DRAFT BASIC ASSESSMENT REPORT:

THE DEVELOPMENT OF A FILLING STATION AND ASSOCIATED INFRASTRUCTURE ON ERF 20 OF PRESIDENT PARK X6, EMALAHLENI (WITBANK)

Report prepared for: Meronox (Pty) Ltd

Report dated: July 2021 (draft)

Report number: BA 2020/04

DARDLEA ref: 1/3/1/16 1N-234

Prepared by:
AdiEnvironmental cc
P.O. Box 647
Witbank
1035
Tel: 013 – 697 5021
Fax: 013 – 697 5021
E-mail: adie@adienvironmental.co.za

Author: A. Erasmus and R. Janse van Rensburg

PROJECT INFORMATION SUMMARY

PROJECT TITLE	Basic Assessment Report: The Development of a Filling Station on Erf 20 of President Park X6, eMalahleni (Witbank)

CLIENT	Meronox (Pty) Ltd
CONTACT DETAILS	Postnet Suite 290, Private Bag x7260, Witbank 1035

CONSULTANT	AdiEnvironmental cc
CONTACT DETAILS	P.O. Box 647 Witbank 1035

DARDLEA REFERENCE NO.	1/3/1/16 1N-234
AdiEnv REFERENCE NO.	BA 2020/04

REPORT VERSION	Basic Assessment Report – Draft
DATE	July 2021
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UNDERTAKING BY EAP

as required in terms of Section 2(j) of Appendix 2 of the Environmental Impact Assessment Regulations, 2014 (as amended).

Project: Basic Assessment Report: The development of a filling station on Erf 20 of President Park X6, eMalahleni (DARDLEA Ref. no.: 1/3/1/16 1N-234; AdiEnv Ref no.: BA 2020/04).

I, ADRIENNE ERASMUS, *hereby confirm that:*

- *the information provided in this Draft Basic Assessment Report is, to the best of my knowledge, correct as at the time of compilation thereof;*
- *comments and inputs obtained from stakeholders and interested and affected parties through the public participation process conducted to date have been included in this Draft Basic Assessment Report;*
- *information provided to interested and affected parties (to date) has been included in this Draft Basic Assessment Report;*
- *inputs and recommendations from the specialist reports are included in this Draft Basic Assessment Report.*

Signed at eMalahleni on this 12TH day of JULY of 2021.

Signature: .....

Company: ADI ENVIRONMENTAL CC

I, P.A. Janse van Rensburg, *hereby confirm that:*

- *the information provided in this Draft Basic Assessment Report is, to the best of my knowledge, correct as at the time of compilation thereof;*
- *comments and inputs obtained from stakeholders and interested and affected parties through the public participation process conducted to date have been included in this Draft Basic Assessment Report;*
- *information provided to interested and affected parties (to date) has been included in this Draft Basic Assessment Report;*
- *inputs and recommendations from the specialist reports are included in this Draft Basic Assessment Report.*

Signed at eMalahleni on this 12th day of July of 2021.

Signature: .....

Company: AdiEnvironmental CC

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LIST OF ABBREVIATIONS

°C	Degrees Celsius
ADT	Average Daily Traffic
BA	Basic Assessment
BAR	Basic Assessment Report
CBA	Critical Biodiversity Area
COGTA	Department of Co-operative Governance and Traditional Affairs
DAFF	Department of Agriculture, Forestry and Fisheries
DARDLEA	Department of Agriculture, Rural Development, Land and Environmental Affairs
DMR	Department of Mineral Resources
DoE	Department of Energy
DWS	Department of Water and Sanitation
EAP	Environmental Assessment Practitioner
e.g.	For example
EIA	Environmental Impact Assessment
EIR	Environmental Impact Report
EIS	Ecological Importance and Sensitivity
ELM	eMalahleni Local Municipality
EMPr	Environmental Management Programme
ESA	Ecological Support Area
ha	hectares
HIA	Heritage Impact Assessment
I&AP	Interested and Affected Party
km	kilometer
kl	kiloliter
ℓ	liter
l/s	liters per second
m	meters
m^2	square meters
m^3	cubic meters
mamsl	meters above mean sea level
mbgl	meters below ground level
mm	millimeter
MBSP	Mpumalanga Biodiversity Sector Plan
MTPA	Mpumalanga Tourism and Parks Agency
NFEPA	National Freshwater Ecosystem Priority Areas
PIA	Palaeontological Impact Assessment
PES	Present Ecological State
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
SANRAL	South African National Roads Agency Limited
SDF	Spatial Development Framework
TRAC	Trans African Concession
vph	vehicles per hour

SECTION 1: INTRODUCTION

The applicant, ***Meronox (Pty) Ltd.***, intends to develop a filling station and associated infrastructure on a portion of Erf 20 of President Park X6, located on the corner of Nita Avenue and Mandela Drive, eMalahleni (Figure 3.1).

The filling station will comprise of underground petrol and diesel tanks (23 000ℓ x 5), fuel pumps, a canopy covered forecourt and a convenience store. The filling station will be accessed via a left-in left-out road (which will cross Erf 21) from Mandela Drive as well as from Nita Avenue.

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 ultimate aim of an environmental impact assessment is to *"identify, predict and evaluate the actual and potential risks for and impacts on the geographical, physical, biological, social, economic and cultural aspects of the environment, in order to find the alternative and options that best avoid negative impacts altogether, or where negative impacts cannot be avoided, to minimise and manage negative impacts to acceptable levels, while optimising positive impacts, to ensure that ecological sustainable development and justifiable social and economic development outcomes are achieved."*(DEA, 2017).

The proposed activity would require a Basic Assessment process since the following listed activity as identified in the Environmental Impact Assessment Regulations, 2014 (as amended)) is triggered:

Listing	Activity
Listing Notice 1: Listed Activity 14	*The development and related operation of facilities or infrastructure, for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic metres.*

AdiEnvironmental cc. was appointed as independent environmental consultant to conduct the required Basic Assessment and compile the necessary documentation.

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.*

The overall aim of the process is to provide the competent authority with adequate information to make an informed decision regarding the proposed activity, thereby ensuring that activities with an unacceptable degree of negative impacts are not authorized and that authorized activities are undertaken in a manner where environmental impacts are managed to acceptable levels.

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.

Diagram 1 provides a schematic description of the Basic Assessment process followed and the current status of the process.

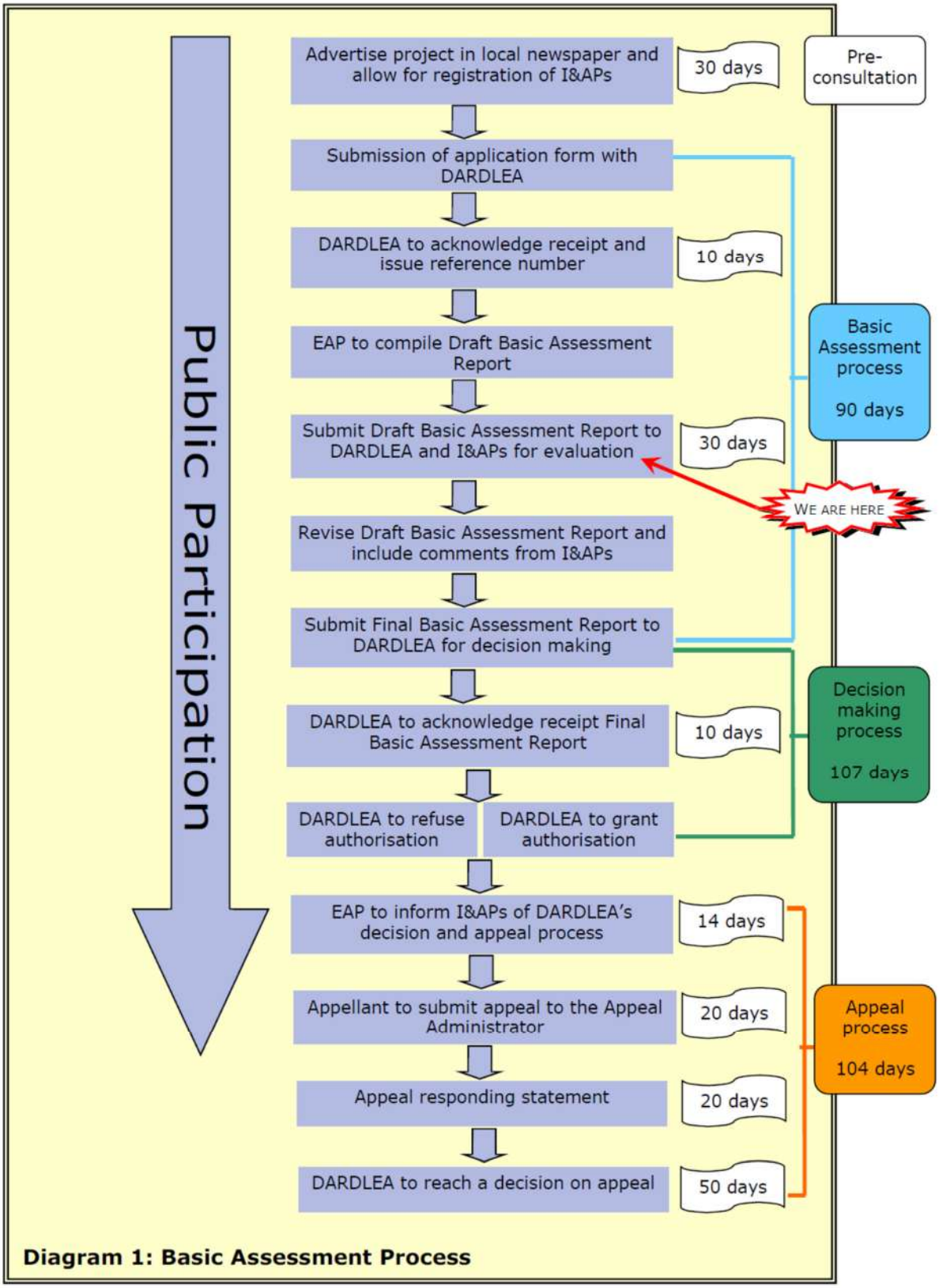


Diagram 1: Basic Assessment Process

SECTION 2: CONTACT DETAILS

As per Appendix 1 of the EIA Regulations, 2014 (as amended), this section provides the following details:

> *(i) the EAP who prepared the report; and*
> *(ii) the expertise of the EAP, including a curriculum vitae.*

In addition, the contact details of the applicant and the specialists who conducted the required specialist studies are also provided.

2.1 Details of the project applicant

Name of Applicant	Meronox (Pty) Ltd.
Company Registration No	2009/015785/07
Address	Postnet Suite 290, Private Bag x7260, Witbank, 1035
Contact Person	Mr. M.G. de Abreu
Cell number	082 876 4752
Fax number	086 610 5671
E-mail	mdeabreu@mweb.co.za

2.2 Details of the registered landowner

Erf 20 of President Park X6 is registered at the Deeds Office to Meronox (Pty) Ltd (i.e. the applicant) – see the Windeed Property Report provided in Appendix 1.

2.3 Details of the Environmental Assessment Practitioner (EAP)

Meronox (Pty) Ltd. appointed AdiEnvironmental cc, an independent environmental consultancy, to undertake the Basic Assessment process for the proposed development in accordance with the Environmental Impact Assessment Regulations (EIA), 2014 (as amended).

Name of company	AdiEnvironmental cc
Company registration number	CK99/036174/23
Address	P.O. Box 647 Witbank, 1035
Environmental Assessment Practitioner 1 (EAP1)	Adrienne (Adie) Erasmus *M.Sc* *Pr. Sci. Nat. (400078/96)* *EAP Registration No:2019/604*
Environmental Assessment Practitioner 2 (EAP2)	Riana Janse van Rensburg *Pr. Sci. Nat. (130290)* *M. Env. Mgt.* *EAP Registration No:2019/1341*
Telephone number	013-697 5021
Cell number	083 271 8260
E-mail	adie@adienvironmental.co.za riana@adienvironmental.co.za

Ms. A. Erasmus has a M.Sc with more than 25 years environmental management experience. She is a Professional Natural Scientist (Botanical and Ecological Science) registered with South African Council for Natural Scientific Professions. Ms. R. Janse van Rensburg has an M. Env. Mgt with more than 18 years environmental management experience and is also registered as a Professional Natural Scientist (Environmental Scientist).

Both Ms. Erasmus and Ms. van Rensburg are Registered Environmental Assessment Practitioners (EAPs) with the Environmental Assessment Practitioners Association of South Africa (EAPASA) – see the website www.eapasa.org for further details.

Ms. Erasmus and Ms. Janse van Rensburg have been involved in the management and execution of numerous environmental assessments. The Curriculum Vitae of the Environmental Assessment Practitioners (EAPs) are provided in Appendix 2 together with a list of projects completed to date.

Both EAPs comply with the requirements as stipulated in Regulation 13 of the EIA Regulations, 2014 (as amended) in terms of independence, expertise, objectivity, etc. The declaration and affirmation by the EAPs is included in the front of this document.

AdiEnvironmental cc has no vested interest (other than fair remuneration) in the approval of this project, and hereby declares its independence as required by the EIA Regulations, 2014 (as amended).

2.4 Details of the specialists

Specialist studies were undertaken as part of the Basic Assessment process to address issues that required further investigation. The following specialists were appointed by the EAP:

Specialist Study	Consultant	Qualifications
Heritage Assessment	Prof Anton van Vollenhoven (Archaetnos Culture and Cultural Resource Consultants)	• BA • BA (HONS) Archaeology • MA Archaeology • Post-Graduate Diploma in Museology • Diploma Tertiary Education • DPhil Archaeology • MA Cultural History • Management Diploma • DPhil History *ASAPA Accreditation: 166* *SASCH Accreditation: CH001*
Palaeontological Assessment	Dr Heidi Fourie (Heidi Fourie Consulting)	• B.Sc Geology and Zoology • Ph.D Palaeontology *Member: Palaeontological Society of SA.*
Vegetation and Wetland Study	Ina Venter (Kyllinga Consulting)	• M.Sc (Botany) • B.Sc Hons (Botany) • B.Sc (Environmental Sciences) *SACNASP Registration: 400048/08*
Bullfrog Study	J.C.P. (Jaco) van Wyk	• M.Sc (Zoology) – in-depth study of the Giant Bullfrog • B.Sc Hons (Zoology) • B.Sc (Zoology) *SACNASP Registration: 400062/09*
Groundwater	Albert Van Heerden	• B.Sc (Geology)

Specialist Study	Consultant	Qualifications
study	(Geo-Pollution Technologies – Gauteng (Pty) Ltd.)	• B.Sc (Hons) (Geology) • M.Sc (Hydrogeology) *SACNASP Registration: 120177 (Candidate Natural Scientist).*
	Morne' Burger (Geo-Pollution Technologies – Gauteng (Pty) Ltd.)	• B.Sc (Geology) • B.Sc (Hons) (Geology) • B.Sc (Hons) Geohydrology) • M.Sc (Geohydrology) *SACNASP Registration: 400296/12*

The Curriculum Vitae and declarations of independence of the above-mentioned specialists are provided in Appendices 1 and 2.

SECTION 3: DESCRIPTION OF THE ACTIVITY

The purpose of this section is to present sufficient project information to Interested and Affected Parties, stakeholders and government departments in terms of the design parameters applicable to the project.

This section therefore provides information on the following as per Appendix 1 of the EIA Regulations, 2014 (as amended):

- *A description of the scope of the proposed activity;*
- *A description of the activities to be undertaken including associated structures and infrastructure;*
- *A plan which locates the proposed activity as well as associated structures and infrastructure (i.e. conceptual design/layout plan).*

It should be noted that the project description details are preliminary at this early stage of the project life-cycle. It is thus possible that some of the design parameters may change during the detailed design phase. However, the project description used in this Basic Assessment Report assumes a worst-case scenario, where the maximum development footprint and all associated infrastructure are taken into account.

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

3.1.1 Introduction

The applicant, ***Meronox (Pty) Ltd.***, intends to develop a filling station and associated infrastructure on a portion of Erf 20 of President Park X6, located on the corner of Nita Avenue and Mandela Drive, eMalahleni (Figure 3.1).

Figure 3.1 indicates the location of the site and Table 3.1 provides the property details.

Table 3.1: Details of the filling station property

Suburb	President Park X6
Erf Number	20
Title Deed Number	T11826/2016
21 Digit SG Code	TOJS01050000002000000 (Erf 20)
Registered Landowner	Meronox (Pty) Ltd
Size of property	Erf 20 – 0.9862ha (9862 m^2)
Centre Co-ordinates of site	25°52'57.26"S 29°15'25.50"E
Magisterial District	eMalahleni Local Municipality
Closest Town	eMalahleni (Witbank)

Figure 3.1: Location of the site

An access road to the proposed filling station will extend across a portion of Erf 21 from Mandela Drive (Figure 3.1). Erf 21 also belongs to the applicant.

3.1.2 Zoning of stand

Erf 20 and Erf 21 were zoned 'Business 2' in terms of the eMalahleni Land Use Scheme (2020), which permits the establishment of a filling station subject to the approval of a Consent-Use Application (Appendix 10).

In order to accommodate the development of a filling station and access road over the adjacent property, Erven 20 and 21 were subdivided and Portion 1 of Erf 20 (4012m^2) and Portion 1 of Erf 21 (467m^2) consolidated creating Erf 23 (4479m^2), President Park x6 (Figure 3.2). The subdivision and consolidation application submitted by Korsman and Associates in this regard was approved (6 April 2021; Appendix 10) by the eMalahleni Local Municipality. It should be noted that to date, the consolidated Erf 23 has not been registered at the Deeds Office and therefore the properties are still referred to as Erf 20 and Erf 21 in this BAR.

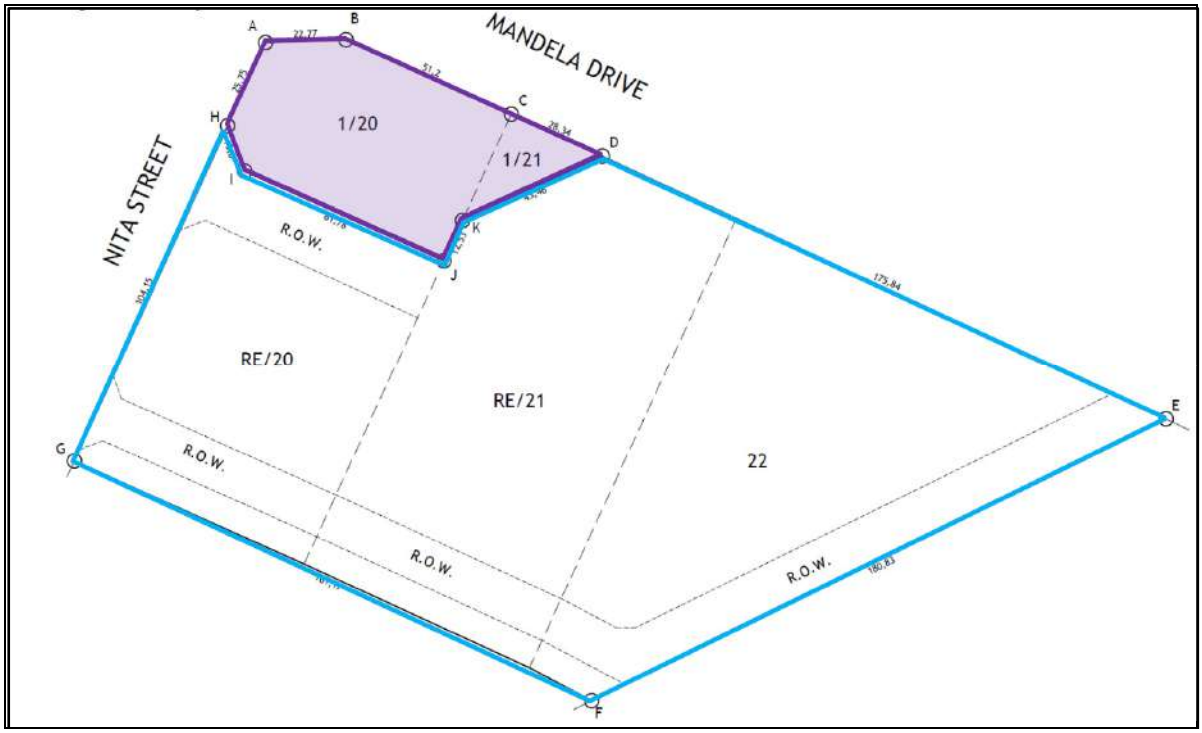


Figure 3.2: Consolidation of Portion 1 of Erf 20 and Portion 1 of Erf 21 (future Erf 23) (taken from Korsman and Associates, 2020)

A Consent-Use Application for a filling station (being a consolidation of Portion 1 of Erf 20 and Portion 1 of Erf 21, future Erf 23) submitted by Korsman and Associates was also approved (6 April 2021) by the eMalahleni Local Municipality (Appendix 10).

In terms of the eMalahleni Land Use Scheme (2020), the following definition for filling station is applicable:

> *"Land used or a building designed or used for the purposes of fuelling, washing, polishing and lubricating of motor vehicles, including incidental and routine maintenance but excluding any normal and major mechanical repairs, sale of motor vehicles and spares, panel beating and spray painting". "The following uses are included: The storage of fuels and the retail selling of vehicle fuel and lubricants; One working bay for emergency repairs to vehicles but excluding panel beating, spray-painting and major repairs; A convenience store including a confectionery and take away facility including a kitchen, with a maximum floor area, accessible to the general public, of 250 m², which floor area shall include the floor area accessible to the public as well as any store room, office, fridge area, safe which is used for the operation of the convenience store; An automatic teller machine; and The sale of LP Gas".*

3.1.3 Layout of filling station

The proposed filling station will be developed on Portion 1 of Erf 20 (Figure 3.2), which is 4012m^2 in extent.

The filling station will be accessed via a left-in left-out road (which will cross Erf 21, Figure 3.2 and Figure 3.3) from Mandela Drive. Approximately 350m^2 will be used for the left-in left-out access road from Mandela Drive. An access point will also be provided from Nita Avenue (Figure 3.2 and Figure 3.3).

In general, the proposed filling station (Figure 3.3) will consist of:

- Underground tanks/tank farm (93 Unleaded, 95 Unleaded and diesel);
- 4 Pump islands (above-ground fuel pumps and hose dispensers);
- Associated pump and tank infrastructure (e.g. delivery pipes, fillers, suction pumps, etc.);
- Canopy covered forecourt with 8 vehicle refuelling bays;
- Convenience store of ±300m²;
- Car parking (20 parking bays, including one for disabled persons);
- Delivery parking areas;
- Ablution facilities;
- Access roads from Mandela Drive and Nita Avenue;
- Stormwater channel and containment slab with catchpit;
- Landscaped area surrounding site.

As indicated in Figure 3.3, the convenience store (C-store) and parking bays (10) will be located in the south eastern portion of the site.

The forecourt and 4 pump islands will be located in approximately the centre of the site (Figure 3.3). Concrete islands (with crash barriers) would be provided on which the fuel pumps (with hose dispensers) and air supply would be constructed.

In order to prevent soil and water pollution as a result of accidental spills, the forecourt would be located on top of a concrete containment slab. A stormwater channel with catchpit would be installed along the southern boundary of the forecourt to capture any polluted runoff water. A canopy would also be installed, which would divert clean rainwater away from the forecourt area.

Figure 3.4 provides an indication of where the underground tanks could be installed.

Figure 3.4: Possible tank positions on site (provided by EDL Consulting Engineers, 2020).

The tank farm will comprise of five (5) 23 000 liter underground tanks and associated infrastructure. It is anticipated that two (2) tanks will be installed for diesel, 1 for 95 Unleaded petrol and 2 for 93 Unleaded petrol. Based on the installation of five (5) underground tanks, approximately 115 000 liters or 115m^3 of fuel would be stored on site.

Construction standards:
The underground tanks and related infrastructure will be installed in accordance with the various Health, Safety and Environmental policies and Standard Specifications of the appointed oil company. In addition, all work at the filling station will be done in accordance to the following SANS standards:

- *SANS 10089 Part 3: The Petroleum Industry Part 3: The installation, modification, and decommissioning of underground storage tanks, pumps/dispensers and pipework at service stations and consumer installations.*
- *SANS 10089 Part 2: The petroleum industry Part 2: Electrical and other installations in the distribution and marketing sector.*
- *SANS 1535: Glass-reinforced polyester-coated steel tanks for the underground storage of hydrocarbons and oxygenated solvents and intended for burial horizontally.*

The tank farm would be located at least 3m clear of any building. The following dimensions would be applicable for the tank installation excavation:

Length:	1m in excess of overall length of tank
Breadth:	1m in excess of tank diameter
Depth:	The top of the tank must be a minimum depth of 1250mm below finished ground level.

In the unlikely event that a high groundwater level occurs on site, the tanks would be safeguarded against movement or floating by means of reinforced concrete saddles.

Backfill material will be placed in 150 mm layers up to the top of the tank and will be well compacted at optimum moisture content (minimum 90% Mod AASHTO). If necessary, the tanks will be half-filled with water to prevent flotation caused by compaction of the backfill material.

Once the excavations around the tanks have been backfilled, the manhole, concrete slab (saddle) and pipe work will be installed. Finally, the tank farm will be backfilled with wet soilcrete (8:1 river sand: cement mix (4 X 50km/m^3) up to the pavement formation level.

In general, the underground tanks would be refuelled through fillers located a few meters from the tanks. Fuel would then be pumped from the underground tanks to the above-ground pump islands (fuel pumps) via delivery pipes by using either suction pumps or submersible turbine pumps.

Fuel leak monitoring wells:
Fuel leak monitoring wells would be installed at the filling station to monitor for possible tank leakage and to act as future observation wells.

Usually, high-density polyethylene slotted/perforated pipes (160mm), wrapped in a porous geotextile or ABS single-walled wedge-slot tubular screens would be installed on the centre line of the tanks. The bottom ends would be plugged and the top ends finished off with a suitable plumber plug. The wells would be taken down to 500 mm – 1 m below the floor of the excavation depending on the nature of the soils.

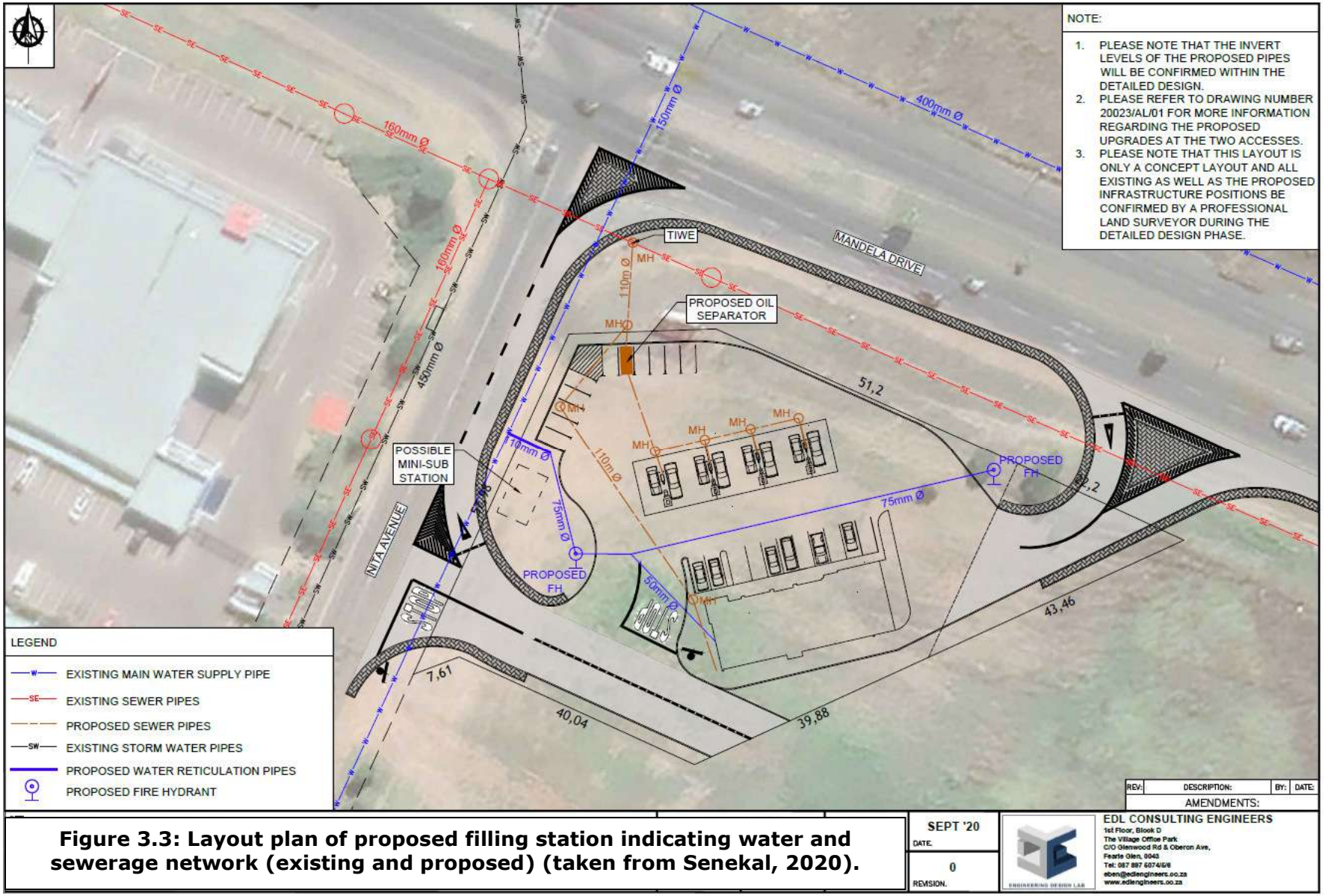


Figure 3.3: Layout plan of proposed filling station indicating water and sewerage network (existing and proposed) (taken from Senekal, 2020).

3.2 Services required

The said site is located within the urban edge of the eMalahleni Local Municipality. Services (water, sewage, electricity, etc.) will be provided by the eMalahleni Local Municipality.

EDL Engineers (Pty) Ltd (hereafter referred to as Senekal, 2020) was appointed to investigate the civil engineering services required for the proposed filling station. A copy of the civil services report is provided in Appendix 9.

Senekal (2020) indicated that all services (water, sewer, stormwater, roads and accesses) can be provided (acceptably and economically) for the proposed filling station subject to the implementation of the proposed improvements to the infrastructure as recommended.

In addition, RDV Consulting Electrical Engineers (Pty) Ltd (hereafter referred to as Diederiks, 2020) was appointed to investigate the electrical services that would be required in terms of the proposed filling station. A copy of the electrical engineering services report is proposed in Appendix 9.

It should be noted that 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.

3.2.1 Water and firefighting

Senekal (2020) indicated that the proposed filling station can be serviced by means of a 110mm diameter uPVC pipe running from the existing water main in Nita Avenue, entering the site from the west (Figure 3.3). From this pipe, a 75mm diameter pipe is proposed to service each of the two (2) hydrants situated on site (Figure 3.3). A 50mm diameter pipe is proposed for water reticulation to the building (Figure 3.3).

The estimated water demand/daily flow (Senekal, 2020) is expected to be as follows:

BUILDING AREA (m^2)	UNITS	PEAK HOURLY FACTOR (PHF)	WATER DEMAND (kl/d)	WATER DEMAND (l/s)
Approx. 300	kl/100m^2	3	7.2	0.083

In terms of firefighting, Senekal (2020) indicated that the proposed filling station falls into the moderate risk category. The water infrastructure must therefore be capable of delivering a total fire flow of 25 litres/second/hydrant for 4 hours with a minimum pressure head at the fire node of 15m. A total of 2 fire hydrants must be provided as indicated in Figure 3.3.

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.

3.2.2 Sewage

As indicated in Figure 3.3, a 110mm diameter Class 34 uPVC pipe (at minimum gradients of 1:60) will connect to the existing 160mm diameter municipal sewer located in the road reserve adjacent to Mandela Drive.

The Average Daily Dry Weather Sewage Flow (AADWF) is expected to be as follows:

BUILDING AREA (m^2)	UNITS	SEWAGE FLOW (kl/unit production)	CALCULATED FLOW (l/s)
Approx. 300	kl/100m^2	0.52	2380

An oil separator is proposed near the northern boundary of the site (Figure 3.3). From this oil separator, another 110mm diameter Class 34 uPVC pipe is to be installed that will connect to the existing sewer pipe in Mandela Drive (Figure 3.3).

3.2.3 Stormwater infrastructure

In view of the site currently being undeveloped, there is no form of stormwater infrastructure on site.

The nearest stormwater kerb inlet and associated pipe (450mm diameter) is in Nita Avenue, in front of the Nissan Dealership. This stormwater discharges the stormwater onto undeveloped land just north of the intersection of Mandela Drive and Nita Avenue (Figure 3.5).

Based on the information provided in Table 3.2, the stormwater infrastructure on site will have to be sized to accommodate a total flow of 0.227 m^3/s during the 25 year storm event.

Table 3.2: Pre-development flow (1:5 year) and Post-development flow (1:25 year) (taken from Senekal, 2020)

	Pre-development flow (1:5 year)	Post-development flow (1:25 year)
ERF	23	
AREA (ha)	0.04479	
AREA DISTRIBUTION FACTOR	Rural: 100% Urban: 0%	Rural: 0% Urban: 100%
AVERAGE SLOPE (m/m)	0.03809	
Tc (min)	15	6
Combined run-off coefficient	0.342	0.864
Rainfall intensity (mm/hr)	84.376	211.580
Peak flow (m3/s)	0.036	0.227

A total of two (2) 5m long kerb inlets are proposed at strategic positions on site as indicated in Figure 3.5. The site is to be sloped as set out in Figure 3.5.

In addition, Senekal (2020) proposed the following:

- Running from each 5m long kerb inlet (Figure 3.5), two (2) 375mm diameter concrete stormwater pipes to assist with the stormwater runoff from the site.
- A shallow channel is proposed in the paving on the northern side of the convenience store to guide stormwater from the site to the north eastern kerb inlet near the access from Mandela Drive (Figure 3.5).
- The proposed stormwater pipe, running from the two (2) proposed kerb inlets on site, is proposed to be connected to the existing stormwater pipe in Nita Avenue, with an associated manhole, and by means of a proposed 450mm 100D concrete pipe (Figure 3.5).
- To minimise any risk of possible capacity restraints and overflows, the existing stormwater pipe in Nita Avenue is proposed to be upgraded to

a 600mm 100D concrete pipe from the position of the proposed manhole in front of Nissan Dealership, running north toward the existing outlet structure north of Mandela Drive.

- All pipes are to be installed at the existing slopes present on site as these gradients are more than the minimum required gradients for these stormwater pipes.

Rain that falls onto the canopy (roof) of the filling station will be treated as clean water and routed separately to the overall stormwater management system.

In order to prevent soil and water pollution as a result of accidental spills, the forecourt would be located on top of a concrete containment slab. A stormwater channel with catchpit would be installed along the southern boundary of the forecourt to capture any polluted runoff water.

Water from the forecourt and fuel delivery pavements will be routed via an oil separator (Figure 3.3) in order to remove any potential contaminants.

3.2.4 Roads and accesses

As already indicated, the filling station will be accessed via a left-in left-out road (which will cross Erf 21) from Mandela Drive with 5m wide IN and OUT lanes, respectively. This access is proposed about 100m south east of the Mandela Drive and Nita Avenue intersection (Figure 3.6). A 45m taper lane is required on Mandela Drive (Figure 3.6) to accommodate traffic turning left into the site, ultimately promoting safety on site and on Mandela Drive.

An access point will also be provided from Nita Avenue. A new lane of 3.5m wide is proposed on the eastern side of Nita Avenue (Figure 3.6), which is proposed to run from the intersection of Mandela Drive and Nita Avenue, forming a left slip lane for the full access into the site. This full access, which is planned opposite the existing access to the Nissan Dealership, is proposed to have 5m wide IN and OUT lanes as well as a 'STOP' condition at Nita Avenue, with the latter having the Right-of-Way.

Both accesses will have bell-mouth radii (Figure 3.6) large enough to account for the manoeuvring of larger vehicles (e.g. fuel tanker trucks).

Both accesses must be surfaced and must have road markings and signage complying with the standards of the ELM and the South African Road Traffic Signs Manual (SARTSM).

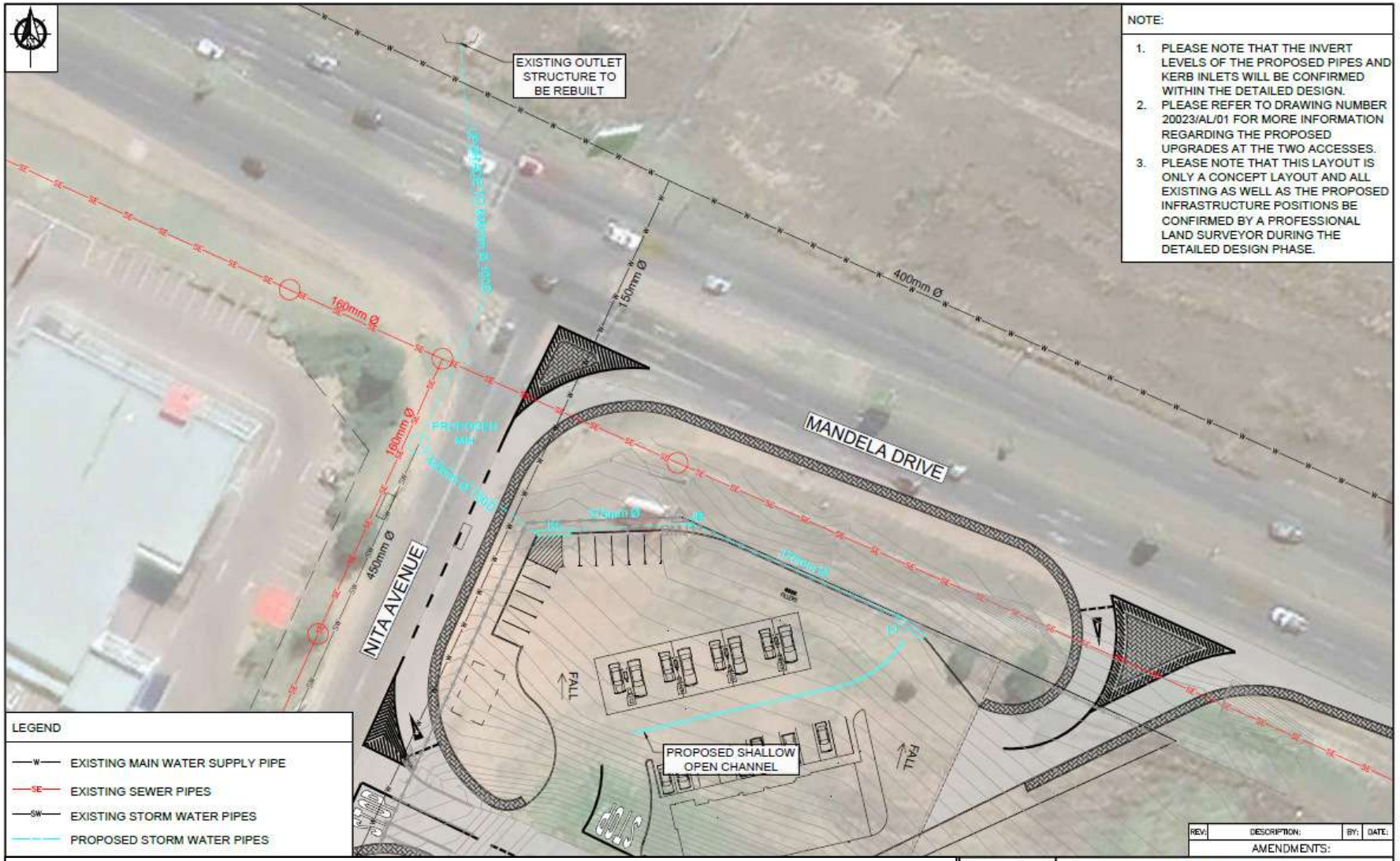


Figure 3.5: Stormwater infrastructure layout for the proposed filling station site (taken from Senekal, 2020)

Figure 3.6: Concept access layout plan (taken from Senekal, 2020)

3.2.5 Electricity

Currently, there is no electrical supply to the proposed filling station site.

The estimated load required by the filling station is 200kVA (non-confirmed at this stage).

After consultation with the ELM, Diederiks (2020) indicated that the following bulk services need to be installed for the proposed filling station:

- A 315kVA\11kV, 420V\242V miniature substation, to be installed by the owner of the property.
- The miniature substation to be installed on the stand boundary (Figure 3.3) and to be connected by means of a T3 Ring Main Unit into an existing 70mm², 11kV, XLPE municipal cable that feeds the "Nissan Substation" (behind Nissan). Since there are a number of cables installed at this position, the developer will be responsible, with the aid of the municipality, to locate and identify the correct cable.
- The 315kVA miniature substation that will be installed by the Developer, will be handed over to the eMalahleni Local Municipality once the miniature substation has been installed and connected to the electrical network.
- The municipality will be at liberty to make use of any surplus miniature capacity not utilized by the developer. At such time, that the developer decides to move forward with the development of the balance of the stands, the developer will be required to lodge a new application with the municipality.

Diederiks (2020) indicated that as far as possible, low wattage energy saving LED lights must be installed at the filling station. In addition, the proposed filling station must comply with the energy efficient requirements of the ELM. All outside lights and area lighting must also be of the LED type.

3.2.6 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 ELM and disposed of at the licensed Leeuwpoort Waste Disposal Site.

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

Any hazardous waste (e.g. empty oil cans, contaminated cloth/paper/sand, etc.), should be stored in a separate bin and disposed of by an appointed company at a licensed Hazardous Waste Disposal Facility.

3.3 Reason for project

Erf 20, Erf 21 and Erf 22 (originally part of Portion 234 of Zeekoewater 311 JS) were rezoned from 'Agriculture' to 'Business 2' in 2013 as part of the President Park X6 township establishment. 'Business 2' in terms of the eMalahleni Land Use Scheme (2020) permits the establishment of a filling station subject to the approval of a Consent-Use Application.

The original land owner subsequently sold the three (3) erven to the applicant (Meronox (Pty) Ltd.) in 2019.

The applicant identified the need for a filling station in the said area in view of the site being located adjacent to the very busy Mandela Drive and in close proximity to residential areas and business nodes. The site is highly visible and easily accessible from Mandela Drive.

Mandela Drive was identified in the Spatial Development Framework as one of the activity spines where the Municipality would allow non-residential uses to take place in order to optimally utilize the visual exposure from the high traffic volumes along this road.

As indicated in Section 3.1.1, a Consent-Use Application for a filling station was submitted by Korsman and Associates and approved (6 April 2021) by the eMalahleni Local Municipality (Appendix 10).

The applicant now wants to proceed with the development of a filling station on a portion of Erf 20 but requires environmental approval before commencing with the said development.

SECTION 4: APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

The primary legal requirement for this project stems from the need for a Basic Assessment (BA) and Environmental Authorisation (EA) in terms of National Environmental Management Act, 1998 (NEMA) (Act 107 of 1998) and the Environmental Impact Assessment Regulations, 2014 (as amended).

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 NEMA, 1998 (Act 107 of 1998), a number of activities that require an environmental impact assessment (either a Basic Assessment (BA) or a full Environmental Impact Assessment (EIA)) before undertaking these activities.

The proposed activity would require a Basic Assessment process since the following listed activity (as identified in the Environmental Impact Assessment Regulations, 2014 (as amended)) is triggered:

Listing	Activity
Listing Notice 1: Listed Activity 14	*The development and related operation of facilities or infrastructure, for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic metres.*

Appendix 1 of the EIA Regulations, 2014 (as amended) prescribes the content of the Basic Assessment Report and supporting documentation that must be submitted to the competent authority in order to obtain an Environmental Authorisation (EA). Table 4.1 provides an overview of where the requirements of Appendix 1 of the EIA Regulations (2014) are addressed in this BA Report.

Table 4.1: Content of the Basic Assessment Report in accordance with Appendix 1 of the EIA Regulations, 2014 (as amended)

APPENDIX 1 OF GN 326 OF 7 APRIL 2017	SECTION IN BA REPORT
3(1) A basic assessment report must contain the information that is necessary for the competent authority to consider and come to a decision on the application, and must include—	
(a) details of— (i) the EAP who prepared the report; and (ii) the expertise of the EAP, including a curriculum vitae;	 (i) Section 2 (ii) Section 2 and Appendix 2
(b) the location of the activity, including: (i) the 21 digit Surveyor General code of each cadastral land parcel; (ii) where available, the physical address and farm name; (iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;	 (i) Section 5.1 (ii) Section 5.1 (iii) Section 5.1
(c) a plan which locates the proposed activity or activities applied for as well as associated structures and infrastructure at an appropriate scale; or, if it is— (i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or (ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken;	Figure 5.1 - Topographical map; Figure 5.3 - Aerial view
(d) a description of the scope of the proposed activity, including— (i) all listed and specified activities triggered and being applied for; and (ii) a description of the activities to be undertaken including associated structures	 (i) Section 1.1 (ii) Section 3; Section 7

APPENDIX 1 OF GN 326 OF 7 APRIL 2017	SECTION IN BA REPORT
and infrastructure;	
(e) a description of the policy and legislative context within which the development is proposed including— (i) an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that are applicable to this activity and have been considered in the preparation of the report; and (ii) how the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools frameworks, and instruments;	(i) Section 4; Table 4.2 (ii) Section 4; Table 4.2
(f) a motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location;	Section 3; Section 7; Section 10
(g) a motivation for the preferred site, activity and technology alternative;	Section 7
h) a full description of the process followed to reach the proposed preferred alternative within the site, including— (i) details of all the alternatives considered;	(i) Section 7
(ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;	(ii) Section 6; Section 11 and Appendices 11-14
(iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them;	(iii) Section 6
(iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	(iv) Section 5
(v) the impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts— (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated;	(v) Section 8
(vi) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives;	(vi) Section 8
(vii) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	(vii) Section 8
(viii) the possible mitigation measures that could be applied and level of residual risk;	(viii) Section 9 (EMPr)
(ix) the outcome of the site selection matrix;	(ix) Section 7
(x) if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and	(x) N/A
(xi) a concluding statement indicating the preferred alternatives, including preferred location of the activity;	(xi) Section 7.6
(i) a full description of the process undertaken to identify, assess and rank the impacts the activity will impose on the preferred location through the life of the activity, including— (i) a description of all environmental issues and risks that were identified during the environmental impact assessment process; and (ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures;	Section 8
(j) an assessment of each identified potentially significant impact and risk, including— (i) cumulative impacts; (ii) the nature, significance and consequences of the impact and risk; (iii) the extent and duration of the impact and risk; (iv) the probability of the impact and risk occurring; (v) the degree to which the impact and risk can be reversed; (vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and (vii) the degree to which the impact and risk can be avoided, managed or mitigated;	Section 8
(k) where applicable, a summary of the findings and impact management measures identified in any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included	Section 5; Section 9 (EMPr); Section 10

APPENDIX 1 OF GN 326 OF 7 APRIL 2017	SECTION IN BA REPORT
in the final report;	
(l) an environmental impact statement which contains— (i) a summary of the key findings of the environmental impact assessment; (ii) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers; and (iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;	(i) Section 10 (ii) Section 9 (EMPr) and Figure 9.1 (iii) Section 7; Section 10
(m) based on the assessment, and where applicable, impact management measures from specialist reports, the recording of the proposed impact management outcomes for the development for inclusion in the EMPr;	Section 9 (EMPr)
(n) any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation;	Section 10
(o) a description of any assumptions, uncertainties, and gaps in knowledge which relate to the assessment and mitigation measures proposed;	Section 10
(p) a reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;	Section 10
(q) where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required, the date on which the activity will be concluded, and the post construction monitoring requirements finalised;	N/A
(r) an undertaking under oath or affirmation by the EAP in relation to— (i) the correctness of the information provided in the reports; (ii) the inclusion of comments and inputs from stakeholders and I&APs; (iii) the inclusion of inputs and recommendations from the specialist reports where relevant; and (iv) any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties; and	Front of Document
(s) where applicable, details of any financial provision for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts;	N/A
(t) any specific information that may be required by the competent authority; and	N/A
(u) any other matters required in terms of section 24(4)(a) and (b) of the Act.	N/A

Table 4.2 provides a summary of the key policy and legislative requirements applicable to the proposed project, including how it was considered in the preparation of the report.

Table 4.2: Applicable legislation, policies and/or guidelines

Legislation/policies/guidelines	Aim of legislation, policy or guideline	Where considered in BA Report	Adherence of proposed activity
Environmental Management			
The Constitution of the Republic of South Africa, 1996 (Act 108 of 1996)	To establish a Constitution with a Bill of Rights for the RSA. It sets out of a number of fundamental environmental rights (Section 24).	Throughout the Basic Assessment process.	The development will not be harmful to the health or wellbeing of surrounding landowners/users. Mitigation measures will be implemented to ensure that the environment is not polluted or degraded.
National Environmental Management Act, 1998 (Act 107 0f 1998) and amendments	To provide for the integrated management of the environment. Chapter 1 sets out the national environmental principles. Chapter 5 deals specifically with integrated management. Chapter 7 deals with compliance and enforcement with specific reference to Section 28 (duty of care)	Throughout the Basic Assessment process.	Environmental management principles and general objectives of Integrated Environmental Management taken into account throughout the Basic Assessment process.
Environmental Impact Assessment Regulations, 2014 and amendments	Regulations pertaining to environmental impact assessments.	Throughout the Basic Assessment process. Listed Activity 27 of GN 983 (as amended).	Basic Assessment process undertaken for the proposed development in accordance with the requirements of the Regulations.
National Appeal Regulations, 2014 and amendments	To regulate the procedure contemplated in Section 43(4) of the Act relating to the submission, processing and consideration of a decision on an appeal.	N/A	On receipt of the Environmental Authorisation, I&APs will be informed that an Appeal against the decision can be lodged and the procedure as prescribed in the National Appeal Regulations, 2014 must be followed.
Public Participation Guideline in terms of EIA Regulations, 2017	Guideline on the public participation process	Section 6 - Public participation	Adjacent landowner/users, relevant stakeholders and Interested and Affected Parties were consulted to obtain input with regards to the proposed development and to resolve any queries or concerns with regards to the activity.
Directions Regarding Measures to Address, Prevent and Combat the Spread of COVID-19 Relating to National Environmental Management Permits and Licences (Covid-19 Directions of 5 June 2020)	COVID directions regarding environmental management	Section 6 – Public participation	The Public Participation Process was designed to satisfy the requirements of Chapter 6 and Appendix 1 of the EIA Regulations, 2014 (as amended) and the PP Guideline, 2017. The Covid-19 Directions of 5 June 2020 were no longer applicable when the initial public participation (as indicated in Section 6.1) was undertaken.

Legislation/policies/guidelines	Aim of legislation, policy or guideline	Where considered in BA Report	Adherence of proposed activity
Guideline on Need and Desirability in terms of EIA Regulations, 2017	Guideline with regards to need and desirability of activities	Throughout the document Section 10 - Impact statement	The need and desirability of the proposed development was considered during the Basic Assessment process.
Biodiversity			
National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004) and amendments	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.	Section 5.7 - Vegetation Section 5.8 - Animal life	No sensitive environments are present on site. General mitigation measures in terms of the protection of the natural environment are however, indicated in the EMPr (Section 9).
National Biodiversity Framework (NBF, 2008)	To co-ordinate and align the efforts of the organisations and individuals involved in conserving and managing South Africa's biodiversity	Section 5.7 - Vegetation Section 5.8 - Animal life	No sensitive environments are present on site. General mitigation measures in terms of the protection of the natural environment are however, indicated in the EMPr (Section 9).
National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004): National List of Ecosystems that are threatened and in need of protection (9 December 2011).	The purpose of listing threatened ecosystems is primarily to reduce the rate of ecosystem and species extinction. This includes preventing further degradation and loss of structure, function and composition of threatened ecosystems. The purpose of listing protected ecosystems is primarily to preserve witness sites of exceptionally high conservation value.	Section 5.7 - Vegetation	The proposed development is not located within any threatened ecosystems listed in the NEM: Biodiversity Act.
Threatened or Protected Species Regulations (GN 152 of 23 February 2007)	To further regulate the permit system in terms of restricted activities involving threatened or protected species.	Section 5.7 – Vegetation Section 5.8 - Animal life	No threatened or protected species are known to be present on site. The Regulations to be noted if threatened plants and bullfrogs are found on site during construction and need to be relocated.
List of Protected Tree Species under the National Forests Act, 1998 (Act No. 84 of 1998)	Provides a list of protected tree species.	Section 5.7 - Vegetation	No protected tree species are present on site.
National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003) and amendments	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	Section 5.7 – Vegetation Section 5.8 - Animal life	The site is not located within or near a protected area. The Witbank Nature Reserve is located approximately 3.5km east of the site. The proposed development will however, not have any direct or indirect impacts on the nature

Legislation/policies/guidelines	Aim of legislation, policy or guideline	Where considered in BA Report	Adherence of proposed activity
	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.		reserve.
National Protected Areas Expansion Strategy (NPAES, 2008)	To achieve cost-effective expansion of the protected area network that enhances ecological sustainability and resilience to climate change.	Section 5.7 – Vegetation Section 5.8 – Animal life	The site is not located within or near a proposed expansion area.
Mpumalanga Nature Conservation Act, 1998 (Act 10 of 1998) and amendments	To control nature conservation in Mpumalanga.	Section 5.7 - Vegetation Section 5.8 - Animal life	No conservation areas, CBA's or ESA's are indicated in the Mpumalanga Biodiversity Sector Plan (MBSP, 2013) for the site. The Witbank Nature Reserve is however, located approximately 3.5km east of the site. The closest CBA is located approximately 400m east of the site opposite the Highveld Mall.
Conservation of the Agricultural Resources Act, 1983 (Act 43 of 1989) and amendments	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 for matters connected therewith.	Section 5 - Biophysical description Section 9 - EMPr	Mitigation measures (e.g. erosion control) to be implemented during construction and operation to ensure compliance with the CARA Act. Mitigation measures included in the EMPr, Section 9.
Alien and Invasive Species Regulations, 2020; Alien and Invasive Species Lists, 2020.	Regulations regarding alien and invasive species.	Section 5.7 - Vegetation Section 5.8 - Animal life Section 9 – EMPr	Mitigation measures to be implemented during construction and operation to ensure that alien and invasive species are controlled. Mitigation measures included in the EMPr, Section 9.
Water			
National Water Act, 1998 (Act 36 of 1998) and amendments	To control water management aspects.	Section 5.9 - Surface water and wetlands Section 9 – Mitigation and management measures	No rivers, streams or dams are located on site or in close proximity of the site. The closest stream is an unnamed tributary (locally known as Madelspruit), which is located approximately 800 m west of the site (Figure 5.1). The Olifants River is located 3.8 km east of the site. A Seep Wetland is located to the east of the site, which becomes a Valley Bottom Wetland/drainage area downstream. Mitigation measures (in terms of water management) to be implemented during construction and operation to ensure compliance with the National Water Act.

Legislation/policies/guidelines	Aim of legislation, policy or guideline	Where considered in BA Report	Adherence of proposed activity
			Mitigation measures included in the EMPr, Section 9.
Water Use Licence Applications & Appeal Regulations, 2017	To prescribe the procedure and requirements for water use licence applications as contemplated in sections 41 of the Act; as well as an appeal in terms of section 41(6) of the Act.	N/A	The site is located within 500m of a water course (wetland). A Water Use License is however, not required since the proposed development will have a low risk as per the Risk Assessment conducted by Venter (2020). A General Authorisation could be applicable.
Water Services Act, 1997 (Act 108 of 1997)	To provide for the rights of access to basic water supply and basic sanitation.	Sections 3 and 7 – Service provision.	The site is located within the urban edge of the eMalahleni Local Municipality (ELM). Services (water, sewage, electricity, etc.) will be provided by the ELM by connecting to the existing municipal infrastructure.
National Freshwater Ecosystem Priority Assessment (NFEPA) of 2012 and implementation manual.	Provides strategic spatial priorities for conserving South Africa's freshwater ecosystems and supporting sustainable use of water resources.	Section 5.9 - Surface water and wetlands	According to the NFEPA database, the site is located within an area identified as an Ecological Support Area (ESA): Wetland Clusters. No wetlands were however, identified on site. Wetlands are present east of the site. Mitigation measures (in terms of water management) to be implemented during construction and operation to ensure that the said wetlands are not impacted.
Best Practice Guidelines published by the Department of Water Affairs and Forestry: G1 - Storm Water Management	Provides best practice principles and guidelines in terms of water management.	Section 3.2.3 - Storm water management	Site specific storm water management measures were compiled for the site.
Waste			
National Environmental Management: Waste Act, 2008 (Act 59 of 2008) and amendments	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.	Section 7 – Waste management Section 9 – Mitigation and management measures	During the operational phase, waste will be removed by the eMalahleni Local Municipality and disposed at the licenced Leeuwpoort Waste Disposal Site. A waste management license is not required for this project. Mitigation measures in terms of waste management are included in the EMPr, Section 9.
Nkangala District Municipality Integrated Waste Management Strategy	A strategy dealing with waste.	Section 7 – Waste management Section 9 – Mitigation and management measures	
eMalahleni Local Municipality Waste Management By-Laws	To regulate the management of waste within the eMalahleni Local Municipal area.	Section 7.4.4 – Waste management	
Development Planning			
Spatial Planning and Land Use Management Act, 2013 (Act 16 of 2013)	To provide a framework for spatial planning and land use management	Section 3 - Description of activity Section 5.17 - Sense of place Figure 5.20 – SDF	Erf 20, Erf 21 and Erf 22 (originally part of Portion 234 of Zeekoewater 311 JS) were rezoned from 'Agriculture' to 'Business 2' in 2013 as part of the President Park X6 township establishment. 'Business 2' in terms of the eMalahleni Land Use Scheme, 2020
Integrated Development Plan for the eMalahleni Local Municipality	Broad spatial framework guidelines for the eMalahleni Local Municipality.		
Spatial Development Framework for the eMalahleni Local Municipality	Spatially based policy guidelines whereby changes, needs and growth in the region		

Legislation/policies/guidelines	Aim of legislation, policy or guideline	Where considered in BA Report	Adherence of proposed activity
	can be managed to benefit the whole community.		permits the establishment of a filling station subject to the approval of a Consent-Use Application. As indicated in Section 3, a Consent-Use Application for a filling station was submitted by Korsman and Associates and approved (6 April 2021) by the eMalahleni Local Municipality (Appendix 10). According to the eMalahleni Local Spatial Development Framework (LSDF), Mandela Drive was identified as one of the activity spines/corridors (Figure 5.20) where non-residential uses would be allowed in order to optimally utilize the visual exposure from the high traffic volumes along this road. The proposed filling station would be highly visible and easily accessible from Mandela Drive and therefore fits into the development plans of the eMalahleni Local Municipality. The proposed development should therefore not impact on the sense of place of the area.
Sub-division of Agricultural Land, 1970 (Act 70 of 1970)	To control the subdivision and, in connection therewith, the use of agricultural land.	Section 5.3 – Land Use	Erf 20, Erf 21 and Erf 22 (originally part of Portion 234 of Zeekoewater 311 JS) were rezoned from 'Agriculture' to 'Business 2' in 2013 as part of the President Park X6 township establishment.
National Framework for Sustainable Development (NFSD, 2008)	To enunciate South Africa's national vision for sustainable development and indicate strategic interventions to re-orientate South Africa's development path in a more sustainable direction. It proposes a national vision, principles and areas for strategic intervention that will enable and guide the development of the national strategy and action plan.	Throughout the Basic Assessment process.	Sustainable development principles taken into account throughout the Basic Assessment process.
Sustainable Development Goals, 2015	A universal call to action to end poverty, protect the planet and ensure that all people enjoy peace and prosperity by 2030.	Throughout the Basic Assessment process.	Sustainable Development Goals taken into account in the Basic Assessment process in terms of minimizing damage to the environment (EMPr).
National Development Plan 2030 (NDP, 2012)	The NDP aims to eliminate poverty and reduce inequality by 2030. These goals can be realized by drawing on the energies of its people, growing an inclusive economy, building capabilities, enhancing the capacity	Section 3.3 - Reason for project Section 7 – Alternatives Section 10 - Impact statement	The proposed development will create employment opportunities during the construction and operational phases.

Legislation/policies/guidelines	Aim of legislation, policy or guideline	Where considered in BA Report	Adherence of proposed activity
	of the state, and promoting leadership and partnerships throughout society.		
Heritage Resources			
National Heritage Resources Act, 1999 (Act 25 of 1999) and amendments	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.	Section 5.13 - Sites of archaeological/cultural interest Section 9 - EMPr	A Heritage Impact Assessment was conducted. No sites of archaeological interest were identified on site by the appointed archaeologist. A Palaeontological Impact Assessment was conducted and mitigation measures provided in Section 9.
Air Quality			
National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004) and amendments	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.	Section 5.11 - Air quality Section 9 - EMPr	An emissions license is not required.
Highveld Priority Area Air Quality Management Plan, 2011	To achieve and maintain compliance with the ambient air quality standards across the HPA, using the Constitutional principle of progressive realisation of air quality improvements. The AQMP for the HPA provides the framework for implementing departments and industry to include AQM in business planning to ensure effective implementation and monitoring.	Section 5.11 - Air quality Section 9 - EMPr	The development is located within the Highveld Priority Area. Mitigation measures w.r.t. air quality (fumes, dust, etc.) are provided in Section 9.
National Dust Control Regulations, 2013	To prescribe general measures for the control of dust in all areas.	Section 5.11 – Air quality Section 9 – EMPr	Dust could be generated as a result of construction activities and use of heavy machinery. Mitigation/management measures with regards to dust are indicated in the EMPr, Section 9. No dust will be generated during the operational phase since the access roads would be tarred/paved.
Noise			
Noise Control Regulations (GN 154 of 1992)	To set out rules relative to the control of noise.	Section 5.12 - Noise Section 9 – EMPr	The ambient noise level of the site is relatively high since the site is located adjacent to Mandela Drive and Nita Avenue, which both carry fairly high volumes of traffic throughout the day. Section 8 provides an
eMalahleni Noise Control By-Law, 2016	To regulate noise within the eMalahleni Local Municipal area.	Section 5.12 - Noise Section 9 – EMPr	

Legislation/policies/guidelines	Aim of legislation, policy or guideline	Where considered in BA Report	Adherence of proposed activity
			indication of the potential noise impact during the construction and operational phases. Mitigation/management measures with regards to noise are indicated in the EMPr (Section 9).
Health and Safety			
Health Act, 1977 (Act 63 of 1977) and amendments	To promote public health.	Section 9 – EMPr	Mitigation measures to reduce potential impacts on the site workers provided in the EMPr, Section 9.
Occupational Health and Safety Act, 1993 (Act 85 of 1993) and amendments	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.	Section 9 - EMPr	Mitigation measures to reduce potential impacts on the contractors and employees/site workers provided in the EMPr, Section 9.
National Building Regulations and Standards Act, 1977 (Act 103 of 1977) and amendments	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.	Section 3 - Project description Section 7 - Alternatives	The buildings will be constructed according to the National Building Regulations.
National Veld and Forest Fire Act, 1998 (Act 101 of 1998) and amendments	To prevent and combat veld, forest and mountain fires throughout South Africa.	N/A	The applicant must ensure that he complies with the Act.
Dangerous Goods/Hazardous substances			
SANS 10089 Part 3: The Petroleum Industry Part 3: The installation, modification, and decommissioning of underground storage tanks, pumps/dispensers and pipework at service stations and consumer installations.	To ensure that underground storage tanks, pumps/dispensers and pipework at service stations and consumer installations are correctly installed/modified/ decommissioned.	Section 9 - EMPr	Contractor to comply.
SANS 10089 Part 2: The petroleum industry Part 2: Electrical and other installations in the distribution and marketing sector.	To ensure that electrical and other installations are correctly installed	Section 9 – EMPr	Contractor to comply.
Various SANS standards and publications w.r.t. to the petroleum industry.			Contractor and site operator to comply.
Petroleum Products Act, 1977 (Act No. 120 of 1977) and amendments	To regulate the distribution and sale of petroleum.		Site operator to comply.
Regulations Site and Retail licences (Government Gazette No. 28665 of 27 March 2006)	To regulate the distribution and sale of petroleum.		Site operator to obtain the necessary site and/or retail licence from the Department of Energy before commencing with the filling station.
Regulations regarding the use of payment cards to purchase petroleum products at a retail site (Government Gazette Notice No. 731 of 9 July 2009)	To regulate the distribution and sale of petroleum.		Operational phase: Site operator to comply with these regulations.
Regulations regarding the display of prices at which petroleum products are available for	To regulate the distribution and sale of petroleum.		Operational phase: Site operator to comply with these regulations.

Legislation/policies/guidelines	Aim of legislation, policy or guideline	Where considered in BA Report	Adherence of proposed activity
sale (Government Gazette Notice No. 376 of 14 May 2010)			
National Road Traffic Act, 1996 (Act 93 of 1996)	Regulations relating to the transportation of dangerous goods and substances by road		Operational phase: Oil company delivering fuel to the site must adhere to these regulations.
General			
Protection of Personal Information Act, 2013 (Act 4 of 2013)	The purpose of this act is to give effect to the constitutional right to privacy by safeguarding personal information and to regulate the manner in which personal information may be processed.	Throughout Basic Assessment process.	Throughout Basic Assessment process.
Promotion of Access to Information Act, 2000 (Act 2 of 2000) and amendments	To give effect to the constitutional right of access to any information held by the State and any information that is held by another person and that is required for the exercise or protection of any rights.	Throughout Basic Assessment process.	Throughout Basic Assessment process.
Promotion of Administrative Justice Act, 2000 (Act 3 of 2000) and amendments	The Act aims to make the administration (e.g. Government and Parastatals) effective and accountable to people for its actions.	Throughout Basic Assessment process.	Throughout Basic Assessment process.

SECTION 5: BIOPHYSICAL DESCRIPTION

Appendix 1 of the EIA Regulations (2014, as amended) requires a description of *"the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects".*

This section provides an overview of the environmental features of the site and surrounding area, which includes the biophysical, socio-economic and cultural/heritage aspects. The aim of this section is to provide information on the current baseline conditions of the site that will be used to identify potential impacts of the development on the environment and vice versa in Section 8 (Impact Assessment) of this report.

5.1 Location of the site

The proposed filling station will be located on a portion of Erf 20 of President Park X6, eMalahleni. The site is located on the corner of Nita Avenue and Mandela Drive, adjacent to the Portuguese Club and opposite the Nissan dealership, eMalahleni (Figure 5.1). The access road from Mandela Drive will extend across a portion of Erf 21.

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

- 25°52'57.26"S 29°15'25.50"E.

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

- TOJS01050000002000000 (Erf 20)
- TOJS01050000002100000 (Erf 21)

The said property falls under the jurisdiction of the eMalahleni Local Municipality (MP312) and the Nkangala District Municipality (DC31).

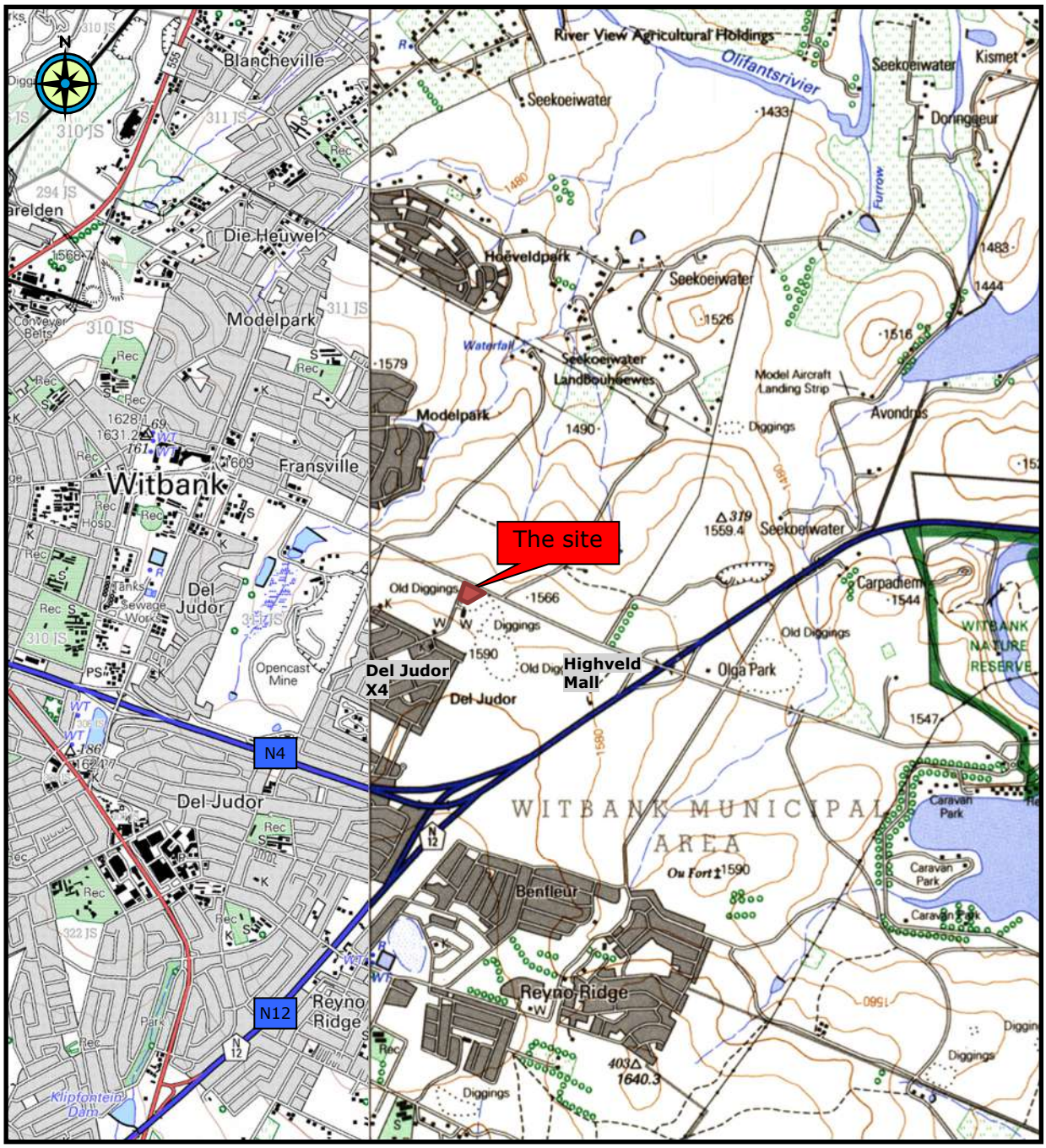


Figure 5.1: Location of site
(taken from 1: 50 000 2529CC and 2529 CD)

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.

5.2.1 Temperature

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

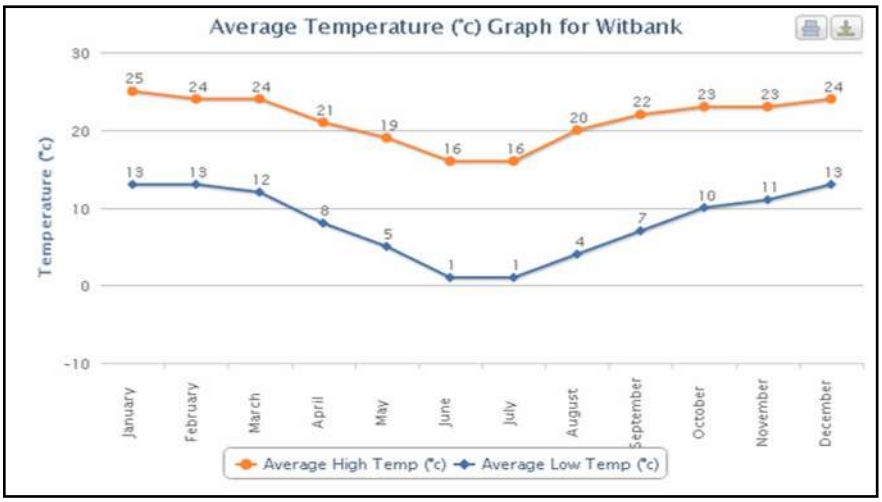


Figure 5.2a: Average temperature graph for eMalahleni (taken from www.worldweatheronline.com)

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.

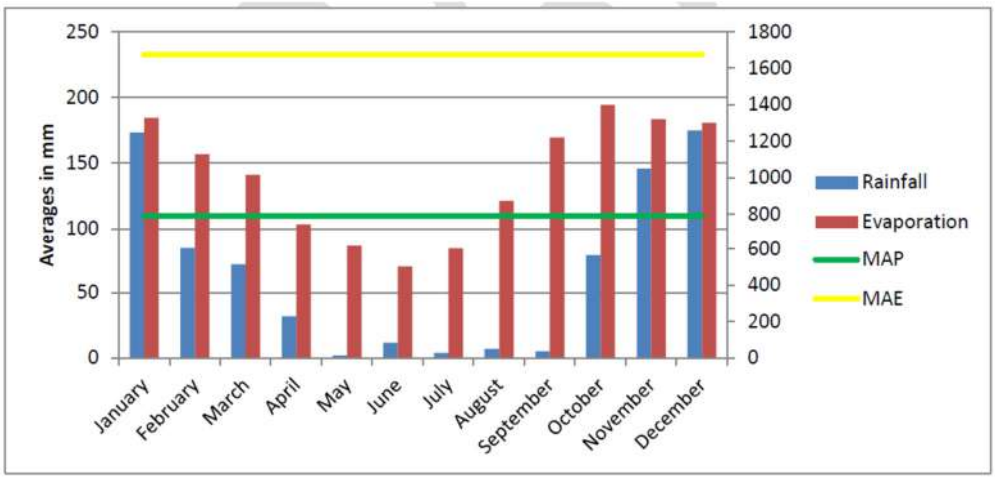


Figure 5.2b: Average rainfall and evaporation for eMalahleni (taken from Gouws, 2015)

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).

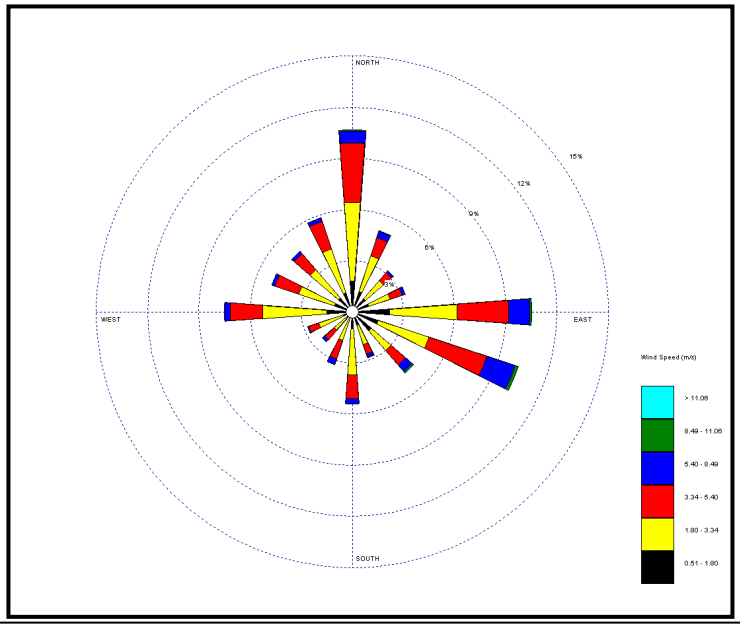


Figure 5.2c: Wind rose for eMalahleni (2004-2007)
(taken from uMoya-NILU Consulting (Pty) Ltd., 2010)

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

Erven 20 and 21 are registered at the Deeds Office to Meronox (Pty) Ltd. A copy of the Windeed Property Report is provided in Appendix B of Appendix 1.

5.3.2 Zoning of the site

As previously indicated, the proposed filling station will be located on a portion of Erf 20 of President Park X6, eMalahleni, with the access road from Mandela Drive extending across a portion of Erf 21 (Figure 3.3).

Erven 20, 21 and 22 are zoned 'Business 2" according to the eMalahleni Land Use Scheme (2020) (Appendix 10). According to this zoning, the following primary land uses are allowed on the said erven: *auction house, carwash,*

confectioner, conference centre, drive-thru restaurant, garden service establishment, government use, gymnasium, hotel, institution, laboratory, laundromat, liquor enterprise, medical suites, motor dealer, office, parking garage, place of refreshment, residential building, service enterprise, shop, social hall, step down facility, tavern, tuck shop, veterinary clinic.

In order to accommodate the filling station and the access road from Mandela Drive on one property, a subdivision and consolidation application in terms of Section 71(2), Section 77, Section 80(1) and Chapter 6 of the eMalahleni Spatial Planning and Land Use Management by-law, 2016, was submitted and approved (6 April 2021; Appendix 10) by the eMalahleni Local Municipality.

Based on this approval, the filling station and access road from Mandela Drive will in future be located on Erf 23 (being a consolidation of Portion 1 of Erf 20 and Portion 1 of Erf 21; Figure 3.2). It should be noted that to date, the consolidated Erf 23 has not been registered at the Deeds Office.

In addition, an application for special consent to accommodate a filling station on the said site was approved by the eMalahleni Local Municipality on 6 April 2021 (see Appendix 10 for further details).

In terms of the Emalahleni Land Use Scheme (2020), the following definition is applicable with regards to a filling station:

> *"Land used or a building designed or used for the purposes of fuelling, washing, polishing and lubricating of motor vehicles, including incidental and routine maintenance but excluding any normal and major mechanical repairs, sale of motor vehicles and spares, panel beating and spray painting". "The following uses are included: The storage of fuels and the retail selling of vehicle fuel and lubricants; One working bay for emergency repairs to vehicles but excluding panel beating, spray-painting and major repairs; A convenience store including a confectionery and take away facility including a kitchen, with a maximum floor area, accessible to the general public, of 250 m², which floor area shall include the floor area accessible to 4 the public as well as any store room, office, fridge area, safe which is used for the operation of the convenience store; An automatic teller machine; and The sale of LP Gas".*

In view of the above-mentioned, the correct zoning of the said site is as follows: "Business 2" with additional rights for a filling station as stipulated in Condition 3.5 of the eMalahleni Local Municipality approval (dated: 6 April 2021; Appendix 10).

5.3.3 Size of the site

The size of the site is as follows:

ERF 23, PRESIDENT PARK X6	
Portion 1 of Portion 20:	4 012 m^2
Portion 1 of Erf 21	467m^2
Total extent of property:	**4 479m^2**

5.3.4 Servitudes

No servitudes are known to be present on site. The property is however, affected by the road reserves of Mandela Drive (northern boundary) and Nita Avenue (western boundary) (Figure 5.3).

5.3.5 Land use and existing infrastructure

Figure 5.3 provides an aerial view of the site and adjacent properties.

The proposed site has not been developed (currently a vacant stand) but has been impacted by past activities, e.g. partly covered by imported fill some 1.0m thick (Van der Merwe, 2020).

Material was excavated from site between 1985 and 1990 for the construction of Mandela Drive and other streets in eMalahleni (Hansmeyer, 2010). The borrow pit was subsequently backfilled with building rubble and sand (Photo 5.3).

A small sports facility (comprising of a hockey rink/basketball court, spectator stand, floodlights, etc.) is present in the southern portion of Erf 20 (Photo 5.1). The entire area surrounding the sports facility was levelled and is used for parking (Photo 5.2). On an annual basis, the site is used by the circus and an amusement park company (with merry-go-rounds, Ferris wheel, etc.).

A berm was constructed along the northern boundary of the site (Photo 5.4) to divert storm water to a culvert extending underneath Mandela Drive. Sewer manholes were noted on the northern boundary of the site adjacent to the berm.

Photo 5.1: Sports facility with floodlights

Photo 5.2: Levelled area used for parking

Photo 5.3: Area where building rubble is present

Photo 5.4: Berm along northern boundary

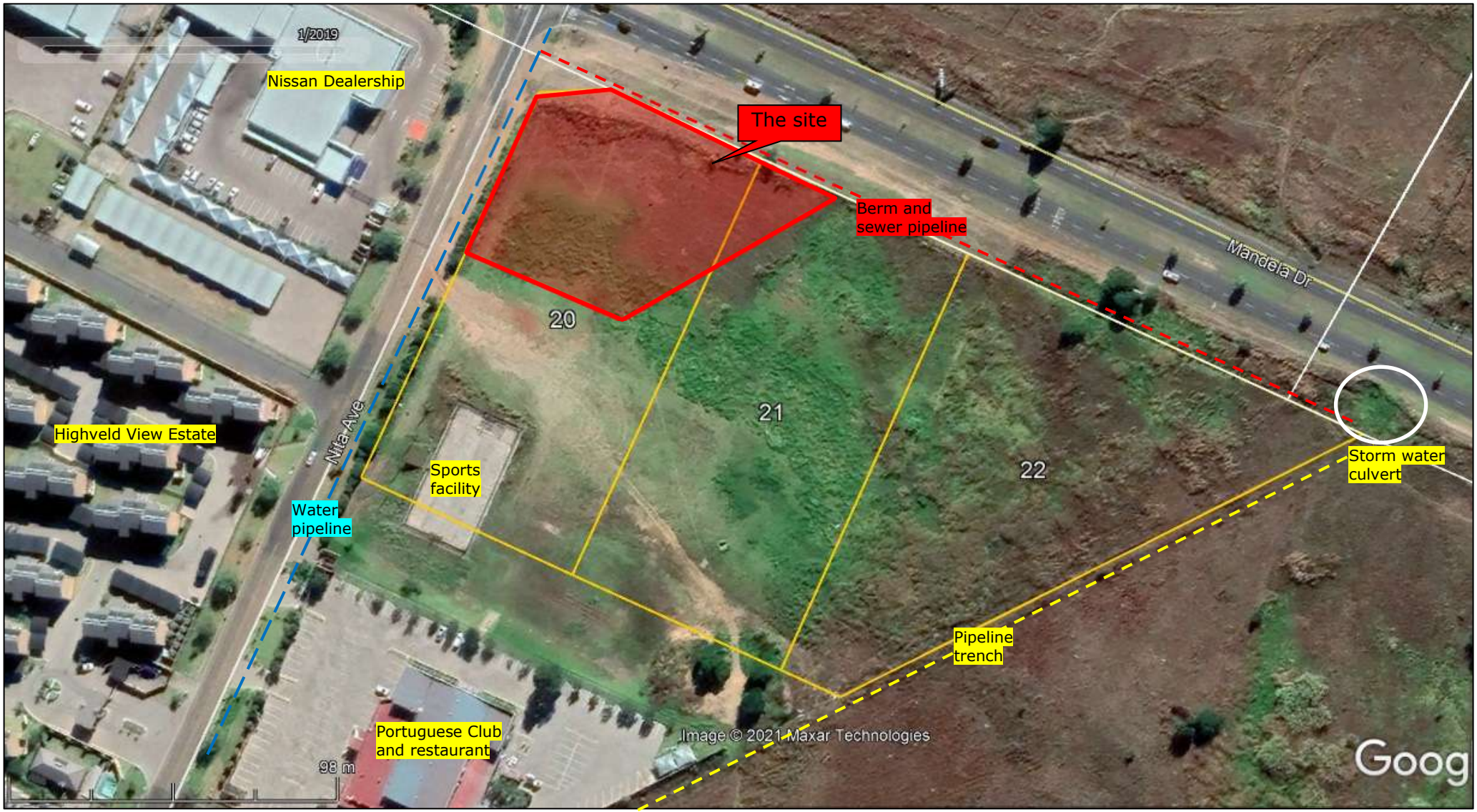


Figure 5.3: Aerial view of the site

5.3.6 Surrounding land uses

The site is located within the eMalahleni urban area (Figure 5.3) and is surrounded by various land uses, e.g. residential (Del Judor x4), businesses, etc.

Mandela Drive is located along the northern boundary of the site (Photo 5.5; Figure 5.3) and Nita Avenue along the western boundary (Photo 5.6; Figure 5.3).

A Nissan motor dealership (Photo 5.6), Highveld View Estate and Indlela Lodge are present west of Nita Avenue (Figure 5.3). Further west is the quarry belonging to Afrisam Aggregates and Ready-mix (Figure 5.4).

Photo 5.5 Nita Avenue and Mandela Drive junction

Photo 5.6: Nissan Dealership

The Portuguese Club and Casa Portuguesa Restaurant are located to the south (Figure 5.3).

The properties north and east are currently vacant (Figure 5.4) and are owned by the eMalahleni Local Municipality. The Highveld Mall, the Ridge Casino and Entertainment Complex and the N4 national road are located further towards the east (Figure 5.4).

Figure 5.4: View of the site in relation to surrounding land uses

Sensitivity Assessment
The screening report (as per the outcome of the National Screening Tool, 2017; Appendix 1) produced a Medium sensitivity for the Civil Aviation Theme due to the site being located between 8 and 15 km of a civil aviation aerodrome.

According to Google Earth and local knowledge of the area, the closest aerodrome is located 9km north west of eMalahleni near the Paxton Correctional Services facility (i.e. the prison). Helipads may however, be present at the various hospitals and/or on private properties in the surrounding area.

The proposed site is located within an already developed area as indicated in Figure 5.4. The height of buildings is restricted to three storeys as per the zoning certificates (Appendix 10). It is therefore not expected that the proposed development will impact on any aviation paths. The sensitivity rating for the Civil Aviation Theme should therefore be **Low.**

5.4 Geology

A geotechnical study of Erf 20 was undertaken by J. van der Merwe of Johann van der Merwe (Pty) Ltd Engineering Geologist (referred to as Van Der Merwe, 2020). A copy of the report is provided in Appendix 7 and should be consulted with regards to the methodology used.

5.4.1 Underlying geology
Erf 20 is underlain by rhyolite of the Selonsrivier Formation, Rooiberg Group (Figure 5.5a). This was confirmed during the geotechnical study (Van der Merwe, 2020).

Material was excavated from site (indicated as diggings in Figure 5.5b) between 1985 and 1990 for the construction of Mandela Drive and other streets in eMalahleni (Hansmeyer, 2010). The borrow pit was subsequently backfilled with building rubble and sand.

The closest mine (quarry belonging to Afrisam Aggregates and Ready-mix) is located a few hundred meters west of the site (Figure 5.4).

The said site is not subject to dolomite related instabilities. In addition, the site is not located in an area of known active seismicity.

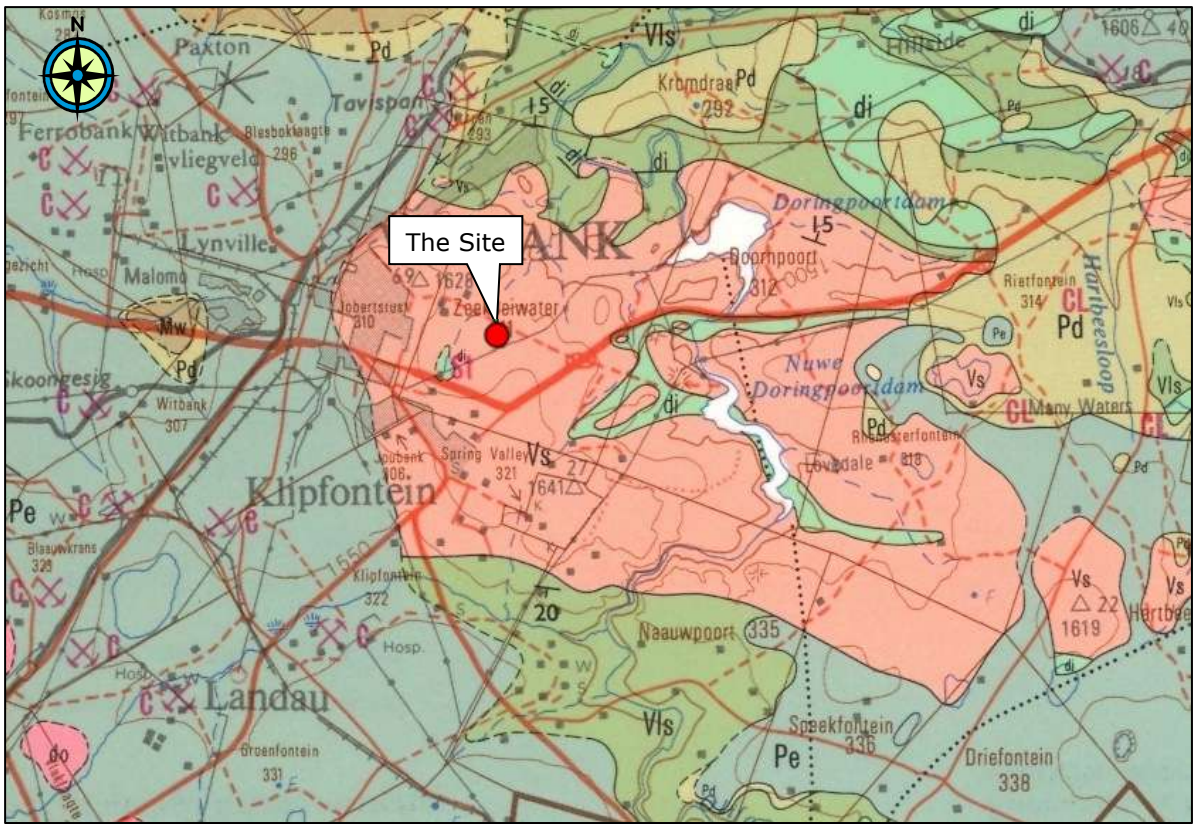


Figure 5.5a: Geology of the site (taken from 1: 250 000 Geological Series 2528 Pretoria)

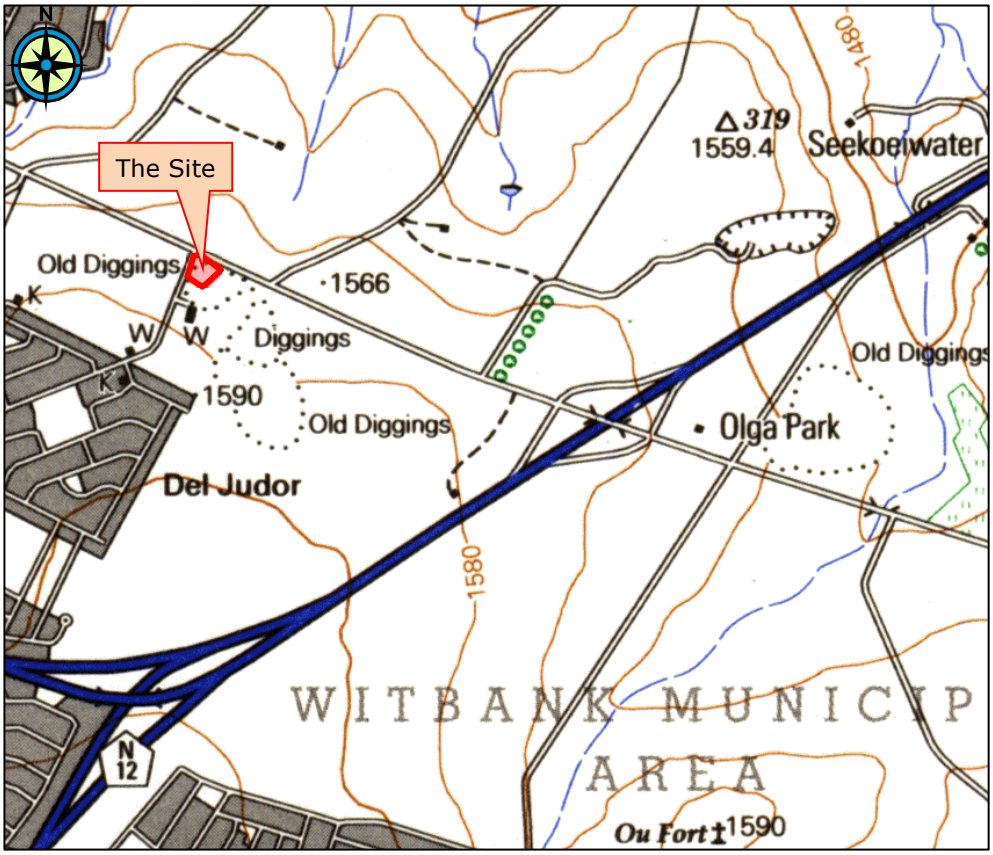


Figure 5.5b: Diggings indicated on site and in surrounding area
(taken from 1: 50 000 2529 CD)

5.4.2 Geotechnical zones identified

Van der Merwe (2020) identified two Geotechnical Zones on Erf 20 namely: Soil Zone "A" and Soil Zone "B" (Figure 5.6).

Soil Zone "A" (Figure 5.6)

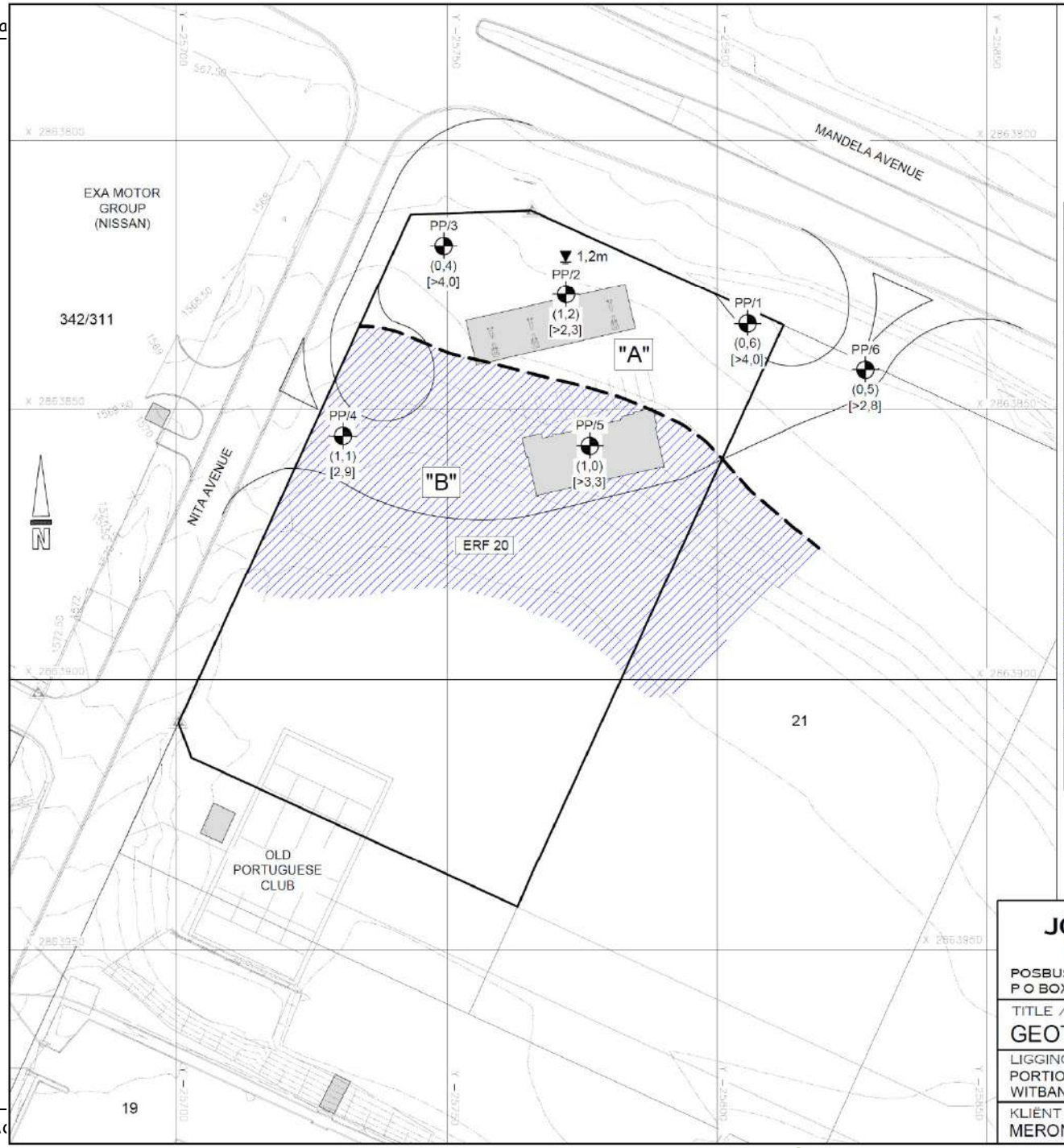
Soil Zone "A" covers the northern portion of the property (Figure 5.6) and can be described as follows (based on test pits PP/1 to PP/3 & PP/6):
Thin to moderate horizon (0.2m to 0.6m thick) of generally medium dense to dense SANDY colluvium overlying a thin to moderate horizon (0.2m to 0.4m thick) of medium dense GRAVELLY pebble marker over a moderate to prominent horizons (0.9m to 3.6m thick) of either generally dense GRAVELLY or SANDY residual felsite or a moderate horizon (0.6m thick) of stiff SILTY residual felsite.

Van der Merwe (2020) indicated the following with regards to Soil Zone "A":
- The sandy and gravelly transported soils are potentially collapsible and compressible.
- All site soils in this zone are potentially 'low' in potential expansiveness with a total surface heave value of <7.5mm.
- Soft excavation by backactor is foreseen to depths ranging between >2.3m and 4.0m below surface.
- Stable sidewalls during investigation.
- Point water seepage encountered in testpit PP2 (Figure 5.6) at a depth of 1.2m below surface. Ferricrete-rich soils indicate possible seasonal perched water table in the wet season from surficial depths of between 0.2m and 0.6m below surface.
- Classified as a Class "C1/S" in terms of the NHBRC Standards and Guidelines of October 2014.
- Recommendations (e.g. deep strip foundations; compaction of in-situ soils below individual footings; soil raft; modified normal construction) must be implemented during the construction phase. Further details provided in Appendix 7 and Section 9 of this BAR.
- The sandy and gravelly soils blanketing Soil Zone "A" should be suitable for use as fill (i.e. after carefully removing all organic material) underneath surface beds and for use possibly as selected and lower subbase layers in road construction (G6 Quality).

Soil Zone "B" (Figure 5.6)

Soil Zone "B" covers the southern portion of the property (Figure 5.6) and is characterized by *a moderate horizon (1,0m to 1,1m thick) of generally loose imported fill overlying a thin to moderate horizon (0.4m thick) of medium dense gravelly pebble marker over a prominent horizon (1.8m to > 1.9m thick) of generally medium dense to very dense sandy residual felsite or very soft rock felsite with depth* (as indicated by test pits PP/4 and PP/5).

Van der Merwe (2020) indicated the following with regards to Soil Zone "B":
- The sandy imported fill is potentially collapsible and compressible.
- All site soils in this zone are potentially 'low' in potential expansiveness with a total surface heave value of <7.5mm.
- Soft excavation by backactor is foreseen to depths ranging between 2.9m and 3.3m below surface. Very hard excavation and light blasting foreseen in the very soft rock felsite.
- Stable sidewalls during investigation.
- Slight groundwater seepage encountered at 2.1m depth in testpit PP4 (Figure 5.6). Ferricrete-rich soils indicate possible seasonal perched water table in the wet season from surficial depth of 1.0m below surface.



LEGEND:

- PP/1 — TEST PIT BY BACKACTOR, POSITION AND NUMBER SHOWING
- (0,6) — THICKNESS OF POTENTIALLY COLLAPSIBLE AND COMPRESSIBLE SOIL HORIZON IN METRES
- [>4,0] — REFUSAL DEPTH OF BACKACTOR IN M.B.G.L.
- ▼ 1,2m — DEPTH OF WATER SEEPAGE IN M.B.G.L.
- MATERIAL BOUNDARY*

SOIL ZONE	BRIEF MATERIAL DECRIPTION
"A"	Thin to moderate horizon (0,2m to 0,6m thick) of generally *medium dense to dense* SANDY colluvium overlying a thin to moderate horizon(0,2m to 0,4m thick) of *medium dense* GRAVELLY pebble marker over a moderate to prominent horizons (0,9m to >3,6m thick) of either generally *dense* GRAVELLY or SANDY residual felsite or a moderate horizon (0,6m thick) of *stiff* SILTY residual felsite. ⇨ *The sandy and gravelly transported soils are potentially collapsible and compressible.* ⇨ *All site soils in this zone are potentially "low" in potential expansiveness with a total surface heave value of <7,5mm.* ⇨ *Soft excavation by a backactor are foreseen to depths ranging between >2,3m and >4,0m below surface.* ⇨ *Stable sidewalls during investigation.* ⇨ *Point water seepage encountered in test pit PP/2 at a depth of 1,2m below surface. Ferricrete-rich soils indicate a possible seasonal perched water table in the wet season from surficial depths of between 0,2m and 0,6m below surface.*
"B"	Moderate horizon (1,0m to 1,1m thick) of generally *loose to medium dense* SANDY imported fill overlying a thin to moderate horizon (0,4m thick) of *medium dense* GRAVELLY pebble marker over a prominent horizon (1,8m to >1,9m thick) of generally *medium dense to very dense* SANDY residual felsite or *very soft rock* FESITE with depth. ⇨ *The sandy imported fill is potentially collapsible and compressible.* ⇨ *All site soils in this zone are potentially "low" in potential expansiveness with a total surface heave value of <7,5mm.* ⇨ *Soft excavation by a backactor are foreseen to depths ranging between 2,9m and >3,3m below surface. Very hard excavation and light blasting foreseen in the very soft rock felsite.* ⇨ *Stable sidewalls during investigation.* ⇨ *Slight ground water seepage encountered at 2,1m depth in test pit PP/4. Ferricrete-rich soils indicate a possible seasonal perched water table in the wet season from a surficial depth of 1,0m below surface.*

NOTE :

* = *Soil boundaries are approximate and should be considered as a gradual change from one soil zone to the next.*

Figure 5.6: Geotechnical zones identified by Van der Merwe (2020).

JOHANN VAN DER MERWE (PTY) LTD
INGENIEURSGEOLOOG / ENGINEERING GEOLOGIST
POSBUS 95562 WATERKLOOF 0145
P O BOX 95562 WATERKLOOF 0145
TEL : 082 570 2222
FAX : 086 685 8369

TITLE / TITLE: GEOTECHNICAL MAP	TEK / DRG NO: M20/3838
LIGGING / LOCALITY: PORTION 234 OF THE FARM ZEEKOEWATER 311-JS, WITBANK, MPUMALANGA PROVINCE	DATUM / DATE: JULY 2020
KLIËNT / CLIENT: MERONOX (PTY) LTD	SKAAL / SCALE: ~1 : 750 ON A3

- Classified as a "S2/P" (disturbed ground) in terms of the NHBRC Standards and Guidelines of October 2014.
- It is recommended that the potentially collapsible and compressible sandy fill blanketing this soil zone be removed in order to expose the natural in situ soils after which similar foundation methods as for Soil Zone "A" may be adopted.
- Disturbed ground conditions caused by previous activities (old borrow pits, test pits, etc.) should be identified and carefully reinstated prior to the construction of rigid structures or paved areas, neglect to do this, may result in structural distress to buildings.
- The sandy fill occupying Soil Zone "B" should be suitable for use as backfill underneath surface beds and lower selected layers (G8 quality) after removal of the coarser than 60mm fraction and all foreign matter.

From a geotechnical point of view, the said site can thus be developed subject to the implementation of recommendations made by Van der Merwe (2020).

5.5 Topography

Erf 20 has not been developed (currently a vacant stand) but has been impacted by past activities, e.g. partly covered by imported fill some 1.0m thick (Van der Merwe, 2020).

The site is characterised by a generally flat topography. The general slope is towards the northeast grading from an elevation 1 571m to 1 568m above masl at an average gradient of roughly 3% to 4% (Van der Merwe, 2020).

Other impacts on the topography include the presence of the sports facility, excavation of trenches, construction of berms, building rubble/soil stockpiles, roads, etc. (Figure 5.3). The topography of the surrounding area has also been impacted by other activities such as businesses, quarries, roads, etc. (Figure 5.3 and Figure 5.4).

5.6 Soil

A geotechnical study of Erf 20 was undertaken by J. van der Merwe of Johann van der Merwe (Pty) Ltd Engineering Geologist (referred to as Van Der Merwe, 2020). A copy of the report is provided in Appendix 7 and should be consulted with regards to the methodology used.

5.6.1 Soil properties

As indicated in Section 5.4.2, Erf 20 is blanketed by a thin to moderate veneer of transported soils and imported fill overlying a prominent horizon of residual soils over felsite/rhyolite bedrock (Van der Merwe, 2020).

PROFILE OF SOIL ZONE "A" (Figure 5.6)	
0,0 – 0,2:	Moist, dark greyish brown, dense, voided, silty SAND containing roots; colluvium.
0,2 – 0,4:	Abundant coarse medium and fine, sub-rounded QUARTZ GRAVELS and NODULAR FERRICRETE in a matrix as above and containing roots; pebble marker. Overall consistency is medium dense.
0,4 – 1,2:	Moist, pinkish brown to reddish brown blotched grey and yellow, dense, voided, silty SAND containing numerous angular FELSITE GRAVELS and runnels of grey SAND with fine roots; reworked residual felsite.

PROFILE OF SOIL ZONE "A" (Figure 5.6)	
1,2 – 1,8:	Abundant coarse medium and fine, sub-rounded and sub-angular FELSITE GRAVELS and COBBLES clast supported in a matrix as above; residual felsite. Overall consistency is dense.
1,8 – 4,0:	Moist, pinkish brown to greenish brown blotched yellow and red, dense, intact, silty SAND containing numerous FELSITE GRAVELS; residual felsite. *Note: Firm silty reworked residual felsite was only encountered in test pit PP/2 at a depth of between 0,6m and 1,2m below surface.*

PROFILE OF SOIL ZONE "B" (Figure 5.6)	
0,0 – 0,6:	FILL; Slightly moist, dark brown blotched pink, medium dense, silty SAND containing minor GRAVELS and COBBLES with roots and foreign material.
0,6 – 1,1:	FILL; Slightly moist, dark brown, loose, silty SAND containing minor COBBLES, roots and foreign material.
1,1 – 2,1:	Moist becoming very moist, brown blotched pink, yellow and purple, medium dense containing loose pockets, slightly voided, silty SAND containing numerous fine FELSITE GRAVELS; residual felsite.
2,1 – 2,9:	Moist to very moist, purplish brown blotched yellow, medium dense, intact, silty SAND containing numerous fine and medium FELSITE GRAVELS; residual felsite.
2,9+	Purple stained black and white, highly weathered, very closely jointed, very soft rock FELSITE.

Further details are provided in Section 5.4.2 and Appendix 7.

5.6.2 Soil forms

Soil Zone "A" (Figure 5.6) falls within the Anthrosol group and more particularly, the Grabouw soil form as identified by Venter (2020b). This soil form (Photo 5.7) may represent the original soil profile but with varying degrees of disturbance (including significant compaction). In these areas, rainwater infiltration is very limited (as a result of the compacted surfaces) resulting in increased storm water volumes flowing from site towards Mandela Drive and properties located to the north thereof.

Soil Zone "B" (Figure 5.6) falls within the Technosol group (Venter, 2020b) and more particularly the Johannesburg soil form, i.e. soil profiles covered by concrete structures, cement and waste materials including building gravel.

Photo 5.7: Grabouw soil form present on the site (taken from Venter, 2020b)

No hydric (wetland) soil forms were identified on Erf 20 or the adjacent Erf 21 (Venter, 2020b).

5.6.3 Agricultural potential/land capability

The screening report (as per the outcome of the National Screening Tool, 2017; Appendix 1) produced a Medium sensitivity (land capability: low to moderate) for the Agricultural Combined Sensitivity Theme (Figure 5.7).

As already indicated, material was excavated from site (between 1985 and 1990) for the construction of Mandela Drive and other streets in eMalahleni. The borrow pit was subsequently backfilled (mainly with building rubble and sand), levelled and grassed.

Most of Erf 20 falls within the Technosol group and more particularly, the Johannesburg soil form (i.e. soil profiles covered by concrete structures, cement and waste materials including building gravel) with a small portion within the Anthrosol group and more particularly, the Grabouw soil form. These soil forms are not suitable for agricultural purposes. In addition, the proposed site is located within an already developed area as indicated in Figure 5.4. The sensitivity rating for the Agricultural Combined Sensitivity Theme should therefore be **Low.**

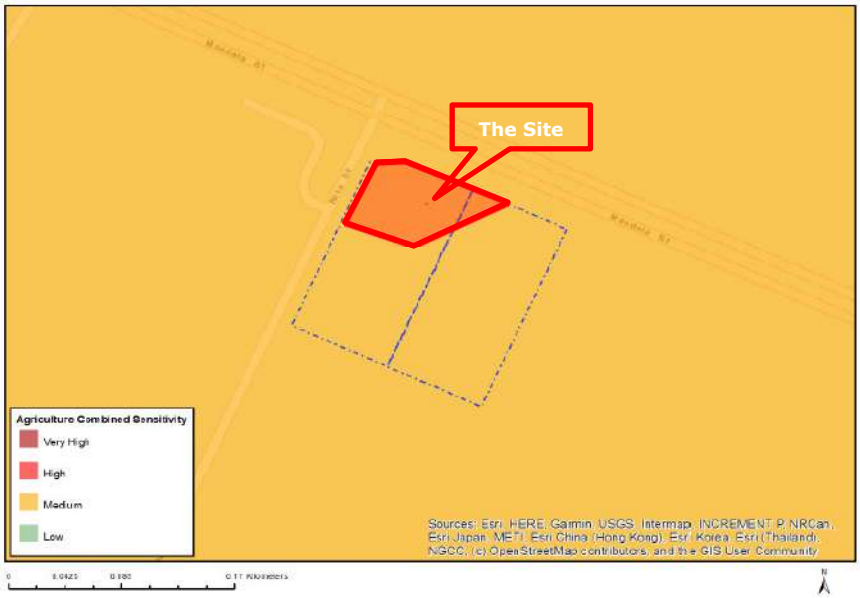


Figure 5.7: Agricultural Combined Sensitivity Theme (as per the outcome of the National Screening Tool, 2017)

5.7 Natural vegetation

5.7.1 Regional vegetation and conservation status

According to the 'The vegetation of South Africa, Lesotho and Swaziland', the site falls within the Mesic Highveld Grassland Bioregion, specifically the Rand Highveld Grassland (veld type Gm11) (Mucina & Rutherford, 2006; Figure 5.8). 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 is found at an altitude of 1 300 metres above mean sea level (mamsl) to 1 635 mamsl in areas between rocky ridges from Pretoria to eMalahleni (Witbank). It also extends onto ridges in the Stoffberg and Roossenekal regions as well as west of Krugersdorp.

This vegetation type is species-rich and comprises wiry, sour grassland

alternating with low, sour shrubland on rocky outcrops and steeper slopes. The most common grasses on the plains belong to the genera *Themeda, Eragrostis, Heteropogon* and *Elionurus*. A high diversity of herbs, many of which belong to the *Asteraceae* family, is also a typical feature. Rocky hills and ridges carry sparse woodlands with *Protea caffra* subsp. *caffra, Acacia caffra* and *Celtis africana*, accompanied by a rich suite of shrubs among which the genus *Searsia* (previously *Rhus*) is most prominent.

Almost half of the Rand Highveld Grassland has already been transformed by cultivation, urbanisation, plantations and dams. This vegetation type has been afforded the status of endangered with a conservation target of 24%. Only approximately 1% of this vegetation type is currently conserved.

Figure 5.8: Vegetation type (taken from Mucina and Rutherford, 2006)

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.

According to the National Biodiversity Assessment (2019), the Rand Highveld vegetation type is classified as Endangered (i.e. any remaining vegetation that resembles the Rand Highveld Grassland is considered to be of conservation importance).

Mpumalanga Biodiversity Conservation Plan (2006)
The site and surrounding area are indicated as **'No Natural Habitat Remaining'** (Figure 5.9a) in terms of the terrestrial biodiversity assessment of the Mpumalanga Biodiversity Conservation Plan (2006).

Figure 5.9a: Terrestrial biodiversity assessment of the Mpumalanga Biodiversity Conservation Plan, 2006

Mpumalanga Biodiversity Sector Plan (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) was subsequently developed. The MBSP 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 MBSP (2013), the site is classified as **Other Natural Areas** (Figure 5.9b). The area surrounding the said site is also classified as Other Natural Areas and Heavily Modified (Figure 5.9b).

Other Natural Areas (ONAs)	Areas that have not been identified as a priority in the current systematic biodiversity plan, but retain most of their natural character and perform a range of biodiversity and ecological infrastructural functions. Although they have not been prioritised for biodiversity, they are still an important part of the natural ecosystem.	An overall management objective should be to minimise habitat and species loss and ensure ecosystem functionality through strategic landscape planning. These areas offer the greatest flexibility in terms of management objectives and permissible land-uses, but some authorisation may still be required for high-impact land-uses.

The closest Critical Biodiversity Area (CBA) is located approximately 600m east of the site opposite the Highveld Mall (Figure 5.9b).

Figure 5.9b: Terrestrial biodiversity assessment of the Mpumalanga Biodiversity Sector Plan, 2013

Erf 20 does not fall within a nature reserve, conservancy or other protected area (Mpumalanga Biodiversity Sector Plan, 2013; Figure 5.9c). The Witbank Nature Reserve is located approximately 3.5km east of the site (Figure 5.9c).

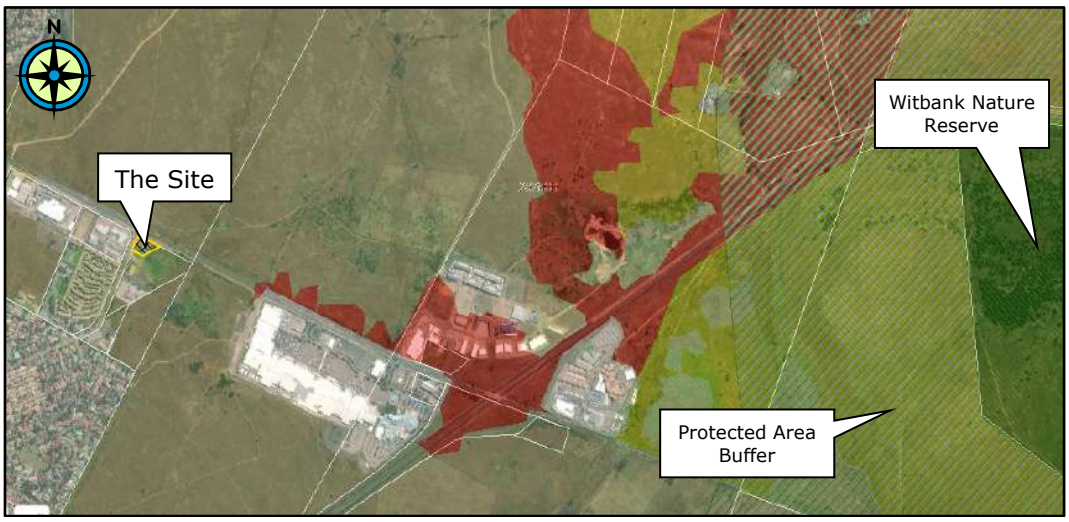


Figure 5.9c: Location of site in relation to the nearest Protected Area (taken from Mpumalanga Biodiversity Sector Plan, 2013)

Based on the above-mentioned, the proposed project does not trigger any listed activities in Listing Notice 3 of the EIA Regulations, 2014 (as amended).

5.7.2 Onsite vegetation

A screening assessment of the vegetation and possible onsite wetlands was undertaken by I Venter of Kyllinga Consulting (referred to as Venter, 2020a). Subsequently, a wetland assessment and delineation study was undertaken by I Venter of Kyllinga Consulting (referred to as Venter, 2020b). Copies of the reports are provided in Appendix 3 and should be consulted with regards to the methodology used.

As indicated in Figure 5.10, the **Modified Grassland vegetation unit** is present on Erf 20 and where the access road will extend (across Erf 21) from Mandela Drive to the site.

Figure 5.10: Vegetation and wetland units identified (taken from Venter, 2020a)

The **Modified Grassland vegetation unit** consists of a mix of alien and invasive species with a few common indigenous plant species as indicated in Table 5.3. Venter (2020a) indicated that the high level of disturbance is present across the site (i.e. up to the site boundaries). *Pennisetum clandestinum* (Kikuyu) is present in patches throughout most of the site and appears to be informally harvested (for resale). Numerous other weeds are also present (Table 5.3).

Table 5.3: Plant species recorded in the Modified Grassland vegetation unit (Venter, 2020a)

SPECIES	GROWTH FORM	ALIEN/INVASIVE/ INDIGENOUS	INDICATOR
Acacia karroo	Tree	Indigenous	Widespread
Acacia mearnsii	Tree	Category 1b invader	Disturbance
Acacia melanoxylon	Tree	Category 1b invader	
Arundo donax	Grass	Category 1b invader	
Bidens bipinnata	Herb	Alien	
Bidens pilosa	Herb	Alien	
Canna indica	Shrub	Category 1b invader	
Chamaecrista mimosoides	Herb	Indigenous	Widespread
Cymbopogon validus	Grass	Indigenous	Rocky areas
Cynodon dactylon	Grass	Cosmopolitan	Widespread

SPECIES	GROWTH FORM	ALIEN/INVASIVE/ INDIGENOUS	INDICATOR
Datura stramonium	Shrub	Category 1b invader	Disturbance
Eragrostis gummiflua	Grass	Indigenous	
Eragrostis plana	Grass	Indigenous	Disturbance/ wetness
Grevillea robusta	Tree	Category 3 invader	
Hyparrhenia hirta	Grass	Indigenous	
Melia azedarach	Tree	Category 1b invader	Disturbance
Melinis repens	Grass	Indigenous	
Paspalum dilatatum	Grass	Alien	
Pennisetum clandestinum	Grass	Alien	
Pogonarthria squarrosa	Grass	Indigenous	
Schizachyrium sanguinum	Grass	Indigenous	Rocky areas
Searcia lancea	Tree	Indigenous	Widespread
Solanum mauritianum	Shrub	Category 1b invader	
Tagetus minuta	Shrub	Alien	Disturbance
Verbena bonariensis	Forb	Category 1b invader	Disturbance/ wetness

Venter (2020a) confirmed that the vegetation to the east of the site (i.e. outside of the site boundaries of Erf 22; Figure 5.10) is a remnant of the Rand Highveld Grassland vegetation type. The remaining terrestrial vegetation present on site (Erf 20, 21 & 22) has been highly modified/transformed (due to past disturbances on site) and no longer resembles this vegetation type (Venter, 2020a).

As indicated in Figure 5.10, the **Modified Grassland vegetation unit** (Photo 5.8) is present on Erf 20 and where the access road will extend (across Erf 21) from Mandela Drive to the site.

In Figure 5.10, a portion of the Wetland Vegetation unit is indicated to be present on Erf 20 and where the access road will extend (across Erf 21) from Mandela Drive to the site. This Wetland Vegetation unit was initially identified by Venter (2020a) but during the subsequent wetland assessment and delineation study, a smaller wetland (Artificial Wetland, Figure 5.16) was delineated (Venter, 2020b) which does not extend onto the proposed site as indicated in Section 5.9.4 and Figure 5.16.

Venter (2020a) indicated that the vegetation on site is of **Low sensitivity** due to the disturbed nature of the vegetation. A full vegetation assessment was therefore not required (Venter, 2020a).

Photo 5.8: View of the Modified Grassland vegetation unit present on site

5.7.3 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).

The following three Red Data plant species are recorded on the PRECIS Database of the South African National Biodiversity Institute for the quarter degree square 2529CD:

Latin Name	Status	Habitat	Habitat on site
Encephalartos lanatus (Olifants River cycad)	Near threatened	Sheltered rocky ledges	NO
Frithia humilis	Endangered (EN)	Very shallow soils derived from coarse material from the Irrigasie formation, Ecca Group.	NO
Nerine gracilis	Vulnerable (VU)	Damp areas in undulating grassland	NO

The following three plant species are indicated in the screening report (as per the outcome of the National Screening Tool, 2017; Appendix 1):

Latin Name	Status	Habitat	Habitat on site
Pavetta zeyheri subsp middelburgensis	Rare	Outcrops of rocks and boulders or rocky sheets	NO
Pachycarpus suaveolens	Vulnerable B1ab(iii)	Short or annually burnt grasslands, 1400-2000 m.	NO
Brachycorthis conica subsp transvaalensis	Critically Endangered	Short, open grassland and wooded grassland, on sandy gravel overlying dolomite, sometimes also on quartzite, 1 000-1 705 m.	NO

It is highly unlikely that any of the above-mentioned species would be present on site due to the disturbed nature of the vegetation. In addition, Venter (2020a; 2020b) did not record any threatened plant species during the site visits.

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 Department of Agriculture, Land Reform and Rural Development (previously the National Department of Agriculture).

None of the 47 tree species listed in Schedule A of this Act occur on site 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.

No plant species listed in the NEMA Biodiversity Act were noted 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 must be obtained prior to their removal.

It is highly unlikely that protected plant species are present on site due to the disturbed nature of the vegetation.

5.7.5 Invasive species

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.

Venter (2020a; 2020b) recorded a total of 17 alien and invasive species on site (Erven 20, 21, 22) of which 14 were recorded within the Modified Grassland vegetation unit as indicated in Table 5.4.

Table 5.4: Alien and invasive species recorded within the Modified Grassland vegetation unit (taken from Venter, 2020a; Venter, 2020b)

SPECIES	GROWTH FORM	ALIEN/INVASIVE
Acacia mearnsii	Tree	Category 1b invader
Acacia melanoxylon	Tree	Category 1b invader
Arundo donax	Grass	Category 1b invader
Bidens bipinnata	Herb	Alien
Bidens pilosa	Herb	Alien
Canna indica	Shrub	Class 1b invader
Datura stramonium	Shrub	Category 1b invader
Grevillea robusta	Tree	Category 3 invader
Melia azedarach	Tree	Category 1b invader
Paspalum dilatatum	Grass	Alien
Pennisetum clandestinum	Grass	Alien
Solanum mauritianum	Shrub	Class 1b invader
Tagetus minuta	Shrub	Alien
Verbena bonariensis	Forb	Category 1b invader

- *"Category 1a: Invasive species which must be combatted 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."*

The above-mentioned plant species (Table 5.4) will have to be controlled on site during the construction and operational phases. Additional disturbances on site may result in additional species encroaching into the site.

5.7.6 Sensitivity Assessment

The screening report (as per the outcome of the National Screening Tool, 2017; Appendix 1) produced the following sensitivities:

- Plant species theme: **Low** sensitivity and a **Medium** sensitivity due to the possible presence of seven species.
- Terrestrial biodiversity theme: **Very high** sensitivity
    - Vulnerable ecosystem.

Plant species theme:

Venter (2020a) indicated that the vegetation of the site (Erven 20, 21, 22) is transformed (due to past disturbances on site) with low species diversity. It no longer resembles the Rand Highveld Grassland vegetation type (Venter, 2020a).

In addition, it is highly unlikely that any of the threatened plant species (Section 5.7.3) would be present on site due to the disturbed nature of the vegetation. In addition, Venter (2020a; 2020b) did not record any threatened plant species during the site visits.

The site sensitivity for plant species theme is therefore **Low** (and not Medium as indicated in the Screening Report) due to the highly modified state of the site vegetation, the low species diversity and the absence of habitat for the threatened species.

Terrestrial biodiversity theme:

The site falls within the Rand Highveld Grassland vegetation type, which is a Vulnerable vegetation type. Venter (2020a) confirmed that the vegetation to the east of the site (i.e. outside of the boundaries of Erven 20, 21 and 22) is a remnant of the Rand Highveld Grassland vegetation type. The remaining terrestrial vegetation on site has however, been highly modified/transformed (due to past disturbances on site) and no longer resembles this vegetation type (Venter, 2020a). In view of this, Venter (2020a) indicated that the vegetation on site is of **Low sensitivity.** The site sensitivity for the terrestrial biodiversity theme should be **Low** (and not Very High as indicated in the Screening Report).

5.8 Animal life

5.8.1 Regional conservation status

According to the MBSP (2013), the site is classified as **Other Natural Areas** in both the terrestrial (Figure 5.9b) and aquatic biodiversity assessment. The area surrounding the said site is classified as Other Natural Areas and Heavily Modified.

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

5.8.2 On-site habitats

As indicated in Section 5.7.2, the natural vegetation on site is highly modified/transformed due to past disturbances. Venter (2020a; 2020b) identified three vegetation units (Modified grassland; Artificial ponding;

Artificial Wetland; Transformed; Figure 5.10 and Figure 5.16) on Erven 20, 21 and 22 which could provide some form of habitat for animal species.

The areas north of Mandela Drive and east of the site (Figure 5.4) are vacant and could provide habitat for animal species.

It is however, highly unlikely that large animal species would permanently inhabit the proposed site due to the human activity in the surrounding area (Figure 5.3) and the close proximity of domestic animals (e.g. dogs, cats, etc.).

Smaller animal species (e.g. rodents), birds, reptiles and amphibians are however, expected to be found on site. Spoor of small antelope, scrub hare pellets and a scrub hare were noted on site, which indicate that the site is utilized by smaller animal species. Bird species, e.g. the Cape Turtle Dove (*Streptopelia capicola)*, Blacksmith Plover (*Vanellus armatus)*, Crowned Plover (*Vanellus coronatus*) and Southern Red Bishop (*Euplectes progne*), were also noted on site.

5.8.3 Habitat for bullfrogs

As indicated in Section 6.5, a resident from Del Judor x4 (Mr. S. Bloy) indicated (email dated: 3 September 2020; Appendix 11) that he had '*seen bullfrogs on 2 occasions, once in December 2017 and again in December 2019, very close to the proposed site.* On both occasions, the area experienced heavy rainfall. The bullfrogs were noted in an artificial depression/ponding area to the south of Erf 20 (Figure 5.11) and **not on the proposed filling station site.**

Figure 5.11: Artificial Ponding area in southern portion of the site where bullfrogs were previously noted.

In order to address this issue of concern raised through the public participation process, Mr. J.C.P van Wyk, a bullfrog specialist was appointed to conduct a bullfrog habitat assessment of the proposed development site.

Site visit (5 November 2020)
A site visit (5 November 2020) was undertaken by the bullfrog specialist, the wetland specialist (I. Venter of Kyllinga Consulting) and AdiEnvironmental. During this site visit, the site and surrounding area were inspected for suitable habitat and breeding places as well as for any evidence of bullfrogs. **No bullfrogs were noted during this site visit.**

Bullfrog specialist report
Subsequent to this site visit, the following report was produced: *Giant Bullfrog (Pyxcephalus adspersus) Habitat assessment and long-term survival plans at President Park x6, eMalahleni (Witbank). Report prepared by J.C.P. van Wyk. Report dated: November 2020.* A copy of the report (referred to as Van Wyk 2020) is provided in Appendix 3.

In the above-mentioned report, Van Wyk (2020) indicated the following in terms of the suitability of the site for bullfrogs**:** *'The actual study site itself (development site) is not of high conservation value. Even if the site is left in its current condition of neglect, it is not guaranteed that the giant bullfrog would survive in the long run due to the many anthropogenic factors on and around the site. Neighbouring properties and roads restrict bullfrog foraging, hibernation-aestivation and dispersal. Habitat fragmentation has taken place and walls, buildings, roads and other structures increasingly inhibit movement'.*
In other words, the proposed site does not provide suitable habitat for bullfrogs. See the report provided in Appendix 3 for further information.

Subsequent monitoring of site (January/February 2021)
During January 2021, the tropical storm/cyclone Eloise resulted in above-average rainfall in the eastern parts of Southern Africa, including eMalahleni. It was thus the ideal opportunity to monitor the site for the presence of bullfrogs. AdiEnvironmental therefore monitored the site from 25 January 2021 until 4 February 2021.

The following monitoring report is provided in Appendix 3: *Monitoring of the President Park x6 site after the Cyclone Eloise rains (25 January – 4 February 2021) by AdiEnvironmental cc. Report prepared by: A. Erasmus and R. J. van Rensburg. Report dated: 5 February 2021.*

On 29 January 2021, AdiEnvironmental noted a Giant Bullfrog within the Artificial Ponding Area (Figure 5.11 and Photo 5.9). Mr. Bloy also informed the bullfrog specialist that he had sighted the bullfrog on the said day. This was the first and last time that the bullfrog was seen.

Photo 5.9: The bullfrog within the artificial ponding area (@ 29 January 2021)

On 30 January 2021, the bullfrog was no longer observed on site (i.e. by AdiEnvironmental and Mr. S. Bloy – see the monitoring report provided in Appendix 3). On the said day, Mr. Bloy indicated that he had noted eggs on site. Tadpoles and eggs were however, noted by AdiEnvironmental on 31 January 2021 within the ponded vehicle tracks (Photo 5.10a).

As indicated in the monitoring report (Appendix 3), AdiEnvironmental visited the site daily to monitor the progress of the tadpoles. It was soon evident that the artificial ponding area and the ponded vehicle track area (Photos 5.10b & c) do not contain water for long periods of time (as previously reported by Mr. Bloy).

Photo 5.10a: Tadpoles within ponded vehicle tracks (@ 1 February 2021)

Photo 5.10b: Tadpoles in adjacent ponded area (@ 2 February 2021)

Photo 5.10c: Ponded vehicle tracks with tadpoles (@ 32 February 2021)

Photo 5.10d: View of dead tadpoles (@ 4 February 2021)

MTPA site visit (4 February 2021)

Dr. Hannes Botha of the Mpumalanga Tourism and Parks Agency (MTPA) was contacted to conduct a site visit and provide input regarding whether or not suitable habitat for bullfrogs is present on site. The said site visit took place on 4 February 2021.

During the site visit, AdiEnvironmental and Dr. Botha noted that:

- all the artificial ponding areas (Artificial Ponding area and the ponded vehicle tracks) were dry;
- all the tadpoles had died (Photo 5.10c).
- no further bullfrog breeding efforts (eggs and/or tadpoles) were observed on site.

Subsequent to the site visit, Dr. Botha indicated the following (letter dated: 11 February 2021; Appendix 3): *'The site intended for development is clearly ecologically disturbed and is characterised by evidence of infilling, depositing of soil, rocks and other materials, fences, diggings, roads, fire events, invasive plants, and general neglect. Artificial ponding is present where depressions formed due to anthropogenic influences. The site intended for development is representative of an urban environment under pressure due to encroaching urbanisation'.*

After reviewing the bullfrog specialist report (Van Wyk, 2020) and the above-mentioned monitoring report, Dr Botha indicated agreement in terms of the following:

1. *No Giant Bullfrogs were seen in the area intended for development during the site meeting. This was noteworthy because after the high rainfall experienced over the previous weeks one would have expected to see bullfrogs in the area where they were previously reported.*
2. *Development may start, when authorised by the proper regulating authority, but the depression/artificial pond area (area 1) should be left intact to act as a temporary refuge for bullfrogs that might be present at or may return to the area in following seasons.*
3. *Due to the physical size of the property, it was agreed that the maintenance of a buffer zone around the depression/artificial pond area would not be needed.*
4. *Should Giant Bullfrogs be found during the construction phase, the MTPA must be notified and the bullfrogs must be removed by the appointed ECO and the MTPA Herpetologist to be relocated to the nearest suitable bullfrog habitat.*

Addendum to bullfrog specialist report

The above-mentioned monitoring report (Appendix 3) and the letter from Dr. Botha (dated: 11 February 2021; Appendix 3) were provided to the bullfrog specialist who subsequently compiled an Addendum to the original specialist report (referred to as Van Wyk (2021)) and provided in Appendix 3.

According to Van Wyk (2021), it is evident that the Giant Bullfrog population on or near the site is very small and would require an exceptional rainy season for the population to breed successfully.

Van Wyk (2021) agreed that the recommendations of Dr. Botha be followed and that the depression/artificial ponding area be left intact as long as possible during the construction phase. Van Wyk (2021) further stated that the intention is not to force the developer to keep the pond intact forever *'but rather just to keep the pond going and available for as long as possible in the event that bullfrogs return for some reason'.*

Van Wyk (2021) indicated that enough information was gleaned from the above-mentioned monitoring report to make an informed decision and concluded that ***'there is no further objection against the development from a Giant Bullfrog perspective'.***

A copy of the Addendum was forwarded to Dr. Botha (MTPA) for his input. He subsequently indicated (e-mail dated: 19 February 2021; Appendix 3) the following: *"I agree with the addendum and support the conclusions and recommendations it contains."*

It should be noted that no suitable habitat for bullfrogs was identified on Portion 1 of Erf 20 (proposed filling station site) and Portion 1 of Erf 21 (access road site).

Sensitivity Assessment
The screening report (as per the outcome of the National Screening Tool, 2017; Appendix 1) produced the following sensitivities:
- Animal species theme: Low sensitivity.

This is correct as indicated in Section 5.8.2.

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 B11J quaternary catchment (Figure 5.12).

Figure 5.12: The proposed site in relation to the B11J quaternary catchment.

5.9.2 Surface environments
The Olifants River is located 3.8 km east of the site (Figure 5.12). An unnamed tributary of the Olifants River (locally known as Madelspruit) is located approximately 800 m west of the site (Figure 5.1).

As indicated in Section 5.9.4, a Seep Wetland is located to the east of the site (Figure 5.16), which becomes a Valley Bottom Wetland/drainage area as indicated in Figure 5.16.

5.9.3 Surface water runoff
As indicated in Section 5.5, the natural slope of the overall site is towards the north and Mandela Drive (Figure 5.6). However, the topography has been impacted by past excavation and construction activities resulting in a terraced topography as indicated in Figure 5.13.

According to Hansmeyer (2010), surface water runoff drains into the levelled area surrounding the Portuguese Club (Figure 5.13). From here, the water flows in a northerly direction into the next levelled area and the backfilled borrow pit (Figure 5.13). This results in the backfilled area becoming waterlogged and decanting along the northern boundary of the site.

The surface water on site is mostly diverted to the north eastern corner into a culvert that extends underneath Mandela Drive.

A trench was excavated around the sports facility to divert surface water runoff around the structure and towards Nita Avenue, where erosion as a result of the surface water runoff was noted (Photo 5.11).

A berm was constructed along the northern boundary of the site (Photo 5.4) to divert storm water to the culvert extending underneath Mandela Drive.

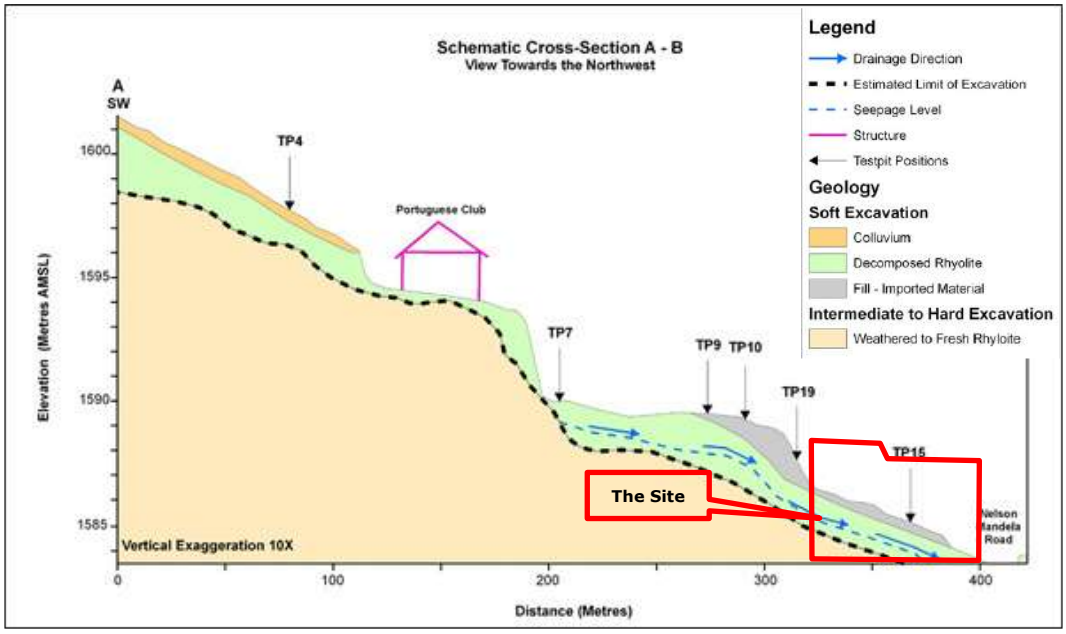


Figure 5.13: Schematic cross-section of site (taken from Hansmeyer, 2010)

Photo 5.11: Storm water being diverted around the sports facility towards Nita Avenue

5.9.4 Wetlands

According to the NFEPA database, the site is located within an area identified as an Ecological Support Area (ESA): Wetland Clusters. Wetlands are indicated

to be present east of the site in both the Freshwater Biodiversity Assessment and Mpumalanga Highveld Wetlands databases (Figures 5.14 and 5.15).

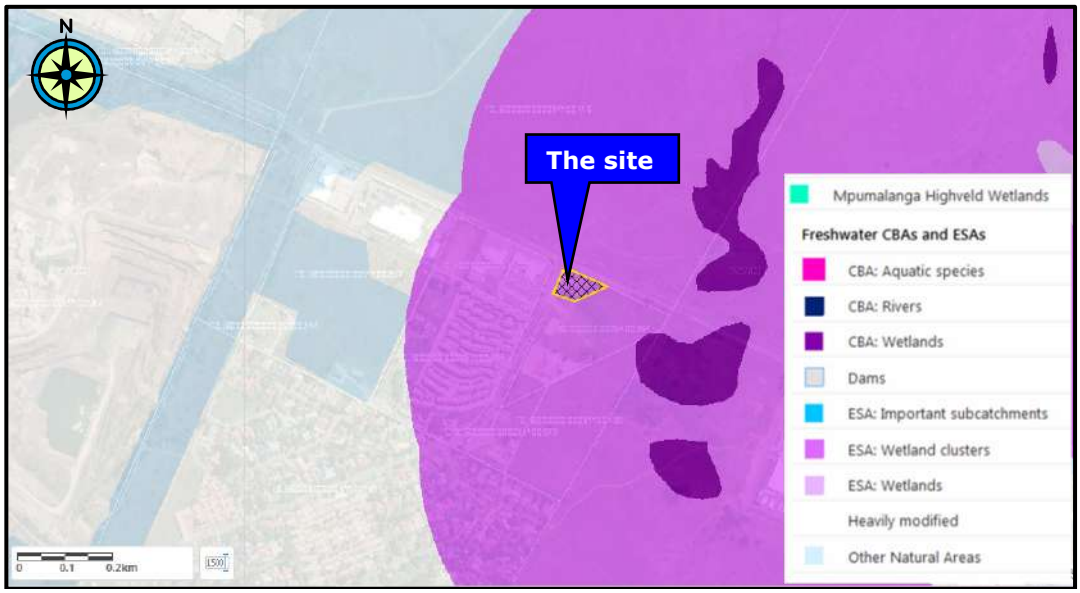


Figure 5.14: Freshwater biodiversity assessment of the Mpumalanga Biodiversity Sector Plan, 2013

Figure 5.15: Mpumalanga Highveld Wetlands

A wetland assessment and delineation study was undertaken by I Venter of Kyllinga Consulting (referred to as Venter, 2020b). A copy of the report is provided in Appendix 3 and should be consulted with regards to the methodology used.

As indicated in Section 5.6, no hydric (wetland) soil forms are present on site even though the vegetation in the central, northern and eastern portions of the site does indicate wetter conditions (Venter, 2020b). The wet conditions are a result of the accumulation of water in the soils due to historical disturbances (e.g. removal of topsoil/subsoil, importing of gravel and other materials, compaction of the soils as a result of vehicles parking on site, etc.). In these

areas, the soil is characterised by a shallow orthic topsoil (between 0.1 and 0.35 m deep), without any mottling, gleying or the presence of a gleyed horizon underneath (Venter, 2020b). The orthic topsoil is darkened as a result of weathered organic material (grass and other vegetation roots).

During rainfall events, water infiltrates the shallow topsoil horizon where vertical movement is limited (due to a mixture of hard plinthite and imported gravel) creating temporary wetness (on these compacted surfaces) before moving in a lateral direction towards the lower-lying landscape positions (Venter, 2020b).

As a result of the above-mentioned, Venter (2020b) identified an Artificial Wetland and two Artificial Ponding areas on Erf 21 and Erf 22 as indicated in Figure 5.17. Venter (2020b) did not classify the Artificial Wetland and the Artificial Ponding areas as wetlands due to the absence of hydric (wetland) soil forms (see Section 5.6.2 for further details).

As indicated in Figure 5.16, no wetlands were identified on Portion 1 of Erf 20 and Portion 1 of Erf 21 (Venter, 2020b).

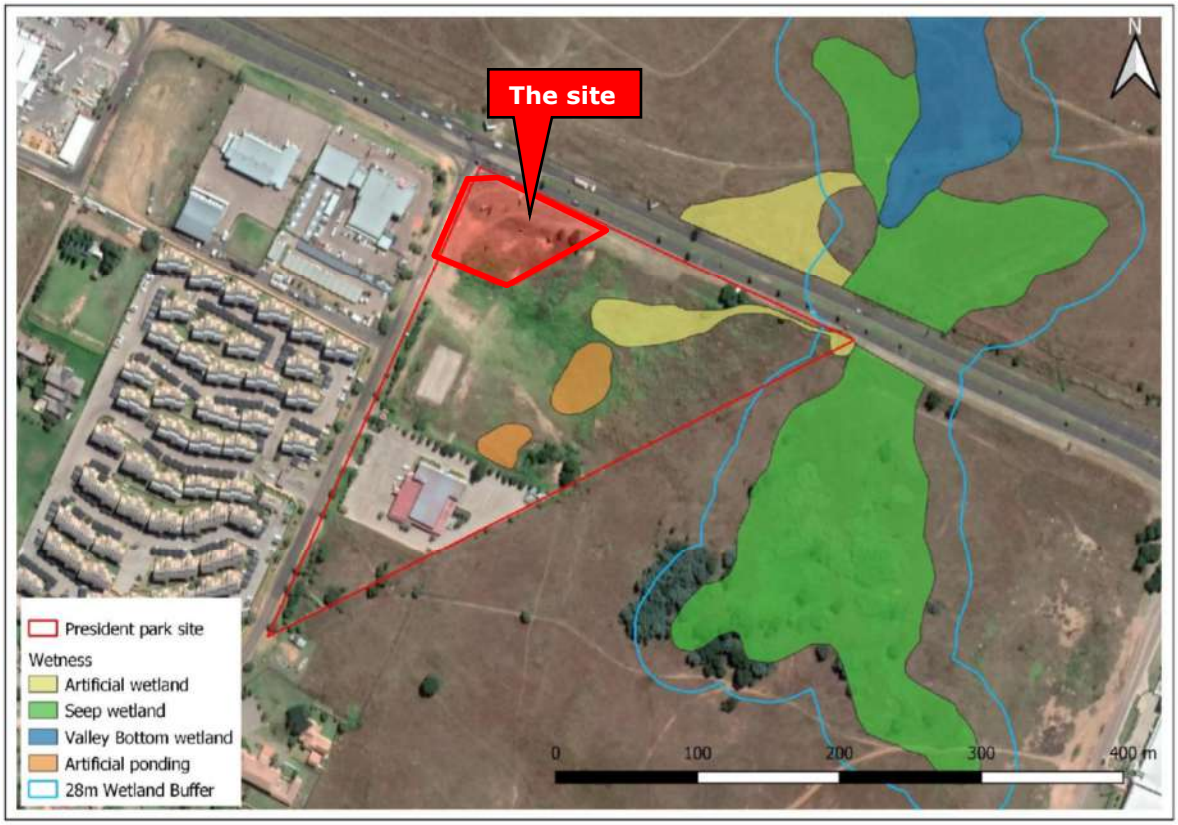


Figure 5.16: Wetland units identified (taken from Venter, 2020b)

According to Venter (2020b), a Seep Wetland is present east of the site (Figure 5.16). The Seep Wetland flows from the south to the north, passing through a culvert underneath Mandela Drive, after which it becomes a Channelled Valley Bottom wetland (Figure 5.16).

Further details regarding the Seep Wetland and Channelled Valley Bottom Wetland (including the Present Ecological State (PES) and Ecological Importance and Sensitivity (EIS)) are provided in Appendix 3.

Sensitivity assessment
The screening report (as per the outcome of the National Screening Tool, 2017; Appendix 1) produced a **Low** sensitivity and **Very High** (aquatic Critical Biodiversity Areas) sensitivity for the Aquatic Biodiversity theme.

As indicated in the preceding sections, no wetlands are present on the proposed development site as indicated by Venter (2020b). According to the MBSP Freshwater Biodiversity Assessment (2013), the proposed development site does not fall within an Ecological Support Area (ESA): Important subcatchment or Critical Biodiversity Area. It does however, fall within an ESA: Wetland Clusters (Figure 5.14). The Low sensitivity rating for the Aquatic Biodiversity Theme is therefore correct.

The Very High sensitivity rating (aquatic Critical Biodiversity Areas) for the Aquatic Biodiversity Theme is however incorrect and should be **Low** as indicated above.

5.10 Groundwater

A geohydrological investigation was conducted for the proposed filling station site (Erf 20) by A. van Heerden of Geo-Pollution Technologies (hereafter referred to as Van Heerden, 2020). A copy of the geohydrological study is provided in Appendix 8. This report should be consulted with regards to methodology used.

5.10.1 Hydrogeological setting
According to the 1:500 000 General Hydrogeological Map, the Selonsrivier Formation (Rooiberg Group) rocks typically act as secondary aquifers (intergranular and fractured rock aquifers). The multi-layered weathering system associated with these rocks could result in up to two aquifer systems being present:

- a shallow, saprolitic aquifer with a weathered, intergranular soft rock base associated with the contact of fresh bedrock and the weathering zone;
- a fractured bedrock aquifer.

The aquifer can be classified as a minor aquifer with moderate vulnerability (Van Heerden, 2020).

5.10.1.1 Unsaturated zone - Shallow, saprolitic aquifer
The main source of recharge into the shallow aquifer is rainfall that infiltrates the aquifer through the unsaturated (vadose) zone. Vertical movement of water is faster than lateral movement in this system as water moves predominantly under the influence of gravity. This aquifer may contain coarse, sand sediment when underlain by sandstone respectively. The hydraulic conductivity of the coarse, sand sediment can reach up to 20 m/day with porosities ranging between values of 0.25 to 0.5 (Van Heerden, 2020).

5.10.1.2 Saturated zone - Fractured, bedrock aquifer
Groundwater movement is predominantly associated with secondary structures in this aquifer (fractures, faults, dykes, etc.). The average water level depth in the area ranges between 5 and 10 mbgl. Borehole yields in the Selonsrivier fractured aquifers are generally low and can be expected to be between 0.1 and 0.5 l/s with regional flow resembling flow in the porous medium (i.e. obeying Darcy's law). These formations contain limited quantities of water resources due to the poor storage capacity of the igneous rock (Van Heerden, 2020).

Both the porosity and the hydraulic conductivity of the Selonsrivier Formation fractured and intergranular aquifers are known to be low. The commonly expected values of porosity and permeability for igneous rock types are 0.05 (porosity) and 10^{-5} $m.d^{-1}$ (hydraulic conductivity) respectively (Kruseman & de Ridder, 1994). Movement of groundwater in this aquifer will be preferential in secondary structures such as joints, faults and fractures (Van Heerden, 2020).

Rooiberg Group (Transvaal Supergroup)
The porphyritic rhyolite and felsite associated with this unit represent acidic lava having a greater resistance to weathering than rock types which represent basic lava. The nature of these rocks and their weathering product is similar to that of granite, so that groundwater is usually encountered in the transition zone between weathered and more solid rock. Breccia and joint zones as well as lithological and dyke contact zones also contribute to a groundwater yield potential that is classed as poor on the basis that 86% of the available borehole yield records report a value of less than 2 l/sec. The groundwater rest level typically occurs between 10 m and 30 m below surface (Van Heerden, 2020).

One (1) percussion borehole (monitoring borehole MW1; Figure 5.17) was drilled taking the planned development and groundwater flow into account. During the drilling of the said borehole, the following lithological information was obtained:

- 0 mbgl to 5mgbl: brown to red soil overburden;
- 5 mbgl to 20 mbgl: red, moderately weathered rhyolite (highly weathered).

During drilling, only seepage water (at 16 mbgl) was encountered. The static groundwater level was measured at 5.31 mbgl (Van Heerden, 2020).

5.10.2 Perched water table

Van der Merwe (2020) indicated that the fill material occupying Soil Zone "B" (Figure 5.7) acts as a sponge for collecting water due to its loose and permeable nature. Water percolating through the fill eventually perches on top of the underlying less permeable residual felsite thereby creating a seasonal perched water table (Van der Merwe, 2020). Venter (2020b) provided a similar explanation – see Section 5.9.4 for further details.

Point water seepage was encountered in two test pits: PP/2 from below 1,2m and in PP/4 from below 2,1m below surface (Figure 5.7). Van der Merwe (2020) indicated that this must be taken into account when designing subsurface structures. The necessary damp proofing of structures must also be provided. In addition, underground tanks will need to be anchored to prevent uplift when empty.

5.10.3 Hydrocensus

Van Heerden (2020) indicated that no boreholes within a 1 km radius of the proposed site were identified through the NGA database search.

During the hydrocensus, only one (1) borehole (BH1) within a 1km radius of the site (other than the newly drilled monitoring borehole (MW1) on site) was identified as indicated in Table 5.5 and Figure 5.17.

Table 5.5: Summarized hydrocensus information (taken from Van Heerden, 2020)

PROPERTY	BOREHOLE	COMMENTS
Casa Portuguesa	No	No one available at time of site visit. A telephonic conversation with the owner confirmed that they do use municipal water and have no borehole.
Nissan	No	According to employee, no borehole. Uses municipal water.
Highveld View	*Yes*	*Borehole (BH1; Figure 5.17) was sealed, therefore no water level could be measured. Water sample taken from water tank. Use: irrigating of the gardens, using as swimming pool water as well as drinking water*
Witbank Baptist Church	No	No one available at time of site visit. A telephonic conversation with Mr. Karl confirmed that they do use municipal water.

To the south and south-western direction of the proposed site (in an upstream direction; Figure 5.17), private properties (houses) along Nita Avenue, Melissa Street, Lynette Street and Cecile Street were also visited. However, no additional boreholes could be identified as there was no access to these properties (owners of the properties were either not available or did not want to interact due to COVID-19 pandemic) (Van Heerden, 2020).

5.10.4 Hydraulic conductivity and estimated groundwater flow velocity

A bail-down test was conducted on monitoring borehole MW1 (Figure 5.17) in order to determine the hydraulic conductivity of the underlying aquifer. Based on this test, Van Heerden (2020) indicated the hydraulic conductivity (K) of the aquifer as 0.01 m/d.

An approximate groundwater flow velocity ("v" in metres per day) was calculated using the following values: K = 0.01m/d; i (hydraulic gradient) = 0.03 in a northern direction; n (porosity) = 0.05 (5%).

V= Ki/n
V = 6 x 10-3 m/d

Van Heerden (2020) indicated that based on the above-mentioned flow velocity, groundwater onsite is expected to travel approximately 2.2m per year in a northernly direction (Figure 5.17) under steady state conditions (if no preferential flow paths exist).

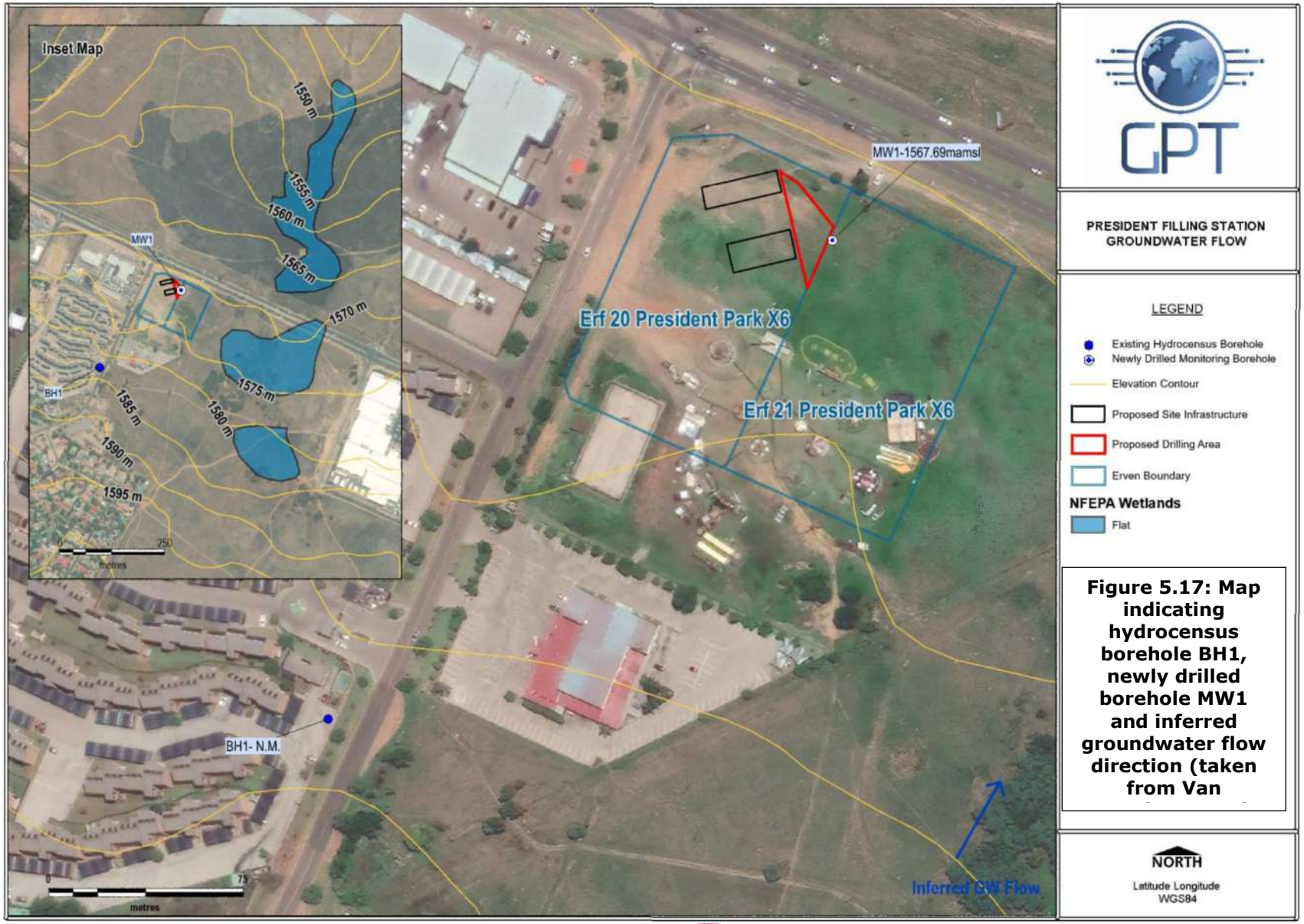


Figure 5.17: Map indicating hydrocensus borehole BH1, newly drilled borehole MW1 and inferred groundwater flow direction (taken from Van

5.10.5 Groundwater quality

Van Heerden (2020) collected a groundwater sample from the Borehole MW1 (Figure 5.17) and Borehole BH1 (Figure 5.17) in order to screen for volatile petroleum hydrocarbons and to test the water quality in terms of inorganic elements.

As indicated in Table 5.6, none of the samples exceeded the Target Water Quality Range (TWQR) limits, therefore both samples comply with the SANS 241-1:2015 Standards for Domestic Use.

It should be noted that the calcium concentration as measured in Borehole BH1 (Figure 5.17) and the manganese concentration as measured in borehole MW1 (Figure 5.17) are within the tolerable limits (Table 5.6).

Based on the water analyses, Van Heerden (2020) further indicated that:

- Borehole BH1 (upstream of proposed site; Figure 5.17):
  - has higher proportions of SO_4 and Ca (calcium);
  - falls within slightly polluted water type, with the presence of SO_4.
- Borehole MW1 (downstream of proposed site; Figure 5.17):
  - has higher proportions of K and HCO_3;
  - has deeper fresher groundwater;
  - presence of HCO_3 suggests evidence of freshly recharged water.

As indicated in Table 5.7 and Table 5.8, both samples were below the detection limit in terms of hydrocarbon compounds indicating no potential health risks associated with Borehole MW1 and Borehole BH1.

Table 5.6: Water qualities compared to SANS 241-1:2015 guidelines for domestic use (taken from Van Heerden, 2020)

Water Quality Constituents		MW1	BH1	TWQR	Tolerable	Exceeding TWQR
Total Alkalinity	M Alk. [mg/l CaCO3]	54.00	61.20	*Not available*		
Aluminium	Al [mg/l]	0.00	0.00	0 - 0.15	0.15 - 0.5	> 0.5
Calcium	Ca [mg/l]	4.86	37.00	0 - 32	32 - 80	> 80
Chloride	Cl [mg/l]	3.82	21.00	0 - 100	100 - 600	> 600
Dissolved Oxygen	DO [mg/l]	5.92	6.08	*Not available*		
Electrical Conductivity	EC [mS/m]	15.00	51.20	*Not available*		
Fluoride	F [mg/l]	0.00	0.18	0 - 1.0	1.0 - 1.5	> 1.5
Iron	Total Fe [mg/l]	0.00	0.00	0 - 0.1	0.1 - 1.0	> 1.0
Magnesium	Mg [mg/l]	2.06	24.40	0 - 30	30 - 70	> 70
Manganese	Mn [mg/l]	0.06	0.00	0 - 0.05	0.05 - 1.0	> 1.0
Nitrate	NO_3 as N [mg/l]	1.59	0.49	0 - 6		> 6
pH	pH units	7.05	7.19	6.0 - 9.0		<6, >9
Potassium	K [mg/l]	9.90	6.24	0 - 50	50 - 100	> 100
Sodium	Na [mg/l]	13.00	21.30	0 - 100	100 - 200	> 200
Sulphate	SO_4 [mg/l]	1.91	162.00	0 - 200	200 - 400	> 400
Total Dissolved Solids	TDS [mg/l]	76.11	311.17	0 - 450	450 - 1 000	> 1000
Cation/Anion Balance %		-2.39	-2.56	*Error should not exceed 5%*		

Notes: A value of zero indicates that the analysis was below the detection limit

TWQR- Target water quality range

Tolerable - Suitable for short-term intake, in some instance's health problems can occur during extensive long-term intake in sensitive individuals such as infants

Exceeding TWQR- Exceedance of target water quality range may lead to adverse effects

Table 5.7: Water analysis results (mg/l) – organic compounds (taken from Van Heerden, 2020)

SAMPLE NO.	BOREHOLE MW1	BOREHOLE BH1
SAMPLE DEPTH (mbgl)	10 mbgl	Tap sample
GASOLINE RANGE ORGANICS		
Benzene	BDL	BDL
Toluene	BDL	BDL
Ethylbenzene	BDL	BDL
Xylenes	BDL	BDL
MTBE	BDL	BDL
TAME	BDL	BDL
Naphthalene	BDL	BDL
1,2,4 Trimethyl benzene	BDL	BDL
1,3,5 Trimethyl benzene	BDL	BDL
POLY AROMATIC COMPOUNDS		
Acenephthene	BDL	BDL
Acenaphthylene	BDL	BDL
Fluorene	BDL	BDL
Phenanthrene	BDL	BDL
Anthracene	BDL	BDL
Fluoranthene	BDL	BDL
Pyrene	BDL	BDL
DIESEL RANGE ORGANICS		
TPH Aliphatic C_8-C_{10}	BDL	BDL
TPH Aliphatic C_{10}-C_{12}	BDL	BDL
TPH Aliphatic C_{12}-C_{16}	BDL	BDL
TPH Aliphatic C_{16}-C_{20}	BDL	BDL
TPH Aliphatic C_{10}-C_{14}	BDL	BDL
*TPH Aliphatic C_{15}-C_{36}	BDL	BDL
TOTAL VPHs IDENTIFIED	BDL	BDL
ESTIMATED VPHs UNIDENTIFIED	BDL	BDL
ESTIMATED TOTAL VPHs	BDL	BDL

Legend: BDL = Below Detection Limit.

Table 5.8: Water screening results (RBSL) (taken from Van Heerden, 2020)

RELEVANT GW EXPOSURE PATHWAY	BOREHOLE MW1	BOREHOLE BH1
Tier 1 RBSL GW Ingestion –commercial	*No compound exceeded its screening level*	*No compound exceeded its screening level*
Tier 1 RBSL Indoor Air - commercial	*No compound exceeded its screening level*	*No compound exceeded its screening level*
Tier 1 RBSL Outdoor Air – commercial	*No compound exceeded its screening level*	*No compound exceeded its screening level*

5.10.6 Conclusion

Based on the above-mentioned, groundwater contamination susceptibility was identified for the site (Van Heerden, 2020). Van Heerden (2020) indicated that groundwater contamination migration could occur directly from surface contamination or mobilize into the subsurface, along weathered fractured bedrock, bedding plane fractures and joints. However, based on the results of the hydrocensus and the aquifer classification map of South Africa, the aquifer underlying the site is a minor aquifer system (moderately-yielding aquifer system of variable water quality). Van Heerden (2020) indicated that the proposed filling station can continue from a hydrogeological perspective subject

to the implementation of the recommendations and mitigation measures (including monitoring) to protect the underlying aquifer.

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 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.

The air quality of the proposed site is predominately governed by the various industrial and mining activities in and around eMalahleni.

As indicated in Figure 5.3, the proposed site is located within an area that has largely been developed, with vacant land towards the north and east.

The following could impact upon the air quality of the proposed development site:

- Various power stations and opencast mining activities in the eMalahleni area (including the nearby Afrisam Aggregates and Ready-mix quarry/facility).
- Emissions from vehicles utilizing the surrounding road network (e.g. Mandela Drive, Nita Avenue, nearby N4 national road) in the area;
- Dust from vehicles driving/parking on site as well as using nearby gravel roads;
- Smoke emitted from veld fires.

5.12 Noise

The ambient noise of the site and surrounding area is predominantly governed by the following:

- Traffic utilizing Nita Avenue/Mandela Drive/nearby N4 national road;
- Business, recreational, institutional and residential activities taking place in the surrounding area;
- Blasting at the nearby Afrisam Aggregates and Ready-mix quarry/facility.

5.13 Sites of archaeological and cultural interest

5.13.1 Cultural Heritage sensitivity

A Heritage Impact Assessment (HIA) is required in terms of Section 38 of the National Heritage Resources Act (Act 25 of 1999) for any development or activity that will change the character of a site and exceeds 5 000m^2.

Prof. A.C. van Vollenhoven of Archaetnos Culture & Cultural Resource Consultants was appointed to conduct a Heritage Impact Assessment (referred

to as van Vollenhoven *et. al*., 2020). A copy of the said report is provided in Appendix 4 and should be consulted with regards to the methodology used.

According to Van Vollenhoven *et. al*. (2020), a large number of heritage reports (SAHRIS database; Archaetnos' database) have been written for the eMalahleni area which either indicate that nothing of heritage significance was found or that the sites have no contextual link to the proposed site.

The following background information is however, provided in order to place the surveyed area in a historical context and to contextualise possible finds that could be unearthed during construction activities.

5.13.1.1 Stone Age

No Stone Age sites are indicated on a map contained in a historical atlas of this area (Bergh, 1999). The closest known Stone Age occurrence is that of rock art close to the Olifants River to the south of Witbank (Bergh, 1999), i.e. southwest of the proposed site. This however should rather be seen as a lack of research in the area and not as an indication that such features do not occur. Some Middle Stone Age artefacts were identified out of context during previous surveys in the wider geographical area (Archaetnos' database).

Van Vollenhoven *et. al.* (2020) did not record any natural shelters during the survey. It is therefore possible that people did not stay here for extended periods. The close vicinity of water sources and ample grazing would however, have made it a prime spot for hunting and obtaining water. Therefore, one may assume that Stone Age people probably would have moved through the area.

5.13.1.2 Iron Age

No Iron Age sites are indicated in the historical atlas for the town of eMalahleni (Witbank), but this may only indicate a lack of research. The closest known Iron Age occurrences to the surveyed area are Late Iron Age sites that were identified to the west of Bronkhorstspruit and in the vicinity of Bethal (Bergh, 1999).

The good grazing and access to water in the area would have provided a good environment for Iron Age people, although building material may have been reasonably scarce. One would therefore expect that Iron Age people may have utilized the area. This is the same reason why white settlers later moved into this environment (Van Vollenhoven *et. al*., 2020).

5.13.1.3 Historical Age

No farm buildings, structures, objects or graveyards from this time period were found on site (Van Vollenhoven *et. al.* (2020).

5.13.1.4 Conclusion

Van Vollenhoven *et. al.* (2020) indicated that no sites of cultural heritage significance were identified within the proposed development site and that the development may therefore proceed.

The subterranean presence of archaeological and/or historical sites, features or artefacts is a distinct possibility and may only become known later (i.e. during the construction phase). Operating controls and monitoring should therefore be aimed at the possible unearthing of such features (Van Vollenhoven *et. al.,* 2020). Mitigation measures in this regard are included in the EMPr (Section 9) of this report and must be implemented.

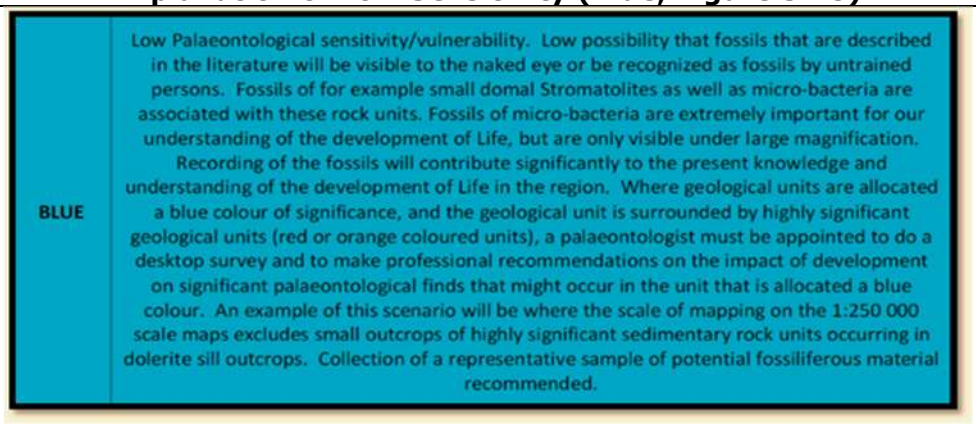
Sensitivity assessment

The screening report (as per the outcome of the National Screening Tool, 2017; Appendix 1) produced a Low sensitivity for the Archaeological and Cultural Heritage Theme. This is in line with the findings of Van Vollenhoven *et. al.* (2020) who identified no sites of cultural heritage significance within the proposed development site.

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 (Figure 5.18) is indicated as follows:

Sensitivity (Figure 5.18)	Geology	Required Action
Low (Blue)	Selonsrivier Formation	No palaeontological study required. However, protocol for finds required.
Explanation of Low Sensitivity (Blue; Figure 5.18)		



In order to obtain clarity regarding the above-mentioned action required, an accredited palaeontologist, Dr. Heidi Fourie, was consulted who indicated that a concealed boundary with the Vryheid Formation is present to the west of the site and that a desktop study would be necessary. In view of this, Dr. Heidi Fourie (Heidi Fourie Consulting) was appointed to conduct a Desktop Palaeontological Impact Assessment (referred to as Fourie, 2020). A copy of the said report is provided in Appendix 5 and should be consulted with regards to the methodology used.

5.13.2.1 Outline of the geology

The palaeontological sensitivity of a site is closely related to the underlying geology, since fossils mainly occur in rocks of sedimentary nature and not in rocks from igneous or metamorphic nature.

According to the 1: 250 000 Geological Series (number 2528 Pretoria), the site is underlain by volcanic rocks of the Selonsrivier Formation, Rooiberg Group, Transvaal Supergroup (Figure 5.5a). The Selonsrivier Formation has either a sandstone or a quartzite at its base and mainly consists of red rhyolite. No fossils have been recorded for the Selonsrivier Formation (Fourie, 2020).

The potential impact of the development on the fossil heritage is indicated as LOW for the Selonsrivier Formation, Rooiberg Group, Transvaal Supergroup. However, there is a concealed boundary with the Vryheid Formation, Ecca Group, Karoo Supergroup, to the west of the site (Fourie, 2020).

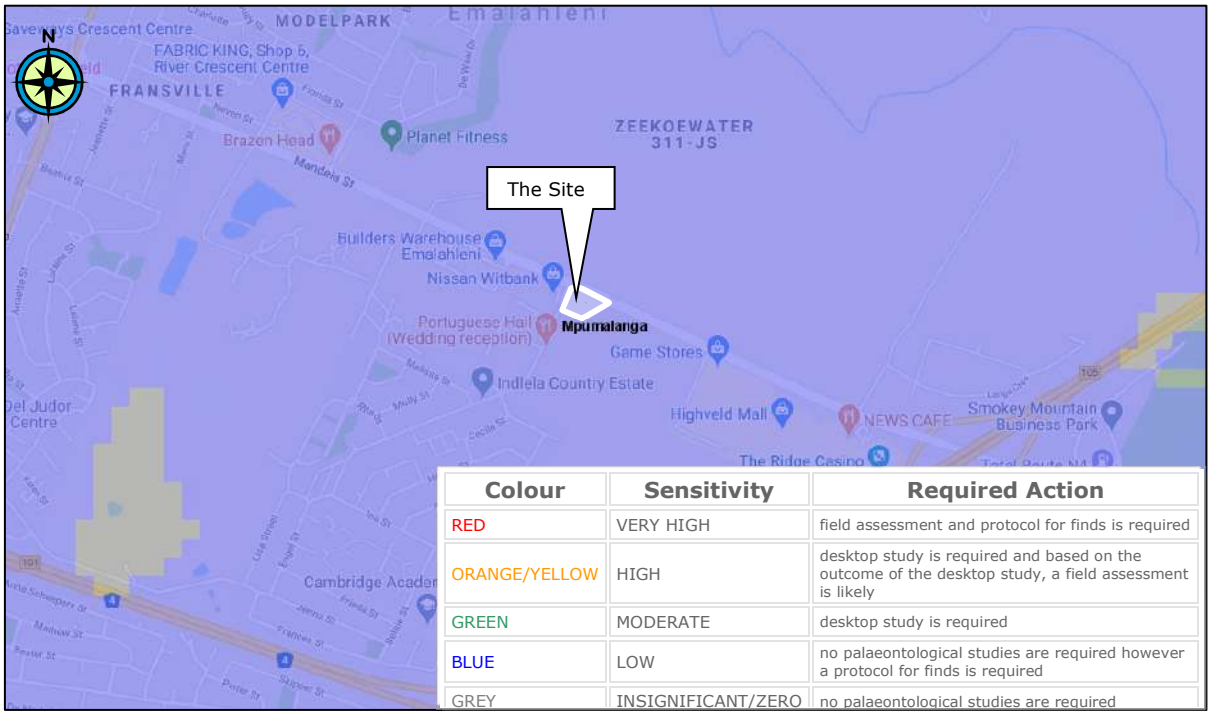


Figure 5.18: Requirement for palaeontological study (taken from SAHRA, 2020)

The Vryheid Formation, Ecca Group, Karoo Supergroup consists essentially of sandstone, shale and subordinate coal beds. This formation contains the largest coal reserves in South Africa.

Ecca rocks are stable and lend themselves well to developments. These rocks are only unstable in or directly above mining activities (Snyman, 1996). Fourie (2020) indicated that the proposed development site is partly situated on the flat-lying Vryheid Formation.

5.13.2.2 Outline of palaeontology

The Vryheid Formation, Ecca Group, Karoo Supergroup is renowned for its fossil wealth. The Ecca Group may contain fossils of diverse non-marine trace, *Glossopteris* flora, mesosaurid reptiles, palaeoniscid fish, marine invertebrates, insects, and crustaceans (Johnson, 2009).

Glossopteris trees rapidly colonised the large deltas along the northern margin of the Karoo Sea. Dead vegetation accumulated faster than it could decay, and thick accumulations of peat formed, which were ultimately converted to coal. It is only in the northern part of the Karoo Basin that the glossopterids and cordaitales, ferns, clubmosses and horsetails thrived (McCarthy and Rubidge, 2005).

The *Glossopteris* flora is thought to have been the major contributor to the coal beds of the Ecca. These are found in Karoo-age rocks across Africa, South America, Antarctica, Australia and India. This was one of the early clues to the theory of a former unified Gondwana landmass (Norman and Whitfield, 2006).

Table 5.9a provides an indication of the occurrence of fossils in the Selonsrivier and Vryheid Formations.

Table 5.9a: Occurrence of fossils in the Selonsrivier and Vryheid Formations (taken from Fourie, 2020).

Selonsrivier Formation in the development area	
No fossils recorded. Fossils within minor sedimentary units unlikely because of fluvial depositional setting and subsequent metamorphism.	Possible evidence for a catastrophic event at the base of Rooiberg Group (basin floor collapse, slumping, volcanism). Selonsrivier and Kwaggasnek units previously included within upper Pretoria Group by some geologists.
Vryheid Formation on surrounding areas	
Rich fossil plant assemblages of the Permian Glossopteris Flora (lycopods, rare ferns and horsetails, abundant glossopterids, cordaitaleans, conifers, ginkgoaleans), rare fossil wood, diverse palynomorphs. Abundant, low diversity trace fossils, rare insects, possible conchostracans, non-marine bivalves, fish scales. (Please refer to Appendix 5 for further information in this regard).	Globally important fossil floras from Middle Permian Gondwana. Seriously under-collected in recent years, despite ongoing mining for coal.

Fossils in South Africa mainly occur in rocks of sedimentary nature and not in rocks from igneous or metamorphic nature. Therefore, if there is the presence of Karoo Supergroup strata the palaeontological sensitivity can generally be LOW to VERY HIGH as indicated in Table 5.9b.

Table 5.9b: Criteria used (Fossil Heritage Layer Browser/SAHRA) (taken from Fourie, 2020)

Geology	**Sensitivity/vulnerability**	**Recommended Action**
Vryheid Formation (Pv) (Pe)	Very High	Field assessment and protocol for finds is required.
Selonsrivier Formation (Vs)	Low	Desktop study

In terms of the proposed development site, the palaeontological sensitivity is LOW for the Selonsrivier Formation as fossils have not been recorded for this formation (Fourie, 2020). The impact is potentially VERY HIGH for the surrounding Vryheid Formation (Fourie, 2020).

5.13.2.3 Conclusion and recommendation

Although the proposed development site is underlain by the Selonsrivier Formation, Fourie (2020) indicated that it was necessary to do a Desktop Palaeontological Impact Assessment as the proposed development site is surrounded by an area with a Very High palaeontological sensitivity.

Based on the findings of the desktop study, Fourie (2020) raised no objection to the proposed development and indicated that the development may go ahead.

Special care must however, be taken during the construction phase (e.g. digging, drilling, blasting, excavating of foundations, removal of overburden, etc.). A protocol for finds and management plan are provided in Appendix 2 of Appendix 5. If any palaeontological material is exposed during digging, excavating, drilling or blasting SAHRA must be notified. All construction activities must be stopped, a 30 m no-go barrier constructed and a palaeontologist should be called in to determine proper mitigation measures (Fourie, 2020).

5.14 Sensitive landscapes

Venter (2020) identified no wetlands on site as indicated in Section 5.9.4. No sensitive landscapes (wetlands/seepage areas, etc.) are thus present on site.

5.15 Visual aspects

The site is located within the eMalahleni urban area (Figure 5.4) and is surrounded by various land uses, e.g. residential (Del Judor x4), businesses, etc.

Mandela Drive is located along the northern boundary of the site (Figure 5.3) and Nita Avenue along the western boundary (Figure 5.3). A Nissan motor dealership, Highveld View Estate and Indlela Lodge are present west of Nita Avenue (Figure 5.3).

The Portuguese Club and Casa Portuguesa Restaurant are located to the south as indicated in Figure 5.3.

The properties north and east of the site are currently vacant (Figure 5.4) and owned by the eMalahleni Local Municipality. The Highveld Mall is located further towards the east (Figure 5.4).

The site is highly visible from Mandela Drive, Nita Avenue and all the adjacent properties (e.g. Nissan Dealership, Highveld View Estate, Casa Portuguesa restaurant, open veld, etc.) and to an extent from the Highveld Mall.

5.16 Traffic

The feasibility study conducted with regards to the proposed filling station included a traffic impact study and was undertaken by J. van Rooyen of EDL Engineers (Pty) Ltd. (hereafter referred to as Van Rooyen, 2020a). A copy of the report is provided in Appendix 6. This report should be consulted for methodology used.

5.16.1 Proposed development

As previously indicated, the proposed filling station will be located on a portion of Erf 20 of President Park X6, eMalahleni, with the access road from Mandela Drive extending across a portion of Erf 21 (Figure 3.3). The said site is located west of the N4 national road and south of Mandela Drive.

The proposed filling station will be developed on Portion 1 of Erf 20 (Figure 3.2) which is 4012m^2 in extent. The medium sized modern filling station will comprise of underground petrol and diesel tanks (23 000ℓ x 5), fuel pumps, a canopy covered forecourt and a convenience store.

The filling station will be accessed via a left-in left-out road (which will cross Erf 21, Figure 5.19) from Mandela Drive. Approximately 350m^2 will be used for the left-in left-out access road from Mandela Drive. An access point will also be provided from Nita Avenue (Figure 5.19).

5.16.2 Surrounding Road Network

Mandela Drive
Mandela Drive functions as a Minor Arterial (Class 3) road and runs in an east-west direction (Figure 5.19). The road is a surfaced dual carriageway with two through lanes (of approximately 3.7m side per direction) and a kerbed median for most of its length passing the proposed filling station site (Figure 5.19) preventing access from Mandela Drive when travelling in an easterly direction.

Mandela Drive has signalised intersections with the N4 on-and-off ramps and Langa Cres/Highveld Mall Access. An 'All-way' Stop is present at the T-junction with Nita Avenue. Mandela Drive is the main link between the central business district (CBD) of eMalahleni, the Witbank Dam and the residential areas located south of the N4 (e.g. Reyno Ridge, Ben Fleur and Bankenveld).

According to Van Rooyen (2020b), Mandela Drive carries traffic volumes ranging between 650 and 1300 vph per direction during the Friday Afternoon (PM) and Saturday Morning (AM) peak periods.

Nita Avenue
Nita Avenue (Figure 5.19) is a Collector Street (Class 4) that provides access from Mandela Drive to the residential area, Del Judor x4. The road is a surfaced single carriageway road with no median and one (1) lane in each direction. An 'All-way' Stop is present at the T-junction with Mandela Drive.

According to Van Rooyen (2020b), Nita Avenue carries traffic volumes ranging between 110 and 180 vehicles per hour (vph) per direction, during the Friday Afternoon (PM) and Saturday Morning (AM) peak periods (i.e. in the vicinity of the proposed development site).

5.16.3 Existing traffic volumes
Traffic Counts were used to determine the traffic demand and traffic volumes for the study area (Van Rooyen, 2020a). A classified count was conducted by EDL Consulting Engineers in March 2020, at the intersection of Mandela Dr and Nita Ave. The detailed (classified) traffic count report is provided in Annexure B of Appendix 6.

The 13-hour classified traffic count was conducted by EDL Consulting Engineers on 17 March 2020 at the intersection of Mandela Dr and Nita Ave. These counts were converted to 24-hour counts and broken up into different traffic streams as indicated in Table 5.10.

Table 5.10: Average Daily Traffic (ADT) travelling past the site @ 17 March 2020 (taken from Van Rooyen, 2020a)

ROAD AND DIRECTION	TRAFFIC VOLUME (veh/day)	ADOPTED INTERCEPTION RATE
Westbound on Mandela Drive past the site (positive traffic)	10 947	4.0%
Eastbound on Mandela Drive past the site (no direct access)	9 960	1.0%
Northbound on Nita Avenue past the site (negative traffic)	2 921	3.0%
Southbound on Nita Avenue past the site (positive traffic)	1 468	6.0%
TOTAL ADT	**25 296**	
Planned (& approved) retail development (approx. 12 000m^2)	4 200	3.0%

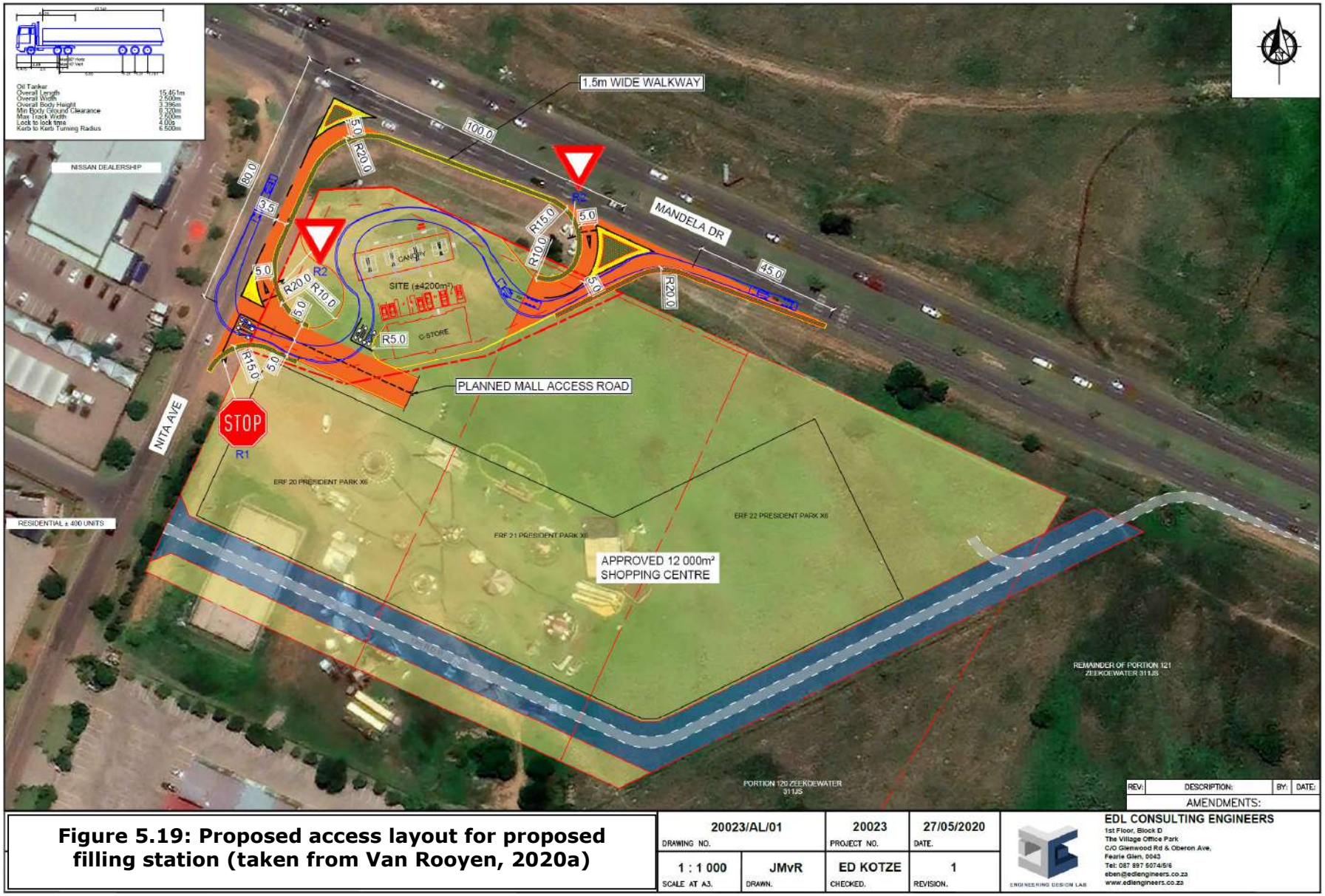


Figure 5.19: Proposed access layout for proposed filling station (taken from Van Rooyen, 2020a)

As indicated in Table 5.10, the Average Daily Traffic (ADT) currently travelling through the intersection of Mandela Dr and Nita Avenue is approximately 25 296 vehicles per day, with heavy vehicles constituting approximately 1.7% of the daily traffic and Taxi's about 6.2% of the daily traffic (Van Rooyen, 2020a).

Van Rooyen (2020a) indicated that lower interception rates are expected for traffic travelling on the opposite side of the street and required to turn across oncoming traffic in order to access the proposed filling station site (e.g. northbound on Nita Avenue; negative traffic; Table 5.10).

A low interception rate is also predicted for traffic eastbound on Mandela Drive (Table 5.10) in view of no direct access (due to the presence of the median kerb) and vehicles having to use Nita Avenue to access the proposed filling station site.

Being on the southern side of Mandela Drive, the proposed filling station site will mainly serve traffic travelling westbound (Table 5.10), with the other nearby filling station sites catering mainly for vehicles travelling eastbound on Mandela Drive (Van Rooyen, 2020a).

5.16.4 Future traffic volumes

The existing Nissan, UD Trucks and Datsun dealerships opposite the site and the new approximately 400 unit Residential development on Nita Ave will contribute a large amount to the traffic passing the site and therefore increases the need for a new filling station in the area (Van Rooyen, 2020a).

The balance of Erf 20, Erf 21 and Erf 22 (total about 26 254m^2) will be used to develop a 12 000m^2 (Gross Leasable Area (GLA)) shopping/retail centre adjacent to the filling station. The proposed retail centre will be accessed from Mandela Drive (left-in only) and two full access points from Nita Avenue as indicated in Figure 5.19. The said access roads were approved by the eMalahleni Local Municipality (i.e. in terms of the previous Traffic Impact Assessment done by WSP in March 2010).

A separate traffic impact assessment was undertaken (J. van Rooyen of EDL Engineers (Pty) Ltd., hereafter referred to as Van Rooyen, 2020b) with regards to the proposed retail centre. Van Rooyen (2020b) indicated that the proposed retail centre development is supported from a traffic engineering perspective, provided that the following upgrades and site accesses are implemented by the developer:

- Conversion of the 'All-way' stop to a 'two-phase' signalised intersection (i.e. Mandela Drive and Nita Avenue);
- Addition of a left-turn lane on western side of Nita Avenue;
- Addition of a slip exit lane on the eastern side of Nita Avenue.

In addition, Van Rooyen (2020b) recommended that the following be provided with regards to non-motorised and public transport:

- A pedestrian walkway (1.5m wide) along the northern and western boundaries of the site;
- An additional public transport facility formal pick-up/drop-off/waiting area to accommodate 12 minibus taxis within the parking area of the proposed development.

Van Rooyen (2020a) indicated that the proposed retail centre will increase the traffic and the demand for fuel at the site significantly and will add approximately 4 200 vehicles per day, as per Table 3.1 in the COTO TMH 17

Manual, with an AADT trip rate of 35 vehicles/100m²/day. From the above, it is clear that the future traffic demand will increase significantly.

According to Van Rooyen (2020a), there are no future roads nor any changes or upgrades that are proposed (in the foreseeable future) for Mandela Drive (other than the access) near the proposed filling station site that might affect the proposed filing station site.

According to Van Rooyen (2020a), the increase in daily traffic can be calculated as a compounded growth of 3.46% per year over 10 years. The traffic growth can be expected to increase further within the foreseeable future in view of undeveloped land available opposite the site, adjacent to Mandela Drive (Figure 5.4).

Based on the above-mentioned, an average annual traffic growth of +3.0%/annum was adopted over the next 3 years with regards to the said area.

5.16.5 Potential impact on traffic

As already indicated, the filling station will be accessed via a 'left-in left-out' access road from Mandela Drive, approximately 100m east of the intersection of Mandela Drive and Nita Avenue (Figure 5.19).

A 'Full' access will be provided from Nita Avenue, approximately 80m south of the intersection of Mandela Drive and Nita Avenue (Figure 5.19).

Van Rooyen (2020a) indicated that these accesses will have very little impact on passing traffic due to new deceleration lanes to be provided (Figure 5.19).
During the construction phase, construction vehicles or even abnormal vehicles or delivery vehicles could affect and/or disrupt current traffic flows. During this phase, possible traffic congestion or increase in congestion, temporary obstructions in the roadway and the influence on adjacent development must be considered.

During the operational phase, the existing traffic flow patterns on the roadways adjacent to the proposed filling station site are expected to vary and change over time. Filling stations are developments that intercept trips from background traffic as opposed to other developments that generate additional trips. The interception of traffic could cause minor disruptions if not considered thoroughly.

In planning a filling station, provision must also be made for a fuel delivery vehicle to safely enter and exit the site. Typically, the entrance lane width should be at least 5m wide, to accommodate a Single Unit + Trailer Unit. For light vehicles, a minimum width of only 3.5m is required.

Figure 5.19 shows the turning circles of a fuel truck provided indicating that the proposed filling station site will be able to accommodate fuel delivery vehicles.

Van Rooyen (2020a) recommended that the following issues should be considered to minimise the possible negative impacts that the proposed filling station might have on passing traffic (i.e. during operational phase):

- The detail design of the proposed filling station should adhere to the prescribed specifications (and subsequent approvals) of the applicable road authorities.
- Care should be taken pertaining to the placing of signage in the proximity of access points to the proposed filling station.

- Issues pertaining to surface damage and poor condition of the roads in proximity of the site should be reported to the applicable road authority and custodian of the respective roads;
- Appropriate road signs and traffic markings should be implemented at the site to ensure safe and convenient access for passing traffic on both roads.

5.16.6 Conclusion

Van Rooyen (2020a) indicated that the existing traffic passing the site will not be negatively affected by the proposed filling station's operation, if proper access design standards, turning and deceleration lanes (where applicable) and appropriate signage are provided as part of the overall design of the proposed filling station.

5.17 Sense of place

The proposed filling station site will be located within an established urban area and within the urban edge of eMalahleni (Figure 5.20). In terms of land use, the surrounding area is utilized for business, institutional, residential and recreational activities.

The balance of Erf 20, Erf 21 and Erf 22 (total about 26 254m^2) will be used to develop a 12 000m^2 (Gross Leasable Area (GLA)) shopping/retail centre adjacent to the filling station. The proposed retail centre will be accessed from Mandela Drive (left-in only) and two full access points from Nita Avenue as indicated in Figure 5.19. The said access roads were approved by the eMalahleni Local Municipality (i.e. in terms of the previous Traffic Impact Assessment done by WSP in March 2010).

The proposed filling station would be highly visible from the adjacent Nita Avenue and the busy Mandela Drive. According to the eMalahleni Spatial Development Framework (SDF; 2015), Mandela Drive was identified as one of the activity spines/corridors (Figure 5.20) where non-residential uses would be allowed in order to optimally utilize the visual exposure from the high traffic volumes along this road.

The proposed filling station would be highly visible and easily accessible from Mandela Drive and therefore fits into the development plans of the eMalahleni Local Municipality. The proposed development should therefore not impact on the sense of place of the area.

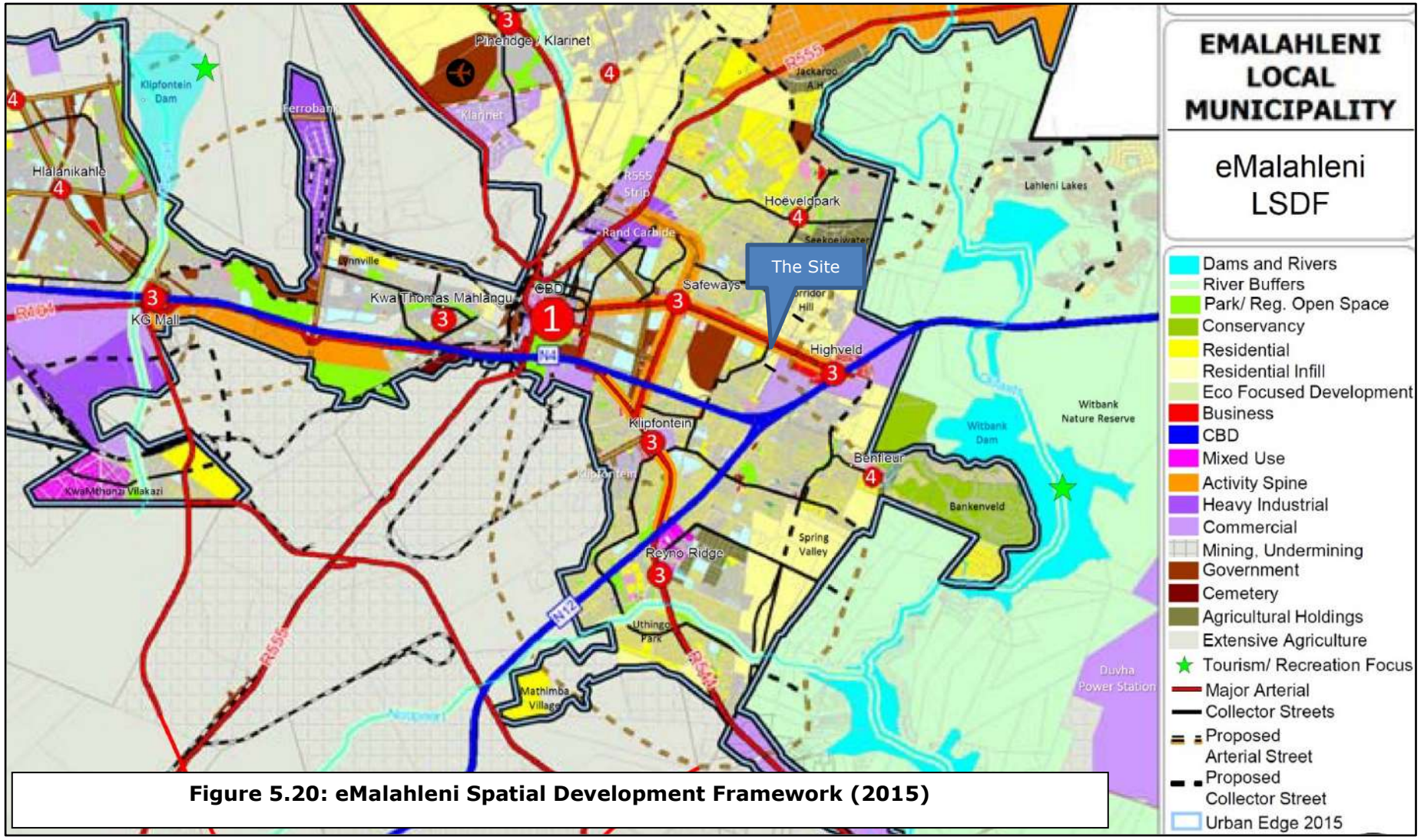


Figure 5.20: eMalahleni Spatial Development Framework (2015)

5.18 Concluding Remarks

As a result of past disturbances, the vegetation of the proposed filling station site (Modified Grassland vegetation unit) is highly modified/transformed with low species diversity. It no longer resembles the Rand Highveld Grassland vegetation type (Venter, 2020a). No suitable habitat for bullfrogs was identified on the proposed filling station site (including the access road site).

Most of Erf 20 falls within the Technosol group and more particularly, the Johannesburg soil form (i.e. soil profiles covered by concrete structures, cement and waste materials including building gravel) with a small portion within the Anthrosol group and more particularly, the Grabouw soil form. These soil forms are not suitable for agricultural purposes.

Van der Merwe (2020) identified two Geotechnical Zones on Erf 20 namely: Soil Zone "A" and Soil Zone "B" (Figure 5.6) and indicated from a geotechnical point of view that the said site can be developed subject to the implementation of the stipulated recommendations.

Groundwater contamination susceptibility was identified for the site (Van Heerden, 2020). Van Heerden (2020) indicated that groundwater contamination migration could occur directly from surface contamination or mobilize into the subsurface, along weathered fractured bedrock, bedding plane fractures and joints. However, based on the results of the hydrocensus and the aquifer classification map of South Africa, the aquifer underlying the site is a minor aquifer system (moderately-yielding aquifer system of variable water quality). Van Heerden (2020) indicated that the proposed filling station can continue from a hydrogeological perspective subject to the implementation of the recommendations and mitigation measures (including monitoring) to protect the underlying aquifer.

According to Venter (2020b), no hydric (wetland) soil forms are present on site and therefore no wetlands and sensitive landscapes (wetlands/seepage areas, etc.) are present on site.

Van Vollenhoven (2020) identified no sites of cultural heritage significance within the proposed site. From a palaeontological point of view, Fourie (2020) raised no objection to the proposed development and indicated that the development may go ahead with caution.

Filling stations are developments that intercept trips from background traffic as opposed to other developments that generate additional trips. Van Rooyen (2020a) indicated that the existing traffic passing the site will not be negatively affected by the proposed filling station's operation, if proper access design standards, turning and deceleration lanes (where applicable) and appropriate signage are provided as part of the overall design of the proposed filling station.

The proposed filling station would be highly visible and easily accessible from Mandela Drive and therefore fits into the development plans of the eMalahleni Local Municipality. The proposed filling station would be located adjacent to a planned retail centre (i.e. on Erf 20 (remaining portion), Erf 21 and Erf 22) and should therefore not impact on the sense of place of the area.

SECTION 6: DESCRIPTION OF THE PUBLIC PARTICIPATION PROCESS

The public participation process is defined in the Public Participation (PP) Guideline (2017) as *"a process by which potential interested and affected parties are given opportunity to comment on, or raise issues relevant to, the application.*"

According to the PP Guideline (2017), some characteristics of a comprehensive PP process include providing role-players with clear, accurate and understandable information about the activity, allowing them to voice their support, concerns and questions regarding the project and encouraging transparency and accountability in decision-making.

Interested and Affected Parties/role players also have a responsibility towards ensuring a successful public participation process and must ensure that:

a. *comments are submitted within the specified timeframes or any extension of a timeframe agreed to by the applicant or the EAP;*
b. *comments are submitted directly to the EAP; and*
c. *any direct business, financial, personal or other interest which the I&AP may have in the approval or refusal of the application is disclosed to the EAP.*

The Public Participation Process was designed to satisfy the requirements of Chapter 6 and Appendix 1 of the EIA Regulations, 2014 (as amended) and the PP Guideline, 2017. The Covid-19 Directions of 5 June 2020 were no longer applicable when the initial public participation (as indicated in Section 6.1) was undertaken.

This section of the report therefore provides an overview of the public participation process followed to date and represents the Comments and Response Report as required in terms of Section 44 of the EIA Regulations, 2014 (as amended) and the PP Guideline, 2017.

The following information is provided in this section of the report:

- Details regarding the advertising of the project (Section 6.1);
- Comment received in response to advertising and the distribution of the Background Information Document (Sections 6.2 to 6.4);
- A list of registered Interested and Affected Parties, stakeholders and government departments (Section 6.3);
- A map indicating directly affected and adjacent landowners (Figure 6.2);
- A summary of the comments received from I&APs and a response from the EAP (Table 6.4).
- Supporting documentation e.g. copies of e-mails, notices, Background Information Document (BID), comment sheets, etc. (Appendices 11 to 15).

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 (as amended), was placed in the local newspaper, Witbank News, on Friday, 4 September 2020. A copy of the advert is provided in Appendix 11.

The Witbank News is distributed in eMalahleni, Middelburg, Ga-Nala, Ogies, Clewer, Blinkpan, Balmoral and surrounding areas with approximately 27 000 copies sold every Thursday.

6.1.2 On-site advertising

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

- On the corner of Nita Avenue and Mandela Drive (A1 size; Figure 6.1 – Photo 6.1);
- On site on the basketball court fence (A3 size; Figure 6.1 – Photo 6.2);
- On the notice board at Casa Portuguesa Restaurant, Portuguese Club (A3 size; Photo 6.3);
- On the fence at the Witbank Public Library (A3 size; Photo 6.4);
- On the notice board at Fourway's Café, Del Judor X4 (A3 size; Photo 6.5).

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.

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

Figure 6.1: Aerial view of notice placements

Photo 6.4: A view of the notice displayed at the Witbank Public Library

Photo 6.5: A view of the notice displayed at Fourway's Café, Del Judor X4

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.

In addition to the above, the notice was also placed (3 September 2020) on the Ward 34 Facebook Page (Appendix 11).

6.1.4 Feedback from the advertising process

The following persons registered as Interested and Affected Parties (I&APs) in terms of the advertising of the project.

NAME	CORRESPONDENCE	COMMENT
S. Bloy (resident of Del Judor x4)	Telephone call (3 September 2020); Email (3 September 2020; Appendix 11).	Bullfrogs noted on site during December 2017 and December 2019 after heavy rains. See Section 6.4.1 and Table 6.4.
E. Michau (owner of Lavender Lane Guesthouse)	Telephone call (9 September 2020); Email (9 September 2020; Appendix 11) with BID forwarded.	Telephonically wanted to know when development would commence. Indicated that the guesthouse is available for accommodation of contractors. See Table 6.4.
O. Riba (eMalahleni Local Municipality)	Email (dated: 9 September 2020; Appendix 11)	Registered as I&AP. See Section 6.3, Table 6.1, Table 6.2 and Table 6.4
N. Ngubane (Ngubane Urban House (Pty) Ltd.) on behalf of Masakhane Mining Supply and Construction cc.	Email (dated: 30 September 2020; Appendix 15)	**Objection.** They are planning another filling station within 500m radius of the proposed filling station. See Section 6.6.1 and Table 6.4.

There was thus no need for a public meeting.

6.2 Directly affected landowner/user

Meronox (Pty) Ltd

The proposed development site is located on a portion of Erven 20 and 21 of President Park X6 (Figure 6.1), which is owned by Meronox (Pty) Ltd. (i.e. the applicant for the proposed development) – see the Windeed Property Report provided in Appendix B of Appendix 1.

No outside party will thus 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
Government Departments			
Department of Agriculture, Forestry and Fisheries (DAFF)	F. Mashabela	E-mail (dated: 4 September 2020; 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	E-mail (dated: 4 September 2020; Appendix 13) with BID forwarded.	None
Department of Co-operative Governance and Traditional Affairs (COGTA)	M. Loock	E-mail (dated: 4 September 2020; Appendix 13) with BID forwarded.	None
Department of Energy	M. Machete; S. Ntuli (licensing officer)	E-mail (dated: 4 and 9 September 2020; Appendix 13) with BID forwarded.	None
Department of Mineral Resources	S. Mathavela	E-mail (dated: 4 September 2020; Appendix 13) with BID forwarded.	None
Department of Rural Development and Land Reform (Commission on Restitution of Land Rights)	T. Mkhonto	E-mail (dated: 4 September 2020; Appendix 13) with BID forwarded.	None
Department of Water and Sanitation (DWS)	T. Ndlhovu; N.S. Maliaga	E-mail (dated: 4 September 2020; Appendix 13) with BID forwarded.	None
Stakeholders			
Eskom Distribution (Land & Rights)	T. Ludere	E-mail (dated: 4 September 2020; Appendix 13) with BID forwarded.	None

AUTHORITY/ STAKEHOLDER	CONTACT PERSON	CORRESPONDENCE SENT	COMMENTS
Eskom Transmission	L. Motsisi	E-mail (dated: 4 September 2020; Appendix 13) with BID forwarded.	None
Mpumalanga Tourism and Parks Agency (MTPA) – Land Advisory Unit	P. Nkosi	E-mail (dated: 4 September 2020; Appendix 13) with BID forwarded.	None
South African Civil Aviation Authority (SACAA)	K. Mthapo	E-mail (dated: 4 September 2020; Appendix 13) with BID forwarded.	None
South African Heritage Resources Agency (SAHRA)	N. Khumalo (SAHRIS)	Loaded BID on SAHRA website on 3 September 2020 (Appendix 13).	Yes. See Section 6.3.1 and Table 6.4.
South African National Roads Agency (SANRAL)	V. Bota K. Schmid I. van der Linde L. Dlanjwa	E-mail (dated: 4 September 2020; Appendix 13) with BID forwarded.	None
Trans African Concessions (TRAC)	C. Davis R. Nkosi	E-mail (dated: 4 September 2020; Appendix 13) with BID forwarded.	None
South African Petroleum Industry Association (SAPIA)	N. Machumele	Email (dated: 4 September 2020; Appendix 13) with BID forwarded.	None
Fuel Retailers Association (FRA)	L. Nyakutsikwa	Email (dated: 4 September 2020; Appendix 13) with BID forwarded.	None
Fuel Retailers Association (FRA) – Regional Chairperson: Mpumalanga	D. Marx	Email (dated: 4 September 2020; Appendix 13) with BID forwarded.	None
Local Authorities			
Nkangala District Municipality	S. Links A. Thwala	E-mail (dated: 4 September 2020; Appendix 13) with BID forwarded.	None
eMalahleni Local Municipality	E. Nkabinde O. Riba	E-mails (dated: 4 September 2020 & 9 September 2020; Appendix 13) with BID forwarded.	None
eMalahleni Local Municipality	Councillor L. Steyn (Ward 34)	E-mail (dated: 3 & 4 September 2020; Appendix 13) with BID forwarded.	None

6.3.1 South African Heritage Resources Agency (SAHRA)

A letter (dated: 1 October 2020; Ref: 15459; Appendix 15) was received from the South African Heritage Resources Agency (SAHRA) indicating the following:

In terms of the National Heritage Resources Act, no 25 of 1999 (NHRA), heritage resources, including archaeological or palaeontological sites over 100 years old, graves older than 60 years, structures older than 60 years are generally protected. They may not be disturbed without a permit from the relevant heritage resources authority. In contexts of development applications, the developer must ensure that no heritage resources will be impacted by the proposed development, by lodging an application to SAHRA and submitting detailed development specifications as a notification of intent to develop. If the application is made in terms of s. 38 (8) of the NHRA then it is incumbent on the developer to ensure that a Heritage Impact Assessment (HIA) is undertaken, as s. 38(2)a does not apply. Such a study should follow the SAHRA 2007 impact assessment guidelines and section 38(3).

Due to the extent of the development and its location near a developed area, a detailed motivation in a letter that recommends exemption can be drafted by a suitably qualified archaeologist. The letter must contain an exemption.

Any earth moving activities pose a threat to palaeontological and heritage resources, particularly in relatively undisturbed areas, coal mine area, Koppies, Mountains and River valleys are sensitive to these types of heritage resources. The proposed development area is located in an area of insignificant and low significant palaeontological sensitivity area. As per the requirements listed on the SAHRIS palaeo-sensitivity map, a Fossil Finds Procedure must be written up by a suitably qualified palaeontologist. The Procedure must contain a geological map and detailed procedure that outlines the roles and responsibilities of the ECO, construction crew, maintenance staff and an independent palaeontologist in the event that fossils are uncovered.

SAHRA APM unit will process the case further once the above requested reports are submitted to the case.

Response from AdiEnvironmental

See Table 6.4.

6.4 Adjacent landowners/users and other Interested and Affected Parties

Table 6.2 and Figure 6.2 provide an indication of the adjacent landowners who were consulted as part of the public participation process.

As indicated in Figure 6.2, the proposed site is located on the corner of Nita Avenue and Mandela Drive, adjacent to the Portuguese Club and opposite the Nissan dealership, eMalahleni. The properties are currently vacant, except for a basketball court that is used by local residents.

The surrounding area is mostly developed, with land uses including residential, business, institutional and recreational taking place. The land towards the north, east and southeast of the site is vacant (Figure 6.2).

The following strategy was employed to inform the adjacent landowners/users of the proposed development:

- The directly adjacent and surrounding land users were identified remotely through the use of Google Earth, Street View and by doing a drive-by.

- 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.

- Contact details for the adjacent landowners/users were obtained and they were informed of the proposed development telephonically and via email as indicated in Table 6.2.

- Background Information Documents were also distributed by hand to adjacent landowners/users whose contact details could not be obtained as indicated in Table 6.2.

- The proposed development and larger residential/business area are located in Ward 34. The ward councillor (Ms. L. Steyn) was contacted telephonically and via email (Table 6.2) to obtain her comment on behalf of the wider community.

- The ward councillor (Ms. L. Steyn) placed the notice and Background Information document on the Ward 34 Facebook page (Appendix 11).

A copy of the Background Information Document is provided in Appendix 12. The Background Information Document included the following information:

- Project name and reference number;
- Applicant name;
- Legal requirements and list of activities to be authorised;
- Details of the EAP;
- Description of the public participation process;
- Responsibilities of I&APs;
- Date by which I&APs must register and forward comment;
- A link to the AdiEnvironmental website for an electronic copy of the Background Information Document and Basic Assessment Report;
- Project and property description;
- Locality map;
- Proposed layout plan.
- Short description of the process to be followed and proposed timeline;
- Comment sheet.

Comments received from the adjacent landowners/users in response to the advertising and distribution of the Background Information Document are indicated in Table 6.2.

Table 6.2: Identified adjacent landowners/users who received BIDs

PROPERTY (FIGURE 6.2)	LANDOWNER/ CONTACT PERSON	CORRESPONDENCE	COMMENTS
Builders Warehouse	H. Sepuba	E-mails (dated: 4 September 2020; Appendix 14) with BID forwarded.	None
Casa Portuguesa Restaurant	P. Manarte	E-mail (dated: 4 September 2020; Appendix 14) with BID forwarded.	None
CTM	A. Ndala	E-mail (dated: 4 September 2020;	None

PROPERTY (FIGURE 6.2)	LANDOWNER/ CONTACT PERSON	CORRESPONDENCE	COMMENTS
		Appendix 14) with BID forwarded.	
Del Judor X4 Neighbourhood Watch	S. White	E-mail (dated: 4 September 2020; Appendix 14) with BID forwarded.	None
Vacant Land Portions 415, 416, 120 and 121 of Zeekoewater 311 JS	eMalahleni Local Municipality (E. Nkabinde; O. Riba)	E-mails (dated: 4 September 2020 & 9 September 2020; Appendix 13) with BID forwarded.	None
Foton		No longer in business.	
Highveld Mall	C. Bendall	E-mail (dated: 4 September 2020; Appendix 14) with BID forwarded.	None
Highveld View Estate (CSI Rentals)	J. Laas	E-mail (dated: 4 September 2020; Appendix 14) with BID forwarded.	None
Indlela Lodge	W. Cillie	E-mail (dated: 4 September 2020; Appendix 14) with BID forwarded.	None
Jerobi Trailers	B. Ellis	E-mail (dated: 4 September 2020; Appendix 14) with BID forwarded.	None
Jonsson Workwear	J. Loots	E-mail (dated: 4 September 2020; Appendix 14) with BID forwarded.	None
Portuguese Club	M. da Cunha	E-mail (dated: 4 September 2020; Appendix 14) with BID forwarded.	None
Resilient REIT Ltd. (Highveld Mall)	S. van der Walt	E-mail (dated: 4 September 2020; Appendix 14) with BID forwarded.	None
Witbank Baptist Church	K. Buchan-Smith	E-mail (dated: 4 September 2020; Appendix 14) with BID forwarded.	None
Witbank Nissan	M. da Cunha	E-mail (dated: 4 September 2020; Appendix 14) with BID forwarded.	None
Steven Bloy	Resident of Del Judor x4	E-mail (dated: 4 September 2020; Appendix 11) with BID forwarded.	Yes. See Section 6.4.1 and Table 6.4.
D. Wessels	Leads to Business	E-mail (dated: 4 September 2020; Appendix 14) with BID forwarded.	None

Figure 6.2: Aerial view indicating adjacent landowners/users

6.4.1 Mr. S. Bloy (resident of Del Judor x 4)

Mr. Steven Bloy (resident of Del Judor x4) indicated (email dated: 3 September 2020; Appendix 11) that *'I have been living in Del Judor Extension 4 since 2009 and I have seen bullfrogs on 2 occasions, once in December 2017 and again in December 2019, very close to the proposed site and would like to bring this to your attention. Photos are attached, with dates and times as the file names'.* The completed comment sheet provided by Mr. Bloy is included in Appendix 11. Further details are provided in Table 6.4.

Response from AdiEnvironmental
See Table 6.4.

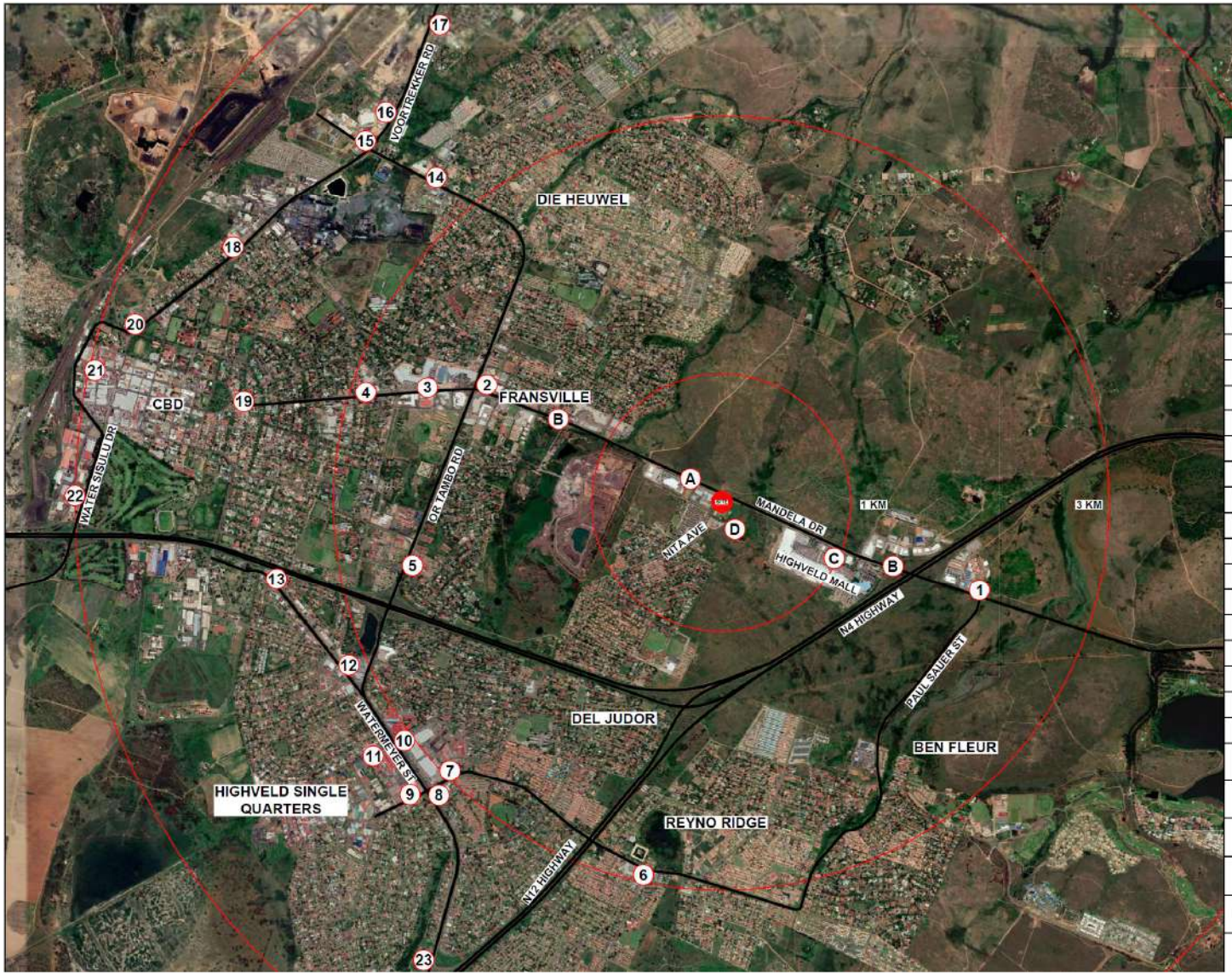
6.5 Filling stations identified and informed

Table 6.3 provides an indication of filling stations identified within a 5km radius (Figure 6.3) who were consulted as part of the public participation process.

Comments received from the filling station owners in response to the advertising and distribution of the Background Information Document are indicated in Table 6.3.

Table 6.3: Identified filling stations who received BIDs

PROPERTY	LANDOWNER/ CONTACT PERSON	CORRESPONDENCE	COMMENTS
Total Route N4	L. Greyling	E-mail (dated: 4 September 2020; Appendix 14) with BID forwarded.	Yes. Objection. See Section 6.5.1 & 6.5.3 and Table 6.4.
Total President	F. Visagie	E-mail (dated: 14 September 2020; Appendix 14) with BID forwarded.	Yes. Objection. See Section 6.5.2 & 6.5.3 and Table 6.4.
Sasol Gordon	L. Mashego	E-mail (dated: 14 September 2020; Appendix 14) with BID forwarded.	None
Sasol Swartbos	Mr. Dickson	E-mail (dated: 14 September 2020; Appendix 14) with BID forwarded.	None
Caltex Park Motors	B. Greyvenstein	E-mail (dated: 14 September 2020; Appendix 14) with BID forwarded.	None
Engen Del Judor	D. Marx	E-mail (dated: 4 September 2020; Appendix 14) with BID forwarded.	None
Shell Saveways	H. Froneman	E-mail (dated: 4 September 2020; Appendix 14) with BID forwarded.	None
Shell OR Tambo (Sunray Shell) Witbank Fuel Retailers Association	D. Swart	E-mail (dated: 4 September 2020; Appendix 14) with BID forwarded.	Yes. See Section 6.5.4 and Table 6.4
Caltex Nova	W. Zeelie	E-mail (dated: 4 September 2020; Appendix 14) with BID forwarded.	None



COMPETITOR SITES		
NO.	SITE	ROUTE DISTANCE
1	TOTAL ROUTE N4 BUSINESS PARK	2.15km
2	SHELL OR TAMBO	2.05km
3	SHELL SAVEWAYS	2.46km
4	TOTAL PRESIDENT	2.93km
5	ENGEN DEL JUDOR	3.06km
6	TOTAL PLAZA	6.40km
7	ENGEN KANA FILLING STATION	5.74km
8	SASOL WATERMEYER ST	5.53km
9	CALTEX MOTORS	5.60km
10	SASOL KLIPFONTEIN	5.10km
11	TOTAL STEVENSON ST	5.17km
12	CALTEX NOVA MOTORS	4.47km
13	ENGEN WATERMEYER ST	5.35km
14	SASOL GORDON RD	4.11km
15	SASOL VOORTREKKER RD	4.73km
16	SHELL MIDWIT DIESEL	5.07km
17	ENGEN JOUBERT ST	5.79km
18	SASOL LEYDS AVE	5.97km
19	CALTEX PARK MOTORS	3.84km
20	CALTEX ELIZABETH AVE	5.04km
21	SASOL CBD	5.59km
22	SASOL WATER SISULU	6.51km
23	ENGEN CG GYPSY	6.89km
A	LOCAL AND COMMUTER MARKET ALONG MANDELA DR	
B	COMMUTER MARKET BETWEEN RESIDENTIAL AREAS AND N4	
C	ADJECENT MARKET OF HIGHVELD MALL	
D	APPROVED SHOPPING CENTRE (LOCAL MARKET)	

Figure 6.3: Existing filling stations located within 5km radius of proposed filling station site (taken from EDL Consulting Engineers, 2020)

6.5.1 Total Route N4

An email (dated: 2 October 2020; Appendix 15) was received from Mr. E. van Wyk (Total Route N4 Filling Station) requesting to be registered as an I&AP. Registration as an I&AP was confirmed (see email dated: 2 October 2020; Appendix 15).

In addition, a completed comment sheet (Appendix 15) was provided indicating the following:

How do you think the proposed activity will impact on you?
The proposed filling station will have a serious impact on the financial sustainability of Total Route N4 filling station, approximately 2.07km along the same arterial road. The result of the development of the proposed filling station will be such that both filling stations (Route N4 and the proposed) will not be profitable and therefore become unviable.

Any suggestions to mitigate potential impacts?
No mitigation measures will overcome the financial impact on Total Route N4, and the development of the proposed filling station must be stopped.
Route N4 filling station was built in 2008 and the local economy has since then not increased at all; in fact, the closure of large employers e.g. Highveld Steel, Vanchem, Highveld Bottling, etc. since 2008 has caused the economy to shrink.

Response from AdiEnvironmental
See Table 6.4.

6.5.2 Total President

An email (dated: 2 October 2020; Appendix 15) was received from Mr. F. Visagie (Total President) objecting to the proposed filling station. Receipt of the said objection was acknowledged (see email dated: 2 October 2020; Appendix 15).

In addition, a completed comment sheet (dated: 1 October 2020; Appendix 15) was also provided indicating the following:

How do you think the proposed activity will impact on you?
Have a financial and social impact that will be negative to broader community as this will lead to job losses.

Any suggestions to mitigate potential impacts?
There is no need nor any economical justification for another filling station in Mandela. Already six filling station serves this street. There has been no development in this area – delay the establishment until there is a market.

Please disclose any direct business, financial, personal or other interest that you may have in the approval or refusal of the application.
Filling stations already marginalise due to the number of stations.

Response from AdiEnvironmental
See Table 6.4.

6.5.3 The Town Planning Hub cc on behalf of Total South Africa

An email and letter (dated: 2 October 2020; Appendix 15) were received from Ms. B. Oosthuizen (The Town Planning Hub cc) who registered as an I&AP on behalf of Total South Africa and indicated the following: *'The reasons for such registration will be discussed below, these comments are very high level and will be refined once given the opportunity to scrutinize the supplementary*

documentation needed for the BAR'. Registration as an I&AP was confirmed (see email dated: 2 October 2020; Appendix 15).

In addition, a completed comment sheet (dated: 1 October 2020; Appendix 15) was provided indicating the following:

> ***How do you think the proposed activity will impact on you?***
> *As mentioned, our office is representing Total South Africa – there are 2 (two) Total filling stations situated along the same road as the proposed filling station, ie: Mandela Road. See below aerial.*
> *The proposed filling station falls within the 3km radius threshold from existing filling stations within urban areas.*
> *Total President is approximately 2.92 km from the proposed site, while Total Route N4 is approximately 2km from the proposed site. The proposed filling station is going to negatively affect the existing filling stations. A feasibility study is required to firstly make sure that the proposed filling station will be feasible and secondly to determine the impact that the filling station will have on the existing filling stations.*
> *Please provide us with a copy of the proposed site plan, access arrangements and the traffic impact study of the development.*
> *Also please indicate what Oil Company is involved with the new filling station.*

Subsequent emails (25 January 2021; 18 March 2021; Appendix 15) were received requesting an update in terms of the status of the Basic Assessment process.

Response from AdiEnvironmental
See Table 6.4.

6.5.4 Shell OR Tambo (Sunray Shell) and Witbank Fuel Retailers Association

An email (dated: 7 September 2020; Appendix 15) was received from Mr. D.A. Swart (Shell OR Tambo/Sunray Shell) requesting that the following two parties *be registered as interested and affected parties i.r.o. the application:*

1) Blackvest CC T/A Sunray Shell – No 3 Nelson Mandela Avenue Witbank.
2) Witbank Fuel Retailers Association o.b.o. Witbank Fuel Retailers.

Both parties were registered as indicated in the email from AdiEnvironmental (dated: 7 September 2020; Appendix 15).

Response from AdiEnvironmental
See Table 6.4.

6.6 Correspondence from other I&APs

6.6.1 Ngubane Urban House (Pty) Ltd o.b.o. Masakhane Mining Supply and Construction cc

An email (dated: 30 September 2020; Appendix 15) was received from Mr. N. Ngubane (Ngubane Urban House (Pty) Ltd) on behalf of Masakhane Mining Supply and Construction CC objecting to the proposed filling station development. Receipt of the said objection was acknowledged (see email dated: 30 September 2020; Appendix 15).

The following was stated in the said letter:

> *Masakhane Mining Supply and Construction CC has entered into an agreement with Emalahleni Local Municipality for the development of a filling station on Portion 121 of the Farm Zeekoewater 311 JS. Due to the aforementioned site status; we object to the proposed development of a filling station to be located on Erf 20 President Park X6.*

Below is a motivation of our objection on behalf of our client Masakhane Mining Supply and Construction CC:
1. The development of two filling stations within a 500-meter radius will have an impact on the sight distance for passing traffic and traffic turning into both filling stations during peak hours on Nelson Mandela Drive. The traffic situation might result in ingress and egress obstructions at the filling stations. Thus having another filling station within such close proximity to our proposed filling station is objected to.
2. Filling stations can have severe environmental effects in an area thus having two filling stations within close proximity may increase pollution in the area.
3. Close proximity (see below image) of filling stations may have a negative socioeconomic impact in terms of financial security of our proposed filling station and job security of employees. According to the South African Fuel Dealers Association indicate that South African filling stations are operating below the break-even point and this can result in closure of our filling station.
4. Filling station studies indicate that the development of a filling station will not increase traffic volume in an area. Thus we object to the proposed filling station on Erf 20 of President Park X6 for the fact that there is no guarantee that no loss of income can be experienced by us and no guarantee that efficient retailing can be achieved by having another filling station along the same side of the Main road.
5. Having the two filling stations in close proximity may cause an ambient noise level to rise in the area.
6. Noise, visual, geological, wetland etc. reports are not available on the appointed environmental sub-consultant website. Thus we cannot fully assess the impact of the proposed development in order to make a meaningful assessment of the proposed development.
7. It is imperative that the competent authority that will be assessing the application ensure compliance with ruling legislation and in this instance sustainable and harmonious development cannot be achieved with competing filling stations next to each other.
8. The existing land use right of Masakhane Mining Supply and Construction CC (filling station appropriate zoning) has not been taken into account in compiling the EIA report as there is no reference to such approved land use rights in close proximity.

Response from AdiEnvironmental
See Table 6.4.

6.6.2 Mr. T. Mnisi (TKS TKzs)

Mr. Mnisi contacted AdiEnvironmental telephonically on 20 October 2020 and subsequently forwarded an email (dated: 20 October 2020; Appendix 15) indicating the following:

'As per our telephone conversation, kindly receive a request for an update on issues related to the new filling Station project. My interest relates to future business opportunities.'

An email (dated: 20 October 2020; Appendix 15) was forwarded acknowledging receipt of the said email and indicating that he had been registered as an I&AP.

6.7 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 30 June 2021 (see cover letter dated: 30 June 2021; Appendix 1). A date for a site visit was also requested.

6.8 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 (DAFF)	F. Mashabela
Department of Agriculture, Rural Development, Land and Environmental Affairs (DARDLEA) - Directorate: Land Use and Soil Management – Ermelo	J. Venter
Department of Co-operative Governance and Traditional Affairs (COGTA)	M. Loock
Department of Energy	M. Machete; S. Ntuli
Department of Mineral Resources	S. Mathavela
Department of Rural Development and Land Reform (Commission on Restitution of Land Rights)	T. Mkhonto
Department of Water and Sanitation (DWS)	T. Ndlhovu; N.S. Maliaga
Other Organisations/Stakeholders	
Eskom Distribution (Land & Rights)	T. Ludere
Eskom Transmission	L. Motsisi
Mpumalanga Tourism and Parks Agency (MTPA) – Land Advisory Unit	P. Nkosi
South African Civil Aviation Authority	K. Mthapo
South African Heritage Resources Agency (SAHRA)	N. Khumalo (SAHRIS)
South African National Roads Agency (SANRAL)	V. Bota, I. van der Linde, L. Dlanjwa
Trans African Concessions (TRAC)	C. Davis, R. Nkosi
South African Petroleum Industry Association (SAPIA)	N. Machumele
Fuel Retailers Association (FRA)	L. Nyakutsikwa
Fuel Retailers Association (FRA) – Regional Chairperson: Mpumalanga	D. Marx
Witbank Fuel Retailers Association	D. Swart
Local Municipality and Municipal Councillor	
Nkangala District Municipality	S. Links, A. Thwala
eMalahleni Local Municipality	E. Nkabinde, O. Riba
eMalahleni Local Municipality	Councillor L. Steyn (Ward 34)
Surrounding Landowners	
Property (Figure 6.2)	**Landowner/Contact person**
Builders Warehouse	H. Sepuba
Casa Portuguesa Restaurant	P. Manarte

INTERESTED AND AFFECTED PARTY LIST	
CTM	A. Ndala
Del Judor X4 neighbourhood watch	S. White
Vacant Land Portions 415, 416, 120 and 121 of Zeekoewater 311 JS	eMalahleni Local Municipality (E. Nkabinde, O. Riba)
Highveld Mall	C. Bendall
Highveld View Estate (CSI Rentals)	J. Laas
Indlela Lodge	W. Cillie
Jerobi Trailers	B. Ellis
Jonsson Workwear	J. Loots
Portuguese Club	M. da Cunha
Resilient REIT Ltd. (Highveld Mall)	S. van der Walt
Witbank Baptist Church	K. Buchan-Smith
Witbank Nissan	M. da Cunha
Other I&APs	
Leads to Business	D. Wessels
Resident of Del Judor x4	S. Bloy
Lavender Lane Guesthouse	E. Michau
TKS TKzs	T. Mnisi
Total Route N4	L. Greyling, E. van Wyk, M. van Wyk
Total President	F. Visagie
Sasol Gordon	L. Mashego
Sasol Swartbos (Voortrekker)	Mr. Dickson
Caltex Park Motors	B. Greyvenstein
Engen Del Judor	D. Marx
Shell Saveways	H. Froneman
Shell OR Tambo/Blackvest CC T/A Sunray Shell	D. Swart
Caltex Nova	W. Zeelie
Ngubane Urban House (Pty) Ltd. o.b.o. Masakhane Mining Supply and Construction cc	N. Ngubane
The Town Planning Hub o.b.o. Total South Africa	B. Oosthuizen/B. Fletcher
Ndlelenhle Mining and Consulting	Mr. Mpahoso

6.9 Summary of issues and response

Appendix 1 (3)(h)(iii) of the EIA Regulations, 2014 (as amended) requires that a summary of the issues raised by Interested and Affected Parties be provided in the Basic Assessment Report as well as an indication of the manner in which the issues were addressed.

Table 6.4 provides such a summary as well as the response from the EAP.

Objections in terms of the proposed filling station were obtained from the following existing filling stations located in eMalahleni:

- Total Route N4 (E. van Wyk; development of filling station to be stopped indicated in the comment sheet; Table 6.4);
- Total President (F. Visagie; Table 6.4).

In addition, an objection was received from Ngubane Urban House (Pty) Ltd. on behalf of Masakhane Mining Supply and Construction cc with regards to the impact on a proposed filling station. As indicated in Table 6.4, the environmental consultant (Ndlelehle Mining and Consulting) indicated in February 2021 that *'the applicant intended to withdraw the application due to unforeseen circumstances and we were not in the position to communicate on their behalf. Nonetheless, the application lapsed due to non-compliance on the time frames'.* To date, no further correspondence with regards to this application has been received and it is therefore taken that the said development is not proceeding.

Table 6.4: Summary of issues of concern and response

Issue	I&AP, Stakeholders, Authority (Section of Report)	Response
HERITAGE IMPACT ASSESSMENT (HIA) AND PALAEONTOLOGICAL IMPACT ASSESSMENT (PIA) SUBMITTED		
In terms of the National Heritage Resources Act, no 25 of 1999 (NHRA), heritage resources, including archaeological or palaeontological sites over 100 years old, graves older than 60 years, structures older than 60 years are generally protected. They may not be disturbed without a permit from the relevant heritage resources authority. In contexts of development applications, the developer must ensure that no heritage resources will be impacted by the proposed development, by lodging an application to SAHRA and submitting detailed development specifications as a notification of intent to develop. If the application is made in terms of s. 38 (8) of the NHRA then it is incumbent on the developer to ensure that a Heritage Impact Assessment (HIA) is undertaken, as s. 38(2)a does not apply. Such a study should follow the SAHRA 2007 impact assessment guidelines and section 38(3). *Due to the extent of the development and its location near a developed area, a detailed motivation in a letter that recommends exemption can be drafted by a suitably qualified archaeologist. The letter must contain an exemption.* *Any earth moving activities pose a threat to palaeontological and heritage resources, particularly in relatively undisturbed areas, coal mine area, Koppies, Mountains and River valleys are sensitive to these types of heritage resources. The proposed development area is located in an area of insignificant and low significant palaeontological sensitivity area. As per the requirements listed on the SAHRIS palaeo-sensitivity map, a Fossil Finds Procedure must be written up by a suitably qualified palaeontologist. The Procedure must contain a geological map and detailed procedure that outlines the roles and responsibilities of the ECO, construction crew, maintenance staff and an independent palaeontologist in the event that fossils are uncovered. SAHRA APM unit will process the case further once the above requested reports are submitted to the case.*	SAHRA – see Section 6.3.1	Noted. A Heritage Impact Assessment and a Palaeontological Impact Assessment were commissioned with regards to the development of a retail centre on Erven 20, 21 and 22. The results of these studies are included in Section 5.14 of this BAR. A copy of the reports are provided in Appendix 4 and Appendix 5. The Draft BAR will be uploaded on the SAHRIS website.
FINANCIAL IMPACT ON OTHER FILLING STATIONS		
How do you think the proposed activity will impact on you? *The proposed filling station will have a serious impact on the financial sustainability of Total Route N4 filling station, approximately 2.07km along the same arterial road. The result of the development of the proposed filling station will be such that both filling stations (Route N4 and the proposed) will not be profitable and therefore become unviable.* ***Any suggestions to mitigate potential impacts?*** *No mitigation measures will overcome the financial impact on Total Route N4, and the development of the proposed filling station must be stopped.* *Route N4 filling station was built in 2008 and the local economy has since then not increased at all; in fact, the closure of large employers e.g. Highveld Steel, Vanchem, Highveld Bottling, etc. since 2008 has caused the economy to shrink.*	Total Route N4 – see Section 6.5.1	A feasibility study was conducted for the proposed development. The results of the feasibility study are indicated in Section 7.2. A copy of the feasibility study is provided in Appendix 6. The proposed filling station mainly caters for westbound traffic along Mandela Drive. The Total Route N4 filling station is located on the opposite side of President/Mandela Drive and does not have direct access for westbound traffic on Mandela Drive. This filling station serves a different traffic stream. The Total President filling station is also located on the other side of Mandela Drive and is located at Nicol Street (3km away) – therefore serves different traffic streams, as well as have different Catchment Markets (Witbank CBD, Saveways Shopping Centre area and up to OR Tambo Drive. The proposed filling station is expected to take between 5% and 10% from seven (7) competitor sites (Table 7.2b), with 16 sites expected to be impacted less than 5%. From Table 7.2b, it can be concluded that the initial impact on the competitors will be low, mainly due to the competitor sites serving different markets and located on the opposite side of the road thus serving different traffic streams (Van Rooyen, 2020a). The existing TOTAL N4 Business Park (Figure 7.2) is also located on the opposite side of Mandela Drive and will be the most affected (10% impact; Table 7.2b). According to Van Rooyen (2020a), this filling station will be able to recover most of the lost sales within 3 to 4 years after the proposed filling station is constructed, due to the positive traffic growth in eMalahleni. The proposed site will thus have an initial negative impact (between 5% and 10%) on a number of existing filling stations (Table 7.2a). The impact should not irreparably jeopardize these businesses in view of the different markets and traffic streams catered for as well as the distances away from the proposed filling station. Van Rooyen (2020a) indicated that with the positive traffic growth in the area, these sites will be able to recover within 3 – 4 years of the new filling station being implemented.
Objection *in terms of the proposed filling station.* ***How do you think the proposed activity will impact on you?*** *Have a financial and social impact that will be negative to broader community as this will lead to job losses.* ***Any suggestions to mitigate potential impacts?*** *There is no need nor any economical justification for another filling station in Mandela. Already six filling station serves this street. There has been no development in this area – delay the establishment until there is a market.* ***Please disclose any direct business, financial, personal or other interest that you may have in the approval or refusal of the application.*** *Filling stations already marginalise due to the number of stations.*	Total President (F. Visagie) – see Section 6.5.2	
How do you think the proposed activity will impact on you? *As mentioned, our office is representing Total South Africa – there are 2 (two) Total filling stations situated along the same road as the proposed filling station, i.e.: Mandela Road. See below aerial.* *The proposed filling station falls within the 3km radius threshold from existing filling stations within urban areas.* *Total President is approximately 2.92 km from the proposed site, while Total Route N4 is approximately 2km from the proposed site. The proposed filling station is going to negatively affect the existing filling stations. A feasibility study is required to firstly make sure that the proposed filling station will be feasible and secondly to determine the impact that the filling station will have on the existing filling stations.*	The Town Planning Hub cc o.b.o. Total South Africa (B. Oosthuizen/Ms. B. Fletcher) – see Section 6.5.3	

Table 6.4: Summary of issues of concern and response		
Issue	**I&AP, Stakeholders, Authority (Section of Report)**	**Response**
TOTAL SOUTH AFRICA		
'The reasons for such registration will be discussed below, these comments are very high level and will be refined once give the opportunity to scrutinize the supplementary documentation needed for the BAR'.	The Town Planning Hub cc o.b.o. Total South Africa (B. Oosthuizen/Ms. B. Fletcher) – see Section 6.5.3	Noted.
Please provide us with a copy of the proposed site plan, access arrangements and the traffic impact study of the development.	The Town Planning Hub cc o.b.o. Total South Africa (B. Oosthuizen/Ms. B. Fletcher) – see Section 6.5.3	Section 3 provides a description and layout of the proposed filling station. Site plan – Figure 3.3 Access arrangements – Figure 3.3 Traffic impact study – see Section 5.16 and Appendix 6.
Also please indicate what Oil Company is involved with the new filling station.	The Town Planning Hub cc o.b.o. Total South Africa (B. Oosthuizen/Ms. B. Fletcher) – see Section 6.5.3	The Oil Company is not known at this stage since negotiations must still take place. Van Rooyen (2020a) indicated that it can be concluded that the proposed site will be feasible for the development of a filling station for all the larger fuel companies (such as SASOL, TOTAL, ENGEN, BP, SHELL, etc.). It could possibly be Engen or Sasol.
PROPOSED FILLING STATION - MASAKHANE MINING SUPPLY AND CONSTRUCTION CC		
Objection in terms of the proposed filing station. *Masakhane Mining Supply and Construction CC has entered into an agreement with Emalahleni Local Municipality for the development of a filling station on Portion 121 of the Farm Zeekoewater 311 JS. Due to the aforementioned site status; we object to the proposed development of a filling station to be located on Erf 20 President Park X6.* *Below is a motivation of our objection on behalf of our client Masakhane Mining Supply and Construction CC:*	Ngubane Urban House (Pty) Ltd. o.b.o. Masakhane Mining Supply and Construction cc (Mr. N. Ngubane) – see Section 6.6.1.	Email from AdiEnvironmental cc (dated: 30 September & 7 October 2020; Appendix 15): *"We hereby acknowledge receipt of your email and attachment".* *"Your objection letter (dated: 29 September 2020; attached for your information) with regards to the proposed filling station located on Erf 20 President Park x6 has reference. Please note that we are still busy with the Basic Assessment process. The specialist studies and the Basic Assessment Report have thus not been loaded onto our website as mentioned in your letter under Point 6.* *In order to address your concerns, we require the following information:* *1. A map indicating the exact location of the proposed filling station site;* *2. The property description of the proposed filling station site (e.g. Erf??);* *3. The current zoning of the proposed filling station site (e.g. Business??);* *4. Has an Environmental Authorisation been obtained for the proposed filling station? If so, please could you forward a copy thereof;* *5. Has a traffic impact assessment and feasibility study been conducted?* *Feedback regarding the above-mentioned would be appreciated".* A follow-up email (dated: 20 October 2020; Appendix 15) was forwarded requesting the said information. To date, no feedback as requested was received. AdiEnvironmental registered Meronox (Pty) Ltd as an Interested and Affected Party in terms of the Basic Assessment process for the said filling station (see email dated: 4 November 2020; Appendix 15). Various other emails were forwarded requesting information regarding the said application. The environmental consultant eventually indicated on 10 February 2021 (Appendix 15) the following: *'The applicant intended to withdraw the application due to unforeseen circumstances and we were not in the position to communicate on their behalf. Nonetheless, the application lapsed due to non-compliance on the time frames'.* To date, no further correspondence with regards to this application has been received and it is therefore taken that the said development is not proceeding. According to Korsman & Associates (Town and Regional Planners), the eMalahleni Local Municipality indicated that no town planning application had been submitted with regards to Portion 121 of the farm Zeekoewater 311 JS. Further, Portion 121 of the farm Zeekoewater 311 JS is zoned 'Agricultural' and a rezoning application will need to be submitted in order to develop a filling station on the said site. Portion 121 of the farm Zeekoewater 311 JS belongs to the eMalahleni Local Municipality.
1. The development of two filling stations within a 500-meter radius will have an impact on the sight distance for passing traffic and traffic turning into both filling stations during peak hours on Nelson Mandela Drive. The traffic situation might result in ingress and egress obstructions at the filling stations. Thus having another filling station within such close proximity to our proposed filling station is objected to.	Ngubane Urban House (Pty) Ltd. o.b.o. Masakhane Mining Supply and Construction cc (Mr. N. Ngubane) – see Section 6.6.1.	N/A. Proposed Masakhane Mining Supply and Construction filling station no longer going ahead as indicated above – see email from environmental consultant (dated: 10 February 2021; Appendix 15) and Section 6.9.
2. Filling stations can have severe environmental effects in an area thus having two filling stations within close proximity may increase pollution in the area.	Ngubane Urban House (Pty) Ltd. o.b.o. Masakhane Mining Supply and Construction cc (Mr. N.	N/A. Proposed Masakhane Mining Supply and Construction filling station no longer going ahead as indicated above – see email from environmental consultant (dated: 10 February 2021; Appendix 15) and Section 6.9.

Table 6.4: Summary of issues of concern and response		
Issue	**I&AP, Stakeholders, Authority (Section of Report)**	**Response**
	Ngubane) – see Section 6.6.1.	
3. Close proximity (see below image) of filling stations may have a negative socioeconomic impact in terms of financial security of our proposed filling station and job security of employees. According to the South African Fuel Dealers Association indicate that South African filling stations are operating below the break-even point and this can result in closure of our filling station.	Ngubane Urban House (Pty) Ltd. o.b.o. Masakhane Mining Supply and Construction cc (Mr. N. Ngubane) – see Section 6.6.1.	N/A. Proposed Masakhane Mining Supply and Construction filling station no longer going ahead as indicated above – see email from environmental consultant (dated: 10 February 2021; Appendix 15) and Section 6.9.
4. Filling station studies indicate that the development of a filling station will not increase traffic volume in an area. Thus we object to the proposed filling station on Erf 20 of President Park X6 for the fact that there is no guarantee that no loss of income can be experienced by us and no guarantee that efficient retailing can be achieved by having another filling station along the same side of the Main road.	Ngubane Urban House (Pty) Ltd. o.b.o. Masakhane Mining Supply and Construction cc (Mr. N. Ngubane) – see Section 6.6.1.	N/A. Proposed Masakhane Mining Supply and Construction filling station no longer going ahead as indicated above – see email from environmental consultant (dated: 10 February 2021; Appendix 15) and Section 6.9.
5. Having the two filling stations in close proximity may cause an ambient noise level to rise in the area.	Ngubane Urban House (Pty) Ltd. o.b.o. Masakhane Mining Supply and Construction cc (Mr. N. Ngubane) – see Section 6.6.1.	N/A. Proposed Masakhane Mining Supply and Construction filling station no longer going ahead as indicated above – see email from environmental consultant (dated: 10 February 2021; Appendix 15) and Section 6.9.
6. Noise, visual, geological, wetland etc. reports are not available on the appointed environmental sub-consultant website. Thus we cannot fully assess the impact of the proposed development in order to make a meaningful assessment of the proposed development.	Ngubane Urban House (Pty) Ltd. o.b.o. Masakhane Mining Supply and Construction cc (Mr. N. Ngubane) – see Section 6.6.1.	The following was indicated in the email from AdiEnvironmental (dated: 7 October 2020; Appendix 15): *'Please note we are still busy with the Basic Assessment process. The specialist studies and Basic Assessment Report have thus not been loaded onto our website as mentioned in your letter under Point 6.'*
7. It is imperative that the competent authority that will be assessing the application ensure compliance with ruling legislation and in this instance sustainable and harmonious development cannot be achieved with competing filling stations next to each other.	Ngubane Urban House (Pty) Ltd. o.b.o. Masakhane Mining Supply and Construction cc (Mr. N. Ngubane) – see Section 6.6.1.	N/A. Proposed Masakhane Mining Supply and Construction filling station no longer going ahead as indicated above – see email from environmental consultant (dated: 10 February 2021; Appendix 15) and Section 6.9.
8. The existing land use right of Masakhane Mining Supply and Construction CC (filling station appropriate zoning) has not been taken into account in compiling the EIA report as there is no reference to such approved land use rights in close proximity.	Ngubane Urban House (Pty) Ltd. o.b.o. Masakhane Mining Supply and Construction cc (Mr. N. Ngubane) – see Section 6.6.1.	Portion 121 of the farm Zeekoewater 311 JS is zoned 'Agricultural' and a rezoning application will need to be submitted in order to develop a filling station on the said site. Portion 121 of the farm Zeekoewater 311 JS belongs to the eMalahleni Local Municipality.
PRESENCE OF BULLFROGS		
I have been living in Del Judor Extension 4 since 2009 and I have seen bullfrogs on 2 occasions, once in December 2007 and again in December 2019, very close to the proposed site and would like to bring this to your attention. Photos are attached, with dates and times as the file names.	Steven Bloy (resident of Del Judor x4) – see Section 6.4.1.	A bullfrog specialist study was commissioned in order to address the concerns from Mr. Bloy. The results of the study are included in Section 5.8 of this BAR. Mitigation measures are provided in Section 9. A copy of the reports are provided in Appendix 3.
How do you think the proposed activity will impact on you? *No personal impact, but the proposed site is in the immediate vicinity of an established giant bullfrog population. I have taken photos of breeding frogs in December 2017 and again in December 2019.* ***Any suggestions to mitigate potential impacts?*** *Relocation of the adult bullfrogs, or setting aside a protected area adjacent to the proposed development.* *I have no interests in the development and support the sustainable development of the city of Witbank. I would however like to see this happen in a responsible and environmentally friendly fashion.*	Steven Bloy (resident of Del Judor x4) – see Section 6.4.1	
REGISTRATION AS INTERESTED AND AFFECTED PARTY (I&AP)		
Baie dankie dat ek gister met jou kon gesels. Ek bedryf die gastehuis nou 15 jaar. Soos die fotos lyk so is dit ook binne. Aangeheg sommer 'n foto en brosjure.	Esther (Lavender Lane Guesthouse) – see Section 6.1.4.	Registered as an I&AP – email (dated: 9 September 2020; Appendix 11) with BID forwarded.
My name is Ordain Riba, I am an Environmental officer with ELM responsible for reviewing and providing comments on all EIA applications within the jurisdiction of Emalahleni Local municipality (ELM), I saw your advert in the EMalahleni news and want to register as an I&AP to be consulted during the PP	O. Riba (Emalahleni Local Municipality) – see Section 6.1.4	Email from AdiEnvironmental cc (dated: 9 September 2020; Appendix 11): "Thank you for your email. I hereby confirm that you have been registered as an I&AP. Please note that a notification was forwarded to Mr. Erald Nkabinde of the ELM with regards to the proposed

Table 6.4: Summary of issues of concern and response		
Issue	**I&AP, Stakeholders, Authority (Section of Report)**	**Response**
process. Please also save my contact details for future use in case I am not so lucky to see some of your projects.		President Park filling station. I shall include you in our distribution list for future projects in this area as requested". Documentation also sent as indicated in Table 6.1 and Table 6.2.
Thank you for taking my call this morning. I received a copy of the BID for the proposed development of a filling station at the corner of Nita Avenue and Mandela Drive today and would like to be registered as an I&AP. I will submit the completed form on another email.	S. Bloy (resident of Del Judor x4) – see Section 6.1.4 and 6.4.1.	Email from AdiEnvironmental cc (dated: 3 September 2020; Appendix 11): "Thank you very much for the completed comment sheet and the information on bullfrogs. Your comments have been noted. Feedback will be provided in the Draft Basic Assessment Report, which will be made available (at a later stage) for a 30 day comment period. Please note that you have been registered as an I&AP as requested".
'… requesting that the following two parties be registered as interested and affected parties i.r.o. the application: *1) Blackvest CC T/A Sunray Shell – No 3 Nelson Mandela Avenue Witbank.* *2) Witbank Fuel Retailers Association o.b.o. Witbank Fuel Retailers.*	Shell OR Tambo/Sunray Shell (D.A. Swart) – see Section 6.5.4	Email from AdiEnvironmental cc (dated: 7 September 2020; Appendix 15): *"I would hereby like to confirm that the following two parties have been registered as Interested and Affected Parties:* *(1) Blackvest CC T/A Sunray Shell – No 3 Nelson Mandela Avenue Witbank* *(2) Witbank Fuel Retailers Association o.b.o. Witbank Fuel Retailers.* *Please confirm that you are also the contact person for the Witbank Fuel Retailers Association? If not, please provide me with the relevant contact information".* Also see Table 6.3.
'As per our telephone conversation, kindly receive a request for an update on issues related to the new filling Station project. My interest relates to future business opportunities.'	Mr. T. Mnisi (TKS TKzs)	An email (dated: 20 October 2020; Appendix 15) was forwarded acknowledging receipt of the said email and indicating that he had been registered as an I&AP. See also Table 6.3.

6.10 Evaluation of Draft Basic Assessment Report

As indicated in Section 11, the Draft Basic Assessment Report (BAR) will be made available to I&APs, stakeholders and government departments for a 30-day review period.

Hard/soft copies of the document will be submitted to relevant authorities. A hard copy and electronic copy of the Draft BAR will be made available to the Interested and Affected Parties and stakeholders consulted and/or registered as part of the process (refer to Table 6.3). An advertisement in this regard will be placed in the Witbank News in order to inform the larger community.

The various departments, stakeholders and I&APs will be requested to forward any comments on the report to the consultant within the 30-day period provided. These comments will be included and addressed in:

- Section 11 (Evaluation of Draft Basic Assessment Report);
- Table 11.1 (Summary of Issues of Concern and Response); and
- Appendix 16;

of the Final Basic Assessment Report.

The Final BAR (incorporating comments from I&APs) will be submitted to the Department of Agriculture, Rural Development, Land and Environmental Affairs for final decision making.

An e-mail will be forwarded to the various departments, stakeholders and Interested and Affected Parties informing them of the comments received and the submission of the Final BAR for decision making.

SECTION 7: DESCRIPTION OF ALTERNATIVES

According to Appendix 1 of the EIA Regulations, 2014 (as amended), one of the objectives of the basic assessment process is to identify the alternatives considered for the proposed development and to rank these alternatives in terms of the potential impacts identified in order to identify the preferred alternatives.

The EIA Regulations, 2014 (as amended) defines alternatives as:
"different means of meeting the general purpose and requirements of the activity, which may include alternatives to the -

a. *property on which or location where the activity is proposed to be undertaken;*
b. *type of activity to be undertaken;*
c. *design or layout of the activity;*
d. *technology to be used in the activity; or*
e. *operational aspects of the activity;*

and includes the option of not implementing the activity."

In addition to the above-mentioned, Section 24O(1)(b)(iv) of NEMA requires that the competent authority must take into account *"where appropriate, any feasible and reasonable alternatives to the activity which is the subject of the application and any feasible and reasonable modifications or changes to the activity that may minimise harm to the environment."*

This section therefore provides a detailed description of the various alternatives investigated and process followed to decide on the preferred alternatives to be implemented.

The following alternatives were investigated:

- 7.1: Alternative sites;
- 7.2: Alternative land uses;
- 7.3: Alternative layout plans;
- 7.4: Alternative service provision (water, electricity, sewage, waste management and storm water management);
- 7.5: No-Project option.

7.1 Alternative sites

7.1.1 Proposed site

The applicant decided upon the development of the proposed filling station on a portion of Erf 20 for the following reasons:

- The site (Erf 20) belongs to the applicant and is undeveloped.
- The site is situated within the urban edge of the eMalahleni Local Municipality.
- The site forms part of an established township development (President Park x6) and is already zoned for business purposes (Business 2). A Consent-Use Application for a filling station was approved (6 April 2021) by the eMalahleni Local Municipality (Appendix 10).
- The site is located adjacent to Mandela Drive, which was identified in the Spatial Development Framework (2015) as one of the activity spines where the Municipality would allow non-residential land uses in

order to optimally utilize the visual exposure from the high traffic volumes along this road. The development of a filling station therefore fits into the development plans of the eMalahleni Local Municipality (i.e. in terms of the Spatial Development Framework, 2015).
- The site is situated in an area with a mixed land use character and adjacent to a proposed retail centre (i.e. on balance of Erf 20, Erf 21 and Erf 22) and will therefore fit in with the surrounding land uses and will not impact on the sense of place.
- Being located within an established urban area, services (water, sewage, electricity) can easily be provided by connecting to the existing networks of the eMalahleni Local Municipality.
- The site is easily accessible from both Mandela Drive and Nita Avenue.
- The site is highly visible to passing traffic utilizing Mandela Drive and Nita Avenue, which lends itself perfectly in terms of visibility of a filling station.
- Mandela Drive is the main link between the central business district (CBD) of eMalahleni, the Witbank Dam and the residential areas located south of the N4 (e.g. Reyno Ridge, Ben Fleur and Bankenveld). The site is thus ideal for a filling station since it is easily accessible.
- The filling station will provide a convenient service to the residents of the nearby residential area (Del Judor x4), visitors to the proposed retail centre and the nearby Highveld Mall as well as the existing businesses in the area (e.g. Nissan, etc.).
- Being located adjacent to the proposed retail centre will significantly increase the traffic and the demand for fuel at the site.

7.1.2 Alternative site(s)

Erf 20, Erf 21 and Erf 22 belong to the applicant who plans to develop a retail centre on the said site. A portion of Erf 20 was excluded from the retail centre development and earmarked for future expansion of the retail centre (i.e. in line with the 'Business 2' zoning) or possibly a filling station (subject to the approval of a Consent-Use application and the Environmental Authorisation). The applicant also deemed the proposed site to be the most feasible for a filling station (i.e. compared to Erf 21 and Erf 22) in view of its location on the corner of Mandela Drive and Nita Avenue. No alternative sites were thus investigated.

7.1.3 No-Project Option

More information with regards to the implication of the 'No project option' is provided in Section 7.5.

7.2 Alternative land uses

Four (4) alternative land uses with regards to the development of Erf 20, Erf 21 and Erf 22 were originally investigated, namely:

- Alternative land use 1 (Agriculture)
- Alternative land use 2 (Residential)
- Alternative land use 3 (Business)
- Alternative land use 4 (Light Industrial)

Table 7.1 provides the advantages and disadvantages of the above-mentioned alternatives.

Table 7.1: Matrix for determining the preferred alternative in terms of land use for Erf 20, Erf 21 and Erf 22

Alternative	Advantages	Disadvantages	Ranking	Option selected
Alternative land use				
Alternative 1 – Agriculture		x The site has not been used for agricultural activities for many years. x The site is located within an established urban area where the surrounding land uses are no longer rural/agricultural. x The majority of the site comprises of an old borrow pit that was backfilled with building rubble and sand. x Venter (2020b) indicated that most of the site (i.e. the levelled area) falls within the Technosol group and more particularly the Johannesburg soil form (i.e. soil profiles covered by concrete structures, cement and waste materials including building gravel). This soil form is not suitable for agricultural purposes. In addition, the size and location make the site unsuitable for agricultural purposes (e.g. cultivation, grazing, etc.). x If agriculture was to be pursued, the property would have to be rezoned from Business 2 to Agriculture.	0 Fatal flaw	No
Alternative 2 – Residential	√ The site is located within an established urban area, which includes residential land uses. The development of houses on site could thus be compatible to that of the surrounding environment. √ Being located within an established urban area, services (water, sewage, electricity) can easily be provided by connecting to the existing networks of the eMalahleni Local Municipality.	x The applicant identified the need for a commercial/business development on site and not the need for more housing. x The site is located adjacent to Mandela Drive, which was identified in the Spatial Development Framework (2015) as one of the activity spines where the Municipality would allow non-residential land uses in order to optimally utilize the visual exposure from the high traffic volumes along this road. x The property would have to be rezoned from Business 2 to Residential. x An old backfilled borrow pit is present, which impacted on the geotechnical properties of the site. Mitigation measures as recommended by Hansmeyer (2010) would have to be implemented which could impact on the development costs.	2nd Option	No
Alternative 3 – Business	*√ The site is already zoned for business purposes*	*x An old backfilled borrow pit is present, which impacted*	*1*	***Yes***

Alternative	Advantages	Disadvantages	Ranking	Option selected
(retail centre)	*(Business 2).* √ *The site is situated in an area with a mixed land use character and the proposed retail centre will therefore fit in with the surrounding land uses and would not impact on the sense of place.* √ *The site is located adjacent to Mandela Drive, which was identified in the Spatial Development Framework (2015) as one of the activity spines where the Municipality would allow non-residential land uses in order to optimally utilize the visual exposure from the high traffic volumes along this road. The proposed business area adjacent to Mandela Avenue therefore fits into the development plans of the eMalahleni Local Municipality.* √ *Being located within an established urban area, services (water, sewage, electricity) can easily be provided by connecting to the existing networks of the eMalahleni Local Municipality (see Section 7.4 For further details).*	*on the geotechnical properties of the site. Mitigation measures as recommended by Hansmeyer (2010) would have to be implemented which could impact on the development costs.*	*Preferred*	
Alternative 4 – Light Industrial	√ Being located within an established urban area, services (water, sewage, electricity) can easily be provided by connecting to the existing networks of the eMalahleni Local Municipality (see Section 7.4 for further details).	x The site would have to be rezoned from 'Business' to 'Industrial 2'. x A light industrial development would not be compatible with the existing land uses and would impact on the sense of place. x It would not be in line with the development plans of the eMalahleni Local Municipality as stated in the Spatial Development Framework (2015).	0 Fatal flaw	No

Legend: 0 = Fatal Flaw; 1 = Preferred Option; 2 = Second Option; 3 = Third Option

As indicated in Table 7.1, **the preferred option for the overall site was Alternative land use 3 (business).**

The applicant plans to pursue the development of a retail centre on the said site as per the site development plan provided in Figure 7.1. The total Gross Building Areas (GBA) of the proposed retail centre will be 26 654.40 m^2 with a Gross Leasable Area (GLA) of 12 000m^2.

An application for environmental authorisation was submitted to DARDLEA for the proposed retail centre development and the applicant is currently waiting for the decision (i.e. environmental authorisation).

North western corner of site (Figure 7.1)
It should however, be noted that the north western corner of the site (Figure 7.1) was set aside for future development, i.e.

- allowing for the future expansion of the retail centre in line with the 'Business 2' zoning; or
- the development of a filling station.

Expansion of proposed retail centre
Erf 20 is zoned 'Business 2" according to the eMalahleni Land Use Scheme (2020) (Appendix 10). According to this zoning, the following primary land uses are allowed on the said erven: *auction house, carwash, confectioner, conference centre, drive-thru restaurant, garden service establishment, government use, gymnasium, hotel, institution, laboratory, laundromat, liquor enterprise, medical suites, motor dealer, office, parking garage, place of refreshment, residential building, service enterprise, shop, social hall, step down facility, tavern, tuck shop, veterinary clinic.*
As indicated above, a range of development options are therefore available to the applicant in terms of the expansion of the proposed retail centre.

However, the applicant wants to capitalise on the high visibility of the site from Mandela Drive and Nita Avenue and rather develop a filling station. In view of this, the suitability/feasibility of the said site for a filling station had to be investigated.

Development of a filling station
A feasibility study with regards to the establishment of a filling station on the proposed site was conducted by JM van Rooyen of EDL Consulting Engineers (Pty) Ltd. (hereafter referred to as Van Rooyen, 2020a). A copy of the feasibility study is provided in Appendix 6 and should be consulted regarding methodology used.

In order to determine whether or not a proposed filling station will be feasible, the developer has to take into account fixed costs (e.g. the cost of land, buildings, engineering, etc.), operational costs (e.g. salaries, services, etc.) as well as expected fuel sales and income from the convenience store. It is also necessary to look at competitor sites and determine the potential impact that the new site may have on other filling stations in the area.

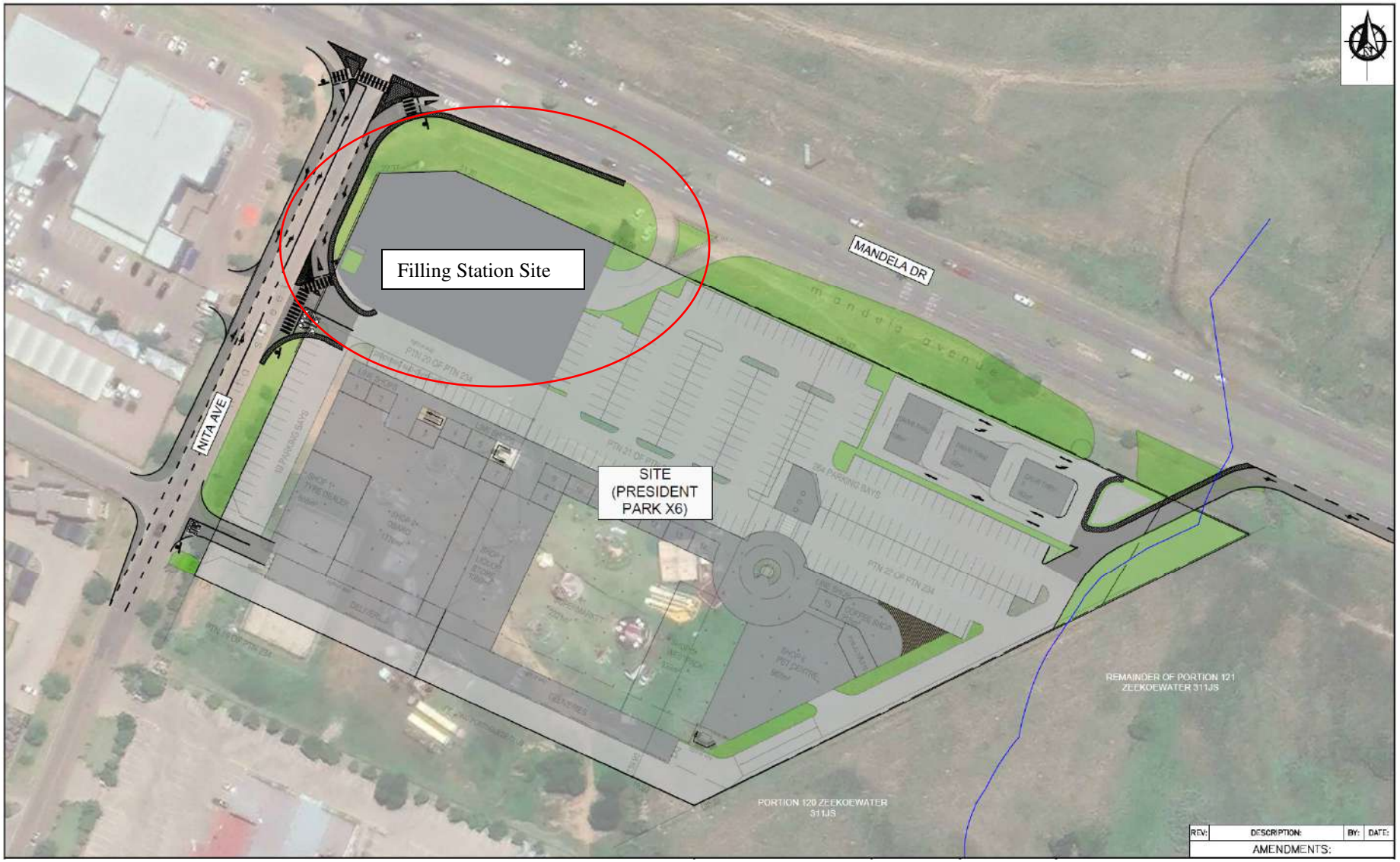


Figure 7.1: Layout plan approved w.r.t. proposed retail centre development (taken from EDL Consulting Engineers, 2021)

Feasibility of filling station

Competitor sites

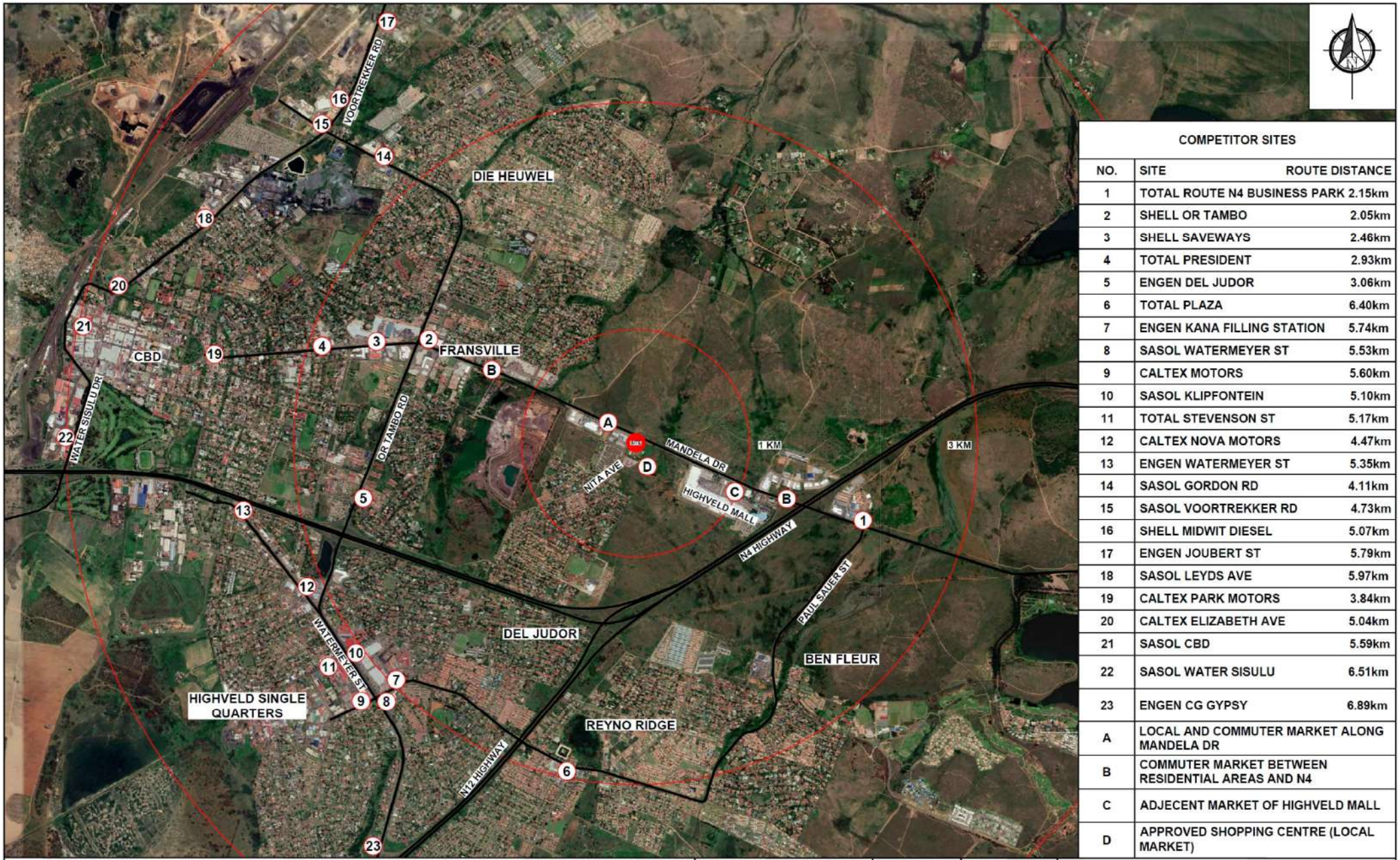
Van Rooyen (2020a) indicated that according to the latest published draft guidelines (January 2020) of the Department of Energy (DoE), based on the Amended Petroleum Products Act of 1977, an urban site must evaluate the competitors within a 5km radius.

As per the requirement of the DoE, a total of 23 existing filling station sites (Figure 7.2) were identified as relevant within the 5km radius by Van Rooyen (2020a). However, it should be noted that the following existing filling stations are located outside the 5km radius (Figure 7.2):

FILLING STATION	DISTANCE (km)
TOTAL Plaza	6.40
ENGEN Kana Filling Station	5.74
SASOL Watermeyer St	5.53
CALTEX Motors	5.60
SASOL Klipfontein	5.10
TOTAL Stevenson St	5.17
ENGEN Watermeyer St	5.35
SHELL Midwit Diesel	5.07
ENGEN Joubert St	5.79
SASOL Leyds Ave	5.97
CALTEX Elizabeth Ave	5.04
SASOL CBD	5.59
SASOL Walter Sisulu	6.51
ENGEN GC Gypsy	6.89

A total of 9 filling stations are therefore located within the 5km radius (Figure 7.2) as indicated in Table 7.2a.

Information regarding the filling stations that fall outside of the 5km radius is provided in Appendix 6.



COMPETITOR SITES		
NO.	SITE	ROUTE DISTANCE
1	TOTAL ROUTE N4 BUSINESS PARK	2.15km
2	SHELL OR TAMBO	2.05km
3	SHELL SAVEWAYS	2.46km
4	TOTAL PRESIDENT	2.93km
5	ENGEN DEL JUDOR	3.06km
6	TOTAL PLAZA	6.40km
7	ENGEN KANA FILLING STATION	5.74km
8	SASOL WATERMEYER ST	5.53km
9	CALTEX MOTORS	5.60km
10	SASOL KLIPFONTEIN	5.10km
11	TOTAL STEVENSON ST	5.17km
12	CALTEX NOVA MOTORS	4.47km
13	ENGEN WATERMEYER ST	5.35km
14	SASOL GORDON RD	4.11km
15	SASOL VOORTREKKER RD	4.73km
16	SHELL MIDWIT DIESEL	5.07km
17	ENGEN JOUBERT ST	5.79km
18	SASOL LEYDS AVE	5.97km
19	CALTEX PARK MOTORS	3.84km
20	CALTEX ELIZABETH AVE	5.04km
21	SASOL CBD	5.59km
22	SASOL WATER SISULU	6.51km
23	ENGEN CG GYPSY	6.89km
A	LOCAL AND COMMUTER MARKET ALONG MANDELA DR	
B	COMMUTER MARKET BETWEEN RESIDENTIAL AREAS AND N4	
C	ADJECENT MARKET OF HIGHVELD MALL	
D	APPROVED SHOPPING CENTRE (LOCAL MARKET)	

Figure 7.2: Competitor sites within 5km radius (taken from Van Rooyen, 2020a)

FIGURE 2 DRAWING NO.		20023 PROJECT NO.	MAY 2020 DATE.
1 : 30 000 SCALE AT A3.	JMvR DRAWN.	E.D. KOTZE CHECKED.	0 REVISION.

EDL CONSULTING ENGINEERS
1st Floor, Block D
The Village Office Park
C/O Glenwood Rd & Oberon Ave,
Fearie Glen, 0043
Tel: 087 897 5074/5/6
eben@edlengineers.co.za
www.edlengineers.co.za

Table 7.2a: Summary of competitor sites within 5km radius (taken from Van Rooyen, 2020a)

Competitor site (Figure 7.2)	Location in relation to site	Average fills (litres per vehicle)	Notes
TOTAL Route N4 Business Park (situated on the corner of Mandela Dr and Corridor Crescent, east of the N4 highway).	2.15 km	28.9	Can be reached by means of a 'Left-in' access on Mandela Drive and a 'Full' access on Corridor Crescent.
			Offers four (4) pump islands, selling petrol and diesel fuels and one (1) island selling diesel fuel exclusively.
			Offers a modern medium sized convenience store with a bakery and an ABSA ATM inside, as well as a coffee station. Nearby shops include a Kohler Auto (Opel and Isuzu dealership), Jimmy's Killer Prawns and a Prosperity Property sale.
SHELL OR Tambo (situated on the corner of Mandela Dr Service Road and OR Tambo Service Road).	2.05km	33.4	Can be reached by means of 3 full accesses on the service roads.
			Offers four (4) pump islands selling petrol and diesel fuels and one (1) island selling diesel fuel exclusively.
			Offers a modern OK Express. Nearby businesses include a BMG Bearings, Ford Dealership (Eastvaal Motors).
SHELL Saveways (Situated at the Saveways Crescent Centre).	2.46km	23.5	Can be reached by means of a 'Full' access to the shopping centre and a 'Left-in and Left-out' access from Mandela Drive.
			Offers four (4) pump islands selling petrol and diesel fuels and one (1) island selling diesel fuel exclusively.
			Offers a modern medium sized convenience store with an internal FNB ATM, with an in-store bakery. Other amenities at the premises include a car wash. Nearby shops include large Saveways Shopping Centre.
TOTAL President (Situated on the corner of Mandela Dr and Nicol St.).	2.93km	18.4	Can be reached by means of a 'Full' access on Nicol St and a 'Left-in and Left-out' access on Mandela Drive.
			Offers four (4) pump islands selling petrol and diesel fuels.
			Offers a modern medium sized convenience store with an internal Cash Express ATM. Nearby shops include Solly's Car Sales, Haus of Cars and Porto Shop mini supermarket.
ENGEN Del Judor (Situated on the corner of Geringer St and Louise St.).	3.06km	24.2	Can be reached by means of a full access on each road.
			Offers four (4) pump islands selling petrol and diesel fuels and one (1) island with canopy selling diesel fuel exclusively.
			Offers a modern medium to large sized convenience store with a Woolworths food and Corner bakery. Other amenities at the premises include a Nedbank ATM. Nearby shops include Barcelos Chicken. This filling station is opposite the police station.
CALTEX Nova Motors (Situated on the corner	4.47km	29.5	Can be reached by means of a full access on Steenkamp St and a 'Left-in and Left-out' on Watermeyer Street.

Competitor site (Figure 7.2)	Location in relation to site	Average fills (litres per vehicle)	Notes
of Watermeyer St and Steenkamp St).			Offers five (5) pump islands selling petrol and diesel fuels and one (1) island selling diesel fuel exclusively.
			Offers a modern large sized convenience store with a Bakery and Seattle Coffee Company. Other amenities at the premises include an ABSA ATM and a car wash. Nearby shops include Fair Deal Motors and Diner Fast Foods.
SASOL Gordon Rd (Situated on the corner of OR Tambo Rd and Gordon Rd)	4.11km	19.3	Can be reached by means of a 'Left-in and Left-out' access on OR Tambo Rd and a full access on Gordon road.
			Offers four (4) pump islands selling petrol and diesel fuels.
			Offers a modern medium sized convenience store with an ABSA ATM inside. Other amenities at the premises include a car wash.
SASOL Voortrekker Rd (Situated on the corner of OR Tambo Rd and Voortrekker Rd).	4.73km	27.1	Can be reached by means of a full access on OR Tambo Rd and a 'Left-in and Left-out' accesses on Voortrekker Rd.
			Offers four (4) pump islands under a square canopy selling petrol and diesel fuels and one (1) island selling diesel fuel exclusively.
			Offers a modern medium sized convenience store with an ABSA ATM inside. Nearby shops include a KFC opposite the site and the Techno Park Business Park next to the site.
CALTEX Park Motors (Situated on the corner of Mandela Dr and Smuts Ave).	3.84km	11.9	Can be reached by means of a full access on each road.
			Offers six (6) pump islands under a square canopy selling petrol and diesel fuels.
			Offers a modern medium sized convenience store. Other amenities at the premises include a Cash Express ATM and a car wash.

In order to assess the impact of the proposed filling station on the other filling stations (Table 7.2a), the shared traffic streams were determined as indicated in Table 7.2b. Using information w.r.t. shared traffic streams, moving market factors and fuel sales, Van Rooyen (2020a) determined the impact of the proposed filling station on other filling stations in terms of lost fuel sales. The expected impact on surrounding sites is provided in Table 7.2b.

Table 7.2b: Expected shared traffic and loss of fuel sales on surrounding sites (taken from Van Rooyen, 2020a)

FILLING STATION (Figure 7.2)	POTENTIAL PASS-BY TRAFFIC (VEH/DAY)	POTENTIAL TRAFFIC SHARED WITH NEW FILLING STATION (VEH/DAY)	PERCENTAGE OF TOTAL TRAFFIC SHARED (%)	MOVING MARKET FACTOR (%)
TOTAL Route N4 Business Park (No. 1)	15 000	3 750	25%	10%
SHELL OR Tambo (No. 2)	21 000	4 200	20%	8%
SHELL Saveways (No. 3)	17 500	2 975	17%	7%
TOTAL President (No. 4)	16 500	2 475	15%	6%
ENGEN Del Judor (No. 5)	18 000	1 800	10%	5%
SASOL Gordon Rd (No. 14)	15 000	1 500	10%	5%
SASOL Voortrekker Rd (No. 15)	22 000	1 650	7.5%	5%
SHELL Midwit Diesel (No. 16)	16 000	1 200	7.5%	<5%
ENGEN Joubert Street (No. 17)	16 000	Closed	-	<5%
CALTEX Park Motors (No. 19)	11 000	1 100	10%	5%
TOTAL Plaza ENGEN Kana FS SASOL Watermeyer St CALTEX Motors SASOL Klipfontein TOTAL Stevenson St CALTEX Nova Motors ENGEN Watermeyer St SASOL Leyds Ave CALTEX Elizabeth Ave SASOL CBD SASOL Walter Sisulu ENGEN GC Gypsy			<5%	<5%

Van Rooyen (2020a) indicated that the traffic shared between existing stations and the proposed site does not imply the same or proportional percentage of lost fuel sales. Passing road users are more likely to purchase fuel or turn into a filling station based on the overall aesthetic perception of the facility and the quality of service offered. The station's location, its accesses, available amenities, visibility, site layout and overall convenience offered influence the loss of fuel sales when competing against a new, modern competitor.

The proposed filling station mainly caters for westbound traffic along Mandela Drive.

The proposed filling station is expected to take between 5% and 10% from seven (7) competitor sites (Table 7.2b), with 16 sites expected to be impacted less than 5%.

From Table 7.2b, it can be concluded that the initial impact on the competitors will be low, mainly due to the competitor sites serving different markets and located on the opposite side of the road thus serving different traffic streams (Van Rooyen, 2020a).

The existing TOTAL N4 Business Park (Figure 7.2) is also located on the opposite side of Mandela Drive and will be the most affected (10% impact; Table 7.2b). According to Van Rooyen (2020a), this filling station will be able to recover most of the lost sales within 3 to 4 years after the proposed filling station is constructed, due to the positive traffic growth in eMalahleni.

The proposed site will thus have an initial negative impact (between 5% and 10%) on a number of existing filling stations (Table 7.2a). The impact should not irreparably jeopardize these businesses in view of the different markets and traffic streams catered for as well as the distances away from the proposed filling station. Van Rooyen (2020a) indicated that with the positive traffic growth in the area, these sites will be able to recover within 3 – 4 years of the new filling station being implemented.

Expected fuel sales and income from the convenience store
According to Van Rooyen (2020a), the following empiric formula is used by the fuel industry to calculate the expected average litres of fuel to be sold in a month:

Liters per month = (vehicles per day passing the site) X (average fill per vehicle) X (% vehicles of pass-by traffic turning into the site) X (average full normal trading days in a month)

Traffic volumes (vehicles per day passing the site)
(Please consult Section 5.16 And Appendix 6 for further details with regards to the traffic counts conducted).

From the traffic count (2020), the site is exposed (vehicles passing the site) to an ADT of approximately **25 296 veh/day** travelling in all directions along Mandela Drive and Nita Ave at the intersection where the filling station is proposed.

The existing Nissan, UD Trucks and Datsun dealerships opposite the site and the new approximately 400 unit Residential development on Nita Ave will contribute a large amount to the traffic passing the site and therefore increases the need for a new filling station in the area (Van Rooyen, 2020a).

Nearby future developments include the addition of a retail centre directly adjacent to the site, with approved rights for approximately 12 000m² GLA (Gross Leasable area). This retail centre will add approximately 4 200 vehicles per day (as per Table 3.1 in the COTO TMH 17 Manual) with an AADT trip rate of 35 vehicles/100m²/Day. From the above, it is clear that the future traffic demand will increase significantly (Van Rooyen, 2020a).

Average Fill:
Table 7.2a provides an indication of the average fills per vehicle at the surrounding filling stations.

According to Van Rooyen (2020a), the survey indicated an average fill at nearby stations in higher income areas of approximately **12 - 39 litres per vehicle**. Due to the slightly lower local traffic in the area of the site and for the purpose of the study, an average fill of **22 litres per vehicle** was deemed appropriate and adopted for the calculations of the subject site.

Interception rates (%vehicles of passer-by traffic turning into the site):
Van Rooyen (2020a) indicated that the turn-in percentage (interception rate) is determined by the following factors:

- Convenience (clean new facility and easily accessible);
- Visibility (good-long time to decide whether to use the facility or not);
- The amount of passer-by traffic (fixed, as per traffic count);
- Type of traffic (Transient, Commuter or local; income level of the area also a factor);
- Service provided to public (car wash, convenience shop, A.T.M. etc.);
- Good accesses (proper deceleration and acceleration lanes)
- Location (homebound and work bound and surrounding area);
- Site layout (large enough to have proper site circulation);
- Fuel Rewards Programs.

Table 7.2c provides the expected interception rates for the different traffic streams of the proposed development. Van Rooyen (2020a) estimated the interception rate for traffic flow on the opposite side of the road from the filling station as lower as vehicles need to cross traffic to enter the filling station, and eastbound traffic on Mandela Drive is also low as the traffic does not have direct access.

Table 7.2c: Expected interception rates (taken from Van Rooyen, 2020a)

ADT = 25 296 existing veh/day passing the site		
Road and Direction	**Traffic Volume (veh/day)**	**Adopted Interception Rate**
Westbound on Mandela Dr past the site (Positive Traffic)	10947	4.0%
Eastbound on Mandela Dr past the site (No Direct Access)	9960	1.0%
Northbound on Nita Ave past the site (Negative Traffic)	2921	3.0%
Southbound on Nita Ave past the site (Positive Traffic)	1468	6.0%
Planned (& Approved) Retail Development (approx. 12 000m^2)	4200	3.0%

Van Rooyen (2020a) indicated that the interception rates expected for the proposed site varies on Mandela Drive and Nita Avenue. Lower interception rates are expected for the traffic travelling on the opposite side of the street, which will have to turn across oncoming traffic (negative traffic), and also on Mandela Drive eastbound traffic, which does not have direct access to the site, and have to use Nita Avenue to access the site.

Full trading days in a month:
With the nearby mall and attractions generating higher traffic on Saturdays and Sundays, it is expected that 28 trading days per month is appropriate and is therefore assumed for the proposed filling station (Van Rooyen, 2020a).

Expected monthly sales:
For new developments, a general guideline is used when estimating fuel sales for future years. It is commonly found that the full potential of a filling station's fuel sales is not reached during the first year of operation. Only during the third year the full (100%) potential is normally reached.

In-depth calculations for diesel sales were not conducted separately for this study. The average fills on diesel is more than that of petrol, but the profit per litre is lower. It was thus assumed that the typical profit on diesel transactions will be similar to the profit on petrol transactions. Diesel sales normally constitute only 5 – 20% of the total fuel sales, depending on the % Heavy Vehicles and there are usually other competitors that already cater for the diesel market, by offering reward programs and discounts as well as 30-day accounts.

Van Rooyen (2020a) estimated that diesel transactions will account for approximately only 10% of the monthly fuel sales (i.e. considering the surrounding area and the very low percentage of heavy vehicles passing the site). Table 7.2d provides a summary of the estimated fuel sales for the proposed site.

Table 7.2d: Expected fuel sales in a month (taken from Van Rooyen, 2020a)

MONTHLY SALES POTENTIAL	ALL VEHICLES				
MOVEMENT	Mandela Dr		Nita Ave		New Retail
	EAST	WEST	NORTH	SOUTH	
Traffic Flow (Vehicles per Day)	9 960	10 947	2 921	1 468	4 200
Average Fill (Litres per Day)	22,0	22,0	22,0	22,0	22,0
Trading Days (Days per Month)	28	28	28	28	28
Interception Rate (%)	1,00%	4,00%	3,00%	6,00%	3,00%
SUB-TOTAL	61 354	269 734	53 980	54 257	77 616
SALES POTENTIAL	331 088		108 237		77 616
					516 941

The estimated annual forecast fuel sales for 2021, 2022 and 2023 are provided in Table 7.2e. It is expected that up to 564 875 liters per month could be sold in 2023.

Table 7.2e: Annual forecast sales potential (taken from Van Rooyen, 2020a)

ANNUAL FORECAST - MONTHLY SALES POTENTIAL						
PERIOD		POTENTIAL GROWTH		ESTIMATED LITRES		TOTAL
YEAR		Percentage of Potential	Growth Rate	Petrol	Diesel	LITRES PER MONTH
1	2021	90%	3,00%	431 284	47 920	**479 204**
2	2022	95%	3,00%	468 901	52 100	**521 002**
3	2023	100%	3,00%	508 388	56 488	**564 875**

Major fuel companies generally regard a new urban site feasible if the fuel sales volume forecast indicates that more than 300 000 litres of fuel will be sold per month.

As indicated in Table 7.2e, the expected fuel sales will be over 564 000 litres in the 3rd year of operations. In view of this, Van Rooyen (2020a) indicated that it can be concluded that the proposed site will be feasible for the development of a filling station for all the larger fuel companies (such as SASOL, TOTAL, ENGEN, BP, SHELL, etc.) at the intersection of Mandela Drive and Nita Ave.

Van Rooyen (2020a) indicated that the feasibility will be dependent on obtaining direct access approval from both Mandela Drive and Nita Ave (Figure 7.1).

Evaluation of the site
According to Van Rooyen (2020a), a qualitative assessment ranked the proposed site as follows:

	Comment	Rating
Visibility:	Being located next to a Class 3 route that connects several suburbs and places of interest as mentioned before, with no natural obstructions or topography that impairs the visibility, the site is easily visible to passing traffic from a good distance away.	**VERY GOOD**
Location:	The study site is located at an Intersection, next to Mandela Drive, a minor arterial (Class 3) road which feeds traffic to-and-from Emalahleni and the N4 Freeway. It is also close to several commercial developments as well as a large shopping centre (Highveld Mall) situated about 500m to the east of where the filling station is proposed.	**VERY GOOD**
Access:	'Left-in, Left-out' access is proposed from Mandela Drive and a Full access from Nita Avenue is proposed for the proposed filling station (with a right turn lane for the full access and with a left-slip lane at the intersection of these mentioned roads). It can hence be concluded that seeing as this site will be able to serve both east and westbound traffic travelling on Mandela Drive and both directions of travel on Nita Ave, the access layout can be described as **GOOD**. The access on Nita Ave has been approved as part of the Retail (12,000m² shopping centre) development adjacent to the filling station.	**GOOD**

	Comment	Rating
Trading Market:	Considering that this filling station relies on daily commuters traveling to-and-from Emalahleni (Witbank) and the N4 Freeway as well as traffic to-and-from the nearby shopping centre, the Nissan dealership located opposite the site and local traffic on Nita Ave, during weekdays and weekends, the trading market is described as **VERY GOOD**. The approved 12 000m² shopping centre adjacent to the site also helps to increase its own local trading market.	**VERY GOOD**
Competitor Stations:	There are a few existing filling stations situated on Mandela Drive (but are located on the opposite side of Mandela Drive, serving mainly eastbound traffic) and several existing filling stations within Emalahleni, of which none are within 1km radius from the site. There is a total of 7 sites within a 1 - 3km radius. There are also 16 sites within a 3 - 5km radius, but these mainly serve different traffic streams and markets. The study site is thus rated **GOOD** in terms of competitors.	**GOOD**
Traffic Volumes:	The survey indicated high traffic volumes (around 25 296vpd) passing the proposed site in all directions. The exposure to traffic can thus be described as **VERY GOOD.** Please note that this existing traffic excludes the expected additional 4 200 vpd (vehicles per day) for the approved shopping centre located adjacent.	**VERY GOOD**

In view of the above-mentioned, Van Rooyen (2020a) concluded that the proposed site has **VERY GOOD** trading potential.

Feasibility of proposed site
A summary of typical costs associated with a new, modern (medium) filling station development located on a site roughly like the proposed filling station is provided in Section 4 of Appendix 6.

The cost variation of a filling station development is largely influenced by the cost of the zoned property, the size of the site and the civil engineering works (mainly the cost of the earthworks and the accesses).

Major fuel companies generally regard such an urban site feasible if the projected fuel sales are in the region of 300 000 liters per month, depending on several factors, but this is not cast in stone and various fuel companies have different views on the required minimum fuel sales thresholds. Given the expected fuel sales in year 3, tabulated in Table 7.2e (±564 000 liters per month) and the estimated development cost of ±R14.15m (Table 5 of Appendix 6), it can be concluded that the proposed filling station will be feasible for the larger fuel companies as the projected fuel sales are way more than 300 00 litres per month.

Considering the expected fuel sales (Table 7.2e), it can be concluded that **the proposed site will indeed be feasible for the development of a filling station, subject to obtaining access approval from Mandela Drive.**

Development of the site as a filling station was thus seen as the preferred option.

7.3 Alternative layout plans

Two (2) layouts for the proposed filling station were provided, namely:

- Alternative layout 1 – Figure 7.3;
- Alternative layout 2 – Figure 7.4.

Alternative layout 1 (Figure 7.3) was discarded as it did not make provision for the turning of fuel tankers delivering fuel to the site. **The preferred option is therefore Alternative layout 2 (Figure 7.4).**

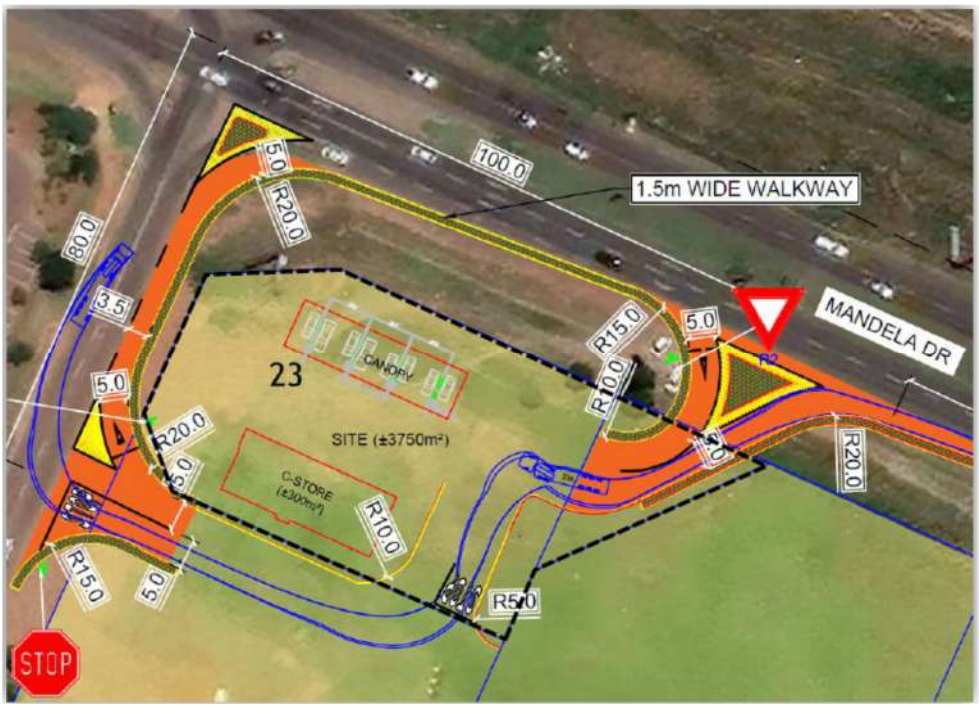


Figure 7.3: Alternative layout 1 (with convenience store in southern part of site and canopy to the north thereof)

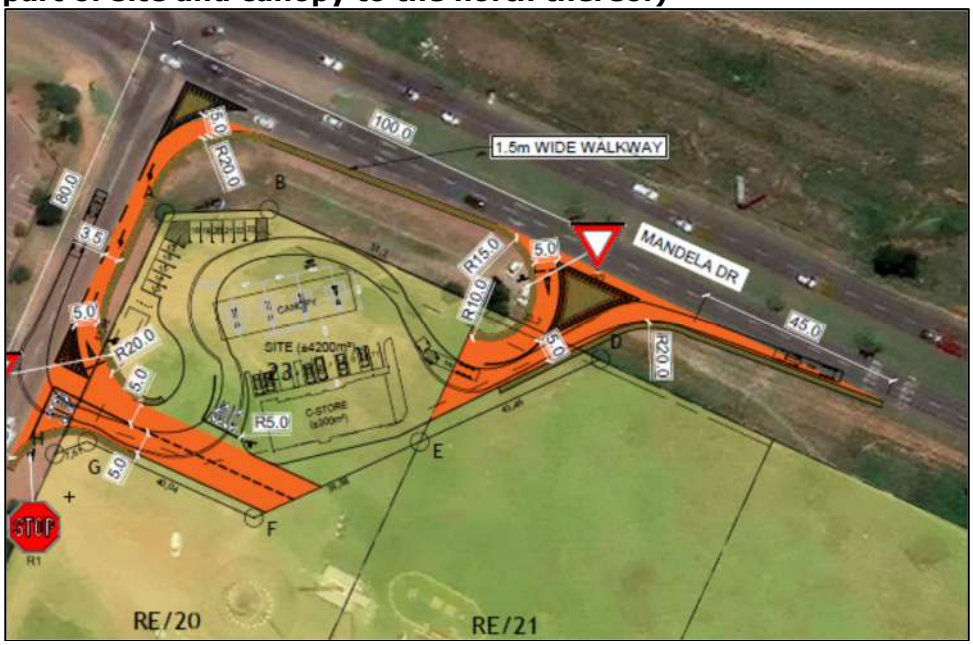


Figure 7.4: Alternative layout 2 (convenience store and canopy moved to provide for turning of fuel tankers)

7.4 Alternative service provision

The proposed site (Erf 20) is located within the eMalahleni Local Municipality and can connect to the existing municipal services (water, sewage, electricity, etc.). Figure 7.5 indicates the location of the existing municipal water and sewer infrastructure adjacent to the site.

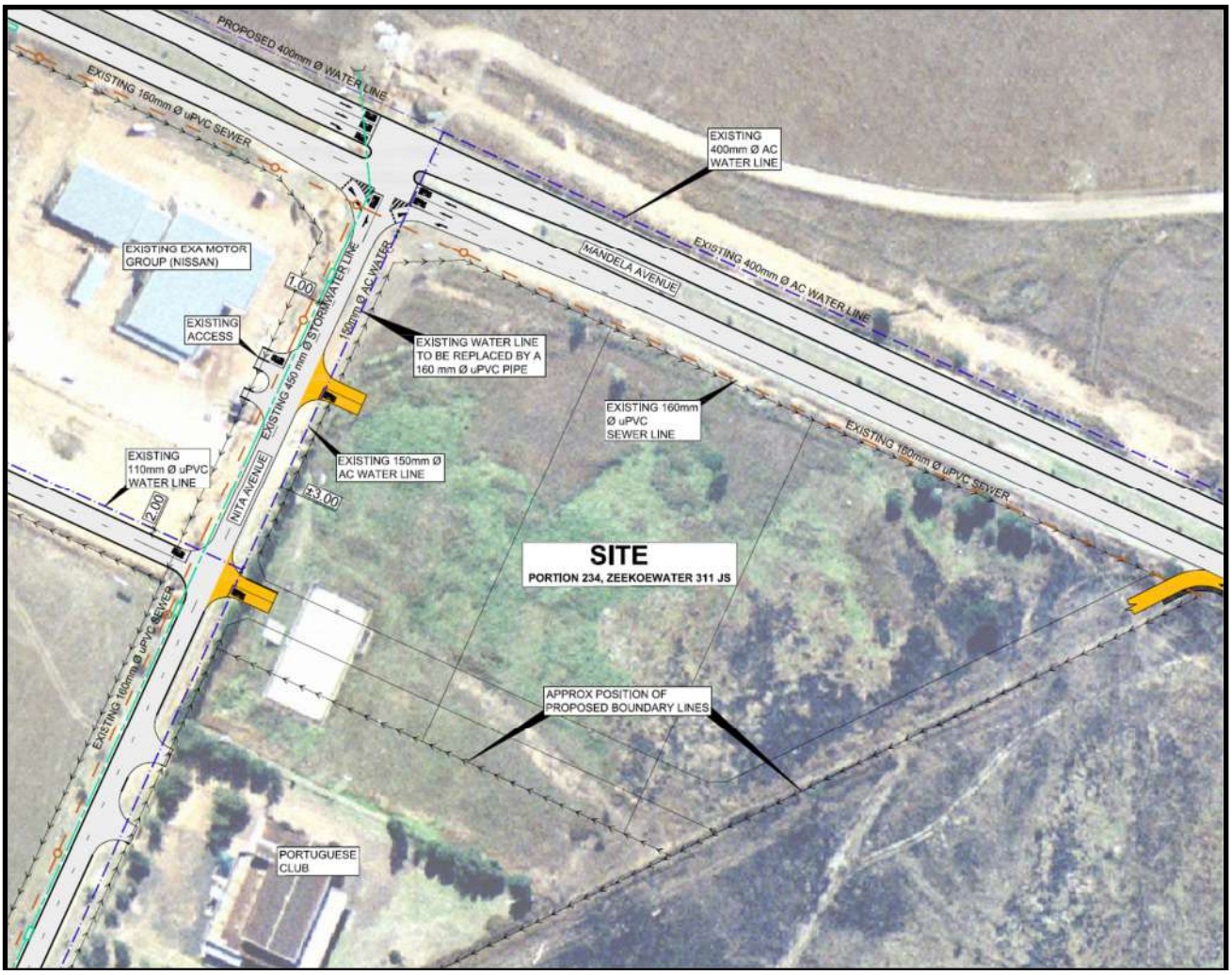


Figure 7.5: Location of the existing municipal water and sewer infrastructure adjacent to the site (taken from WSP SA Civil and Structural Engineers (Pty) Ltd., 2010)

Table 7.3 provides an indication of the alternatives investigated with regards to service provision to the proposed filling station:

- Water provision;
- Electricity;
- Sewage disposal;
- Waste disposal;
- Storm water management.

Table 7.3: Matrix for determining the preferred alternative in terms of service provision

Alternative	Advantages	Disadvantages	Ranking	Option selected
Alternative service provision				
7.4.1 Water provision				
Alternative 1 - water from eMalahleni Local Municipality	√ *The filling station can connect to the existing 150 mm water pipeline, which is located along the western boundary of the site and connects to a larger 400mm diameter AC water main running parallel to and north of Mandela Drive (Figure 7.5). It is anticipated that a Class 16 uPVC pipe will be installed as well as a 110mm uPVC pie in order to connect the site.*	x *The eMalahleni Local Municipality indicated that the existing water pipeline is old and unreliable and that a 350 m long section of the pipeline from the Nita Avenue/Mandela Drive crossing to Del Judor X4 be replaced by a 160 mm diameter uPVC pipe (the installation of a new pipeline may however, not be necessary should the retail centre be constructed first and the pipeline replaced as part of that development).*	*1 Preferred*	***Yes***
Alternative 2 - surface water		x No surface water environments (river/stream) are located on site. A Seep Wetland is located to the east of the site, which becomes a Valley Bottom Wetland drainage area. x A hydrological study would have to be conducted to determine if a sustainable volume of water is available from the unnamed tributary of the Olifants River (locally known as Madelspruit; located approximately 800 m west of the site) or the Olifants River (located 3.8km east of the site). x A water treatment plant would have to be installed to treat the water to potable standards as the water in these systems could be polluted due to residential, industrial, mining, etc. activities. x A pump would have to be installed in the river, which would be risky in terms of theft. x A pipeline would have to be installed from the river, across numerous wetlands and roads, to the site. x A servitude would have to be registered across the adjacent properties. x A water use license would be required from the Department of Water and Sanitation.	0 Fatal flaw	No
Alternative 3 – groundwater		x A geohydrological study would have to be conducted to determine if a sustainable water supply could be provided.	2nd Option	No

Alternative	Advantages	Disadvantages	Ranking	Option selected
		x Boreholes would have to be drilled. x Water may have to be treated to potable standards before being used. x A water use license would be required from the Department of Water and Sanitation.		
7.4.2 Electricity				
Alternative 1 - electricity from the eMalahleni Local Municipality	√ *The proposed development falls under the jurisdiction of the eMalahleni Local Municipality and can connect to the existing municipal electrical network subject to the installation of additional bulk services.*		*1 Preferred*	***Yes***
Alternative 2 - obtaining electricity from Eskom		x The proposed development falls under the jurisdiction of eMalahleni Local Municipality and can therefore not connect directly to the Eskom grid.	0 Fatal flaw	No
7.4.3 Sewage disposal				
Alternative 1 - connecting to the existing municipal sewer infrastructure of the eMalahleni Local Municipality	√ *There is are existing 160 mm diameter uPVC sewer lines present along the northern boundary of the site and west of Nita Avenue (Figure 7.5).* √ *The development can connect to the eMalahleni Local Municipality sewer system by means of a 110 mm uPVC sewer connection.* √ *According to WSP (2010), the eMalahleni Local Municipality indicated that the existing sewer line will have sufficient capacity for a retail development.*	x If the municipal sewer infrastructure is not maintained resulting in blockages, overflowing manholes, etc., it could impact on the filling station, retail centre and surrounding businesses/residents in terms of odours. Depending on the location of the overflowing manholes, it could impact on the adjacent Seep Wetland and the associated downstream areas.	*1 Preferred*	***Yes***
Alternative 2 - sewage package plant		x Engineers would have to be appointed to determine the size and placing of a sewage package plant. x The estimated wastewater treatment demand may not warrant the installation of a sewage treatment/package plant (increased construction and maintenance costs). x The site may be too small to accommodate a sewage treatment/package plant. x If the sewage treatment/package plant is not functioning properly, it could impact on the filling station, the retail centre and surrounding	2nd Option	No

Alternative	Advantages	Disadvantages	Ranking	Option selected
		x businesses/residents in terms of odours if the effluent does not meet the required standards. x If the sewage treatment/package plant is not functioning properly, it could impact on the adjacent Seep Wetland and the associated downstream areas if the effluent does not meet the required standards. x A water use license would be required from the Department of Water and Sanitation.		
Alternative 3 - septic tank and French drain		x Septic tanks with French drains are no longer accepted by the Department of Water and Sanitation due to the potential pollution risks.	0 Fatal flaw	No
Alternative 4 – conservancy tanks		x Engineers would have to be appointed to determine the size and placing of conservancy tanks. x The conservancy tanks would have to be emptied on a regular basis by means of a honey sucker. This would result in additional costs as a service provider would have to be sourced. x The sewage would have to be disposed at one of the Sewage Treatment Plants in eMalahleni, which would also result in additional costs. x There is a risk that the conservancy tank/tanks could overflow, resulting in soil and groundwater pollution as well as bad odours. Overflows could also impact on the nearby Seep Wetland depending on the location of the conservancy tank(s).	0 Fatal flaw	No
7.4.4 Waste management				
Alternative 1 – waste collected by the eMalahleni Local Municipality	✓ *The site falls within the urban edge of the eMalahleni Local Municipality where municipal services are provided.* ✓ *Refuse will thus be collected by the eMalahleni Local Municipality's refuse removal unit and will be disposed of at the registered Leeuwpoort Waste Disposal Site.* ✓ *As per the ELM requirements, a central refuse area (with waste skips) will be provided near the site boundary in Nita Avenue for easy collection by the*	x *Odours emanating from the central refuge area if waste is not collected by the ELM refuse removal unit on a regular basis allowing waste to accumulate on site.*	*1* *Preferred*	***Yes***

Alternative	Advantages	Disadvantages	Ranking	Option selected
	municipality.			
Alternative 2 – new onsite waste disposal site		x The site is only 4479m^2 and thus too small for an onsite waste disposal site. x An onsite waste disposal site would impact on the filling station, retail centre and surrounding businesses/residents in terms of odours, flies and rodents. x A waste management license would have to be obtained. x An onsite waste disposal site would result in additional costs since the applicant would have to appoint a service provider to manage the site.	0 Fatal flaw	No
7.4.5 Storm water management				
Alternative 1 - connecting to the existing municipal storm water system of the eMalahleni Local Municipality and upgrading thereof with attenuation of storm water (Figure 7.10)	✓ *The site falls within the urban edge of the eMalahleni Local Municipality where municipal services are provided.* ✓ *The development can connect to the existing municipal storm water system in Nita Avenue and Mandela Drive (Figure 3.3). Site specific storm water management measures would however, have to be implemented for the filling station site.*		*1* *Preferred*	***Yes***

As indicated in Table 7.3, **the preferred options with regards to service provision to the filling station site are as follows:**

Water provision	Alternative 1 - water from eMalahleni Local Municipality; connect to existing water infrastructure of eMalahleni Local Municipality (Figure 7.5).
Electricity	Alternative 1 - obtaining electricity from eMalahleni Local Municipality.
Sewage disposal	Alternative 1 – connect to existing sewer infrastructure of eMalahleni Local Municipality (Figure 7.5).
Waste disposal	Alternative 1 – waste collected by eMalahleni Local Municipality
Storm water management	Alternative 2 - connecting to the existing municipal storm water system of the eMalahleni Local Municipality.

Senekal (2020) indicated that all services (water, sewer, storm water, roads and accesses) can be provided by the eMalahleni Local Municipality (acceptably and economically) for the proposed filling station subject to the implementation of the proposed improvements to the infrastructure as recommended in Section 3.2 of this BAR.

In terms of electricity, Diederiks (2020) indicated (after consultation with the eMalahleni Local Municipality) that additional bulk services as indicated in Section 3.2.5 will need to be installed for the proposed filling station.

7.5 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 filling station was exercised, it could mean that:

- The applicant would have to investigate other land uses (e.g. retail) for the site in line with the existing zoning (i.e. Business 2).
- The applicant would have to investigate alternative sites for the proposed filling station.
- A prime development site would stay vacant and not be able to reach its full development potential benefitting the community of eMalahleni.
- The site would remain unkempt, posing a health and safety risk to residents living in the nearby residential area as well as eMalahleni as a whole.
- The eMalahleni Local Municipality would not be able to meets its goal of developing the said area in line with the Spatial Development Framework (2015).
- Potential employment opportunities for residents of the nearby residential area and eMalahleni as a whole would be lost.
- Other potential uses for the site would have to be investigated.
- The applicant could sell the property.
- The applicant would have to discard the proposed development plans.

7.6 Concluding statement on alternatives

In summary, the following alternatives are deemed feasible and will be assessed in Section 8 of this document:

Section	Preferred Alternative	Description
7.1	Site: Portion 1 of Erf 20 and Portion 2 of Erf 21 (future Erf 23)	The proposed filling station will be located on Portion 1 of Erf 20 and Portion 1 of Erf 21, President Park X6, eMalahleni.
7.2	Business Alternative 3	A filling station to be established on the said property.
7.3	Alternative Layout 2 (Figure 7.4)	Convenience store, canopy, underground tanks and provision for the turning of fuel tankers.
7.4.1	Water provision Alternative 1	Water from eMalahleni Local Municipality and connect to existing water infrastructure of eMalahleni Local Municipality as per Figure 7.5 (subject to possible upgrading as required by the ELM if not already done as part of the retail centre development).
7.4.2	Electricity Alternative 1	Obtaining electricity from eMalahleni Local Municipality (subject to the installation of additional bulk services).
7.4.3	Sewage disposal Alternative 1	Connecting to existing sewer infrastructure of eMalahleni Local Municipality as per Figure 7.5.
7.4.4	Waste management Alternative 1	Waste collected by the eMalahleni Local Municipality and disposed of at the registered Leeuwpoort Waste Disposal Site.
7.4.5	Storm water management Alternative 2	Connecting to the existing municipal storm water system of the eMalahleni Local Municipality and provision of site specific storm water management measures.

SECTION 8: ENVIRONMENTAL IMPACT DESCRIPTION AND EVALUATION

8.1 Introduction

As required in terms of Appendix 1 of the EIA Regulations, 2014 (as amended), this section of the report describes the impacts and risks identified (physical and social) as a result of the proposed project, including:

- an indication of the preferred alternatives;
- the methodology used in determining and ranking the potential impacts;
- the nature, significance, consequence, extent, duration and probability of the impacts during all phases of the development;
- the degree to which these impacts can be avoided, managed, mitigated, reversed or may cause irreplaceable damage;
- positive impacts;
- cumulative impacts;
- mitigation measures to be implemented.

The impacts presented in this section were identified through the status quo of the environment, specialist input, experience of the EAPs and comment from I&APs.

8.2 Description of the preferred alternatives

Section 7 provides a detailed description of all alternatives investigated with regards to this project. As indicated in Section 7.6, the following alternatives are deemed feasible and will be assessed in Section 8.5:

Preferred Alternative	Description
Site: Portion 1 of Erf 20 and Portion 2 of Erf 21 (future Erf 23)	The proposed filling station will be located on Portion 1 of Erf 20 and Portion 1 of Erf 21, President Park X6, eMalahleni.
Business Alternative 3	A filling station to be established on the said property.
Alternative Layout 2 (Figure 8.1)	Convenience store, canopy, underground tanks and provision for the turning of fuel tankers.
Water provision Alternative 1	Water from eMalahleni Local Municipality and connect to existing water infrastructure of eMalahleni Local Municipality as per Figure 7.5 (subject to possible upgrading as required by the ELM if not already done as part of the retail centre development).
Electricity Alternative 1	Obtaining electricity from eMalahleni Local Municipality (subject to the installation of additional bulk services).
Sewage disposal Alternative 1	Connecting to existing sewer infrastructure of eMalahleni Local Municipality as per Figure 7.5.
Waste management Alternative 1	Waste collected by the eMalahleni Local Municipality and disposed of at the registered Leeuwpoort Waste Disposal Site.
Storm water management Alternative 2	Connecting to the existing municipal storm water system of the eMalahleni Local Municipality and provision of site specific storm water management measures.

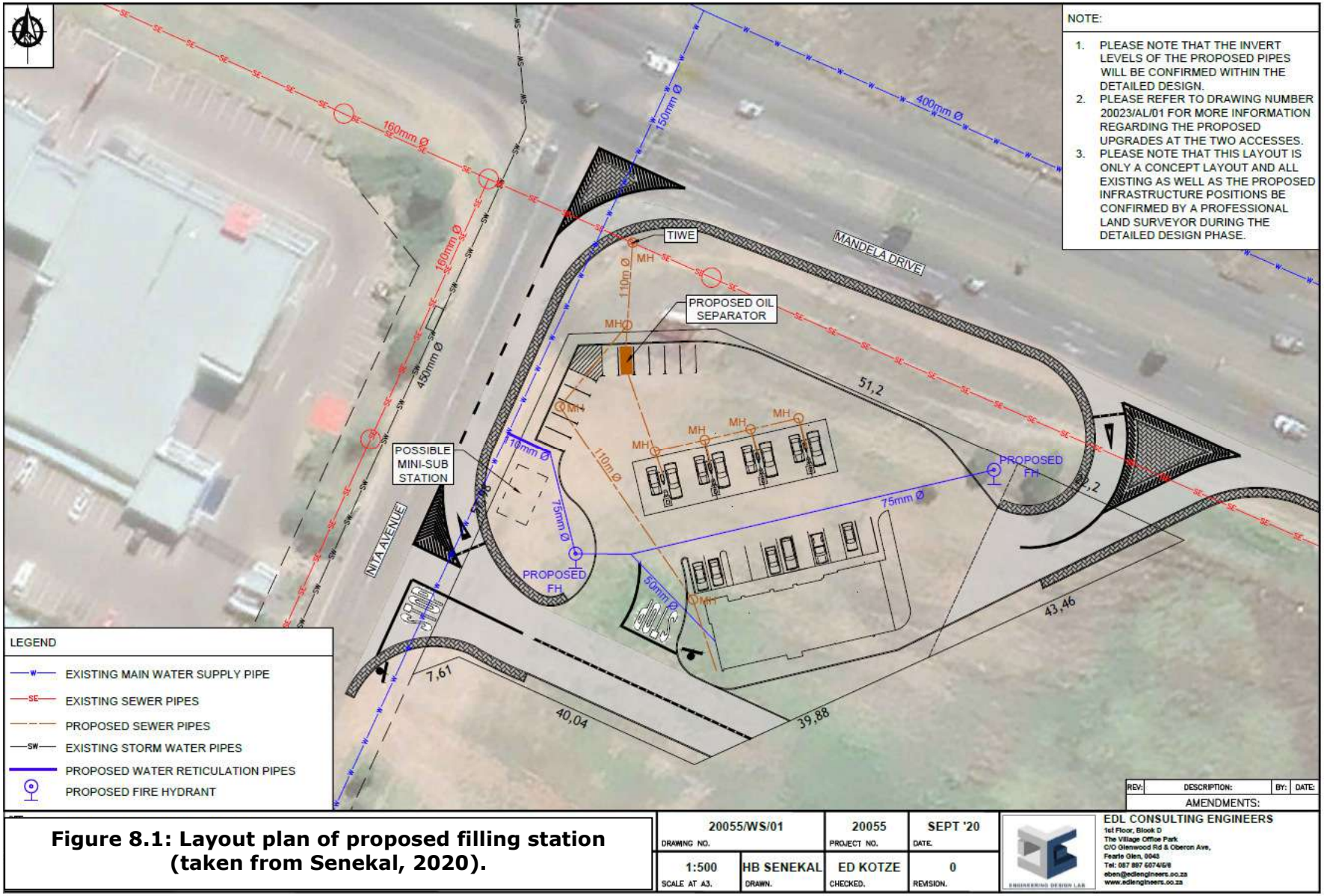


Figure 8.1: Layout plan of proposed filling station (taken from Senekal, 2020).

8.3 Development phases

The impact of the development has to be assessed in terms of the following development phases:

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

8.3.1 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.

No actual construction took place on site. Thus, no impacts are associated with the planning and design phase.

8.3.2 Construction phase

The proposed filling station will be developed on Portion 1 of Erf 20 (Figure 3.2), which is 4012m^2 in extent. In general, the proposed filling station (Figure 8.1) will consist of:

- Underground tanks/tank farm (93 Unleaded, 95 Unleaded and diesel);
- 4 Pump islands (above-ground fuel pumps and hose dispensers);
- Associated pump and tank infrastructure (e.g. delivery pipes, fillers, suction pumps, etc.);
- Canopy covered forecourt with 8 vehicle refuelling bays;
- Convenience store of ±300m²;
- Car parking (20 parking bays, including one for disabled persons);
- Delivery parking areas;
- Ablution facilities;
- Access roads from Mandela Drive and Nita Avenue;
- Storm water channel and containment slab with catchpit;
- Landscaped area surrounding site.

The filling station will be accessed via a left-in left-out road (which will cross Erf 21, Figure 3.2 and Figure 8.1) from Mandela Drive. Approximately 350m^2 will be used for the left-in left-out access road from Mandela Drive. An access point will also be provided from Nita Avenue (Figure 3.2 and Figure 8.1).

The construction phase would involve the following:

- Fencing of the site;
- Clearing and removal of waste (including building material, etc.) on site;
- Clearing of the remaining vegetation and topsoil;
- Levelling of the area;
- Excavation/earthworks for the underground tank pits, services trenches and building foundations;
- Installation of the underground tanks and associated infrastructure;
- Installation and connection of 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 from Nita Avenue and Mandela Drive;
- ❖ Surfacing/paving of the parking area;
- ❖ Rehabilitation of the disturbed areas (i.e. landscaping).

Section 8.5 provides details with regards to potential impacts identified during the construction phase.

8.3.3 Operational phase

The operational phase would involve the utilisation of the filling station and associated infrastructure (including access roads).

Section 8.5 provides details with regards to potential impacts identified during the operational phase.

8.4 Approach and methodology

This section presents the proposed approach to assessing the potential impacts, with the aim of determining the significance of these impacts. The impact will be determined for each aspect of the environment with and without the implementation of mitigation measures. This allows for a prediction of how the impact can be managed or mitigated. The evaluation of impacts is conducted in terms of the following criteria:

- **Nature of impact (i.e. description of the impact)**

- **Extent (i.e. spatial scope or geographical extent of the impact to the receiving environment)**

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 (i.e. length of permanence of the impact. In other words, how long will the impact last)**

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 (i.e. likelihood that the impact will occur)**

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/intensity of impact (i.e. degree of alteration to the affected receiving environment)**

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 (i.e. whether the impact will have a positive (beneficial) or negative (detrimental) effect on the receiving environment)**

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

- **Reversibility (i.e. whether the impact can be reversed or not)**

Reversible	Impact is reversible without incurring significant time and cost
Reversible (costly)	Impact is reversible only by incurring significant time and cost
Irreversible	Impact is irreversible

8.5 Description of potential impacts

The following section provides an indication of the environmental features that will be impacted (directly and indirectly) during the construction and operational phases of the proposed project.

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.

Please note: Only the most important mitigation measures associated with identified impacts are indicated in this section. The Environmental Management Programme Report (EMPr; included in Section 9 of this report) provides a comprehensive description of the various mitigation and management measures proposed to ensure minimal impact on the environment.

8.5.1 Topography

As indicated in Section 5.5, Erf 20 has not been developed (currently a vacant stand) but has been impacted by past activities, e.g. partly covered by imported fill some 1.0m thick (Van der Merwe, 2020).

The site is characterised by a flat topography sloping towards the northeast with an average gradient of roughly 3% to 4% (Van der Merwe, 2020).

Construction phase

The clearing of vegetation (0.4 ha), removal of the potentially collapsible and compressible sandy fill (some 1m thick) blanketing Soil Zone "B" and changes to the topography during construction (i.e. excavations, levelling of the site,

construction of buildings and parking area) would have a direct impact on the already impacted topography of the proposed filling station site (including access road area).

The excavation of the tank farm (for underground tanks) will have a temporary impact on the topography until such time that it is backfilled.

Operational phase
Direct impact on topography will continue in terms of the presence of the buildings (topographical highs) within an area where the topography has already been impacted as a result of past activities as well as the presence of surrounding businesses, roads, adjacent retail centre (if constructed), etc.

IMPACT ON TOPOGRAPHY					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Short	Highly probable	Low Negative	Low Negative	Reversible
OPERATIONAL PHASE					
Site	Long	Highly probable	Low Negative	Low Negative	Reversible

8.5.2 Geology

As indicated in Section 5.4, the site is underlain by rhyolite of the Selonsrivier Formation, Rooiberg Group.

As indicated in Section 5.4.2, Van der Merwe (2020) identified two Geotechnical Zones namely: Soil Zone "A" and Soil Zone "B" (Figure 5.6) and indicated that the proposed site can be developed subject to the implementation of mitigation measures as recommended.

Construction phase
In Soil Zone "A", soft excavation by backactor is foreseen to depths ranging between >2.3m and 4.0m below surface. The canopy (including pump islands) and tank farm (underground tanks) will be located within this area.

The convenience store (c-store) will be located within Soil Zone "B" where soft excavation by backactor is foreseen to depths ranging between 2.9m and 3.3m below surface while very hard excavation and light blasting is foreseen in the very soft rock felsite (Van der Merwe, 2020).

The direct impact on the underlying geology (rhyolite of the Selonsrivier Formation) will depend on the depth of excavations required for the underground tanks, foundations and service trenches. The possible impact on the underlying geology cannot be mitigated.

As already indicated, the canopy (including pump islands) and tank farm (underground tanks) will be located within Soil Zone "A" characterised by sandy and gravelly transported soils that are potentially collapsible and compressible. In order to avoid impact, the recommendations of Van der Merwe (2020) (e.g. deep strip foundations; compaction of in-situ soils below individual footings; soil raft; modified normal construction methods) must be implemented during the construction phase.

Before any construction (e.g. construction of the convenience store) takes place within Soil Zone "B", the potentially collapsible and compressible sandy fill blanketing this soil zone must be removed in order to expose the natural in

situ soils after which similar foundation methods as for Soil Zone "A" may be adopted (Van der Merwe, 2020).

In addition, disturbed ground conditions caused by previous activities (old borrow pits, test pits etc.) within Soil Zone "B" should be identified and carefully reinstated prior to the construction of rigid structures or paved areas, neglect to do this, may result in structural distress to buildings.

In both Geotechnical Zones, the mitigation measures recommended by Van der Merwe (2020) must be implemented in order to avoid any impact on the structures built.

Operational phase
During the operational phase, the buildings and associated infrastructure could continue to be impacted if the mitigation measures recommended by Van der Merwe (2020) are not implemented during the construction phase.

IMPACT OF GEOLOGY/GEOTECHNICAL ASPECTS					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Permanent	Definite	Medium Negative	Low Negative	Irreversible
OPERATIONAL PHASE					
Site	Permanent	Probable	Medium Negative	Low Negative	Irreversible

Proposed mitigation:

- *The mitigation measures recommended by Van der Merwe (2020) to be implemented as part of the construction phase.*

8.5.3 Soil

Most of Erf 20 falls within the Technosol group and more particularly, the Johannesburg soil form (i.e. soil profiles covered by concrete structures, cement and waste materials including building gravel) with a small portion within the Anthrosol group and more particularly, the Grabouw soil form. These soil forms are not suitable for agricultural purposes.

According to Venter (2020b), no hydric (wetland) soil forms are present on site.

A) Loss of arable land

None. The development of the proposed filling station site (including access road) would not impact on arable land as most of the site is covered by the Johannesburg soil form (i.e. soil profiles covered by concrete structures, cement and waste materials including building gravel) with a small portion within the Anthrosol group and more particularly, the Grabouw soil form. Both these soil forms are not suitable for agricultural purposes.

B) Disturbance of soil profiles

Construction phase
Before any construction takes place within Soil Zone "B", the potentially collapsible and compressible sandy fill blanketing this soil zone must be removed in order to expose the natural in situ soils (Van der Merwe, 2020).

During the construction phase, the underlying soil of Soil Zone "A" and Soil Zone "B" will be impacted in terms of soil structure, nutritional and chemical

values when the vegetation is removed, the remaining soil removed, the site sloped and buildings and associated infrastructure (including the tank farm (underground tanks)) are constructed/excavated. The soil will also be impacted in terms of stockpiling of topsoil, subsoil, overburden and rocks. The impact is however, considered low due to the transformed nature of the soil.

Operational phase
Direct impact on soil i.t.o. soil structure, nutritional and chemical values and soil compaction will continue due to the presence of the buildings, etc. on site.

DISTURBANCE OF SOIL PROFILES					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Short	Definite	Low Negative	Low Negative	Irreversible
OPERATIONAL PHASE					
Site	Long	Definite	Low Negative	Low Negative	Irreversible

C) Increase in erosion and sedimentation

Construction phase
The clearing of vegetation (0.4 ha), removal of the potentially collapsible and compressible sandy fill blanketing Soil Zone "B" and changes to the topography during construction (i.e. excavations, levelling of the site, construction of buildings and parking area) would result in changed runoff patterns and an increased risk of soil erosion and sedimentation if mitigation measures are not implemented. This could indirectly impact on the adjacent roads (Nita Avenue and Mandela Drive) and the existing storm water infrastructure in terms of erosion and sedimentation.

Operational phase
The presence of impermeable surfaces (i.e. buildings and parking area) would impact on the surface water runoff patterns (volume, intensity, infiltration) on site, which could lead to an increased risk of soil erosion if storm water management measures were not implemented during the construction phase and are not maintained during the operational phase. This could indirectly impact on the adjacent roads (Nita Avenue and Mandela Drive) and the existing storm water infrastructure in terms of sedimentation.

INCREASE IN EROSION AND SEDIMENTATION					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Short	Highly probable	Medium Negative	Low Negative	Reversible
OPERATIONAL PHASE					
Site	Long	Highly probable	Medium Negative	Low Negative	Reversible

Proposed mitigation:

- *The mitigation measures in Section 9 (EMPr) with regards to storm water management must be implemented during all phases of the development.*
- *Monitor for erosion and intervene and/or rehabilitate where necessary.*

D) Risk of soil pollution

Construction phase
Before any construction takes place within Soil Zone "B", the potentially collapsible and compressible sandy fill (some 1m thick) blanketing this soil zone must be removed in order to expose the natural in situ soils (Van der Merwe, 2020). Concrete structures, cement, waste materials (including building gravel), etc. could be present. The removal of this fill material could result in soil pollution if the said material is stockpiled and not immediately removed from site.

In addition, the remaining soil on site could be polluted if the construction vehicles are not maintained/repaired resulting in oil leaks and fuel spills, waste management measures are not implemented and proper ablution and sanitation facilities are not provided for the site workers to use on site.

Operational phase
Soil pollution could occur if:

- waste management measures are not implemented at the site (especially hazardous waste management e.g. oil cans, fuel spillages, etc.);
- the sewerage system (to be connected to the ELM sewer network) does not have sufficient capacity or was not properly installed resulting in sewage overflowing from the manholes;
- proper storm water control measures are not implemented and polluted runoff water (e.g. from fuel spillages, vehicles leaking oil, etc.) enters the municipal storm water system.

RISK OF SOIL POLLUTION					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Short	Probable	Medium Negative	Low Negative	Reversible
OPERATIONAL PHASE					
Site	Long	Probable	Medium Negative	Low Negative	Reversible

Proposed mitigation:

- *The waste management measures indicated in Section 9 (EMP) to be implemented during all phases of the development.*

8.5.4 Land use and sense of place

The proposed site is located within an established urban area and within the urban edge of eMalahleni.

According to the eMalahleni Spatial Development Framework (2015), Mandela Drive was identified as one of the activity spines/corridors where non-residential uses would be allowed in order to optimally utilize the visual exposure from the high traffic volumes along this road.

Construction phase
The proposed site (zoned for business purposes with consent use for a filling station) is currently vacant and in a state of neglect (overgrown, waste dumped, etc.). Once developed, the property should be well managed and no longer an eyesore to the general public.

The proposed left-in left-out access road from Mandela Drive will extend across the road reserve belonging to the eMalahleni Local Municipality (ELM). Approval

for the left-in access road was granted by the ELM (Appendix 10). The left-out access road can only be constructed once the intersection of Mandela Drive and Nita Avenue has been upgraded. The proposed access road would form part of the local road network and provide access to the proposed filling station thus not impacting on the sense of place.

Operational phase
The proposed filling station adjacent to Mandela Drive and Nita Avenue and adjacent to the proposed retail centre would be highly visible and would attract business. It therefore fits into the development plans of the eMalahleni Local Municipality and should not impact on the land use and/or sense of place of the area.

IMPACT ON LAND USE AND SENSE OF PLACE					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Short	Definite	Low Neutral	Low Neutral	N/A
OPERATIONAL PHASE					
Site	Long	Definite	Medium Positive	Medium Positive	N/A

8.5.5 Natural vegetation and animal life

As a result of past disturbances, the vegetation of the proposed filling station site (including the access road site) is highly modified/transformed with low species diversity. It no longer resembles the Rand Highveld Grassland vegetation type (Venter, 2020a). No threatened plant species were recorded. Venter (2020a) indicated that the vegetation on site is of low sensitivity.

The highly modified/transformed nature of the vegetation and the location of the site within an urban environment and within close proximity to residential areas (and domestic animals) provides limited (artificial) habitat for animal species (i.e. smaller fauna species). No suitable habitat for bullfrogs was identified on the proposed filling station site (including the access road site).

A) Destruction/loss of natural vegetation

Construction phase
The construction activities (filling station and access roads) would impact on ±0.4ha of the Modified Grassland vegetation unit (Venter, 2020a).
The removal of the said vegation would also result in the removal of invader plants which would have a positive impact on the natural environment and stop the spread thereof into the surrounding area.

Operational phase
No direct impact since no more vegetation would be removed. Alien vegetation could however, establish on site and spread to the surrounding area if alien plants are utilized in the gardens.

DESTRUCTION/LOSS OF NATURAL VEGETATION					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Short	Definite	Low Neutral	Low Neutral	N/A
OPERATIONAL PHASE					
Site	Long	Probable	Low Negative	Low Negative	Reversible

B) Impact on animal life

Construction phase
The proposed development could impact on the smaller fauna species noted in the area in terms of the destruction and loss of the Modified Grassland vegetation unit that could provide potential habitat. During construction, the species would either migrate out of the area to the open space areas located north of Mandela Drive and east of the site or in a worst-case scenario could be killed.

The development would not impact on the existing culvert underneath Mandela Drive that acts as a corridor for smaller species moving between the open space areas located north of Mandela Drive and east of the site.

Operational phase
No further direct impact on animal life is expected as no further construction activities will take place.

IMPACT ON ANIMAL LIFE					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Short	Probable	Medium Negative	Low Negative	Irreversible
OPERATIONAL PHASE					
None	None	None	None	None	N/A

Proposed mitigation:

- *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.*

The proposed filling station development (including access roads) will not impact on the Artificial ponding area (Figure 5.11) and the vehicle tracks where a Giant Bullfrog as well as eggs and tadpoles were discovered in January/February 2021. As indicated, these artificial depressions dried up within days and all tadpoles died before metamorphosis could be completed indicating that the site does not provide suitable habitat for the long-term survival of the said Giant Bullfrog population.

If the adjacent retail centre has not been development when construction of the proposed filling station takes place, then mitigation measures as recommended by the specialists should be implemented in order to prevent any potential indirect impacts on the Artificial ponding area (Figure 5.11) as a result of the construction activities.

IMPACT ON ANIMAL SPECIES OF CONSERVATION CONCERN					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Short	Improbable	Medium Negative	Medium Negative	Irreversible
OPERATIONAL PHASE					
None	None	None	None	None	N/A

Proposed mitigation:

- *The depression/artificial ponding area south of the site (Artificial Ponding area; Figure 5.11) to be demarcated as a NO-GO Area for all site workers*

in order to protect this temporary refuge for the Giant Bullfrogs that might be present at or may return to the area in following seasons.

- *Should Giant Bullfrogs be found during the construction phase, the MTPA must be notified and the bullfrogs must be removed by the appointed ECO and the MTPA Herpetologist to be relocated to the nearest suitable bullfrog habitat (i.e. Witbank Nature Reserve).*

8.5.6 Surface water (including wetlands and sensitive landscapes)

A) Direct impact on surface water environments (including wetlands)

Construction and Operational phases

None. The development of the proposed filling station site (including access roads) will not impact directly on any surface water environments (streams/rivers) or wetlands (Venter, 2020b).

B) Impact on surface water runoff velocity

Construction phase

The clearing of vegetation and changes to the topography during construction (i.e. removal of fill material (some 1.0m thick) from Soil Zone "B", excavations, levelling of the site, construction of buildings and parking area) would result in changed runoff patterns (volume, intensity, infiltration) and an increased risk of soil erosion and sedimentation if mitigation measures are not implemented. This could indirectly impact on the adjacent roads (Nita Avenue and Mandela Drive), the existing storm water infrastructure and the area located to the north of Mandela Drive (currently natural vegetation). The impact is expected to be minimal since the site is small (approximately 0.4ha) and relatively flat.

Operational phase

The buildings, parking area, access roads, etc. (covering an area of approximately 0.4ha) will increase the impermeable surfaces on site and decrease infiltration into the soil. This would impact on the surface water runoff patterns (volume, intensity, infiltration) on site, which could lead to an increased risk of soil erosion if storm water management measures were not implemented during the construction phase and are not maintained during the operational phase. This could indirectly impact on the adjacent roads (Nita Avenue and Mandela Drive), the existing storm water infrastructure and the area located to the north of Mandela Drive (currently natural vegetation).

IMPACT ON SURFACE WATER RUNOFF VELOCITY (EROSION, SEDIMENTATION, FLOODING)					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Short	Highly probable	Medium Negative	Low Negative	Reversible
OPERATIONAL PHASE					
Site	Long	Highly probable	Medium Negative	Low Negative	Reversible

Proposed mitigation:

- *The storm water management plan as indicated in Figure 3.3 to be implemented.*
- *The mitigation measures in Section 9 (EMPr) with regards to storm water management must be implemented during all phases of the development.*
- *Monitor for erosion and intervene and/or rehabilitate where necessary.*

C) Impact on surface water runoff quality

Construction phase
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 and proper ablution and sanitation facilities are not provided for the site workers to use on site.

Operational phase
Indirect pollution of surface water runoff could take place if:

- waste management measures are not implemented at the site (especially hazardous waste management e.g. oil cans, fuel spillages, etc.);
- the sewerage system (to be connected to the ELM sewer network) does not have sufficient capacity or was not properly installed resulting in sewage overflowing from the manholes;
- proper storm water control measures are not implemented and polluted runoff water (e.g. from fuel spillages, vehicles leaking oil, etc.) enters the municipal storm water system;

Surface water runoff may be polluted if fuel spills (minor or major) occur and remedial action is not immediately taken. In addition, vehicles may have small oil leaks resulting in oil accumulating on the forecourt surface over time. Indirect pollution of surface water runoff and downstream resources could thus take place if mitigation measures (e.g. oil separators) are not in place.

IMPACT ON SURFACE WATER RUNOFF QUALITY					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Short	Probable	Medium Negative	Low Negative	Reversible
OPERATIONAL PHASE					
Site	Long	Probable	Medium Negative	Low Negative	Reversible

Proposed mitigation:

- *The waste management measures as indicated in Section 9 (EMP) to be implemented during all phases of the development.*
- *The storm water management plan as indicated in Figure 3.5 must be implemented.*
- *Oil separator to be provided as indicated in Figure 3.3.*

8.5.7 Groundwater

Van Heerden (2020) indicated that groundwater contamination migration could occur directly from surface contamination or mobilize into the subsurface, along weathered fractured bedrock, bedding plane fractures and joints. However, based on the results of the hydrocensus and the aquifer classification map of South Africa, the aquifer underlying the site is a minor aquifer system (moderately-yielding aquifer system of variable water quality).

Van Heerden (2020) indicated that the proposed filling station can continue from a hydrogeological perspective subject to the implementation of the recommendations and mitigation measures (including monitoring) to protect the underlying aquifer.

Construction phase

Fuel and oil spillage during construction

With the use of heavy construction equipment comes the use of contaminants like fuel and oil. There is a possibility that some of this product could enter the environment if an incident should occur. Spills on surface can either run off the sealed areas into surface water drainage channels and surface water bodies. The aquifer will be very susceptible to any fuel or oil spill during construction. Mitigation measures as recommended by Van Heerden (2020) must be implemented in order to reduce the potential impact.

FUEL AND OIL SPILLAGE DURING CONSTRUCTION					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Short	Highly probable	Medium Negative	Low Negative	Reversible

Proposed mitigation:

- *The mitigation measures recommended by Van Heerden (2020) to be implemented as part of the construction phase.*

Removal of soil, subsoil and rock

The construction phase would involve the installation of the underground tanks, (i.e. removal of vegetation and excavation of pit for tanks). Depending on the tank size, installation takes place between 3m and 6m. Groundwater would therefore not be impacted as a result of the excavation activities as the water table is situated at 16m 9i.e. where seepage was encountered during the drilling phase). The buffer between the groundwater table and the underground tanks (installed on a worse-case scenario at 6m) will be 10m (Van Heerden, 2020).

REMOVAL OF SOIL, SUBSOIL AND ROCK DURING TANK INSTALLATION					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Short	Improbable	Low Negative	Low Negative	Irreversible

Potential Dewatering of Groundwater during Tank Installation

The underground tanks will be installed within geotechnical zone Soil Zone "A" where point water seepage was encountered in testpit PP2 (Figure 5.6) at a depth of 1.2m below surface. Van der Merwe (2020) mentioned that the ferricrete-rich soils indicate a possible seasonal perched water table in the wet season from surficial depths of between 0.2m and 0.6m below surface (Van der Merwe, 2020). However, no hydric (wetland) soil forms were identified on Erf 20 or the adjacent Erf 21 (Venter, 2020b).

The presence of a perched water table was also not recorded during the groundwater study (Van Heerden, 2020). During the drilling phase of Borehole MW1, seepage only was encountered at approximately 16 mbgl, and the static water level is 5.31 mbgl. It is unlikely that dewatering will be required based on the depth where seepage was encountered and based on the static water level of the newly drilled borehole on site (Van Heerden, 2020).

Operational phase

Despite rigorous operating procedures and mechanical integrity of equipment, some product may escape from containment to groundwater during site operations. Therefore, effective containment and controls must be put in place.

Hazardous Liquid (contaminants) Surface Spills

The most frequent spills are refuelling incidents, spills caused by leaking truck fuel tanks, filling of portable containers, filling of underground storage tanks either directly or through filler points. Hazardous liquids spilled on surface can run off the sealed areas into surface water drainage channels and surface water bodies. Surface spills can cause hazardous liquids to mobilize directly into the storm waters. It is highly unlikely that surface spills can enter the major shallow intergranular aquifer directly as seepage was found to be at 16m (Van Heerden, 2020). The areas susceptible to surface spills should be impermeable. The surface runoff will be routed to an oil separator as indicated in Figure 8.1.

HAZARDOUS LIQUID (CONTAMINANTS) SURFACE SPILLS					
OPERATIONAL PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Long	Probable	Medium Negative	Low Negative	Reversible

Proposed mitigation:

- *The mitigation measures recommended by Van Heerden (2020) to be implemented as part of the construction phase.*

Hazardous Liquid (Contaminants) Subsurface Leaks

Hazardous liquids can also be spilled under dispenser valves and flexible couplings, pipelines, tanks and off set fill pipes, faulty oil or water separator operations. Since the pipelines and underground storage tanks will be installed below the soil horizon (0-5 m), it may be assumed that the pollutants will travel directly into the intergranular aquifer, hereafter into the deeper fractured aquifer (Van Heerden, 2020).

HAZARDOUS LIQUID (CONTAMINANTS) SUBSURFACE LEAKS					
OPERATIONAL PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Local	Long	Probable	Medium-High Negative	Medium Negative	Reversible (costly)

Proposed mitigation:

- *The mitigation measures recommended by Van Heerden (2020) to be implemented as part of the construction phase.*

Migration of Contaminants

The vertical migration distance of the contaminants will be very short for the intergranular aquifer. The horizontal migration for the aquifer would be very high if the contaminants enter the aquifer. The hazardous liquids can then further either stagnate where it will form a secondary source of contamination or mobilize further into the fractured aquifer. Mobilization of hazardous liquids into the fractured aquifer can occur along the weathered fracture bedrock, bedding planes and through vertical fractures (Van Heerden, 2020).

Based on the hydrocensus, no nearby groundwater users were identified with the exception of BH1 (Highveld View, upstream of the proposed site). If development does occur in the future to the north of the site, then these nearby

groundwater users may be impacted in the instance of a leak, as the plume movement will be towards the north to northeastern direction (Van Heerden, 2020). Leak proof dip trays or membrane arrangement beneath the dispenser must be fitted. Pump sumps should be impervious to fuel and adequately protected against erosion and fitted with leak detectors. Fuel storage tanks installed below the ground should be of the corrosion resistant double skin or composite type and incorporate leak detection monitoring. The manholes should have secondary containment.

MIGRATION OF CONTAMINANTS					
OPERATIONAL PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Local	Long	Probable	Medium-High Negative	Medium Negative	Reversible (costly)

Proposed mitigation:

- *The mitigation measures recommended by Van Heerden (2020) to be implemented as part of the construction phase.*

8.5.8 Sites of archaeological and cultural interest

A) Impact on archaeological/cultural sites

Construction and operational phases

None. Van Vollenhoven *et. al.* (2020) indicated that no sites of cultural heritage significance were identified within the proposed site and that the development may therefore proceed (see Section 5.13.1 for further details).

B) Impact on palaeontology

Construction phase

None. As indicated in Section 5.13.2, the proposed site is underlain by volcanic rocks of the Selonsrivier Formation, Rooiberg Group, which has a 'Low' palaeontological sensitivity with no fossils having been recorded (Fourie, 2020). Based on the findings of the desktop study, Fourie (2020) raised no objection to the proposed development and indicated that the development may go ahead.

Operational phase

The operational activities will have no direct or indirect impact on the palaeontology of the site as no further construction will take place.

8.5.9 Air quality

As indicated in Section 5.11, the eMalahleni area forms part of a national air pollution hotspot known as the Highveld Priority Area. The proposed site is thus located within this air quality hot spot where the air quality is predominately governed by the various industrial and mining activities in and around eMalahleni.

A) Impacts in terms of dust

Construction phase

Dust generation and vehicle emissions due to construction activities and use of heavy machinery could impact on site workers, patrons of the Portuguese Club and Casa Portuguesa Restaurant, adjacent landowners/users (e.g. Nissan, Highveld View Estate, Indlela Lodge) and road users utilising Nita Avenue and

Mandela Drive. The tenants and customers to the adjacent retail centre could also be impacted if the said centre has already been developed. The extent of the impact would depend on the time of year, wind direction (which is predominantly easterly and northerly winds), wind velocity and mitigation measures in place.

Operational phase
During the operational phase, no direct impact on the air quality is anticipated due to the development being supplied with electricity.

The roads (internal and access) and parking areas would be paved and/or tarred and therefore no dust generation will take place.

IMPACT IN TERMS OF DUST					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Short	Highly probable	Medium Negative	Low Negative	Reversible
OPERATIONAL PHASE					
Site	Long	Highly probable	Low Negative	Low Negative	Reversible

Proposed mitigation:

- *Dust suppression measures to be implemented on site during the construction phase (see Section 9 (EMPr) for details).*

B) Impacts in terms of odours

Construction phase
During construction, the air quality of the site and surroundings could be impacted in terms of odours if the chemical toilets used are not maintained and proper waste management measures are not implemented.

Operational phase
The air quality of the site and surroundings could be impacted in terms of:

- Odours if the sewer system (to be connected to the existing ELM sewer network) does not have sufficient capacity, is not maintained or was not installed properly resulting in sewage overflowing from the manholes;
- Odours if proper waste management measures are not implemented;
- Fumes from the fuel pumps if these facilities are not managed according to the set requirements;
- Vent gasses from vent pipes and the interceptor chamber, if the vent pipes are not positioned away from buildings;
- Odours and gasses, if petroleum spills occur and the necessary contingency plan is not in place.

This could impact on adjacent landowners/users (e.g. Nissan, Highveld View Estate, Indlela Lodge) and road users utilising Nita Avenue and Mandela Drive. The tenants and customers to the adjacent retail centre could also be impacted if the said centre has already been developed.

IMPACT IN TERMS OF ODOURS					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Short	Probable	Medium Negative	Low Negative	Reversible
OPERATIONAL PHASE					

Site	Long	Probable	Medium Negative	Low Negative	Reversible

Proposed mitigation:

- *The waste management measures as indicated in Section 9 (EMPr) to be implemented during all phases of the development.*
- *The sewerage infrastructure to be properly installed and well maintained.*
- *Vent pipes and the interceptor chamber to be positioned away from buildings.*

8.5.10 Noise

As indicated in Section 5.12, the ambient noise of the proposed site and surrounding area is predominantly governed by traffic utilizing Nita Avenue/Mandela Drive/nearby N4 national road; business, recreational, institutional and residential activities taking place in the surrounding area; blasting at the nearby Afrisam Aggregates and Ready-mix quarry/facility.

Construction phase

Heavy machinery used and possible blasting during the construction phase will contribute to increased ambient noise levels in the immediate area, which could impact on the construction workers, residents living at Highveld View Estate, adjacent businesses (e.g. Nissan Dealership, Portuguese Club, Casa Portuguesa Restaurant, etc.) as well as road users utilising Nita Avenue and Mandela Drive. The tenants and customers of the adjacent retail centre could also be impacted if the said centre has already been developed. Construction noise cannot really be mitigated, but would be of short duration.

Operational phase

Some operational noise would be created in the form of increased numbers of people and vehicles visiting the filling station. The impact is however, expected to be insignificant since the proposed site will be located adjacent to a proposed retail centre.

IMPACT IN TERMS OF NOISE					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Short	Highly probable	Medium Negative	Medium Negative	Reversible
OPERATIONAL PHASE					
Site	Long	Highly probable	Low Negative	Low Negative	Reversible

Proposed mitigation:

- *The mitigation measures in terms of noise as indicated in Section 9 (EMPr) to be implemented.*

8.5.11 Visual aspects

As indicated in Section 5.15, the site is highly visible from Mandela Drive, Nita Avenue and all the adjacent properties (e.g. Nissan Dealership, Highveld View Estate, Casa Portuguesa restaurant, open veld, etc.) and to an extent from the Highveld Mall.

Construction phase

The proposed site is currently vacant and in a state of neglect. Once developed, the property should be well managed and no longer an eyesore to the general public.

Construction activities would be highly visible from Mandela Drive, Nita Avenue and all the adjacent properties (e.g. Nissan Dealership, Highveld View Estate, Casa Portuguesa restaurant, open veld, etc.) and to an extent from the Highveld Mall. It would also be visible from the adjacent retail centre if the said centre has already been developed.

Operational phase

Residents of Highveld View Estate, patrons visiting the Portuguese Club and the Casa Portuguesa Restaurant, clients visiting the Nissan Dealership as well as road users utilising Mandela Drive and Nita Avenue could be negatively impacted in terms of visual aspects if the filling station is not maintained and is not kept neat and tidy. The tenants and customers of the adjacent retail centre could also be impacted if the said centre has already been developed.

IMPACT IN TERMS OF VISUAL ASPECTS					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Short	Highly probable	Low Neutral	Low Neutral	Reversible
OPERATIONAL PHASE					
Site	Long	Probable	Low Negative	Low Negative	Reversible

8.5.12 Traffic

As indicated in Figure 8.1, the filling station will be accessed via a 'left-in left-out' access road from Mandela Drive, approximately 100m east of the intersection of Mandela Drive and Nita Avenue (Figure 5.19). A 'Full' access will be provided from Nita Avenue, approximately 80m south of the intersection of Mandela Drive and Nita Avenue (Figure 5.19).

Van Rooyen (2020a) indicated that these accesses will have very little impact on passing traffic due to new deceleration lanes to be provided (Figure 5.19).

Construction phase

All construction activities will take place on site and will not directly impact on traffic utilising the surrounding road network (i.e. Nita Avenue and Mandela Drive).

During the construction phase, construction vehicles or even abnormal vehicles or delivery vehicles could affect and/or disrupt current traffic flows. During this phase, possible traffic congestion or increase in congestion, temporary obstructions in the roadway and the influence on adjacent development must be considered (Van Rooyen, 2020a).

The construction of the new access road from Mandela Drive (left-in left-out access, Figure 8.1) and the one access point from Nita Avenue (Figure 8.1) could impact on road users/motorists. The impact is however, expected to be low and short term.

IMPACT IN TERMS OF CONSTRUCTION TRAFFIC					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Short	Highly Probable	Low Negative	Low Negative	Reversible

Operational phase

All operational activities will take place on site and will thus not have a direct impact on traffic in the surrounding area.

The balance of Erf 20, Erf 21 and Erf 22 (total about 26 254m^2) will be used to develop a 12 000m^2 (Gross Leasable Area (GLA)) shopping/retail centre adjacent to the filling station. The proposed retail centre will be accessed from Mandela Drive (left-in only) and two full access points from Nita Avenue. These access roads were approved by the eMalahleni Local Municipality.

The operation of the retail centre would result in an increase in cars, buses and taxis in the area as well as the demand for fuel at the site. It will add approximately 4200 vehicles per day with an AADT trip rate of 35 vehicles/100m^2/day. From the above, it is clear that the future traffic demand will increase significantly.

In general, filling stations intercept trips from the background traffic as opposed to other developments (e.g. proposed retail centre) that generate additional trips. The operational activities should thus not lead to an increase in traffic in the area. However, the interception of traffic could cause minor disruptions if not considered thoroughly (Van Rooyen, 2020a).

As indicated in Figure 8.1, the filling station will be accessed via a 'left-in left-out' access road from Mandela Drive, approximately 100m east of the intersection of Mandela Drive and Nita Avenue (Figure 5.19).

A 'Full' access will be provided from Nita Avenue, approximately 80m south of the intersection of Mandela Drive and Nita Avenue (Figure 5.19). Van Rooyen (2020a) indicated that this access will have very little impact on passing traffic due to a new turning lane to be provided (Figure 5.19).

Van Rooyen (2020a) indicated that the existing traffic passing the site will not be negatively affected by the proposed filling station's operation, if proper access design standards, turning and deceleration lanes (where applicable) and appropriate signage are provided as part of the overall design of the proposed filling station.

The ELM however, did not approve the left-out access road from Mandela Drive (Appendix 10) in view of the current traffic congestion experienced during peak time hours at the intersection of Mandela Drive and Nita Avenue. The ELM indicated that the intersection must be upgraded to ease the congestion and to accommodate the left-out access from the said site.

IMPACT ON TRAFFIC IN TERMS OF ACCESS ROAD FROM MANDELA DRIVE					
OPERATIONAL PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Short	Highly Probable	Medium Negative	Low Positive	Reversible

Proposed mitigation:

- *The intersection of Mandela Drive and Nita Avenue to be upgraded (i.e. conversion of the 'All-way' stop to a 'two-phase' signalised intersection as recommended by Van Rooyen, 2020b) before the construction and implementation of the left-out access road from Mandela Drive.*
- *The access roads to the filling station to be constructed according to approved designs.*

In planning a filling station, provision must be made for a fuel delivery vehicle to safely enter and exit the site. The layout of the proposed filling station was revised (Figure 3.4) in order to accommodate fuel delivery vehicles and light vehicles visiting the filling station and ensuring sufficient area to turn.

8.5.13 Interested and Affected Parties

The proposed filling station site belongs to the project applicant and therefore no other landowner will be directly impacted in terms of the development of the said site (i.e. in the short term and/or long term).

A) Positive impacts on Interested and Affected Parties (I&APs)

Construction and operational phases

The proposed development could have the following positive impacts on I&APs:

- During the construction phase, the site will be cleared of all waste, etc. thus improving the visual aspect of the site and reducing the current health and safety risk.
- The proposed development would lead to employment opportunities during the construction and operational phases.
- The filling station would be easily accessible to people travelling along Mandela Drive and Nita Avenue.
- The proposed filling station will be convenient (in terms of refuelling and purchasing of items such as bread and milk) for residents of the Del Judor x4 residential area.
- The development would also be convenient for visitors to the adjacent retail centre and the nearby Highveld Mall as they would be able to refuel and not have to travel further along Mandela Drive.
- Upgrading of the road intersection (Mandela Drive/Nita Avenue) would improve the current traffic situation in the area which would benefit all I&APs utilising the said roads.

POSITIVE IMPACTS ON I&APs					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Short	Highly probable	Medium Positive	Medium Positive	N/A
OPERATIONAL PHASE					
Site	Long	Highly probable	Medium Positive	Medium Positive	N/A

B) Potential negative impacts on Interested and Affected Parties (I&APs)

Construction and operational phases

The proposed development could have the following negative impacts on I&APs:

- During the construction phase, contractors working on site could be directly impacted upon if the necessary safety and occupational health measures are not adhered to.
- The connection of services (water, electricity, sewage) to the municipal infrastructure could impact on the residents of Del Judor X4 and the surrounding businesses.
- The construction of access roads to the site (i.e. from Nita Avenue and Mandela Drive) could impact on the road users.
- Road users could also be impacted should any services or storm water infrastructure be constructed across Nita Avenue and Mandela Drive.

- The municipality and its users could be impacted if the water pipeline located adjacent to Nita Avenue or the sewer line located adjacent to Mandela Drive are damaged in any way during the construction of the access roads to the site.
- The construction of the left-in left-out access road from Mandela Drive would extend over the road reserve belonging to the ELM. The ELM approved the construction of the left-in access road but not the left-out road (i.e. until such time that the intersection is upgraded).
- The construction of the left-in left-out access road from Mandela Drive would extend over the road reserve and thus impact on pedestrians utilising this area.
- Other impacts in terms of the natural environment, noise, odours, visual, traffic, etc. are indicated in the preceding sections.

NEGATIVE IMPACTS ON I&APs					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Short	Highly probable	Medium Negative	Low Negative	Reversible
OPERATIONAL PHASE					
Site	Long	Highly probable	Medium Negative	Low Negative	Reversible

Impact of fire/explosion

The employees, adjacent land users and customers of the filling station could be directly impacted upon should the necessary safety measures not be implemented at the filling station and a fire/explosion occurs.

FIRE/EXPLOSION					
OPERATIONAL PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Long	Improbable	High Negative	Medium Negative	Reversible

Impact on other filling stations

The proposed filling station mainly caters for westbound traffic along Mandela Drive.

The proposed filling station is expected to take between 5% and 10% from seven (7) competitor sites (Table 7.2b), with 16 sites expected to be impacted less than 5%.

From Table 7.2b, it can be concluded that the initial impact on the competitors will be low, mainly due to the competitor sites serving different markets and located on the opposite side of the road thus serving different traffic streams (Van Rooyen, 2020a).

The existing TOTAL N4 Business Park (Figure 7.2) is also located on the opposite side of Mandela Drive and will be the most affected (10% impact; Table 7.2b). According to Van Rooyen (2020a), this filling station will be able to recover most of the lost sales within 3 to 4 years after the proposed filling station is constructed, due to the positive traffic growth in eMalahleni.

The proposed site will thus have an initial negative impact (between 5% and 10%) on a number of existing filling stations (Table 7.2a). The impact should not irreparably jeopardize these businesses in view of the different markets and traffic streams catered for as well as the distances away from the proposed

filling station. Van Rooyen (2020a) indicated that with the positive traffic growth in the area, these sites will be able to recover within 3 – 4 years of the new filling station being implemented.

IMPACT ON OTHER FILLING STATIONS					
OPERATIONAL PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Long	Highly probable	Medium Negative	Medium Negative	Reversible

8.6 Cumulative impacts

Due to the disturbed nature and location of the site as well as the small scale of the proposed development (approximately 0.4ha), no significant cumulative impacts are expected in terms of the following: topography, geology, soil, land use, vegetation, animal life, surface water (including wetlands), groundwater, air quality, noise, sites of archaeological and cultural sensitivity.

In general, filling stations intercept trips from the background traffic as opposed to other developments (e.g. proposed retail centre) that generate additional trips. The operational activities should thus not lead to an increase in traffic in the area. However, the interception of traffic could cause minor disruptions if not considered thoroughly (Van Rooyen, 2020a). Proper access points must be constructed and the intersections upgraded as indicated by Van Rooyen (2020a) in order to prevent a potential impact on the general road user.

The proposed development together with all other developments in eMalahleni would impact on the services (e.g. water, sewage, electricity, roads, etc.) provided by the local municipality. Some upgrades in terms of the water pipelines, electrical infrastructure and the storm water system are necessary before the development can be connected to these services. The eMalahleni Local Municipality must ensure that the required services can be provided and that there is sufficient capacity at the sewage works to cater for the additional development.

8.7 '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 filling station was exercised, it could mean that:

- The applicant would have to investigate other land uses (e.g. retail) for the site in line with the existing zoning (i.e. Business 2).
- The applicant would have to investigate alternative sites for the proposed filling station.
- A prime development site would stay vacant and not be able to reach its full development potential benefitting the community of eMalahleni.
- The site would remain unkempt, posing a health and safety risk to residents living in the nearby residential area as well as eMalahleni as a whole.

- The eMalahleni Local Municipality would not be able to meets its goal of developing the said area in line with the Spatial Development Framework (2015).
- Potential employment opportunities for residents of the nearby residential area and eMalahleni as a whole would be lost.
- Other potential uses for the site would have to be investigated.
- The applicant could sell the property.
- The applicant would have to discard the proposed development plans.

8.8 Concluding remarks

In view of the highly disturbed nature of the site, the proposed development of the filling station would have an overall low negative impact.

Medium negative impacts as a result of the proposed development of the site are anticipated in terms of geology/geotechnical aspects, soil, air quality, surface water, groundwater, noise, traffic. These potential impacts can be reduced by implementing the mitigation measures as indicated in Section 9 (EMPr) of this report.

SECTION 9: ENVIRONMENTAL MANAGEMENT PROGRAMME

9.1 Definition and objectives

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 (Lochner, 2005).*

As indicated in Regulation 19(4) of the EIA Regulations, 2014 (as amended), an Environmental Management Programme (EMPr) must form part of the Basic Assessment Report and must be in accordance with Appendix 4 of the EIA Regulations, 2014 (as amended).

According to the EIA Regulations, 2014 (as amended), an EMPr must include-
(d) A description of the impact management objectives, 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 8).

9.2 Contact details of Environmental Assessment Practitioner

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 Assessment Practitioner who prepared the EMPr are provided in Section 2 of this Basic Assessment Report.

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

9.3 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.

The proposed filling station will be developed on Portion 1 of Erf 20 (Figure 3.2), which is 4012m^2 in extent. The filling station will comprise of underground petrol and diesel tanks (23 000ℓ x 5), fuel pumps, a canopy covered forecourt and a convenience store.

The filling station will be accessed via a left-in left-out road (which will cross Erf 21, Figure 3.2 and Figure 3.3) from Mandela Drive. Approximately 350m^2 will be used for the left-in left-out access road from Mandela Drive. An access point will also be provided from Nita Avenue (Figure 3.2 and Figure 3.3).

The said site is located within the urban edge of the eMalahleni Local Municipality. Services (water, sewage, electricity, etc.) will be provided by the eMalahleni Local Municipality. The link services (roads and electricity) and the internal reticulation (water, sewer, electricity and lighting) of the development will be done by the developer to the satisfaction of the eMalahleni Local Municipality.

Planning, design 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. No actual construction (pre-construction or construction) took place on site. Thus, no impacts are associated with the planning and design phase.

Construction phase (12-18 months)
The construction phase would involve the following:

- Fencing of the site;
- Clearing and removal of waste (including building material, etc.) on site;
- Clearing of the remaining vegetation and topsoil;
- Levelling of the area;
- Excavation/earthworks for the underground tank pits, services trenches and building foundations;
- Installation of the underground tanks and associated infrastructure;
- Installation and connection of 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 from Nita Avenue and Mandela Drive;
- Surfacing/paving of the parking area;
- Rehabilitation of the disturbed areas (i.e. landscaping).

Section 8 provides further details with regards to potential impacts identified.

Operational phase (unknown timeframe)
The operational phase would involve the utilisation of the filling station and associated infrastructure (including access roads).

Section 8 provides details with regards to potential impacts identified during the operational phase.

9.4 Sensitivity mapping

An EMPr must provide -
(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.

Section 5 of this Basic Assessment Report provides a description of the biophysical environment of the site.

No sensitive landscapes are present on the proposed filling station site as indicated in Figure 9.1.

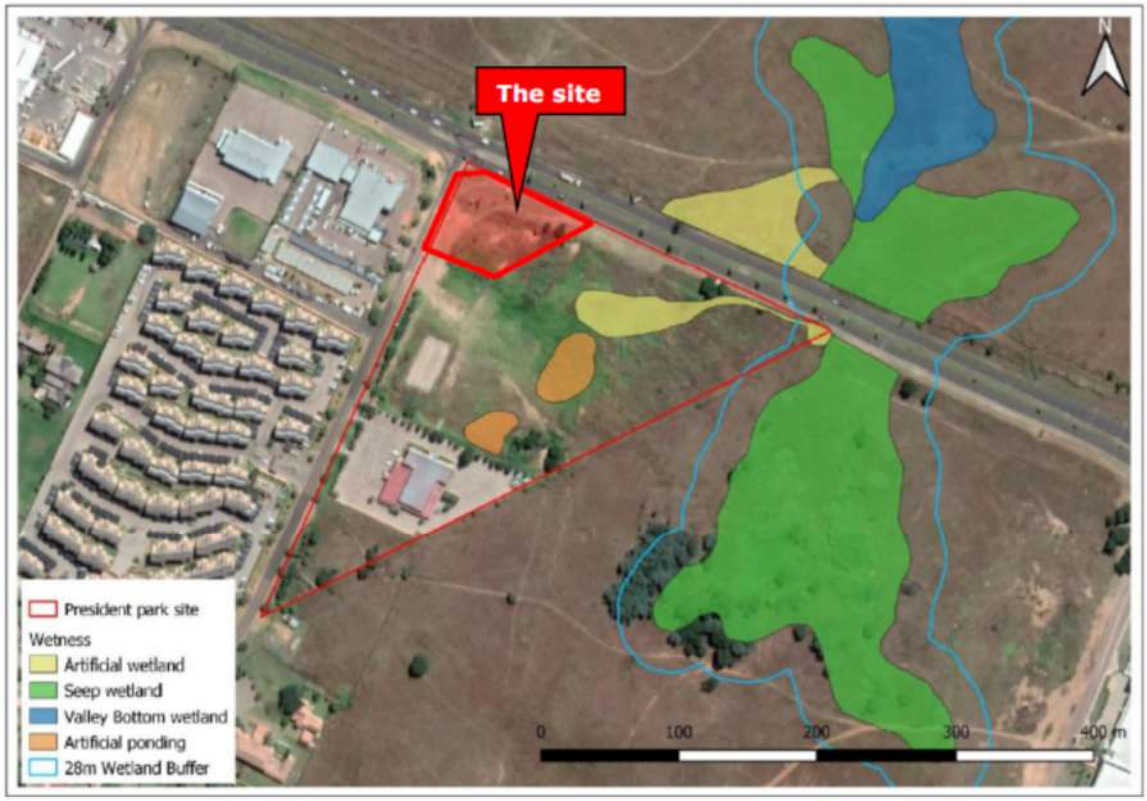


Figure 9.1: Site sensitivity (taken from Venter, 2020b)

9.5 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.

Before any construction can commence, the following will be required:

- Environmental Authorisation in terms of the Environmental Impact Assessment Regulations, 2014 (as amended).
- Approval from the eMalahleni Local Municipality with regards to the left-out road from the proposed filling station to Mandela Drive (i.e. after the upgrading of the intersection of Mandela Drive and Nita Avenue has been completed).

9.5.1 Construction site office

Impact management outcome:

1) *To ensure that an appropriate site is selected for the construction site office and that the construction 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 area within the site boundaries must be selected, demarcated and fenced for the construction site office. It is recommended that the construction site office be placed adjacent to Nita Avenue within the site boundaries of Portion 1 of Erf 20 where it will be easily accessible. This placement would also prevent contractors from accessing the site directly from Mandela Drive.
b. The construction site office may not be placed outside the boundaries of Portion 1 of Erf 20.
c. No overnight accommodation may be provided at the construction site office.
d. 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.
e. Potable water must be made available to site workers.
f. Proper waste management facilities must be provided as part of the construction site office.
g. An area for the parking of construction vehicles and other vehicles should be clearly demarcated within the boundaries of Portion 1 of Erf 20, close to the construction site office. When not in use, all vehicles should be parked within this area.

9.5.2 Construction activities

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 must comply with the conditions of the issued Environmental Authorisation.
c. The preferred layout plan (Figure 8.1) must be implemented with regards to the position of the filling station and the access roads.

d. If the adjacent retail centre has not been constructed, the following must be demarcated before any construction takes place:
   - The depression/artificial ponding area in the southern portion of Erf 21 (Figure 9.1) must be demarcated and left intact to act as a temporary refuge for Giant Bullfrogs that might be present at or may return to the area. These areas must be demarcated as No-Go Areas and all site workers must be informed thereof.

e. Site Environmental Control Officer (SECO): Before construction commences the applicant must appoint a person who will be responsible for the day-to-day implementation of the EMPr (including Environmental Awareness Training) and who will report to the site manager.

f. Environmental Control Officer (ECO): The applicant must also appoint an ECO who will have the responsibility of monitoring and reporting on compliance (on a monthly basis) with the conditions of the Environmental Authorisation as well as monitoring and reporting on the implementation of the EMPr.

g. All construction activities must be limited to the said site. The said site must be properly demarcated/fenced and the footprint kept as small as possible.

h. Only one access point should be provided from Nita Avenue during the construction phase. No access from Mandela Drive should be provided.

i. No construction activities may take place within the road reserve of Mandela Drive or Nita Avenue without prior approval from the eMalahleni Local Municipality.

j. Care must be taken not to impact on the ELM sewer line located on the northern boundary of the site (i.e. within the Mandela Drive road reserve) or the ELM water pipeline located on the western boundary of the site (i.e. within the Nita Avenue road reserve).

k. The necessary upgrades in terms of services (water, electricity) and traffic as recommended by the project engineers must be done.

l. No stockpiling of building material/spoil or dumping of building waste may take place on adjacent properties.

m. Area to be cleared of vegetation at any one time must be limited in order to reduce the potential for dust generation during the windy months and erosion during the rainy season.

n. No removal of vegetation may take place outside of the site boundaries.

o. Dust suppression measures must be implemented during dry and windy periods. Water for dust suppression must be obtained from the ELM and not from any surface water sources (nearby rivers/streams).

p. For safety purposes, excavations must not be undertaken until such time as all required materials are available and services can be laid. Excavations should be closed as soon as is practically possible.

q. All construction activities must be limited to daylight hours (7am – 6pm) and weekdays (Monday to Friday) in order to prevent any impact on the surrounding residents.

r. All machinery used during the construction phase must be properly muffled and maintained so as to reduce noise generation to a minimum. The eMalahleni Noise Control By-Law, 2016 must be complied with.

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

Archaeological and palaeontological remains

- If any archaeological remains or historical material are exposed during the construction phase, construction at the affected area must cease immediately and the Provincial Heritage Resources Authority and SAHRA's APM Unit 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).
- The area should be demarcated in order to prevent any further work until an investigation has been completed.
- An archaeologist should be contacted immediately to provide advice on the matter. Should it be a minor issue, the archaeologist will decide on future action. Depending on the nature of the find, it may include a site visit.
- If needed the necessary permit from SAHRA must be applied for. This must be done in conjunction with the appointed archaeologist.
- The removal of the archaeological material may only be done by the archaeologist once approval has been granted by SAHRA and in accordance with any conditions stipulated by SAHRA.
- Work on site will only continue after the archaeologist/SAHRA has agreed thereto.
- 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.
- The appointed Site ECO must familiarise him- or herself with the Vryheid Formation and its fossils. Alternatively, a palaeontologist to be involved during the digging and excavation (ground breaking) phase of the development. If any palaeontological material is exposed (during digging, excavating, drilling or blasting) SAHRA must be notified, all construction activities must be stopped, a 30 m no-go barrier constructed and a palaeontologist called to determine proper mitigation measures. A protocol for finds and management plan are provided in Appendix 2 of Appendix 5 of the Basic Assessment Report.

Animal life

Impact management outcome:

1) *To minimize the potential impact on animal life (especially Giant Bullfrogs) that may be present on site (especially if the adjacent retail centre has not been developed).*

Mitigation and management measures:

a. Before any construction takes place, the depression/artificial ponding area in the southern portion of Erf 21 (Figure 9.1) must be demarcated and left intact to act as a temporary refuge for Giant Bullfrogs that might be present at or may return to the area. This area must be demarcated as a No-Go Area and all site workers must be informed thereof.
b. Should Giant Bullfrogs be found during the construction phase, the MTPA must be notified and the bullfrogs must be removed by the appointed ECO and the MTPA Herpetologist to be relocated to the nearest suitable bullfrog habitat (i.e. Witbank Nature Reserve).
c. Commence with clearing of vegetation from the western side and progressively continue in an easterly direction to provide mobile fauna (e.g. birds and hare, when present) with an opportunity to leave the site and move into the vacant land to the east without

becoming isolated or threatened (e.g. mortalities) by earthmoving equipment.

d. 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.
e. All site workers/contractors must be informed that no poaching/trapping of animals will be allowed on the vacant property east and north of the site.

Soil/Geotechnical aspects

Impact management outcome:

1) To ensure that the buildings are not impacted upon by taking into account the geotechnical aspects of the site as recommended by Van der Merwe (2020).

Mitigation and management measures:

a. Before any construction takes place within Soil Zone "B", the potentially collapsible and compressible sandy fill (some 1m thick) blanketing this soil zone must be removed in order to expose the natural in situ soils (Van der Merwe, 2020). Concrete structures, cement, waste materials (including building gravel), etc. could be present. An area for temporary stockpiling of this material (i.e. before removal from site) must be demarcated within the boundaries of the site.
b. Within Soil Zone "A", one of the following foundation solutions to be considered for the construction of proposed rigid, single-storey, masonry residential structures: Deep strip foundations; Compaction of in-situ soils below individual footings; Soil raft; Modified normal construction. Further details provided in Appendix 7.
c. Disturbed ground conditions caused by previous activities (old borrow pits, test pits etc.) to be identified and carefully reinstated prior to the construction of rigid structures or paved areas. Neglect to do this, may result in structural distress to buildings.
d. At the time of construction, a competent person must inspect all foundation excavations to ensure that the materials are adequate for the proposed structures and that they adhere to the geotechnical recommendations.
e. The placement of the fill must be controlled with suitable field tests to confirm that the required densities are achieved during compaction and that the quality of fill material is within specification (Van der Merwe, 2020).

Management measures in terms of soil and storm water runoff

Impact management outcome:

1) To ensure that 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 (during the construction and operational phases) on the buildings and parking area, storm water infrastructure, adjacent roads and landowners/users and the downstream area (located to the north of Mandela Drive) in terms of soil erosion, sedimentation and flooding.

a. During construction, 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 contour berms and other suitable structures (e.g. geo-

textile silt fences, gabions, placement of bales or the use of sandbags) to ensure flow velocities are reduced.

b. Sediment controls (e.g. geo-textile silt fences and silt traps) should be placed immediately downslope of the construction footprint to intercept sediment. The same measures should be put in place downslope of soil or materials stockpiles.
c. If soil erosion is noted, appropriate remediation measures must be implemented.

Impact management outcome:

3. To reduce the potential impact of storm water drainage from the site on the surrounding area in terms of water flow, flooding and soil erosion during the operational phase.
4. To reduce the potential impact of ponding on the underground tanks during the operational phase.

Mitigation and management measures:

a. The surface water management measures as indicated in Section 3.2.3 and Figure 3.3 to be implemented.
b. The road pavement and forecourt area to be paved and sloped as per an approved storm water management plan.
c. No ponding of water to occur on site, which could impact on the underground fuel storage tanks and therefore the groundwater of the site.
d. Areas susceptible to contamination or tanker off-loading points should be impermeable to hydrocarbons. Run off should be controlled by appropriate drainage to an oil separator connected to a sewer. Surface spillages that occur must be directed to the oil separator before discharge into the municipal sewer (Van Heerden, 2020).
e. 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.
f. The following additional measures should be implemented: debri and rubbish to be removed from kerb inlets and conduits during routine inspections; sediment to be removed especially after the first couple of months of installation as un-surfaced areas contribute a lot of sand/debri; debri, silt, etc. to be disposed of at an approved landfill site (if contaminated); stone pitching or gabion work to be repaired after major flooding; check on structural integrity of kerb inlets; damaged kerb inlets could lead to uncontrolled erosion downstream.

Impact management outcome:

5) To ensure that the construction and operational phases do not impact on the surface water run-off quality.
6) To prevent the contamination of clean storm water runoff, the surrounding surface water run-off, the surrounding soil and the area located to the north of Mandela Drive.

Mitigation and management measures:

a. The surface water management measures as indicated in Section 3.2.3 and Figure 3.3 to be implemented.
b. The waste management measures as indicated must be implemented during both the construction and operational phases.
c. Regular maintenance of the sewage infrastructure to reduce the potential for blockages and leaks and thus prevent potential water pollution.

d. The forecourt to be located on top of a concrete containment slab.
e. Rain that falls onto the canopy (roof) of the filling station to be treated as clean water and routed separately to the overall storm water management system.
f. Areas where spillages may occur must be sealed to prevent the ingress of water into the soil.
g. A storm water channel with catchpit to be installed along the southern boundary of the forecourt to capture any polluted runoff water.
h. The catchpits to be checked and emptied on a weekly basis and kept clean to prevent blockages and overflow. The collected material to be disposed of at a suitable waste disposal facility (hazardous waste site) by a company such as e.g. Enviroserv.
i. Records of water quality analysis and quantities of materials removed from the catchpit to be kept on file at the site office.
j. The Fuel Supplier must ensure that sufficient training is provided to the operators of the refuelling area. Training must include general site operation, spill response and emergency procedures.
k. An emergency plan for the handling of minor/major spills must be compiled and a copy kept on site. Staff must be appropriately trained to implement the plan.
l. A spill kit must be available on site and the staff trained in the utilization thereof.
m. In the unlikely event of a major spillage or leakage, an appropriate spill response and clean-up contractor must be contacted immediately to assist in clean-up operations.
n. All spills greater than 200 litres must be reported to the Department of Water and Sanitation, Department of Agriculture, Rural Development, Land and Environmental Affairs and the eMalahleni Local Municipality.
o. 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.

Groundwater

Impact management outcome:

1) *To reduce the potential impact on the groundwater of the site and immediate surrounding area during the construction phase as a result of the use of heavy earthmoving machinery.*

Mitigation and management measures:

a. Vehicles to be inspected for oil leaks, etc. regularly and observed leaks repaired as soon as possible.
b. Drip trays should be used when servicing machinery. All contaminated material to be removed off-site and disposed of in a responsible manner.
c. No fuel storage should take place during construction onsite.

Impact management outcome:

2) *To reduce the potential impact on the groundwater of the site and immediate surrounding area as a result of the installation and utilization of the underground fuel storage tanks.*

Mitigation and management measures:

a. The surface water management measures as indicated in Section 3.2.3 and Figure 3.3 to be implemented.
b. Areas susceptible to contamination or tanker off-loading points should be impermeable to hydrocarbons. Run off should be controlled by appropriate drainage to an oil separator connected to sewer. Surface spillages that occur must be directed to the oil separator before discharge into the municipal sewer (Van Heerden, 2020).
c. All dispensers should be fitted with a leak proof drip tray or membrane arrangement beneath the dispenser. To avoid subsurface contamination, under pump sumps should be impervious to fuels, adequately protected against corrosion, and sealed at all pipe entries, fitted with appropriate leak detector devices, designed to allow any removal of fuel (Van Heerden, 2020).
d. It is essential that any pipework has protection against corrosion. Joints for pipework may be mechanical. The pipework should always be connected to tanks or dispensers using flexible connections. The use of enclosed systems within conduits that drain to inspection manholes or double walled piping underground, should be considered, since such mitigation measurements would further reduce the risk of spills to ground (Van Heerden, 2020).
e. The underground tanks and related infrastructure must be installed in accordance with the various Health, Safety and Environmental policies and Standard Specifications of the appointed oil company. In addition, all work at the filling station must be done in accordance with the SANS standards. Installation must also comply with local authority bylaws.
f. All equipment must be installed using approved contractors.
g. Fuel storage tanks installed below ground should be of corrosion resistant double skin or composite type and incorporate leak detection monitoring. The manholes should have secondary containment (Van Heerden, 2020).
h. The tanks must be thoroughly inspected before installation for apparent fracture and damage and to ensure that the protective coating is intact.
i. For the underground tank, the sides of the pit must be cut vertically and the bottom horizontally. Care must be taken to ensure dimensions are not decreased during excavation. Overall dimensions are to be checked before lowering the tank. Jamming the tank in the excavation can be extremely costly to rectify.
j. Observation wells should be installed vertically without any curvature to the pipe adjacent to fuel tanks for monitoring purposes (Van Heerden, 2020).
k. Should the groundwater table be encountered, either saddles and a concrete slab or a single suitable concrete slab must be installed with the underground tanks to counter the potential buoyancy force of the water table.
l. Filler points should be sited that surface water and soil are prevented from entering the filler box. The filler box should be leak proof, able to contain the contents of a bulk delivery vehicle discharge hose and have secondary containment (Van Heerden, 2020).
m. Care shall be taken to ensure that the basic indication that an overfill has occurred or is imminent, is not the spilling of the product out of the dip pipe, but a slowing down or stoppage of the delivery flow. To achieve this, a back pressure must develop in the storage tank (Van Heerden, 2020).

Monitoring Requirements:

- Underground petroleum storage systems will require automatic tank gauging (Van Heerden, 2020).

- Underground Storage Tanks (USTS) must be dipped daily and reconciled against volume to check for losses due to leakage (Van Heerden, 2020).
- Regular inspections of oil separator to ensure proper functioning. Should any information come to light that a possible leak or spill has occurred, the extent of the contamination in the subsurface will need to be determined through a site assessment and a hydrocensus (that includes sampling). The relevant authorities must then be notified.
- The on-site borehole (MW1) drilled as part of the hydrogeological study to be tested on a quarterly basis in order to monitor the groundwater level and groundwater quality in order to ensure that no hydrocarbon contamination is reaching the ground water. Further details provided in Section 8 of Appendix 8.
- Records of monitoring to be kept and made available to the Department of Agriculture, Rural Development, Land and Environmental Affairs and the Department of Water and Sanitation.
- Should contamination be detected, the Department of Agriculture, Rural Development, Land and Environmental Affairs and the Department of Water and Sanitation to be informed and a rehabilitation plan to be compiled and executed.

Waste management

Management measures in terms of waste

Impact management outcome:

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

Mitigation and management measures:

a. Proper waste management measures to be implemented on site.
b. The applicant/contractor must ensure that all site workers receive appropriate training with regards to waste management measures to be implemented for the said site.
c. Waste skips/bins to be provided for placement of general waste, building rubble, etc.
d. Waste skips to be covered with a net to prevent windblown waste.
e. Hazardous waste to be separated from general waste, stored separately in appropriate containers and disposed of at a licensed hazardous waste disposal facility or certified recycling facility. No hazardous substance to be disposed of on site or in the surrounding area.
f. The waste collection area must be kept clean and tidy at all times. This area should not be littered with waste lying outside of the waste bins/skips. Site workers to be instructed on a daily basis (at end of the day) to collect windblown rubbish which may collect on site and in the adjacent area. This will assist with the overall visual appearance of the site.
g. An area within the site boundaries must be demarcated for the temporary stockpiling of the imported infill material (could include waste material) that must be removed from Geotechnical Soil Zone "B" before removal from site. It should be determined if any of this material could be used as fill material with regards to the new construction taking place.
h. No waste to be burnt, buried or dumped on site or the surrounding area.
i. Waste skips/bins to be emptied on a regular basis and the waste disposed of at the licensed Leeuwpoort Waste Disposal Site.
j. Proper bunded storage facilities must be provided for the storage of oils, grease, fuels, etc. to be used during the construction phase.

k. Waste (including building rubble) not to be placed on the soil stockpiles or disposed in a haphazard way in the surrounding area resulting in the contamination of the soil and the environment.
l. 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 must be ripped and the cement/concrete removed on completion of construction activities.
m. 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. All spills of chemicals or hydrocarbons (oil, grease, diesel, petrol, etc.) should be cleaned with the use of suitable absorbent materials (e.g. drizit or oclanzorb). Appropriate soil remediation measures should be implemented where soil has been contaminated with oil.
n. Contaminated soil generated as a result of fuel, oil, etc. spills to be disposed of in a specially marked drum located at the construction site office. An approved waste contracting firm to collect the drum and dispose of the contaminated soil at an appropriate waste disposal site.
o. An environmental incident report must be completed indicating the date of the incident, description of incident and action taken.
p. The Department of Agriculture, Rural Development, Land and Environmental Affairs (DARLEA) and the Department of Water and Sanitation (DWS) must be informed of the event within 24 hours.
q. A copy of the environmental incident report must be kept on file at the construction site office(s).

Impact management outcome:

3) To reduce potential soil, surface water and groundwater pollution as a result of waste management activities during the operational phase.

Mitigation and management measures:

a. The waste collection area must be kept clean and tidy at all times. This area will not be littered with waste lying outside of the waste bins/skips.
b. Rubbish bins for domestic waste will be provided in the forecourt area for use by the general public. These rubbish bins will be emptied as soon as full and the contents disposed in metal cages/skips/bins located in the yard behind the convenience store.
c. Domestic waste generated by the convenience store and the forecourt area will be sorted and stored in metal cages/skips/bins until collected and disposed at the registered Leeuwpoort Waste Disposal Site.
d. The eMalahleni Local Municipality will collect the waste on a weekly basis and dispose thereof at the registered Leeuwpoort Waste Disposal Site.
e. Where possible, recycling of waste will be encouraged and appropriate bins provided for the recycling initiative.
f. Hazardous waste will be separated from general waste, stored separately in appropriate containers and disposed of at a licensed hazardous waste disposal facility or certified recycling facility. No hazardous substance will be disposed of on site.
g. Site workers will be instructed to collect windblown rubbish which may collect within the surrounding landscaped, paved or undeveloped area on the said site. This will assist with the overall visual appearance of the site.
h. The site operator will ensure that all site workers receive appropriate training with regards to the overall waste management measures to be implemented for the said site.
i. Site workers must be aware of the importance of the implementation of the waste management measures.

Impact management outcome:

4) *To ensure the proper storage and management of hazardous substances and materials (e.g. fuel, motor oil, cooking oil, grease, disinfectants) on site and reduce the potential impact on site workers and interested and affected parties.*
5) *To ensure the proper disposal of hazardous wastes generated on site and reduce the potential impact on site workers and interested and affected parties.*

Mitigation and management measures:

a. A register of all hazardous substances stored on site must be kept. Relevant Material Safety Data Sheets (MSDS) must be available on site for all potentially hazardous substances (as defined in the regulations for Hazardous Chemical Substances). In the event of an emergency, procedures detailed in the MSDS must be followed.
b. Proper storage facilities must be provided for the storage of oils, grease, fuels, chemicals and any hazardous materials.
c. Major stocks of hazardous substances (other than fuel) should preferably be stored off-site.
d. Hazardous waste must be separated from general waste, stored separately in appropriate containers and disposed of at a licensed hazardous waste disposal facility or certified recycling facility.
e. No hazardous substance is to be disposed on site.
f. A grease trap must be provided in the kitchen of the convenience store. This grease trap must be cleaned every second week. The generated waste (oil, grease, etc.) must be disposed of in a specially marked drum located in the yard behind the convenience store. On a regular basis, an approved waste contracting firm (e.g. Enviroserv) must collect the drum and dispose of the waste at an appropriate waste disposal site. Records of this maintenance activity and removal of waste must be kept.
g. Contaminated sand generated as a result of fuel, oil, etc. spills must be disposed of in a specially marked drum located in the yard behind the convenience store. On a regular basis, an approved waste contracting firm (e.g. Enviroserv) must collect the drum and dispose of the contaminated sand at an appropriate waste disposal site.
h. Contaminated soil/fuel that cannot be removed must be treated in situ with an appropriate remedial agent. In this instance, the services of an expert may be required.
i. Any material soaked with fuel or oil must be placed in a drum and arrangements made for its safe disposal at an appropriate waste disposal site by an approved waste contracting firm (e.g. Enviroserv).
j. In all instances where a firm is contracted to collect waste (e.g. Enviroserv), the site operator must 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. 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. Records of environmental related incidents should be maintained.
m. All spills greater than 200 litres must be reported to the Department of Water and Sanitation, the Department of Agriculture, Rural Development, Land and Environmental Affairs and the eMalahleni Local Municipality.
n. An emergency plan for the handling of major/minor spills at the facility and during transportation of product must be compiled and a copy kept on site. Staff must be appropriately trained to implement the plan.

o. The site operator must ensure that all site workers receive relevant training with regards to the handling of hazardous substances.
p. Site workers must be made aware of the health risks associated with hazardous substances.

Example of Environmental Incident Register:

ENVIRONMENTAL INCIDENT REGISTER				
DATE AND TIME	INCIDENT REPORTED BY	CONTACT DETAILS (telephone/cell number; address)	DETAILED DESCRIPTION OF ENVIRONMENTAL INCIDENT REPORTED	RESPONSE FROM ECO

9.5.3 Rehabilitation of the environment after construction

Impact management outcome:

1) *To ensure that any disturbed areas not developed are properly rehabilitated and maintained.*
2) *To control the growth of declared weeds and/or invader plants.*

Mitigation and management measures:

a. Before construction, the remaining topsoil must be removed and stockpiled in a demarcated area within the site for rehabilitation of disturbed areas and/or landscaping.
b. The topsoil should not be compacted.
c. A meeting to be held on site between the applicant, contractor and the Site ECO to approve all remediation activities to be undertaken as part of the rehabilitation of the site in order to ensure that the site is rehabilitated to acceptable standards.
d. Once construction has been completed, all temporary structures, excess materials, equipment and waste must be removed from site.
e. All residual stockpiles must be removed to spoil or spread on site as directed by the Site ECO.
f. The site and surrounding areas to be cleared of all litter.
g. Any undeveloped disturbed areas (i.e. areas to be developed at a later stage or to be used for landscaping) 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.
h. Proper storm water control measures and erosion control must be implemented to prevent erosion of the newly rehabilitated areas during heavy rainfall.
i. Temporary erosion control measures (e.g. geo-textile silt fences, diversion ditches, sediment traps, sandbags, etc.) to be kept in place to control erosion until the long-term erosion control methods are established and functioning.
j. For rehabilitation purposes, indigenous water wise plants must be used. The local nurseries specialising in indigenous plants should be consulted with regards to appropriate plants to be used with regards to the landscaping of the site.
k. The planting of any alien invader plant species as part of landscaping should be prohibited in order to prevent the spread of invasive species from the site.
l. The regulations in terms of Alien Invasive Species and the Mpumalanga Nature Conservation Act, 1998 (Act 10 of 1998) with regards to declared alien species must be noted and complied with.
m. Regular site inspections to be conducted to identify any declared weeds and/or invader plants. If identified, the plants to be eradicated using appropriate methods.
n. 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.
o. A post-construction audit by the Site ECO must be conducted to ensure that any shortcomings are identified and addressed.

9.5.4 Interested and Affected Parties (I&APs)

Impact management outcome:

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

Mitigation and management measures to be implemented:

a. The applicant/contractor must adhere (at all times) to the requirements of the Occupational Health and Safety Act, 1993 (Act 85 of 1993) (as amended), the Construction Regulations, 2003 (as amended) and any other applicable legislation (including applicable bylaws of the eMalahleni Local Municipality).
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. All machinery used on site must be properly muffled and maintained so as to reduce noise generation to a minimum.
d. 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.

Impact management outcome:

2) *To ensure that the site workers and the adjacent landowners/users (i.e. Portuguese Club, Casa Portuguesa Restaurant, Nissan Dealership, residents of Highveld View and Del Judor X4, etc.) are not impacted in terms of the construction work performed.*
3) *To reduce the potential visual impact as a result of the presence of the filling station on Interested and Affected Parties.*

Mitigation and management measures to be implemented:

a. Landowners/users to be notified in advance that construction will commence.
b. Landowners/users to be provided with contact numbers (e.g. cell numbers, email, etc.) with whom complaints can be lodged.
c. Landowners/users to be informed in advance that blasting will take place (if required). Mitigation measures to be implemented to limit the impact of blasting on residents, property, domestic animals, etc.
d. The waste management measures as indicated to be implemented in order to keep the site neat and tidy at all times.
e. All machinery used on site to be properly muffled and maintained so as to reduce noise generation to a minimum.
f. Site workers must be instructed to keep noise to a minimum.
g. Construction activities to be limited to daylight hours (7am - 6pm) and weekdays (Monday to Friday) in order to minimize the impact on residents in terms of noise and dust.
h. No members of the general public should be allowed at the construction site.
i. A notice must be placed in the Witbank News if the connection of the bulk services is going to lead to any service interruptions in eMalahleni.
j. All construction and operational management principles as indicated in this EMPr must be implemented.

Impact management outcome:

4) *To ensure that general road users and pedestrians utilizing Nita Avenue and Mandela Drive are not impacted as a result of the construction and*

operation of the filling station (especially in terms of the upgrading of roads).

Mitigation and management measures:

a. The general construction principles indicated to be implemented.
b. Permission to be obtained from the eMalahleni Local Municipality for the proposed left-out access road from Mandela Drive once the intersection of Mandela Drive and Nita Avenue has been upgraded (i.e. conversion of the 'All-way' stop to a 'two-phase' signalised intersection).
c. Proper signage, warning signals, a barrier, etc. (i.e. required safety measures) must be provided along Nita Avenue and Mandela Drive to warn the road users that the access roads to the filling station is being constructed. These signs must be visible at night.
d. Construction vehicles to only access the site from Nita Avenue.
e. Disruption of traffic during peak periods to be minimised or if possible avoided.
j. Care should be taken pertaining to the placement of signage in close proximity to the access point to ensure that road visibility is not affected.
k. The site operator must ensure that the filling station does not become a drop off and pick up point for the local taxi operators.
l. Only the access points from Nita Avenue and Mandel Drive to be used during the operational phase as indicated in the layout plan.

Impact management outcome:

5) To ensure good relations with all Interested and Affected Parties (I&APs) by creating open channels of communication to address matters of concern that may arise.

Mitigation and management measures to be implemented:

a. Landowners/users (i.e. residents of Highveld View Estate/Del Judor X4 and nearby businesses) to be provided with contact numbers (cell numbers, email, etc.) with whom complaints can be lodged.
b. A Complaints Register to be kept at the construction site office(s).
c. All complaints received to be recorded in the Complaints Register. The following to be recorded:
    - Date when complaint/concern was received;
    - Name of person to whom the complaint/concern was reported;
    - Nature of the complaint/concern reported;
    - Way in which the complaint/concern was addressed (date to be included).
d. All complaints received must be investigated and a response given to the complainant within 7 days.
e. The Complaints Register to be kept up to date for inspection by members of the Department of Agriculture, Rural Development, Land and Environmental Affairs (DARDLEA) and the eMalahleni Local Municipality (ELM).

An example of a complaints register is provided below.

COMPLAINTS REGISTER				
DATE AND TIME	NAME	CONTACT DETAILS (telephone/cell number; address)	DETAILED DESCRIPTION OF COMPLAINT	RESPONSE FROM ECO

Impact management outcome:

6) *To ensure that fugitive emissions do not impact on site workers and Interested and Affected Parties.*

Mitigation and management measures to be implemented:

a) Vent pipes should be positioned at a point remote from all buildings and neighbouring property boundaries to mitigate the impact of vent gasses from vent pipes and the interceptor chamber.
b) All sample points must be enclosed and routed to drip tanks thus eliminating vapour within the facility.
c) When required, double mechanical seals must be used.
d) Operation and maintenance procedures must be compiled and implemented. Site workers must be aware of the said operation and maintenance procedures.

Impact management outcome:

7) To minimize the potential for fire-related accidents and explosions at the filling station and in this way to protect site workers and Interested and Affected Parties.

Mitigation and management measures to be implemented:

a. Smoking must be prohibited on the said site. No smoking signs must be prominently displayed.
b. Safety signage must be put in place. These include, "no naked flames; no smoking; no cellular phones".
c. Sufficient fire extinguishers must be provided as required by legislation. The site operator must ensure that the said fire extinguishers are serviced on a regular basis and are operational.
d. The closest fire hydrant must be clearly marked and indicated to all site workers. The site operator must ensure that the fire hydrant is checked on a regular basis to ensure that it is operational.

e. An emergency response plan for firefighting must be compiled and all site workers must receive training.
f. An emergency assembly point should be identified on or near the site and clearly marked.
g. The site operator must ensure that all site workers are trained in the use of the appropriate firefighting equipment.
h. The site operator should liaise with the emergency services of the eMalahleni Local Municipality to ensure that they are aware of where the site is, the layout of the site as well as where the on-site firefighting equipment is located.
i. The contact number of the emergency services of the eMalahleni Local Municipality must be prominently displayed on site.
j. The Department of Agriculture, Rural Development, Land and Environmental Affairs and the Department of Water and Sanitation must be informed within 24 hours of the occurrence of such an event.

9.6. Contingency plan w.r.t. fuel spillages

9.6.1 Equipment required

The following equipment must be kept on-site in order to deal with fuel spillages:

- Absorbing fibres;
- Sandbags;
- Sand to absorb spills;
- Two waste bins: one for storage of used fibres and the other for discarding used fibres.

A sufficient quantity of the above-mentioned must be kept on-site at all times.

This equipment must be kept:

- In places where spills are likely to occur i.e. near the pumps and delivery area;
- Located in a clean, dry and easily accessible storage facility.

9.6.2 Classification of spills

9.6.2.1 Minor spills

Minor spill
A minor spill is one that is less than 200 litres and does not threaten any streams, rivers or storm water drains or the public.

The following procedure must be followed when a minor spill occurs:

- Ensure that the bulk serviceman stops the delivery immediately by operating the emergency cut-off device.
- Check the immediate environment to ensure that there is no source of ignition.
- Contain the spillage by using sand from the fire buckets or soak up the spill with unused fibres. (**Note:** If sand was used and the incident has been dealt with, then arrange for the sand to be disposed of by a specialist contractor. Remember that the sand is still hazardous, as it is highly flammable.)
- If the spill soaked into the ground, then the soil should be ploughed to allow for aeration. Water can then be used to bring soil to the surface and mopped up immediately with the absorbent fibre.

- If absorbent fibres were used then, discard the fibres in the bin for used fibres. Waste fibre must be removed by a specialist contractor.
- If there is product on the vehicle, then wash and wipe the vehicle prior to the vehicle departing from the site.
- Complete an Incident Report.
- Investigate the cause of the spill and take the necessary actions taken to prevent a re-occurrence.

9.6.2.2 Major spill

Major spill
A major spill is one where more than 20 litres of fuel or oil products is involved. However, a spill of less than 200 litres that threatens any streams, rivers or storm water drains or even incidents that may attract the public, press or authorities attention must be considered a major spill and dealt with in the same manner.

The following procedure must be followed when a major spill occurs:

- Ensure that the bulk serviceman stops the delivery immediately by operating the emergency cut-off device.
- Check the immediate environment to ensure that there is no source of ignition and switch off the site's master switch.
- Close the filling station and warn any people in close proximity of the site to move away.
- Contact the nearest fire station.
- Do not start any vehicle parked near the filling station.
- Try and contain the spillage with sand or soil or try to prevent the product from leaving the filling station's premises and ensure that the fire extinguisher is easily accessible. Note: If a major spill occurs on paving or on non porous surfaces, then form a barrier using sand or sandbags to prevent the spill from entering any drains or from contaminating the natural water system.
- If a major spill occurs on soil or porous surfaces, then remove the contaminated soil for disposal or rehabilitation to prevent the spill from contaminating the groundwater.
- Remove as much of the spill as possible and then mop up using the absorbing fibres. Note: Watering the soil will bring up the oil to the surface and make it easier to mop up the product with the absorbing materials.
- Complete an Incident Report.
- Investigate the cause of the spill and take the necessary actions taken to prevent a re-occurrence.

9.6.3 Mitigation measures to follow when an overspill occurs

The following procedure must be followed when an overspill occurs:

- Stop the delivery of the wet stock products by closing the vehicle faucet and foot valve. Note: The driver cannot disconnect the delivery hose until arrangements can be made to dispense the fuel in the delivery hose, i.e. until the preset quantity of product has been offloaded completely.
- Having emptied the hose, ensure the bulk serviceman disconnects the hose, replaces the filler cap and locks it.
- Amend the Delivery Note to reflect the additional products delivered and confirm the change by authorising the document.

- Ensure the bulk serviceman cleans up any spills before leaving the site.
- Complete an Incident Report.
- Investigate the cause of the spill and take the necessary actions taken to prevent a re-occurrence.

9.6.4 Mitigation measures to deal with contaminations

A contamination can occur:

- When two different products are mixed together,
- When excessive volumes of water are mixed with the product, or
- As a result of dirt.

The following procedure would have to be followed:

- Draw a sample of at least 500ml and place it in a clean glass container in the presence of a reliable witness. Note: Retain the sample in the event that it is required.
- Label the sample to reflect the tank number, or pump number, product, suspected contamination and date of the sample.
- Contact the supplier for further information regarding product testing.
- Investigate the cause of the contamination and take the necessary actions taken to prevent a re-occurrence.

9.7 Decommissioning phase

This phase would involve the decommissioning of the facilities already constructed on site at that particular date, if ever required. This would depend on whether the entire project would be decommissioned or only parts thereof.

At the time of decommissioning, a Basic Assessment will have to be undertaken and an Environmental Management Programme (EMPr) compiled with regards to the decommissioning of the filling station.

The following would form part of the measures to be implemented with regards to the removal/replacement of the underground tanks:

- Surrounding land owners/users (e.g. nearby businesses, eMalahleni Local Municipality, etc.) must be informed of the proposed decommissioning of the filling station.
- All demolition activities must be restricted to the said site.
- The site must be fenced or a protective barrier erected to confine the demolition activities to the said site.
- Access to the site must be restricted to one point and must be controlled.
- All site workers must be issued with personal protective clothing.
- The removal of rubble from the site must be coordinated in order to avoid the disruption of traffic and impact on interested and affected parties.
- If a site office/camp site is required, its extent to be confined to the said property.
- Demolition activity to be phased in order to avoid the construction of temporary ablution and toilet facilities. The maintenance of the sewer connection should be ensured for the duration of the site works.
- Strict waste management measures must be implemented for the duration of the demolition activity.

- The area to be excavated must be cordoned off with red danger tape and no smoking signs displayed.
- The site engineer, contractor and environmental consultant (contamination expert) must be present on the day of excavation.
- The location of all electrical, storm water or water pipelines must be determined prior to excavation to ensure that they are not damaged in the excavation process.
- All fuel inside the tank must be removed and the tank degassed.
- The site must then be excavated to expose the tank.
- In order to ensure that the tank is not damaged during the excavation, a small backactor must be used or the area must be manually excavated, with the removed soil stockpiled in a demarcated area on site.
- All pipes and vents connected to the tank must be disconnected and sealed before the tank is removed.
- If there are no suspected leaks or contamination, the new tank can be installed.

- If a leak is suspected, soil samples must be taken from a number of points in the excavation as well as the stockpiled soil.
- Water samples must be taken if there are any free-standing pools in the excavated pit with background soil and water samples taken off-site.
- The pit must be left open while the samples are sent to an appropriate laboratory for analysis. Should the analysis indicate the soil to be contaminated, soil must be removed from the pit until all the contaminated material has been removed.
- Contaminated water must be pumped out, collected and disposed of in an appropriate manner. Further soil samples must be taken and sent for analysis with the process repeated until analysis shows contamination to be within acceptable levels.
- The contaminated soil must be stockpiled separately and remediated on site or removed to an appropriate landfill site.
- The new tank can then be placed in the existing hole.
- The removed tank to be loaded onto a flat-bed trailer and taken to the contractor's storage yard or to the Oil Company's designated storage area.
- The tank to be flushed to remove any remaining residues with the flushed water either stored for future flushing or processed to remove the fuel.
- Contaminated metal must be steam-cleaned prior to disposal. The 'steam' and condensed water must be considered contaminated and disposed of appropriately.
- If any metal, including piping, has future value it may be moved, after cleaning, to a storage area for redundant materials.
- The relevant Oil Company's existing procedure for the disposal of metal must be applied.
- The tanks to be sent for disposal (i.e. cut up to prevent re-use underground). Only those tanks found to be in excellent condition (i.e. meet SANS codes) may be used again as above ground tanks.
- All pipe work must be removed and disposed of at a registered waste disposal site.
- Once all tanks and pipe work have been removed, a risk based contamination assessment must be undertaken where applicable.
- The tank cavity must be filled with fresh clean soil. This soil must be well watered and compacted to the Oil Company's specifications.
- Excavations must be immediately backfilled after removal of the tanks.

9.8 Remediation costs

Table 9.1 provides an indication of remediation costs in the event of product spills or leakages at a filling station. The geology, hydrogeology, volume of product lost (i.e. size of the plume) and the size of the installation will determine the cost of remediation.

Table 9.1: General cost estimates involved with remediation (taken from Van Heerden, 2020a).

Remedial strategy	Total cost (thousands)	Estimated timeframes*
VER (mobile)	R 600 000	<3 years
Dig & Dump 100m^3	R 300 000	<6 months
MNA	R 900 000	5 years
ISCO/ Bioremediation	R 650 000	1-2 years

Note: Assuming all factors in favour of the method. Based on estimated standard filling station capacity (unknown at the time of the request).

As indicated in Table 9.1, the costs range from R 300 000 to R 900 000 for a remediation project. The average cost is R 612 500.

Since the geology and the hydrogeology of a site are outside the control of the operator, the remediation costs can only be influenced by the volume of product lost to the environment. By minimizing the volume that is lost, either in a once off event or over a long period of time, the potential remedial costs can be minimized.

Through proper construction of storage facilities, handling of product and inventory reconciliation it is possible to manage the potential remedial costs to less than R 500 000. Further details are provided in Appendix 8.

9.9 Operational activities

a. The applicant must comply with the conditions of the issued Environmental Authorisation.
b. All operational activities must be limited to the said site.
c. The following **energy saving** initiatives should be implemented, where possible, 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 lighting/lighting equipment with a D/N switch for all outside areas;*
    - *Solar geysers to be installed where feasible;*
    - *Gas stoves to be used by convenience store where feasible.*
d. 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 required;*
- *Water usage to be monitored;*
- *Waterwise signage to be displayed in the public restrooms;*
- *Waterwise taps (e.g. taps with infra-red sensors/low-flow taps) to be installed in the public restrooms.*

e. The water and sewer infrastructure should be inspected on a regular basis to ensure that there are no blockages/leakages or spillage.

f. Proper waste management measures must be implemented at the filling station.
   - Waste bins for general waste must be provided in a number of places on site and in the parking area to minimize the distance to waste bins.
   - The site must be kept clean and tidy at all times and may not be littered with waste lying outside of waste bins.
   - No waste may be burnt, buried or dumped on site.
   - Where possible, recycling of waste must be encouraged and appropriate bins provided for the recycling initiative.
   - A fence/wall must be erected around the refuse area in order to contain the waste and to ensure that it does not have a visual impact on customers and/or adjacent residents/tenants.

g. The overall management of the site and associated infrastructure will be of utmost importance and therefore the implementation of these mitigation measures must be monitored and audited on a regular basis.

h. It is recommended that the developer and site operator of the filling station become involved with the local Community Policing Forum (CPF) in order to combat crime (e.g. burglaries, etc.).

9.10 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 9.6.1) 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 the eMalahleni Local Municipality, Department of Agriculture, Rural Development, Land and Environmental Affairs (DARDLEA) and Department of Water and Sanitation (DWS) may (at any time) conduct an inspection of the project 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:

9.10.1 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. It should thus be displayed at the construction site office.

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 8 of this document while mitigation measures to be implemented are provided in Section 9.

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 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 (including appointed contractor) must inform all his employees 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 employees (including appointed contractor).

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

Through training/awareness, the applicant will also make his employees 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 employees 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 employees 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 with new employees:

- Time of commencement and completion of duties;
- Cleaning of workplace and the importance thereof;
- Safety clothing and its importance and correct use;
- Procedure to follow in case of illness and injury;
- Annual leave and when due;
- Importance of instructions;
- Late for work and leaving workplace without permission;
- Emergency procedures;
- Environmental awareness;
- Training and its importance;
- Alcohol and drug abuse;
- Medical fitness;
- Disciplinary procedures.

The following topics should form part of the environmental awareness discussions to be held with the employees:

- NO-GO areas;
- Water;
- Fauna and flora;
- Smoking and fires;
- Dust;
- Noise;
- Waste management.

Various signs (including the Environmental Policy) should be displayed on site to remind site workers of the basic environmental principles and inform them of the 'DO'S' and 'DON'TS'.

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.

9.10.2 Site documentation and record keeping

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

- A copy of the Basic Assessment Report (BAR) 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/landowners/etc.

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

Complaints Register

A complaints register must be kept at the construction site office. 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 construction site office.

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

Other legislation
The following should also be displayed at the construction 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 construction 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 employees must also comply with all other relevant legislation.

9.10.3 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:
Site Environmental Control Officer (SECO): The applicant must appoint a person who will be responsible for the day-to-day implementation of the EMPr (including Environmental Awareness Training) and will report to the site manager.

Environmental Control Officer (ECO): The applicant must appoint an 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 monthly 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.

SECTION 10: ENVIRONMENTAL IMPACT STATEMENT

10.1 Introduction

The applicant, ***Meronox (Pty) Ltd.***, intends to develop a filling station on the corner of Nita Avenue and Mandela Drive, eMalahleni. The proposed filling station will be developed on Portion 1 of Erf 20, which is 4012m^2 in extent.

The filling station will be accessed via a left-in left-out road (which will cross Erf 21) from Mandela Drive. Approximately 350m^2 will be used for the left-in left-out access road from Mandela Drive. An access point will also be provided from Nita Avenue.

10.2 Location of site

The proposed filling station site will be located within an established urban area and within the urban edge of eMalahleni. In terms of land use, the surrounding area is utilized for business, institutional, residential and recreational activities.

The site is located adjacent to Mandela Drive, which was identified in the Spatial Development Framework (2015) as one of the activity spines where the Municipality would allow non-residential land uses in order to optimally utilize the visual exposure from the high traffic volumes along this road. The proposed filling station adjacent to Mandela Drive therefore fits into the development plans of the eMalahleni Local Municipality.

Erf 20 and Erf 21 were zoned 'Business 2' in terms of the eMalahleni Land Use Scheme (2020) (Appendix 10), which permits the establishment of a filling station subject to the approval of a Consent-Use Application. A Consent-Use Application for a filling station (being a consolidation of Portion 1 of Erf 20 and Portion 1 of Erf 21, future Erf 23) submitted by Korsman and Associates was approved (6 April 2021) by the eMalahleni Local Municipality (Appendix 10).

The balance of Erf 20, Erf 21 and Erf 22 (total about 26 254m^2) will be used to develop a 12 000m^2 (Gross Leasable Area (GLA)) retail centre adjacent to the filling station. The proposed retail centre will be accessed from Mandela Drive (left-in only) and two full access points from Nita Avenue. The said access roads were approved by the eMalahleni Local Municipality.

According to the traffic count, the site is exposed (vehicles passing the site) to an ADT of approximately 25 296 veh/day travelling in all directions along Mandela Drive and Nita Avenue at the intersection where the filling station is proposed. Van Rooyen (2020a) indicated that the proposed retail centre will increase the traffic and the demand for fuel at the site significantly and will add approximately 4 200 vehicles per day.

A medium sized modern filling station (comprising of underground petrol and diesel tanks (23 000ℓ x 5), fuel pumps, a canopy covered forecourt and a convenience store) is proposed for the said site. The site is currently vacant and not maintained. The visual aspects of the site and surroundings would thus be improved and no longer pose a health and safety risk to residents

living in the nearby residential area. The proposed development should therefore not impact on the sense of place of the area.

10.3 Provision of services

The proposed filling station site is located within the urban edge of the eMalahleni Local Municipality. As indicated in Section 7.4, services (water, sewage, electricity, etc.) will be provided by the eMalahleni Local Municipality.

Senekal (2020) indicated that all services (water, sewer, stormwater, roads and accesses) can be provided by the eMalahleni Local Municipality (acceptably and economically) for the proposed filling station subject to the implementation of the proposed improvements to the infrastructure (see Section 3.2 of this BAR).

In terms of electricity, Diederiks (2020) indicated (after consultation with the eMalahleni Local Municipality) that additional bulk services as indicated in Section 3.2.5 will need to be installed for the proposed filling station.

10.4 Environmental suitability of site

As a result of past disturbances, the vegetation of the proposed filling station site (Modified Grassland vegetation unit) is highly modified/transformed with low species diversity. It no longer resembles the Rand Highveld Grassland vegetation type (Venter, 2020a). The site is not located within a Critical Biodiversity Area, nature reserve, conservancy or other protected area. Venter (2020a) indicated that the vegetation on site is of Low sensitivity due to the disturbed nature of the vegetation. No suitable habitat for bullfrogs was identified on the proposed filling station site (including the access road site).

According to Venter (2020b), no hydric (wetland) soil forms are present on site and therefore no wetlands and sensitive landscapes (wetlands/seepage areas, etc.) are present on site. In addition, no surface water environments (e.g. rivers/streams/pans) are located on or near the site. The closest water course (an unnamed tributary of the Olifants River locally known as Madelspruit) is located approximately 800 m west of the site.

Most of Erf 20 falls within the Technosol group and more particularly, the Johannesburg soil form (i.e. soil profiles covered by concrete structures, cement and waste materials including building gravel) with a small portion within the Anthrosol group and more particularly, the Grabouw soil form. These soil forms are not suitable for agricultural purposes.

Van der Merwe (2020) identified two Geotechnical Zones on Erf 20 namely: Soil Zone "A" and Soil Zone "B" (Figure 5.6) and indicated from a geotechnical point of view that the said site can be developed subject to the implementation of the stipulated recommendations.

In terms of groundwater, no direct impact is expected as the water table is situated at 16m. Depending on the tank size, installation takes place between 3m and 6m. The buffer between the groundwater table and the underground tanks (installed on a worse-case scenario at 6m) will be 10m.

Van Heerden (2020) indicated that the proposed site is susceptible to groundwater contamination in view of the underlying geology. Van Heerden (2020) indicated that groundwater contamination migration could occur directly from surface contamination or mobilize into the subsurface, along weathered fractured bedrock, bedding plane fractures and joints. However, based on the results of the hydrocensus and the aquifer classification map of South Africa, the aquifer underlying the site is a minor aquifer system (moderately-yielding aquifer system of variable water quality). Van Heerden (2020) indicated that the proposed filling station can continue from a hydrogeological perspective subject to the implementation of the recommendations and mitigation measures (including monitoring) to protect the underlying aquifer.

Van Vollenhoven (2020) identified no sites of cultural heritage significance within the proposed site. From a palaeontological point of view, Fourie (2020) raised no objection to the proposed development and indicated that the development may go ahead with caution.

The filling station development would thus take place on an already impacted site where no sensitive environmental features were identified. The site is suitable from a geotechnical and hydrogeological perspective (subject to the implementation of the specified mitigation measures) for a filling station.

10.5 Impact on traffic

Filling stations are developments that intercept trips from background traffic as opposed to other developments (e.g. proposed retail centre) that generate additional trips. The operational activities should thus not lead to an increase in traffic in the area. However, the interception of traffic could cause minor disruptions if not considered thoroughly (Van Rooyen, 2020a).

The filling station will be accessed via a 'left-in left-out' access road from Mandela Drive, approximately 100m east of the intersection of Mandela Drive and Nita Avenue. A 'Full' access will be provided from Nita Avenue, approximately 80m south of the intersection of Mandela Drive and Nita Avenue. Van Rooyen (2020a) indicated that this access will have very little impact on passing traffic due to a new turning lane to be provided.

Van Rooyen (2020a) indicated that the existing traffic passing the site will not be negatively affected by the proposed filling station's operation, if proper access design standards, turning and deceleration lanes (where applicable) and appropriate signage are provided as part of the overall design of the proposed filling station.

10.6 Impact on other filling stations

The proposed filling station mainly caters for westbound traffic along Mandela Drive.

The proposed filling station is expected to take between 5% and 10% from seven (7) competitor sites (Table 7.2b), with 16 sites expected to be impacted less than 5%. From Table 7.2b, it can be concluded that the initial impact on the competitors will be low, mainly due to the competitor sites

serving different markets and located on the opposite side of the road thus serving different traffic streams (Van Rooyen, 2020a).

The existing TOTAL N4 Business Park (Figure 7.2) is also located on the opposite side of Mandela Drive and will be the most affected (10% impact; Table 7.2b). According to Van Rooyen (2020a), this filling station will be able to recover most of the lost sales within 3 to 4 years after the proposed filling station is constructed, due to the positive traffic growth in eMalahleni.

The proposed site will thus have an initial negative impact (between 5% and 10%) on a number of existing filling stations (Table 7.2a). The impact should not irreparably jeopardize these businesses in view of the different markets and traffic streams catered for as well as the distances away from the proposed filling station. Van Rooyen (2020a) indicated that with the positive traffic growth in the area, these sites will be able to recover within 3 – 4 years of the new filling station being implemented.

10.7 Feasibility of filling station site

Major fuel companies generally regard a new urban site feasible if the fuel sales volume forecast indicates that more than 300 000 litres of fuel will be sold per month.

As indicated in Table 7.2e, the expected fuel sales will be over 564 000 litres in the 3rd year of operations. In view of this, Van Rooyen (2020a) indicated that it can be concluded that the proposed site will be feasible for the development of a filling station for all the larger fuel companies (such as SASOL, TOTAL, ENGEN, BP, SHELL, etc.) at the intersection of Mandela Drive and Nita Ave.

Van Rooyen (2020a) indicated that the feasibility will be dependent on obtaining direct access approval from both Mandela Dr and Nita Ave.

The ELM however, did not approve the left-out access road from Mandela Drive (Appendix 10) in view of the current traffic congestion experienced during peak time hours at the intersection of Mandela Drive and Nita Avenue. The ELM indicated that the said intersection must be upgraded to ease the congestion and to accommodate the left-out access from the said site.

10.8 Trading potential of site

According to Van Rooyen (2020a), a qualitative assessment ranked the trading potential of the proposed filling station site as follows:

	Comment	Rating
Visibility:	Being located next to a Class 3 route that connects several suburbs and places of interest as mentioned before, with no natural obstructions or topography that impairs the visibility, the site is easily visible to passing traffic from a good distance away.	**VERY GOOD**
Location:	The study site is located at an Intersection, next to Mandela Drive, a minor arterial (Class 3) road which feeds traffic to-and-from Emalahleni and the N4 Freeway. It is also close to several commercial developments as well as a large shopping centre	**VERY GOOD**

	Comment	Rating
	(Highveld Mall) situated about 500m to the east of where the filling station is proposed.	
Access:	'Left-in, Left-out' access is proposed from Mandela Drive and a Full access from Nita Avenue is proposed for the proposed filling station (with a right turn lane for the full access and with a left-slip lane at the intersection of these mentioned roads). It can hence be concluded that seeing as this site will be able to serve both east and westbound traffic travelling on Mandela Drive and both directions of travel on Nita Ave, the access layout can be described as **GOOD**. The access on Nita Ave has been approved as part of the Retail (12,000m² shopping centre) development adjacent to the filling station.	**GOOD**
Trading Market:	Considering that this filling station relies on daily commuters traveling to-and-from Emalahleni (Witbank) and the N4 Freeway as well as traffic to-and-from the nearby shopping centre, the Nissan dealership located opposite the site and local traffic on Nita Ave, during weekdays and weekends, the trading market is described as **VERY GOOD**. The approved 12 000m² shopping centre adjacent to the site also helps to increase its own local trading market.	**VERY GOOD**
Competitor Stations:	There are a few existing filling stations situated on Mandela Dr (but are located on the opposite side of Mandela Dr, serving mainly eastbound traffic) and several existing filling stations within Emalahleni, of which none are within 1km radius from the site. There is a total of 7 sites within a 1 - 3km radius. There are also 16 sites within a 3 - 5km radius, but these mainly serve different traffic streams and markets. The study site is thus rated **GOOD** in terms of competitors.	**GOOD**
Traffic Volumes:	The survey indicated high traffic volumes (around 25 296vpd) passing the proposed site in all directions. The exposure to traffic can thus be described as **VERY GOOD.** Please note that this existing traffic excludes the expected additional 4 200 vpd (vehicles per day) for the approved shopping centre located adjacent.	**VERY GOOD**

In view of the above-mentioned, Van Rooyen (2020a) concluded that the proposed site has **VERY GOOD trading potential.**

10.9 Public participation

The proposed development site belongs to the project applicant and the development of the said site will thus not impact directly on any other Interested and Affected party.

Issues of concern received through this public participation process and the way in which these issues were addressed are detailed in Section 6 and Table 6.4.

Objections in terms of the proposed filling station were obtained from the following existing filling stations located in eMalahleni:

- Total Route N4 (E. van Wyk; development of filling station to be stopped indicated in the comment sheet; Table 6.4);
- Total President (F. Visagie; Table 6.4);

- Ngubane Urban House (Pty) Ltd. (on behalf of Masakhane Mining Supply and Construction cc; potential impact on proposed filling station of which the application was withdraw; Table 6.4).

A feasibility study was undertaken and the results included in Section 5.16, Section 7.2 and Section 10 of this BAR. Feedback was also provided in Table 6.4.

The proposed development could have the following positive impacts on I&APs:

- During the construction phase, the site will be cleared of all waste, etc. thus improving the visual aspect of the site and reducing the current health and safety risk.
- The proposed development would lead to employment opportunities during the construction and operational phases.
- The filling station would be easily accessible to people travelling along Mandela Drive and Nita Avenue.
- The proposed filling station will be convenient (in terms of refuelling and purchasing of items such as bread and milk) for residents of the Del Judor x4 residential area.
- The development would also be convenient for visitors to the adjacent retail centre and the nearby Highveld Mall as they would be able to refuel and not have to travel further along Mandela Drive.
- Upgrading of the road intersection (Mandela Drive/Nita Avenue) would improve the current traffic situation in the area which would benefit all I&APs utilising the said roads.

10.10 Assumptions, uncertainties and gaps in knowledge

The following assumptions and limitations are applicable to this report:

- The report is based on project information provided by the applicant.
- In determining the significance of impacts after mitigation, it is assumed that the proposed mitigation measures will be implemented by the applicant during the construction and operational phases of the development.
- Due to the subterranean nature of fossils and heritage resources, objects or features may be uncovered during the construction phase.

10.11 Reasoned opinion as to whether the proposed activity should be authorised (or not)

The filling station development would take place on an already impacted site where no sensitive environmental features were identified. The site is suitable from a geotechnical and hydrogeological perspective (subject to the implementation of the specified mitigation measures) for a filling station. The proposed filling station site is also feasible from an economic point of view.

Based on the findings of this Basic Assessment Report, it is felt that the proposed project could be approved subject to the implementation of the mitigation measures proposed in the Environmental Management Programme (EMPr) provided in Section 9 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 development 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).

In view of the findings of this Basic Assessment, the following listed activity can be approved:

Listing	Activity
Listing Notice 1: Listed Activity 14	*The development and related operation of facilities or infrastructure, for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic metres.*

10.12 Reasons why the activity should be authorised (or not)

It is recommended that the activity be authorised for the following reasons:

- √ The proposed site belongs to the project applicant.
- √ The said property is situated within the urban edge of the eMalahleni Local Municipality.
- √ The site is already zoned for a filling station.
- √ The site is situated in an area with a mixed land use character and the proposed filling station will therefore fit in with the surrounding land uses and would not impact on the sense of place.
- √ The site is located adjacent to Mandela Drive, which was identified in the Spatial Development Framework (2015) as one of the activity spines where the Municipality would allow non-residential land uses in order to optimally utilize the visual exposure from the high traffic volumes along this road. The proposed filling station adjacent to Mandela Drive therefore fits into the development plans of the eMalahleni Local Municipality.
- √ Being located within an established urban area, services (water, sewage, electricity) can be provided by connecting to the existing networks of the eMalahleni Local Municipality subject to certain improvements.
- √ No Interested and Affected Party will be directly impacted.
- √ The proposed development will NOT impact on any sensitive natural or cultural areas.
- √ No surface water environments (e.g. rivers, streams, wetlands, etc.) are present on site.
- √ The proposed project will not have any negative impacts on the environment that cannot be mitigated and managed.
- √ The site would be managed improving the visual aspects of the site and no longer posing a health and safety risk to residents living in the nearby residential area.
- √ The proposed filling station site is feasible from an economic point of view.
- √ The proposed development would lead to additional employment opportunities during the construction and operational phases.

Based on the above-mentioned, it is evident that:

- the proposed development is necessary (need);
- the proposed development will be located on an appropriate site (desirability);
- the development will benefit the local/regional community.

Therefore, the need and desirability of the said project was determined through the Basic Assessment process.

10.13 Period for which the EA is required

It is expected that construction will commence as soon as the relevant approvals are obtained and the required upgradings completed.

The validity period of the EA is however, not applicable since the activity includes operational aspects.

10.14 Conditions to be included in the EA

The following conditions should be included in the Environmental Authorisation:

- *The management and monitoring measures as indicated in Section 9 (EMPr) of the Basic Assessment Report must be implemented.*
- *The geotechnical mitigation measures recommended by Van der Merwe (2020) must be implemented in order to avoid any impact on the structures built.*
- *The mitigation measures recommended by Van Heerden (2020) must be implemented in order to protect the underlying aquifer.*
- *The upgrading of the intersection of Mandela Drive and Nita Avenue as recommended by the traffic engineers to be implemented before the left-in left-out access road is constructed.*
- *Services to be upgraded where applicable.*

SECTION 11: EVALUATION OF DRAFT BASIC ASSESSMENT REPORT

11.1 Availability of Basic Assessment Report

The Draft Basic Assessment Report (dated: July 2020) will be submitted to the Department of Agriculture, Rural Development, Land and Environmental Affairs for evaluation purposes. A hard/soft 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;
- Mpumalanga Tourism and Parks Agency.

A hard copy and electronic copy of the Draft Basic Assessment Report will be made available during the above-mentioned period to Interested and Affected Parties and stakeholders consulted and/or registered as part of the Basic Assessment Process (refer to Section 11.2).

A hard copy of the Draft BAR will be provided at the Casa Portuguesa Restaurant/Portuguese Club and at the offices of AdiEnvironmental. An electronic version will be made available on the company website (www.adienvironmental.co.za). An advertisement in this regard will be placed in the Witbank News in order to inform the larger community.

The various departments, stakeholders and I&APs will be requested to forward any comments on the report to the consultant within the 30-day period provided. These comments will be included and addressed in:

- Section 11 (Evaluation of Draft Basic Assessment Report);
- Table 11.1 (Summary of Issues of Concern and Response); and
- Appendix 16;

of the Final Basic Assessment Report.

An e-mail will be forwarded to the various departments, stakeholders and Interested and Affected Parties informing them of the comments received and the submission of the Final BAR for decision making.

The Final BAR (incorporating comments from I&APs) will be submitted to the Department of Agriculture, Rural Development, Land and Environmental Affairs for final decision making.

11.2 Informing Interested and Affected Parties

The following Interested and Affected Parties and stakeholders will be notified by means of 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 (DAFF)	F. Mashabela
Department of Agriculture, Rural Development, Land and Environmental Affairs (DARDLEA) - Directorate: Land Use and Soil Management – Ermelo	J. Venter

INTERESTED AND AFFECTED PARTY LIST	
Department of Co-operative Governance and Traditional Affairs (COGTA)	M. Loock
Department of Energy	S. Ntuli
Department of Mineral Resources	S. Mathavela
Department of Rural Development and Land Reform (Commission on Restitution of Land Rights)	T. Mkhonto
Department of Water and Sanitation (DWS)	N.S. Maliaga
Other Organisations/Stakeholders	
Eskom Distribution (Land & Rights)	T. Ludere
Eskom Transmission	L. Motsisi
Mpumalanga Tourism and Parks Agency (MTPA) – Land Advisory Unit	P. Nkosi
South African Civil Aviation Authority	K. Mthapo
South African Heritage Resources Agency (SAHRA)	N. Khumalo (SAHRIS)
South African National Roads Agency (SANRAL)	V. Bota, I. van der Linde, L. Dlanjwa
Trans African Concessions (TRAC)	C. Davis, R. Nkosi
South African Petroleum Industry Association (SAPIA)	N. Machumele
Fuel Retailers Association (FRA)	L. Nyakutsikwa
Fuel Retailers Association (FRA) – Regional Chairperson: Mpumalanga	D. Marx
Witbank Fuel Retailers Association	D. Swart
Local Municipality and Municipal Councillor	
Nkangala District Municipality	S. Links, A. Thwala
eMalahleni Local Municipality	E. Nkabinde, O. Riba
eMalahleni Local Municipality	Councillor L. Steyn (Ward 34)
Surrounding Landowners	
Property	**Landowner/Contact person**
Builders Warehouse	H. Sepuba
Casa Portuguesa Restaurant	P. Manarte
CTM	A. Ndala
Del Judor X4 neighbourhood watch	S. White
Vacant Land Portions 415, 416, 120 and 121 of Zeekoewater 311 JS	eMalahleni Local Municipality (E. Nkabinde, O. Riba)
Highveld Mall	C. Bendall
Highveld View Estate (CSI Rentals)	J. Laas
Indlela Lodge	W. Cillie
Jerobi Trailers	B. Ellis
Jonsson Workwear	J. Loots
Portuguese Club	M. da Cunha

INTERESTED AND AFFECTED PARTY LIST	
Resilient REIT Ltd. (Highveld Mall)	S. van der Walt
Witbank Baptist Church	K. Buchan-Smith
Witbank Nissan	M. da Cunha
Other I&APs	
Leads to Business	D. Wessels
Resident of Del Judor x4	S. Bloy
Lavender Lane Guesthouse	E. Michau
TKS TKzs	T. Mnisi
Total Route N4	L. Greyling, E. van Wyk, M. van Wyk
Total President	F. Visagie
Sasol Gordon	L. Mashego
Sasol Swartbos (Voortrekker)	Mr. Dickson
Caltex Park Motors	B. Greyvenstein
Engen Del Judor	D. Marx
Shell Saveways	H. Froneman
Shell OR Tambo/Blackvest CC T/A Sunray Shell	D. Swart
Caltex Nova	W. Zeelie
Ngubane Urban House (Pty) Ltd. o.b.o. Masakhane Mining Supply and Construction cc	N. Ngubane
The Town Planning Hub o.b.o. Total South Africa	B. Oosthuizen/B. Fletcher
Ndlelenhle Mining and Consulting	Mr. Mpahoso

11.3 Comments received

This section will be completed after the completion of the above-mentioned evaluation period.

REFERENCES

- AdiEnvironmental cc. 2021. **Monitoring of the President Park X6 Site After the Cyclone Eloise Rains (25 January – 4 February 2021) by AdiEnvironmental cc.** Report compiled by: A. Erasmus and R. Janse van Rensburg. Report dated: 5 February 2021.

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- Van Heerden, A. 2020. **Hydrocensus and Impact Assessment for Proposed Fuel Station at President Park.** Report prepared by: Geo-pollution Technologies – Gauteng (Pty) Ltd. Report dated: May 2020. GPT Reference: ALELA-20-5215.

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APPENDIX 1:

APPLICATION FORM

- Cover letter from AdiEnvironmental cc (dated: 30 June 2021; Ref: BA 2020/04) to the Department of Agriculture, Rural Development, Land and Environmental Affairs (DARDLEA) regarding submission of application form.
- Copy of the application form.

APPENDIX 2:

CURRICULUM VITAE

- A. Erasmus *Pr. Sci. Nat.; Registered EAP*
- R. Janse van Rensburg *Pr. Sci. Nat.; Registered EAP*
- List of projects completed by A. Erasmus and R. Janse van Rensburg
- A. van Vollenhoven *Accredited archaeologist*
- H. Fourie *Accredited palaeontologist*
- I. Venter *Pr. Sci. Nat. (ecologist – vegetation and wetland study)*
- J.C.P. van Wyk *Pr. Sci. Nat.* (zoologist – bullfrog study)
- A. van Heerden *Cand. Nat. Sci.* (hydrogeologist – groundwater study)
- M. Burger *Pr. Sci. Nat. (geohydrologist – groundwater study)*

APPENDIX 3:

ECOLOGICAL STUDIES

- Venter, I. 2020a. **Screening Assessment for the President Park x6 Site.** Report compiled by: Kyllinga Consulting. Report dated: June 2020.
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- Letter (dated: 11 February 2021; Ref: 13/6/1) from Dr. H. Botha (Mpumalanga Tourism and Parks Agency).
- Van Wyk, J.C.P. 2021. **Addendum: Giant Bullfrog *(Pyxcephalus adspersus)* Habitat Assessment and Long-term Survival Plan on Erven 20, 21 and 22 of President Park X6, eMalahleni (Witbank) on Portion 234 of the Farm Zeekoewater 211 JS, Mpumalanga Province.** Report prepared by: J.C.P. van Wyk. Report dated: 16 February 2021.
- E-mail (dated: 19 February 2021) from Dr. H. Botha (Mpumalanga Tourism and Parks Agency) regarding the Addendum.

APPENDIX 4:

HERITAGE REPORT

- Van Vollenhoven, A.C., J. Smit and D. Viljoen. 2020. **A Report on a Heritage Impact Assessment for the Proposed Development of a Retail Centre on Erven 20, 21 and 22 of President Park X6, eMalahleni, Mpumalanga Province.** Report compiled by: Archaetnos Culture & Cultural Resource Consultants. Report dated: 20 May 2020.

APPENDIX 5:

PALAEONTOLOGICAL REPORT

- Fourie, H. 2020. **The Development of a Retail Centre on Erven 20, 21 and 22 of President Park X6, eMalahleni (Witbank) - Palaeontological Impact Assessment: Desktop Study.** Report prepared by: Heidi Fourie Consulting. Report dated: 31 May 2020.

APPENDIX 6:

FEASIBILITY STUDY

- Van Rooyen, J.M. 2020. **Filling Station Feasibility Study (Traffic Impact Study with Assumptions) Erf 20, President Park x6, on Mandela Drive, Emalaleni, Mpumalanga.** Report prepared by: EDL Engineers (Pty) Ltd. Report dated: May 2020. Project number: 20023.

APPENDIX 7:

GEOTECHNICAL STUDY

- Van der Merwe, J. 2020. **Report on a foundation investigation carried out for the proposed new filling station development on Portion 234 of the farm Zeekoewater 311 JS, Witbank, Mpumalanga Province.** Report prepared by: Johann van der Merwe (Pty) Ltd Consulting Applied Earth and Environmental Scientists. Report dated: 7 June 2020. Project number: M20/3838.

APPENDIX 8:

GROUNDWATER STUDY

- Van Heerden, A. 2020. **Hydrocensus and Impact Assessment for Proposed Fuel Station at President Park.** Report prepared by: Geo-pollution Technologies – Gauteng (Pty) Ltd. Report dated: May 2020. GPT Reference: ALELA-20-5215.

APPENDIX 9:

SERVICES REPORT

- Senekal, H.B. 2020. **Civil Services Report: Proposed Erf 23, President Park X6, eMalahleni, Mpumalanga.** Report prepared by: EDL Engineers (Pty) Ltd. Report dated: September 2020. Reference: Z:/PROJECTS/20001-20099/.
- Diedericks, M.A. **Electrical Engineering Services Report: Proposed Development of Erf 20 & Erf 21 (Portion 234) of the Farm Zeekoewater 311JS.** Report prepared by: RDV Consulting Electrical Engineers. Report dated: 28 September 2020.

APPENDIX 10:

TOWNPLANNING MEMORANDUM

- Korsman & Associates. 2020. **Simultaneous Subdivision, Consolidation and Special Consent Application in terms of Section 71(2), Section 77, Section 80(1) and Chapter 6 of the Emalahleni Spatial Planning and Land Use Management By-Law, 2016, Read with the Provisions of the Spatial Planning and Land Use Management Act, Act 16 of 2013, on Erven 20, 21 & 22 President Park Emalahleni Extension 6 Township, Registration Division J.S., Province Mpumalanga.** Report prepared by: Korsman & Associates Town and Regional Planners. Report dated: 3 December 2020.
- Letter from Emalahleni Local Municipality (dated: 6 April 2021) to Korsman and Associates regarding the **Application for Subdivision, Consolidation and Simultaneous Special Consent: Erven 20 and 21, President Park Extension 6.**
- Zoning certificates for Erf 20 and Erf 21 obtained from the eMalahleni Local Municipality.

APPENDIX 11:

ADVERTISING OF THE PROJECT

- A copy of the advertisement published in the Witbank News, 4 September 2020.
- A copy of the on-site notice
- Printout of company website page www.adienvironmental.co.za – Document Downloads (Notice to Interested and Affected Parties; Background Information Document).
- Printout of the Ward 34 Facebook Page (3 September 2020).
- E-mail from L. Steyn (Ward Councilor Ward 34; dated: 3 September 2020).
- E-mail and completed comment sheet from S. Bloy (dated: 3 September 2020) to AdiEnv.
- E-mail from AdiEnv (dated: 3 September 2020) to S. Bloy.
- Email from AdiEnvironmental (dated: 3 September 2020) to S. Bloy.
- E-mail from E. Michau (dated: 10 September 2020) to AdiEnv.
- E-mail from AdiEnv (dated: 9 Septebmer 2020) to E. Michau.
- E-mail from O. Riba (eMalahleni Local Municipality; dated: 9 September 2020).
- Email from AdiEnvironmental (dated: 9 September 2020) to O. Riba.

APPENDIX 12:

BACKGROUND INFORMATION DOCUMENT

APPENDIX 13:

INFORMING AUTHORITIES & STAKEHOLDERS

- E-mail from AdiEnvironmental cc (AdiEnv) (dated: 4 September 2020) to:

AUTHORITY/ STAKEHOLDER	CONTACT PERSON
Department of Agriculture, Forestry and Fisheries	Mashabela, F
Department of Agriculture, Rural Development, Land and Environmental Affairs - Directorate: Land Use and Soil Management – Ermelo	Venter, J
Department of Co-Operative Governance and Traditional Affairs	Loock, M
Department of Energy	Machete, M
Department of Mineral Resources	Mathavhela, S
Department of Rural Development and Land Reform (Commission on Restitution of Land Rights)	Mkhonto, T
Department of Water and Sanitation	Ndlhovu, T; Maliaga, NS
Mpumalanga Tourism and Parks Agency	Nkosi, P

- E-mail from AdiEnv (dated: 9 September 2020) to S. Ntuli (Department of Energy).
- E-mail from AdiEnv (dated: 4 September 2020) to:

Eskom Distribution	Ludere, T
Eskom Transmission	Motsisi, L
South African National Roads Agency (SANRAL)	Bota, V; Van der Linde, I; Schmid, K
South African Civil Aviation Authority (SACAA)	Mthapo, K
Trans African Concessions (TRAC)	Davis, C; Nkosi, R

- Webpage printout (dated: 3 September 2020): South African Heritage Resources Information System (SAHRIS).
- E-mail from AdiEnv (dated: 4 September 2020) to L. Dlanjwa (SANRAL).
- E-mail from AdiEnv (dated: 4 September 2020) to:

Nkangala District Municipality	Links, S; Thwala, A
Steve Tshwete Local Municipality	Nkabinde, E
Councillor Ward 34	Steyn, L

- E-mail from AdiEnv (dated: 9 September 2020) to O. Riba (eMalahleni Local Municipality).
- E-mail from AdiEnv (dated: 3 September 2020) to L. Steyn (Ward Councilor Ward 34).
- E-mail from AdiEnv (dated: 4 September 2020) to Fuel Retailers Association (FRA) and South African Petroleum Industry Association (SAPIA).
- E-mail from AdiEnv (dated: 4 September 2020) to Fuel Retailers Association (FRA) – Regional Chairperson: Mpumalanga (D. Marx).

APPENDIX 14:

INFORMING INTERESTED AND AFFECTED PARTIES

- E-mail from AdiEnv (dated: 4 September 2020) to:

Property	Landowner/Contact person
Builders Warehouse	F. van Dyk
Casa Portuguesa Restaurant	P. Manarte
CTM	A. Ndala
Del Judor X4 Neighbourhood Watch	S. White
Highveld Mall	C. Bendall
Highveld View Estate (CSI Rentals)	J. Laas
Indlela Lodge	W. Cillie
Jerobi Trailers	B. Ellis
Jonsson Workwear	J. Loots
Leads2Business	D. Wessels
Portuguese Club and Witbank Nissan	M. da Cunha
Witbank Baptist Church	K. Buchan-Smith
Highveld Mall (Resilient)	S. van der Walt

- E-mail from AdiEnv (dated: 4 September 2020) to Total Route N4 (L. Greyling).
- E-mail from AdiEnv (dated: 14 September 2020) to Total President (F. Visagie) and Sasol Gordon (L. Mashego).
- E-mail from AdiEnv (dated: 14 September 2020) to Sasol Swartbos.
- E-mail from AdiEnv (dated: 14 September 2020) to Caltex Park Motors.
- E-mail from AdiEnv (dated: 4 September 2020) to Engen Del Judor (D. Marx).
- E-mail from AdiEnv (dated: 4 September 2020) to Shell Saveways (H. Froneman).
- E-mail from AdiEnv (dated: 4 September 2020) to Shell OR Tambo (D. Swart).
- E-mail from AdiEnv (dated: 4 September 2020) to Caltex Nova (W. Zeelie).

APPENDIX 15:

COMMENTS RECEIVED

- Letter from the South African Heritage Resources Agency (SAHRA) (dated: 1 October 2020; Ref: 15459) to AdiEnv.
- E-mail from E. van Wyk (Elmir Projects/Total Route N4 Filling Station; dated: 2 October 2020) and completed comment sheet (dated: 2 October 2020).
- Email from AdiEnv (dated: 2 October 2020) to E. van Wyk (Elmir Projects/Total Route N4 Filling Station).
- E-mail from F. Visagie (Total President; dated 2 October 2020) and completed comment sheet (dated: 1 October 2020).
- E-mail from AdiEnv (dated: 2 October 2020) to F. Visagie (Total President).
- E-mail from B. Oosthuizen (The Town Planning Hub cc; dated: 2 October 2020) on behalf of Total South Africa, completed comment sheet (dated: 1 October 2020) and letter (dated: 1 October 2020) from B. Fletcher.
- E-mail from AdiEnv (dated: 2 October 2020; 25 January 2021; 18 March 2021) to B. Oosthuizen (The Town Planning Hub).
- E-mail from D.A. Swart (Sunray Shell; dated: 7 September 2020).
- Email from AdiEnv (dated: 7 September 2020) to D.A. Swart (Sunray Shell)
- E-mail from N. Ngubane (Ngubane Urban House (Pty) Ltd.; dated: 30 September 2020) and letter (dated: 29 September 2020).
- Email from AdiEnv (dated: 30 September 2020) to N. Ngubane (Ngubane Urban House (Pty) Ltd.).
- Email from AdiEnv (dated: 7 October 2020; 20 October 2020) to N. Ngubane (Ngubane Urban House (Pty) Ltd.).
- Email from AdiEnv (dated: 4 November 2020) to Mr. Maphosa (Ndlelehle Mining and Consulting) as well as subsequent emails (dated: 9 November 2020; 11 November 2020; 12 November 2020; etc.).
- Email from Mr. Maphosa (Ndlelehle Mining and Consulting; dated: 10 February 2021).
- Email from Mr. T. Mnisi (dated: 20 October 2020).
- Email from AdiEnv (dated: 20 October 2020) to Mr. Mnisi.