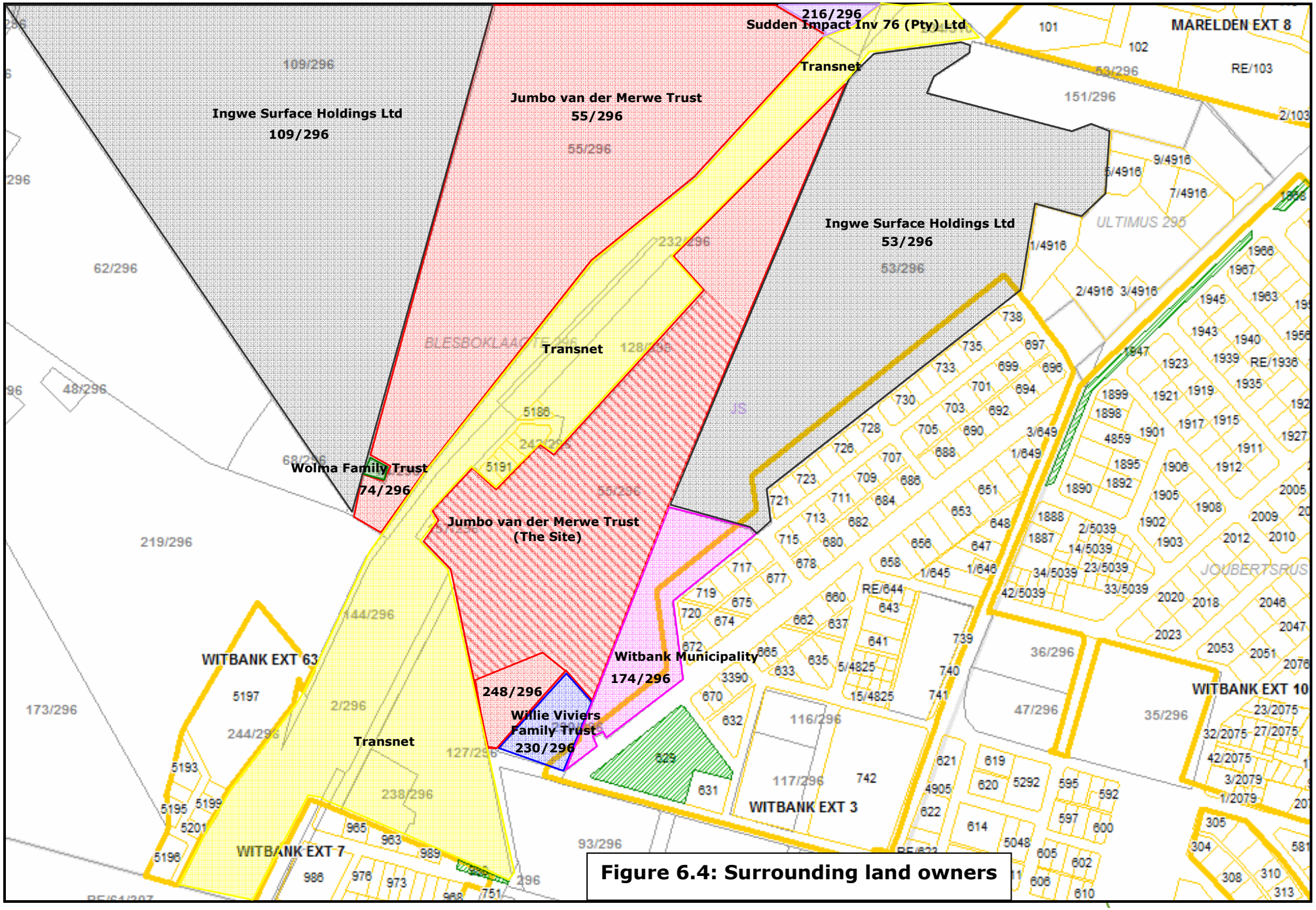

Figure 6.4: Surrounding land owners

6.7 List of Interested and Affected Parties

From the above public participation process, the following list of Interested and Affected Parties was compiled:

INTERESTED AND AFFECTED PARTY LIST	
Organisation	**Name**
Government Departments	
Department of Agriculture, Forestry and Fisheries	F Mashabela
Department of Agriculture, Rural Development, Land and Environmental Affairs - Directorate: Land Use and Soil Management – Ermelo	J Venter
Department of Co-Operative Governance and Traditional Affairs	M Loock
Department of Mineral Resources	S Mathavela
Department of Public Works, Roads and Transport	B Viljoen
Department of Rural Development and Land Reform	ND Nkambule F Mdushani
Department of Water and Sanitation	A Rambuda
Department of Agriculture, Rural Development, Land and Environmental Affairs	The Director
Other Organisations	
Eskom Distribution	T Ludere
Mpumalanga Tourism and Parks Agency (MTPA)	K Narasoo
South African Heritage Resources Agency (SAHRA)	Website
Telkom	J Smit
Local Municipality and Municipal Councillor	
eMalahleni Local Municipality	M Makgalemele E Nkabinde
Nkangala District Municipality	S Links
Ward 15 councillor	P Mashiane
Ward 20 councillor	R Cronje
Surrounding Landowners	
Property (Figure 6.4)	**Landowner/Contact person**
Undermined area - Portions 1, 13, 14, 17, 19, 20 and 32 of Blesboklaagte	Anglo Operations (Pty) Ltd. - J Lourens
Undermined area - Portions 53, 109 of Blesboklaagte	Ingwe Surface Holdings Ltd (South32) - P. Lombard; D. Korff
Gas pipeline extending across Portion 55 of Blesboklaagte	Sasol Gas - S. Reyneke; S. Bracey

INTERESTED AND AFFECTED PARTY LIST	
Portions 2, 127, 128, 144, 157, 232, 233 and 234 of Blesboklaagte	Transnet - T. Mavulwana
Portion 74 of Blesboklaagte	Wolma Family Trust - C. Deiner
Portion 174 of Blesboklaagte	eMalahleni Local Municipality
Portion 216 of Blesboklaagte	Sudden Impact Inv 76 (Pty) Ltd. - P.R. Botha; J. Vermeulen
Portion 230 of Blesboklaagte	Willie Viviers Family Trust - M. Viviers
Businesses located on Portion 230 of Blesboklaagte	Witbank Panel Beaters - S. van der Merwe Always Towing - Pieter DM Services - S. van der Merwe

7. ENVIRONMENTAL IMPACT DESCRIPTION AND EVALUATION

7.1 Introduction

This section of the report describes and evaluates the potential impact of the proposed development on the environment. The impact of the development has to be assessed in terms of the following development phases:

- **Planning and design phase**
- **Construction phase**
- **Operational phase**
- **Decommissioning phase**

7.2 Evaluation of impacts

The evaluation of impacts is conducted in terms of the following criteria:

- **Nature of impact**

- **Extent of impact**

Site	Effect limited to the site and its immediate surroundings
Local	Effect limited to within 3-5 km of the site
Regional	Effect will have an impact on a regional scale

- **Duration of impact**

Short	Effect lasts for a period 0 to 5 years
Medium	Effect continues for a period between 5 and 10 years
Long	Effect will cease after the operational life of the activity either because of natural process or by human intervention
Permanent	Where mitigation either by natural process or by human intervention will not occur in such a way or in such a time span that the impact can be considered transient

- **Probability**

Improbable	Less than 33% chance of occurrence
Probable	Between 33 and 66% chance of occurrence
Highly probable	Greater than 66% chance of occurrence
Definite	Will occur regardless of any prevention measures

- **Significance of impact**

Low	Where the impact will have a relatively small effect on the environment and will not have an influence on the decision
Medium	Where the impact can have an influence on the environment and the decision and should be mitigated
High	Where the impact definitely has an impact on the environment and the decision regardless of any possible mitigation

- **Status**

Positive	Impact will be beneficial to the environment
Negative	Impact will not be beneficial to the environment
Neutral	Positive and negative impact

It must be noted that many of the potential negative consequences can be mitigated successfully. It is however, necessary to make a thorough assessment of all possible impacts in order to ensure that environmental considerations are taken into account, in a balanced way, as far as possible, supporting the aim of creating a healthy and pleasant environment.

7.3 Planning and design phase

The planning and design phase involved mostly office work and site surveys with regards to the design of the layout plan, the Basic Assessment Report and the specialist studies. It also involves obtaining the necessary authorisations for the said development.

Six (6) test pits were excavated and closed as part of the geotechnical study. The excavation of the test pits impacted on small areas (±3m x 2m) of natural vegetation, soil and geology.

No actual construction took place on site.

7.4 Construction phase

As indicated in Section 3.1 and Figure 5.1, the proposed shopping centre will be located on a portion of Portion 55 of the farm Blesboklaagte 296 JS (an area of 10.1104 ha), eMalahleni. The development will comprise of the following as indicated in Figure 3.2:

- A main/primary shopping complex south of Main Street (i.e. on Portion 270) comprising a variety of shops, restaurants, parking areas, etc.;
- A warehouse type development north of Main Street (i.e. on Portion 271).
- Link services and internal reticulation (i.e. sewage, water, electricity, storm water control);
- Three access roads as indicated in Figure 5.22.

The construction phase would involve the following:

- clearing of vegetation and levelling of the site;
- excavation/earthworks for the service trenches and building foundations;
- installation of the services (i.e. water supply, electrical connections, sewer network, internal roads, storm water pipes);
- laying of the required foundations for buildings;
- building of the outer structures;
- installation of the required internal fittings;
- construction of access roads and traffic circles;
- surfacing/paving of parking area;
- rehabilitation of disturbed areas;
- landscaping.

Section 7.7 provides further details with regards to potential impacts identified.

As indicated in Section 3.1.1, Portion 269 comprises an existing church. This portion will be subdivided from the overall property and transferred to the church. No changes will be made to the existing church located in the

southern corner of the site. Portion 269 will thus not be assessed as part of this impact assessment since no additional construction or operational activities will take place.

Portion 268 will also be subdivided from the overall property and utilized as a right-of-way servitude to the existing church. As Portion 268 comprises the existing access road to the church, no additional construction or operational activities will take place. Portion 268 will thus not be assessed as part of this impact assessment.

7.5 Operational phase

The operational phase would involve the following:

- The utilization of the site, buildings and associated infrastructure for business/retail purposes.

Section 7.7 provides further details with regards to potential impacts identified.

7.6 Decommissioning phase

If required, this phase would involve the decommissioning of facilities constructed (at the said time) as part of this project (see Section 7.4).

The decommissioning phase will not be discussed in detail. It is recommended that at the time of decommissioning, a specific Environmental Management Programme (EMPr) be compiled which specifically addresses this phase. This EMPr would have to address issues such as the removal of building rubble and the rehabilitation of the site. Soil conservation measures would also have to be implemented.

7.7 Identification of potential impacts

The following tables provide an indication of the environmental features that will be impacted (directly and indirectly) during the construction, operational and decommissioning phases of the proposed project as indicated above.

ENVIRONMENTAL FEATURE(S)	PREDICTED IMPACT CONSTRUCTION PHASE AREA: ±10 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)	PREDICTED IMPACT OPERATIONAL PHASE AREA: ±10 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)	PREDICTED IMPACT PHASE: DECOMMISSIONING PHASE AREA: ±10 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)
TOPOGRAPHY	• The site is fairly flat with a gentle slope in a westerly direction towards the railway line. • In general, the construction activities (e.g. removal of vegetation, sloping of the site, construction of buildings, etc.) would have a direct impact on the topography and would result in changed runoff patterns and an increased risk of soil erosion if mitigation measures are not implemented. • The topography of the site and surrounding area have however, already been impacted by development.	SITE	SHORT	DEFINITE	MEDIUM NEGATIVE	LOW NEGATIVE	• Direct impact on topography will continue in terms of the presence of buildings and parking areas, which in turn will impact upon the runoff from the site.	SITE	LONG	DEFINITE	MEDIUM NEGATIVE	LOW NEGATIVE	During decommissioning, the buildings and associated infrastructure will be demolished and removed from site. The site will be top soiled and shaped to conform to the original slope of the area, which will have a positive impact on the runoff from the site.	SITE	LONG	DEFINITE	LOW POSITIVE	LOW POSITIVE
GEOLOGY	• The site is underlain by shale and shaly sandstone, grit, sandstone and conglomerate with coal of the Ecca Formation, Karoo Supergroup. • It should however, be noted that most of the coal layer has been mined by means of underground workings. • The direct impact on geology will depend on the depth of the excavations required for the buildings and associated infrastructure. The possible impact on the underlying geology cannot be mitigated.	SITE	PERMANENT	DEFINITE	LOW NEGATIVE	LOW NEGATIVE	• NONE. No further impact since no further construction would take place.						NONE. No further impact since no further construction would take place.					
	• During construction, the increased weight on the roof and coal pillars of the undermined area could cause collapse. However, Van As (2015) indicated that the increase in weight as a result of the buildings is negligible (0.5%).	SITE	PERMANENT	IMPROBABLE	MEDIUM NEGATIVE	MEDIUM NEGATIVE	• During the operational phase, the increased weight on the roof and coal pillars could cause collapse. However, Van As (2015) indicated that the increase in weight as a result of the buildings is negligible (0.5%).	SITE	PERMANENT	IMPROBABLE	MEDIUM NEGATIVE	MEDIUM NEGATIVE	Depending on the intended end land use, the removal of the buildings will reduce the weight on the underlying strata, which could minimize the risk of pillar/roof collapse.	SITE	LONG	PROBABLE	LOW NEUTRAL	LOW NEUTRAL
	• Storm water and leaking sewage are currently ponding on a portion of site. The construction activities could result in increased ponding if proper storm water management does not take place from the start and if the sewer lines are not repaired. According to Van As (2015), ponding surface water and sewage could seep into the underground workings, which could lead to pillar erosion. • Alternatively, the existing stormwater and sewage issues could be resolved during construction, improving the current situation.	SITE	SHORT	HIGHLY PROBABLE	MEDIUM NEGATIVE	MEDIUM POSITIVE	• If a proper storm water management system is not installed as part of the shopping centre, and if the sewer infrastructure is not maintained, it could lead to water ponding on site. According to Van As (2015), ponding surface water and sewage could seep into the underground workings, which could lead to pillar erosion.	SITE	LONG	HIGHLY PROBABLE	MEDIUM NEGATIVE	MEDIUM POSITIVE	The potential impact on the undermined area in terms of storm water intrusion would depend on the end land use of the site.					
	▪ An increase in vibration of the upper strata of the underground mine due to heavy vehicles traversing the site during construction could cause erosion and ultimately collapse of the pillars. However, due to the thick sandstone layers and 5m softer sandy crust, vibration is dampened and the impact is seen as negligible according to Van As (2015).	SITE	SHORT	PROBABLE	LOW NEGATIVE	LOW NEGATIVE	• According to Van As (2015), the development of the site will channel heavy vehicles along the non-mined areas present adjacent to the railway line and thus improve the current situation, where the undermined site is being traversed by heavy vehicles on a daily basis.	SITE	LONG	PROBABLE	LOW POSITIVE	LOW POSITIVE	During decommissioning, an increase in vibration due to heavy vehicles could cause erosion and ultimately collapse of the pillars. However, due to the thick sandstone layers and 5m softer sandy crust, vibration is dampened and the impact is seen as negligible according to Van As (2015).	SITE	SHORT	PROBABLE	LOW NEGATIVE	LOW NEGATIVE
	▪ According to Van As (2015), shock waves as a result of blasting could cause collapse of the roof and/or pillars. On most of the site, blasting would not be required due to the presence of soft material up to a depth of 3.5 m (Van As, 2015). However, according to Van der Merwe (2016), blasting may be required in geotechnical zone CHR for service and foundation excavations exceeding 2 m due to the presence of hardpan ferricrete. Mitigation measures would have to be implemented.	SITE	SHORT	PROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE	▪ NONE. No blasting should take place during the operational phase.						During decommissioning, the use of any explosives could cause shockwaves on the undermined area, which could lead to roof/pillar collapse.	SITE	SHORT	PROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE

ENVIRONMENTAL FEATURE(S)	PREDICTED IMPACT CONSTRUCTION PHASE AREA: ±10 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)	PREDICTED IMPACT OPERATIONAL PHASE AREA: ±10 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)	PREDICTED IMPACT PHASE: DECOMMISSIONING PHASE AREA: ±10 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)
GEOLOGY	▪ An old shaft to the underground workings is known to be present on site. Although the shaft was closed, it should be ensured that this area is geotechnically stable before construction takes place.	SITE	LONG	HIGHLY PROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE	• The old shaft to the underground workings would continue to impact on the buildings constructed on site if the shaft area was not correctly rehabilitated during the construction phase.	SITE	LONG	HIGHLY PROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE	The potential impact of the old shaft would depend on the end land use of the proposed site. No impact on the shaft is expected during the decommissioning phase.					
SOILS	• During construction, the soil of an area of ±10ha will be directly impacted in terms of soil structure, nutritional and chemical values when the vegetation and topsoil are removed, the site is sloped and the buildings and associated infrastructure are constructed. The soil will also be impacted in terms of stockpiling of topsoil, subsoil, overburden and rocks.	SITE	LONG	DEFINITE	MEDIUM NEGATIVE	LOW NEGATIVE	• Direct impact on soil will continue i.t.o. soil structure, nutritional and chemical values and soil compaction. • The various stockpiles will be removed and the stockpiling areas top soiled, levelled and rehabilitated/grassed on completion of the construction phase. This should have a positive impact on the soils during the operational phase of the project.	SITE	LONG	HIGHLY PROBABLE	LOW NEUTRAL	LOW NEUTRAL	The decommissioning activities will have an initial negative impact on the soil of the site in terms of disturbance (physical and biological properties). The removal of any polluted soil and proper rehabilitation of the site after decommissioning will however, have a positive impact on the soil.	SITE	SHORT	PROBABLE	LOW NEUTRAL	LOW NEUTRAL
	• Sediment transport and erosion may occur following the clearing of the site in preparation of construction. The impact is expected to be minimal since the site is relatively flat and no watercourses are located on or near the site. The R544 provincial road, Main Street, the unknown street, the church and adjacent businesses could however, be impacted in terms of sedimentation should mitigation measures not be implemented.	SITE	SHORT	PROBABLE	LOW NEGATIVE	LOW NEGATIVE	▪ It is unlikely that soil erosion will take place during the operational phase, since the parking bays, roads, etc. will be surfaced and storm water will be channelled into the existing ELM stormwater system.	SITE	SHORT	IMPROBABLE	LOW NEGATIVE	LOW NEGATIVE	Soil erosion could occur if the site is not revegetated properly after decommissioning.	SITE	SHORT	PROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE
	Soil pollution may occur if: • the construction vehicles are not maintained/repaired resulting in oil leaks and fuel spills; • waste management measures are not implemented, • proper ablution and sanitation facilities are not provided for the site workers to use on site. • It should be noted that soil pollution is currently taking place within the Portion 271 area located north of Main Street as a result of the leaking municipal sewer infrastructure and the dumping of waste. The construction of the shopping centre could thus have a positive impact on the soil in terms of addressing the sewage problem, removing the polluted soil from site and preventing further dumping of waste.	SITE SITE	SHORT SHORT	PROBABLE PROBABLE	MEDIUM NEGATIVE MEDIUM POSITIVE	LOW NEGATIVE MEDIUM POSITIVE	Soil pollution could occur if: • waste management measures are not implemented at the shopping centre; • unauthorised industrial activities are allowed on site; • the sewer infrastructure is not properly installed and maintained or does not have sufficient capacity resulting in leaking manholes, etc..	SITE	LONG	PROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE	Soil pollution may occur if: • The vehicles are not maintained/repaired resulting in oil leaks and fuel spills; • Waste management measures are not implemented; • Proper sanitation and ablution facilities are not provided for use by site workers.	SITE	LONG	HIGHLY PROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE
SOILS	• The site is classified as having moderate potential arable land (AGIS Comprehensive Atlas), which will be impacted as a result of construction. However, the site has not been cultivated for many years and no agricultural activities are taking place in the area. The soil has been impacted by various human activities as indicated in Section 6.5 and has been polluted in places as a result of leaking sewage and the dumping of waste.	SITE	SHORT	PROBABLE	LOW NEGATIVE	LOW NEGATIVE	NONE. No further construction will take place.						• The removal of any polluted soil and proper rehabilitation of the site after decommissioning will however, have a positive impact on the soil.	SITE	LONG	PROBABLE	MEDIUM POSITIVE	MEDIUM POSITIVE
	• In terms of excavation characteristics, Van der Merwe (2016) anticipates some excavation problems for trenches deeper than 2m in the south eastern portion of the site (Geotechnical Zone CHR; Figure 5.14) due to the presence of hardpan ferricrete in the south eastern portion of the site. Blasting may be required, which could impact on the roof and/or pillars of the undermined area.	SITE	SHORT	HIGHLY PROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE	NONE. No further construction will take place.						NONE. It is not anticipated that new trenches/foundations will be excavated.					

ENVIRONMENTAL FEATURE(S)	PREDICTED IMPACT CONSTRUCTION PHASE AREA: ±10 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)	PREDICTED IMPACT OPERATIONAL PHASE AREA: ±10 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)	PREDICTED IMPACT PHASE: DECOMMISSIONING PHASE AREA: ±10 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)
SOILS	• According to Van der Merwe (2016), the site contains slightly problematic material due to the presence of slightly collapsible sandy soil (Geotechnical Zone C1H). Special precautions with regards to services and structures will be required. • Although the exposed rock at depth should have adequate bearing capacities, the bedding planes within the quartzite, shale or mudstone must be inspected by a competent person during the placement of the foundations to ensure no failure occurs along these bedding planes. • In addition, rising damp and ponding of water could impact on structures (Geotechnical Zones CHR and C1H). • Mitigation measures would have to be implemented.	SITE	SHORT	HIGHLY PROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE	• The services and structures will continue to be impacted if the mitigation measures recommended by Van der Merwe (2016) were not implemented during the construction phase.	SITE	LONG	HIGHLY PROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE	NONE. The existing buildings will be decommissioned.					
	• According to Van der Merwe (2016), Geotechnical Zone PQ comprises an area in the southern portion of the site that was quarried and where spoil was dumped. This area would have to be rehabilitated before construction can take place.	SITE	SHORT	DEFINITE	MEDIUM NEGATIVE	LOW NEGATIVE	• The buildings on site would continue to be impacted in terms of cracks, etc. if the quarried areas were not properly rehabilitated during the construction phase.	SITE	LONG	HIGHLY PROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE	NONE. The area would have been rehabilitated during the construction phase.					
LAND USE / SENSE OF PLACE	▪ The construction activities should not have a negative impact on the surrounding properties or land uses as the proposed shopping centre is situated in close proximity to an established residential area, businesses and various other land use activities. ▪ The proposed site is however, earmarked for industrial development in the eMalahleni Local Municipality Spatial Development Framework (SDF; 2013/2014). According to Korsman & Associates (2017), a shopping centre would be better suited in this area since it can be viewed as an extension of the services and activities provided through the nearby CBD.	LOCAL	SHORT	HIGHLY PROBABLE	LOW POSITIVE	LOW POSITIVE	▪ The operational activities should not have a negative impact on the surrounding properties or land uses as the proposed shopping centre is situated in close proximity to an established residential area, businesses and various other land use activities. ▪ A shopping centre in this area will also provide commuters and residents in the area with a close-to-home, convenient place for shopping and social gatherings. ▪ It is also believed that the development of the property will contribute positively to the area in terms of a visual and aesthetical upgrade.	LOCAL	LONG	HIGHLY PROBABLE	LOW POSITIVE	LOW POSITIVE	The decommissioning of the buildings and associated infrastructure and rehabilitation of the site would allow for a different land use on site. The impact will depend on the existing land use in the area.	SITE	LONG	HIGHLY PROBABLE	LOW NEUTRAL	LOW NEUTRAL
	▪ A Sasol gas pipeline, water and sewer pipelines extend across the site. These pipelines (as well as Sasol, eMalahleni Local Municipality and surrounding landowners/users) could be impacted upon during the construction phase if the required way-leaves/approvals were not obtained beforehand and mitigation measures not implemented.	LOCAL	SHORT	HIGHLY PROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE	▪ A Sasol gas pipeline, water and sewer pipelines extend across the site. These pipelines (as well as Sasol, eMalahleni Local Municipality and surrounding landowners/users) could be impacted upon during the operational phase if mitigation measures are not implemented to protect the pipelines.	LOCAL	LONG	HIGHLY PROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE						
NATURAL VEGETATION/ ANIMAL LIFE	▪ The site is located in the Eastern Highveld Grassland, which has been classified as Endangered in Mucina et. al. (2006) and Vulnerable in the National List of Ecosystems that are threatened and in need of protection (GN 1002 of 2011). ▪ In terms of the Mpumalanga Biodiversity Sector Plan (MBSP, 2013), the southern portion of the site falls within the category 'Heavily Modified' and the northern portion 'Critical Biodiversity Area: Optimal'. However, according to Venter (2016), the classification of the northern portion of the site as a Critical Biodiversity Area is incorrect as the vegetation on site has been heavily modified. ▪ The development of the site will impact directly on ±10 ha of Disturbed/Transformed Grassland vegetation.	SITE	LONG	DEFINITE	MEDIUM NEGATIVE	LOW NEGATIVE	▪ No further direct impact on vegetation since no further construction activities will take place.						NONE. No further impact on vegetation since no further construction activities will take place.					

ENVIRONMENTAL FEATURE(S)	PREDICTED IMPACT CONSTRUCTION PHASE AREA: ±10 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)	PREDICTED IMPACT OPERATIONAL PHASE AREA: ±10 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)	PREDICTED IMPACT PHASE: DECOMMISSIONING PHASE AREA: ±10 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)
NATURAL VEGETATION/ ANIMAL LIFE	▪ Alien plants could be introduced into areas disturbed by construction, which are not rehabilitated.	SITE	SHORT	PROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE	▪ Alien plants could spread to adjacent properties should it be planted for landscaping purposes.	LOCAL	LONG	PROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE	Alien plants could be introduced into areas rehabilitated as part of the decommissioning phase. This could impact on the vegetation of the surrounding area.	SITE	LONG	PROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE
	• No plant species of conservation concern were noted on site. It is not anticipated that plant species of conservation concern or protected plants will be impacted by the construction activities since the site and surrounding area are very disturbed and therefore unlikely to support vulnerable/threatened plant populations.	SITE	LONG	IMPROBABLE	LOW NEGATIVE	LOW NEGATIVE	▪ No further direct impact on vegetation since no vegetation will be removed during the operational phase.						No further direct impact on vegetation since no vegetation will be removed during the operational phase.					
	▪ No large animal species are known to be present on site. It is not anticipated that the development will have a significant impact on animal life since the site and surrounding area are very disturbed and therefore unlikely to support much animal life. ▪ However, some vegetation is present on site, which could provide habitat for small mammals, reptiles, frogs, birds, etc. The construction activities could impact on any animal life (e.g. small mammals/birds) present on site during construction. ▪ According to Venter (2017), the proposed development is unlikely to have a significant impact on ecological corridors since it does not connect to significant open space areas. Most of the surrounding area has been developed.	SITE	LONG	PROBABLE	LOW NEGATIVE	LOW NEGATIVE	▪ No further direct impact on animal life since no further construction activities will take place.						No further direct impact on animal life since no further construction activities will take place.					
SURFACE WATER/SENSITIVE LANDSCAPES	▪ The construction activities will not impact directly on any surface water environments (wetlands, river, stream, etc). The closest river/streams are located ± 1.5 km northwest (Blesbokspruit) and 1.5 km southwest (tributary of the Brugspruit) of the site. Other properties are located between these rivers/streams and the said site. In addition, no wetlands are located on or within 500 m of the site. ▪ In general, the removal of the vegetation and the earthworks required during the construction phase would result in changed runoff patterns, which could result in soil erosion if proper storm water control measures are not implemented. This could impact on the adjacent roads, businesses and the church. ▪ Storm water from the residential area located east of the site is channelled onto the site, where it ponds. This storm water could impact on the construction activities should construction take place during the rainy season. Mitigation measures would thus have to be implemented to divert the storm water from site. ▪ In addition, the municipal sewer lines on site are leaking leading to the ponding of sewage on site. The sewer lines would have to be repaired before construction takes place.	SITE SITE	SHORT SHORT	PROBABLE DEFINITE	MEDIUM NEGATIVE MEDIUM NEGATIVE	LOW NEGATIVE LOW NEGATIVE	▪ No direct impact expected since no surface water environments (e.g. wetlands/ stream/rivers) are present on or near the site. ▪ The buildings and parking area will continue to impact on the surface water runoff of the site. If not well managed, increased runoff could impact on the municipal storm water infrastructure, the road network, the businesses on site, adjacent businesses and the church.	SITE	LONG	PROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE	During the decommissioning phase, building rubble and any polluted soil will be removed from the site and disposed of accordingly. The said area will then be rehabilitated in order to establish a vegetation cover and prevent soil erosion. This would result in clean runoff from the site.	SITE	LONG	PROBABLE	LOW POSITIVE	LOW POSITIVE

ENVIRONMENTAL FEATURE(S)	PREDICTED IMPACT CONSTRUCTION PHASE AREA: ±10 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)	PREDICTED IMPACT OPERATIONAL PHASE AREA: ±10 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)	PREDICTED IMPACT PHASE: DECOMMISSIONING PHASE AREA: ±10 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)
SURFACE WATER/SENSITIVE LANDSCAPES	Surface water runoff may be polluted if: • the construction vehicles are not maintained/repaired resulting in oil leaks and fuel spills; • waste management measures are not implemented, ▪ proper ablution and sanitation facilities are not provided for the site workers to use on site; It should be noted that the surface water runoff is currently being polluted by the leaking sewage in the northern portion of the site. The sewer lines would have to be repaired by the ELM before construction takes place.	SITE	SHORT	PROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE	▪ Indirect pollution of surface water runoff could take place if: ▪ the sewer system does not have sufficient capacity and is not maintained; ▪ unauthorised industrial activities are allowed on site and effluent is released into the storm water system; ▪ proper waste management measures are not implemented.	SITE	LONG	PROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE	Surface water runoff may be polluted if the heavy vehicles are not maintained/repaired resulting in oil leaks and fuel spills and if waste management measures are not implemented.	SITE	SHORT	PROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE
	• Storm water and leaking sewage is currently ponding on site. The construction activities could result in increased ponding if proper storm water management does not take place from the start and if the sewer lines are not repaired. According to Van As (2015), ponding surface water and sewage could seep into the underground workings, which could lead to pillar erosion. • Alternatively, the existing stormwater and sewage issues could be resolved during construction, improving the current situation.	SITE	SHORT	HIGHLY PROBABLE	MEDIUM NEGATIVE	MEDIUM POSITIVE	• If a proper storm water management system is not installed as part of the shopping centre, and if the sewer infrastructure is not maintained, it could lead to water ponding on site. According to Van As (2015), ponding surface water and sewage could seep into the underground workings, which could lead to pillar erosion.	SITE	LONG	HIGHLY PROBABLE	MEDIUM NEGATIVE	MEDIUM POSITIVE	The potential impact on the undermined area in terms of storm water intrusion would depend on the end land use of the site.					
GROUNDWATER	▪ The risk of groundwater pollution as a result of the construction activities is negligible. Van der Merwe (2016) did not encounter water seepage in any of the test pits and Venter (2016) did not identify any wetlands on site or within a 500 m radius of the site. In addition, the said site and surrounding area have been undermined, which would have impacted on the groundwater aquifers.						▪ The risk of groundwater pollution as a result of the operational activities is negligible. Van der Merwe (2016) did not encounter water seepage in any of the test pits and Venter (2016) did not identify any wetlands on site or within a 500 m radius of the site. In addition, the said site and surrounding area have been undermined, which would have impacted on the groundwater aquifers.						The potential impact on the groundwater would depend on the end land use of the site.					
	▪ No groundwater abstraction will take place and therefore there will be no impact on groundwater quantity/volumes.						▪ No groundwater abstraction will take place and therefore there will be no impact on groundwater quantity/volumes.											
SITES OF ARCHAEOLOGICAL/ CULTURAL INTEREST	NONE. No sites of archaeological/cultural interest are known to be present on site as indicated by Van Vollenhoven (2017).						NONE. No sites of archaeological/cultural interest are know to be present on site as indicated by Van Vollenhoven (2017).						NONE. No sites of archaeological/cultural interest are know to be present on site as indicated by Van Vollenhoven (2017).					
	▪ The site is underlain by shale, shaly sandstone, grit and sandstone of the Vryheid Formation sandstone, which has a 'Very High' palaeontological sensitivity. It should however, be noted that the said site is undermined and the coal layers mostly removed. ▪ The direct impact on the palaeontology will depend on the depth of the excavations required for the buildings and associated infrastructure. ▪ Construction activities could impact on fossils contained in the topsoil, subsoil and overburden of the site.	SITE	PERMANENT	IMPROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE	NONE. The operational activities will have no direct or indirect impact on the palaeontology of the site as no further construction will take place.						NONE. The decommissioning activities will have no direct or indirect impact on the palaeontology of the site as no further construction will take place.					

ENVIRONMENTAL FEATURE(S)	PREDICTED IMPACT CONSTRUCTION PHASE AREA: ±10 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)	PREDICTED IMPACT OPERATIONAL PHASE AREA: ±10 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)	PREDICTED IMPACT PHASE: DECOMMISSIONING PHASE AREA: ±10 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)
AIR QUALITY	▪ Dust generation and vehicle emissions due to construction activities and use of heavy machinery could impact on site workers, the adjacent businesses, the nearby residential area, the church, ELM License Department, the railway station and houses and road users. The extent of the impact would depend on the time of year, wind direction and velocity. ▪ The air quality of the site and surroundings could be impacted in terms of odours if: ○ the chemical toilets used during construction are not maintained; ○ proper waste management measures are not implemented. ▪ It should be noted that the air quality of the site is already impacted as a result of odours (leaking sewage) and dust (e.g. utilization of gravel roads on site).	SITE	SHORT	HIGHLY PROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE	• During the operational phase, no direct impact on the air quality is anticipated as the development will be supplied with electricity. • The internal roads and parking areas would be tarred/paved and therefore no dust generation will take place. • Vehicle emissions could impact on the air quality of the site and immediate surroundings due to the increased number of vehicles utilizing the roads. • The air quality of the site and surroundings could be impacted in terms of odours if: ○ the sewer system does not have capacity and is not maintained resulting in sewage leaks; ○ proper waste management measures are not implemented. This could impact on the various shop owners and customers.	LOCAL	LONG	HIGHLY PROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE	Dust generation and vehicle emissions due to decommissioning activities and use of heavy machinery could impact on site workers and the adjacent land users. The extent of the impact would depend on the time of year, wind direction and velocity.	SITE	SHORT	PROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE
VISUAL	▪ Due to the flat topography of the area, the construction activities will be highly visible from the surrounding properties (e.g. businesses, residential area, ELM License Department, railway station and houses, etc.) and adjacent roads. ▪ The site should thus be kept neat and tidy during the construction phase. ▪ During the construction phase, waste and spoil dumped on site will have to be removed and the leaking sewer line will have to be repaired, which will have a positive impact in terms of the aesthetics of the site.	SITE SITE	SHORT SHORT	DEFINITE HIGHLY PROBABLE	MEDIUM NEGATIVE MEDIUM POSITIVE	LOW NEGATIVE MEDIUM POSITIVE	▪ Due to the flat topography of the area, the shopping centre will be highly visible from the surrounding properties (e.g. businesses, residential area, ELM License Department, railway station and houses, etc.) and adjacent roads. ▪ The site should thus be kept neat and tidy during the operational phase. ▪ If the shopping centre is well maintained and managed, the development will contribute positively to the area in terms of a visual and aesthetical upgrade.	SITE SITE	LONG LONG	DEFINITE HIGHLY PROBABLE	MEDIUM NEGATIVE MEDIUM POSITIVE	LOW NEGATIVE MEDIUM POSITIVE	The decommissioning activities could impact on adjacent land owners and road users depending on the nature of the area at the time of decommissioning. If the site is rehabilitated and not developed again, the removing of building rubble and revegetation of the site could have a positive impact in terms of visual aspects.	SITE	LONG	PROBABLE	LOW NEUTRAL	LOW NEUTRAL
NOISE	▪ In general, the ambient noise level of the site is relatively high since the site is located adjacent to the railway line, existing businesses, the R544 provincial road, Main Street, the ELM License Department and a church. Activities on site also contribute to the ambient noise level e.g. learner drivers practising with heavy vehicles on and adjacent to the site. ▪ Heavy machinery used during the construction phase will contribute to increased ambient noise levels in the area, which could impact on the construction workers and the adjacent land users and road users. In addition, the surrounding land and road users could be impacted upon should blasting be required. ▪ The impact would however, be of short term.	SITE	SHORT	HIGHLY PROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE	▪ Operational noise would be created by the various businesses that form part of the shopping centre, by vehicles traversing the site and by customers. ▪ The operational noise could impact on the residential area located east of the site and the church located in the southern corner of the property. ▪ However, the noise levels in the area are already elevated.	SITE	LONG	HIGHLY PROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE	In general, the use of heavy machinery for decommissioning activities would impact on the surrounding area in terms of noise.	SITE	SHORT	PROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE

ENVIRONMENTAL FEATURE(S)	PREDICTED IMPACT CONSTRUCTION PHASE AREA: ±10 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)	PREDICTED IMPACT OPERATIONAL PHASE AREA: ±10 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)	PREDICTED IMPACT PHASE: DECOMMISSIONING PHASE AREA: ±10 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)
TRAFFIC	▪ All construction activities (except for the road upgrades) will take place on site and will not directly impact on traffic. ▪ The delivery of building material during the construction period could lead to a slight increase in traffic on the local road network (i.e. the R544 provincial road, Main Street, etc.). The deliveries would however, not occur on a continuous basis.	SITE	SHORT	PROBABLE	LOW NEGATIVE	LOW NEGATIVE	▪ The proposed activity will lead to an increase in traffic along the local road network. According to Mamabolo (2016), the proposed development would generate 761 combined trips during the weekday afternoon peak traffic and 1 089 during Saturday peak hour. • Traffic flow at the intersections on both sides of the railway line (i.e. R544/Main Street and R544/unknown road to Coronation) will be impacted if these intersections are not upgraded.	LOCAL	LONG	HIGHLY PROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE	Building rubble and other waste would have to be removed from site. This could lead to a slight increase in traffic on the road network. The impact would depend on traffic volumes in the area at the time. Impact on traffic after decommissioning will however, depend on the intended end land use.	SITE	SHORT	PROBABLE	LOW NEGATIVE	LOW NEGATIVE
	▪ The upgrading of the R544/unknown road and R544/Main Street intersections, and the new access points in Main Street and the unknown street on the western boundary of the site could impact on the traffic utilizing these roads. The impact should however, be of short duration. Mitigation measures in terms of road safety would have to be implemented.	SITE	SHORT	DEFINITE	MEDIUM NEGATIVE	LOW NEGATIVE	▪ The proposed new intersection upgrades would be beneficial to road users since some of the intersections are currently operating over capacity.	LOCAL	LONG	HIGHLY PROBABLE	MEDIUM POSITIVE	MEDIUM POSITIVE						
INTERESTED AND AFFECTED PARTIES	▪ ±250 job opportunities would be provided during the construction phase.	SITE	SHORT	DEFINITE	MEDIUM POSITIVE	MEDIUM POSITIVE	▪ ±150 job opportunities would be provided during the operational phase.	SITE	LONG	DEFINITE	MEDIUM POSITIVE	MEDIUM POSITIVE	The impact of the decommissioning of the development in terms of interested and affected parties will depend on the character of the area at that time as well as the intended end land use.					
	▪ Contractors working on site could be directly impacted upon if the necessary safety and occupational health measures are not adhered to.	SITE	SHORT	HIGHLY PROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE	▪ The shop owners, employees and customers at the shopping centre could be directly impacted upon if the necessary safety and occupational health measures are not implemented at the shopping centre.	SITE	LONG	HIGHLY PROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE						
	NONE.						▪ The proposed shopping centre would have a positive impact in terms of the local economy and providing commuters and residents with a close-to-home, convenient place for shopping and social gatherings.	REGIONAL	LONG	HIGHLY PROBABLE	LOW POSITIVE	LOW POSITIVE						
	▪ A Sasol gas pipeline extends through the said site. Sasol, as well as site workers, nearby businesses, residences, road users and other land users could be impacted upon should the stipulated conditions not be adhered to and the gas pipeline be damaged in any way during construction. Damage to the gas pipeline could lead to gas leaks, an explosion and loss of life.	LOCAL	SHORT	HIGHLY PROBABLE	HIGH NEGATIVE	LOW NEGATIVE	▪ A Sasol gas pipeline extends through the said site. Sasol, as well as shop owners, customers, employees, nearby businesses, residences, road users and other land users could be impacted upon should the stipulated conditions not be adhered to and the gas pipeline be damaged in any way during the operational phase. Damage to the gas pipeline could lead to gas leaks, an explosion and loss of life.	LOCAL	SHORT	PROBABLE	HIGH NEGATIVE	LOW NEGATIVE						
	• NONE						• Development of the site will improve the aesthetics of the area since the site would no longer be used for the illegal dumping of waste and spoil, informal parking, etc. In addition, the property would no longer be vacant, which would improve security in the area and make the site unavailable for informal settlement.	LOCAL	LONG	HIGHLY PROBABLE	MEDIUM POSITIVE	MEDIUM POSITIVE						

ENVIRONMENTAL FEATURE(S)	PREDICTED IMPACT CONSTRUCTION PHASE AREA: ±10 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)	PREDICTED IMPACT OPERATIONAL PHASE AREA: ±10 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)	PREDICTED IMPACT PHASE: DECOMMISSIONING PHASE AREA: ±10 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)
INTERESTED AND AFFECTED PARTIES	• The connection of the services (water, electricity, sewage) to the municipal infrastructure could impact on the land users in the area in terms of service interruptions.	SITE	SHORT	HIGHLY PROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE	• The shop owners, customers and employees at the shopping centre as well as surrounding land users could be impacted upon if the services (water, sewage, storm water, electricity, roads) do not have sufficient capacity for the proposed development.	SITE	LONG	DEFINITE	MEDIUM NEGATIVE	MEDIUM NEGATIVE	The impact of the decommissioning of the development in terms of interested and affected parties will depend on the character of the area at that time as well as the intended end land use.					
	• Municipal sewer and water pipelines are located in the northern and southern portions of the site. The Municipality and its users could be impacted if these pipelines are damaged in anyway by the construction activities.	SITE	SHORT	PROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE	• The municipality and its users could be impacted if the sewer and water pipelines located in the southern and northern portions of the site are damaged in any way during the operational phase or if the layout plan was not adhered to and the municipality no longer has access to these pipelines.	SITE	SHORT	PROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE						
	• NONE						• Currently, no paved pedestrian walkways or public transport lay-byes are located in the vicinity of the site. The provision of pedestrian walkways and taxi bays as part of the development will benefit the local community in terms of pedestrian safety and easy access to public transport.	LOCAL	LONG	HIGHLY PROBABLE	MEDIUM POSITIVE	MEDIUM POSITIVE						
	• The gravel roads in the northern portion of the site are currently utilized by Code 10 learner drivers. The driving schools and learner drivers would be impacted upon in terms of no longer being able to utilize the said site for driving lessons. Various open spaces and roads are however, available in the surrounding area for driving lessons.	SITE	LONG	DEFINITE	LOW NEGATIVE	LOW NEGATIVE	• The gravel roads in the northern portion of the site are currently utilized by Code 10 learner drivers. The driving schools and learner drivers would be impacted upon in terms of no longer being able to utilize the said site for driving lessons. Various open spaces and roads are however, available in the surrounding area for driving lessons.	SITE	LONG	DEFINITE	LOW NEGATIVE	LOW NEGATIVE						
	• The church could be impacted upon in terms of construction noise, should construction activities take place on Sundays during church services.	SITE	SHORT	IMPROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE	• The church could be impacted upon by increased noise levels during church services should the shopping centre be open on Sundays.	SITE	LONG	PROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE						
	• The subdivision of the church portion (i.e. Portion 269) and the subsequent transfer of the property to the church, will be beneficial to the church since the property would belong to the church.	SITE	LONG	DEFINITE	MEDIUM POSITIVE	MEDIUM POSITIVE	• The subdivision of the church portion (i.e. Portion 269) and the subsequent transfer of the property to the church, will be beneficial to the church since the property would belong to the church.	SITE	LONG	DEFINITE	MEDIUM POSITIVE	MEDIUM POSITIVE						
	• As previously indicated, the said site is undermined. A risk assessment conducted by Van As (2015) indicated that a shopping centre can be constructed on the undermined area subject to certain conditions. • Should these conditions not be adhered to, various stakeholders (e.g. South32, the ELM, the developer, contractors and employees) could be impacted upon should sinkholes or subsidence occur during the construction phase.	SITE	LONG	IMPROBABLE	HIGH NEGATIVE	LOW NEGATIVE	• As previously indicated, the said site is undermined. A risk assessment conducted by Van As (2015) however, indicated that a shopping centre can be constructed on the undermined area subject to certain conditions. • Should these conditions not be adhered to, various stakeholders (e.g. South32, the ELM, the developer, shop owners, customers, employees, etc.) could be impacted upon should sinkholes or subsidence occur during the operational phase.	SITE	LONG	IMPROBABLE	HIGH NEGATIVE	LOW NEGATIVE						

ENVIRONMENTAL FEATURE(S)	PREDICTED IMPACT CONSTRUCTION PHASE AREA: ±10 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)	PREDICTED IMPACT OPERATIONAL PHASE AREA: ±10 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)	PREDICTED IMPACT PHASE: DECOMMISSIONING PHASE AREA: ±10 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)
INTERESTED AND AFFECTED PARTIES	• According to Van As (2015), the development of the shopping centre (lightweight buildings) on the undermined area will be better than leaving the site vacant because it eliminates: • The ponding and seepage of storm water into the mine. • Vibration from traffic loads which is higher than building loads.	SITE	LONG	PROBABLE	MEDIUM POSITIVE	MEDIUM POSITIVE	• According to Van As (2015), the development of the shopping centre (lightweight buildings) on the undermined area will be better than leaving the site vacant because it eliminates: • The ponding and seepage of storm water into the mine. • Vibration from traffic loads which is higher than building loads.	SITE	LONG	PROBABLE	MEDIUM POSITIVE	MEDIUM POSITIVE	The impact of the decommissioning of the development in terms of interested and affected parties will depend on the character of the area at that time as well as the intended end land use.					
	• According to Van As (2015), the developer accepts that fire is the only risk that cannot be managed. The underground is connected to the undermining of the rest of the CBD and fire in one area could spread to the other areas. A fire would put the entire western section of eMalahleni CBD at risk. It should however, be noted that the construction activities will not increase the risk of fire.	LOCAL	LONG	PROBABLE	MEDIUM NEGATIVE	MEDIUM NEGATIVE	• According to Van As (2015), the developer accepts that fire is the only risk that cannot be managed. The underground is connected to the undermining of the rest of the CBD and fire in one area could spread to the other areas. A fire would put the entire western section of eMalahleni CBD at risk. It should however, be noted that the operational activities will not increase the risk of fire.	LOCAL	LONG	PROBABLE	MEDIUM NEGATIVE	MEDIUM NEGATIVE					
	• Other impacts in terms of the natural environment, noise, visual, traffic, etc. are indicated in the above-mentioned sections.						• Other impacts in terms of the natural environment, noise, visual, traffic, etc. are indicated in the above-mentioned sections.										

7.8 'No project' impacts

The 'no project option' is the alternative of not going ahead with the proposed development. The 'no project option' is only considered if it is found that the development will have significant negative impacts on the environment, which cannot be mitigated or managed.

If the 'no project option' in terms of the proposed project was exercised, it would mean that:

- The applicant would have to investigate other land uses for the site;
- The site would remain vacant;
- The applicant would have to discard the proposed development plans;
- The applicant would have to investigate alternative sites for the proposed shopping centre;
- The applicant would have to sell the property;
- The people residing in the north western parts of eMalahleni would not have easy access to a shopping centre;
- The proposed project would also create job opportunities (construction phase: ±250 employees; operational phase: ±150 employees), which would be lost if the project does not go ahead.

7.9 Cumulative impacts

The development of the said site will not impact directly on any surface water environments (e.g. wetlands/ stream/rivers) or the 1: 100 year flood line. The closest stream is located approximately 1.5 km from the site and no wetlands are located within 500 of the site.

Approximately 10 hectares of Eastern Highveld Grassland (classified as Vulnerable) will be lost as a result of the development, which will lead to an overall loss of this vegetation type. However, the vegetation on site has been heavily impacted. Bare areas and many weeds and alien invader species are present.

The proposed development together with all other developments in eMalahleni would impact on the services (water and sewage) provided by the local municipality. The eMalahleni Local Municipality must ensure that the required services can be provided and that there is sufficient capacity at the sewage works, waste site, water works and substations to cater for this development.

The existing storm water system of the adjacent residential area could impact on the site if the said system was not incorporated as part of the overall storm water management plan for the development. Ponding of water on site must be avoided as indicated by Van As (2015) as this could result in the seepage of water into the underground workings which could erode the pillars, over time having a cumulative impact on the undermined areas and leading to subsidence/sinkholes.

In addition to the above-mentioned, the proposed development would add to the cumulative impact of traffic on the existing road network. The affected intersections must be upgraded as proposed by Mamabolo (2016) in order to prevent a potential impact on the general road user and the railway line crossing.

It is anticipated that the shopping centre would have a positive impact on the local economy, will provide much needed job opportunities and will contribute positively to the area in terms of a visual and aesthetical upgrade.

In addition, the proposed shopping centre would provide commuters and residents in this area with a close-to-home, convenient place for shopping and social gatherings.

8. ENVIRONMENTAL MANAGEMENT PROGRAMME

8.1 Definition and objectives

The Environmental Management Programme (EMPr) was compiled in accordance with Appendix 4 of the Environmental Impact Assessment (EIA) Regulations, 2014 (as amended) as well as the Western Cape Guideline for Environmental Management Plans (Lochner, 2005).

According to the Western Cape Guideline, an Environmental Management Programme (EMPr) can be defined as:

> *An environmental management tool used to ensure that undue or reasonably avoidable adverse impacts of the construction, operation and decommissioning of a project are prevented; and that the positive benefits of the projects are enhanced.*

According to the EIA Regulations, 2014 (as amended), an EMPr must include-
(d) A description of the impact management outcomes, including management statements, identifying the impacts and risks that need to be avoided, managed or mitigated as identified through the environmental impact assessment process for all phases of the development including -
(i) planning and design;
(ii) pre-construction and construction activities;
(iii) operation or undertaking of the activity;
(iv) rehabilitation of the environment; and
(v) closure, where relevant.

This section therefore provides an indication of the mitigation measures to be implemented by the site operator (and site workers) in order to reduce the potential impacts identified (see Section 7).

8.2 Contact details

An EMPr must include -
(a) details of-
(i) the EAP who prepared the environmental management programme; and
(ii) the expertise of that person to prepare an environmental management programme, including a curriculum vitae.

The contact details and expertise of the environmental consultant are provided in Section 2 of this report.

The applicant will be responsible for the implementation of the EMPr. The contact details are provided in Section 2.

8.3 Description of the proposed project

An EMPr must provide -
(b) a detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description.
(c) a map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers.

A detailed description of the proposed development and aspects covered by the EMPr is provided in Section 3 of this report.

Section 5 provides a description of the biophysical environment of the site.

As indicated in Section 5.14, no sensitive environments (e.g. watercourses, sites of cultural heritage significance, etc.) are known to be present on site or will be directly impacted by the proposed shopping centre.

8.4 Phases of the development and timeframe

8.4.1 Planning and design phase and pre-construction activities

The planning and design phase involved mostly office work and site surveys with regards to the design of the layout plan, the Basic Assessment Report and the specialist studies. It also involves obtaining the necessary authorisations for the said development.

Six (6) test pits were excavated and closed as part of the geotechnical study. The excavation of the test pits impacted on small areas (±3m x 2m) of natural vegetation, soil and geology.

No actual work (construction or pre-construction activities) took place on site. Therefore, no mitigation measures need to be implemented.

8.4.2 Construction phase

The construction phase would involve the following:

- clearing of vegetation and levelling of the site;
- excavation/earthworks for the service trenches and building foundations;
- installation of the services (i.e. water supply, electrical connections, sewer network, internal roads, storm water pipes);
- laying of the required foundations for buildings;
- building of the outer structures;
- installation of the required internal fittings;
- construction of access roads and traffic circles;
- surfacing/paving of parking area;
- rehabilitation of disturbed areas;
- landscaping.

Section 7.7 provides further details with regards to potential impacts identified.

As indicated in Section 3.1.1, Portion 269 comprises an existing church. This portion will be subdivided from the overall property and transferred to the church. No changes will be made to the existing church located in the southern corner of the site. Portion 269 will thus not be assessed as part of this impact assessment since no additional construction or operational activities will take place.

Portion 268 will also be subdivided from the overall property and utilized as a right-of-way servitude to the existing church. As Portion 268 comprises the existing access road to the church, no additional construction or operational activities will take place. Portion 268 will thus not be assessed as part of this impact assessment.

Construction phase:
12-18 months

8.4.3 Operational phase

The operational phase would involve the following:

- The utilization of the site, buildings and associated infrastructure for business/retail purposes.

Section 7.7 provides further details with regards to potential impacts identified. Mitigation and management measures are indicated in Section 8.5.

Operational timeframe:
Unknown.

8.4.4 Decommissioning and rehabilitation phase

This phase would involve the decommissioning of the buildings and infrastructure already constructed on site at that particular date, if ever required. This phase will not be discussed in detail. It is recommended that at the time of decommissioning, a specific Environmental Management Programme (EMPr) be compiled which specifically addresses this phase. This EMPr would have to address issues such as the removal of building rubble, ripping of the soil, the sowing of seed and the maintenance of the vegetation until it is established. Soil conservation measures would also have to be implemented.

8.5 Mitigation and management measures to be implemented

An EMPr must include -
(f) a description of proposed impact management actions, identifying the manner in which the impact management outcomes contemplated in paragraphs (d) will be achieved, and must, where applicable, include actions to -
(i) avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;
(ii) comply with any prescribed environmental management standards or practices;
(iii) comply with any applicable provisions of the Act regarding closure, where applicable; and
(iv) comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable.

8.5.1 Construction site office

Impact management outcome:

1) *To ensure that an appropriate site is selected for the construction site office and that the site office is managed in an environmentally responsible manner with the least impact on the natural environment, site workers and adjacent landowners/users.*

Mitigation and management measures:

a. A suitable site must be selected, demarcated and fenced for the construction site office within the demarcated site boundaries.
b. No overnight accommodation may be provided on site.
c. Chemical toilets must be provided for use by the site workers. These must be serviced on a regular basis. No long drop toilets may be allowed.
d. Potable water must be made available to site workers.
e. The waste management measures as indicated in Section 8.5.8 must be implemented.
f. An area for the parking of construction vehicles and other vehicles should be clearly demarcated. When not in use, all vehicles should be parked within this area. The demarcated parking area should be located within or in close proximity to the construction site office.
g. As far as practically possible, vehicles must not be serviced/repaired on site. However, should it not be possible to take the vehicle to a service centre in town for repair, the contractor must ensure that the vehicles are serviced/repaired on a cement slab and that drip trays are utilized. Waste oil, filters, etc. must be properly disposed of (see Section 8.5.8).

8.5.2 General construction principles

Impact management outcome:

1) *To ensure that the activities that occur during the construction phase have the least impact on the natural environment, site workers and adjacent landowners/users.*

Mitigation and management measures:

a. All relevant authorisations must be obtained before construction commences.
b. The applicant/contractor must appoint a Safety Officer and Environmental Control Officer (ECO) in order to ensure compliance with the legislation.
c. All construction activities must be limited to the said site. The said site should be properly demarcated (or fenced) and the footprint kept as small as possible.
d. No members of the general public should be allowed at the construction site.
e. Any significant changes to the layout plan would necessitate approval from the Department of Agriculture, Rural Development, Land and

8.5.2 General construction principles

Environmental Affairs.

f. No unnecessary removal of vegetation should take place.

g. An area must be selected (within the said site) and demarcated for the stockpiling of spoil (e.g. rocks, soil, etc.) until rehabilitation, or until the spoil is disposed of.

h. Should any animals (e.g. reptiles or mammals) be found during the construction phase, a specialist should be contacted immediately to ensure the safe removal of the specimen(s).

i. Only one access point should be provided in the southern portion of the site (Portion 270) and one access point in the northern portion (Portion 271) during the construction phase. These access points should be controlled to minimize the impact on traffic utilizing Main Street, the R544 provincial road and the unknown street.

j. Contractors to be informed to keep to low speeds on site (especially once the site has been cleared) to reduce the amount of dust.

k. Dust suppression measures must be implemented during dry and windy periods.

l. Construction activities to be restricted to normal working hours (Monday to Friday).

m. Sufficient fire extinguishers must be provided as required by legislation.

n. All machinery used during the construction phase must be properly muffled and maintained so as to reduce noise generation to a minimum.

o. If any archaeological remains are exposed during the construction phase, the construction must be terminated immediately and the Provincial Heritage Resources Authority (SAHRA) must be notified in this regard. The applicant must take note of the requirements in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999).

p. If any graves are discovered during construction, the discovery must be reported to the SA Police Service and/or SAHRA or an archaeologist must be called in to handle the matter.

q. The topsoil, subsoil and overburden must be surveyed for fossils during the construction phase.

r. If any palaeontological material is exposed during digging, excavating, drilling or blasting SAHRA must be notified. All construction activities must be stopped and a palaeontologist must be called to determine proper mitigation measures.

s. All pollution incidents must be reported to the Department of Agriculture, Rural Development, Land and Environmental Affairs and the Department of Water and Sanitation within 24 hours of occurrence.

8.5.3 Rehabilitation of the environment after construction

Impact management outcome:

1) *To ensure that the disturbed area due to construction activities is properly rehabilitated and maintained.*
2) *To control the growth of declared weeds and/or invader plants.*

Mitigation and management measures:

a. Before construction, topsoil must be removed and stockpiled in a demarcated area within the site for rehabilitation of the area surrounding the buildings. The topsoil layer generally has a high organic content and carries the seed bank. It is invaluable for post-development rehabilitation.
b. Once construction has been completed, all temporary structures, excess materials, equipment and waste must be removed from site.
c. All residual stockpiles must be removed to spoil or spread on site as directed by the ECO.
d. The disturbed areas must be top soiled and re-vegetated (i.e. rehabilitated) as soon as possible in order to prevent soil erosion and the establishment of alien vegetation.
e. Proper stormwater control measures and erosion control must be implemented to prevent erosion of the newly rehabilitated areas during heavy rainfall.
f. Temporary erosion control measures (e.g. geo-textile silt fences, diversion ditches, sediment traps) and temporary seeding with fast growing annuals to be kept in place to control erosion until the long-term erosion control methods are established and functioning.
g. If soil erosion is noted, appropriate remediation measures must be implemented.
h. For rehabilitation purposes, a seed mix comprising of grass species indigenous to the area should be used. The planting of any alien plant species as part of landscaping should be prohibited.
i. The regulations in terms of Alien Invasive Species, the Conservation of Agricultural Resources Act, 1983 and the Mpumalanga Nature Conservation Act, 1998 (Act 10 of 1998) with regards to declared alien species must be noted and complied with.
j. Regular site inspections will be conducted to identify any declared weeds and/or invader plants. If identified, the plants will be eradicated using appropriate methods.
k. It is advisable to consult the latest edition of 'A guide to the use of herbicides' or contact the National Department of Agriculture, Forestry and Fisheries with regards to the latest information pertaining to the application of herbicides. If pesticides or herbicides are to be used, the product should be chosen responsibly. Storage, administering and disposal must be done according to the prescribed methods.
l. A post-construction audit must be conducted to ensure that any shortcomings are identified and addressed.

8.5.4 General operational principles

Impact management outcome:

1) *To ensure that the activities that occur during the operational phase have the least impact on the natural environment, site workers and adjacent landowners/users.*

Mitigation and management measures:

a. All operational activities must be limited to the said site (e.g. no parking areas to be allowed outside of the shopping centre).

b. The following **energy saving** initiatives must be implemented in order to reduce the carbon footprint of the development.
   - *Energy efficient lighting (e.g. LED lighting) to be installed where possible;*
   - *Designing the buildings in such a way as to maximize the use of daylight (e.g. skylights, large windows, etc.);*
   - *Solar geysers to be installed where feasible;*
   - *Gas stoves to be used by restaurants where feasible.*

c. The following measures to minimize **water use** during the operational phase must be implemented:
   - *Regular maintenance of the water infrastructure to minimize water wastage;*
   - *High pressure washers to be used during cleaning to minimise water use;*
   - *Harvested stormwater to be used for irrigation of gardens if possible;*
   - *Water usage to be monitored;*
   - *Water wise signage to be displayed in the public restrooms;*
   - *Water wise taps (e.g. taps with infra-red sensors/low-flow taps) to be installed in the public restrooms.*

d. The waste management measures provided in Section 8.5.8 of this report should be implemented.

8.5.5 Protecting existing infrastructure on site (Land Use)

Impact management outcome:

1) *To protect the municipal water and sewer lines from damages during the construction and operational phases.*
2) *To protect the Sasol gas pipeline from damages during the construction and operational phases.*

Mitigation and management measures:

a. The municipal water and sewer lines extending across the site must be identified and demarcated before any construction takes place.

b. Before any construction takes place, permission must be obtained from the eMalahleni Local Municipality for the construction of roads, parking

8.5.5 Protecting existing infrastructure on site (Land Use)

areas or buildings across the water and sewer pipelines.

c. No buildings may be constructed across the municipal water pipeline as indicated in the layout plan (Figure 3.2).
d. Before construction, the leaking sewer lines/overflowing manholes should be repaired.
e. The Sasol gas pipeline must be identified and demarcated before any construction takes place.
f. Before any construction takes place, permission must be obtained from Sasol.
g. No buildings may be constructed on the Sasol gas pipeline as indicated in the layout plan (Figure 3.2).
h. All activities including excavation work within the Sasol servitude to be communicated to the Wayleave Office at wayleaves@sasol.com or Tel: 011-865 8549.
i. A Sasol representative must supervise the work to prevent any potential incidents.
j. No mechanical excavation methods are permitted over the pipeline and servitude
k. The rights and conditions of Sasol must be respected and adhered to at all times.

Impact management outcome:

3) *To reduce the health and safety risk on the local community and site workers in terms of the Sasol gas pipeline.*

Mitigation and management measures:

Sasol indicated the following measures to be implemented to reduce the health and safety risk -

a. Monitor and observe for leaks. Leaks may be detected in various ways, including:
   - ⇒ *Hissing sounds or loud continuous blowing noises;*
   - ⇒ *Patches of dead vegetation over the pipeline;*
   - ⇒ *Areas of soil disturbance or dried and cracked soil;*
   - ⇒ *Unfamiliar smells (the gas is odorised in certain pipelines).*
b. Report any suspected leaks to Sasol immediately.
c. No activities should be undertaken near the pipeline which involves open flames or sparks.
d. What to do during an emergency:
   - ⇒ *Move away immediately, at least 100 m from the pipeline, preferably upwind.*
   - ⇒ *Phone Sasol at 0800 212 260 or local police at 10111.*
   - ⇒ *Wait for the emergency personnel to make the area safe.*
   - ⇒ *Don't try to extinguish the fire or stop the leaking gas by yourself, it is very dangerous.*
e. What you should do to avoid fire or explosions:
   - ⇒ *Do not start any vehicle within 100 metres of the pipeline leak.*
   - ⇒ *Do not smoke near the leaking gas.*
   - ⇒ *Do not strike a match or any lighter device.*

8.5.6 Protecting the undermined area (Geology)

Impact management outcome:

1. *To reduce the risk of subsidence and sinkholes due to bord or pillar failure within the underground mine.*
2. *To reduce the risk of damage to structures, injuries or fatalities as a result of the collapse within the underground mine.*

Mitigation and management measures:

a. Before construction takes place, permission must be obtained from South32 for the development of a shopping centre on the undermined area. A meeting in this regard to be arranged between South32, the eMalahleni Local Municipality and the applicant.

b. The old shaft located on site must be located. It must be ensured that the shaft was properly rehabilitated and is geotechnically sound to allow for the construction of buildings on top of the shaft area.

c. Storm water management measures as indicated in Section 8.5.9 to be implemented in order to reduce ponding of storm water on site.

d. Van As (2015) indicated that the following mitigation measures must be implemented to ensure that the development does not impact on the underground mine:

   ⇒ *No people to be allowed to reside on the premises.*
   ⇒ *The eMalahleni Local Municipality to approve the site plans and to enforce the conditions of the site development agreement.*
   ⇒ *The buildings to be designed in such a way that subsidence of the strata will not cause the buildings to collapse. For example, the main members to act as hinges, brick panels to be reinforced and elastic deformation to be predicted in case of subsidence.*
   ⇒ *A value of 150 kPa to be applied for the foundation design, even though the bearing capacity of the ground was tested to be 400 kPa.*
   ⇒ *No French drains to be allowed.*
   ⇒ *No ponding of storm water to be allowed.*
   ⇒ *Seepage into the mine to be discouraged at all cost.*
   ⇒ *In order to reduce the risk of underground fires, petrol or diesel or any other flammable storage tanks to be allowed on site only with special precaution. Tanks to be contained in additional tanks surrounding the primary storage tanks. All piping to be constructed to allow movement and fluid tight joints.*

d. The Department of Mineral Resources (DMR) stipulated the following with regards to the development on the undermine area:

   ⇒ *The shopping centre must be constructed within the proposed 10 ha site boundaries and as indicated in the approved layout plan (Figure 5.8).*
   ⇒ *Construction activities must be well managed and all measures taken to ensure that the environment is not polluted.*
   ⇒ *The area must be effectively fenced to prevent unauthorised access and to facilitate proper control.*
   ⇒ *Once construction is completed, the area must be rehabilitated*

8.5.6 Protecting the undermined area (Geology)

to the satisfaction of the Department.

⇒ *The requirements of Regulations 17(6) and 17(6)(b) of the Mine Health and Safety Act, Act 29 of 2996 must be taken into account.*

⇒ *All persons concerned must be made fully conversant with the requirements of the DMR. A copy of the DMR letter to be provided to all concerned parties before commencement of construction of surface structures over and within a horizontal distance of 100 metres from the undermined area.*

8.5.7 Soil management

Impact management outcome:

1) *To ensure that the activities that occur during the construction phase have the least impact on the soils in terms of soil quality, structure and erosion potential.*
2) *To reduce the potential impact of storm water drainage from the site on the surrounding properties and roads in terms of soil erosion during the construction and operational phases.*

Mitigation and management measures:

a. Before construction, the leaking sewer lines/overflowing manholes should be repaired. Polluted soil must be removed from site and disposed of at a hazardous waste disposal facility.
b. Before construction, the storm water channels leading from the residential area onto the site must be diverted and included as part of the shopping centre storm water management infrastructure. The waterlogged areas must be left to dry out.
c. All waste dumped on site must be removed and disposed of at the licensed Leeuwpoort Waste Disposal Site.
d. Appropriate soil conservation and storm water management measures to be provided in order to prevent soil erosion and loss of topsoil. Increased run-off during construction must be managed using berms and other suitable structures as required to ensure flow velocities are reduced and to prevent soil from accumulating on the adjacent public roads.
e. Topsoil must be removed and stockpiled in a demarcated area for rehabilitation or landscaping purposes once construction has been completed. The topsoil layer generally has a high organic content and carries the seed bank. It is invaluable for post-development rehabilitation.
f. Topsoil stockpiles must be located on a flat area and must not be higher than 2 m.
g. An area must be selected (within the 10 ha site) and demarcated for the stockpiling of spoil (e.g. rocks, soil, etc.).
h. Any stockpile, which is likely to remain for 12 months or more, must be vegetated.
i. All residual stockpiles must be removed to spoil or spread on site as

8.5.7 Soil management
directed by the ECO. j. The existing quarried area (where spoil has been dumped) (Geotechnical Zone PQ; Figure 5.14) must be rehabilitated and the recommendations of Van der Merwe (2016) implemented. k. Monitor for erosion and intervene and/or rehabilitate where necessary.
Impact management outcome: *3) To reduce potential soil pollution as a result of construction and operational activities.*
Mitigation and management measures: a. The waste management measures as indicated in Section 8.5.8 must be implemented during both the construction and operational phases. b. Regular maintenance of the sewage infrastructure to reduce the potential for blockages and leaks and thus prevent potential soil pollution. c. If any soil or surface water contamination is noted, appropriate remediation measures must be implemented immediately. An environmental incident report must be completed indicating the date of the incident, description of incident and action taken. The Department of Agriculture, Rural Development, Land and Environmental Affairs and the Department of Water and Sanitation must be informed of the event within 24 hours. A copy of the environmental incident report must be kept on file at the site office.
Impact management outcome: *4) To ensure that the geotechnical recommendations are taken into account during the construction phase in order to prevent impact on structures during the operational phase.*
Mitigation and management measures: a. The following mitigation measures recommended by Van der Merwe (2016) must be implemented: • *Foundations to be inspected by a competent person to evaluate the stability of the mudstone or quartzite along the bedding planes, and possibly verifying the competency of the foundation rock.* • *Site Class C1H/1A1C (Figure 5.14) - Foundations will require modified normal foundations techniques such as:* ⇒ *lightly reinforced strip footings;* ⇒ *reinforced boxed steel in slightly widened strip foundations;* ⇒ *the use of split construction techniques;* ⇒ *articulation joints at all internal and external doors and openings with light reinforcement (brickforce) in masonry,;* ⇒ *soil replacement by an engineered fill soil raft by removing all or part of the expansive horizon to 1 m beyond the perimeter of the structure and replacing with inert backfill, compacted to 93% MOD ASSHTO;* ⇒ *site drainage;* ⇒ *concrete apron of 1m around all structures;*

8.5.7 Soil management

⇒ *plumbing and service precautions are advised.*

- *Site Class CH/1A1C (Figure 5.14) - Normal foundations will be adequate including the following:*
  - ⇒ *foundation excavations or service trenches may require pneumatic tools, TLB or blasting if hardpan ferricrete is present;*
  - ⇒ *proper compaction (with a wacker compactor) of in situ soils below individual footings with soil near optimum moisture content;*
  - ⇒ *good site drainage with a concrete apron of 1m around all structures;*
  - ⇒ *plumbing and service precautions are advised.*
- *Site Class PQ (Figure 5.14) - The land is not ideally suited for development unless the following rehabilitation measures are implemented:*
  - ⇒ *waste material/building rubble to be removed and properly disposed of;*
  - ⇒ *quarried area to be backfilled with suitable material;*
  - ⇒ *soil replacement by an engineered fill soil raft by removing all or part of the expansive horizon to 1 m beyond the perimeter of the structure and replacing with inert backfill, compacted to 93% MOD ASSHTO density at or near optimum moisture content, where after normal strip footing foundations can be used;*
  - ⇒ *alternatively, this area can be used as a basement parking area.*

b. The following additional mitigation measures recommended by Van der Merwe (2016) must be implemented:

- *Standard sidewall protections in excavations exceeding a depth of 1.5m will be required to ensure the stability of excavations.*
- *Retaining walls and slope stabilization measures recommended on all constructed embankments exceeding 1.5m.*
- *All embankments must be adequately compacted and planted with grass to stop any excessive erosion and scouring of the landscape.*
- *Care should be taken against rising damp if parts of the rock horizon are removed during construction or for cut and fill.*
- *No ponding of surface water may take place since the soil has a moderate permeability.*
- *Good surface drainage should be ensured through landscaping.*

8.5.8 Waste management

Impact management outcome:

1) *To ensure the proper storage, management and disposal of waste during the construction and operational phases.*
2) *To reduce potential soil, surface water and groundwater pollution as a result of waste management activities during construction and operation.*

8.5.8 Waste management

Mitigation and management measures:

General/building waste

a. Proper waste management measures must be implemented at the site.
b. No waste may be burnt, buried or dumped on site or the surrounding area.
c. Waste skips to be provided for placement of general waste, building rubble, etc.
d. Promote source separation through the provision of waste bins clearly marked for recycling and general waste. These bins should be emptied on a regular basis and disposed of accordingly (i.e. sent for recycling, taken to licensed waste disposal site, etc.).
e. The applicant will have to ensure that the contractor removes the building rubble and any domestic waste to a licensed waste disposal site.
f. Waste and building rubble not to be placed on the soil stockpiles resulting in the contamination of the soil.
g. Building rubble must be disposed of at a site specifically earmarked for that purpose. No building rubble is to be disposed of in a haphazard way in the area surrounding the development site.
h. During the construction phase, cement/concrete should be mixed in either demarcated areas or on metal sheeting or conveyor belts. If mixed in demarcated areas, these areas will have to be ripped and the cement/concrete removed on completion of construction activities.
i. Site workers must be instructed to collect windblown rubbish which may collect in the surrounding area on the said site. This will assist with the overall visual appearance of the site.
j. The applicant/contractor must ensure that all site workers receive appropriate training with regards to the overall waste management measures to be implemented for the said site.
k. Site workers must be aware of the importance of the implementation of the waste management measures.
l. Continually reduce resource waste by applying the waste hierarchy (i.e. waste avoidance, reduction, reuse, recycling and disposal).

Hazardous waste management

a. Proper bunded storage facilities must be provided for the storage of oils, grease, fuels, etc. to be used during the construction phase.
b. Wash-down water from equipment not to enter the municipal storm water infrastructure.
c. Collection containers (e.g. drip trays) must be placed under all dispensing mechanisms for hydrocarbons or hazardous liquid substances to ensure that potential contamination from leaks/spillage is reduced.
d. No hazardous substance is to be disposed of on site.
e. No bins containing organic solvents, paint tins or bins containing thinning agents may be cleaned on site, unless containers for liquid

8.5.8 Waste management

disposal are provided. The tins must be collected and rinsed at a central waste collection point, where it poses no threat to surface or ground water.

f. All spills of chemicals or hydrocarbons (oil, grease, diesel, petrol, etc.) should be cleaned with the use of suitable absorbent materials such as drizit or oclanzorb. Appropriate soil remediation measures should be implemented where soil has been contaminated with oil.

g. Contaminated soil generated as a result of fuel, oil, etc. spills will be disposed of in a specially marked drum located at the site office. An approved waste contracting firm (e.g. Enviroserv) will collect the drum and dispose of the contaminated soil at an appropriate waste disposal site.

h. Contaminated soil/fuel that cannot be removed will be treated in situ with an appropriate remedial agent. In this instance, the services of an expert may be required.

i. Waste oils collected on site should be stored in drums in a designated, bunded area and removed by an approved recycling contractor and disposed of at an appropriate licensed waste disposal facility.

j. In all instances where a firm is contracted to collect waste (e.g. Enviroserv, Wastetech, Oilkol, etc.), the site operator will ensure that the correct documentation is completed and filed for future reference.

k. Certificates of hazardous waste disposal (waybills) are to be kept for auditing purposes.

l. Records of environmental related incidents should be maintained.

m. The applicant must ensure that all workers receive relevant training with regards to the handling of hazardous substances and the potential health risks thereof.

n. The contractor and/or applicant will be responsible for establishing an emergency procedure for dealing with spills.

8.5.9 Water management

Impact management outcome:

1) *To reduce the potential impact of storm water drainage and erosion on the surrounding properties and adjacent public roads during both the construction and operational phases.*

2) *To reduce the potential impact of ponding on the undermined area during both the construction and operational phases.*

Mitigation and management measures:

a. Before construction, the leaking sewer lines/overflowing manholes to be repaired to prevent further soil pollution and to reduce the potential impact on the undermined area in terms of ponding on site.

b. Before construction, the storm water channels leading from the residential area onto the site must be diverted and included as part of the shopping centre storm water management infrastructure. The

8.5.9 Water management

waterlogged areas must be left to dry out to reduce the impact on the undermined area in terms of ponding.

c. If possible, construction should take place during the dry season to prevent soil erosion.

d. Appropriate soil conservation and storm water management measures to be provided in order to prevent soil erosion and loss of topsoil. Increased run-off during construction must be managed using berms and other suitable structures to ensure flow velocities are reduced.

e. According to Van As (2015), the ponding of water on site and seepage into the underground workings could result in the erosion of the pillars. The following storm water control measures must thus be implemented to reduce potential ponding on site:
   - The buildings must be placed in such a way that rainwater does not pond on site.
   - Paving slopes must be created.
   - No 'blackwater'/polluted water to be released into the veld.
   - All off-flow to be on the surface inside the premises, from where it must be released onto the adjacent streets and into the existing storm water drainage systems.
   - The storm water system to be designed to a 1:5 year returning period storm.

f. During the construction and operational phase, the storm water management measures must be inspected on a regular basis in order to ensure that the structures are functional (not blocked) and not resulting in ponding. This will be of particular importance at the start of the rainy season and during the rainy season.

Impact management outcome:

2) *To ensure that the construction and operational phases do not impact on the surface water run-off quality.*

Mitigation and management measures:

a. The waste management measures as indicated in Section 8.5.8 must be implemented during both the construction and operational phases.

b. Regular maintenance of the sewage infrastructure to reduce the potential for blockages and leaks and thus prevent potential water pollution.

c. If any soil or surface water contamination is noted, appropriate remediation measures must be implemented immediately. An environmental incident report must be completed indicating the date of the incident, description of incident and action taken. The Department of Agriculture, Rural Development, Land and Environmental Affairs and the Department of Water and Sanitation must be informed of the event within 24 hours. A copy of the environmental incident report must be kept on file at the site office.

8.5.10 Interested and affected parties

Impact management outcome:

1) *To ensure that site workers and the general public are not impacted upon in terms of the construction work being performed.*

Mitigation and management measures:

a. Before construction takes place, the relevant permissions must be obtained from the following affected parties:
   - Department of Public Works, Roads and Transport;
   - Department of Agriculture, Rural Development, Land and Environmental Affairs;
   - eMalahleni Local Municipality;
   - Sasol;
   - South African Heritage Resources Agency;
   - As well as in terms of any other applicable legislation.

b. The applicant/contractors must ensure that the necessary protective gear (PPE) is worn at all times and that signs are erected to warn workers to use hearing protection as well as any other hazards.

c. The applicant/contractor must adhere (at all times) to the requirements of the Occupational Health and Safety Act, 1993 (Act 85 of 1993), the Construction Regulations, 2003 and any other applicable legislation.

d. For safety purposes, excavations must not be undertaken until such time as all required materials are available and services can be laid.

e. Excavations should be closed as soon as is practically possible.

f. If blasting is required, the requirements of the Explosives Act, 2003 (Act 15 of 2003) must be put in place in order to prevent any impact on site workers, etc.

g. All construction and operational management principles as indicated in this EMPr must be implemented.

h. The adjacent landowners/users must be provided with contact numbers with whom complaints or concerns can be discussed.

i. A complaints register must be kept on site. Any complaints received with regards to the development must be recorded in the complaints register.

j. The waste management measures as indicated in Section 8.5.8 must be implemented during the construction and operational phase.

k. All machinery used on site must be properly muffled and maintained so as to reduce noise generation to a minimum.

l. Construction activities must be limited to daylight hours (7am - 6pm) and weekdays (Monday to Friday) in order to minimize the impact on the church and nearby residential area.

m. Sufficient fire extinguishers must be provided as required by legislation. The site manager must ensure that the said fire extinguishers are serviced on a regular basis and are operational.

n. The closest fire hydrant must be clearly marked and indicated to all

8.5.10 Interested and affected parties
site workers. The site manager must ensure that the fire hydrant is checked on a regular basis to ensure that it is operational. o. An emergency response plan for fire fighting must be compiled. p. An emergency assembly point should be identified on or near the site and clearly marked.
Impact management objective: *2) To reduce potential impact on the general road users of the R544 provincial road, Main Street and other nearby streets as a result of the proposed shopping centre.*
Mitigation and management measures: a. Mamabolo (2016) indicated that the following measures must be in place to reduce the impact on the general road user: • *the proposed external road upgrades (as indicated in Section 5.16 of this report) and site accesses must be constructed;* • *the proposed road upgrades and accesses must be constructed to the relevant design standards of the local authority;* • *the proposed pedestrian and public transport facilities must constructed to the relevant design standards of the local authority; and* • *the minimum number of on-site parking bays as per layout plan (Figure 3.2) must be provided (i.e. 621 bays for the shopping centre and 180 bays for the warehouses).* b. The above-mentioned upgrades must be implemented before the opening of the shopping centre. c. The necessary safety measures to be implemented during the construction phase to reduce any potential impact on road users.

8.6 Implementation and monitoring of the EMPr

An EMPr must include -
(g) the method of monitoring the implementation of the impact management actions contemplated in paragraph (f);
(h) the frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);
(i) an indication of the persons who will be responsible for the implementation of the impact management actions;
(j) the time periods within which the impact management actions contemplated in paragraph (f) must be implemented;
(k) the mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);
(l) a program for reporting on compliance, taking into account the requirements as prescribed by the Regulations;

The implementation of the Environmental Management Programme (EMPr) as part of the daily construction and operational activities is crucial and requires commitment from all levels of management and the on-site workers. The successful implementation of an EMPr has the following advantages:

- Meeting legal obligations;
- Contributes to environmental awareness;
- Can facilitate the prevention of environmental degradation;
- Can minimize impacts when they are unavoidable;
- Can ensure good environmental performance and improve community relations.

An approved contractor should be appointed to do the necessary construction on the said site. The contractor and site workers must be aware of their environmental responsibilities. Penalty clauses, in terms of the environment, must be built into the contracts and must be implemented. Monitoring of the environmental management programme must take place on a regular basis in order to ensure compliance.

The contractor must inform all site workers of their environmental responsibility during the construction phase. Measures to protect the environment and mitigation measures formulated in this EMPr must be implemented by the contractor and the site workers. The contractor must thus ensure that the site workers are aware of the Environmental Authorisation and this EMPr and understand the contents thereof.

In order to achieve the above-mentioned, the contractor and site workers should undergo basic environmental awareness training with regards to the contents of this EMPr. Environmental awareness training is critical for the contractor and site workers to understand how they can play a role in achieving the objectives specified in the EMPr. The contractor must ensure that the site workers undergo the necessary environmental awareness training (see Section 8.6.1) before commencing with activities on the site.

This section must be completed on acceptance of the appointment.

MANAGEMENT ACCOUNTABILITY		
Accountability	**Title**	**Name**

MANAGEMENT DECLARATION

I, the undersigned in my capacity as designated above hereby undertake to ensure that the conditions and recommendations in terms of the Environmental Authorisation and Environmental Management Plan (EMPr) are implemented and assume responsibility and accountability in this respect.

I further understand that officials from eMalahleni Local Municipality, Department of Agriculture, Rural Development, Land and Environmental Affairs (DARDLEA), Department of Water and Sanitation (DWS) and Department of Mineral Resources may (at any time) conduct an inspection of the development in order to ensure compliance with the conditions and recommendations in the EMPr.

CONTRACTOR

……
Name and Designation

……
Signature:

……
Date:

EMPLOYER

……
Name and Designation:

……
Signature:

……
Date:

8.6.1 Environmental Awareness Plan (EAP)

An EMPr must include -
(m) An environmental awareness plan describing the manner in which-
- *(i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and*
- *(ii) risks must be dealt with in order to avoid pollution or the degradation of the environment.*

It is recommended that the employees receive basic environmental awareness training. In order to ensure proper training, the applicant must develop and implement an Environmental Awareness Plan (EAP). This section provides an overview of what the proposed EAP will contain and how it will be implemented.

The following components would form an essential part of an Environmental Awareness Plan (EAP): -

- Development of an environmental policy;
- Identification of environmental impacts/risks and mitigation measures;
- Environmental training, awareness and competence;
- Environmental communication and reporting.

Development of an environmental policy

The applicant would have to compile an Environmental Policy (if they do not have one already), which is a one page statement setting out certain principles in terms of their environmental performance.
The environmental policy should indicate the following:

- The applicant's commitments in terms of the environment;
- Identify environmental impacts as a result of the activities taking place on site;
- Actions to be taken to minimize/mitigate the environmental impacts.
- Signature of management.

In order to ensure effective environmental management, it is important that the Environmental Policy is known and understood by all employees/shop owners. It should thus be displayed at the centre offices.

An Environmental Policy Template is provided to assist the applicant in the compilation of their Environmental Policy. A number of templates are also available on the internet.

Environmental Policy Template (taken from Richmond upon Thames, 2012)

*[*Insert company name here*] believe that we have a responsibility to care for and protect the environment in which we operate. We are fully committed to improving environmental performance across all of our business activities, and will encourage our business partners and members of the wider community to join us in this effort.*

*[*Insert company name here*] recognises our key impacts to be in the areas of [for example]:*

- *energy use*
- *raw material use*
- *waste generation*
- *emissions to air/water*
- *water use*
- *transport*

- *procurement*

We will strive to:

- *Adopt the highest environmental standards in all areas of operation, meeting and exceeding all relevant legislative requirements.*
- *Assess our organisational activities and identify areas where we can minimise impacts.*
- *Minimise waste through careful and efficient use of all materials and energy.*
- *Purchase sustainable products wherever feasible [e.g. recycled, FSC or low environmental impact products and energy from renewable sources].*
- *Train employees in good environmental practice and encourage employee involvement in environmental action.*
- *Reduce risks from environmental, health or safety hazards for employees and others in the vicinity of our operations.*
- *Adopt an environmentally sound transport strategy.*
- *Aim to include environmental and ethical considerations in investment decisions where appropriate.*
- *Assist in developing solutions to environmental problems.*
- *Continually assess the environmental impact of all our operations.*

*[*Insert company name here*] have developed a series of action plans to supplement each of our environmental policy objectives. These can be found* [in an appropriate place*].*

*[*Insert company name here*] will periodically review performance and publish these results [*in an appropriate manner*].*

Signed _____

Identification of environmental impacts / risks and mitigation measures

Environmental impacts/risks in terms of the development are indicated in Section 7 of this document while mitigation measures to be implemented are provided in Section 8.

Activities or work procedures that could have a significant impact on the environment have thus been identified and mitigation measures proposed in order to avoid pollution or the degradation of the environment.

This information must be communicated to the employees/contractors/tenants and thus forms the basis for developing an Environmental Awareness Plan (EAP) in order to ensure effective environmental management.

Environmental training, awareness and competence

Training is necessary in order to advance the competency of employees in implementing the Environmental Policy and the EMPr and to ensure effective overall environmental management.

The applicant must inform the contractors/tenants of their environmental responsibilities in terms of this Environmental Management Programme (EMPr). Measures to protect the environment and mitigation measures formulated in this EMPr must thus be implemented by the applicant and contractors/tenants.

In addition, job specific training must be conducted that will be appropriate to the activity and the responsibility of the individuals. Ad-hoc training will be undertaken as required.

Through training/awareness, the applicant will also make the contractors/tenants aware of:

- the importance of conformance with the environmental policy and the requirements of the EMPr;
- the significant environmental impacts, actual or potential, of their work activities and the environmental benefits of improved personal performance;
- their roles and responsibilities in achieving conformance with the environmental policy and the requirements of the EMPr, including emergency preparedness and response requirements; and
- the potential consequences of departure from the specific operating procedures and/or mitigation measures specified in the EMPr.

Environmental training and development needs of contractors/tenants will be identified on a regular basis through:

- Identification of significant environmental impacts;
- Analysis of non-conformance and incident reports;
- Audit reports.

Environmental communication and reporting

Environmental communication and reporting form an integral part of an Environmental Awareness Plan. It is important to maintain effective communication internally and to ensure that external communication (e.g. with government departments or adjacent landowners) is maintained.

In general, environmental communication and reporting will aim to:

- Ensure that the relevant parties understand the environmental policy and objectives;
- Ensure that information is communicated and readily accessible to the relevant parties;
- Improve feedback of operational and environmental performance to management;
- Ensure effective and constructive communication with relevant government departments and adjacent landowners (if applicable);
- Ensure that records are kept of environmental communication and interaction.

The following are some of the topics that should be discussed:

- Time of commencement;
- Cleaning of area and the importance thereof;
- Emergency procedures;
- Environmental awareness (e.g. water, fires, noise, dust, waste management, etc.).

The applicant must conduct regular inspections to check on site conditions and to provide training when necessary to ensure that the mitigation measures are being implemented and that the environment is carefully looked after.

8.6.2 Site documentation and record keeping

The following documentation must be available (at all times) at the site/centre office:

- A copy of the Basic Assessment Report and Environmental Management Programme;
- A copy of the Environmental Authorisation;
- A copy of the Environmental Policy;
- A copy of site audit reports;
- A copy of any other permits/approvals and/or service agreements from other authorities.

The documents should be kept as hard copies as well as in electronic format.

Complaints Register

A complaints register must be kept at the site office during the construction phase. Any complaints received with regards to the project must be recorded in the complaints register. The following information must be recorded:

- Date complaint recorded;
- Nature of complaint;
- Details of complainant (name, address, telephone number, etc.);
- Manner in which complaint was dealt with;
- Date when complaint was reported to the Department of Agriculture, Rural Development, Land and Environmental Affairs and the Department of Water and Sanitation.

Emergency numbers

Emergency numbers (e.g. manager, police, fire department, ambulance, etc.) must be prominently displayed at the site office.

Contact details of adjacent landowners/users must also be kept on file.

Other legislation

The following should also be displayed at the site office:

- Occupational Health and Safety Act, 1993 (Act 85 of 1993) as amended;
- Basic Conditions of Employment Act, 1997;
- Summary of the Employment Equity Act.

Supplementary documentation

The following supplementary documentation should be kept at the site office:

- Site instructions;
- Emergency preparedness and response procedures;
- Incident reports;
- Training records;
- Site inspection, monitoring and auditing reports.

During the course of the development, the applicant and contractors/tenants must also comply with all other relevant legislation.

8.6.3 Auditing and corrective action

Environmental audits identify existing and potential environmental problems and determine what action is needed to comply with legal requirements and the Environmental Management Programme (EMPr). Subsequent audits then confirm that corrective actions have been taken and assess the effectiveness of such actions.

Construction phase:

The applicant must appoint an Environmental Control Officer (ECO) who will have the responsibility of monitoring and reporting on compliance with the

conditions of the Environmental Authorisation as well as monitoring and reporting on the implementation of the EMPr.

The ECO must be appointed before the commencement of construction and must remain employed until all rehabilitation measures as well as site clean-up are completed.

The ECO will be responsible to:

- Monitor and audit the construction activities on a weekly basis;
- Keep a record of each site inspection and the findings thereof;
- Make a register of the environmental monitoring and auditing results available for inspection at the construction site office;
- Keep records relating to the compliance and non-compliance with the conditions of the Environmental Authorization;
- Make these records available to the Department of Agriculture, Rural Development, Land and Environmental Affairs (DARDLEA) within seven (7) working days of the date of the written request by the Department for such records.

A good approach to facilitate legal enforceability of the EMPr during the construction phase is to integrate the EMPr into the tender and contract document (i.e. between the project applicant and the contractors) as a set of environmental specifications. The contractor will thus be informed prior to being appointed of his environmental responsibilities.

Penalties in terms of the environment should be implemented upon non-compliance. This will ensure that the project applicant does not sit with an environmental liability at the end of the contract.

A post-construction audit should be conducted prior to the contractors leaving site.

There are several levels at which corrective action can be affected, namely verbal instructions, written instructions and contract notices.

Level 1: The problem is discussed with the contractor and a solution is worked out together. The discussion is minuted for record purposes and the solution implemented.

Level 2: When a more serious infringement is observed, the contractor is notified in writing and given a deadline by which the issue must be rectified. Costs to be borne by the contractor.

Level 3: The contractor will be ordered to suspend all or part of the work until such time as the problem is rectified or remedial measures put in place. Costs to be borne by the contractor and no extension of time will be granted.

Level 4: Breach of contract and/or termination of employment. The applicant may also institute legal proceedings against the contractor.

An example of a penalty schedule is provided below.

PENALTY SCHEDULE

Level	Description	Penalty	Offences
1	Minor offence	R1000 first offence R2000 second offence And R1000/per day that offence continues beyond notification of offence	• Littering; inadequate or inappropriate on-site waste management or sanitation • Uncontrolled noise and dust nuisance Poaching on site • Inadequate soil / water protection controls for fuel storage & dispensing areas, vehicle parking areas
2	Moderate offence	R5000 first offence R10 000 second offence And R5000 per day that the offence continues beyond notification of offence	• Trespassing onto neighbours properties • Removal of indigenous trees marked for conservation purposes without the permission of the ECO, or trees in demarcated sensitive environmental zones • Disposal of any form of waste to a non-approved dump site • Any illegal /non-permitted abstraction or use of water from a natural resource • The withholding of pertinent information or provision of false information to the ECO or Project Manager
3	Significant offence	R30 000 first offence R50 000 second offence And R30 000 per day that the offence continues beyond notification of offence	• Non-compliance with any risk or safety management requirements • Significant spillage of hazardous materials • Use of natural materials not sourced from a legally permitted source • Construction or use of roads/access across rivers, streams or wetlands that has not been authorized by the Project Manager and ECO
4	Serious offence	Up to R500 000 or total cost of rehabilitating damaged environment	• Any serious pollution event or accident • Any serious encroachment into demarcated sensitive environmental zones, by accident or on purpose • Any serious stormwater damage that could have been avoided through appropriate management interventions

In addition to the schedule of penalties, a portion of the Retention on all contracts could be apportioned to compliance with the EMPr.

<u>Operational phase:</u>
The applicant will be responsible for auditing and corrective action during the operational phase of the development.

9. ENVIRONMENTAL IMPACT STATEMENT

9.1 Introduction

The applicant, Jumbo van der Merwe Trust, plans to utilise a portion of Portion 55 of the farm Blesboklaagte 296 JS for commercial purposes (i.e. for a shopping centre). The site is ± 10 ha in extent and located in close proximity of the eMalahleni Central Business District and the railway station.

The intention is to subdivide the property into five (5) portions as indicated in Figure 3.1, which can then be rezoned for development as the need arises. After subdivision, Portions 270 and 271 will be rezoned from 'Agricultural' to 'Business 3' for the purposes of a shopping centre.

Portion 271 (located north of Main Street) will allow for warehouse type developments and Portion 270 (located south of Main Street) will comprise the main shopping centre. Portion 269 will be transferred to the existing church on site and Portion 268 will provide a right-of-way access to the church. The remainder of the site (±32 ha) will not be developed.

The owner of the property (i.e. the applicant) identified the opportunity to develop the said site, as a high volume of commuters pass the site on a daily basis and no other shopping centres are located in the vicinity. The proposed shopping centre will provide commuters and residents with a close-to-home, convenient place for shopping and social gatherings. In addition, the development will contribute positively to the area in terms of a visual and aesthetic upgrade. Job opportunities will also be created during both the construction and operational phases and the local economy will be stimulated.

According to Korsman & Associates (2017), the proposed change in land use will have no negative impact on the surrounding properties or land uses as it is situated in close proximity to an established residential area, businesses and various other land use activities. Although the site is earmarked for industrial development in the eMalahleni Local Municipality Spatial Development Framework (SDF; 2013/2014), Korsmand & Associates (2017) believes that a shopping centre would be better suited in this area since it can be viewed as an extension of the services and activities provided through the nearby CBD.

The proposed development will however, be situated on an undermined area (Witbank Colliery), which is a defunct mine under care and maintenance of South32 (previously BHP Billiton). A risk assessment was conducted by Van As (2015) to determine the risk of developing a shopping centre on the undermined area. *According to Van As (2015), the risk was found to be negligible.* More information with regards to the undermining of the site and result of the risk assessment is provided in Section 9.4.

Section 4 of this report provides an indication of the alternatives investigated in terms of the site, layout plan and service provision.

It was decided to develop the said site due to the following:

- The property already belongs to the applicant.
- The property is large enough for the activity.
- The eMalahleni Central Business District is located near the site.

- The site is easily accessible from the R544 provincial road and Main Street.
- No other shopping centres are located in close proximity of the site.
- The proposed shopping centre would provide commuters and residents in this area with a close-to-home, convenient place for shopping and social gatherings.
- The topography of the site is suitable for the activity. It is relatively flat, which will minimize the need for earthworks.
- Currently, the site is not utilized for agricultural or residential purposes.
- Development of the site would improve the aesthetics of the area.
- The site is not located near a river or stream and is not subject to the 1:100 year floodline.
- No wetlands are present on site.
- Easy access to services (water, sewage, electricity, roads, stormwater, waste removal) as the site is located within the urban edge.
- Other businesses are located adjacent to the site. The proposed shopping centre will be compatible with the adjacent land uses.

9.2 Services

The said site is located within the eMalahleni Local Municipality (ELM) urban boundary and will therefore be serviced by the municipality.

According to Pienaar (2016), **electrical** capacity is not available at the Smuts Street Substation for the proposed development. The said substation would thus have to be upgraded before the development can be connected.

According to Van As (2016), no upgrading of the **water** or **sewer** infrastructure is necessary. However, the sewer line that extends across the northern portion of the site is leaking, resulting in ponding of sewage on site. The existing sewer system will have to be repaired and the polluted soil disposed of before construction of the shopping centre commences.

The **storm water** system will be connected to that of the eMalahleni Local Municipality. Currently, storm water from the nearby residential area is channelled onto the proposed site, where it ponds. The additional storm water from the residential area should be taken into account in the storm water management system of the shopping centre, in order to prevent ponding. According to Van As (2015), ponding surface water and sewage could seep into the underground workings, which could lead to pillar erosion.

From a **traffic** and transportation point of view, the proposed shopping centre is supported (Mamabolo, 2016) provided that:

- the proposed external road upgrades and site accesses are constructed to the relevant design standards of the local authority;
- the proposed pedestrian and public transport facilities are constructed to the relevant design standards of the local authority; and
- the minimum number of on-site parking bays as per the draft site layout plan are provided (i.e. 621 for the shopping centre and 180 for the warehouses).

The above-mentioned upgrades must be implemented before the opening of the shopping centre and the eMalahleni Local Municipality must ensure that the required services can be provided.

9.3 Public participation

The public participation process followed is described in Section 6 of this report.

The **eMalahleni Local Municipality (ELM)** and **South32** raised concerns regarding the fact that the said site is undermined. The ELM requested that a meeting be arranged with the affected parties in order to address all concerns before the project commences. As indicated in Section 6.4.1, AdiEnvironmental cc requested possible dates for a meeting to be provided by South32. To date, no feedback in this regard was provided. More information regarding the undermining issue is provided in Section 9.4.

Anglo Operations (Pty) Ltd. registered as an interested and affected party as they have surface and mining rights in the area. As indicated in Section 5.4, the defunct Anglo Operations (Pty) Ltd mines are located approximately 1 km to the west of the proposed development site. The proposed development will thus not have a direct impact on Anglo Operations (Pty) Ltd. No further comment was received.

A Sasol gas pipeline is present on site. **Sasol** indicated that the gas pipeline is a major hazard installation and that a risk assessment will have to be conducted. Sasol requested a layout plan of the proposed shopping centre and wanted to know the number of people the buildings were designed for. The subdivision and site development plan was subsequently forwarded to Sasol for input. Sasol conducted a generic risk assessment, which showed that the risk levels are not acceptable and therefore requested additional information in order to conduct formal risk assessment. The applicant will have to ensure that the requested information is provided to Sasol and that approval is obtained before construction commences. In addition, the mitigation and safety measures as stipulated by Sasol will have to be implemented (see Section 8).

A Heritage Impact Assessment and desktop Palaeontological Assessment were requested by the **South African Heritage Resources Agency (SAHRA).** The said studies were conducted (see Section 5.13 and Appendices 8 and 9) as requested by SAHRA and loaded onto the SAHRIS website. No sites of cultural heritage significance were noted on site by Van Vollenhoven (2017). Fourie (2017) did not find any fossils on site during the walk through. Fourie (2017) indicated that topsoil, subsoil and overburden must be surveyed for fossils during the construction phase. This was included as part of the EMP to be implemented (see Section 8).

The **Commission on Restitution of Land Rights** indicated that a land claim has been lodged against the farm Blesboklaagte 296 JS. The claim is however, still in the research stage and has not been gazetted. The applicant has been informed of the potential land claim.

The **Department of Public Works, Roads and Transport** indicated that the applicant would have to obtain approval for access to the site from the R544 provincial road and for any services to be installed within the road reserve. The applicant was informed of this requirement.

Eskom Transmission indicated that they will not be affected by the development.

As indicated in Section 10, the identified authorities, stakeholders and landowners/users will be provided with an opportunity to comment on the Basic Assessment Report. Any additional comments will be included and addressed in the final Basic Assessment Report, which will be submitted to the Department of Agriculture, Rural Development, Land and Environmental Affairs for decision making.

9.4 Environmental features

The environmental features of the site and surrounding area are described in Section 5 of this report. The environmental features of the said site have been impacted upon by a range of activities such as excavation, dumping of spoil, removal of vegetation, gravel roads, installation of pipelines, ponding of water and sewage, etc. No sensitive environments, water courses/wetlands, threatened plants or animal species are present on the site.

Potential impacts on the environment (both positive and negative) that are expected to take place as a result of the proposed development are indicated in Section 7 of this report. Section 8 provides mitigation measures to be implemented in order to reduce the said impacts.

Geology/Undermining

As indicated in Section 5.4, the proposed development is situated on an **undermined area** (Witbank Colliery), which is a defunct mine under care and maintenance of South32.

Since the said site is undermined, the applicant applied to the Department of Mineral Resources (DMR) for permission to develop the said property. Permission was subsequently obtained and the proposed layout plan approved subject to certain conditions and restrictions (letter dated: 1 December 2015; Appendix 14).

The application to DMR included an analysis of the risks involved in developing a shopping centre on an undermined area. According to Van As (2015), the increase in weight due to the presence of buildings is <1% and therefore this risk is negligible. The proposed single storey buildings will be designed in such a way as to minimize risk of injury to its occupants, in the unlikely event of subsidence of the surface.

Van As (2015) recommended the proposed development with confidence based on certain specifications and mitigation measures that must be implemented as indicated in Section 8. It was also indicated that the buildings and paved surface will in fact improve the existing situation. The only risk pertains to an underground fire, which cannot be changed with the development of a shopping centre and would affect the larger eMalahleni CBD area.

South32 however, forwarded a letter (dated: 1 July 2016; Appendix 14) indicating that the company is of the opinion that the structures will not be supported by the existing coal pillars of Witbank Colliery, and that there is a real and imminent risk of collapse. A copy of the risk analysis with regards to the undermining was forwarded to South32 for review. Subsequently,

South32 indicated (letter dated: 28 November 2016; Appendix 14) that they respectfully contest the notion made by SCIP that there is no risk involved for either live/s or property. SCIP Engineering Group responded (letter dated: 8 December 2016) and once again indicated that the risk is negligible. South32 subsequently indicated that their legal team would forward a response. To date, no further comment was received.

The project applicant would have to obtain feedback from South32 with regards to the undermining issue before any construction takes place. In addition, it is recommended that a meeting be held between the applicant, the eMalahleni Local Municipality, SCIP Engineering Group and South32 to resolve the said issues.

Geotechnical aspects

From a geotechnical point of view, the said site is suitable for development provided that the mitigation measures as indicated by Van der Merwe (2016) and included in the EMP (Section 8) are implemented.

An old shaft is also known to be present on site. Even though the shaft was closed, it must be ensured that the shaft area was properly rehabilitated and is geotechnically stable before any construction of buildings takes place.

Ecological aspects

According to Venter (2016), the entire site falls within a single vegetation unit, namely **Disturbed Grassland**. Most of the vegetation was removed in the southern and south eastern portions of the site for the church, roads, informal parking and gathering areas, etc. The remainder of the site is dominated by weeds and alien invader species as well as Couch Grass and various *Eragrostis* species.

No plant Species of Conservation Concern were noted on site and it is not anticipated that plant species of conservation concern or protected plants will be present.

According to Venter 92016), the classification of the northern portion of the site as a Critical Biodiversity Area in the Mpumalanga Biodiversity Sector Plan (2013) is incorrect as the site has been heavily impacted.

Although the potential impact of the development on the vegetation would be low, mitigation measures should still be implemented to minimize the loss of natural vegetation and to prevent erosion as a result of the clearing of the site.

It is not anticipated that the development will have a significant impact on **animal life** since the site and surrounding area are very disturbed and therefore unlikely to support much animal life. Should any animals (e.g. reptiles or small mammals) be found during the construction phase, a specialist should be contacted to ensure the safe removal of the specimen(s).

Surface and groundwater

The proposed development will not directly impact on any **surface water environments** or the 1: 100 year floodline as indicated in Section 5.9. No wetlands, streams, drainage areas, etc. are present on or adjacent to the site.

According to Venter (2016), two artificially wet areas are present in the northern portion of the site. These wet areas are as a result of leaking sewage and the ponding of storm water (from the adjacent residential area) on site.

In terms of groundwater, neither Van der Merwe (2016) or Venter (2016) noted any seepage on site. Van der Merwe (2016) did however, indicate that a shallow water table may exist during high rainfall periods due to the underlying rock horizon.

Van As (2015) indicated that the ponding of water and potential seepage into the underground workings could result in the erosion of the pillars. Proper storm water management as well as regular maintenance of the water and sewer lines would thus be very important to prevent ponding and impacts on the underground workings. The mitigation measures as indicated in Section 8 (EMP) must be implemented.

9.5 Conclusion and recommendation.

Based on the findings of this Basic Assessment Report, it is felt that the proposed development could be approved subject to the implementation of the mitigation measures proposed in the Environmental Management Programme (EMPr) provided in Section 8 of this report.

Regular monitoring and auditing of the activities should take place during both the construction and operational phases to ensure that the mitigation measures are implemented. The shopping centre must be managed in such a way that it is environmentally sustainable, acceptable to the community and complies with the objectives of the National Environmental Management Act, 1998 (Act 107 of 1998). Also of importance would be the implementation of water and energy saving measures in order to reduce the carbon and water footprints of the development.

The proposed project would have a positive impact in terms of supporting the local economy and would provide much needed employment opportunities during both the construction and operational phases. If well managed, the proposed development would also have a positive aesthetic and visual impact on the area.

In view of the findings of this Basic Assessment, the following listed activities can be approved.

Listing	Activity
Listing Notice 1 (GN R327), Listed Activity 26:	Residential, retail, recreational, tourism, commercial or institutional developments of 1000 square metres or more, on land previously used for mining or heavy industrial purposes; excluding (i) where such land has been remediated in terms of part 8 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case the National Environmental Management: Waste Act, 2008 applies; or (ii) where an environmental authorisation has been obtained for the decommissioning of such a mine or industry in terms of this Notice or any previous NEMA notice; or (iii) where a closure certificate has been issued in terms of section 43 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) for such land.

Listing Notice 1 (GN R327), Listed Activity 27:	The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.

The following conditions should be included in the Environmental Authorisation:

- *The management and monitoring measures as indicated in Section 8 (EMPr) of the Basic Assessment Report must be implemented.*
- *Before construction, approval for the proposed development must also be obtained from:*
  - ⇒ *eMalahleni Local Municipality;*
  - ⇒ *Department of Public Works, Roads and Transport;*
  - ⇒ *Sasol;*
  - ⇒ *South32;*
  - ⇒ *South African Heritage Resources Agency.*
- *The conditions stipulated by the Department of Mineral Resources must be implemented.*
- *The conditions stipulated by Sasol must be implemented.*
- *The required road upgrades must be completed as indicated by Mamalolo (2016).*
- *The Smuts Street substation must be upgraded as indicated by Pienaar (2016).*
- *The existing leaking sewer lines extending across the site must be repaired by the ELM before construction commences.*
- *The ELM must ensure that the water, sewer, electricity and storm water infrastructure have sufficient capacity for the proposed development.*
- *The additional storm water from the residential area should be taken into account in the storm water management system of the shopping centre.*

10. EVALUATION OF BASIC ASSESSMENT REPORT

10.1 Availability of Basic Assessment Report

The draft Basic Assessment Report (dated: August 2017) will be submitted to the Department of Agriculture, Rural Development, Land and Environmental Affairs for evaluation purposes. A hard copy of the document will also be forwarded to the following authorities for evaluation (30-day period):

- Department of Water and Sanitation;
- eMalahleni Local Municipality;
- Department of Mineral Resources.

A hard copy and electronic copy of the draft Basic Assessment Report will be made available during the above-mentioned period to the interested and affected parties and stakeholders consulted and/or registered as part of the Basic Assessment Process (refer to Section 10.2).

The various departments, stakeholders and interested and affected parties will be requested to forward any comments on the report to the consultant within the 30-day period provided. A register will be kept of all comments received in terms of the evaluation of the report.

A hard copy of the draft Basic Assessment Report (dated: August 2017) will be made available at the eMalahleni Public Library for evaluation purposes. An electronic version will also be made available on the company website (www.adienvironmental.co.za) and on compact disc (cd) (on request).

The final Basic Assessment Report (incorporating comments from I&APs) will be submitted to the Department of Agriculture, Rural Development, Land and Environmental Affairs for final decision making.

10.2 Informing Interested and Affected Parties

The following interested and affected parties and stakeholders will be notified by means of facsimile, email, etc. of the availability of the reports for evaluation:

INTERESTED AND AFFECTED PARTY LIST	
Organisation	**Name**
Government Departments	
Department of Agriculture, Forestry and Fisheries	F Mashabela
Department of Agriculture, Rural Development, Land and Environmental Affairs - Directorate: Land Use and Soil Management – Ermelo	J Venter
Department of Co-Operative Governance and Traditional Affairs	M Loock
Department of Mineral Resources	S Mathavela
Department of Public Works, Roads and Transport	B Viljoen
Department of Rural Development and Land Reform	ND Nkambule

INTERESTED AND AFFECTED PARTY LIST	
	F Mdushani
Department of Water and Sanitation	A Rambuda
Department of Agriculture, Rural Development, Land and Environmental Affairs	The Director
Other Organisations	
Eskom Distribution	T Ludere
Mpumalanga Tourism and Parks Agency (MTPA)	K Narasoo
South African Heritage Resources Agency (SAHRA)	Website
Telkom	J Smit
Local Municipality and Municipal Councillor	
eMalahleni Local Municipality	M Makgalemele E Nkabinde
Nkangala District Municipality	S Links
Ward 15 councillor	P Mashiane
Ward 20 councillor	R Cronje
Surrounding Landowners	
Property (Figure 6.4)	**Landowner/Contact person**
Undermined area - Portions 1, 13, 14, 17, 19, 20 and 32 of Blesboklaagte	Anglo Operations (Pty) Ltd. - J Lourens
Undermined area - Portions 53, 109 of Blesboklaagte	Ingwe Surface Holdings Ltd (South32) - P. Lombard; D. Korff
Gas pipeline extending across Portion 55 of Blesboklaagte	Sasol Gas - S. Reyneke; S. Bracey
Portions 2, 127, 128, 144, 157, 232, 233 and 234 of Blesboklaagte	Transnet - T. Mavulwana
Portion 74 of Blesboklaagte	Wolma Family Trust - C. Deiner
Portion 174 of Blesboklaagte	eMalahleni Local Municipality
Portion 216 of Blesboklaagte	Sudden Impact Inv 76 (Pty) Ltd. - P.R. Botha; J. Vermeulen
Portion 230 of Blesboklaagte	Willie Viviers Family Trust - M. Viviers
Businesses located on Portion 230 of Blesboklaagte	Witbank Panel Beaters - S. van der Merwe Always Towing - Pieter DM Services - S. van der Merwe

10.3 Comments received

This section will be completed after the completion of the above-mentioned evaluation period.

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