

**BASIC ASSESSMENT REPORT:**  
**PROPOSED FILLING STATION AND**  
**ASSOCIATED INFRASTRUCTURE**  
**ON PORTION 1 OF ERF 10769,**  
**MIDDELBURG X26**  
**MIDDELBURG**

Report prepared for: Pearl Star Investments 85 cc

Report dated: December 2017 (draft)

Report number: BA 2017/04

DARDLEA ref: 1/3/1/16/1N-104

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



Author: R. van Rensburg and A. Erasmus

## PROJECT INFORMATION SUMMARY

<b>PROJECT TITLE</b>	Proposed Filling Station and Associated Infrastructure on Portion 1 of Erf 10769, Middelburg X26, Middelburg
----------------------	--

<b>CLIENT</b>	Pearl Star Investments 85 cc
<b>CONTACT DETAILS</b>	P.O. Box 23 Middelburg 1050 013-282 7204

<b>CONSULTANT</b>	AdiEnvironmental cc
<b>CONTACT DETAILS</b>	P.O. Box 647 Witbank 1035 013-697 5021

<b>DARDLEA REFERENCE NO.</b>	1/3/1/16/1N-104
<b>AdiE REFERENCE NO.</b>	BA 2017/04

<b>REPORT VERSION</b>	Basic Assessment Report – draft
<b>DATE</b>	December 2017
<b>REPORT VERSION</b>	
<b>DATE</b>	

### COPYRIGHT RESERVED

No part of this document may be reproduced in any manner without full acknowledgement of the source.

This report should be cited as:

*AdiEnvironmental cc. 2017. Basic Assessment Report: Proposed filling station and associated infrastructure on Portion 1 of Erf 10769, Middelburg X26, Middelburg*

**UNDERTAKING BY EAP**

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

I, ....., 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..... on this ..... day of..... of 2017.

Signature:.....

Company:.....

I, ....., 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..... on this ..... day of..... of 2017.

Signature:.....

Company:.....

## **TABLE OF CONTENTS**

LIST OF TABLES	iv
LIST OF FIGURES	iv
LIST OF APPENDICES	v
LIST OF ABBREVIATIONS	v
<b>1. INTRODUCTION</b>	<b>1</b>
<b>2. DETAILS OF THE PROJECT APPLICANT AND ENVIRONMENTAL CONSULTANT</b>	<b>4</b>
<b>3. DESCRIPTION OF THE ACTIVITY</b>	<b>5</b>
3.1 Description of the site, design, size and scale of the development.....	5
3.1.1 Introduction.....	5
3.1.2 Zoning of Stand.....	5
3.1.3 Filling Station.....	5
3.2 Services required.....	10
3.2.1 Water and fire fighting.....	10
3.2.2 Electricity.....	11
3.2.3 Sewage.....	11
3.2.4 Waste management.....	11
3.2.5 Storm water control measures.....	12
3.2.6 Access road.....	13
3.3 Applicable legislation, policies and/or guidelines.....	14
<b>4. DESCRIPTION OF ALTERNATIVES</b>	<b>17</b>
4.1 Alternative sites.....	17
4.1.1 Proposed site.....	17
4.1.2 Alternative site.....	17
4.1.3 No project option.....	17
4.2 Alternative land uses.....	17
4.2.1 Expansion of the existing Retail City.....	17
4.2.2 Development of other businesses.....	18
4.2.3 Development of a filling station.....	18
4.2.4 No project option.....	19
4.3 Alternative layout plans.....	19
4.3.1 Layout Plan No 1 - original layout plan.....	19
4.3.2 Layout Plan No 2 - amended layout plan.....	20
4.3.3 Layout Plan No 3 - preferred access points.....	21
4.3.4 No project option.....	24
4.4 Aboveground vs. underground tanks.....	24
4.5 Alternative services.....	24
4.6 The 'No Project Option'.....	24
4.7 Need and desirability of the activity.....	25
4.7.1 Need and desirability.....	25
4.7.2 Feasibility of the filling station.....	25
<b>5. BIOPHYSICAL DESCRIPTION OF THE SITE</b>	<b>35</b>
5.1 Location of the site.....	35
5.2 Climate.....	37
5.2.1 Regional climate.....	37
5.2.2 Mean monthly rainfall.....	37



5.2.3 Mean annual rainfall.....	37
5.2.4 Mean annual evaporation.....	38
5.2.5 Mean monthly maximum and minimum temperatures.....	38
5.2.6 Prevailing wind direction.....	38
5.2.7 The incidence of extreme weather conditions.....	39
5.2.8 Climate change.....	39
5.3 Land use.....	41
5.3.1 Land ownership.....	41
5.3.2 Zoning of the site.....	41
5.3.3 Size of the site.....	41
5.3.4 Servitudes.....	42
5.3.5 Land use and existing infrastructure on site.....	42
5.3.6 Surrounding land uses.....	44
5.4 Geology.....	45
5.5 Topography.....	46
5.6 Soil.....	47
5.6.1 General.....	47
5.6.2 Agricultural potential/land capability.....	48
5.6.3 Geotechnical study.....	49
5.7 Natural vegetation.....	52
5.7.1 Regional vegetation and conservation status.....	52
5.7.2 Vegetation found on site and surrounds.....	55
5.7.3 Plant Species of Conservation Concern.....	59
5.7.4 Protected plant species.....	59
5.7.5 Invader or exotic species.....	60
5.8 Animal life.....	61
5.8.1 Regional conservation status.....	61
5.8.2 Animal life found on site and surrounds.....	62
5.8.3 Species of conservation concern.....	62
5.9 Surface water.....	63
5.9.1 Catchment.....	63
5.9.2 Floodline.....	63
5.9.3 Surface water runoff.....	63
5.9.4 Wetlands on site.....	63
5.10 Groundwater.....	72
5.10.1 Hydrogeological setting.....	73
5.10.2 Perched water table.....	73
5.10.3 Hydrocensus.....	74
5.10.4 Groundwater flow and levels.....	74
5.10.5 Groundwater quality.....	76
5.11 Air quality.....	77
5.12 Noise.....	78
5.13 Sites of archaeological and cultural interest.....	78
5.13.1 Cultural Heritage sensitivity.....	78
5.13.2 Palaeontological sensitivity.....	79
5.14 Sensitive landscapes.....	80
5.15 Visual aspects.....	80
5.16 Traffic.....	80
5.16.1 Existing road network.....	80
5.16.2 Existing traffic volumes.....	81
5.16.3 Capacity analyses.....	83
5.16.4 Access from Samora Machel Street (R35).....	84
5.16.5 Conclusion.....	84
5.17 Sense of place.....	86



<b>6.</b>	<b>DESCRIPTION OF THE PUBLIC PARTICIPATION PROCESS</b>	<b>88</b>
6.1	Advertising of the project.....	88
6.1.1	Press advertising.....	88
6.1.2	On-site advertising.....	88
6.1.3	Informing I&APs via the internet.....	88
6.1.4	Feedback from the advertising process.....	88
6.2	Directly affected landowner/user.....	90
6.3	Identified local authorities/government departments and stakeholders.....	90
6.3.1	Department of Agriculture, Rural Development, Land and Environmental Affairs (DARDLEA) - Directorate: Land Use and Soil Management.....	91
6.3.2	Department of Rural Development and Land Reform (Commission on Restitution of Land Rights).....	92
6.3.3	Middelburg Fuel Retailers Association.....	92
6.3.4	South African Heritage Resources Agency (SAHRA).....	93
6.3.5	South African National Roads Agency (SANRAL).....	94
6.3.6	Trans African Concessions (TRAC).....	94
6.4	Surrounding landowners/users.....	94
6.4.1	General comment from surrounding businesses.....	96
6.4.2	G. Strydom.....	97
6.4.3	Total Filling Station (S. Mokoana/Basuz Trading cc).....	98
6.4.4	R.A. Hanyane.....	101
6.6	Department of Agriculture, Rural Development, Land and Environmental Affairs.....	101
6.7	List of Interested and Affected Parties.....	103
<b>7.</b>	<b>ENVIRONMENTAL IMPACT DESCRIPTION AND EVALUATION</b>	<b>105</b>
7.1	Introduction.....	105
7.2	Evaluation of impacts.....	105
7.3	Planning and design phase.....	106
7.4	Construction phase.....	106
7.5	Operational phase.....	107
7.6	Decommissioning phase.....	107
7.7	Identification of potential impacts.....	107
7.8	No project impacts.....	125
7.9	Cumulative impacts.....	125
<b>8.</b>	<b>ENVIRONMENTAL MANAGEMENT PLAN</b>	<b>126</b>
8.1	Definition and objectives.....	126
8.2	Contact details.....	126
8.3	Description of the proposed project.....	127
8.4	Phases of the development and timeframe.....	128
8.5	Mitigation and management measures to be implemented.....	130
8.6	Contingency plan w.r.t. fuel spillages.....	148
8.7	Decommissioning phase.....	150
8.8	Financial provision for rehabilitation.....	152
8.9	Implementation and monitoring of the EMPr.....	154
<b>9.</b>	<b>ENVIRONMENTAL IMPACT STATEMENT</b>	<b>162</b>
<b>10.</b>	<b>EVALUATION OF BASIC ASSESSMENT REPORT</b>	<b>175</b>

REFERENCES

APPENDICES



### **LIST OF TABLES**

Table 3.1: Applicable legislation, policies and/or guidelines.....	12
Table 4.1: Expected fuel sales in a month.....	27
Table 4.2: Annual forecast sales.....	28
Table 4.3: Estimated literage pumped per month.....	29
Table 4.4: Summary of competitor sites.....	31
Table 4.5: Shared Traffic.....	32
Table 4.6: Impact on surroundings sites.....	32
Table 5.1: Average Monthly Rainfall depths (mm) and days with rainfall of >0.1mm.....	37
Table 5.2: Maximum rainfall intensities.....	38
Table 5.3: Mean monthly evaporation figures.....	38
Table 5.4: Mean monthly maximum and minimum temperatures.....	38
Table 5.5: Mean monthly wind speed and direction.....	39
Table 5.6: Summary of key potential climatic changes for the Nkangala District Municipality.....	41
Table 5.7: Invasive plant species recorded on site.....	60
Table 5.8a: Summary table of the EIS and functional importance of the wetland unit.....	70
Table 5.8b: Summary of sensitivity and conservation importance.....	70
Table 5.9: Summarized hydrocensus information.....	74
Table 5.10: Results of the petroleum hydrocensus analyses.....	76
Table 5.11: Results of the drinking water quality analyses.....	77
Table 5.12: Road network classification.....	81
Table 5.13: Link Traffic Flows.....	81
Table 5.14: Modal Split.....	82
Table 5.15: Total passing traffic (AM/PM peak hour).....	82
Table 5.16: Trip distribution.....	83
Table 5.17: Trip draw off rate and Trip draw off vehicles per 24 hours.....	83
Table 6.1: Identified local authorities/government departments and stakeholders who received BIDs.....	90
Table 6.2: Identified adjacent land owners/users who received BIDs.....	95

### **LIST OF FIGURES**

Figure 3.1: Proposed layout plan of the filling station and access road.....	7
Figure 3.2: Conceptual layout plan.....	8
Figure 3.3: Location of service connections.....	12
Figure 4.1: Layout Plan No 1 indicating the filling station and access road.....	19
Figure 4.2: Layout Plan No 2 indicating the filling station and access road.....	20
Figure 4.3: Layout Plan No 3 (preferred access points).....	22
Figure 4.4: Tanker Truck Path.....	23
Figure 5.1: Location of site.....	36
Figure 5.2: Windroses - Middelburg.....	40
Figure 5.3: Aerial view of the site and surrounds.....	43
Figure 5.4: Geology of the site.....	46
Figure 5.5: Terrain type of the proposed site.....	47
Figure 5.6: Land type of the proposed site.....	47
Figure 5.7: Land capability of the proposed site.....	49
Figure 5.8: Grazing capacity of the proposed site.....	49
Figure 5.9a: Location of test pits in relation to the site.....	50
Figure 5.9b: Geotechnical zones.....	51
Figure 5.10: Vegetation type.....	53
Figure 5.11: Terrestrial biodiversity assessment - Mpumalanga Biodiversity Conservation Plan, 2006.....	54



Figure 5.12:	Terrestrial biodiversity assessment - Mpumalanga Biodiversity Sector Plan, 2013.....	55
Figure 5.13:	Vegetation units identified on site.....	56
Figure 5.14:	Freshwater biodiversity assessment.....	62
Figure 5.15:	Seep wetland present on site and adjacent to the site.....	64
Figure 5.16:	Sensitivity of the site.....	71
Figure 5.17:	Conservation importance of the site.....	72
Figure 5.18:	Boreholes identified as part of hydrocensus.....	75
Figure 5.19:	Requirement for palaeontological study.....	79
Figure 5.20:	Proposed access from Samora Machel Street (R35) and La Roca Boulevard.....	86
Figure 5.21:	Steve Tshwete Spatial Development Framework (2015).....	87
Figure 6.1:	Aerial view of notice placements.....	89
Figure 6.2:	Surrounding land owners.....	96
Figure 6.3:	Area leased by G. Strydom.....	98
Figure 8.1:	Sensitivity of the site.....	128

### **LIST OF APPENDICES**

Appendix 1:	Application Form
Appendix 2:	Curriculum Vitae
Appendix 3:	Feasibility Study
Appendix 4:	Test pit profiles
Appendix 5:	Vegetation and Wetland Study
Appendix 6:	Geohydrological Study
Appendix 7:	Advertising of the project
Appendix 8:	Correspondence with the authorities and interested and affected parties
Appendix 9:	Background information document
Appendix 10:	Comment received
Appendix 11:	Civil Engineering Report
Appendix 12:	Traffic Impact Assessment
Appendix 13:	Palaeontological Report
Appendix 14:	Townplanning Memorandum

### **LIST OF ABBREVIATIONS**

BAR	Basic Assessment Report
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
DWS	Department of Water and Sanitation
EIA	Environmental Impact Assessment
EIR	Environmental Impact Report
EMPr	Environmental Management Programme Report
ha	hectares
I&AP	Interested and Affected Party
km	kilometer
mamsl	meters above mean sea level
m	meters
mbgl	meters below ground level
mm	millimeter





Mbsp	Mpumalanga Biodiversity Sector Plan
MTPA	Mpumalanga Tourism and Parks Agency
NFEPA	National Freshwater Ecosystem Priority Areas
SAHRA	South African Heritage Resources Agency
SANS	South African National Standards
TRAC	Trans African Concessions
vph	vehicles per hour



## 1. INTRODUCTION

The applicant, Pearl Star Investments 85 cc, intends to develop a filling station and associated infrastructure on Portion 1 of Erf 10769, Middelburg X26, Middelburg. The said site is 5000 m<sup>2</sup> in extent and located adjacent to Samora Machel Street (R35 provincial road) and La Roca Boulevard (access road to Middelburg Mall).

Access to the site will be provided from La Roca Boulevard and Samora Machel Street (R35 provincial road) (hereafter referred to as Samora Machel Street (R35)) to the site.

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

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

Listing	Activity
<b>12</b>	<i>The development of (i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres; or (ii) infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs (a) within a watercourse; (b) in front of a development setback; or (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a water course;- excluding (aa) the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour; (bb) where such development activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies; (cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies; (dd) where such development occurs within an urban area; (ee) where such development occurs within existing roads, road reserves or railway line reserves; or (ff) the development of temporary infrastructure or structures where such infrastructure or structures will be removed within 6 weeks of the commencement of development and where indigenous vegetation will not be cleared.</i>
<b>14</b>	<i>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.</i>
<b>19</b>	<i>The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse but excluding where such infilling, depositing, dredging, excavation, removal or moving – (a) will occur behind a development setback; (b) is for maintenance purposes undertaken in accordance with a maintenance management plan; (c) falls within ambit of activity 21 in this Notice, in which case that activity applies; (d) occurs within existing ports or harbours that will not increase the development footprint of the port or harbour; or (e) where such development is related to the development of a port or harbour, in which case activity 26 of Listing Notice 2 of 2014 applies.</i>

In order to obtain environmental authorisation, a Basic Assessment must be conducted as described in Regulations 19 and 20 of the Environmental Impact Assessment Regulations 2014 (as amended) as promulgated in terms



of Section 24(5) and 44 of the National Environmental Management Act, 1998 (Act 107 of 1998).

The objective of the Basic Assessment process is to, through a consultative process:

- a) Determine the policy and legislative context within which the activity is located and document how the proposed activity complies with and responds to the policy and legislative context;
- b) Identify the alternatives considered, including the activity, location, and technology alternatives;
- c) Describe the need and desirability of the proposed alternatives;
- d) Through the undertaking of an impact and risk assessment process inclusive of cumulative impacts which focused on determining the geographical, physical, biological, social, economic, heritage and cultural sensitivity of the sites and locations and the risk of impact of the proposed activity and technology alternatives on these aspects to determine: (i) the nature, significance, consequence, extent, duration and probability of the impacts occurring; and (ii) degree to which these impacts (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated.
- e) Through a ranking of the site sensitivities and possible impacts the activity and technology alternatives will impose on the sites and location identified through the life of the activity to: (i) identify and motivate a preferred site, activity and technology alternative; (ii) identify suitable measures to avoid, manage or mitigate identified impacts; and (iii) identify residual risks that need to be managed and monitored.

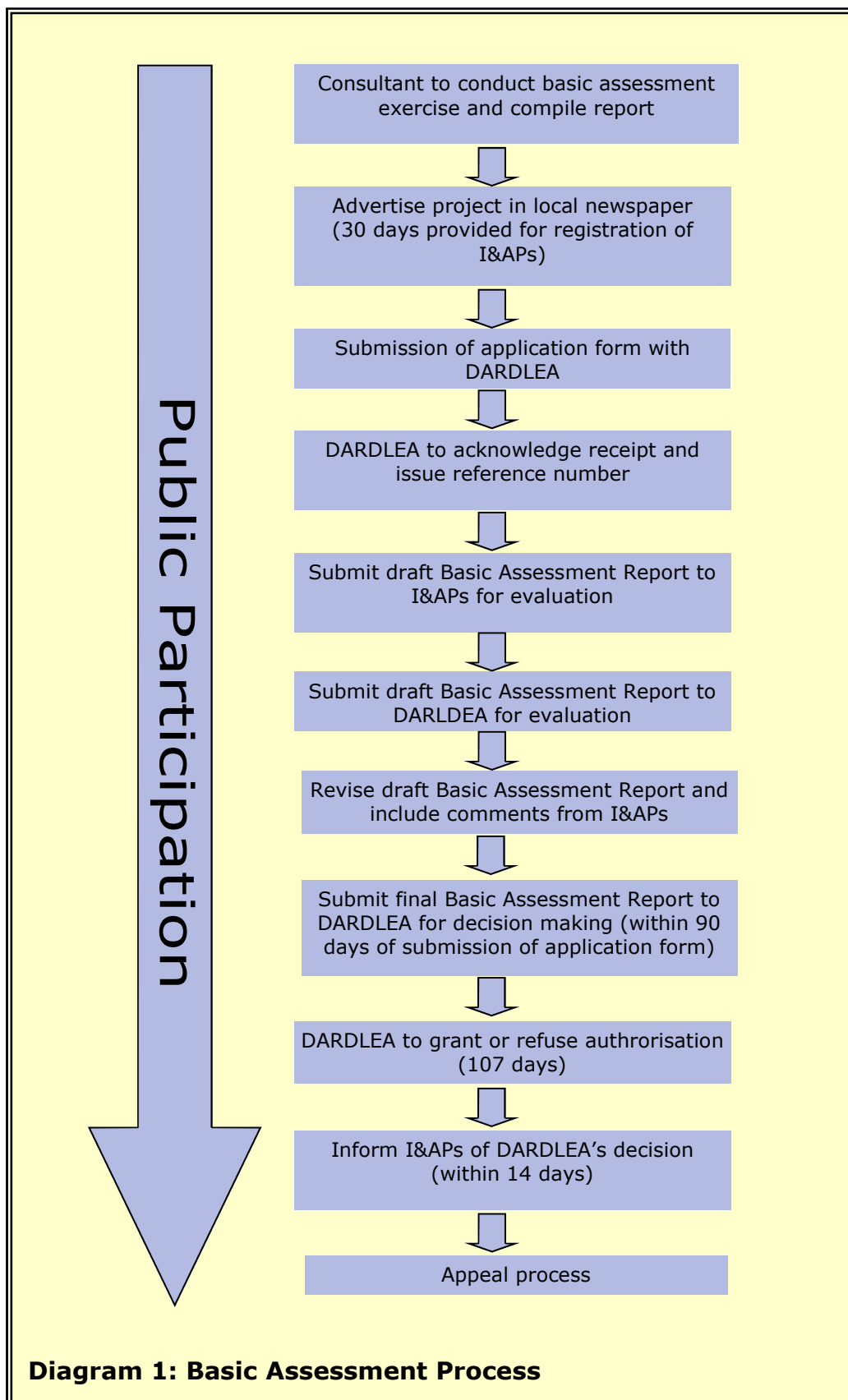
AdiEnvironmental cc. was appointed as independent environmental consultant to conduct the required Basic Assessment and compile the necessary documentation. This Basic Assessment Report (BAR) is compiled in accordance with Appendix 1 of the Environmental Impact Assessment Regulations, 2014 (as amended)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

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

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

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





## 2. DETAILS OF THE PROJECT APPLICANT AND ENVIRONMENTAL CONSULTANT

<b>Name and address of applicant:</b> Pearl Star Investments 85 cc P.O. Box 23 Middelburg 1050	
Contact Person:	Mr. Nazir Gani
Telephone number:	013-282 7204
Cell number:	082 318 4786
E-mail:	nazir@ismailsfurn.co.za

<b>Name and address of environmental consultant:</b> AdiEnvironmental cc P.O. Box 647 Witbank 1035	
Contact persons:	Mrs. A. Erasmus <i>Pr. Sci. Nat.</i> Ms. R. Janse van Rensburg
Cell number:	083 271 8260
Telephone number:	013-697 5021
Fax number:	013-697 5021
Email:	adie@adienvironmental.co.za riana@adienvironmental.co.za

A copy of the application form and the declaration of independence by the applicant and environmental consultant are provided in Appendix 1.

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



### 3. DESCRIPTION OF THE ACTIVITY

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

##### 3.1.1 Introduction

The applicant, Pearl Star Investments 85 cc, intends to develop a filling station and associated infrastructure on Portion 1 of Erf 10769, Middelburg X26, Middelburg. Figure 5.1 indicates the location of the site.

The said site is 5000 m<sup>2</sup> in extent and located adjacent to Samora Machel Street (R35) and La Roca Boulevard (access road to Middelburg Mall).

##### 3.1.2 Zoning of Stand

The said site is currently zoned "Business 2" and would therefore have to be rezoned to "Public Garage" for use as a filling station. Urban Dynamics Mpumalanga (Pty) Ltd. (hereafter referred to as Urban Dynamics, 2017) was appointed by the applicant to apply for the rezoning of the site. A copy of the townplanning memorandum is provided in Appendix 14.

The definition of a "Public Garage" in terms of the Steve Tshwete Town Planning Scheme (2004) is:

*"A building or portion of a building other than a parking garage used or constructed or designed or adapted to be used for the sale of motor fuels, lubricants motor spares and motor accessories and may include a convenience shop, caretaker's flat and provision for the maintenance and/or repair of motor vehicles for reward but shall not include panel beating and spray painting. (A Municipality may stipulate: (1) size of convenience shop and restaurant.)"*

##### 3.1.3 Filling Station

Figure 3.1 provides an indication of the proposed filling station layout and access roads as designed by WSP Group Africa (Pty) Ltd (hereafter referred to as Kotze, 2017).

Access to the site will be provided from La Roca Boulevard as well as from a road extending from Samora Machel Street (R35) to the site (Figure 3.1). The proposed access road will extend across the Remainder of Portion 27 of Middelburg Town and Townlands 287 JS to the site. The proposed road will be 120m long and 5m wide (Figure 3.1). According to Kotze (2017), the left-in-only access road was approved 'in principle' by SANRAL (letter dated: 21 October 2016; Appendix 10) subject to detailed design being submitted before construction.

According to Urban Dynamics (2017), the following development parameters are proposed for the filling station:

- Height: 3 storeys;
- Coverage: 60%;
- FAR: In accordance with an approved Site Development Plan;
- Parking: 40% of the area of the site, including the area around the fuel pump islands, but excluding workshops, show rooms, work areas, lubricating and washing areas, shops;
- Building Lines: 10m Street, 2m rear, 2m other.

Figure 3.2 provides an indication of the conceptual layout plan for the filling station designed by Kotze (2017). A detailed layout plan indicating the exact



location of the infrastructure as well as information pertaining to storm water management, oil traps, fuel leak monitoring system, etc. will however, only be available once an oil company (e.g. Sasol, Total, BP, Engen) has been appointed.

In general, the proposed filling station (Figure 3.2) will consist of:

- Underground tanks/tank farm (93 Unleaded, 95 Unleaded and diesel);
- Pump island (above-ground fuel pumps and hose dispensers);
- Associated pump and tank infrastructure (e.g. delivery pipes, fillers, suction pumps, etc.);
- Canopy covered forecourt with 10 vehicle refuelling bays;
- Convenience store (including fast food outlet) of  $\pm 200\text{m}^2$ ;
- ATM;
- Car parking;
- Delivery parking areas;
- Ablution facilities;
- Two access roads;
- Storm water channel and containment slab with catchpit;
- Generator
- Landscaped area.

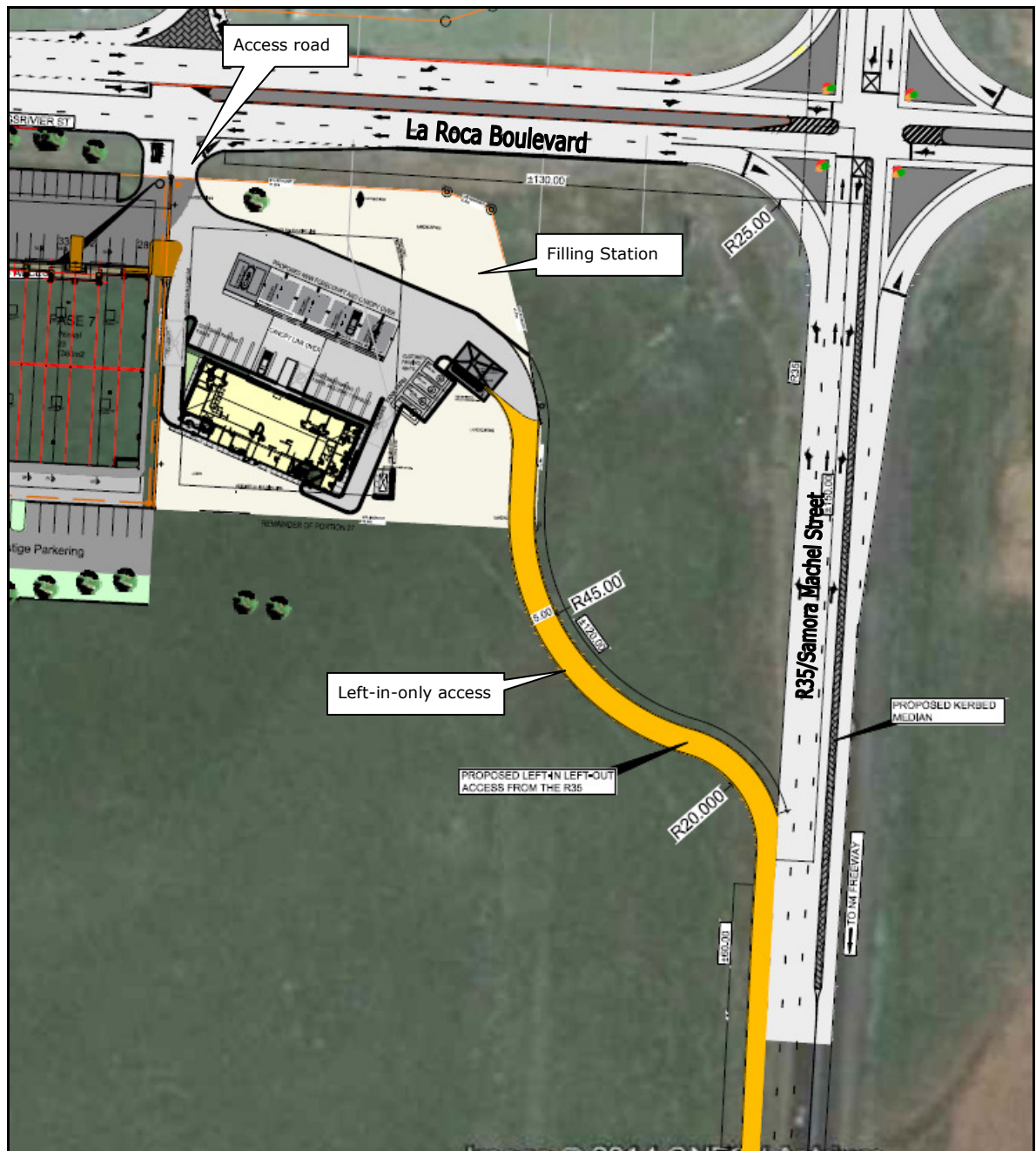
The forecourt and refuelling bays will be located in the northern portion and the tank farm (underground tanks) in the eastern portion (Figure 3.2).

The tank farm will comprise of 4 (perhaps 5) 23 000 liter underground tanks and associated infrastructure. 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  $115\text{m}^3$  of fuel would be stored on site.

As indicated on the current layout plans (Figures 3.1 and 3.2), the convenience store and parking bays will be located in the south western portion of the site.

Access to the site would be from the south eastern and north western corners of the site (Figure 3.2).

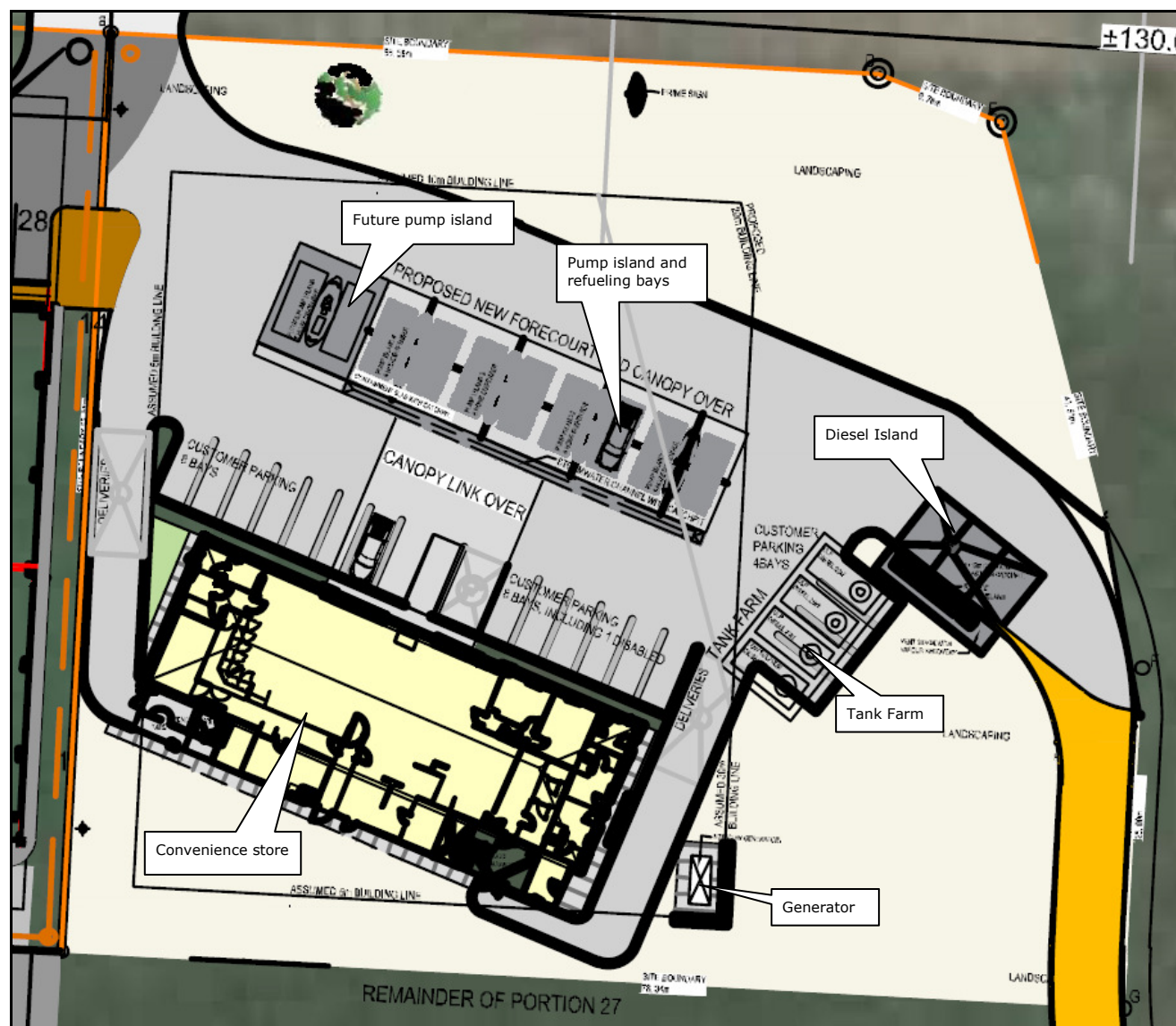




**Figure 3.1: Proposed layout plan of the filling station and access road (taken from Kotze, 2017)**







**Figure 3.2: Conceptual layout plan (taken from Kotze, 2017)**

**Fuel dispensation and forecourt area:**

As indicated in Figure 3.2, the forecourt and pump islands will be located in the northern portion of the site. For ease of access, a separate refuelling point (diesel island) will be provided for large trucks in the eastern portion of the site (Figure 3.2).

The tank farm (Figure 3.2) 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.



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.

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 (Figure 3.2) would be located on top of a concrete containment slab. A storm water 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.

A 5 m x 10 m containment slab (with catchpit) would also be provided at the remote diesel island (Figure 3.2).

Provision was made for a generator (Figure 3.2) in the event of a power outage. Vehicles would thus still be able to refuel during power outages.

#### **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.

#### **Backfilling:**

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<sup>3</sup>) up to the pavement formation level.

#### **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 (2010): 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 (2007): The petroleum industry Part 2: Electrical and other installations in the distribution and marketing sector.*
- *SANS 1535 (2007): Glass-reinforced polyester-coated steel tanks for the underground storage of hydrocarbons and oxygenated solvents and intended for burial horizontally.*



### 3.2 Services required

The said site is located within the Steve Tshwete Local Municipality (STLM) urban boundary and forms part of Middelburg x26 which is already serviced by the municipality.

Strydom & Malan Consulting Engineers (hereafter referred to as Strydom, 2017) investigated the availability of services (water, sewer, stormwater, access) for the proposed development. A copy of the civil engineering report is provided in Appendix 11.

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 STLM. It is accepted that the publication "Guidelines for Human Settlement Planning and Development services" will be used as a guideline for the design of internal and external services for the proposed filling station.

#### 3.2.1 Water and fire fighting

The proposed filling station will connect to the existing water distribution network of Middelburg X26. The adjacent Retail City (belonging to the project applicant) is already linked to the municipal water distribution system.

According to Strydom (2017), a 315mm diameter water pipeline is present on the northern boundary of La Roca Boulevard as indicated in Figure 3.3 and the development will connect to this water pipeline.

The estimated water demand/daily flow (Strydom, 2017) is expected to be as follows:

Expected water consumption of potable water (based on 0.4 kL per 100 m <sup>2</sup> potential floor area per day)	350/100*0.4=1,400 liters per day with expected peak flow = 0.052 l/s
Expected water consumption for wash bay (if required)	2000 liter per day
Fire water peak flow	100 l/s
<b>Total expected peak flow</b>	<b>100,052 l/s</b>

Details of the proposed internal water reticulation to be provided (Strydom, 2017) in order to meet the requirements of the Steve Tshwete Local Municipality are indicated below.

Minimum pipe size in network	110 mm diameter uPVC
Peak Factor	3.2
Fire Risk Category	High
Minimum Flow at Fire Hydrants	1500 /min
Absolute minimum water pressure (Fire)	15 m
Fire hydrant Spacing (maximum)	120m
Minimum Pipe Size	Outside diameter uPVC for main lines - 90 mm
Pipe Material	uPVC (Main Lines) and HDPE (Connections)
Cover to pipes	800 mm minimum
Hydrant Valves	Screw type
Valves	Right hand (clockwise closing)
Water Meters	Responsibility of developer to arrange with Council



Water for fire fighting will also be obtained from the Steve Tshwete Local Municipality. 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. The Fire Department of the Steve Tshwete Local Municipality will be consulted with regards to the fire water design and required approvals obtained.

### 3.2.2 Electricity

The proposed filling station will connect to the existing electrical network of Middelburg X26. The adjacent Retail City (belonging to the project applicant) is already linked to the municipal electrical distribution system.

### 3.2.3 Sewage

The filling station will connect to the existing municipal sewer network of Middelburg x26. The adjacent Retail City (belonging to the project applicant) is already linked to the said municipal sewer system.

A 160 mm diameter sewer line is present on the northern boundary of the site as indicated in Figure 3.3.

The average daily sewage generated (Strydom, 2017) is expected to be as follows:

Expected sewer outflow (based on 0,22 kL per 100 m <sup>2</sup> per day)	$350/100 \cdot 22 = 770$ liters per day
Peak factor	1.5
Expected peak daily flow	$1.5 \cdot 770 = 1,155$ liters per day
Allowance for infiltration	(15%)
<b>Total design flow rate</b>	<b>0.0154 l/s</b>

The following table (taken from Strydom, 2017) provides details of the proposed internal sewer reticulation to be provided in order to meet the requirements of the Steve Tshwete Local Municipality:

Minimum pipe size in network	160 mm
Pipe Material	Structure Wall uPVC
Maximum Manhole Spacing	80 m
Peak Factor	To be determine
Minimum flow speed	0,7 m/s
Minimum slope	1:80 for 110 mm diameter and 1:120 for 160 mm diameter
Minimum cover to pipes in servitudes	800 mm
Minimum cover to pipes in sidewalks	1000 mm
Manholes	1000 mm inside diameter with step irons if deeper than 1,2 m
Rodding eyes	Positioned at the beginning of a line if there are 4 house connections or less before the next manhole. Rodding eyes to be installed with it's own chamber and cover.

### 3.2.4 Waste management

During the construction phase, building rubble and a small amount of domestic waste will be generated. The contractor will have to provide adequate containers for the collection of waste. The applicant will have to



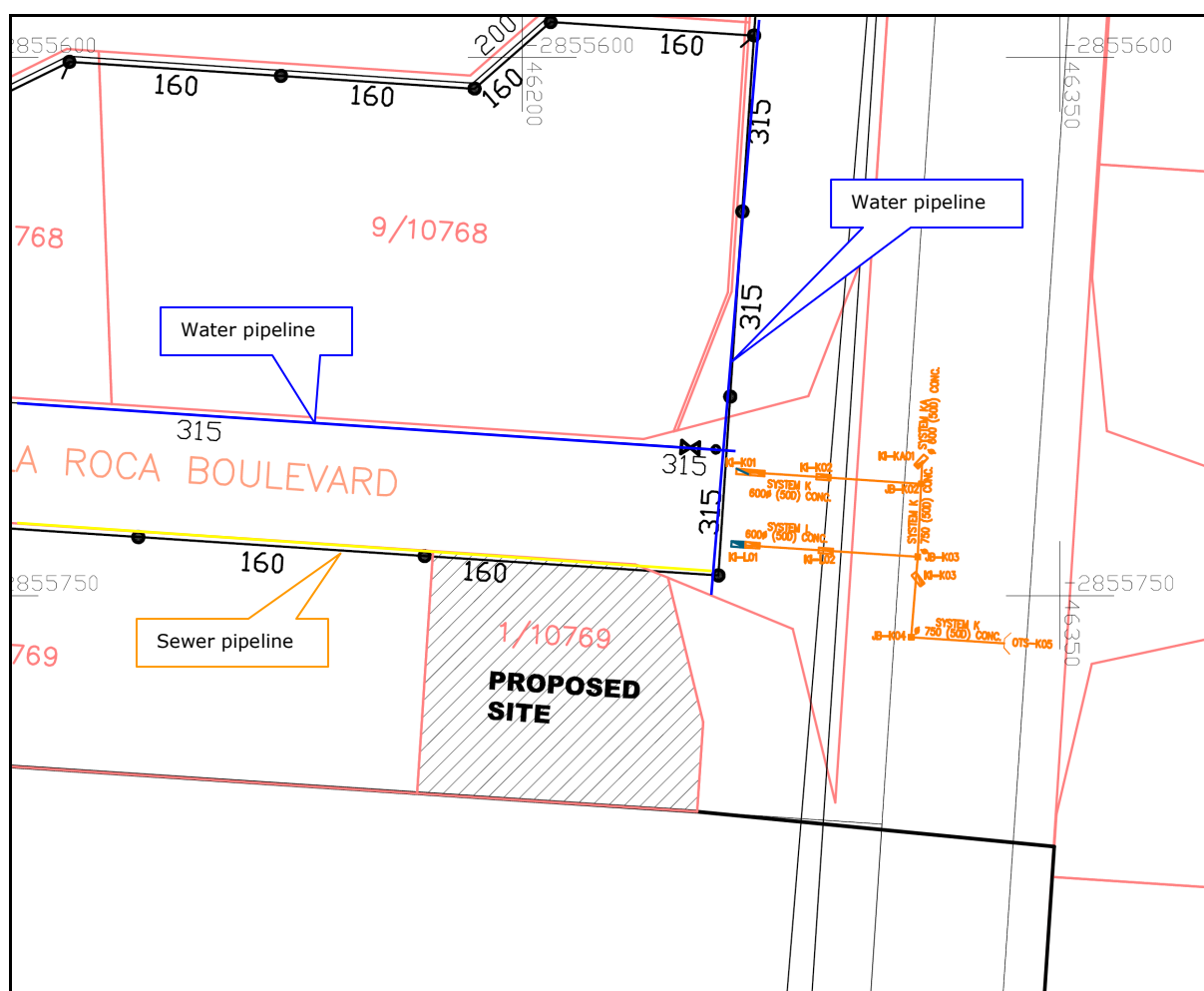
ensure that the contractors remove the said building rubble and domestic waste to the licenced Rietfontein Waste Disposal Site.

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 STLM and disposed of at the licensed Rietfontein 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.



**Figure 3.3: Location of service connections (taken from Strydom, 2017)**

### 3.2.5 Storm water control measures

The filling station will connect to the existing storm water network of Middelburg x26 and associated with La Roca Boulevard. According to Strydom



(2017), a 600 mm diameter pipe is present on the north-eastern corner of the site.

Rain that falls onto the canopy (roof) of the filling station will be treated as clean water and routed separately to the overall storm water management system, which would comprise of catchpits and concrete storm water pipes (with a recurrence interval of 5 years) that would connect to the existing 600mm diameter pipe as indicated above.

According to Figure 3.2, the forecourt would be located on top of a concrete containment slab. A storm water channel with catchpit would be installed along the southern boundary of the forecourt to capture any polluted runoff water. A 5 m x 10 m containment slab (with catchpit) would also be provided at the remote diesel island (Figure 3.2).

Water from the forecourt and fuel delivery pavements will be routed via a grease/oil separator in order to remove any potential contaminants. Strydom (2017) indicated that the installation of a silt trap is advisable in order to ensure that clean surface water is not contaminated with hazardous material (oil/or fuel). The specific position and particular size of the silt trap will be finalised during the final design phase.

More information regarding storm water management will only be available once an oil supplier has been appointed and detailed plans drawn up.

### 3.2.6 Access road

Figure 3.1 provides an indication of the proposed layout plan and access roads.

Access to the site will be provided from La Roca Boulevard (i.e. access road to Middelburg Mall) as well as from Samora Machel Street (R35) to the site. The access road from Samora Machel Street (R35) will extend across the Remainder of Portion 27 of Middelburg Town and Townlands 287 JS to the site (Figure 5.3). This road will be tarred.

The following table provides details of the proposed internal road network (Strydom, 2017) to be provided in order to meet the requirements of the Steve Tshwete Local Municipality:

<b>Roads</b>	
Pavement layers	
Road treatment bed	150 mm
Lower Sub-base	150 mm natural gravel
Sub-base	150 mm modified gravel
Base	150 mm cement stabilized gravel
Kerbing	
Access road, internal roads and parking	Mountable both sides
Circle	Mountable on outside and semi mountable on inside
Road surfacing	
Access roads, circle, internal roads and parking	80 mm concrete interlocking paving blocks



### 3.3 Applicable legislation, policies and/or guidelines

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

**Table 3.1: Applicable legislation, policies and/or guidelines**

Title of legislation, policy or guideline:	Administering authority:	Aim of legislation, policy or guideline
The Constitution of the Republic of South Africa, 1996 (Act 108 of 1996)	Department of Justice and Constitutional Development	To establish a Constitution with a Bill of Rights for the RSA. It sets out of a number of fundamental environmental rights (Section 24).
Spatial Planning and Land Use Management Act, 16 of 2013	Department of Rural Development and Land Reform	To provide a framework for spatial planning and land use management
Environment Conservation Act, 1989 (Act 73 of 1989) and amendments	Department of Agriculture, Rural Development, Land and Environmental Affairs	To control environmental conservation.
National Environmental Management Act, 1998 (Act 107 Of 1998) and amendments	Department of Agriculture, Rural Development, Land and Environmental Affairs	To provide for the integrated management of the environment.
National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004) and amendments	Department of Agriculture, Rural Development, Land and Environmental Affairs	To reform the law regulating air quality in order to protect the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development while promoting justifiable economic and social development; to provide for national norms and standards regulating air quality monitoring, management and control by all spheres of government; for specific air quality measures; and for matters incidental thereto.
National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004) and amendments	Department of Environmental Affairs	To provide for the management and conservation of South Africa's biodiversity within the framework of the National Environmental Management Act, 1998; the protection of species and ecosystems that warrant national protection; the sustainable use of indigenous biological resources; the fair and equitable sharing of benefits arising from bioprospecting involving indigenous biological resources; the establishment and functions of a South African Biodiversity Institute; and for matters connected therewith.
National Environmental Management: Waste Act, 2008 (Act 59 of 2008) and amendments	Department of Environmental Affairs and Department of Agriculture, Rural Development, Land and Environmental Affairs	To reform the law regulating waste management in order to protect health and the environment by providing for the prevention of pollution and ecological degradation and for securing ecologically sustainable development.
National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003) and amendments	Department of Environmental Affairs	To provide for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes; for the establishment of a national register of all national, provincial and local protected areas; for the management of those areas in accordance with national norms and standards; for intergovernmental co-operation and public consultation in matters concerning protected areas; and for matters in connection therewith.
Environmental Impact Assessment Regulations, 2014 (Government Gazette	Department of Agriculture, Rural Development, Land	Regulations pertaining to environmental impact assessments.



Title of legislation, policy or guideline:	Administering authority:	Aim of legislation, policy or guideline
No. 33306 of 18 June 2010) and amendments	and Environmental Affairs	
National Water Act, 1998 (Act 36 of 1998) and amendments	Department of Water and Sanitation	To control water management aspects.
National Veld and Forest Fire Act, 1998 (Act 101 of 1998) and amendments	Department of Agriculture, Forestry and Fisheries	To prevent and combat veld, forest and mountain fires throughout South Africa.
National Heritage Resources Act, 1999 (Act 25 of 1999) and amendments	South African Heritage Resources Agency	This legislation aims to promote good management of the national estate, and to enable and encourage communities to nurture and conserve their legacy so that it may be bequeathed to future generations.
Alien and Invasive Species Regulations, 1 August 2014	Department of Environmental Affairs	Regulations regarding alien and invasive species.
List of Protected Tree Species under the National Forests Act, 1998 (Act No. 84 of 1998)	Department of Agriculture, Forestry and Fisheries	Provides a list of protected tree species.
Promotion of Access to Information Act, 2000 (Act 2 of 2000) and amendments	Department of Justice and Constitutional Development	To give effect to the constitutional right of access to any information held by the State and any information that is held by another person and that is required for the exercise or protection of any rights; and to provide for matters connected therewith.
Promotion of Administrative Justice Act, 2000 (Act 3 of 2000) and amendments	Department of Justice and Constitutional Development	The Act aims to make the administration (e.g. Government and Parastatals) effective and accountable to people for its actions.
Conservation of the Agricultural Resources Act, 1983 (Act 43 of 1989) and amendments	Department of Agriculture, Forestry and Fisheries	To provide control over the utilization of the natural resources of the Republic in order to promote the conservation of soil, the water sources and the vegetation and the combating of weeds and invader plants; and for matters connected therewith.
Occupational Health and Safety Act, 1993 (Act 85 of 1993) and amendments	Department of Labour	To provide for the health and safety of persons at work and for the health and safety of persons in connection with the activities of persons at work and to establish an advisory council for occupational health and safety.
Health Act, 1977 (Act 63 of 1977) and amendments	Department of Health	To promote public health.
Mpumalanga Nature Conservation Act, 1998 (Act 10 of 1998) and amendments	Mpumalanga Tourism and Parks Agency	To control nature conservation.
National Building Regulations and Standards Act, 1977 (Act 103 of 1977) and amendments	Department of Trade and Industry	To provide for the promotion of uniformity in the law relating to the erection of buildings in the areas of jurisdiction of local authorities; for the prescribing of building standards; and for matters connected therewith.
National Road Traffic Act, 1996 (Act 93 of 1996)	South African National Road Agency Limited	Regulations relating to the transportation of dangerous goods and substances by road
Petroleum Products Act, 1977 (Act No. 120 of 1977) and amendments	Department of Energy	To regulate the distribution and sale of petroleum.
Regulations Site and Retail licences (Government Gazette No. 28665 of 27 March 2006)	Department of Energy	To regulate the distribution and sale of petroleum.
Regulations regarding the use of payment cards to purchase petroleum products at a retail site (Government Gazette Notice No. 731 of 9 July 2009)	Department of Energy	To regulate the distribution and sale of petroleum.
Regulations regarding the display of prices at which petroleum products are available for sale (Government Gazette Notice No. 376 of 14 May 2010)	Department of Energy	To regulate the distribution and sale of petroleum.
South African Bureau of Standards' SANS 10400 X and 10400 XA	Department of Trade and Industry	The application of the National Building Regulations in terms of environmental sustainability and energy usage in buildings.
Various by-laws of the Steve Tshwete Local Municipality, e.g.: <ul style="list-style-type: none"> <li>o Integrated waste management;</li> <li>o Noise and control;</li> </ul>	Steve Tshwete Local Municipality	To regulate land use with the Steve Tshwete Local Municipal area.





Title of legislation, policy or guideline:	Administering authority:	Aim of legislation, policy or guideline
<ul style="list-style-type: none"> <li>o Petroleum products;</li> <li>o Standard drainage;</li> <li>o Spatial Planning and Land Use Management;</li> <li>o Water services, etc.</li> </ul>		
Integrated Development Plan for the Steve Tshwete Local Municipality	Steve Tshwete Local Municipality	Broad spatial framework guidelines for the Steve Tshwete Local Municipality.
Spatial Development Framework for the Steve Tshwete Local Municipality	Steve Tshwete Local Municipality	Spatially based policy guidelines whereby changes, needs and growth in the region can be managed to benefit the whole community.
Steve Tshwete Local Municipality Town Planning Scheme, 2004	Steve Tshwete Local Municipality	To regulate land use with the Steve Tshwete Local Municipal area.
Nkangala District Municipality Climate Change Response Strategy	Nkangala District Municipality	A strategy in response to climate change.
Nkangala District Municipality Integrated Waste Management Strategy	Nkangala District Municipality	A strategy dealing with waste.
Integrated Environmental Management Guideline Series (Guideline 5 – 10 October 2012) – Companion to the Environmental Impact Assessment Regulations, 2010	Department of Agriculture, Rural Development, Land and Environmental Affairs	To provide clarity on the processes to be followed when applying for an environmental authorisation in terms of the EIA Regulations and gives a comprehensive interpretation of the listed activities.



## **4. DESCRIPTION OF ALTERNATIVES**

This section provides an indication of the alternatives investigated in terms of the site, layout plan and service provision. The need, desirability and feasibility of the development are also indicated.

### **4.1 Alternative sites**

#### **4.1.1 Proposed site**

The applicant identified the opportunity to develop a filling station on Portion 1 of Erf 10769, Middelburg X26. The said site is located south of La Roca Boulevard (i.e. access road to the Middelburg Mall) and west of Samora Machel Street (R35).

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

- The property already belongs to the applicant and is undeveloped.
- The property is large enough for the activity.
- The site forms part of an established township development, namely Middelburg X26 and is zoned as Business 2.
- Easy access to services (water, sewage, electricity, roads, storm water, waste removal) as the site is serviced as part of the established township Middelburg X26.
- The site is easily accessible from Samora Machel Street (R35) and La Roca Boulevard.
- The site is highly visible to passing traffic utilizing Samora Machel Street (R35) and La Roca Boulevard, which lends itself perfectly in terms of visibility of a filling station.
- Samora Machel Street (R35) is one of only three roads connecting the N4 national road with Middelburg, making the site ideal for a filling station since it is located at the entrance to the town and easily accessible.
- There are only two other filling stations located within a 3 km radius of the site.
- The filling station will provide a convenient service to the general public visiting the Middelburg Mall and surrounding businesses.
- The topography of the site is suitable for the activity. It is relatively flat, which will minimize the need for earthworks.

#### **4.1.2 Alternative site**

No alternative sites were investigated since the said property belongs to the applicant. In addition, the applicant deems the proposed site to be the most feasible for a filling station.

#### **4.1.3 No project option**

More information with regards to the implication of the 'no project option' is provided in Section 4.6.

### **4.2 Alternative land uses**

#### **4.2.1 Expansion of the existing Retail City**

The said site forms part of Middelburg X26 and is currently zoned "Business 2". The Middelburg Mall and Barloworld Toyota are located north of the site (Figure 5.3).



Retail City, which belongs to the applicant, is located on the western boundary of the site. The applicant could expand the existing Retail City onto the proposed site. However, the applicant did not identify a need for any more retail type businesses in the area.

In addition, the applicant wanted to capitalise on the high visibility of the site from Samora Machel Street (R35) and La Roca Boulevard and rather develop a filling station which is not catered for in the approved 'Business 2' zoning.

**This option was therefore discarded.**

#### **4.2.2 Development of other businesses**

The said site is located in an area with a variety of land uses namely business, light industrial, commercial, hospitality, etc. A number of options are thus available for the development of the said site.

Currently, the zoning of the site allows for 'Business 2' type development, which includes the following permitted buildings according to the Steve Tshwete Municipality Town Planning Scheme, 2004:

- place of refreshment;
- shop;
- business premises;
- service industry;
- service workshop;
- commercial workshop;
- dwelling units;
- all types of offices;
- garden nursery;
- health club;
- bar/tavern.

As indicated above, a range of development options are therefore available to the applicant on the proposed site.

However, the applicant wanted to capitalise on the high visibility of the site from Samora Machel Street (R35) and La Roca Boulevard and rather develop a filling station which is not catered for in the approved 'Business 2' zoning.

**The option of developing other businesses as catered for in the 'Business 2' Zoning was thus discarded.**

#### **4.2.3 Development of a filling station (preferred alternative)**

According to Urban Dynamics (2017), a site for a filling station was originally identified with the establishment of Middelburg x26. The identified site was located on a portion of the property now occupied by Barloworld Toyota. The filling station was however never developed, which left a gap in the market for a filling station that can provide a service to the general public visiting the Middelburg Mall and surrounding businesses.

There are only two other filling stations located within a 3 km radius of the site, namely the Midwater Centre Engen and the new Total filling station opposite the site (recently opened i.e. operational middle October 2017). According to Urban Dynamics (2017), the lack of competitor sites within the 3 km radius clearly indicates that there is a need for an additional filling station in the area.



Traffic volumes in the area are expected to increase, since the SAE Business Park located east of the site is still expanding and future residential and commercial developments are proposed on the vacant land south and west of the site (SDF, 2014).

The applicant therefore identified the establishment of a filling station on the said site as the preferred development option. However, a rezoning application would have to be submitted to the Steve Tshwete Local Municipality since the establishment of a filling station or "Public Garage" is not allowed under the current "Business 2" zoning of the site (see Section 4.2.2).

The establishment of a filling station on site would thus be dependant on approval from the Steve Tshwete Local Municipality in terms of the rezoning application.

**The development of a filling station on the said site is thus the preferred option.**

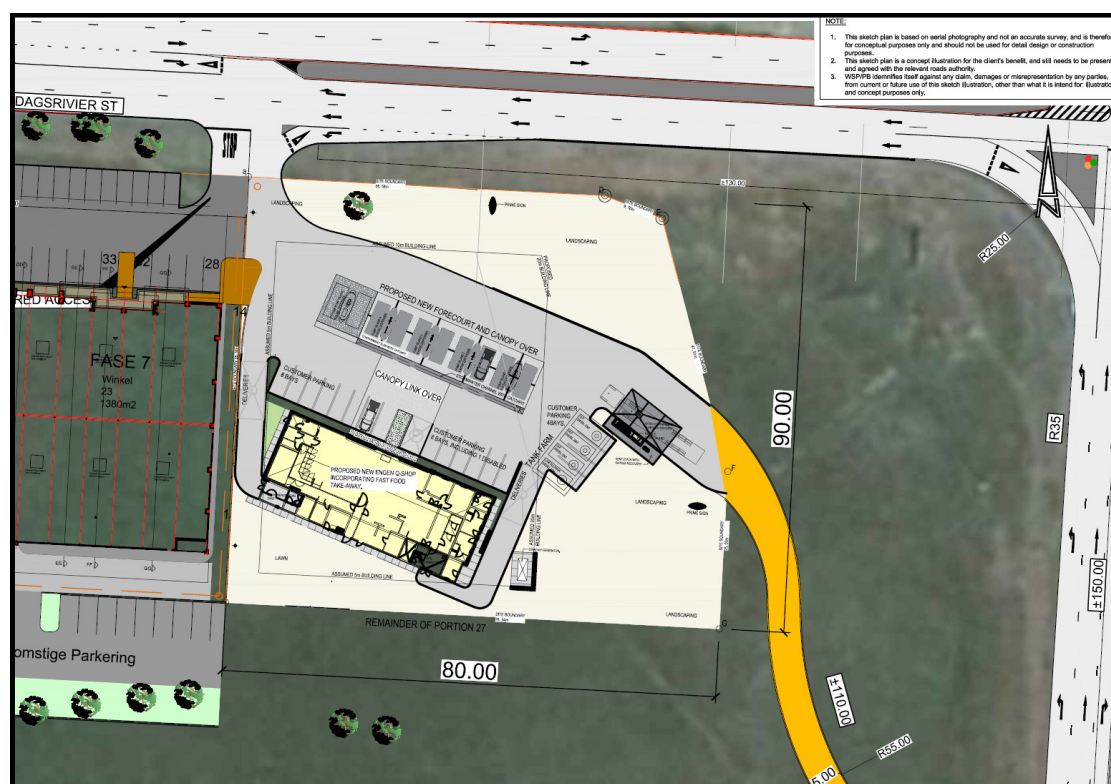
#### 4.2.4 No project option

More information with regards to the implication of the 'no project option' is provided in Section 4.6.

### 4.3 Alternative layout plans

#### 4.3.1 Layout Plan No 1 - original layout plan (Figure 4.1)

Figure 4.1 provides an indication of the original layout plan (Layout Plan No 1) with regards to the proposed development drafted by Kotze, 2017.



**Figure 4.1: Layout Plan No 1 indicating the filling station and access road (taken from Kotze, 2017)**



Filling Station:

The proposed layout plan of the filling station is described in Section 3.1.3 of this report. A detailed layout plan indicating the exact location of the infrastructure will only be available once an oil company (e.g. Sasol, Total, BP, Engen) has been appointed. Small changes to the existing layout plan may therefore be made at a later stage.

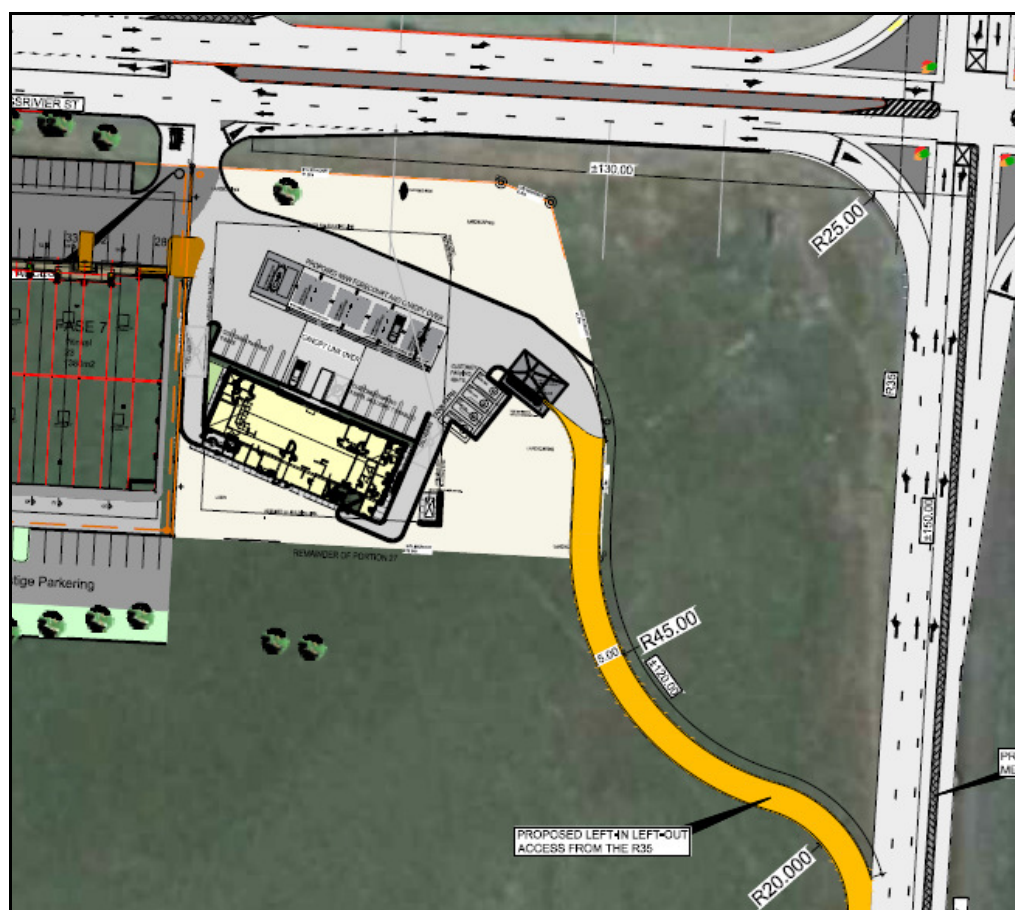
Left-in-only access road:

As indicated in Figure 4.1, the proposed left-in-only access road to the filling station would extend across the Public Open Space area leased by Mr. Strydom from the Steve Tshwete Local Municipality. The applicant subsequently decided to re-align the left-in-only access road to avoid crossing the said lease area.

**The original layout plan (Layout Plan No 1) was thus discarded and a new layout plan compiled.**

**4.3.2 Layout plan no. 2 - amended layout plan (Figure 4.2)**

The amended layout plan (Layout Plan No 2) is indicated in Figure 4.2. A description of the components of this layout plan is presented in Section 3.1.3 of this report.



**Figure 4.2: Layout Plan No 2 indicating the filling station and access road (taken from Kotze, 2017)**



#### Filling Station:

The proposed layout plan of the filling station is described in Section 3.1.3 of this report. A detailed layout plan indicating the exact location of the infrastructure will only be available once an oil company (e.g. Sasol, Total, BP, Engen) has been appointed. Small changes to the existing layout plan may therefore be made at a later stage.

#### Left-in-only access road and exit road:

The left-in-only access road was re-aligned so as to avoid a direct impact on the Public Open Space (leased by Mr. G. Strydom) as indicated in Figure 4.2. It will however extend across the Remainder of Portion 27 of Middelburg Town and Townlands 287 JS and then join Samora Machel Street (R35).

According to Roberts (2017), the left-in-only access from Samora Machel Street (R35) does not allow vehicles to get back onto Samora Machel Street (R35) directly. Customers leaving the site would only be able to exit via La Roca Boulevard (i.e. as per Layout Plan No 2).

Since the dual carriageway road (La Roca Boulevard; Figure 4.2) prevents vehicles from turning right towards Samora Machel Street (R35) when leaving the site, customers would have to travel to the roundabout at the Middelburg Mall entrance, make a U-turn and travel back to Samora Machel Street (R35). This circuitous movement is undesirable as it adds approximately 460 m to the trip and adds unwarranted traffic to La Roca Boulevard (Roberts, 2017).

In view of the above-mentioned, Roberts (2017) recommended that a new layout be drafted with alternative access arrangements.

#### **Layout Plan No. 2 was therefore discarded.**

#### **4.3.3 Layout plan no. 3 - preferred access points (Figure 4.3)**

As indicated in Section 4.3.2, the left-in-only access from Samora Machel Street (R35) does not allow vehicles direct access to Samora Machel Street (R35). Customers leaving the site would only be able to exit via La Roca Boulevard (as per Layout Plan No 2) and would have to travel an additional 460 m in order to access Samora Machel Street (R35).

In addition to the above-mentioned, the closeness of the adjacent shopping centre access complicates the situation according to Roberts (2017).

Roberts (2017) therefore proposed a new roundabout that would allow for all directional movements as indicated in Figure 4.3.

A new layout plan (Figure 4.3) was thus drafted providing for the following:

- A left-in/left-out access from Samora Machel Street (R35);
- A new roundabout in La Roca Boulevard.





**Figure 4.3: Layout Plan No 3 (preferred access points) (taken from Roberts, 2017)**

As indicated in Figure 4.3, the new roundabout would also accommodate traffic from the adjacent Retail City and Barloworld Toyota opposite the road. Currently, the Toyota dealership only has a left-in/left-out access in La Roca Boulevard and an exit only to Dolerite Crescent. This leads to many illegal entries to the property. The proposed roundabout would thus also benefit Barloworld Toyota.

The left-in-only access road from Samora Machel Street (R35) was approved 'in principle' by SANRAL (letter dated: 21 October 2016; Appendix 10) subject to detailed design being submitted before construction. The layout indicating the proposed left-in/left-out access would thus have to be submitted by the traffic engineers to SANRAL for review and approval.

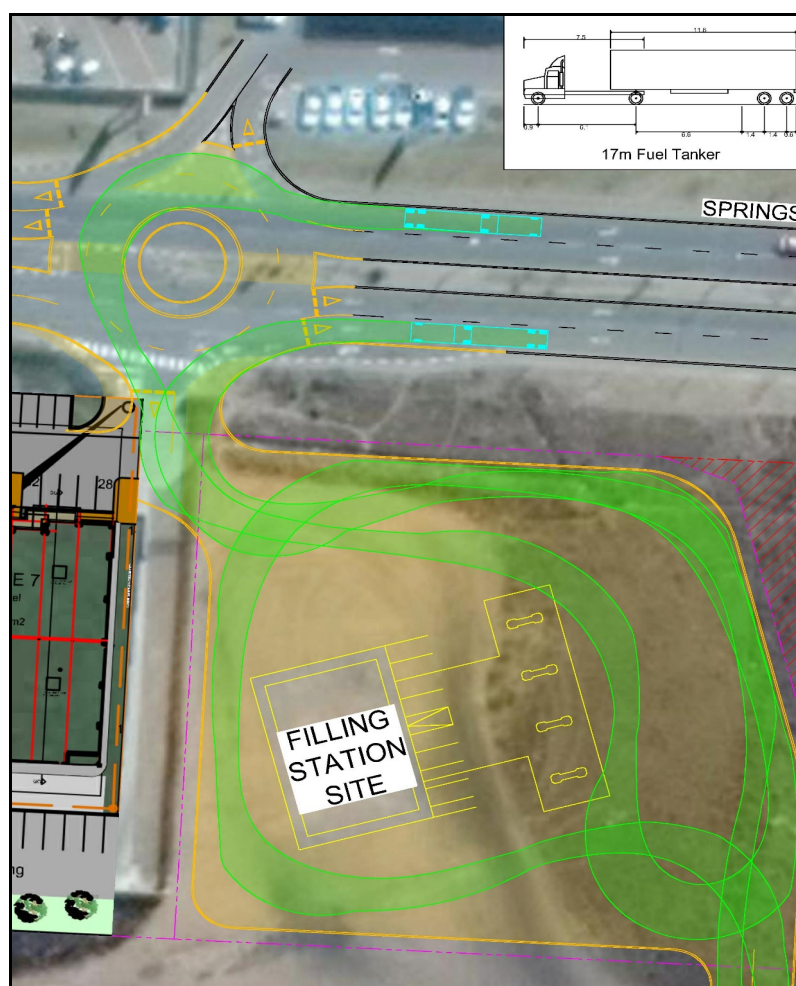


According to Roberts (2017), the roundabout layout is desirable and preferable for the following reasons:

- The wasted 460 m returning movement (travel time) is eliminated.
- All turning movements can be safely accommodated.
- Passing motorists can enter and exit the adjacent properties including the filling station in a safe manner (no u-turns).
- Combining the retail shopping centre and the proposed filling station access on the south side of La Roca Boulevard means all side road traffic is channelled in an orderly and safe manner before the roundabout.
- Travel speeds are lowered improving safety.

**Layout Plan No 3 (Figure 4.3) is thus the preferred option in terms of access to the site.**

In addition to the changes to the access roads, Roberts (2017) also proposed that the filling station infrastructure (i.e. buildings and canopy) be turned a few degrees eastward (Figure 4.4) in order to improve visibility and allow easy access and turning for the 17 m fuel tankers.



**Figure 4.4: Tanker Truck Path (taken from Roberts, 2017)**

**Layout Plan No 2 (Figure 3.2) however, still indicates the conceptual layout of the filling station in terms of location of tank farm, shop, fuel pumps, etc.** Detailed designs will only be available at a later stage once the preferred fuel supplier has been decided upon.





#### **4.3.4 No project option**

More information with regards to the implication of the 'no project option' is provided in Section 4.6.

#### **4.4 Aboveground vs. underground tanks**

Currently, the intention is to install 4 (perhaps 5) underground petrol and diesel tanks as part of the filling station as indicated in Section 3.1.3.

Alternatively, aboveground tanks could be installed instead of the planned underground tanks. Aboveground tanks are however, usually associated with fuel depots (catering for trucks) and not public filling stations. An aboveground facility would not fit in with the sense of place of the area and would have an aesthetic impact on the area including La Roca Boulevard, the nearby Samora Machel Street (R35) and businesses located in the SAE Business Park.

**The installation of aboveground fuel tanks was therefore discarded.**

#### **4.5 Alternative services**

The said site is located within the Steve Tshwete Local Municipality (STLM) urban boundary and forms part of Middelburg x26 which is already serviced by the municipality.

Since the said site will be connected to the existing municipal services (water, electricity, sewage) as indicated in Section 3.2, no other alternatives with regards to services were investigated.

#### **4.6 The 'No Project Option'**

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

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

- The applicant would have to investigate other land uses (e.g. retail) for the site i.e. in line with the existing zoning (i.e. Business 2);
- The site would remain vacant;
- The applicant would have to discard the proposed development plans;
- The applicant would have to investigate alternative sites for the proposed filling station;
- The applicant would have to sell the property;
- Job opportunities (construction phase: ±20 employees; operational phase: ±10 employees) would be lost.



## **4.7 Need and desirability of the activity**

### **4.7.1 Need and desirability**

The applicant identified the need for a filling station close to the Middelburg Mall and adjacent Retail City (Urban Dynamics, 2017).

According to Urban Dynamics (2017), the high visibility of the site from Samora Machel Street (R35) and the Middelburg Mall access road (La Roca Boulevard) lends itself perfectly in terms of visibility for a filling station. In addition, Samora Machel Street (R35) is one of only three roads connecting the N4 national road with Middelburg, making the site ideal for a filling station since it is located at the entrance to town. Access to the site is also considered to be good.

There are only two other filling stations located within a 3 km radius of the site, namely the Midwater Centre Engen and the new Total filling station opposite the site (recently opened i.e. operational middle October 2017). According to Urban Dynamics (2017), the lack of competitor sites within the 3 km radius clearly indicates that there is a need for an additional filling station in the area.

Traffic volumes in the area are expected to increase, since the SAE Business Park located east of the site is still expanding and future residential and commercial developments are proposed on the vacant land south and west of the site (SDF, 2014). A new provincial hospital is currently being constructed along the R35 provincial road.

The trading market is considered to be good as it will consist of the following:

- retail/commercial traffic;
- traffic from a medium to high income residential area with moderate vehicle ownership;
- a combination of local and transient traffic.

In addition to the above-mentioned, the proposed filling station will be convenient (in terms of refuelling and purchasing items such as bread and milk) for employees working long hours at the Middelburg Mall. The development will also be convenient for visitors from surrounding towns to the Middelburg Mall as they would no longer have to travel past the Middelburg Mall into town to refuel (Urban Dynamics, 2017).

Additional job opportunities would be provided, which could aid in the economic stability of a few families (Urban Dynamics, 2017).

### **4.7.2 Feasibility of the filling station**

A feasibility study with regards to the establishment of a filling station on the proposed site was conducted by E Kotze of WSP SA Civil and Structural Engineers (Pty) Ltd. (hereafter referred to as Kotze, 2017). A copy of the feasibility study is provided in Appendix 3 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.



#### 4.7.2.1 Start-up costs

A breakdown of the start-up costs that will be incurred by the applicant are provided in Section 4.1 of Appendix 3.

#### 4.7.2.2 Expected fuel sales and income from the convenience store

According to Kotze (2017), the following empiric formula is used by the fuel industry to calculate the expected average litres of fuel to be sold in a month:

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

#### Traffic volumes (vehicles per day passing the site)

According to Kotze (2017), the Average Daily Traffic (ADT) passing the site during March 2017 was 25 600 vehicles per day. The ADT per travelling direction was as follows:

- 6 800 veh/day eastbound away from Middelburg Mall;
- 4 200 veh/day westbound towards Middelburg Mall;
- 8 900 veh/day northbound towards Middelburg;
- 5 700 veh/day southbound towards the N4 (not interceptable).

#### Average fill per vehicle:

According to Kotze (2017), the proposed site will primarily cater for a mix of transient and local traffic. An average fill rate of 18 liters per vehicle was adopted, based on the average fill of 17.2 litres per vehicle calculated at three competitor site.

#### Interception rates (%vehicles of passer-by traffic turning into the site):

Kotze (2017) 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 and residential);
- Service provided to public (car wash, convenience shop, A.T.M. etc);
- Location (homebound and work bound);
- Site layout (large enough to have proper site circulation).

A left-in-only access road (Figure 4.2) was proposed to intercept the northbound traffic along Samora Machel Street (R35). According to Kotze (2017), the left-in-only access road was approved 'in principle' by SANRAL (letter dated: 21 October 2016; Appendix 10) subject to detailed design being submitted before construction. Without this direct access, the site will be less feasible with much lower interception rates for the northbound traffic.

Kotze (2017) estimated the interception rate for the proposed filling station with the proposed left-in-only access road (Figure 4.2) as follows:

<b>ADT = 25 700 veh/day passing the site</b>	
<b>Road and Direction</b>	<b>Interception Rate</b>
Samora Machel Street (R35) northbound	3.75%
Samora Machel Street (R35) southbound	-
La Roca Boulevard eastbound	1.50%
La Roca Boulevard westbound	5.00%



According to Kotze (2017), the traffic from the positive northbound traffic flow will be able to access the site by performing an easier left turn movement in comparison with a right turn movement by the negative southbound traffic flow. In view of this, a consequent higher interception rate was adopted for the westbound (La Roca Boulevard westbound = 5%) and northbound (Samora Machel Street (R35) = 3.75%) traffic flow.

As can be seen from the above table, no provision was made for traffic interception from Samora Machel Street (R35) southbound (i.e. going towards the N4 national road) due to the right turn movement required.

Interception from La Roca Boulevard eastbound is only expected to be 1.5% since the said road is separated by a median. A partial access was recently constructed for the new shops (Retail City) adjacent to the filling station site.

Trading days:

According to Kotze (2017), 28 trading days per month were assumed since the area is surrounded by a number of retail shops, the Middelburg Mall and fast food outlets that are open 7 days a week. The site is also located next to the R35 provincial road, which is a major arterial road that carries higher weekend traffic on Fridays and Saturdays (between Middelburg and the N4 national road and other destinations which require the vehicles to make use of the N4 national road). In view of this, slightly more trading days were assumed than would be the norm in other areas, which do not have these specific traffic characteristics.

Expected monthly sales:

Using information w.r.t. traffic flow, average fill, trading days and interception rate, the expected monthly fuel sales for the proposed filling station was calculated by Kotze (2017). The expected fuel sales in a month are provided in Table 4.1.

**Table 4.1: Expected fuel sales in a month (taken from Kotze, 2017)**

MONTHLY SALES POTENTIAL	ALL FUEL SALES				
	R35 / Access Rd to Mall				
MOVEMENT	EB	WB	NB	SB	
Traffic Flow (Veh/day)	6 800	4 200	8 900	6 607	
Average Fill (Litres/Veh)	18.0	18.0	18.0	18.0	
Trading Days (Days/Month)	28	28	28	28	
Interception Rate (%)	1.50%	5.00%	3.75%		
<b>SUB-TOTAL</b>	<b>51 408</b>	<b>105 840</b>	<b>168 210</b>	<b>0</b>	<b>-</b>
<b>SALES POTENTIAL</b>	<b>325 458</b>				
<b>TOTAL ESTIMATED CURRENT MONTHLY SALES POTENTIAL</b>					<b>325 458</b>

As indicated in Table 4.1, the expected current monthly sale potential of the filling station is 325 458 liters per month.

The estimated future monthly fuel sales until the year 2026 are provided in Table 4.2. It is expected that up to 416 564 liters per month could be sold in 2026.



**Table 4.2: Annual forecast sales (taken from Kotze, 2017)**

ANNUAL FORECAST - MONTHLY SALES POTENTIAL						
PERIOD		POTENTIAL GROWTH		ESTIMATED LITRES		TOTAL
YEAR		Percentage of Potential	Growth Rate	PETROL	DIESEL	LITRES PER MONTH
1	2017	85%	3.00%	250 746	34 193	284 938
2	2018	95%	3.00%	288 653	39 362	328 014
3	2019	100%	3.00%	312 960	42 676	355 637
4	2020	100%	3.00%	322 349	43 957	366 306
5	2021	100%	3.00%	332 020	45 275	377 295
6	2022	100%	2.00%	338 660	46 181	384 841
7	2023	100%	2.00%	345 433	47 105	392 538
8	2024	100%	2.00%	352 342	48 047	400 388
9	2025	100%	2.00%	359 389	49 008	408 396
10	2026	100%	2.00%	366 576	49 988	416 564

According to Kotze (2017), the estimated fuel sales during the third year of operations is ±355 000 liters/month, with sales from the convenience store estimated at R 390 000 per month. It is estimated that the convenience store would generate about R1.10 for every litre of fuel sold (Kotze, 2017).

According to Kotze (2017), only about 20% of the approved SAE Business Park located east of the site (Figure 5.2) has been developed. The entire development comprises 50+ hectares and >80 stands. It is expected that the SAE Business Park (and hence traffic) will increase steadily over the next 15 years at a growth rate of at least 3%/annum. Additional traffic in the area would lead to an increase in interception rate and increased sales.

#### 4.7.2.3 Updated volume forecast

A revised estimated volume forecast was provided by Roberts (2017) as part of the updated traffic impact assessment. A copy of the said report is provided in Appendix 12 and should be consulted with regards to the methodology used.

According to Roberts (2017), the interception or draw-off method was used in calculating the expected monthly fuel sales for the proposed filling station. The following formula was used:

$$\text{Volume pumped} = (\text{passing traffic per day}) \times (\text{interception rate}) \times (\text{average fill}) \times (\text{work days})$$

Table 4.3 provides an indication of the expected monthly fuel sales for the proposed filling station. As indicated in Table 4.3, the expected current monthly sale potential of the filling station is 377 000 liters per month. **The filling station is thus viable from a literage pumped viewpoint as potential sales are greater than 300 000 liters per month for petrol (Roberts, 2017).**



According to Roberts (2017), the proposed shop and car wash are expected to add another 50% sales (35%/65%) in addition to the pumped petrol business.

Roberts (2017) indicated that it normally takes 3 years for a filling station to "mature" and therefore the expected literage per month can increase over this time by the traffic growth rate. Assuming a growth rate of 4,0% per annum (Table 4.3) , the traffic can increase by 1,12 fold over 3 years. The proposed filling station is expected to pump on average 424 000 litres per month (petrol fuel) only) by 2020 (Table 4.3).

**Table 4.3: Estimated literage pumped per month (2017) (taken from Roberts, 2017)**

Direction	Northbound	Westbound	Eastbound	Total
All day traffic volume/passing traffic per day (vpd)	8701	4566	6709	19 976
Interception rate	4,0%	2,0%	3,0%	
Intercepted vehicles per day	348	91	201	640
Average litres per fill/average fill	22	20	20	
Average trading days/work days per month	28	28	28	
<b>Pumped volume per month (2018)</b>	<b>214 000</b>	<b>51 000</b>	<b>112 000</b>	<b>377 000</b>
Total volume pumped per month for passing traffic (2018)				<b>377 000</b>
Add 4% growth for 3 years (2020)*				<b>47 000</b>
<b>Total average volume per month for all traffic (2020)</b>				<b>424 000</b>

Legend: \*: Annual traffic growth rate of 4% as per the traffic capacity analysis section (see Chapter 7 of Appendix 12).

Passing traffic per day:

Table 4.3 provides an indication of the passing traffic per day in a Northbound, Westbound (less common trips) and Eastbound direction.

Interception rate:

According to Roberts (2017), the interception rate used for the site was based on the following: '*Similar to the main-road orientated Sites (i.e. left-in left-out access off the R35 and full access of the District Road) with a new modern building and virtually no competition, the interception rate should be at least 3.0 to 4% for this type of Site*'.

Roberts (2017) indicated that a relatively high interception rate for the site can be expected since the site is located:

- inbound to Middelburg town and Middelburg Mall;
- the first facility from the N4;
- with direct access off Samora Machel Street (R35).



The following interception rates were adopted for the proposed filling station (Roberts, 2017) and also indicated in Table 4.3:

Road and Direction	Interception Rate
Samora Machel Street (R35) northbound	4%
La Roca Boulevard westbound	2% (approaching the Middelburg Mall)
La Roca Boulevard eastbound	3%

Based on the above-mentioned, Table 4.3 provides an indication of the intercepted vehicles per day in a Northbound, Westbound (less common trips) and Eastbound direction.

Roberts (2017) indicated that from the latest traffic count (@ 18 October 2017) calculations (see Chapter 5 (trip generation) of Appendix 12), **a total of 640 vehicles are expected to be intercepted per day (Table 4.3).**

It should be noted that the new Total filling station's passing traffic was not included in this site's volume forecast flows (Roberts, 2017) as it is located on the opposite side of the road serving the outbound traffic from Middelburg (i.e. Samora Machel Street (R35) southbound).

#### Average fill:

According to Roberts (2017), the average fill expected for the site (based on the area wide and the R35 viewpoints) is as follows:

- *A modern facility with a mixture of **card and cash payments as well as longer-distance traffic**, the average fill should be at least **20 liters petrol**. Since the fills at this Site are mainly related to Middelburg traffic (many trips are related to Mugg Bean facility at the Total filling station with no fills), the average fill on the R35 is to be expected.*
- ***Annexure A** (of Appendix 12) includes 200 average fills taken at the newly opened Total filling station on the east side of the R35 being 16.6 litres on a weekday (Wednesday 18<sup>th</sup> October 2017). The associated average diesel fill was 46.6 litres in a sample of 18 visits. Since this was the first week that the Total filling station was opened the average fill for the future is expected to increase as patronage grows.*
- *Data supplied by **Engen** (refer to **Annexure A** (of Appendix 12) for details) shows average petrol and diesel fills to be 20.1 and 46.6 litres respectively. This survey is expected to be more realistic as it covers more samples over a month period.*
- *The direct access off the R35 is expected to increase the card carrying component with an associated average fill of 22 to 25 litres. The **22 litre average fill for R35 traffic** has been chosen for this report.*

Roberts (2017) indicated that the average fills adopted for the proposed local filling station patrons is **20 litres for petrol**.

Based on the above-mentioned, Table 4.3 indicates that 22 litres per fill (petrol) was used for the Northbound direction and 20 litres per fill (petrol) for the Westbound (less common trips) and Eastbound directions.

It should be noted that Roberts (2017) indicated that the diesel component was ignored in the said report as many factors influence the sale of unregulated diesel.



Trading days:

Roberts (2017) indicated that for an average month, there are 28 full trading days. This figure was also used in Table 4.3.

**4.7.2.4 Competitor sites**

There are two competitor sites within the normal 3 km radius of influence and three sites slightly out of the normal influence radius as indicated in Table 4.4.

**Table 4.4: Summary of competitor sites (taken from Kotze, 2017)**

Competitor site	Location in relation to site	Average fills (litres of fuel)	Notes
Engen Midwater Mall	2.6 km northwest at the Midwater centre	18.1	Modern and neat with a branded convenience store and ATM.
Engen Middelburg High School	Outside of the 3 km radius, along Samora Machel Street	16.2	Older established site that has been trading for many years. Neat appearance with a cafe like convenience store. Associated with a workshop.
Total R35/R555	Outside of the 3 km radius. Located 4.5km north at the R35/R555 intersection in Middelburg CBD	17.4	Modern benchmark station with a branded convenience store and appealing amenities.
Total R35/Spring Street (Under construction @ time of study)	135m east opposite the proposed site next to Samora Machel Street (R35) and Spring Street.	None	Under construction (@ time of study). Impact on the proposed filling station will be limited, since the Total site has no direct access from Samora Machel Street (R35) and low positive traffic on Spring Street (under 4000 vpd). Will be a marginal site and will not have a large impact on the proposed site.
Total Depot	Along Samora Machel Street (R35) near the CBD	-	Caters for clients with accounts and does not compete with a retail filling station.
Other stations	Middelburg CBD	-	There are >10 other filling stations in the CBD, located within a 5 km radius. A small portion of fuel sales will be gained from each of these filling stations.

In order to assess the impact of the proposed filling station on the other filling stations (Table 4.4), the shared traffic streams were determined as indicated in Table 4.5.





**Table 4.5: Shared traffic (taken from Kotze, 2017)**

SITE	FILLING STATION	POTENTIAL PASS-BY TRAFFIC [VEH/DAY]	TRAFFIC SHARED WITH NEW FILLING STATION [VEH/DAY]	PERCENTAGE OF TOTAL TRAFFIC SHARED [%]	GENERAL COMMENT
1	Engen Midwater Mall	20'000	4'000	20%	Serves separate local catchment market. Closest site at 2.6 km due northwest.
2	Engen Middelburg High School	18'000	7'200	40%	Serves Samora Machel transient market. Outside 3 km radius.
3	Total R555/R35	32'000	9'600	30%	Serves CBD local market and R35 Samora Machel market. Outside 3 km.
4	Total R35/Spring St	25'600	3'700	14.5%	Serves local market and to a lesser degree the Samora Machel transient market (no direct access to R35).

A new filling station (Total R35/Spring Street; Table 4.4; Table 4.5) on the eastern side of the R35 and adjacent to Spring Street was under construction at the time of the study. This new facility will have some impact on the planned filling station site, but as it will not have access from the R35 and only access from Spring Street, the impact will be limited. A traffic circle was recently built in Spring Street, from which this new site will get its access via the southern leg.

Using information w.r.t. shared traffic streams, moving market factors and fuel sales, Kotze (2017) 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 4.6.

**Table 4.6: Impact on surrounding sites (taken from Kotze, 2017)**

SITE	FILLING STATION	PRESENT ESTIMATED FUEL SALE VOLUME [LPM]	MOVING MARKET FACTOR [%]	LOST FUEL SALES IF DEVELOPMENT IS BUILT [LPM]	(PRESENT FUEL SALES) - (LOST FUEL) [LPM]	3 YEAR FUTURE SALES FROM LOST FUEL SALES [LPM]
1	Engen Midwater	500'000	8%	40'000	460'000	502'000
2	Engen Middelburg High School	310'000	10%	31'000	279'000	305'000
3	Total R555/R35	520'000	10%	52'000	468'000	511'000
4	New Total R35/Spring St	320,000	10%	32'000	288'000	314'000
<b>TOTAL</b>				<b>± 155'000</b>		

As indicated in Table 4.5, the proposed filling station will have an initial detrimental impact on the filling stations in adjacent local markets. According to Kotze (2017), a total of 155 000 liters/month will be gained from the four competitor sites indicated in Table 4.6. The remainder of the sales will be gained from sites and markets outside the study area (i.e. Middelburg CBD area and other suburbs as well as the N4 transient market).



#### 4.7.2.5 Conclusion

Both Kotze (2017) and Roberts (2017) indicated that the proposed filling station would be feasible and would be able to sell over 300 000 litres of fuel per month.

Roberts (2017) indicated that it normally takes 3 years for a filling station to "mature" and therefore the expected literage per month can increase over this time by the traffic growth rate.

According to Kotze (2017), a qualitative assessment ranked the proposed site as follows:

	<b>Comment</b>	<b>Rating</b>
<b>Visibility:</b>	The site is located alongside a straight section of Samora Machel Street (R35), so visibility is good. The subject site is fairly visible to both the negative and positive traffic as the site is vacant.	<b>GOOD</b>
<b>Access:</b>	The subject site will be directly accessible to traffic traveling northbound along Samora Machel Street (R35) and Spring Street (access road to the adjacent Middelburg Mall).	<b>GOOD;</b>
<b>Trading Market:</b>	The Trading Market consists of retail/commercial traffic, as well as a medium to high income residential area with moderate vehicle ownership, with a combination of local and transient traffic.	<b>GOOD</b>
<b>Competitor Stations:</b>	There are two (2) competitor stations/sites within the normal 3 km radius of influence and three (3) other competitor stations slightly out of the normal influence radius (towards the north) as indicated in Table 4.3. The subject site will share most of its traffic with the Engen High school filling station, as it is along the same road. The overall threat to the proposed station is therefore fair, given that most of the local residents and commuters will have another filling station to choose from in addition to the existing competitor sites.	
<b>Traffic Volumes:</b>	The traffic survey indicated that the subject site is currently exposed to moderate to high volumes of traffic of over 25 600 vehicles per day.	<b>GOOD</b>

In addition, Kotze (2017) indicated the following with regards to the site:

- The land cost, building and other fixed costs will be similar to that of a normal/average new filling station.
- The land is fairly flat and the cost of the road & civil engineering works will be average to below average when compared to other similar new sites.
- The site is feasible from a fuel sales (retail filling station facility) viewpoint, based on the expected monthly fuel-and convenience store sales (Table 4.2).
- The sales from other amenities have not been taken into account (i.e. car wash, fast food restaurants, etc.).

Kotze (2017) indicated that the impact on any of the competitor sites will not be enough to impact on the feasibility of the individual sites surveyed. Annual traffic growth in the area will ensure that short terms losses are regained within 3 to 4 years (Kotze, 2017).

According to Roberts (2017), the other filling station sites within Middelburg are located in other trading areas and are not expected to be materially



affected in terms of competition. If there is an impact it is expected to be marginal. Roberts (2017) further indicated that the amount of fuel volume that a new filling station could "take away" from existing sites is normally based on many factors including but not limited to:

- Brand;
- Supplementary facilities including shop, quick service restaurant, post boxes, car wash, etc.;
- Surrounding activities such as a shopping centre;
- Direct access from the main road;
- Proficiency/service of the operator;
- Cleanliness;
- Modern or old site.

According to Roberts (2017), the filling station will be of strategic importance since it is located adjacent to a Class 2 road (Samora Machel Street/R35) with direct visibility and access off this route. It will also be the first filling station entering Middelburg from the N4 national road.

