

ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

FINAL EIA REPORT

**ESTABLISHMENT OF THE SILVERTON AUTOMOTIVE SPECIAL ECONOMIC ZONE (SEZ) ON
THE REMAINDER OF PORTION 89 OF THE WILLOWS 340 JR, WATLOO, GAUTENG.**

REF: GAUT 002/19-20/E0023

ENVIRONMENTAL CONSULTANT: ROCK ENVIRONMENTAL CONSULTING (PTY) LTD

P O BOX 40541

MORELETA PARK

0044

TEL: 012 997 4742

FAX: 012 997 0415

EMAIL: rock.arno@lantic.net

CONTACT PERSON (s):

Arno van den Berg/ Pieter van der Merwe

APPLICANT:

Tshwane Economic Development Agency (TEDA)

DATE: 12 September 2019

TABLE OF CONTENT

1. INTRODUCTION	10
1.1 OBJECTIVES OF THE SCOPING REPORT	11
1.2 DETAILS OF THE EAP	17
2 LOCALITY AND STUDY AREA	18
2.1 SURROUNDING DEVELOPMENT AND LAND USES	19
3 SCOPE OF THE PROPOSED ACTIVITY AND PROJECT DESCRIPTION	21
3.1 MARKET DEMAND	25
3.2 SITE DEVELOPMENT PLAN	28
4 LEGISLATIVE CONTEXTS	29
4.1 ALIGNMENT OF THE ACTIVITY WITH APPLICABLE LEGISLATION AND POLICIES CONSIDERED.	29
4.2 ENVIRONMENTAL IMPACT ASSESSMENT	32
4.3 WATER USE LICENSE APPLICATION	34
4.4 HERITAGE IMPACT ASSESSMENT	34
4.5 NATIONAL ENVIRONMENTAL MANAGEMENT BIODIVERSITY ACT 10 OF 2004.	34
5 PROJECT NEED AND DESIRABILITY	36
6 DETAILS OF THE ENVIRONMENTAL PROCESS FOLLOWED	41
6.1 ACTIONS TO BE UNDERTAKEN	41
6.2 ALTERNATIVES	43
6.2.1 Location alternative	44
6.2.2 Site layout alternatives	44
6.2.3 Transport alternative	44
6.2.4 Electricity Alternative	44
6.2.5 No Go Alternative	45
7 PUBLIC PARTICIPATION	47
7.1 INTRODUCTION	47
7.2 OBJECTIVES OF THE PUBLIC PARTICIPATION PROCESS	47
7.3 THE GUIDELINES FOLLOWED FOR THE PUBLIC PARTICIPATION PROCESS	48
7.4 PUBLIC PARTICIPATION PROCESS	48
7.4.1 Identification of key Interested and Affected Parties	49

7.4.2 Compilation and distribution of the Background Information Documents (BID)	49
7.4.3 Placement of the press advertisement	49
7.4.4 Placement of on-site notice(s).....	51
7.4.5 Proof of submission of the draft Scoping report is presented below	53
7.4.6 Public meeting	54
8 ENVIRONMENTAL DESCRIPTION.....	55
8.1 MAIN LAND USE ASPECTS	56
8.2 CLIMATE	57
8.2.1 Temperature	57
8.2.2 Precipitation.....	58
8.2.3 Evaporation	59
8.3 TOPOGRAPHY	59
8.4 ECOREGIONS.....	60
8.5 CATCHMENTS.....	61
8.6 SURFACE WATER STUDY	63
8.6.1 Drainage systems	63
8.6.2 Aquatic Ecology	67
8.6.3 Site comparison	73
8.6.4 Conclusion and recommendations	75
8.7 WETLANDS	77
8.7.1 Determining the ecological integrity of the wetland	77
8.7.2 Assessments made	80
8.7.3 Results.....	80
8.7.4 Wetland ecological function	81
8.7.5 Wetland ecological health.....	81
8.7.6 Wetland PES Assessment.....	83
8.7.7 Wetland EIS Assessment	83
8.7.8 Conclusion	83

8.8 VEGETATION.....	84
8.8.1 Regional vegetation and parameters	84
8.8.2 Regional conservation assessment	86
8.9 SOCIO-ECONOMIC ANALYSIS.....	88
8.9.1 Projected outputs and expected key outcomes of the SEZ	88
8.9.2 Projected economic impact of the SEZ on local, district, provincial and national economy....	88
8.9.3 Results of benefit assessments	89
8.9.4 Projected employment to be created during the various phases.....	90
8.9.5 Industrial activity targeted by the SEZ	93
8.9.6 Education	94
8.9.7 Health care	94
8.10 TOPOGRAPHY AND SURFACE DRAINAGE.....	95
8.11 GEOLOGY, HYDROGEOLOGY AND GEOTECHNICAL.....	95
8.12 ELEMENTS OF CULTURE HISTORICAL IMPORTANCE.....	108
8.13 ENGINEERING SERVICES.....	109
8.13.1 Water and sanitation	109
8.13.2 Electricity	110
8.13.3 Roads and Traffic.....	110
8.13.4 Storm water drainage	118
9. ACTIVITIES, IDENTIFIED IMPACTS AND PRELIMINARY ASSESSMENT.....	123
9.1 INTRODUCTION	132
9.2 METHODOLOGY.....	133
9.3 ACTIVITIES, IMPACTS AND PRELIMINARY ASSESSMENT	137
9.4 PRELIMINARY ISSUE / IMPACT ASSESSMENT FOR THE PROPOSED DEVELOPMENT	137
9.4.1 Construction phase	138
9.4.2 Operational Phase	156
9.4.3 Closure and Decommissioning Phase	161
9.5 SITE SELECTION.....	162
9.6 MOTIVATION FOR NOT CONSIDERING ALTERNATIVES.....	162
10 CONCLUSIONS.....	167
11 APPENDIXES	168

TABLE OF FIGURES

Figure 1: Locality plan	18
Figure 2: Township Establishment plan	20
Figure 3: SEZ 1st Phase Concept Master Plan	22
Figure 4: SA Tier 1 Suppliers Local Content Profile	23
Figure 5: Phase 1 of the development	24
Figure 6: Phase 2 of the development	25
Figure 7: Site development plan.....	28
Figure 8 : Income Categories of the Area	37
Figure 9: Global Vehicle Productions, 2005-2018	38
Figure 10: Alternative layout planwith wetland incrinchment and grave incrinchment	43
Figure 11: Facility illustration of the actual planned buildings	45
Figure 12: Solar efficiency and building distances.	45
Figure 13: Historical Google earth image of 2005.....	56
Figure 14: Average Temperatures (Source Meteoblue 1985 to 2019).....	57
Figure 15: Average Maximum Temperature Days (Source Meteoblue 1985 to 2019)	58
Figure 16: Average Temperatures	59
Figure 17: Quaternary Catchment	62
Figure 18: River Classification (DWA 2005).....	64

Figure 19: Photographs depicting non-perennial and water treatment/stormwater drainage	65
Figure 20: Watercourses surrounding the project area and sampling points	66
Figure 21: Intermittent watercourse within (left) and upstream (right) from the project area	66
Figure 22: Perennial watercourse within (right) and upstream (left) of the project area	67
Figure 23: US1 Surface Water Monitoring Point	69
Figure 24: US2 Surface Water Monitoring Point	69
Figure 25: DS Surface Water Monitoring Point	69
Figure 26: US Biomonitoring Site	72
Figure 27: DS Biomonitoring Site	73
Figure 28: The relative positions of the temporary wetland edge, the 30 m buffer	81
Figure 29: Estimate of the ecosystem services delivered by the broad wetland	82
Figure 30: Estimate of the ecosystem services delivered by the narrow wetland	82
Figure 31: Estimate of the ecosystem services delivered	84
Figure 32: Conservation value of the study area (C-Plan 3.3)	86
Figure 33: GN 1002 Vulnerable Marikana Thornveld	87
Figure 34: Employment Impacts during the Construction Phase (Short Tern Impacts).....	91
Figure 35: Employment Impact of the commercialisation Phase (Long Term Sustainable).....	91
Figure 36: Geology overlain in Google earth.....	95
Figure 37: Test positions (test pits and DPSH)	96

Figure 38: Clay zones on site	99
Figure 39: Grading curve.....	101
Figure 40: Summary of corrected DPSH test results	101
Figure 41: Site zonation according to materials encountered	105
Figure 42: Surveyed Intersections	113
Figure 43: Intersection geometry and controls	113
Figure 44: Stormwater Drainage Areas.....	118
Figure 45: Stormwater Drainage designs.....	121
Figure 46: Stormwater Drainage designs (cont.)	122
Figure 47: Mammal sensitivity map for the study area.	130

LIST OF TABLES

Table 1: Immediate demand for space	26
Table 2: Submission of the scoping report	52
Table 3: Average monthly precipitation for the Pretoria Area (Source Meteoblue 1985 to 2019)	58
Table 4: Average monthly evaporation for the Pretoria Area (DWS A2E003)	59
Table 5: Main attributes of the Western Bankenveld Ecoregion (DWS 2005)	60
Table 6: IUA, Present Ecological State and Recommended Ecological Class	67
Table 7: Classification of River Health Assessment Classes	68
Table 8: Surface Water Monitoring Points	68
Table 9: Water quality analysis	69
Table 10: AUI 1, RU 1_4, Pienaars River Habitat and Biota RQO	70
Table 11: Biomonitoring Sites and Coordinates	71
Table 12: Comparison between sites monitored	74
Table 13: The classification of reach 1056 as given in the DWS database.	77
Table 14: Measure of the severity of the impact at a site (Kleynhans et al., 2008)	77
Table 15: The drivers of habitat integrity	78
Table 16: GDP impact from SEZ stakeholders	89
Table 17: Income impact from SEZ Stakeholders	90

Table 18: Number of jobs created through the SEZ Development	92
Table 19: Projected Impact of Production:	93
Table 20: Summary of laboratory results	100
Table 21: Summary of laboratory results	104
Table 22: Summary of heave calculations	106
Table 21: Preliminary Annual Average Daily Demand for water	109
Table 22: Peak Day Dry Weather Flow (PDDWF) for water	110
Table 25: Proposed road upgrades	116
Table 26: Design criteria and parameters	120
Table 27: Mammal species identified and derived to reside within the study area	126
Table 26: Severity Ratings	135

1. INTRODUCTION

The purpose of this environmental Impact Assessment Report (EIAR) and EMPr is to broadly and collaboratively identify all the possible issues and impacts from activities associated with the proposed construction of the Silverton Automotive Special Economic Zone on the remainder of Portion 89 of the farm Willows 340 JR.

This EIAR and EMPr will therefore contain all the information that is necessary for an adequate understanding of the nature of issues or impacts associated with this proposed development, the access road and all other associated infrastructure such as electricity, water and parking areas. The EIA report will focus on identifying the impacts on the physical and biological environment and to some extent the social environment, along with the impact mitigation thereof.

The planning and eventual construction and operation of the proposed plant represent the legal trigger for the Environmental Impact Assessment (EIA) process to follow in terms of the List of Activities and Competent Authorities identified in term of Sections 24 & 24D of the National Environmental Management Act (Act No. 107 of 1998) (NEMA), GNR 325 and 324 of 7 April 2017.

The main triggering activity focuses on the activity for the transformation of more than 20 ha of indigenous vegetation that automatically requires a Full Scoping and EIA process. Other activities include activities under the Basic Assessment listings but will be handled in the Full Scoping and EIA process.

1.1 OBJECTIVES OF THE EIAR

The objectives of the EIA report is to, through a consultative process-

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

To adhere to the requirements of the EIA regulations in terms of contents of the EIA Report, the following must be included in the report:

(a) details of– (i) the EAP who prepared the report; and (ii) the expertise of the EAP, including a curriculum vitae;	Section 1.2
(b) the location of the development footprint of the activity on the approved site as contemplated in the accepted scoping report, including: (i) the 21-digit Surveyor General code of each cadastral land parcel; (ii) where available, the physical address and farm name; and (iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;	Section 2
(c) a plan which locates the proposed activity or activities applied for as well as the associated structures and infrastructure at an appropriate scale	Section 2
(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 associated structures and infrastructure related to the development;	Section 3 & Section 4
(e) a description of the policy and legislative context within which the development is located and an explanation of how the proposed development complies with and responds to the legislation and policy context;	Section 4
(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 development footprint within the approved site as contemplated in the accepted scoping report;	Section 5
(g) a motivation for the preferred development footprint within the approved site as contemplated in the accepted scoping report;	Section 3.2

(h) a full description of the process followed to reach the proposed development footprint within the approved site as contemplated in the accepted scoping report, including:	Section 6.2
(i) details of the development footprint alternatives considered;	Section 6.2
(ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;	Section 7
(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;	Section 7
(iv) the environmental attributes associated with the development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Section 8
(v) the impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts–	Section 9
(aa) can be reversed;	
(bb) may cause irreplaceable loss of resources; and	
(cc) can be avoided, managed or mitigated;	
(vi) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks;	
(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;	
(viii) the possible mitigation measures that could be applied and level of residual risk;	
(ix) if no alternative development footprints for the activity were investigated, the motivation for not considering such; and	
(x) a concluding statement indicating the location of the preferred alternative	

development footprint within the approved site as contemplated in the accepted scoping report;	
(i) a full description of the process undertaken to identify, assess and rank the impacts the activity and associated structures and infrastructure will impose on the preferred development footprint on the approved site as contemplated in the accepted scoping report 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 9
(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 mitigated;	Section 9
(k) where applicable, a summary of the findings and recommendations of any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final assessment report;	Section 9.4 and the EMPr
(l) an environmental impact statement which contains— (i) a summary of the key findings of the environmental impact assessment	Section 8

(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 development footprint on the approved site as contemplated in the accepted scoping report indicating any areas that should be avoided, including buffers; (iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives	
(m) based on the assessment, and where applicable, recommendations from specialist reports, the recording of proposed impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation;	Section 9.4
(n) the final proposed alternatives which respond to the impact management measures, avoidance, and mitigation measures identified through the assessment;	Section 9.5
(o) 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
(p) a description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed;	Section 11
(q) 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 12
(r) where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required and the date on which the activity will be concluded and the post construction monitoring requirements finalised;	Not applicable
(s) 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	Section 14

(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 or affected parties;	
(t) where applicable, details of any financial provision for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts;	Not applicable
(u) an indication of any deviation from the approved scoping report, including the plan of study, including— (i) any deviation from the methodology used in determining the significance of potential environmental impacts and risks; and (ii) a motivation for the deviation;	Not applicable
(v) any specific information that may be required by the competent authority; and	Not applicable
(w) any other matters required in terms of section 24(4)(a) and (b) of the Act.	Not applicable

1.2 DETAILS OF THE EAP

REC Services Pty Ltd 566 Rubenstein Drive, Moreleta Park, 0044 P. O. Box 40541, Moreleta Park, 0044 Telephone: 012 997 4742 Email: rock.arno@lantic.net	
--	--

The Scoping and EIA process for the Silverton SEZ was undertaken by REC Services Pty Ltd. The Assessment was undertaken by Arno van den Berg who is a registered Environmental Scientist with SACNASP. Arno is a member of the International Association of Impact Assessment practitioners of South Africa (IAIA SA).

REC Services Pty Ltd specializes in Environmental Impact Assessments and Management during the planning and development stages of a range of development projects. REC Services Pty Ltd is a streamlined firm with an integrated approach to environmental impact assessments, networking with expertise where necessary, while always keeping a holistic view on assignments. Our 30-year experience is across a broad range of development projects and clients involved in assignments in the urban and rural environments.

Arno van den Berg undertook this EIA process from cradle to grave. Arno undertook his studies at the University of Johannesburg and obtained an M.Sc. degree in Environmental Management in 2009. Before this, he obtained his B. Hons degree in Botany and B.Sc. in Environmental Science. He has been part of REC Services Pty Ltd for 10 years. Arno is registered with the South African Council for Natural Scientific Professions (SACNASP) in 2015 in the field of Environmental Sciences. CV of EAP attached in Appendix 5.

2 LOCALITY AND STUDY AREA

The project will entail the establishment of the Silverton Automotive (SEZ) on the remainder of Portion 89 of the farm The Willows 340 JR, Waltloo, Gauteng. The land is currently open and vacant, undeveloped with traces of an abandoned Ford test track within the site. The land is owned by the City of Tshwane Metropolitan Municipality. The size of the property is 81.6 ha. Only 45.97ha will physically be developed which will trigger EIA activities. The site SG code is as follow: TOJR00000000034000089.



Figure 1: Locality plan

There is one formal road which runs within the property however the property is also connected to formal roads on the northern and southern boundary which enhance the function of proposed activities on the site.

2.1 SURROUNDING DEVELOPMENT AND LAND USES

The immediate areas surrounding the application site are:

- **Northern and Eastern Boundary:**

The Moretele View; Naledi and Nellmapius residential neighbourhoods as well as the Mamelodi Hospital.

- **Southern Boundary:**

The Nellmapius residential neighbourhood; clinic and a large plot of undeveloped land.

- **Western Boundary:**

The Ford Motor Company South Africa and Watloo Industrial area

The application site is ideally located along key movement routes and next to the Ford Motor Company South Africa as well as in close proximity to the Watloo industrial area, the nearby Denneboom train station and is supported by residential neighbourhoods on the northern, eastern and southern borders of the site.

The area carries great development potential and has been identified, in the City of Tshwane 2017 RSDF for Region 6, as one of the key areas which investment should be channelled into in order to tackle the largescale unemployment in the residential neighbourhoods of Mamelodi, Nellmapius and Eersterus within the area.

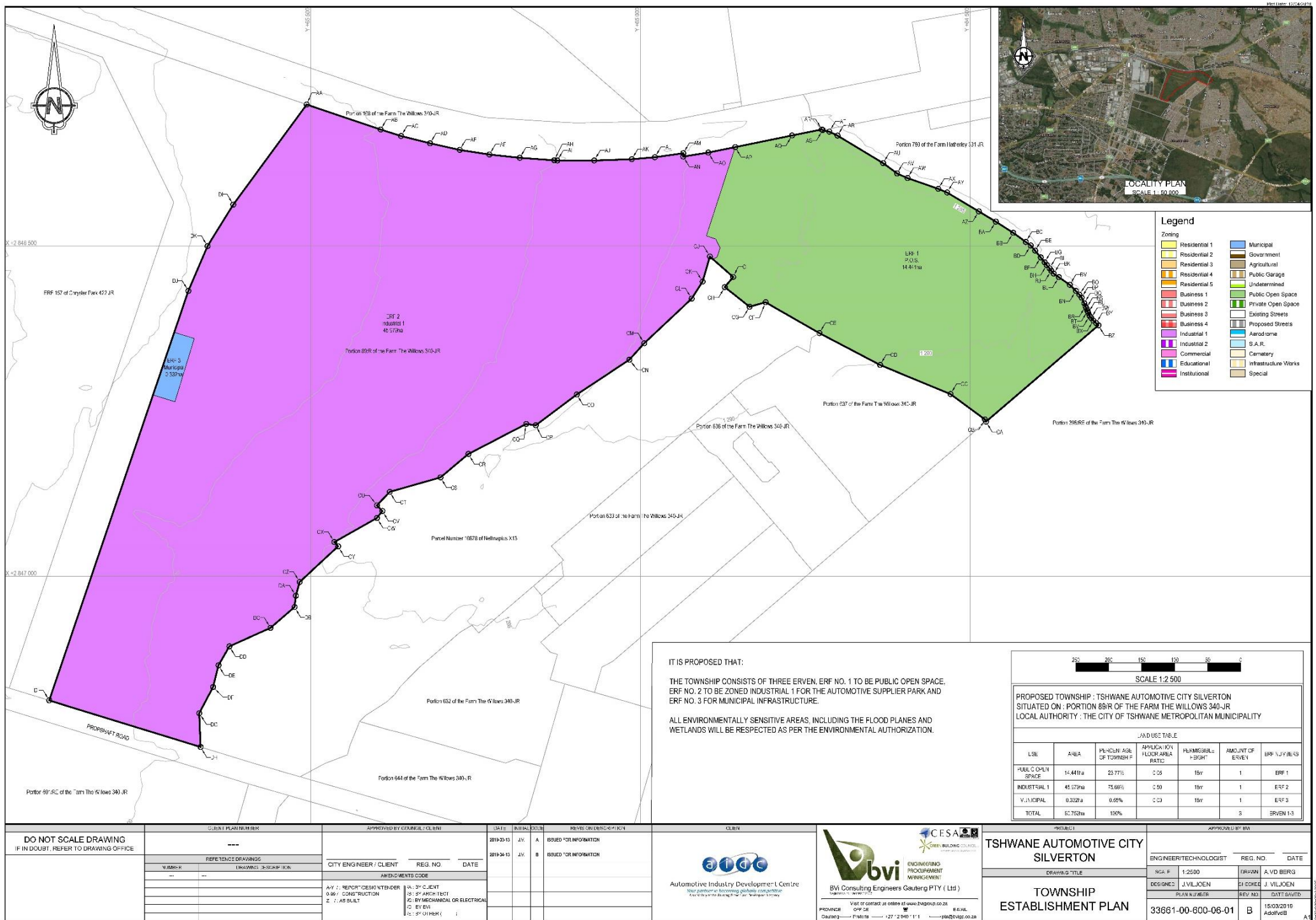


Figure 2 : Township Establishment plan

3 SCOPE OF THE PROPOSED ACTIVITY AND PROJECT DESCRIPTION

The establishment of automotive supplier parks is a global trend that started in the early 1990s. More than 50 such parks exist today worldwide, and is testimony to the importance of the automotive manufacturing industry globally.

Also in South Africa the automotive manufacturing industry plays a vital role in the local economy, as it is the largest manufacturing sector. The manufacturing base continues to expand, and as an example Ford Motor Company South Africa (FMCSA) will practically double its capacity within its plant located in Silverton, Tshwane. FMCSA's expansion plans will lead to the creation of business and development opportunities for their supply chain including the people of surrounding communities. The SEZ forms part of the broader development of the Tshwane Automotive City (TAC) that is supported by the Gauteng Provincial Department of Economic Development (GDED) and the City of Tshwane municipality (CoT).

In 2016, a Master Plan for Silverton Industrial and Retail Park was developed to offer a diversity of appropriate land uses and other economic activities. The Plan that was developed spans over 224 hectares that includes 4 development phases, of which

- Short Term (Next 7 years): Phase 1 & 2 on 81.6 hectares of Tshwane Owned Land for the development of a Supplier Park (EIA Considered for this Phase)
- Medium Term (Next 5 to 8 years): Phase 3 on 81 hectares of Tshwane Owned Land for the development of mix use Industrial, Retail and Residential space.
- Longer Term (Next 8 to 15 years): Phase 4 on 42 hectares for Mix used, situated on a privately-owned land portion. Consultation are underway with CoT to consider land swap alternatives upon such time that comfort is obtained that socio-economic objectives is met in Phase 1 to 3 before this phase will be activated.

The first and second phase of the SEZ is planned to be situated on 81.6 ha of CoT-owned land adjacent to the FMCSA plant and facilities. The location of these Phases in relation to FMCSA is shown in the graphic below.

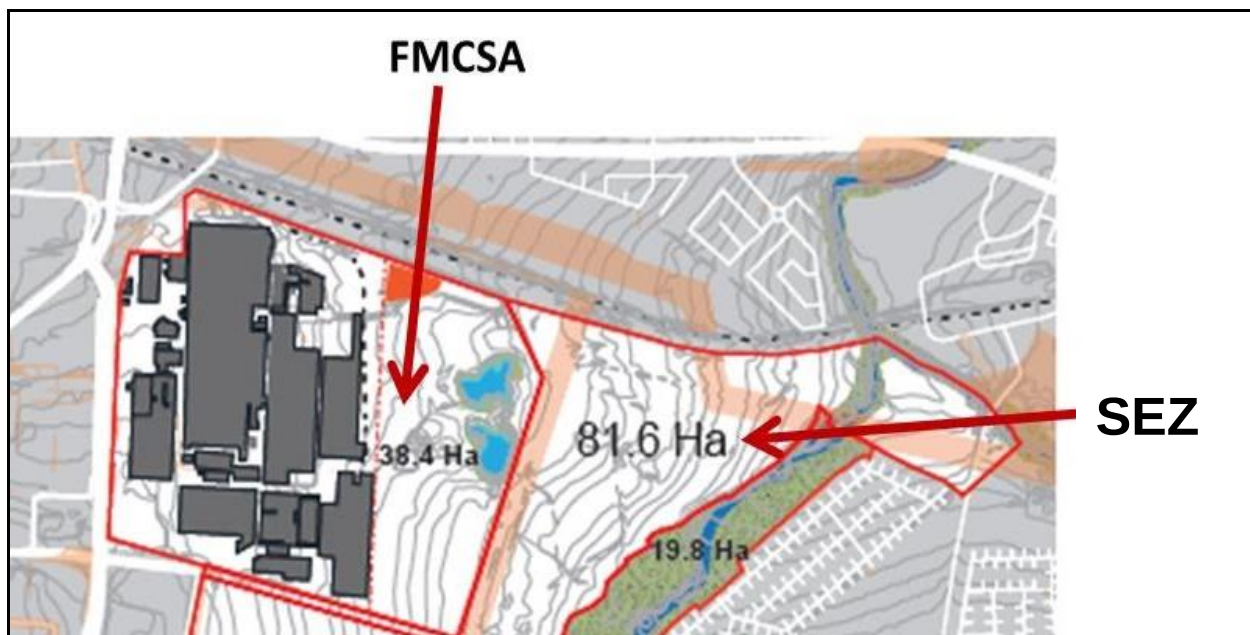


Figure 3: SEZ 1st Phase Concept Master Plan

The **primary driver** for the establishment of the SEZ is the expansion of Automotive Manufacturing Capacity in line with the SA Automotive Master Plan 2035. One key anchor market would be Ford Motor Company of South Africa (FMCSA), with its plant located in Silverton, Tshwane. The FMCSA expansion involves two new ranges of commercial vehicles (the Ranger and Raptor brands) with planned production of over 200 000 vehicles annually, of which some 60 - 70% are exported to the global market. The SEZ adjacent to the plant is aimed at critical Tier 1 and 2 component suppliers, third party logistics and other service providers that offer JIT/JIS services that enable the seamless and effective assembly-to-order of vehicles in the FMCSA plant. FMCSA therefore provides a guaranteed 'market' to its suppliers and providers, and aims to reap productivity and cost benefits for its production via highly efficient supply chains.

As a result of the planned expansion by FMCSA over the period 2020 - 2022, it is expected that uptake of space in the SEZ will be above average initially and much better than is typical in unsolicited park developments. Already, various suppliers have indicated very high levels of commitment to establish operations in the park. It is further expected that **increased focus on localisation** as envisaged in the SA Automotive Industry Masterplan 2035 of the dti will provide continued impetus for local and international component suppliers to consider location in the park.

Imported content of parts and accessories in nominal values amounted to R18 billion in 2017, accounting for 40% of Tier 1 sales to local OEMs. This presents a tremendous **growth opportunity** for the SA component supply base (see below).

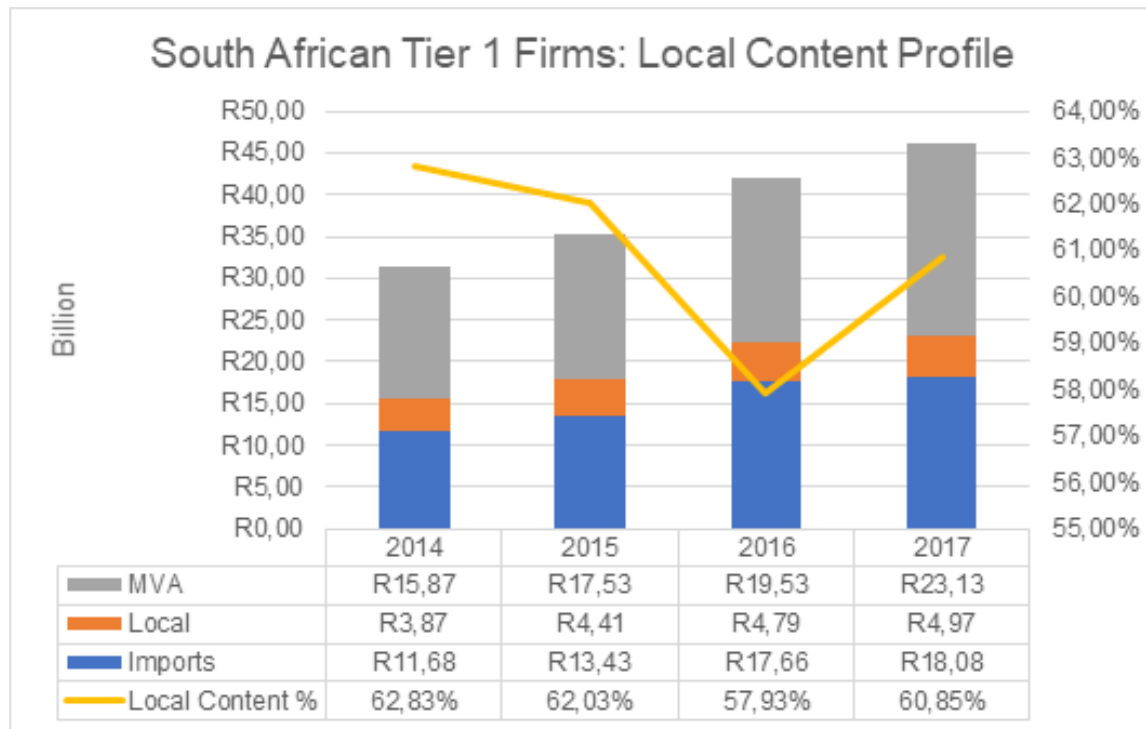


Figure 4: SA Tier 1 Suppliers Local Content Profile

The SEZ will evolve into an **important industrial hub** in the eastern region of Tshwane, with significant socio-economic benefits for surrounding communities, mainly in the form of formal employment opportunities, training and transport. Development of the envisaged park and other surrounding sites will involve substantial upgrades to road and rail, electricity and water infrastructure, with its concomitant multiplier effects. The benefits are outlined more fully in the later economic impact assessment.

The SEZ will not be detrimental to other industrial/commercial activities in the vicinity, as it is expected that current activities will benefit from the upstream and downstream increase in economic activity stemming from the establishment of the SEZ.

This phase consists of a municipal erf for electrical services and an industrial area.



The site currently provides for various individual industrial suppliers, with erven ranging in size from about 10 000 m² and upwards.

Phase 1 includes provision for the construction of the following shared services buildings/areas:

- Motor vehicle parts manufacturing industries
- Subservient offices
- Clinic

Phase 2

This area has been deemed economically viable as there are already enough interested end users to occupy a portion of the property. This phase will contribute to various uses, including an area for open space.

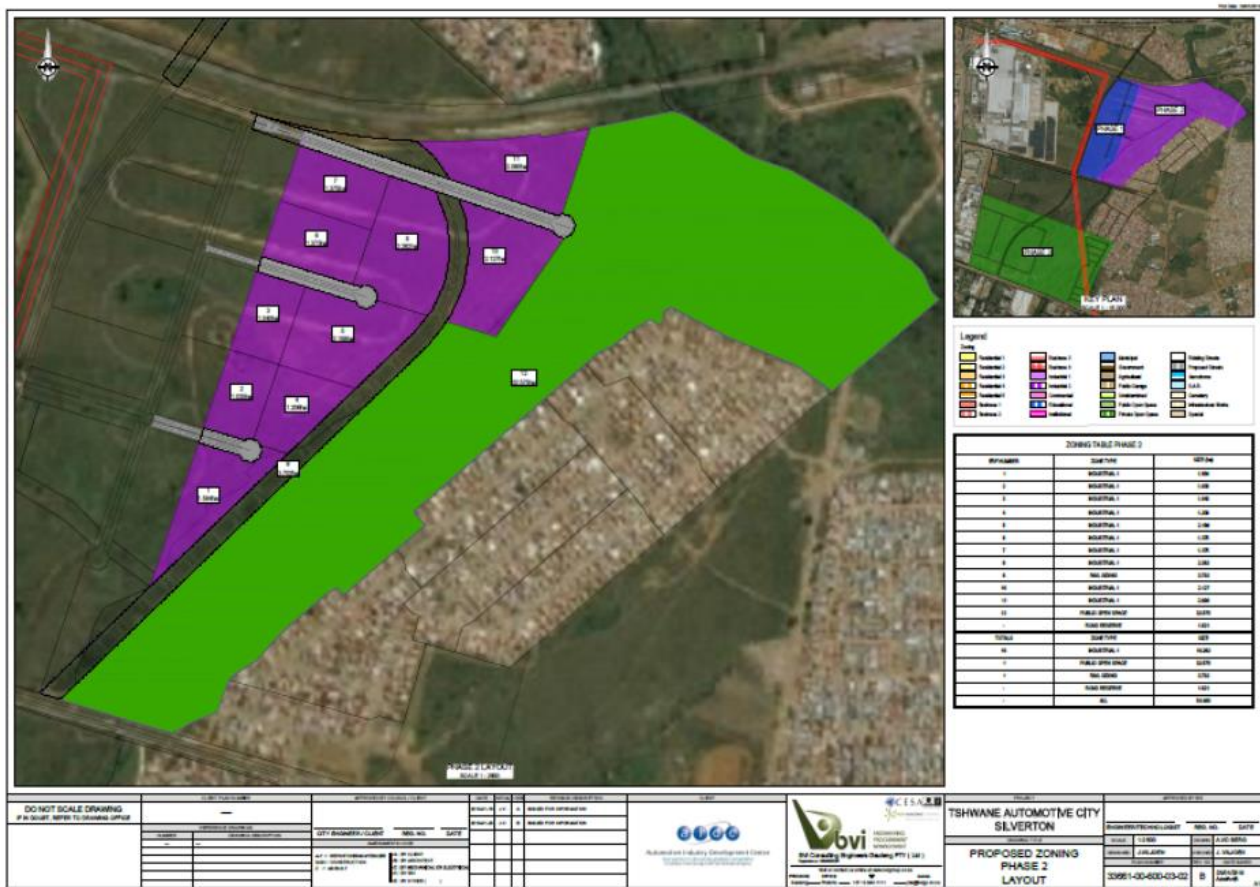


Figure 6: Phase 2 of the development

3.1 MARKET DEMAND

FMCSA's Silverton assembly plant in the eastern regions of Tshwane is one of the largest manufacturing entities and employers of the Tshwane metropole. It has an annual turnover of +R60 billion and manufactures 100 000 vehicle units each year. Following an investment of R3 billion in its South African operations, FMCSA is increasing capacity to 200 000 units annually, starting later in 2019. As a consequence of this, there will be a concomitant increase in the production capacity of both its Tier 1 and Tier 2 supplier base. In order to facilitate this expansion, **additional industrial space** is required and the SEZ provides an ideal environment for the development of such space.

The market demand for the SEZ is equal to the demand for lettable industrial space. An overview of the immediate (actual) demand and a rationale for the future (projected) demand for lettable space within the SEZ is outlined below.

- Immediate Demand

On the basis of personal interactions with identified suppliers, the immediate requirement for space is summarised below.

Table 1: Immediate demand for space

	Company	Type of Business	Space Requirement (m ²)
	Vacuform	Vac forming load bed liners	4 000
	Motherson	Assembly	5 000
	Silverton Manufacturing	Assembly	12 000
	Xuba Polymer Industries	Compounding of polymer raw material	4 400
	Standard Profile	Assembly	2 600
	MA Automotive Tool & Die	Pressed parts assembly	13 000
	Total		41 000

It is assumed that revenue for the SEZ from leasing of space will flow after 2021, after establishment of tenant-specific facilities during 2020. The immediate demand of 41 000 m² accounts for one-third of available lettable space of both phases.

- Projected Demand

Projections for future demand growth in the initial years leading to full occupancy of the development, are based on the following factors:

- Negotiations by Original Equipment Manufacturers such as BMW, Nissan and FMCS with more Tier 1 suppliers on the basis of guaranteed off-take agreements. To date various suppliers have been approached. Types of businesses (commodities) that may potentially locate in the SEZ are:
 - Canopies and running boards
 - Metal pressings
 - Harnesses
 - Mirrors
 - Sequencing and kitting
 - Fuel tanks
 - Vehicle mats
- Existing Tier 1 suppliers (mentioned above) have identified a number of Tier 2 suppliers that may be interested in locating in the SEZ, and there may well be others as the park concept becomes reality. Such suppliers are involved in:
 - Plastic sheet extrusions
 - Steel sheet merchanting/value-adding
 - Packaging
 - Assembly equipment supply.

The key driver for demand going forward is higher local content targets to be met by automotive OEMs. As outlined in the rationale earlier, tremendous scope for replacement of imports through localisation exists, to the tune of some R18 billion or more. FMCSA along with other Original Equipment Suppliers (OEMs - vehicle assemblers) is aiming to **increase local content** from ~ 45% currently to ~ 60% over the lifetime of the new production run, and this implies the need for significant localisation by suppliers. Hence, international suppliers will be targeted by OEMs to localise all or part

3.2 SITE DEVELOPMENT PLAN

[illegible]

The site development plan was used when the biodiversity studies were carried out. The plan was amended to incorporate the wetland delineation into the design.

4 LEGISLATIVE CONTEXTS

Various legislative requirements need to be fulfilled surrounding the proposed project. The legislative requirements are presented below:

4.1 ALIGNMENT OF THE ACTIVITY WITH APPLICABLE LEGISLATION AND POLICIES CONSIDERED.

APPLICABLE LEGISLATION	REFERENCE WHERE APPLIED
Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996). The Constitution of South Africa guides the right of every individual in South Africa to an environment that is not harmful to their health.	In total as an umbrella legislation.
The National Environmental Management Act (Act No. 107 of 1998) (NEMA) The National Environmental Management Act (Act 107 of 1998 as amended on the 8th of December 2014) (NEMA) and the Regulations and associated listed activities identified under Regulations 982, 983, 984 and 985, is the key national legislation underpinning environmental Authorisations in South Africa. These regulations were amended in GN R. 324, 325, 326 and 327 on 7 April 2017. Activities listed in the EIA regulations will be listed in Section 4.2 of this report.	NEMA and associated regulations are directly relevant to this Application.
The National Water Act (Act No. 36 of 1998) (NWA) An Integrated Water Use Licence Application (IWULA) will be lodged with the DWS in terms of Section 21 of the NWA, which lists several water uses requiring authorisation.	An IWULA and IWWMP will be required.

The National Heritage Resources Act (Act No. 25 of 1999) The National Heritage Resources Act requires all developers (including mines) to undertake cultural heritage studies for any development exceeding 0.5 ha in extent. It also provides guidelines for impact assessment studies to be undertaken where cultural resources may be disturbed by development activities. The document will be submitted to the South African Heritage Resources Agency (SAHRA) as part of the impact assessment process.	An HIA will be conducted to analyse the site for any cultural or historical elements.
The National Environmental Management: Air Quality Act (Act 39 OF 2004) The National Environmental Management: Air Quality Act has a list of activities that would require an air emissions license. The objectives of this act are 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.	Not applicable. No listing activities in terms of the Air Emissions license will be triggered by this activity.
National Environmental Management: Biodiversity Act (Act 10 of 2004) Identifies that all people and organizations should act with due care to conserve and avoid negative impacts on biodiversity, and to use biological resources sustainably, equitably and efficiently. Biodiversity thus refers to the life-support systems and natural resources upon which we depend.	Biodiversity studies to be undertaken in accordance with the stipulations of this act. Biodiversity is assessed using various special tools such as GDARD C-Plan 3.3 and the National list of threatened ecosystems.

Gauteng Provincial Environmental Management Framework, 2014. The purpose of these Gauteng Provincial Environmental Management Framework (GPEMF) Standards is to provide rules which must be complied with, ensuring governance of the GPEMF Standards, compliance to the principles contained in section 2 of the National Environmental Management Act 107 of 1998 (NEMA) and duty of care, in terms of section 28(1) of NEMA, and to ensure sustainable development within Gauteng Province. These Standards will also negate the need to obtain an environmental authorisation in terms of section 24(2)(d) of NEMA in relation to an excluded activity	Standards of “Duty of Care” must be implemented. The development must strive to be sustainable for future generations and must take into consideration principles of sustainable development.
The Gauteng Draft Red Data Policy Management measures and rules in terms of red data fauna and flora on a proposed development site.	All specialist studies to look for red data plants and animals on and around the site. These studies also focusses on the habitat assessment

4.2 ENVIRONMENTAL IMPACT ASSESSMENT

A Full scoping and EIA process need to be followed for the activities that will be triggered in terms of the 2014 EIA regulations as amended, promulgated in terms of the National Environmental Management Act 107 of 1998 as amended. Because there is basic assessment and Full Scoping and EIA activities listed in the table below, a Full Scoping and EIA process will apply.

Activity	Listing notice 1	Description
14	The development and related operation of facilities or infrastructure, for the storage, or for the storage and handling, of dangerous good, where such storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic metres.	The establishment of the SEZ will include activities where storage of fuel, storage of chemicals and storage of other dangerous goods will be conducted which is associated with the automotive industry.
19	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;	This activity is applicable where development will approach the river and wetland area. This activity will be refined as more information becomes available.
Activity No(s):	Provide the relevant Basic Assessment Activity(ies) as set out in Listing Notice 2 (GN R325)	Describe the portion of the proposed project to which the applicable listed activity relates.
15	The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for- (i) the undertaking of a linear activity (ii) maintenance purposes	Clearance of indigenous vegetation over 20 ha in size.

Activity No(s):	Provide the relevant Basic Assessment Activity(ies) as set out in Listing Notice 3 (GN R324)	Describe the portion of the proposed project to which the applicable listed activity relates.
12	The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan (C) in Gauteng (ii) Within Critically Biodiversity Areas or Ecological Support Areas identified in the Gauteng Conservation Plan or bioregional plans.	A section of the vegetation to be cleared falls within an ecological supported area in terms of C-Plan 3.3. The vegetation assessment undertaken by KEMS Pty Ltd indicated the entire site to be historically transformed and no primary vegetation remains on site. This activity is included for purposes of caution.
14	The development of (ii) infrastructure or structures with a physical footprint of 10 square metres or more where such development occurs- (a) within a watercourse; (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse in (C) Gauteng (iv) Sites identified as Critical Biodiversity Areas (CBAs) or Ecological Supported Areas (ESAs) in the Gauteng Conservation plan or in bioregional plans.	This activity is applicable for any activity that might be needed within 32m of the adjacent river and/ or stream. This includes the sewer connection and the storm water outlets. No roads or structures will be constructed within 32 m of any river or stream.

4.3 WATER USE LICENSE APPLICATION

A water use license application in terms of Activity Section 21 of the National Water Act 36 of 1998 will be needed and will be applied for to the Department of Water Affairs.

This application will include:

A water use license will be applied for in support of Section 21(c) and (i) of the National Water Act, 1998 (Act No. 36 of 1998) for the proposed development. The public participation process included the advertisement of the WULA and applicable 60 day commenting period.

4.4 HERITAGE IMPACT ASSESSMENT

In accordance with the National Heritage Resources Act 25 of 1999, any development larger than 500 square metres need to have an application in terms of Section 38 of the Act, if it is believed that any heritage resources will be affected. The applicant will therefore conduct the Heritage impact assessment before any feedback is given from PHRA-G to ensure that there will be no time constraints going forward.

4.5 NATIONAL ENVIRONMENTAL MANAGEMENT BIODIVERSITY ACT 10 OF 2004.

The Biodiversity Act regulates the need for studies such as biodiversity, wetlands and ecology. The specialist studies to be undertaken for the Silverton SEZ is based on the Gauteng Department of Agriculture and Rural Development (GDARD) Biodiversity Guidelines. These guidelines were compiled in accordance with the National Environmental Management Biodiversity Act. A shapefile was submitted to GDARD with the project footprint area. The submission is done to GDARD biodiversity section. The reply from GDARD biodiversity indicated that specialist studies would be needed for Vegetation, plants with special reference to *Habenaria kraenzliniana*, Wetlands, Mammals with special reference to *Lutra maculicollis* and rivers.

4.6 The SEZ will be located in a Spatial Economic Zone. The primary pieces of legislation governing the establishment and operation of the proposed SEZ are:

- Special Economic Zones Act 16 of 2014 (“**SEZ Act**”);
- Public Finance Management Act 1 of 1999 (“**PFMA**”);
- Municipal Finance Management Act 56 of 2003 (“**MFMA**”);
- Municipal Systems Act 32 of 2000 (“**MSysA**”);
- Municipal Structures Act 117 of 1998 (“**MStructA**”); and
- Companies Act 71 of 2008 (“**Companies Act**”).

In addition to the above, there are certain regulations that will also apply. Firstly, Treasury Regulations for departments, trading entities, constitutional institutions and public entities issued in terms of the PFMA (“**Treasury Regulations**”) apply to the proposed SEZ. And secondly, the Minister for Trade and Industry may make regulations regarding any matter which, in terms of the SEZ Act, is required or permitted to be prescribed any ancillary or incidental administrative or procedural matter that it is necessary to prescribe for the proper implementation of administration of the SEZ Act.

The SEZ Act states that upon the designation of an area as a SEZ and the granting of a SEZ license to the applicant, the applicant must establish an entity to manage the SEZ. The SEZ Act then goes further and states that in the case of a provincial government, the entity must be established as a provincial government business. The SEZ Act makes provision for the following overall governance framework regarding a SEZ:

- SEZ Advisory Board;
- Applicant who is awarded the SEZ license;
- EZ entity with SEZ Board; and
- SEZ Operator.

5 PROJECT NEED AND DESIRABILITY

The SEZ is a collaborative venture between the City of Tshwane Metropolitan Municipality, the Gauteng Provincial Department of Economic Development and the Department of Trade and Industry. The SEZ venture as an element of the greater Tshwane Automotive City Masterplan aims to transform the City of Tshwane into a globally competitive automotive investment destination and the automotive capital of Africa.

The development presents a great opportunity for economic stimulation and is a feasible option for international investment, considering that South Africa's automotive industry is the largest manufacturing sector and continues to expand.

Motivation:

The proposed development will strive to create an environment which facilitates the expansion and transformation of the automotive industry whilst also attraction Foreign Direct Investment.

The location of this site, in close proximity to the Ford Motor Company SA and other automotive industry firms translates to immense development potential and makes it ideal for the proposed project. The City of Tshwane's RSDF 2017 points out that the Silverton/Watloo/Koedoespoort industrial area has been identified as one of the specialised activity areas of metropolitan importance due to its excellent degree of accessibility (road & rail) as well as its significant provision of industrial related employment opportunities on a metropolitan scale.

The City of Tshwane is under constant pressure to expand and develop in order to accommodate the growing urban population. This has been reflected in the City's recent Spatial Development Frameworks and planning policies, where there has been a call for greater mixed-use nodal development in order to reduce the rate of horizontal expansion in the city and focus on densification around key nodes. The SEZ concept is in line with this theme of sustainable development as it looks to incorporate a variety of uses within the development, thus prioritising integrated and densified development in later stages (Phase 3 and 4) of the Development.

The development's location in the Silverton/Watloo area is ideal, considering that it is surrounded by residential neighbourhoods such as Mamelodi; Nellmapius; Faerie Glen and Lynwood. This presents an advantageous situation for both the SEZ and the surrounding neighbourhoods because the employment opportunities provided by the SEZ development will be easily filled by the surrounding communities. This is supported by the Economic Impact Report 2016 which found that since 2010, the population of the area surrounding the development site has grown steadily at just over 1.7%, meaning that the supply of local labour is also increasing. Furthermore, these communities are a source of income for the development, as they will also spend their incomes on the goods and services within the development as well as other surrounding businesses and firms, therefore the whole community will benefit.

The Economic Impact Report 2016 also conducted a study on the income levels of the community as they sought to draw a link between income and quality of life. The graph below shows that the largest income group in the area earns between R1601 and R3 200 per month however, what can also be seen is that a large portion of the population, approximately 23.6% earn less than R1 601 per month.

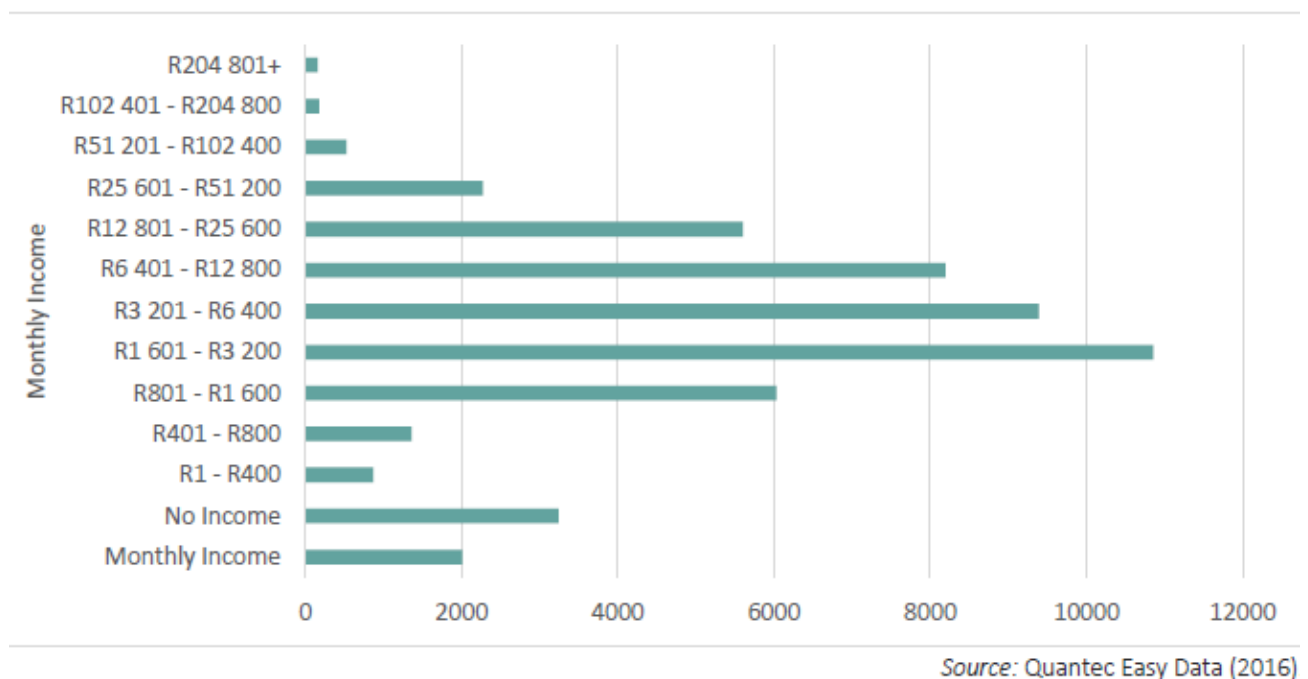


Figure 8 : Income Categories of the Area

The development will aim to create a multiplier effect through the creation of economic opportunities which will lead to greater income levels for the community around the development which ultimately will lead to improved quality of life for the community.

Although the development will operate in Tshwane, its success is largely dependent on global vehicle production trends, therefore it is important to understand where the global industry is going through looking at past trends and forecasting.

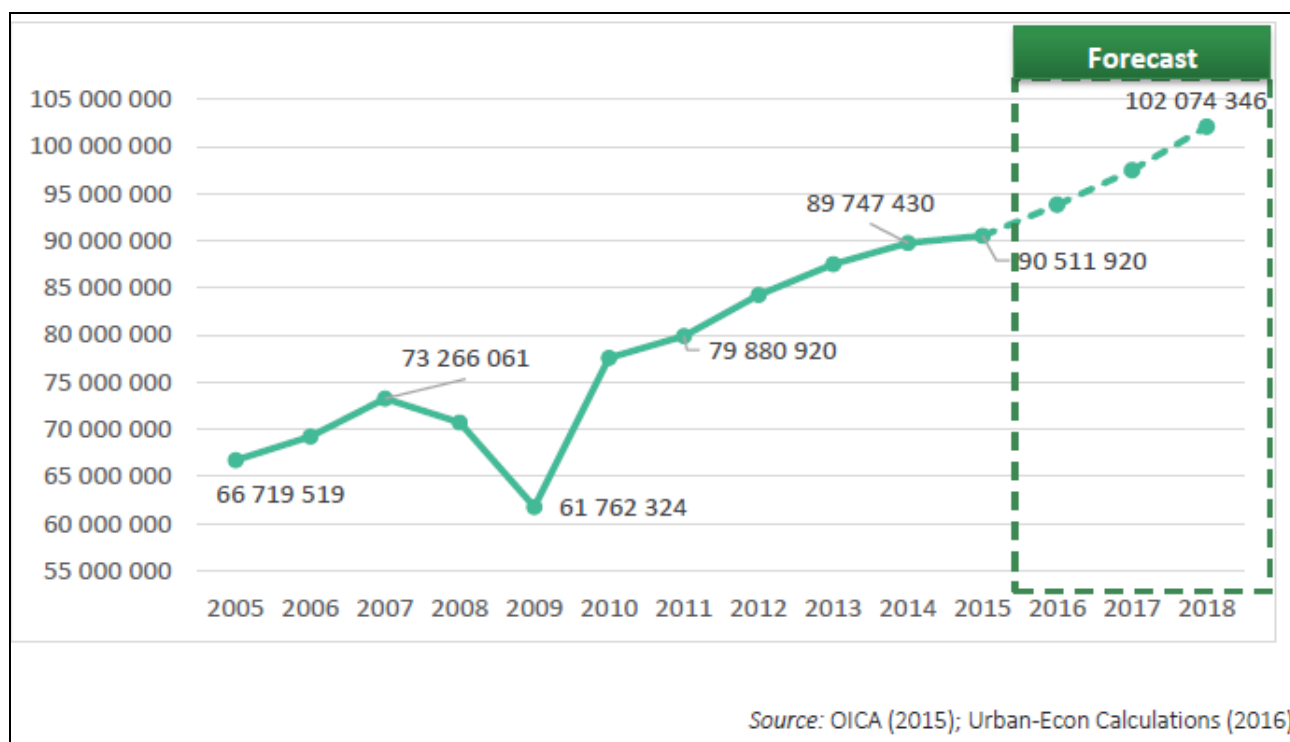


Figure 9: Global Vehicle Productions, 2005-2018

The graph above, showing the estimated vehicle production trends from 2005 to 2018, illustrates that there has been strong growth since 2005 and rapid recovery in the aftermath of the financial crisis of 2007.

The above indicators suggest a favourable global environment for the automotive industry and no immediate threats which could potentially disturb this trend of growth, therefore the automotive industry is a key investment sector which will create many opportunities which can be exploited by the Ford Motor Company South Africa as well as any other suppliers and manufacturers based in the development.

5.2 Need and desirability in terms of the Spatial Planning and Land Use Management Act, Act 16 of 2013 (SPLUMA)

The Spatial Planning and Land Use Management Act, Act 16 of 2013 was a ground policy in the sphere of urban, rural and regional planning as it sought to ensure that all land development applications comply with and be motivated in accordance with a set of standards and development principles

Chapter 2 of the act contains the Development Principles as well as the Norms and Standards developed in order to regulate all land development. Section 7 contains the 5 spatial development principles which must always be adhered to.

In terms of the above, the application for the establishment of a township is **going to introduce the element of mixed-use development**, which is a much-needed intervention within this area, as noted in the CoT MSDF which states that land-uses in this area have been limited to industrial activities. The SEZ will assist the community, especially the previously disadvantaged, by providing access to opportunities and attempting to improve the spatial imbalances of the past. The approval of the application will serve as a testament to the City of Tshwane Metropolitan Municipality's support for planning practices which strive to be inclusionary.

The SEZ development will be in line with this principle as it **will strive to achieve economic growth** in the most sustainable manner possible. The site is not viable for agricultural activities and provision will be made to protect environmentally sensitive areas. The development will also stimulate the functioning of land markets while also adhering to the required infrastructure upgrades, if applicable. The application works against urban sprawl and aims to create a more viable community.

The SEZ development will comply with the **optimal use of resources** and the minimization of negative financial, social, environmental and economic impacts. The developers aim to finalize the application and construction as timeously as possible.

5.3 Need in terms of the Gauteng Spatial Development Framework, 2030:

Taken from page 4 of the GSDF 2030, while many development principles were highlighted, the most important of these is need for **concentrated development** in and around key regional and district nodes. The theme of concentration runs throughout the GSDF as reference is made to a great need for infill development as well as densification instead of expanding existing urban areas which has led to intense urban sprawl, as seen in the east of Tshwane.

Densification is also a paramount feature of the proposed Gauteng 25 year Integrated Transport Master Plan which heavily endorses the concept of Transit Orientated Development, which forms a part of the SEZ development concept as seen in the establishment of public transport lay- byes as well as the development of a public transport facility within the site also proposed in the Traffic Impact Assessment for the development.

6 DETAILS OF THE ENVIRONMENTAL PROCESS FOLLOWED

6.1 ACTIONS TO BE UNDERTAKEN

During the course of this environmental study the following actions and steps will still be followed in accordance with the Regulations set out in Government Notice No. 982 of 2014 of the NEMA regulations as amended:

- An Application for Authorisation, signed by the Applicant, together with a Declaration of Independence, which was signed by the environmental consultant, and submitted to GDARD with the draft scoping report.
- The public participation process was initiated and aim to inform the public about the proposed process and will be asked for input, comments and suggestions
- The draft Scoping report was made available for comments to I&APs, the local authorities and other stakeholders. The draft Scoping report included a Plan of Study for the EIA phase.
- The Final Scoping report, inclusive of any comments received within 30 days, was submitted to GDARD for evaluation
- Once GDARD accepted the final Scoping Report, an Environmental Impact Assessment Report with an attached Environmental Management Programme was compiled. All issues raised by GDARD in response to the Final Scoping report submitted for approval will be addressed in the draft EIAR. The EIAR will address issues and impacts identified by the Environmental Practitioner as well as by the specialist studies.

The Draft EIA with attached EMPr report were made available for comments to the registered I&AP's. Comments received from I&AP's regarding the EIA and EMPr report was incorporated into the draft and EIA and EMPr report.

The EIA Report contains specialist studies. The following specialist studies will be conducted and some have been included into this EIA report during the EIA phase:

- **Vegetation Survey:** A description of the vegetation of the study area, including the identification and assessment of potential Red Data species.
- **Wetland delineation study** to identify and delineate the wetland buffers.
- **Wetland assessment** with Present Ecological State calculation.
- **Heritage Impact Assessment** to identify any items of areas of heritage importance. This report will address requirements in terms of the graveyard situated on site.
- **Surface Water and Aquatic Ecology Assessment** to determine the state of the river and give a basis for surface water monitoring during construction and in the operational phase.
- **Storm water management plan** to ensure that dirty and clean water are separated and that no contamination of any of the water resources will occur.

6.2 ALTERNATIVES

No alternatives have been assessed in **this report**. The applicant already did a feasibility study in terms of this project. Therefore, various layout alternatives considered in the feasibility report can be presented but the final alternative was already considered and chosen prior to the Scoping and EIA. The initial layout proposed by the engineers are presented below.

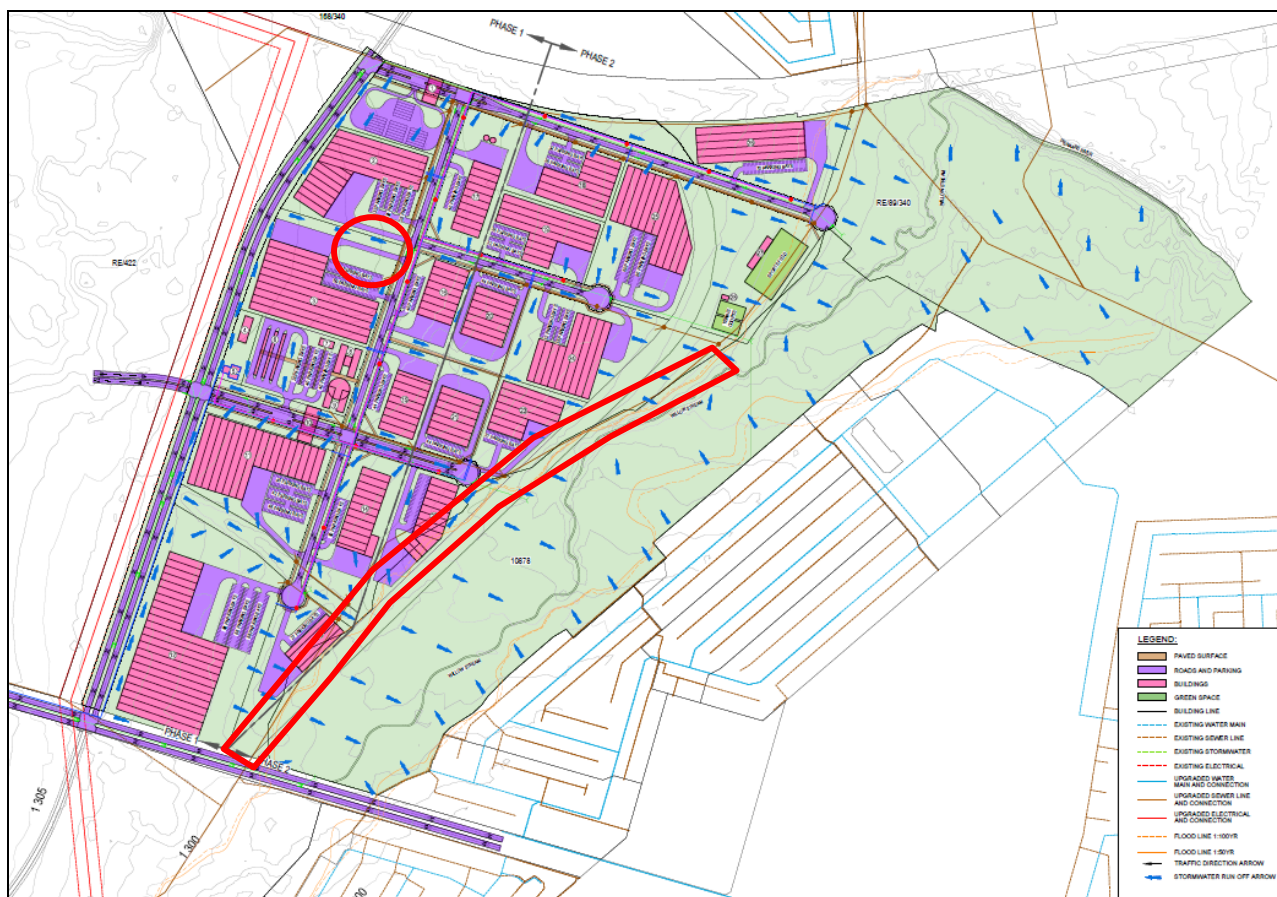


Figure 10: Alternative layout plan with wetland incrinchment in the red block and grave incrinchment in a circle

This alternative layout was replaced with the new layout after the wetland delineation study was conducted by Dr. Steve Mitchell and the Heritage Impact Assessment. A 30m buffer was reserved as per the GDARD biodiversity Guidelines for the wetland and a motivated 20m for the fraveyard. The layout plan was therefore amended accordingly to accommodate the wetland and 30m wetland buffer. The area in red above was amended.

Because of these two alternative considerations as already assessed in the desktop study stage, and the fact that the applicant altered their original plans to accommodate and avoid sensitivities with the layout, no other layout alternatives will be assessed.

6.2.1 Location alternative

In terms of the SEZ area there were no location alternatives that could be considered. The following are the reasons as to why the location was chosen. The location of the proposed area is ideally located within close proximity of the existing automotive activities. And in line with the SEZ requirements the land is currently owned by CoT. (Privately owned land will not be considered for SEZ Status) . This location will ensure lower costs in terms of transportation, lower emissions, dust and noise.

6.2.2 Site layout alternatives

Site layout alternatives permit consideration of different spatial configurations of an activity on a particular site. This may include particular components of a proposed development or may include the entire activity. In terms of layout options, the applicant planned to build in a larger area of the wetland. The wetland Assessment and delineation altered the layout to be situated outside of the 30m buffer of the wetland. Please see Figure 10 above.

6.2.3 Transport alternative

Transport alternatives were evaluated in the Traffic Impact Assessment. At a stage in the project a railway siding was considered for transport of parts via train. This option was abandoned due to the large proposed impact of a siding on the wetland area.

6.2.4 Electricity Alternative

The Silverton SEZ will not be able to run on solely renewable energy as it is an industrial and commercial use park and indications from potential tenants is that processes to be undertaken will need higher power demands. The use of solar power in other power requirements for lighting and normal household uses will be encouraged for the development. Electricity alternatives will be incorporated into the Urban design guidelines. The use of roof top solar panels will be incorporated in the design.

Solar panels will be situated on most rooftop areas. In [Figure 11](#) below, it shows the actual render of the proposed buildings planned for the Silverton SEZ. The plan is to include solar panels as part of the roof design to provide electricity for day to day power demands.



Figure 11: Facility illustration of the actual planned buildings

One of the most important aspects of solar efficiency is the orientation of buildings. Site layouts should enable buildings to be designed for optimal orientation and the longer axis of the building should be orientated so that it runs near east/west as possible. Another important consideration in solar energy efficiency is the distance between buildings, to ensure that buildings do not block out the sun from buildings situated to the south of them. Spacing of buildings are critical for maximum solar efficiency.

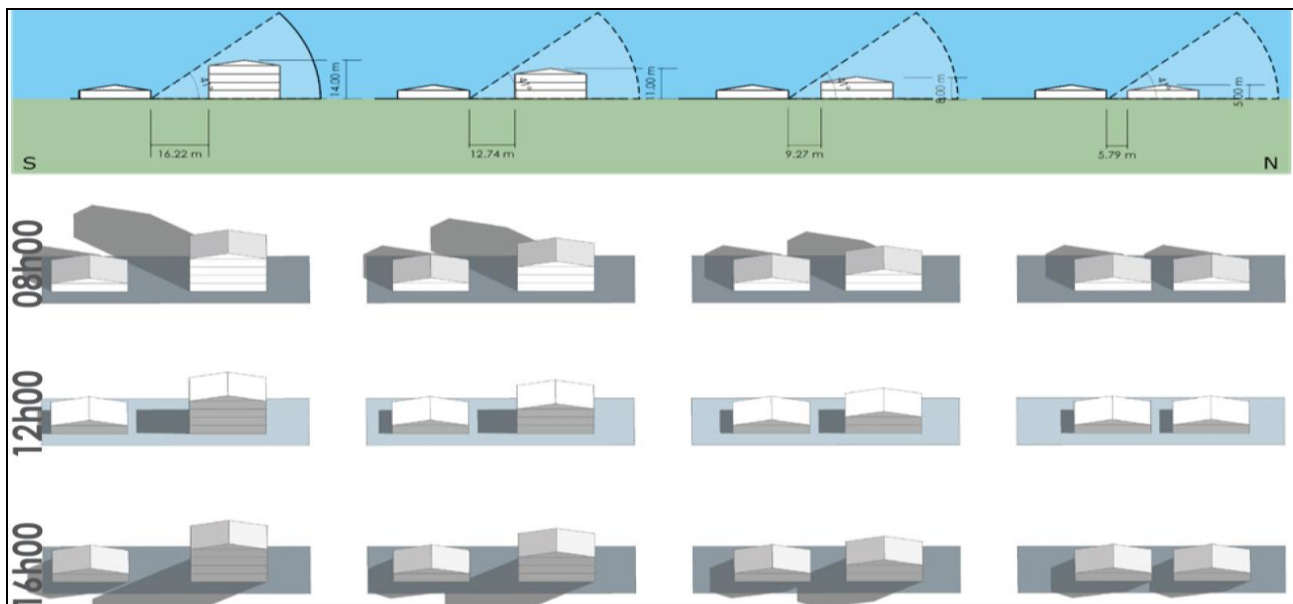


Figure 12: Solar efficiency and building distances.

6.2.5 No Go Alternative

The proposed project construction has to be assessed against the backdrop of the project not going forward. This is done to ensure that any impact assessments, environmental aspects and impacts to be imposed on the proposed site, can be measured against a baseline. The No Go alternative will therefore form part of the

Impact Assessment methodology to be used in the Environmental Impact Assessment stage of this project after approval of the scoping phase.

As per a desktop analysis, if the project did not continue, the baseline information would include no noise pollution, no air pollution due to manufacturing processes. There will be no impact on the water resources such as the river and wetland. No increase in traffic will be experienced. As part of negative impacts if the project **did not continue**, there would be no new job opportunities, no new economic benefit for the GDP of the area and the applicant themselves. The project estimate of 6 000 jobs would not materialise and South Africa will lose the economic benefit of producing the new Ford Ranger and Ford Raptor in South Africa, specifically Gauteng.

The no -go option will have a negative impact on the existing GDP of Gauteng and South Africa as a no-go option will result in Ford South Africa to consider a cost benefit that might see them move the assembly plant of the new Ranger and Raptor abroad.

7 PUBLIC PARTICIPATION

7.1 INTRODUCTION

A public participation process formed part of the Environmental Scoping process. Stakeholders and I&AP's were given the opportunity to participate in this process and their comments, whether positive or negative, will have to be considered in the evaluation process by the Authorities. The public participation process aims to enlighten the public on the positive and negative aspects that the proposed development will have on their immediate surroundings. The applicant is compelled to mitigate impacts to an acceptable status, the significant impacts, as well as consider suitable alternatives as identified during the process.

7.2 OBJECTIVES OF THE PUBLIC PARTICIPATION PROCESS

The public participation process has the following objectives:

- To inform Interested and Affected parties of the proposed development;
- Provide an opportunity for I&AP's to raise environmental issues/concerns;
- To promote transparency and an understanding of the project and its consequences;
- To serve as a structure for liaison and communication with I&AP's;
- To serve as a data gathering mechanism (of local knowledge);
- To identify issues that can easily be overlooked in the initial stages of planning.

To summarise, the objective of the on-going public participation process is to promote openness and transparency concerning the proposed development, during the length of the project. The process should by no means be regarded as a vehicle to temper opposition or objections. Any conclusions agreed upon must be socially, financially and technically acceptable and feasible in order to meet the requirements of both the NEMA and the vision of the proponent.

The aim is to identify all I&AP's and remain in contact with them during the EIA process. The public participation process does not terminate at the completion of the Scoping Report, but proceeds up to the stage of submission of the draft and final EIA report.

7.3 THE GUIDELINES FOLLOWED FOR THE PUBLIC PARTICIPATION PROCESS

The Public Participation Process (PPP) for this project was conducted by REC Services Pty Ltd, and undertaken strictly according to the EIA Regulations of 2014 as amended (GNR 326 in 2017).

7.4 PUBLIC PARTICIPATION PROCESS

The following public participation process is being conducted:

- Identification of key Interested and Affected Parties.
- Compilation of the Background Information Document
- A public meeting was organised and undertaken
- The draft Scoping report for comment was submitted to the ward councillor and Nellmapius Library on 24 May 2019.
- An advertisement was placed on two opportunities.
- Two site notices was placed on site on 28 May 2019. The site notices was placed as per the location given below:
- The Draft Scoping Report was submitted on public comment and stakeholder comments for 30 days. The draft Scoping report was submitted to the Department of Water and Sanitation, Provincial Heritage Resources Agency of Gauteng, City of Tshwane Municipality, Ward councillor of Ward 86, Nellmapius library and the Gauteng Department of Agriculture and Rural Development for comments. Please refer to Section 7.4.5 of this report for a comprehensive list.
- Comments received in response to the draft Scoping report were included in a comments and response sheet.
- Correspondence with I&APs, and addressing I&AP's comments.
- Compilation of a register of I&Aps if registrations are received. A public open day was held by the City of Tshwane Metropolitan Municipality. This meeting was a combined effort to address the public participation for the lease of municipal land, and to address the public participation requirements for the Environmental Impact Assessment process.
- Compilation of a comments and response sheet.

A comments and response sheet is included in Appendix 2H of this report. Comments received verbally from the ward councillor of ward 86, written comments from GDARD and verbal comments from an I&AP were included in the Comments and response sheet. Comments included concerns regarding the public participation where the ward councillor did not want REC Services to engage with the community and distribute BIDs. It also included concerns regarding access to the graves after the development is done.

7.4.1 Identification of key Interested and Affected Parties

I&AP's were identified by means of a site visit and consultation with local residents who are familiar with the area and their neighbours.

7.4.2 Compilation and distribution of the Background Information Documents (BID)

The aim of a BID is to provide all I&AP's with a brief description of the proposed development. The BID also contains the details of the proponent and the environmental consultant. Furthermore, it serves as an overview of the public participation process. A comment sheet was attached to the BID, which the I&AP's were asked to complete and return to REC Services Pty Ltd if they had any suggestions or comments. Please refer to Appendix 2B for copies of the BIDS.

Only one BID was distributed to the ward councillor. No other BIDs were distributed in response to a request from the ward councillor. The ward councillor of Ward 86 requested that the public/community be informed by a public meeting and not by Background Information Documents (BIDs). This was as a result of a meeting held between REC Services and the ward councillor on 24 May 2019.

7.4.3 Placement of the press advertisement

Please refer to Appendix 2D for a copy of the press notice that will be placed in a local newspaper, the Pretoria News when the scoping report is available for public view.

- in the Pretoria News (on 26 April 2019 and on 29 May 2019) to informing the Public of the proposed development. This advert communicated the availability of the scoping report and the public meeting held on 22 June 2019 to the public at 10:00.

FRIDAY APRIL 26, 2019

703 First/Final Notices

ESTATE of the late: HAINSWORTH: MARGARET LOUISE, I.D. No: 441205 0121 088. Last address: 198 Gannet Crescent, Wierda Park, Centurion. Master's Office, Pretoria. Magistrate's Office, Pretoria. Estate No: 010021/2017.

In terms of Section 35(5) of the Administration of Estates Act, No 66 of 1965, notice is hereby given that copies of the First and Final Liquidation and Distribution Accounts in the Estate specified above will be open for the inspection of all persons with an interest therein for a period of 21 days from the date specified or from the date of publication hereof, whichever may be the later, and at the offices of the Masters of the High Court and Magistrates as stated. Should no objection thereto be lodged with the Masters concerned during the specified period, the Executors will proceed to make payments in accordance with the accounts.

Dated on this 12th day of April 2019.
TARRYN DE JONGH ATTORNEYS
213 Richard Street
Hatfield, Pretoria
Tel: (012) 4304701
Email: tarryn@djvh.co.za
(11109568)

ESTATE of the late: MOGADIMA: POPOTSI LUCAS, I.D. No: 501106 5528 087. surviving spouse: QUEEN JOYCE MOGADIMA, I.D. No: 550910 0362 082. Last address: 1722 - L Section, Soshanguve, Pretoria. Magistrate's Office, Bronkhorstspuit. Master's Office, Pretoria. Estate No: 10285/2009.

In terms of Section 35(5) of the Administration of Estates Act, No 66 of 1965, notice is hereby given that copies of the First and Final Liquidation and Distribution Accounts in the Estate specified above will be open for the inspection of all persons with an interest therein for a period of 21 days from the date specified or from the date of publication hereof, whichever may be the later, and at the offices of the Masters of the High Court and Magistrates as stated. Should no objection thereto be lodged with the Masters concerned during the specified period, the Executors will proceed to make payments in accordance with the accounts.

711 Public Notices

NOTICE OF ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

Notice is hereby given in terms of Regulation 41 of the Regulations published in Listing Notice 1 of 4 December 2014 as amended and Chapter 6 of the National Environmental Management Act, 1998 (Act no. 107 of 1998), for a Scoping and EIA application for the following activities:

ESTABLISHMENT OF THE AIDC INDUSTRIAL AND RETAIL PARK (SILVERTON SPECIAL ECONOMIC ZONE) ON THE REMAINDER OF PORTION 89 OF THE FARM WILLOWS 340 JR, WATLOO, GAUTENG.

PROJECT DESCRIPTION: Establishment of the AIDC industrial and retail park (Silverton special economic zone) on the remainder of Portion 89 of the farm The Willows 340 JR, Watloo, Gauteng.

PROJECT LOCALITY: The subject property is also situated adjacent to Watloo, Gauteng and is surrounded by Silverton and Nelmsplus. The development will stay out of the 1:100-year flood line. The proposed site for the SASP is 81.6 ha in size and zoned as agricultural land.

APPLICANT: Supplier Park Development Company trading as Automotive Industry Development Centre

OTHER LEGAL MATTERS: A Water use license will be needed for activities identified in Section 21 (c) and (i) of the National Water Act 36 of 1998. Such a Water use license application is in progress. Any comments in this regard can be submitted within 60 days to REC. A Heritage Impact Assessment will be undertaken in accordance with Section 38 of the National Heritage Resources Act 25 of 1999. Any comments in this regard can be forwarded to Tebogo Molokomme at Tebogo.Molokomme@gauteng.gov.za

ENVIRONMENTAL CONSULTANT: REC Services (Pty) Ltd. PO Box 40541, Moreleta Park, Pretoria, 0044. Tel: (012) 997 4742 Fax: (012) 997 0415. Email: rock.arno@antlic.net

In order to register as an interested and/or affected party, please submit your name, contact details and interest in the matter within 30 days of the publication of this advertisement.
(11108608)

PRETORIA NEWS, WEDNESDAY MAY 29, 2019

713 Sale in Execution

IN THE HIGH COURT OF SOUTH AFRICA, MPUMALANGA DIVISION (functioning as Gauteng Division, Pretoria, Mbombela)
Case No: 70/2017
In the case between
MHLABELA LUCKY SHABANGU
Execution Creditor
and
MINISTER OF POLICE
Execution Debtor

NOTICE OF SALE IN EXECUTION OF MOVABLE PROPERTY BY WAY OF PUBLIC AUCTION

PURSUANT to taxed costs in the High Court Mombela given on 13th September 2018, the undermentioned goods will be sold at 10:00 on 31st May 2019 by public auction to be held at 7th Floor, Wachthuis, 231 Pretorius Street, Pretoria by the Sheriff for the Magistrate's Court, Sheriff, Pretoria Central to the highest bidder for cash.

1. The conditions of sale will be available at the office of the Sheriff 24 hours before the time appointed.
2. Registration as a buyer is a requirement in terms of the following:

The Consumer Protection Act 68 of 2008;
The Financial Intelligence Centre Act 38 of 2001;
3. Goods will only be sold for cash to the highest bidder or sold subject to confirmation as per Consumer Protection Act on the instructions of the judgment creditor or his attorney.

4. Goods offered for sale are:
60 x Assorted Computers.
Signed at Belfast on the 10th day of May 2019.
TCRAMPTON INC
Attorneys for Execution
Creditor, 25 Fitzgerald Street, Belfast 1120
Tel: (013) 2531148/9
Fax: (013) 2630712
Email: tcrampton@antlic.net
REF: SHABANGU NL
File No: AA1518 (11123823)

IN THE HIGH COURT OF SOUTH AFRICA, MPUMALANGA DIVISION (functioning as Gauteng Division, Pretoria, Mombela)
Case No: 76/2017
In the case between
NORMAN SURPRISE NKOSI
Execution Creditor
and
MINISTER OF POLICE
Execution Debtor

NOTICE OF SALE IN EXECUTION OF MOVABLE PROPERTY BY WAY OF PUBLIC AUCTION

PURSUANT to taxed costs in the High Court Mombela given on 13th September 2018, the undermentioned goods will be sold at 10:00 on 31st May 2019 by public auction to be held at 7th Floor, Wachthuis, 231 Pretorius Street, Pretoria by the Sheriff for the Magistrate's Court, Sheriff, Pretoria

NOTICE OF ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

Notice is hereby given in terms of Regulation 41 of the Regulations published in Listing Notice 1 of 4 December 2014 as amended and Chapter 6 of the National Environmental Management Act, 1998 (Act no. 107 of 1998), for a Scoping and EIA application for the following activities:

ESTABLISHMENT OF THE SILVERTON AUTOMOTIVE SPECIAL ECONOMIC ZONE (SEZ) ON THE REMAINDER OF PORTION 89 OF THE WILLOWS 340 JR, WATLOO, GAUTENG. REF: GAUT 002/18-20/0023 PROJECT DESCRIPTION:

Establishment of the Silverton special economic zone on the remainder of Portion 89 of the farm The Willows 340 JR, Watloo, Gauteng.

PROJECT LOCALITY: The subject property is also situated adjacent to Watloo, Gauteng and is surrounded by Silverton and Nelmsplus. The development will stay out of the 1:100-year flood line. The proposed site for the SEZ is 81.6 ha in size and zoned as agricultural land. Around 40.57 ha will physically be developed. The land will be leased from City of Silverton Metropolitan Municipality.

APPLICANT: Tahwane Economic Development Agency (TEDA)

OTHER LEGAL MATTERS

A Water use license will be needed for activities identified in Section 21 (c) and (i) of the National Water Act 36 of 1998. Such a Water use license application is in progress. Any comments in this regard can be submitted within 60 days to REC. A Heritage Impact Assessment will be undertaken in accordance with Section 38 of the National Heritage Resources Act 25 of 1999. Any comments in this regard can be forwarded to Tebogo Molokomme at Tebogo.Molokomme@gauteng.gov.za

ENVIRONMENTAL CONSULTANT: REC Services (Pty) Ltd. PO Box 40541, Moreleta Park, Pretoria, 0044. Tel: (012) 997 4742 Fax: (012) 997 0415. Email: rock.arno@antlic.net

The Scoping report will be available for public view from 27 May 2019 to 27 June 2019 at the ward councillor Mr. Thebe Ntseing (ward 88) at 200 Love Drive Nelmsplus, and at the Nelmsplus Library at 95 Lesedi Street, Nelmsplus. In order to register as an interested and/or affected party, or to submit comments on the draft Scoping report, please submit your name, contact information and interest in the matter before and of business 27 June 2019 to the details of REC Services directly above.

A public Consultation input will be given at the Public meeting to be held by City of Tahwane on 22 June 2019. The public meeting will be held at the Silverton Recreational Centre, 513 Pretoria Road, Silverton. The time is 10:00. This meeting will provide a chance to register as an interested and/or affected party for the EA process.
(11126706)

Please refer to Appendix 2E. Two site notices was placed on site on 28 May 2019. The site notices was placed as per the location given below:



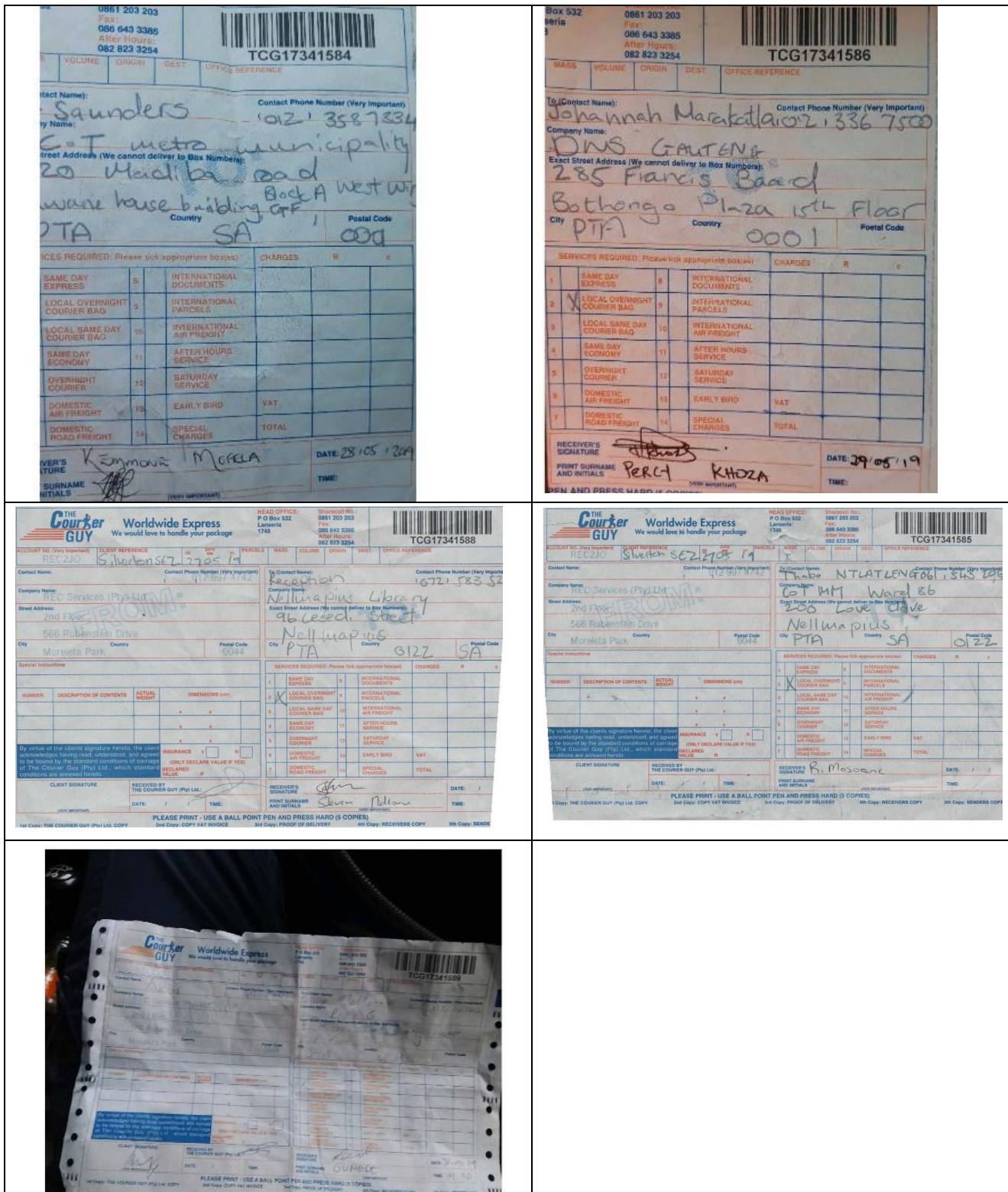
7.4.5 Placement and submission of the draft Scoping report

The draft scoping report was submitted as indicated in Table 2:

Table 2: Submission of the scoping report

State Department	Contact Person	Postal/Physical address
GDARD	011 240 3052/ 3 EIA Administration SUE Branch	56 Eloff St Umnotho House Johannesburg, 2100
City of Tshwane Metropolitan Municipality	Boniswa Masinyana Deputy Director: Open Space Planning and Applications 012 358 7334 Environment & Agriculture Management Department	320 Madiba Street Pretoria 0001 Tshwane House Building Room CP 122, Block A, Ground Floor.
Ward councillor- Ward 86 City of Tshwane Metropolitan Municipality	Thabo Ntlatleng 061 543 2068 ntlatlengratoreko@gmail.com	200 Love Drive, Nellmapius Pretoria, 0122
Gauteng Department of Water affairs and Sanitation	012 336 7500 Johannah Marakatla	285 Francis Baard , Bothongo Plaza East, 15 th Floor, Pretoria 0001
Statutory Bodies: Provincial Heritage Resources Authority - Gauteng (PHRA-G)	011 355 2545 Mr. Tebogo Molokomme	PHRAG Surrey House- 35 Rissik Street, 2nd Floor, Jhb , 2000
Public view Nellmapius Library	Reception 072 583 5240	96 Lesedi Street Nellmapius Pretoria, 0122

Proof of submission of the draft Scoping report is presented below.



The image displays four Courier Guy shipping forms and one photograph of a shipping box. The forms are for international shipments to South Africa (SA) and are dated 28/05/2019.

Form 1 (Top Left): Recipient: Saunders, Contact Phone Number: 012 358 7334, Street Address: 20 Maitland Road, Post Office Box 1, Post Code: 0001. Services: SAME DAY EXPRESS, LOCAL OVERNIGHT COURIER BAG, LOCAL SAME DAY COURIER BAG, SAME DAY ECONOMY, OVERNIGHT COURIER, DOMESTIC AIR FREIGHT, DOMESTIC ROAD FREIGHT. Charges: VAT, SPECIAL CHARGES, TOTAL.

Form 2 (Top Right): Recipient: Johannah Marakatlai, Contact Phone Number: 012 336 7500, Street Address: 285 Francis Baard, Bothongo Plaza 1st Floor, Post Office Box 1, Post Code: 0001. Services: SAME DAY EXPRESS, LOCAL OVERNIGHT COURIER BAG, LOCAL SAME DAY COURIER BAG, SAME DAY ECONOMY, OVERNIGHT COURIER, DOMESTIC AIR FREIGHT, DOMESTIC ROAD FREIGHT. Charges: VAT, SPECIAL CHARGES, TOTAL.

Form 3 (Bottom Left): Recipient: Ntshongwana, Contact Phone Number: 012 583 52, Street Address: 506 Rubenstein Drive, Post Office Box 1, Post Code: 0044. Services: SAME DAY EXPRESS, LOCAL OVERNIGHT COURIER BAG, LOCAL SAME DAY COURIER BAG, SAME DAY ECONOMY, OVERNIGHT COURIER, DOMESTIC AIR FREIGHT, DOMESTIC ROAD FREIGHT. Charges: VAT, SPECIAL CHARGES, TOTAL.

Form 4 (Bottom Right): Recipient: Ntshongwana, Contact Phone Number: 012 583 52, Street Address: 506 Rubenstein Drive, Post Office Box 1, Post Code: 0044. Services: SAME DAY EXPRESS, LOCAL OVERNIGHT COURIER BAG, LOCAL SAME DAY COURIER BAG, SAME DAY ECONOMY, OVERNIGHT COURIER, DOMESTIC AIR FREIGHT, DOMESTIC ROAD FREIGHT. Charges: VAT, SPECIAL CHARGES, TOTAL.

Photograph (Bottom Left): A photograph of a shipping box with a Courier Guy label, showing the recipient's address and contact information.

The attendance register for the public meeting is presented below.

[illegible]

8 ENVIRONMENTAL ATTRIBUTES DESCRIPTION

In order to determine the environmental impacts and identify possible issues associated with the proposed development, it is necessary to provide baseline environmental information. Following comprehensive site investigations and desk studies, as well as discussions with Interested and Affected Parties, the following section provides a description of the environmental conditions and important elements within the study area.

8.1 MAIN LAND USE ASPECTS

The study area is characterized by various land uses which can be expected from the area. The study site is undeveloped and has an existing vegetation cover. The study site consists of a wetland on site which have been delineated. The rest of the development site is vacant with traces of an off-road test track present. A graveyard is situated in the study area. Historical images indicates a widespread transformation and cultivation of the wetland and grassland areas. Most of the site therefore consists of a transformed vegetation type.



Figure 13: Historical Google earth image of 2005

8.2 CLIMATE

The climate information provided in this assessment is based on modelled and simulated data from the Pretoria area. The data consist of historical and recent data from local and adjacent weather stations modelled and simulated to provide a good indication of the average monthly climate from 1985 up to date (2019). The Silverton Automotive SEZ project area is located Silverton a suburb of Pretoria, forming part of the City of Tshwane Metropolitan Municipality in the Gauteng Province. Pretoria is located at 1332 m above sea level at longitude 25.74°S and latitude 28.19°E.

8.2.1 Temperature

Pretoria's climate is classified as warm and temperate. Pretoria has an average annual temperature of about 18.7°C, which is a bit high, despite the 1352 m altitude. Major reason for a warm climate is because of its sheltered valley position. The valley acts as a heat trap and prevents flow of cool southerly and northern-easterly air masses throughout the year.

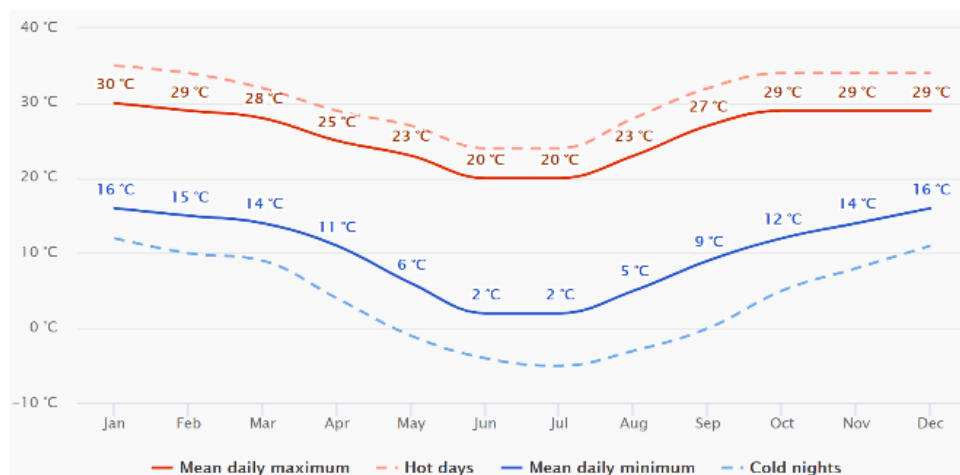


Figure 14: Average Temperatures (Source Meteoblue 1985 to 2019)

The mean daily average maximum will reach temperatures of 30 °C during the peak summer months (December and January), with hot days peaking at an average of 35 °C. The mean daily average minimum will reach temperatures as low as 2 °C during the peak winter months (June and July), with cold nights dropping as low as -5 °C.

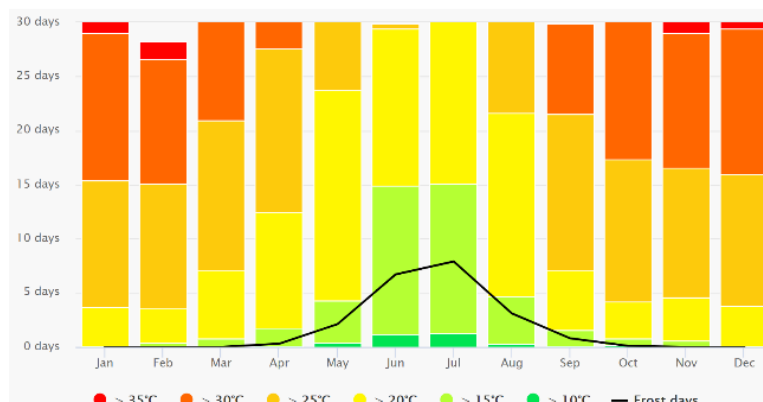


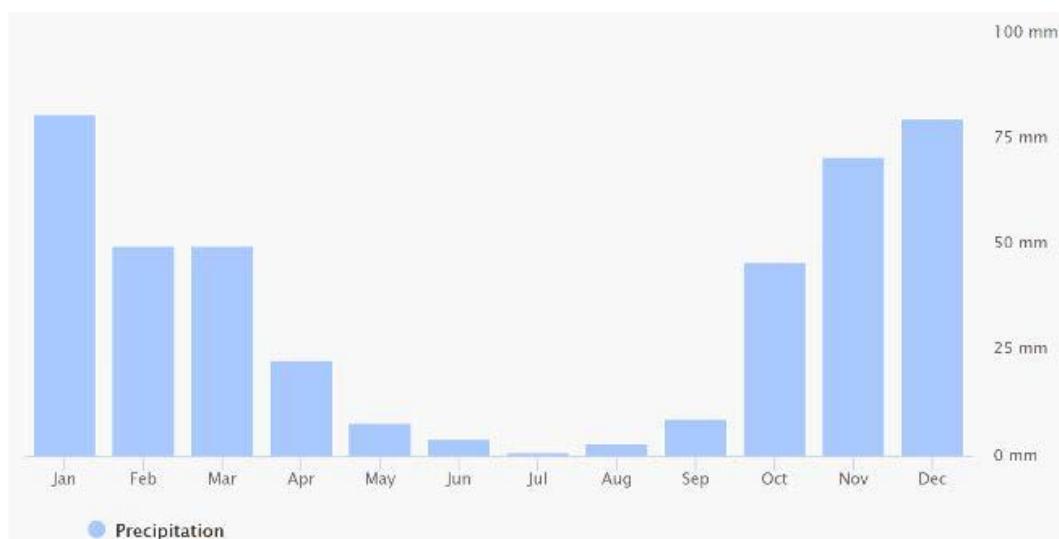
Figure 15: Average Maximum Temperature Days (Source Meteoblue 1985 to 2019)

8.2.2 Precipitation

The proposed site is located in the summer rainfall region of Southern Africa with precipitation usually occurring in the form of convectional thunderstorms. As shown in Table 4, average total precipitation per year from 1985 to 2019 for the Pretoria area is 426 mm. The highest average precipitation is observed from October to March, peaking at 81 mm during the month of December.

Table 3: Average monthly precipitation for the Pretoria Area (Source Meteoblue 1985 to 2019)

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Total
Average Total Monthly Rainfall (mm)	81	50	50	23	8	4	1	3	9	46	71	80	426



8.2.3 Evaporation

As per [Table 4](#) below, the average annual evaporation will reach a total of 2005 mm. Peak summer months, December and January, will reach an average of 226 mm and 217 mm respectively.

Table 4: Average monthly evaporation for the Pretoria Area (DWS A2E003)

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Total
Average Total Monthly Evaporation (mm)	217	175	170	135	119	95	100	142	199	211	216	226	2005

8.3 TOPOGRAPHY

The topography of the study area is fairly flat with the highest area reaching 1309 masl (meters above sea level) within the north-western section of the project area. The north-eastern section, around the railway bridge and the watercourse mark the lowest point of the study area at 1291 masl. To the south of the project area levels out with an average elevation of 1303 masl with a slight downward slope towards the eastern and north-eastern section of the project area.

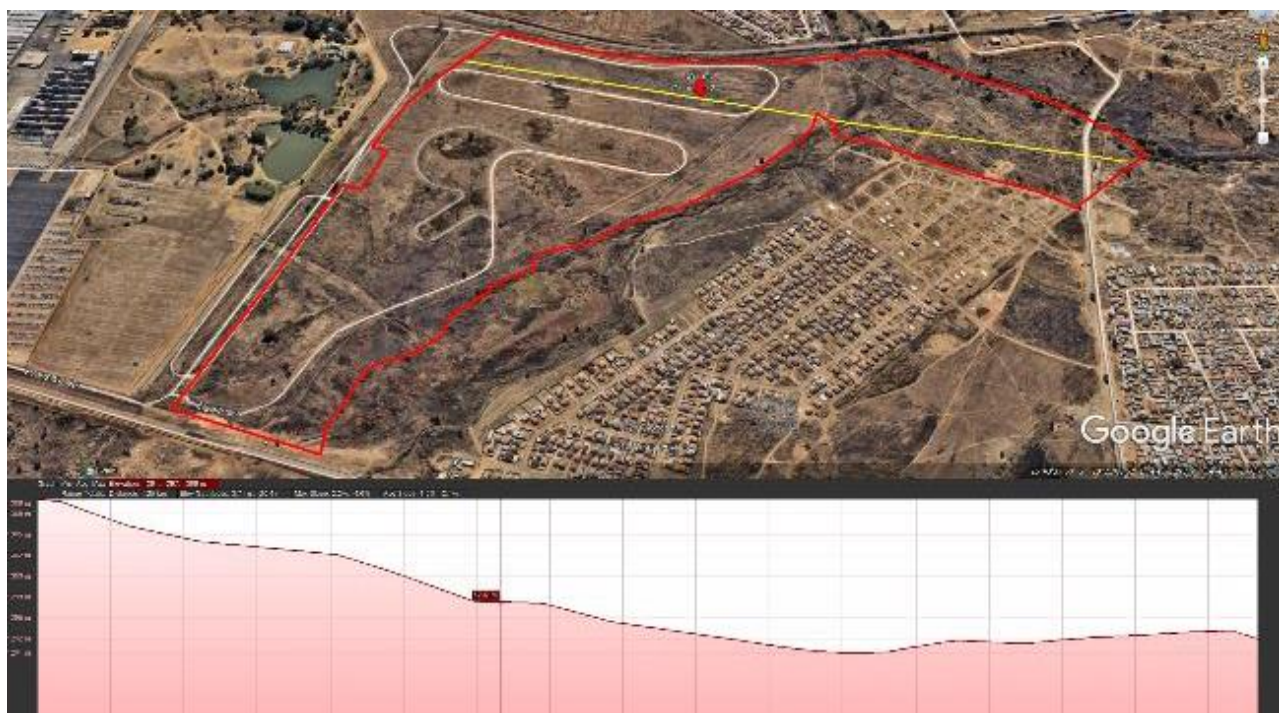


Figure 16: Average Temperatures

8.4 ECOREGIONS

The project area falls within the Eastern Bankenveld Level 1 Ecoregion that covers an area of 19365.5 km². This region has a complex topography that varies from lowlands, hills and mountains to closed hills and mountains with the relief varying from moderate to high. Although various Bushveld and Grassland types occur, Mixed Bushveld is the most definitive vegetation type of the region.

General ecoregion overview:

- Mean annual precipitation: Low to moderate.
- Coefficient of variation of annual precipitation: Moderate.
- Drainage density: Moderate but low in parts.
- Stream frequency: Low to medium.
- Slopes < 5%: Varies from < 20%, 20 - 50%, 60 - 80% and in few cases > 80%
- Median annual simulated runoff: Moderate/low to moderate.
- Mean annual temperature: Moderate to hot in limited areas.

Table 5: Main attributes of the Western Bankenveld Ecoregion (DWS 2005)

Main Attributes	Western Bankenveld
Terrain Morphology: Broad division	Plains; Low Relief; Plains; Moderate Relief; Lowlands; Hills and Mountains; Moderate and High Relief; Open Hills; Lowlands; Mountains; Moderate to High Relief; Closed Hills; Mountains; Moderate and High Relief;
Vegetation types	Waterberg Moist Mountain Bushveld; Mixed Bushveld; Kalahari Plains Thorn Bushveld (limited); Clay Thorn Bushveld; (limited) Rocky Highveld Grassland; Dry Clay Highveld Grassland; (limited)
Altitude (masl)	900 to 1700
MAP (mm)	400 to 700
Coefficient of Variation (% of annual precipitation)	20 to 35
Rainfall concentration index	60 to > 65
Rainfall seasonality	Early to Mid-summer
Mean annual temp (°C)	14 to 22
Mean daily max temp (°C) February	24 to 32
Mean daily max temp (°C) July	14 to 24
Mean daily min temp (°C) February	12 to 20
Mean daily min temp (°C) July	0 to 6
Median annual simulated runoff (mm) for quaternary catchment	20 to 80; 80 to 100

8.5 CATCHMENTS

The property area falls within the Limpopo Water Management Area (WMA), previously known as the Crocodile (West) and Marico, and within the Apies/ Pienaars Sub-Water Management Area. The applicable quaternary drainage region associated with the project area is the A23A. The catchment drains in a north-western direction and eventually flows into the Apies River. The A23A Catchment has various anthropogenic impacting activities (activities with the potential to disrupt and modify associated aquatic conditions), such as manufacturing, industrial activities, and domestic activities. Certain stressors in the environment have been shown to affect freshwater biota in specific measurable means and therefore can serve as effective indicators of changes in the aquatic environment (Zhou *et al.*, 2008). Due to the importance and use of aquatic biota as indicators of integrity, it is important to monitor aquatic conditions for potential ecological degradation (Dickens and Graham, 2002).

The upper parts of the catchment are impacted by urbanization, irrigation in some areas, water treatment works releases and increased flows. The Roodeplaat Dam on the Pienaars and the Bon Accord Dam on the Apies contribute to changes in the flow regime.

The present state of the Pienaars River downstream of the Roodeplaat Dam is in a C category and the EIS is high while the upstream part of the Pienaars is a Class E with a low EIS. This reach of the river provides for the colonization of several fish species no longer found in other tributaries and the system is important for fish movement, especially with the Roodeplaat Dam upstream and the Klipvoor Dam downstream.

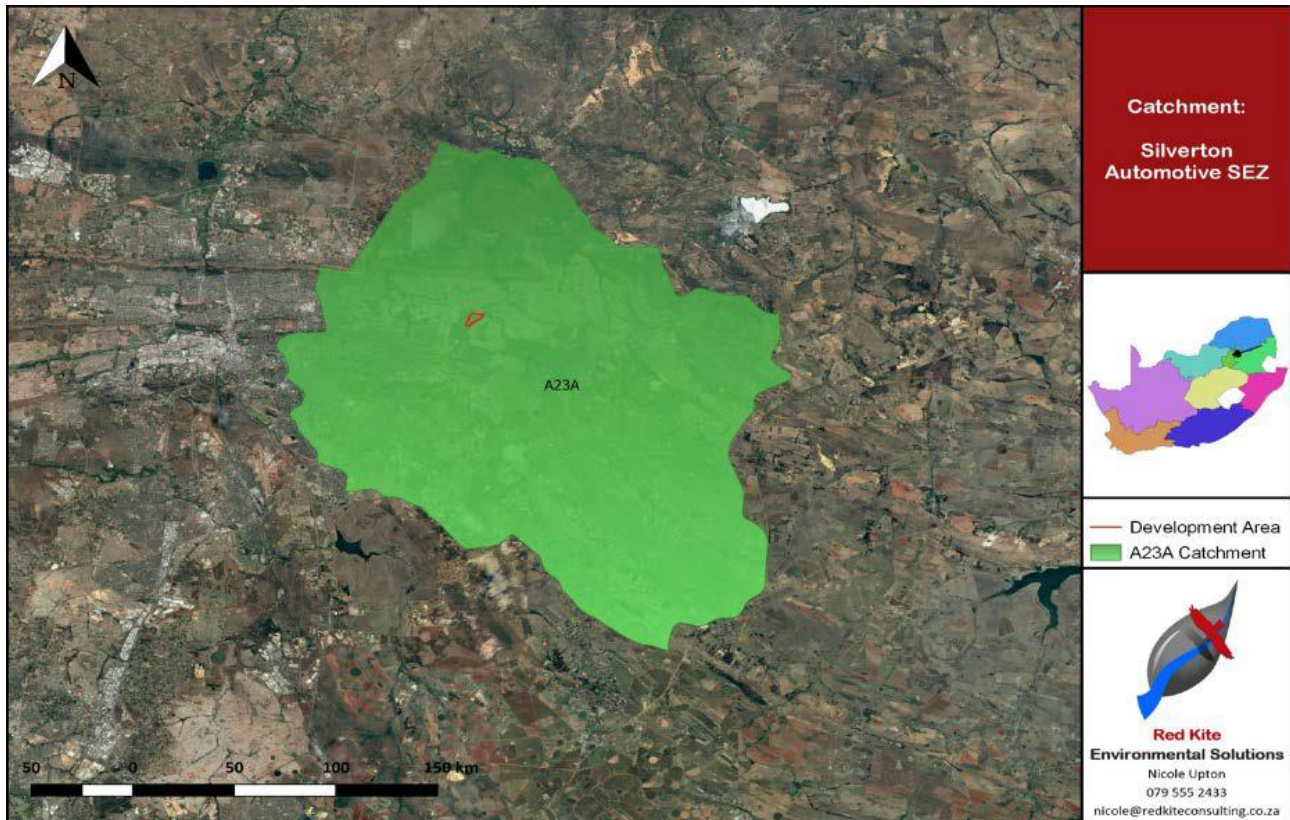


Figure 17: Quaternary Catchment

8.6 SURFACE WATER STUDY

8.6.1 Drainage systems

site survey was conducted on the 5th and the 13th of May 2019, during which all watercourses identified on site were mapped using GPS coordinates (refer to Figure 13). The watercourses located on the study site are a combination of non-perennial streams which only flow for a short period during and after rain events, and perennial rivers in the form of the Pienaars river and the unnamed tributary to the eastern border of the project site.

A watercourse is defined by the NWA as:

- River or spring.
- A Natural channel in which water flows regularly, or intermittently.
- A Wetland, lake or dam into which, or from which water flows.
- Any collection of water that the Minister may, by notice in the Gazette, declare to be a water course, and a reference to a watercourse includes where relevant, its bed and banks.

River channels may be classified according to guidelines by DWS in "A practical field procedure for identification and delineation of wetlands and riparian areas" as shown in Figure 11 (taken from DWA, 2005). Three sections along the length of a watercourse are defined, with the upper Section "A" defined as being above the zone of saturation and it therefore does not carry baseflow. They are mostly too steep to be associated with alluvial deposits and are not flooded with sufficient frequency to support riparian habitat or wetlands. This type does however carry storm runoff during rainfall events, but the flow is of short duration, in the absence of baseflow. The "A" watercourse sections are the least sensitive watercourses in terms of impacts on water yield from the catchment.

A perennial stream or perennial river is a stream or river (Section "C" watercourse) that has continuous flow in parts of its stream bed all year-round during years of normal rainfall. Perennial streams are contrasted with intermittent (Section B watercourse)

streams which normally cease flowing for weeks or months each year, and with non-perennial channels that flow only for hours or days following rainfall. During unusually dry years, a normally perennial stream may cease flowing, becoming intermittent for days, weeks, or months depending on severity of the drought. Section “B” and “C” watercourse sections are the more sensitive in terms of impacts on water yield and quality from the catchment.

As perennial and intermittent stream flow decreases in dry weather, visible flow above the stream bed may not be readily evident, especially in streams with coarse substrate (gravel and rocks), where water is flowing beneath and between these particles (hyporheic flow). From a biological perspective, a stream may be considered flowing if sufficient water is available to support flow-dependent aquatic life, including fish and gill-breathing amphibians, benthic insects, crustaceans, and mollusks, many of which survive in shallow hyporheic flow beneath rocks or logs. This extreme low flow may not be detectable on typical USGS stream flow gauges but is vital to stream ecology.

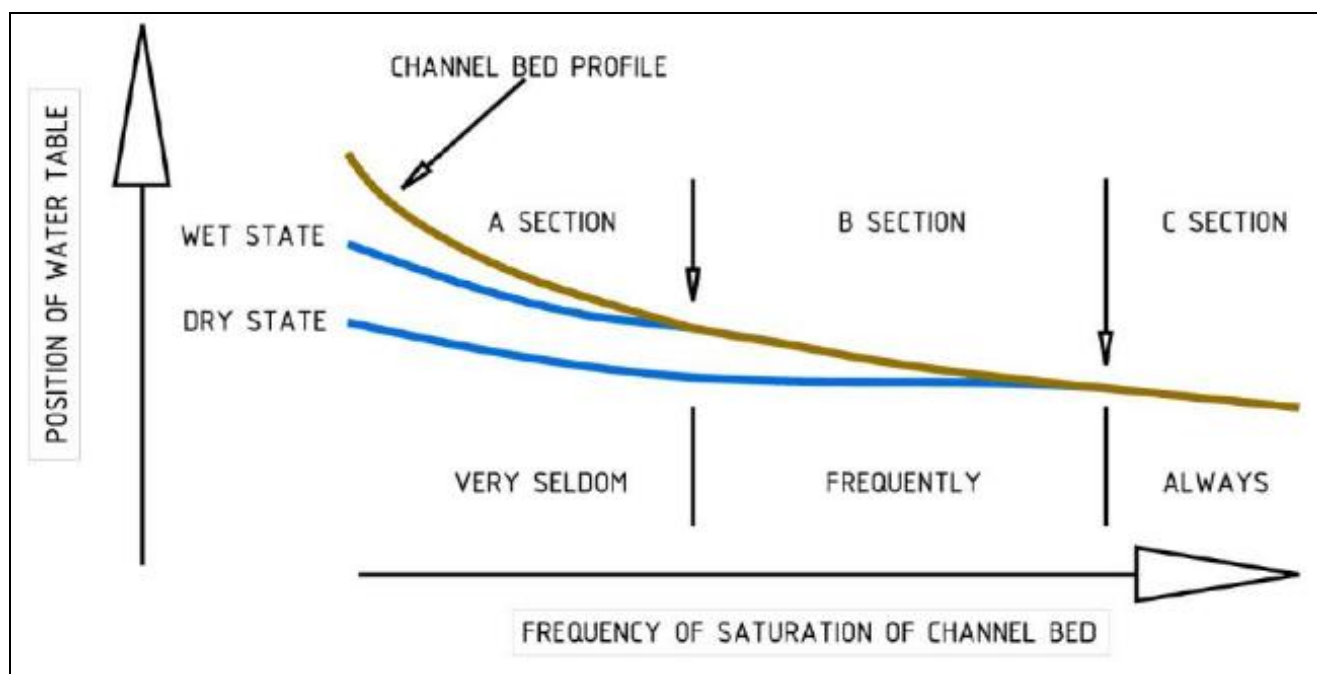


Figure 18: River Classification (DWA 2005)

On the site, Section “A”, “B” and “C” channels occur. The Pienaars River is a perennial river (section “C” watercourse) that borders the project site on the north-eastern corner. The Pienaars River tributary (section “B” watercourse) forming the eastern border of the project site, flowing from south to north, is an intermittent watercourse.

There are many smaller Section “A” drainage channels feeding the above two rivers within the study area. However, these section “A” channels are limited within the project area.

Apart from the above natural drainage channels and rivers, stormwater drainage channels and water treatment facilities within the project and surrounding area also contribute to the hydrological characteristics and quality impacts of the watercourses, especially during the wet/summer season.



Figure 19: Photographs depicting non-perennial and water treatment/stormwater drainage on the project site

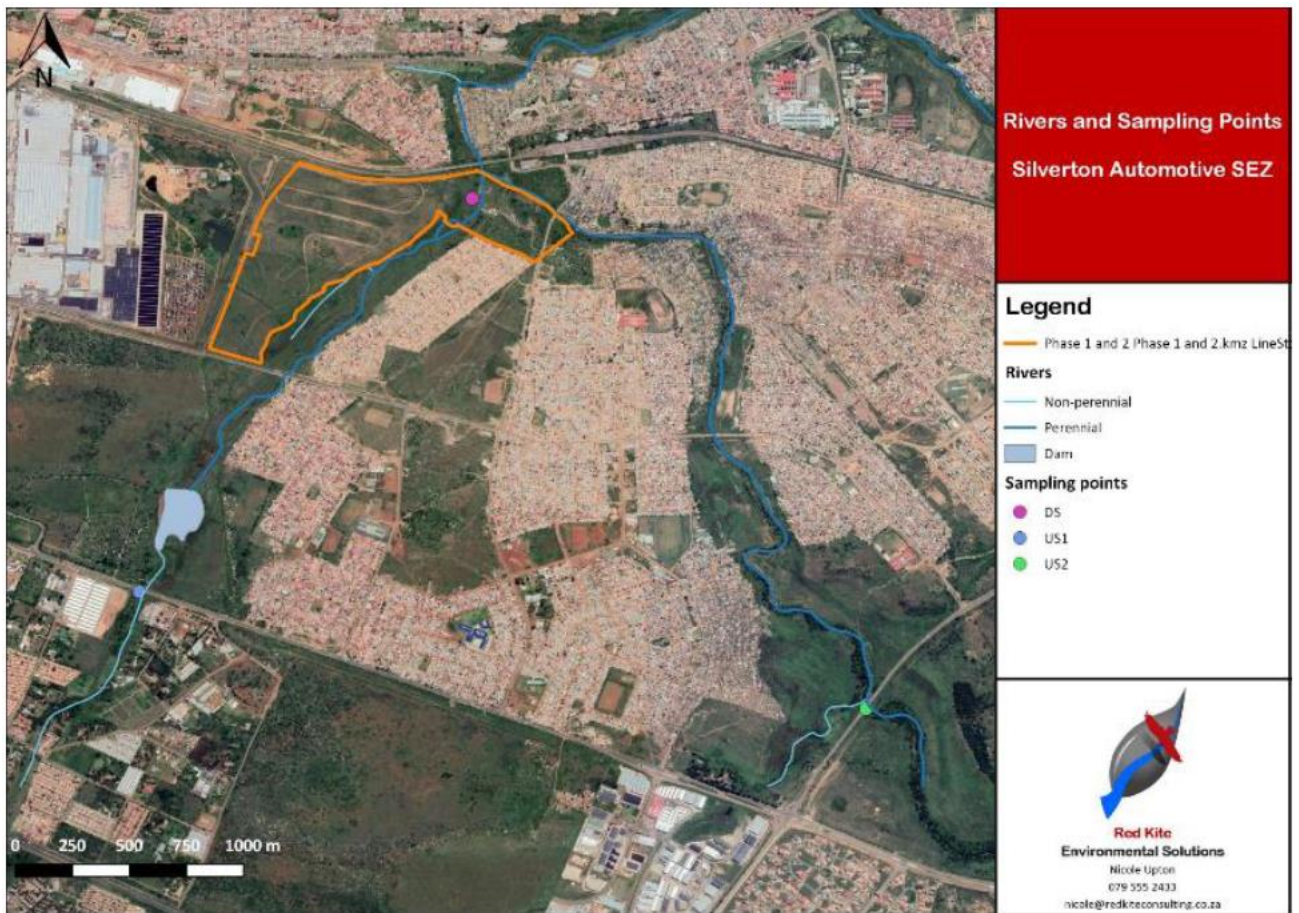


Figure 20: Watercourses surrounding the project area and sampling points



Figure 21: Intermittent watercourse within (left) and upstream (right) from the project area



Figure 22: Perennial watercourse within (right) and upstream (left) of the project area (Pienaars River)

8.6.2 Aquatic Ecology

Studies undertaken by the Department of Water and Sanitation assessed all quaternary catchments as part of the Resource Directed Measures for Protection of Water Resources. In these assessments, the Ecological Importance and Sensitivity (EIS), Present Ecological State (PES) and Recommended Ecological Class (REC) were defined and it serves as a useful guideline in determining the importance and sensitivity of the aquatic ecosystems.

Resource classes are listed according to the overall class per Integrated Unit of Analysis (IUA). IUAs are classified in terms of their extent of permissible utilisation and protection as either Class I: indicating high environmental protection and minimal utilisation; Class II indicating moderate protection and moderate utilisation; and Class III indicating sustainable minimal protection and high utilisation. Resource Quality Objectives (RQOs) are defined for each RU for every IUA in terms of water quality, habitat and biota.

The Pienaars River is considered to have a Present Ecological State of E, Severely Modified. The Recommended Ecological Class is set at Class D according to the RDM/WMA1, 3/00/CON/CLA/0612 Report. One of the main impacts in this catchment is the discharges of the poorly treated sewage effluent into the receiving environment by small communities. These activities will most probably have an impact on the overall health indicators of the catchment which will have an influence on the PES score. The results are summarised in [Table 6](#) below.

[Table 6: IUA, Present Ecological State and Recommended Ecological Class](#)

Integrated Unit of Analysis	IUA Class	River	RU	Quaternary Catchment	EIS	PES	REC
1: Upper crocodile/ Hennops/Hartebeespoort	III	Pienaars River	1_4	A23A	Low	E	D

Table 7: Classification of River Health Assessment Classes

Class	Description
A	Unmodified, natural
B	Largely natural, with few modifications
C	Moderately modified
D	Largely modified
E	Extensively modified
F	Critically modified

- Surface water quality

The field survey was conducted during the transition period to the dry season that may result in higher concentration of contaminants. Three samples were obtained as listed in the table below.

Table 8: Surface Water Monitoring Points

Monitoring Point	Coordinates	Description
US1	25°44'29.49"S, 28°20'24.92"E	Upstream of project site in the unnamed tributary of the Pienaars River
US2	25°44'47.91"S, 28°22'19.18"E	Upstream of the project area in the Pienaars River
DS	25°43'21.45"S, 28°21'17.04"E	Downstream of the project area in the confluence of the Pienaars River and the unnamed tributary.



Figure 23: US1 Surface Water Monitoring Point



Figure 24: US2 Surface Water Monitoring Point



Figure 25: DS Surface Water Monitoring Point

The water samples were analysed by an SANAS accredited laboratory. Water quality data was benchmarked against the RWQO for the A23A catchment as set by the DWS.

Table 9: Water quality analysis

Analysis	US1	US2	DS	RQO's
PH Value	8.1	7.9	8.4	7.5 – 9.2
Total Dissolved Solids @ 180 C	192	336	262	0 - 450
Electrical Conductivity	31.6	55.8	42.8	<85
Turbidity	5.5	1.7	4.2	-
Sulphates (SO ₄)	18	26	27	<70
Nitrate (N)	0.3	<0.1	1.8	<1.0
E.Coli / (100 ml)	2200	40	690	<130

All variables analysed for the samples taken upstream and downstream of the project area fall within the RQO's set for the catchment except for *E.Coli* and Nitrate at the downstream site. The observations that were made on site can be related to the high *E.Coli* levels within the stream, as untreated sewage has been observed in the stream. The *E.Coli* is also high at the upstream site indicating that the upstream impacts are to be related to the poor results. It does, however, increase significantly as it flows downstream that could be attributed to the adjacent community.

The pH values are within the RQOs set for the catchment as well as the rest of the variables analysed. It is not expected that the water quality will improve in the near future as urbanisation is rapidly increasing in the area. It is also the responsibility of the Metropolitan to investigate the upstream impacts that might occur from a Wastewater Treatment Works (WWTW). Although most of the variables are within the respective limits the overall water quality is considered as fair indicating that limited sensitive aquatic macroinvertebrate species will be present in the stream.

The below table provides an overview of the Resource Quality Objectives, relevant to instream habitat and biota for IUA 1: Upper Crocodile/Hennops/Hartebeespoort, Resource Unit 1_4, Pienaars River.

Table 10: AUI 1, RU 1_4, Pienaars River Habitat and Biota RQO

Component	Sub-Component	Narrative RQO	Indicator	Numerical Limit
Habitat	Instream	Habitat availability for fish and macroinvertebrates must be maintained, to sustain biotope diversity. Marginal vegetation required to support BANO	Index of Habitat Integrity, Rapid Habitat Assessment Method and Model (RHAMM)	Instream Habitat Integrity ecological category = D • 42% (A2HART-KAMEE and A2PIENBAVIA)
	Riparian Habitat	Alien invasive control required. Riparian vegetation should be improved from E ecological category to a D category.	Index of Habitat Integrity, Vegetation Response Assessment Index	VEGRAI ecological category = D > 42% Riparian IHI = D > 42% (A2HART-KAMEE and A2PIENBAVIA)
Biota	Diatoms	Diatom assemblage must be maintained within a largely modified condition or improved upon.	Specific Pollution Index	Diatom ecological category = D > 42% (for both REMP sites A2HARTKAMEE and A2PIEN-BAVIA)
	Aquatic Macro-Invertebrates	Macroinvertebrate assemblage must be maintained within a D ecological category or improved upon.	Macroinvertebrate Response Assessment Index and the South African Scoring System Version 5 (SASS5).	MIRAI ecological category = D > 42% REMP Site A2PIENBAVIA: SASS > 60 ASPT > 3.8 REMP Site A2HARTKAMEE: SASS > 60 ASPT > 3.8

Biomonitoring

The biomonitoring sites assessed are indicated in [Figure 20](#), while the detailed descriptions are provided in [Table 11](#). Two sites were identified and assessed during the assessment. These sites will serve as the baseline data obtained for the project and is recommended that these sites are incorporated into the monitoring programme for the development. These sites may change during future assessments to ensure that the project activities are monitored to detect any possible impacts that might occur.

Table 11: Biomonitoring Sites and Coordinates

Description	Location	Coordinates
US	The site is located approximately 200 m south of the project area and is located at the road crossing on Propshaft Road.	25°43'54.77"S 28°20'46.84"E
DS	The site is located 150 m downstream from the project area at the railroad crossing and 100 m after the confluence with the Pienaars River. The site serves as the downstream site from the project area and will be able to detect any impacts that might occur from the project activities.	25°43'22.27"S 28°21'17.19"E

Upstream biomonitoring

The upstream site had a few limitations that may have caused the overall obtained SASS results to be lower than expected. The stream lack water availability and some sections and only stagnant pools were observed at the time of study with very slow flowing sections. Upstream water users contribute to the flow regime of the tributary causing the overall quality to decrease. Waste, such as domestic waste and untreated water from the upstream developments, causes severe algae growth and contributes to poor water quality. The main sampling focus was on the GSM and stones biotopes as these biotopes were the most dominant. All three biotopes were present and aquatic vegetation were the most dominant vegetation biotope between the two types. Algae growth on the stones in current was observed and the observation of poorly treated sewage has also been identified on the rocks and stones. Mostly *Hemiptera* and *Diptera* species were identified as these species prefer the GSM biotope. It is, however, the opinion of the SASS practitioner that the site or stream will not improve in the future due to impacts continuously occurring upstream.



Figure 26: US Biomonitoring Site

Downstream biomonitoring

The downstream site presented the same findings as that of the upstream site which also led to the same results as that of the upstream site. However, the site did show signs of improved conditions, but this will only be observed during wet seasons when the stream has more water available (depth). The site had a fair amount of algae growth, but sampling was done to obtain a PES for this section of the stream. Although some limitations were experienced, such as a lack of GSM biotopes the vegetation biotopes and stones biotopes were sufficient to conduct a biomonitoring event. The results obtained indicate the stream operates in a health Class E category indicating that no significant change from the upstream site has occurred, but that it could obtain a Class D if the necessary mitigation measures are implemented.

The main focus was again on the vegetation biotopes and mostly *Diptera* and *Hemiptera* species were observed during the sampling. The biotopes required to obtain an average SASS score were present although the sampling procedures were somewhat limited due to the low flowing conditions of the stream. The downstream site has an increase in water velocity when compared to the upstream site.



Figure 27: DS Biomonitoring Site

8.6.3 Site comparison

Based on available monitoring data from DWS and the RHP the Instream Habitat Integrity has a category D with a 42%, while the VEGRAI and IHI also have a 42% overall quality. According to the reference sites A2HART-KAMEE and A2PIEN-BAVIA the SASS score should be above 60 with an ASPT score of 3.8. These reference scores were also confirmed in the RQO's Report of June 2017.

The sites were compared using the results obtained during the assessment, which were further compared to the Ecoregion and A23A catchment scores set for the catchment. Table 15 provides the health class each of the sites currently operate in. Although the sites currently operate in a lower health class than required by the River Health Programme, it is still an important aquatic ecosystem and can support a macroinvertebrate community. It is however not expected that the system will improve in the near future but will remain in the current health Class E.

Both sites in the Unnamed tributary of the Pienaars River were altered by natural flow regimes and channel modification. The sites were clearly disturbed by the extensive development and an overgrowth of alien invasive species. Both sites experienced a lack of riparian vegetation that caused the reduced water quality that overall had an impact on the aquatic fauna and flora.

Both sites had suitable GSM sections in which most of the sampling was conducted. A lack of stones and vegetation biotopes influenced the obtained SASS results. The upstream site IHAS scores indicate that the habitat conditions are inadequate to support a diverse macroinvertebrate community. Invertebrate species that were identified during the sampling process were mostly from the Hemiptera, Coleoptera and Diptera families as mentioned in the site descriptions.

The species of these families are mostly pollution tolerant taxa, such as Culicidae (Mosquitoes); Chironomidae (Midges); Simuliidae (Black Flies); Corixidae (Water Boatmen); Gerridae (Pond Skaters) and Dytiscidae (Diving Beetles). The current health class, as indicated in the section below, is expected to remain within this condition and are unlikely to improve in future assessment. The main objective is to improve the Health Class to a D category and to prevent any further degradation to take place.

Table 6 provides an overview of the A23A quaternary catchment indicating that the PES, as well as the REC, is a Class C health category. Reference conditions, as well as scores as obtained from the River Health Programme and the DWS database, were obtained from the DWS-RQIS sampling point A2PIEN-BAVIA indicating that average scores for a Class D range above 60, while Class E ranges with an average from 55. Taking the obtained results from the assessment a comparison between the sites can be made to the RHP and DWS database. The overall results for the section of the associated project area can be classified as shown below. As mentioned before, it is not expected that this system will improve in the near future due to impacts occurring in the upper parts of the catchment.

Table 12: Comparison between sites monitored

Site	SASS5	ASPT	TAXA	IHAS	Class
US	64	3.7	17	58	E
DS	59	3.9	15	60	E

8.6.4 Conclusion and recommendations

The primary aquatic ecology and surface water impacts associated with the proposed expansion are the potential impacts on water quality, habitat and biota degradation due to domestic waste, solid waste, wastewater discharges and storm water management at the project site through continued operation. Other notable impacts include erosion and sedimentation during the construction phase.

In terms of findings related to the overall aquatic ecology and surface water environment relevant to the study site the following conclusions are made:

- The Silverton Automotive SEZ area and proposed activities, is situated within Quaternary Catchment A23A of the Limpopo Water Management Area, within the Apies/ Pienaars Sub-Water Management Area.
- The proposed project area lies within the catchment of the unnamed tributary of the Pienaars river and the confluence of said unnamed river and the Pienaars river.
- The EIS set for the A23A Quaternary Catchment by DWS is Low, PES is a class E, largely modified and the REC has been set as a class D.
- The watercourses located on the project site are characterised as non-perennial drainage through the site, intermittent stream at the eastern side of the site and a perennial river (Pienaars river) at the north-eastern border of the project site.
- The study site and associated watercourses have been drastically impacted due to urban activities, including:
 - **Dumping of domestic waste;**
 - **Dumping of garden refuse;**
 - **Wastewater treatment discharge;**
 - **Contaminated storm water discharge; and**
 - **Manufacturing and industrial activities and wastewater discharge.**

The biomonitoring results at both upstream and downstream points yielded a PES classification of E: Severely Impaired.

A wetland delineation was done by Dr. Stephen A. Mitchell during April 2019. The wetland is a channelled valley bottom wetland: o The entire project site is within 500 m of either the temporary edge of the wetland on the east of the site or of the two water bodies on the Samcor Park property. The entire project site is, therefore, subject to a risk assessment.

- o Erosion of the steam banks is widespread.
- o The determination of the EIS of this wetland is taken from DWS (2014) as Moderate.
- o The PES of this wetland is C - Moderately modified
- o There is moderate invasion of alien vegetation at this site.

The impact on the water resources could be seen as moderate without the implementation of mitigation measures. With the implementation of mitigation management measures the impact of the development on the surface water quality and aquatic environment is ranked as a low significance.

An Integrated Water and Waste Management Plan (IWWMP) needs to be compiled as a technical supporting document for the water use authorisation process. The Environmental Management Plan (EMP) for the proposed expansion should address good waste management practices, guidelines for the storage, handling, use and disposal of waste, etc. It is important that the project aim to limit impacts on the aquatic resources as far as possible in order to maintain its current basic ecosystem functions.

All mitigation measures that were provided within this report should be implemented and included in the relevant management plans. If all mitigation is adhered to, the combined impact could be rated as low.

8.7 WETLANDS

8.7.1 Determining the ecological integrity of the wetland

The reach of the Pienaars River which flows past the site is #1056 in the quaternary catchment A24A. The DWS (2014) database classifies the reach as shown in [Table 13](#).

Table 13: The classification of reach 1056 as given in the DWS database.

Present Ecological State	E
Ecological Importance	Moderate
Ecological Sensitivity	Moderate

“Assessment of habitat integrity is based on an interpretation of the deviation from the reference condition. Specification of the reference condition follows an impact-based approach where the intensity and extent of anthropogenic changes are used to interpret the impact on the habitat integrity of the system. To accomplish this, information on abiotic changes that can potentially influence river habitat integrity are obtained from surveys or available data sources. These changes are all related and interpreted in terms of modification of the drivers of the system, namely hydrology, geomorphology and physico-chemical conditions and how these changes would impact on the natural riverine habitats. (Taken from Kleynhans et al., 2008)”

Table 14: Measure of the severity of the impact at a site (Kleynhans et al., 2008)

IMPACT/SEVERITY CLASS	DESCRIPTION	RATING
None: reference	No discernible impact or the modification is located in such a way that it has no impact on habitat quality, diversity, size and variability.	0
Small	The modification is limited to very few localities and the impact on habitat quality, diversity, size and variability are very small.	0.5-1.0
Moderate	The modifications are present at a small number of localities and the impact on habitat quality, diversity, size and variability are limited.	1.5-2.0
Large	The modification is generally present with a clearly detrimental impact on habitat quality, diversity, size and variability. Large areas are not influenced.	2.5-3.0
Serious	The modification is frequently present and the habitat quality, diversity, size and variability in almost the whole of the defined area are affected. Only small areas are not influenced.	3.5-4.0
Critical	The modification is present overall with a high intensity. The habitat quality, diversity, size and variability in almost the whole of the defined section are influenced detrimentally.	4.5-5.0

[Table 14](#) describes the drivers of the habitat integrity which between them contribute to the physical template of the PES and describes how they were assessed. [Table 15](#) describes the

drivers of the habitat integrity which between them contribute to the physical template of the PES. These were assessed as follows (Kleynhans et al., 2008):

Table 15: The drivers of the habitat integrity which between them contribute to the physical template of the PES

HABITAT INTEGRITY CATEGORY	DESCRIPTION	RATING (% OF TOTAL)
A	Unmodified, natural reference condition: All physical drivers unmodified or virtually unmodified. If use of the resource is present, the impact of such use falls completely within the natural disturbance regimes both in terms of extent and severity.	90-100
B	Largely natural with few modifications: A small change in natural habitats may have taken place but the ecosystem functions are essentially unchanged. <i>Physical drivers:</i> - Hydrology: The flow regime has only slightly been modified - Geomorphic: limited to slight sediment changes - Physico-chemical changes: Water clarity may sporadically be slightly influenced. At worst, only sporadic traces of toxics present. Salts may sporadically be slightly increased. <i>Associated habitat conditions:</i> - Instream: Very little change in habitat types and their dimensions and frequency. Connectivity between habitats virtually unchanged. - Riparian: Riparian habitat close to natural in terms of biophysical characteristics. Very little modification and use of riparian zone. Virtually no fragmentation.	80-89
C	Moderately modified: Loss and change of natural habitat and biota have occurred, but the basic ecosystem functions are still predominantly unchanged. <i>Physical drivers:</i> - Hydrology: The flow regime may have been significantly modified and direct manipulation by impoundments may be present. - Geomorphic: sediment changes due to increased inputs or flow may have increased significantly. - Physico-chemical changes: changes in nutrients, salts, oxygen concentration and temperature may deviate significantly from the reference. Low levels of toxics may sporadically be present. <i>Associated habitat conditions:</i> - Instream: Dimensions and frequency of some habitat types have changed significantly. Fragmentation of habitats may often be present - Riparian: Changes in the structure of the zone may be common. Some fragmentation of the zone may often be present.	60-79
D	Largely modified. A large loss and change of natural habitat, biota and basic ecosystem functions has occurred. <i>Physical drivers:</i> - Hydrology: The flow regime has been extensively modified and manipulation by impoundments may be present. - Geomorphic: Drastic changes in sediment loads due to increased inputs or flow modification may have occurred. - Physico-chemical changes: nutrients, salts, oxygen concentration and temperature may deviate considerably from the reference. Low levels of toxics may regularly be present. <i>Associated habitat conditions:</i> - Instream: Dimensions and frequency of some habitat types may differ drastically from the reference. Fragmentation of habitats may often and extensively be present. - Riparian: Extensive changes of the zone may be present. Significant fragmentation of the zone may have occurred.	40-59

HABITAT INTEGRITY CATEGORY	DESCRIPTION	RATING (% OF TOTAL)
E	Seriously modified. The loss of natural habitat, biota and basic ecosystem functions is extensive. <i>Physical drivers:</i> - Hydrology: The flow regime may have been extensively and severely modified and manipulation by impoundments is likely to be present. - Geomorphic: Extensive and severe changes in sediment loads due to increased inputs or flow modification may have occurred. - Physico-chemical changes: nutrients, salts, oxygen concentration and temperature may deviate severely and regularly from the reference. Significant levels of toxics may regularly be present. <i>Associated habitat conditions:</i> - Instream: Dimensions and frequency of some habitat types may differ extensively and severely from the reference. Fragmentation of habitats may regularly and extensively be present. - Riparian: Severe and extensive changes of the zone may be present. Extensive fragmentation of the zone may have occurred.	20-39
F	Critically / Extremely modified: Modifications have reached a critical level and the system has been modified completely with an almost complete loss of natural habitat and biota. In the worst instances the basic ecosystem functions have been destroyed and the changes are irreversible. <i>Physical drivers:</i> - Hydrology: The flow regime may be extensively and extremely modified and manipulation by impoundments is often present. - Geomorphic: Extensive and extreme changes in sediment loads due to increased inputs or flow modification may have occurred. - Physico-chemical changes: Nutrients, salts, oxygen concentration and temperature may deviate extremely and very regularly from the reference. High levels of toxics may regularly be present. <i>Associated habitat conditions:</i> - Instream: Dimensions and frequency of some habitat types may differ extensively and extremely from the reference. Fragmentation of habitats may be severe. - Riparian: Extreme and extensive changes of the zone may be present. Fragmentation of the zone may be severe.	0-19

8.7.2 Assessments made

Hydrology: The stream is described as non-perennial. However, it held water during the site visit. Recent rainfall would account for the water in the stream. The river for its entire length is bordered by dense urban development. This would increase the surface runoff into the stream and decrease infiltration which would in turn increase the high flood levels and decrease the base flow.

Geomorphology: Erosion of the stream banks is widespread.

Physico-Chemical changes: This was not tested

Other factors: There is moderate invasion of alien vegetation at this site. There is minimal litter carried down the river.

Overall assessment of the PES (from Table 11.3): **C: Moderately modified**

8.7.3 Results

Wetland delineation

The outer edge of the temporary wetland and the 30 m buffer zone are shown in [Figure 28](#). The two water bodies upslope from the site and within the Samcor Park property are classified as Freshwater Ecosystem Priority Areas by the NFEPA programme.

The 30 m buffer for the two water bodies on the Samcor Park property, both classified as NFEPA wetlands, fall outside the Silverton SEZ Phase 1 and 2 sites. The entire Silverton SEZ Phase 1 and 2 sites is within 500 m of either the temporary edge of the wetland on the East of the site or of the two water bodies on the Samcor Park property. The entire Silverton SEZ Phase 1 and 2 sites is, therefore, subject to a risk assessment.

The wetland is a channelled valley bottom wetland according to the descriptors given by Kotze et al. (2009).



Figure 28: The relative positions of the temporary wetland edge (light green), the 30 m buffer (dark green) and the 1:100-year floodline (Blue).

8.7.4 Wetland ecological function

It should be noted that no definitive estimates were made on the level of ecosystem services but that the charts presented below are estimates of how delivery of ecosystem services for the southern and northern parts of the wetland might be (on a scale of 0-minimum to 4-maximum) (Figure 29 and Figure 30). The southern part of the wetland is broader and has a gentler gradient so the water passing through or over the soil will have a longer retention time.

The generally lower level of ecosystem delivery of the northern section is the primarily due to the narrower fringe of wetland but also a result of the different soil type

8.7.5 Wetland ecological health

The overall ecological health of the wetland is estimated as moderate.

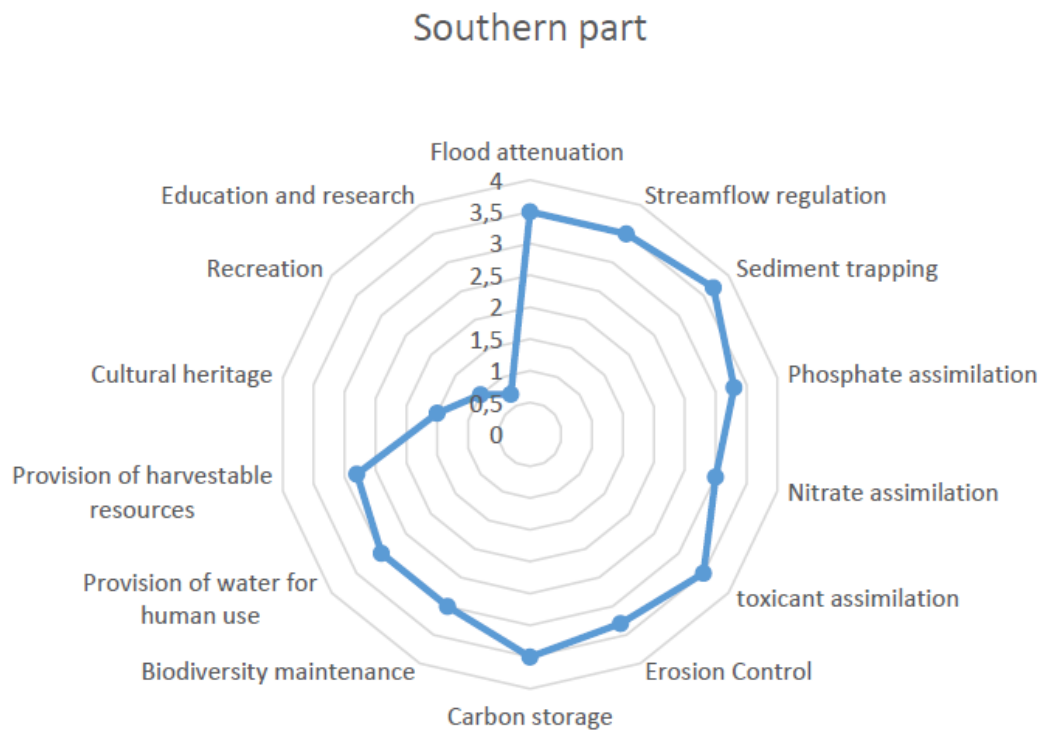


Figure 29: Estimate of the ecosystem services delivered by the broad wetland of the southern part

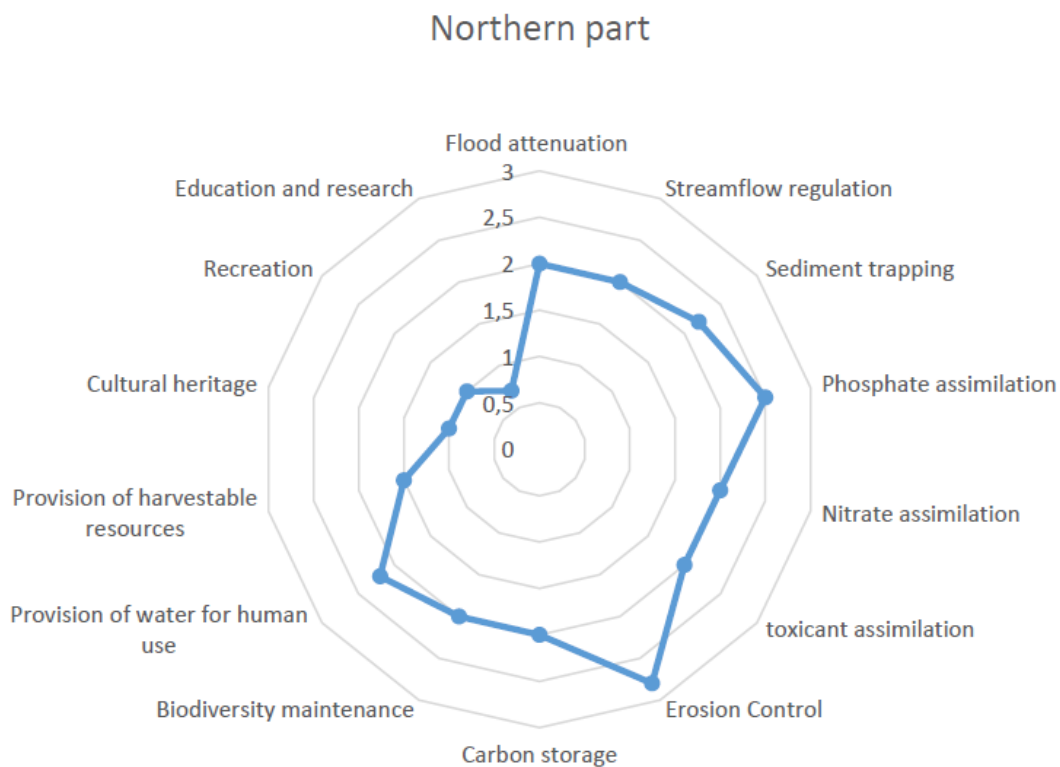


Figure 30: Estimate of the ecosystem services delivered by the narrow wetland of the northern part

8.7.6 Wetland PES Assessment

The PES is estimated as C. This estimate is based purely on what was observed on site and was made in the absence of water quality information. The assumption is also that the catchment area for the wetland on site is a factory and parking lot for new vehicles so there will be no or minimal spillage of noxious chemicals which would pollute the water entering the wetland. This does not assess the PES of the water in the channel which, after rain, would be derived from runoff from the extensive urbanisation upstream.

This contrasts with the estimate of the reach of the Pienaars River into which the wetland discharges which is given as E by DWS (2014).

8.7.7 Wetland EIS Assessment

The EIS for the reach of the Pienaars River into which this wetland discharges is Moderate.

8.7.8 Conclusion

The PES of the wetland is C (Moderately modified). The EIS is moderate.

At the moment there is not a lot of invasive vegetation in the wetland. However, the general pattern of events is that this will change with the disturbance caused by the planned activities. This will need to be managed in order to maintain the wetland health.

The southern part of the wetland is expected to provide more ecosystem services than the northern part. The northern part (being rocky) may provide a more stable base for construction of infrastructure than the southern part (being heavy clay).

8.8 VEGETATION

8.8.1 Regional vegetation and parameters

The study area falls within the Savannah Biome. Mucina and Rutherford described the vegetation as Marikana Thornveld (See [Figure 31](#)). The original extent of the vegetation type is presented below. It should also be noted that the original extent as illustrated in [Figure 31](#) is indicative of the overall regional vegetation type and does not necessary represent the specific site characteristics or the GIS data as adopted into the updated remaining extent of threatened ecosystems as supplied by GDARD.

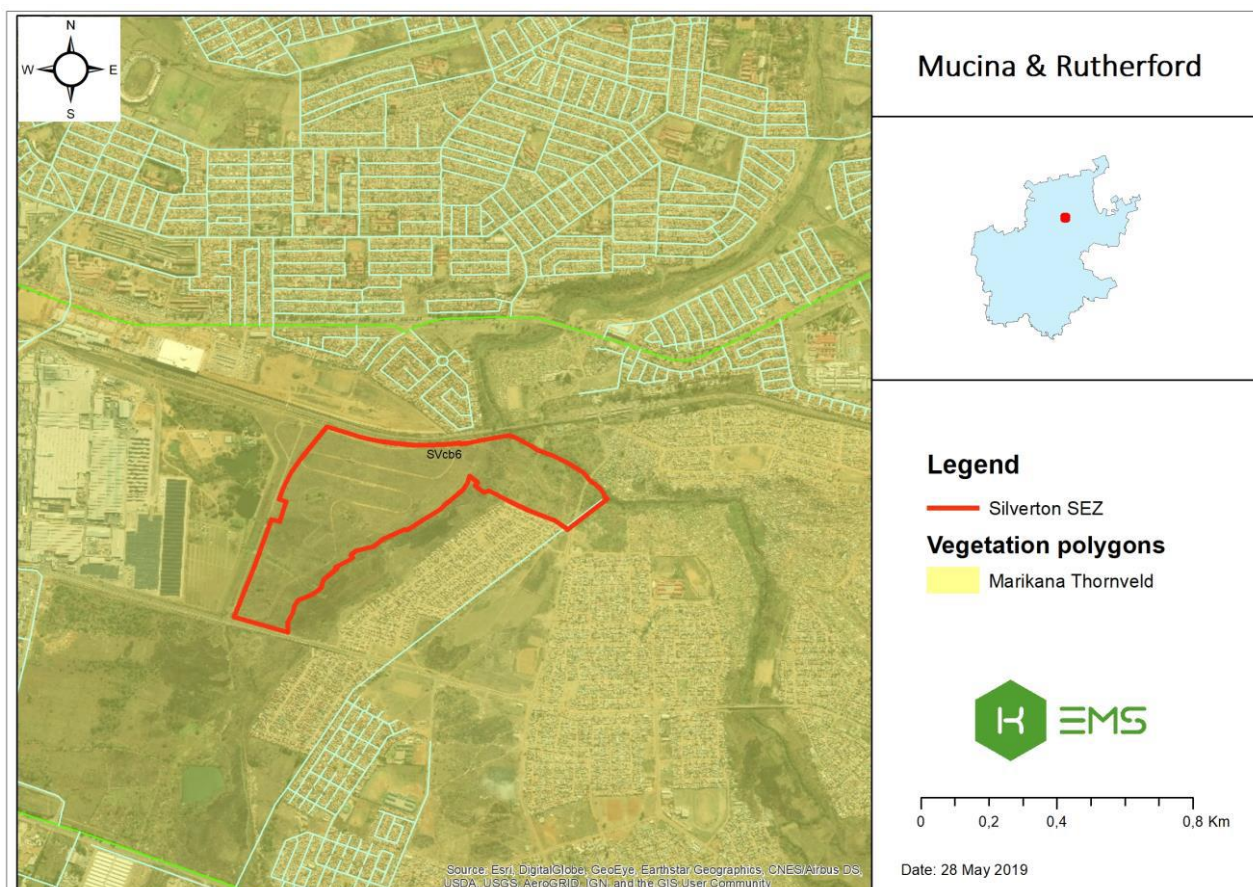


Figure 31: Estimate of the ecosystem services delivered

According to the Mucina and Rutherford (2006) vegetation map of the country, the study area falls entirely within one main vegetation type Marikana Thornveld which falls into the Savannah Biome. A list of expected common and dominant species in undisturbed Marikana Thornveld *includes* the following (those with a "d" are considered to be dominant):

Open Acacia karroo woodland, occurring in valleys and slightly undulating plains, and some lowland hills. Shrubs are denser along drainage lines, on termitaria and rocky outcrops or in other habitat protected from fire. A list of expected common and dominant species in undisturbed vegetation includes the following (those with a "d" are considered to *be dominant*)

Tall Tree: *Acacia burkei*.

Small Trees: *Acacia caffra* (d), *A. gerrardii* (d), *A. karroo* (d), *Combretum molle* (d), *Rhus lancea* (d), *Ziziphus mucronata* (d), *Acacia nilotica*, *A. tortilis* subsp. *heteracantha*, *Celtis africana*, *Dombeya rotundifolia*, *Pappea capensis*, *Peltophorum africanum*, *Terminalia sericea*.

Tall Shrubs: *Euclea crispa* subsp. *crispa* (d), *Olea europaea* subsp. *africana* (d), *Rhus pyroides* var. *pyroides* (d), *Diospyros lycioides* subsp. *guerkei*, *Ehretia rigida* subsp. *ri-gida*, *Euclea undulata*, *Grewia flava*, *Pavetta gardeniifolia*.

Low Shrubs: *Asparagus cooperi* (d), *Rhynchosia nitens* (d), *Indigofera zeyheri*, *Justicia flava*.

Woody Climbers: *Clematis brachiata* (d), *Helinus integrifolius*.

Herbaceous Climbers: *Pentarrhinum insipidum* (d), *Cyphostemma cirrhosum*.

Graminoids: *Elionurus muticus* (d), *Eragrostis lehmanniana* (d), *Setaria sphacelata* (d), *Themeda triandra* (d), *Aristida scabrivalvis* subsp. *scabrivalvis*, *Fingerhuthia africana*, *Heteropogon contortus*, *Hyperthelia dissoluta*, *Melinis nerviglumis*, *Pogonarthria squarrosa*.

Herbs: *Hermannia depressa* (d), *Ipomoea obscura* (d), *Barleria macrostegia*, *Dianthus mooiensis* subsp. *mooiensis*, *Ipomoea oblongata*, *Vernonia oligocephala*.

Geophytic Herbs: *Ledebouria revoluta*, *Ornithogalum tenuifolium*, *Sansevieria aethiopica*.

8.8.2 Regional conservation assessment

The Conservation Planning tool from the Gauteng Department of Agriculture and Rural Development (GDARD) is a tool used to determine the regional conservation within the Gauteng province. It aims to identify patterns and processes that are important for maintaining biodiversity. It is called C-plan and the latest update is C-Plan 3.3 C-Plan identifies Critical Biodiversity Areas (CBAs) at different hierarchical levels, which are terrestrial and aquatic features in the landscape that are critical for conserving biodiversity and maintaining ecosystem functioning. C-Plan identifies CBAs at different levels with decreasing biodiversity importance. The study site transverse through Ecological Support Area (Figure 32). The site also falls within the Vulnerable Marikana Thornveld vegetation as published in GN 1002 as a threatened ecosystem (Figure 33).

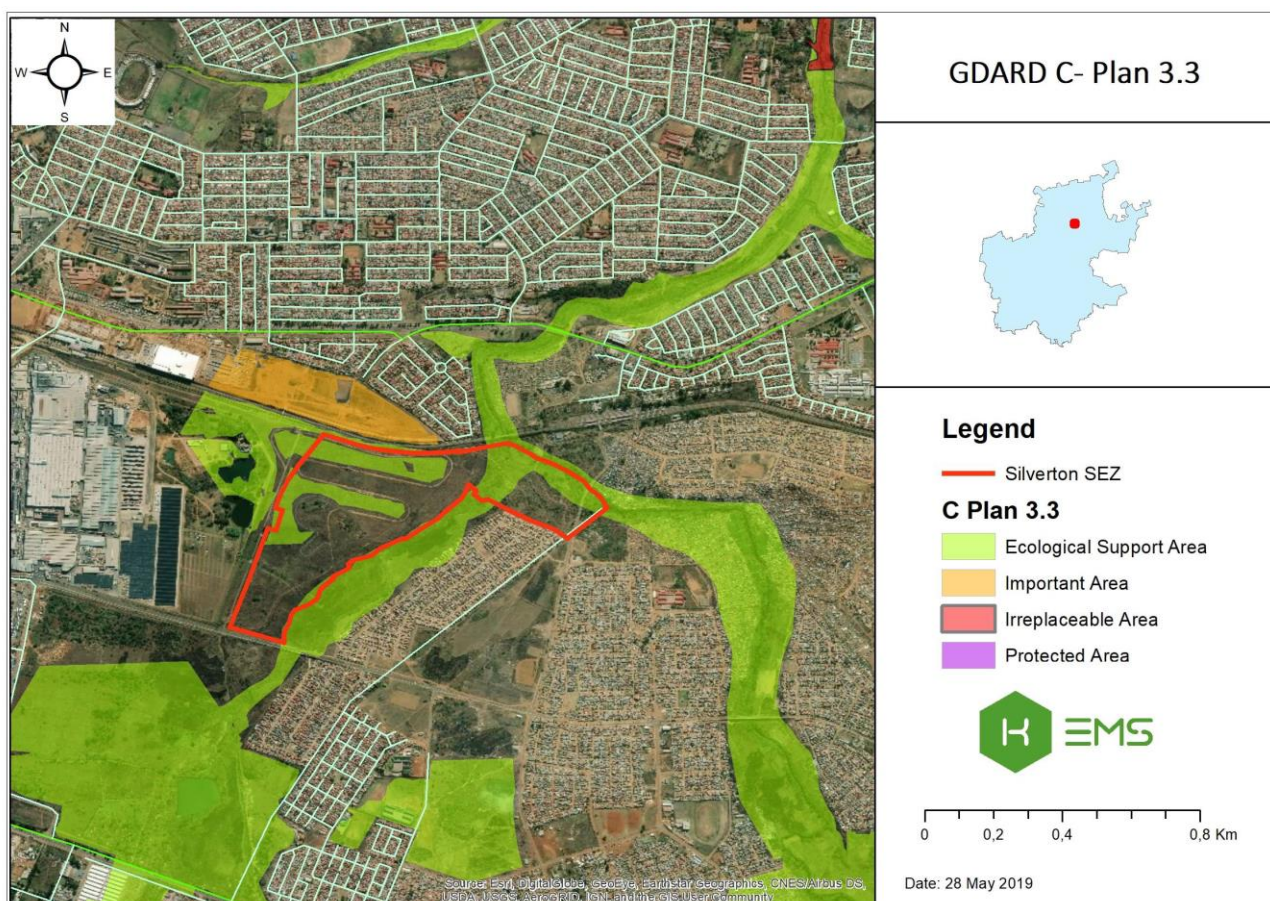


Figure 32: Conservation value of the study area (C-Plan 3.3)

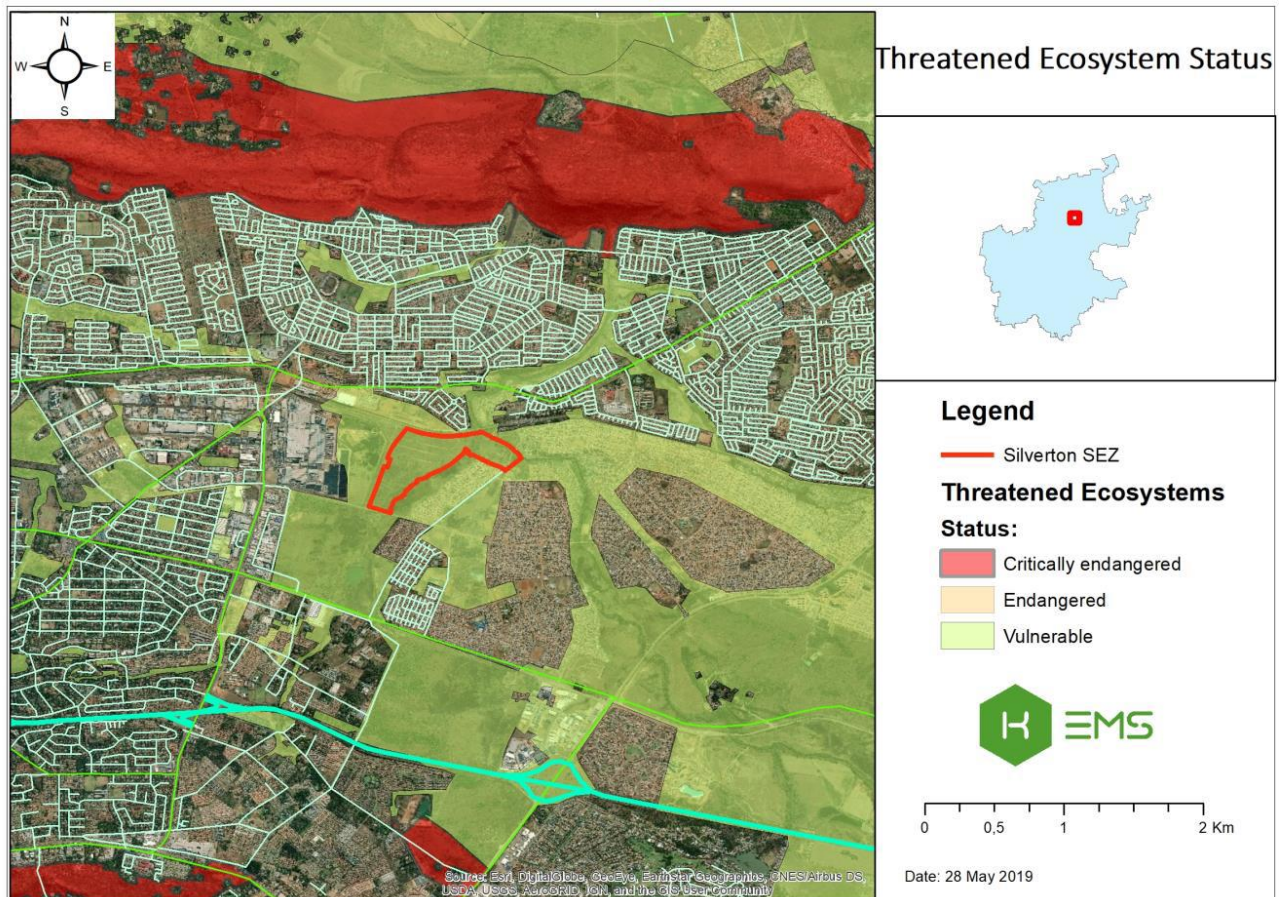


Figure 33: GN 1002 Vulnerable Marikana Thornveld

8.9 SOCIO-ECONOMIC ANALYSIS

8.9.1 Projected outputs and expected key outcomes of the SEZ

Economic impact assessments are conducted to primarily determine how businesses, households and government will be affected by a particular intervention in the economy. Interventions can be in the form of a policy change, investment in a particular industry, or a change in consumer preferences, for example. Economic impact assessments are thus useful in terms of:

- Predicting future changes in an economy due to future capital and operational investment;
- Evaluating changes in an economy due to the implementation of a project - past and current.

An economic impact itself is defined as a change in the flow or distribution of value (money) between different economic agents due to a change in production, consumption, or distribution in the economy. Therefore, it assists in determining who benefits from a particular change in a particular area of the economy.

8.9.2 Projected economic impact of the SEZ on the local, district, provincial and national economies

Economic benefits generally associated with SEZs

This section provides a brief discussion and assessment of the likely benefits associated with SEZs. In the main it draws on the international literature and other sources to illustrate potential impacts which can then be the subject of further assessment in the feasibility phase. In this regard it focuses mainly on the potential impact of successful SEZs. It needs to be recognised that numerous examples of failures are also to be found. It provides brief overviews of:

- The sources and types of economic impacts that have materialised from other SEZs.
- Results of impact assessments conducted on SEZs

8.9.3 Results of benefit assessments

This section focuses on the results of assessments of the economic benefits that are associated with SEZs. It draws primarily on the FIAS review along with the research by Farole on the economic impacts of SEZs in Africa (see FIAS, 2008 and Farole, 2011). Together, these sources provide comprehensive data on impacts drawing on other sources in the process.

The SEZ would represent a unique and further expanding feature of the greater FMCSA manufacturing cluster in Silverton, Tshwane, and would be an important economic thrust to address the declining ratio of manufacturing GDP to total GDP in South Africa. It should be noted that the automotive sector is the highest wage payer in the SA manufacturing industry.

Table 16: GDP impact from SEZ stakeholders

	Direct	Indirect	Induced	Total
Ford Expansion	R301,78	R338,66	R200,72	R841,16
Other (Ford)	R273,24	R265,99	R186,24	R725,47
Silverton Automotive SEZ Phase 1 & 2	R338,66	R329,67	R230,82	R899,16
Silverton Node	R3 706,78	R3 608,41	R2 526,46	R9 841,64
Infrastructure	R943,79	R850,92	R605,46	R2 400,18
Total	R5 564,25	R5 393,66	R3 749,70	R14 707,61

Source: Author, AIH

In term of GDP, the expected total impact is R14,7 billion, with both direct and indirect impact of around R5 billion, and a lower induced impact of approximately R3,7 billion. Of note is the Ford Expansion, which has higher indirect impacts than direct impacts.

Table 17: Income impact from SEZ Stakeholders

	Direct	Indirect	Induced	Total
Ford Expansion	R145,35	R99,10	R266,77	R511,22
Other (Ford)	R127,88	R116,99	R80,76	R325,64
Silverton Automotive SEZ Phase 1 & 2	R158,50	R145,00	R100,10	R403,60
Silverton Node	R1 734,85	R1 587,11	R1 095,59	R4 417,55
Infrastructure	R449,02	R368,68	R262,68	R1 080,38
Total	R2 615,60	R2 316,88	R1 805,89	R6 738,39

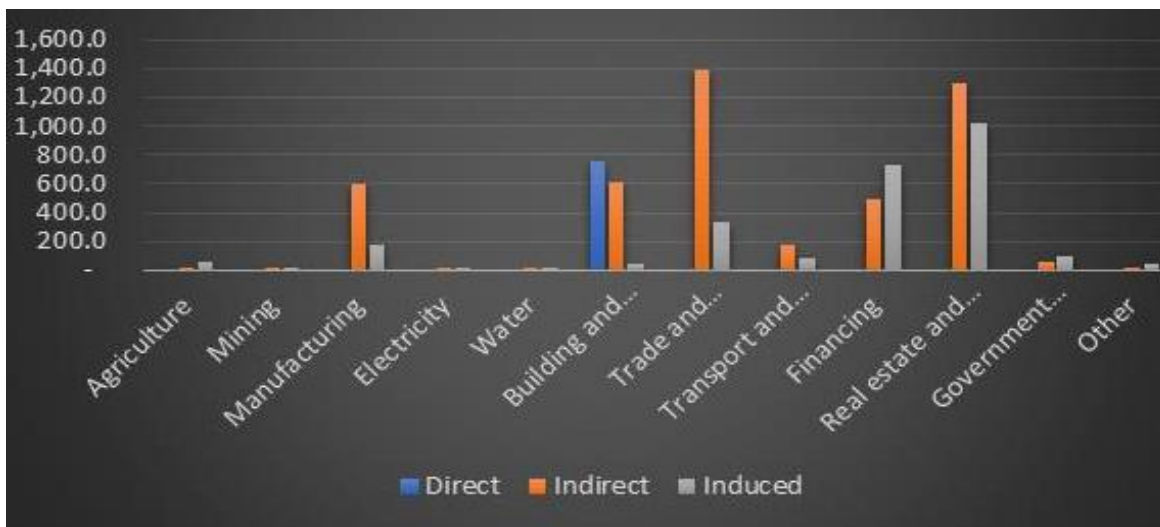
Source: Author, AIH

8.9.4 Projected employment to be created during the various phases of the establishment of the SEZ, the sectors within which employment will be created and the nature of the employment, which may be:

SEZs have been found to play a major role in employment creation in certain countries. The following table shows that, globally, approximately 68 million jobs are in firms located within SEZs. In addition, research has shown that the rate of job creation in a number of SEZ programs has been rapid. Employment in the Dominican Republic's industrial free zones, for example, rose from 500 in 1970 to almost 200,000 in 2008 (FIAS, 2008). Aside from direct employment, indirect employment effects can also be substantial

- Permanent or temporary

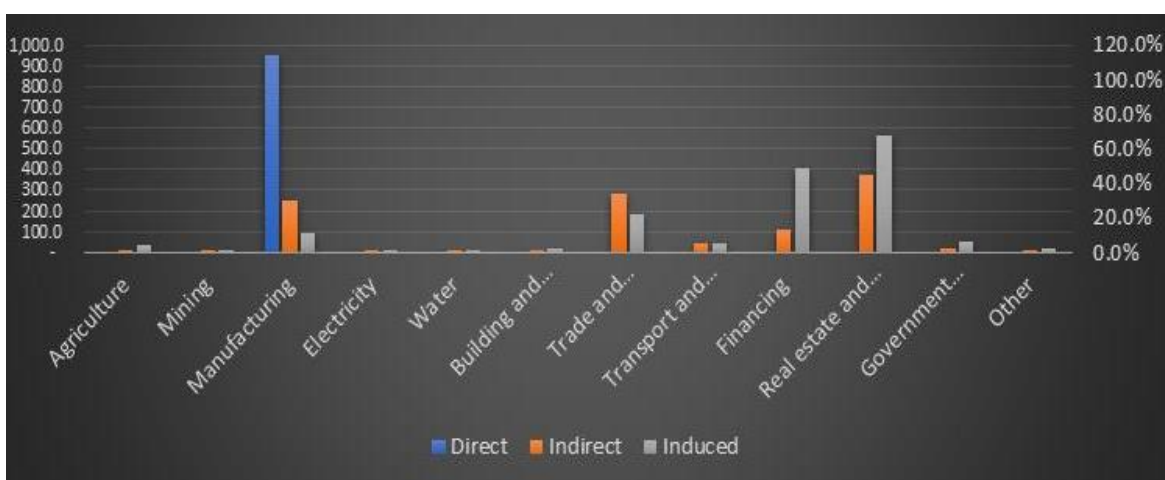
The SEZ development will have a considerable employment impact, with ~ 8 000 estimated jobs (under review) created during construction and ~ 3 500 sustainable jobs (estimated) throughout commercial operation of the SASO. The figure below illustrates the number of temporary jobs created. These jobs will be created mainly during the construction phase of the SEZ as indicated in Figure 34.



Source: Author, AIH

Figure 34: Employment Impacts during the Construction Phase (Short Term Impacts)

Figure 35 shows the number of permanent jobs that will potentially be created during the operational phase of the SASP across the different industries. An opportunity exists to utilise the local workforce to fill the new positions.



Source: Author, AIH

Figure 35: Employment Impact of the commercialisation Phase (Long Term Sustainable)

- Direct or indirect

The proposed SASP would create both direct and indirect jobs. Direct jobs would primarily be created within the boundaries of the SASP. These are jobs in infrastructure development and the new businesses. To the extent that local people are appointed for these jobs, they would have an impact on local unemployment levels and incomes. In cases where the necessary employees cannot be found locally, local impacts would still be relatively prominent as new employees would spend some of their salaries in the local area thereby creating opportunities. Indirect and induced jobs would result from multiplier effects of capital costs, operating expenditure and increased business activity. Some of the indirect jobs would occur in the local area and wider province and the balance would occur elsewhere in the country

Table 18: Number of jobs created through the SEZ Development

	Direct	Indirect	Induced	Total
Ford Expansion	460	1 078	729	2 267
Other (Ford)	730	1 563	1 259	3 551
Silverton Automotive SEZ Phase 1 & 2	910	1 937	1 560	4 407
Silverton Node	9 970	21 201	17 074	48 245
Infrastructure	2 580	5 055	4 100	11 735
Total	14 650	30 833	24 722	70 205

Source: Author, AIH

The employment impact shows that this project has a very high employment multiplier, with both non-direct impacts higher than direct impacts for all projects. The direct impact 14 650 jobs will lead to a non-direct impact of 55 555 jobs. The SEZ 1st and 2nd phase alone will have an impact of over 4000 jobs.

8.9.5 Industrial activity targeted by the SEZ, the sectors and information on what the targeted industrial activities create in the economy including, a demonstration of -

The main industrial activity and focus of the SEZ is automotive manufacturing. The driver of the development is the expansion of the automotive manufacturing capacity of Ford Motor Company South Africa, with its plant located in Silverton, Tshwane. This expansion involves two new ranges of commercial vehicles (the Ranger and Raptor brands) with planned production of over 200 000 vehicles annually, of which some 60 - 70% are exported to the global market.

Investment in the global export programme commenced in **2009** to transform the local production facilities, comprising the Silverton Assembly Plant in Pretoria, as well as the Struandale Engine Plant in Port Elizabeth, into a high-volume flexible single platform operation for the trend-setting new-generation Ranger and its Duratorq TDCi turbodiesel engines.

In **2016**, Ford invested in further expansion of Ranger production and, notably, for the local assembly of the sophisticated Everest SUV for South Africa as well as for export to markets across the Sub-Saharan Africa region. Previously imported from Thailand, local assembly of the Everest gave customers a far wider range of choice, as the line-up increased from just two models to a choice of eight derivatives - matched to a corresponding uptake in sales for this versatile seven-seater SUV. Localising production also contributed towards creating approximately 1 200 new jobs at Ford South Africa and within its local supplier network Ford is one of the largest employers in the automotive sector, currently employing approximately 4 100 people in South Africa, and supporting around 50 000 indirect jobs within the value chain.

2017 saw the announcement of another major capital injection into Ford's local operations to accommodate further increases in installed capacity, with the current capability of producing up to 168 000 units annually. At the same time, it was announced that the first-ever Ford Ranger Raptor will be produced in South Africa when it hits the market in **2022**, introducing an entirely new level of off-road performance and capability to the pick-up segment. The figure below shows the expected level of production from all the stakeholders in the development, including the direct, indirect and Induced impacts.

Table 19: Projected Impact of Production:

	Direct	Indirect	Induced	Total
Ford Expansion	R1 075,10	R1 064,09	R495,08	R2 634,28
Other (Ford)	R639,42	R714,08	R459,07	R1 812,56
Silverton Automotive SEZ Phase 1 & 2	R792,50	R885,03	R568,97	R2 246,50
Silverton Node	R8 674,25	R9 687,03	R6 227,62	R24 588,90
Infrastructure	R2 041,00	R2 186,80	R1 491,53	R5 719,34
Total	R13 222,27	R14 537,04	R9 242,27	R37 001,57

Source: Author, AIH

8.9.6 Education

Skills development is a key focus of the public development agenda in South Africa and the development of specialised skills for the automotive industry is an imperative if the industry is to maintain its industrial competitiveness and keep up with the fast pace of mechanisation and digital technologies within the auto industry environment. The Silverton retail and industrial precinct will incorporate a variety of skills development, training and incubation initiatives that will be initiated by the Tshwane Economic Development Agency (TEDA) in partnership with private industry, thus ensuring proactive learning and sustainable future growth.

8.9.7 Health care

Basic health care is a crucial element to ensure that people are healthy and not at risk for an injury in the workplace. The proposed SEZ location is in a region with three major hospitals. The health care available in the region itself is of high quality. Furthermore, it is critical to adhere to the Occupational Health and Safety Act (OHSA) in the workspace. The SEZ development also plans on developing a clinic where members of the staff can be treated.

8.10 TOPOGRAPHY AND SURFACE DRAINAGE

The slope of the topography varies at different points within the site. The eastern portion of the site slopes in a Northerly direction towards the Pienaar River at 1.1%, while the western portion will slope towards The Willows stream in a South Easterly direction at 2.5%.

8.11 GEOLOGY, HYDROGEOLOGY AND GEOTECHNICAL ASSESSMENT

8.11.1 Geology and Hydrology

At present, the site will not be affected by the 1:50 and 1:100-year flood line, as is shown on the township layout plan submitted with this application. Most of the area is underlain by the mafic intrusive rocks of the Rustenburg Layered Suite of the Bushveld Igneous Complex. Rocks include gabbro, norite, pyroxenite and anorthosite. The shales and quartzites of the Pretoria Group (Transvaal Supergroup) also contribute. Mainly vertic melanic clays with some dystrophic or mesotrophic plinthic catenas and some freely drained, deep soils. Land types mainly Ea, Ba and Ae.

The 1:250 000 geological map 2528 PRETORIA shows that the site is underlain by:

- Shale, carbonaceous in places, hornfels and chert of the Silverton Formation, Pretoria Group, Transvaal Supergroup, and
- Diabase (dolerite) of the Vaalian to post Mongolian Era.

The geological map also indicates the area is underlain by faults.



Figure 36: Geology overlain in Google earth

8.11.2 Geotechnical Investigation

The investigation was conducted to comply with the requirements of SAICE's Site Investigation Code of Practice (2010). The investigation was conducted in two parts, namely test pits and DPSH testing.

Figure 37 overleaf shows the test locations on the site plan. DPSH tests are indicated by green markers and test pits by yellow markers.



Figure 37: Test positions (test pits and DPSH)

Fifty (50) test pits were excavated across the site using a hired TLB to a maximum depth of 3.0m or until effective refusal conditions were encountered. The test pits were profiled according to current standards (Brink and Bruin, 2002) and provided information in terms of the following:

- Geology of the site,
- Engineering properties of materials excavated,
- Water table and groundwater seepage (if encountered),
- Bearing capacity / suitability for founding in the in-situ soil/soft rock layers,
- Potential expansiveness/collapsibility of the soils, and
- Excavatability of the in-situ material.

Representative soil or weak rock horizons were sampled for laboratory testing. Test pit localities were recorded using a hand-held GPS ($\pm 5.0\text{m}$ accuracy).

8.11.2.1 Results: Test pit investigation

- Typical soil profile

The geological conditions encountered were fairly consistent across the site with two primary characterisations; namely a general shale lithology broken by dolerite intrusions encountered in the southern portion of the site.

The predominant geotechnical materials encountered on site can be broadly divided into five groups as listed below.

a) Transported soil

Transported material was primarily described as stiff clay, with varying proportions of silt, sand, gravel, ferricrete nodules, boulders and rock fragments. The transported material extends to a maximum depth of about 1.3m below Natural Ground Level (NGL), except for TP10 in which the extent could not be determined with the TLB. TP10 is possibly located within the floodplain of the waterway which explains the deep transported material.

b) Residual dolerite

Residual dolerite was encountered in three distinct forms/settings as indicated below. Settings were assigned based on varied weathering, location and surrounding material

c) Dolerite rock

Slightly to moderately weathered, intact, soft to medium hard rock dolerite was encountered in TP03 at a depth of 1.2-2.2m. TP03 refused on medium hard rock dolerite at 2.2m.

d) Residual shale

Residual shale was found in two distinct forms/settings as indicated below. The difference in setting is characterised by varied weathering, locations and surrounding material.

e) Shale rock

Very soft rock to soft rock shale was encountered in most of the test pits. The thinly bedded nature of the shale along with the highly fractured presentation allows the material to be excavated by means of TLB except for the rare occasion where refusal occurred.

The figure below indicates zones where clayey material (residual or transported) was encountered to the full extent of the test pit in red shading. Blue shading indicates zones where soft conditions were encountered (see DPSH 1 and 2).



Figure 38: Clay zones on site

- Groundwater

Groundwater seepage was encountered in test pit 36 at a depth of 1.7m below NGL and in test pit 37 at 2.1m below NGL. It is not clear whether these isolated occurrences of seepage in the north eastern (and most high lying) portion of the site result from a perched water table or possibly a leaking service.

- Laboratory test results

Soil samples obtained during investigations were sent to independent soil laboratories for the following tests:

- Foundation Indicators (x8),
- Maximum Dry Density/Optimum Moisture (x7),
- California Bearing Ratio (CBR) (x7), and
- pH and conductivity (x8).

A summary of the laboratory test results is provided in Table 5-3 whilst the comprehensive results are presented in **Appendix 3E**.

Table 20: Summary of laboratory results

Sample No.	TP02	TP05	TP07	TP09	TP10	TP11	TP19	TP36
Depth (m)	0.9-3.0	0.0-1.6	0.0-1.4	1.5-3.0	0.0-3.0	0.8-3.0	1.1-3.0	0.3-3.0
Liquid Limit	39	52	71	47	69	50	28	50
Plasticity Index	16	30	39	22	33	22	10	23
Linear shrinkage	5	11	17	10.5	12	8.5	5.5	10.5
Grading modulus	1.55	1.71	0.36	1.24	0.27	1.52	0.73	1.41
% passing 0.425mm	51	45	90	52	94	42	84	52
% passing 0.075mm	35	17	78	32	82	19	44	45
Expansiveness rating	Low	Medium	Very high	Low	High	Low	Low	Medium
Unified Classification	SC	SC	CH	SC	MH	SM	SC	SC
AASHTO Classification	A-2-6(1)	A-2-7(3)	A-7-5(20)	A-2-7(2)	A7-5(20)	A-2-7(0)	A-4(2)	A-7-6(6)
Optimum moisture content (%)	14.5	18	17.1	14.2	-	15.9	11.9	14.7
Max Dry Density (kg/m ³)	1 769	1 764	1 430	1 644	-	1 731	1 838	1 858
CBR @ 100% Mod AASHTO (%)	10	2.1	1.6	2.4	-	12	17	11
CBR @ 95% Mod AASHTO (%)	8.7	1.5	1.2	1.4	-	9.8	11	6.7
CBR @ 93% Mod AASHTO (%)	6.5	1.1	1.1	1.3	-	5	6.9	4.3
Max swell @ 100% Mod AASHTO (%)	2.4	1.6	2.8	3.1	-	1.2	1.1	1.1
Classification (COLTO)	NC	NC	NC	NC	-	NC	NC	NC

Figure 39 below provides as graphic representation of material grading curves.

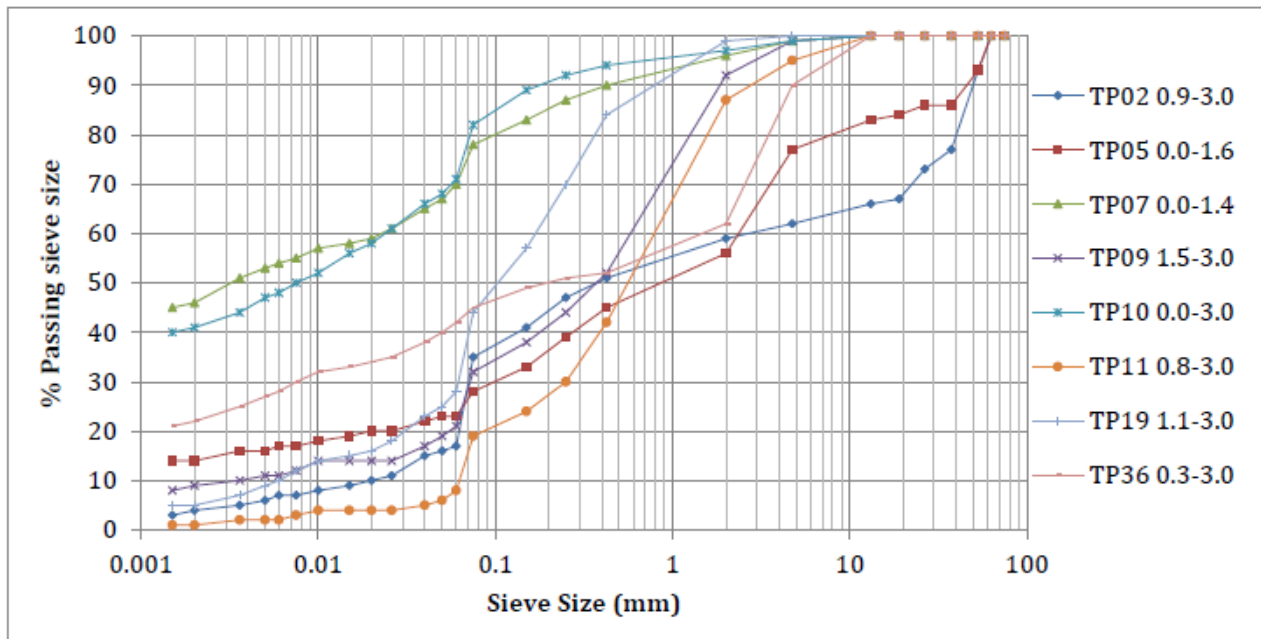


Figure 39: Grading curve

8.11.2.2 DPSH Investigation

DPSH tests provide an indication of the tested medium's consistency as per Brink and Bruin (2002), from which stiffness values can be derived using empirical correlations as per Clayton (1993). The figure below provides a summary of the DPSH results (blow counts per 300mm penetration corrected for skin friction from re-drives).

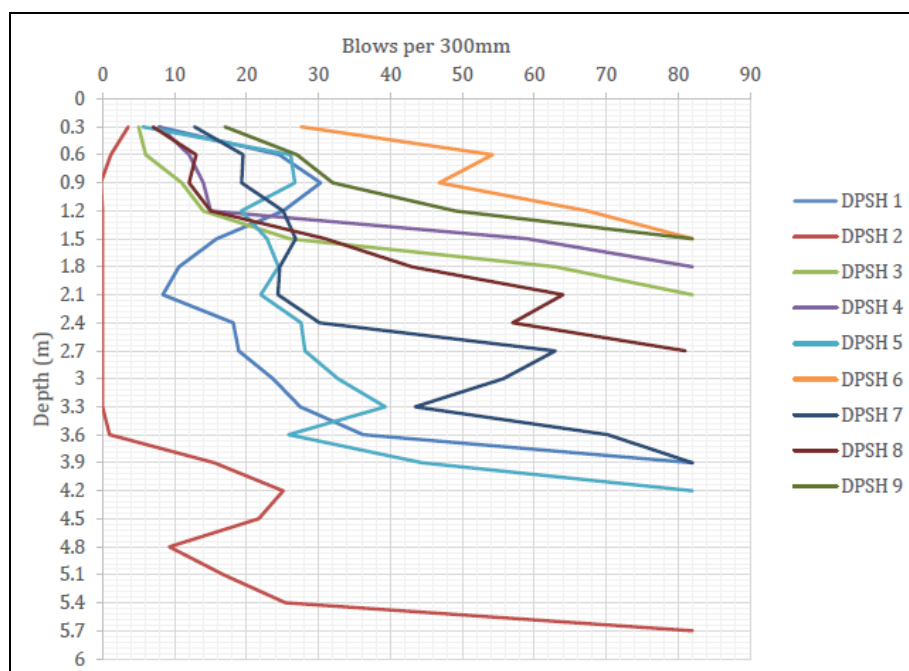


Figure 40: Summary of corrected DPSH test results

Figure 40 indicates varying stiffness conditions of the subsoil materials on site. Furthermore, depth at which refusal occurred was also found to be variable, which can be attributed to the variable depth at which bedrock was encountered, or to obstructions (cobbles/boulders) encountered within the dolerite intrusion zones. DPSH 2 indicates soft compressible material to a depth of about 4.0m. DPSH 1 also indicates soft material to a relatively deep level of about 2.5 below NGL.

8.11.2.3 Geotechnical Evaluation

➤ Material properties

a) Expansive/active soils

Plasticity Index (PI) values for the soils tested range between 10-39 (intermediate to high), with a range of expansiveness ratings from low to very high. Therefore, heave is expected to be problematic in certain areas of the site, and its distribution is envisaged to be linked to dolerite zones. Materials with a medium expansiveness rating or greater are deemed potentially problematic and will require special founding consideration. Refer to Section 7 of this report for further considerations in this regard.

b) Collapsible soils

A collapsible fabric may be defined as the physical arrangement of particles in such a way that a reduction in volume occurs due to increased moisture conditions at a constant applied stress. No collapsible fabric was identified in the test pits and collapse settlement is therefore not expected to be problematic on site. Proper compaction is nonetheless required during construction.

c) Compression and consolidation

Soil compressibility is the propensity of a soil to decrease in volume when subjected to an increase in stress. Consolidation is the process of dissipation of excess pore pressure over time. This occurs in saturated soils of low permeability and such settlements can persist long after completion of construction. Compressible soils such as soft/firm gravelly CLAY were encountered in about 25% of the test pits within the upper ~0.9m and will need to be addressed as outlined in the trailing sections (dependant on the magnitude of the proposed loading).

d) pH and corrosivity

pH and corrosivity testing was not conducted as part of this investigation. It is suggested that this be conducted on a footprint specific basis when foundation excavations commence.

e) Moisture content

Table 5-3 shows the moisture attributes of material present on site and indicates that the optimum moisture content of the soil ranges from 11.9 to 18.0%. The material on site was typically described as slightly moist to moist. The addition of water will be necessary in most cases to bring the material closer to optimum moisture content.

f) Compaction and strength properties

CBR tests were conducted according to TMH1 (1986) on representative samples which were subsequently classified according to COLTO (1998). Results indicate that material is non-classifiable (worse than G10) due to several parameters, with relatively low to extremely low strength properties at varying degrees of compaction.

➤ **Excavation conditions**

Based on SABS 1200, “soft” to “intermediate” excavation conditions are expected to prevail to a depth of 3.0m, with the possibility of boulder excavation in the dolerites.

➤ **Groundwater**

Groundwater was encountered only in test pit 36 at a depth of 1.7m below NGL and in test pit 37 at 2.1m below NGL. Groundwater seepage is not expected to be generally problematic on the site, so long as deep excavations are not required, and development in the proximity of the river is limited.

8.11.2.4 Foundation recommendations

Detailed structural loads and foundation requirements for the development are unknown at this stage, but it is understood that the development will comprise a variety of industrial buildings (typically portal frame or light brick) with foundations of varying forms and sizes. In order to give the recommendations meaning, general foundation sizes were assumed as outlined in [Table 21](#) overleaf. These, together with material parameters

in Table 21 were used to provide generic recommendations. *It is important to note that the generic recommendations will need to be verified by a professional suitably qualified to do so once structural loading, position on site, and settlement sensitivity are understood.*

➤ Material parameters

The following material parameters were derived and assigned to typical materials encountered on site as given in Table 21. Parameters for these materials were derived from laboratory test results and/or according to literature (Byrne and Berry, 2008 and Theyse, 1996).

Table 21: Summary of laboratory results

Material type	Friction angle (°)	Cohesion (kPa)	Density (kN/m ³)	Stiffness (MPa)
Clayey material (unsuitable)	22.00	2.0	15.0	15
VSR shale	30.45	8.0	19.0	30
Fill – G7	29.80	6.8	18.5	50

8.11.2.5 Foundation area demarcation

In the northern areas of the site, relatively shallow shale bedrock will allow direct founding near surface on strip and pad footings. In the southern areas of the site a softer clay profile (exhibiting heave characteristics in places) will necessitate special measures such as removal and replacement of unsuitable material. Piles may be considered for large loads if the infrastructure requires, or if structures are envisaged on areas with deep heaving profile.

These material zones are demarcated in Figure 7-1 as “Area 1” and “Area 2”, and described as follows:

- Area 1 - Yellow: Deeply weathered residual or thick transported material zones - CLAY material (typically expansive), and
- Area 2 - Green: Relatively shallow very soft rock or better shale

Founding guidelines will be provided per material area in the following subsections.

It should be noted that the zones indicated are generalized and based on a limited amount of test points. The occurrence of conditions at variance with the generalized zone descriptions within the zones should not be overlooked. Footprint specific testing/inspection will be necessary during construction to ensure safe founding. Furthermore, possible variation in the delineation of the zone boundaries should not be overlooked and will similarly need to be validated via inspection/investigation once building locations are selected.



Figure 41: Site zonation according to materials encountered

AREA 1 – EXPANSIVE CLAY MATERIAL

These areas comprise deep soil profiles, primarily comprising weathered dolerite but also including residual shale. The clay material possesses low to moderate strength and stiffness, and is also prone to swell/heave with change in moisture content. Heave calculations were undertaken for profiles from four (4) test pits where expansive material was encountered as indicated in the table below.

Table 22: Summary of heave calculations

Test pit No.	Heave potential	Depth (m)	Thickness (m)	Heave/m (mm)	Depth factor	Heave (mm)	Recommendation
TP05	Medium	0.0 – 1.6	1.6	20	0.80	26	Undercut by ~1.6m and fill with G7
TP07	Very high	0.0 – 1.4	1.4	80	0.85	95	Undercut by ~1.4m and fill with G7
TP10	High	0.0 – 3.0	>3.0	40	0.60	>24	Further investigation*
TP36	Medium	0.8 – 3.0	>2.2	20	0.50	>10	Further investigation*

In profiles such as those depicted in TP05 and TP07, the problematic horizon was shallow and thin, and it is recommended that in these cases the problematic material is removed and replaced. The general founding recommendation in this area will comprise undercutting and removing the expansive material to depths of $\leq 1.6\text{m}$ and backfilling with imported G7 quality material in 150mm layers, compacted to 93% of the modified AASHTO density. Founding may proceed at allowable bearing capacity of 100 kPa for strip footings and 150 kPa for pad footings up to 2x2m on G7 fill material.

For instances where the soft, active clay material cannot be economically excavated and replaced with inert material, a deep founding solution or stiffened concrete raft should be considered. Deep foundations may comprise auger piles socketed into R2/R3 rock. The pile diameter and socket length will be subject to the structural load and detailed pile design.

The pile design needs to take heaving soil conditions into account. Rafts will typically be suitable to smaller brick structures while piling will suite larger portal frame type infrastructure. These decisions will need to be made by the professional team once detailed information on the proposed structures are available. Where the depth of the soft/expansive material exceeded the depth of investigation, further investigation will be required.

AREA 2 – SHALLOW SHALE BEDROCK

This area is characterised by very soft rock (or better) shale at a shallow depth often allowing founding directly on the shale rock. The following allowable bearing capacities may be used when founding on shale:

- Very soft rock (pending joint infill evaluation):
 - o 150kPa for strip footings ~0.8 wide,
 - o 200kPa for pad footings ~ 2x2m
- Soft rock or harder (pending joint infill evaluation):
 - o 250kPa for strip footings,
 - o 750kPa for pad footings

Should the shale rock (at least VSR) be too deep to found directly upon, the overlying material may be undercut and the desired founding level be attained by backfilling with G7 material in 150mm layers, compacted to 93% of modified AASHTO density. This will allow founding to occur at the stresses listed above for VSR Shale. Alternatively, the residual soil above the shale may be tested (by DCP) and founding may occur at a suitably reduced pressure on this soil.

All founding conditions should be inspected and approved by a competent person prior to commencement of construction.

8.11.2.6 Precautionary Measures

➤ General Founding

Selection of the optimal founding solution will be a function of the structural loads and the specific geological conditions below the proposed footprint. Further detailed investigation into the subsurface conditions on the footprint will be required before the detailed design is finalised, and construction commences. Note: ARQ will be able to assist in selecting and applying optimal founding measures for each building at the detailed design stage upon request.

➤ **Materials**

Soft and heaving clay conditions need to be accounted for in structural and foundation designs of buildings to be constructed within areas containing such materials. This may include movement joints in building superstructures, founding via reinforced concrete raft foundations, additional brickforce in brick walls, additional steel reinforcing above doors and window frames etc. It may also be beneficial to install wick drains and proper foundation drainage measures within building footprints in these areas. This will need to be addressed in detailed design.

➤ **Further investigations**

Further detailed investigation is recommended within areas where the thickness of soft or expansive clays exceed the reach of the TLB excavating the test pit. Furthermore, it is highly recommended that a competent person inspects and approves founding conditions before construction commences i.e. check they are according to design assumptions.

8.11.2.7 Conclusion

The site presents varying subsurface conditions ranging from weak and active clays unsuitable for founding to shallow shale horizons providing stable founding. General founding recommendations were provided for assumed foundations based on test pit, DPSH and laboratory testing information. Selection of the optimal founding solution for specific buildings in specific areas may be subject to further detailed investigation. ARQ will be able to assist further with such considerations upon request.

8.12 ELEMENTS OF CULTURE HISTORICAL IMPORTANCE

During the site investigations for the Scoping stage, focus was also placed on the presence of any stone-built structure, ruins, grave sites, monuments, complete built structures and the presence of artefacts. Based on preliminary observations, a graveyard occur within the proposed area of the proposed development. A Phase 1 Heritage Impact Assessment will be undertaken. Comments will be sought from the Provincial Heritage Resources Agency of Gauteng.

8.13 ENGINEERING SERVICES

8.13.1 Water and sanitation

The existing bulk water supply is from the new La-Montagne reservoir to the south of the proposed development. There are existing pipelines supplying the area via Simon Vermooten Avenue. The newly constructed La-Montagne reservoir is a 15 ML reservoir. The development will fall in this reservoir zone. Future planning is to construct an additional 15 ML reservoir to augment the supply capacity of the La-Montagne reservoirs to 30 ML. The reticulation network will also require upgrading to satisfy the additional water demand in future.

- **Water demand for the proposed development**

The preliminary annual average daily demand (AADD) for the proposed development is 948 kl (see table below). Considering a peak factor of 3,3, this equates to a 36 l/s requirement.

Table 23: Preliminary Annual Average Daily Demand for water

ERF NO	USE	AREA	APPLICATION FLOOR AREA RATIO	Floor Area	Water consumption	Average annual daily demand kl/day
Erf 1	Public open space	14.441	0.05	7220.5	0.4	28.882
Erf 2	Industrial 1	45.979	0.5	229895	0.4	919.58
Erf 3	Municipal	0.332	0.03	99.6	0.4	0.3984
Total		60.752 ha				948.8604

The fire flow requirement for this development (industrial/business - moderate risk) is 50 l/s @ 15m head.

- **Required upgrade of bulk water supply infrastructure**

Based on discussions with the City of Tshwane the water supply pipeline from the new La-Montagne reservoir up to the intersection of Simon Vermooten Road and Alwyn Street must be upgraded with a 450 mm diameter pipeline. From this intersection a new 250 mm diameter pipeline must be constructed up to the new development.

- **Required upgrade of bulk sewer supply infrastructure**

Discussions held with the City of Tshwane indicates that the development will be able to connect to this outfall sewer and no additional upgrading of the bulk sewer system is necessary. There is an existing bulk outfall sewer flowing in a northerly direction along Willow Spruit, on the eastern side of the development. The peak day dry weather flow (PDDWF) for the proposed development has been calculated to be 948 kl/day (see table below).

Table 24: Peak Day Dry Weather Flow (PDDWF) for water

ERF NO	USE	AREA	APPLICATION FLOOR AREA RATIO	Floor Area	Sewer outflow per area	Sewerage Outflow kl/day
Erf 1	Public open space	14.441	0.05	7220.5	0.4	28.882
Erf 2	Industrial 1	45.979	0.5	229895	0.4	919.58
Erf 3	Municipal	0.332	0.03	99.6	0.4	0.3984
Total		60.752 ha				948.8604

8.13.2 Electricity

There is not sufficient bulk services on the erf boundary for the proposed development. The developers is in process to confirm the actual demand of the individual end users. At present the confirmed load from some of the users is higher than the guidelines. The estimated demand for the complete development is 17MVA and it is expected that an application for increase the point of supply demand may be submitted in the future.

Due to the tight timelines of this project we propose that the bulk services infrastructure between the new proposed 11kV substation and the existing Watloo 3 substation should be installed under this development. The installation will be sufficient for the planned demand. It will include the feeder cables, extension of the Watloo 3 substation and installation of additional feeder breakers.

8.13.3 Roads and Traffic

A Traffic Impact Assessment for the proposed development was conducted by Innovative Transport Solutions (ITS), during March 2019.

This Transport Impact Assessment investigated the following:

- Accesses to the proposed development,
- The impact of the development on the surrounding road network,
- Upgrades required to accommodate the additional traffic generated by the proposed development,
- Public transport requirements, and
- Non-Motorised Transport requirements.

The study investigated the impact on the traffic for the development of the Tshwane Automotive City development, which will be situated on portion RE/89 of Farm The Willows 340-JR. The study also included ERF 10878 of Nellmapius X13, which is the floodplain area of the Willow Spruit on the eastern boundary of the proposed development.

The study allowed for the proposed zoning of Industrial 1 land use, which will consist of motor vehicle parts manufacturing industries, subservient offices and clinic. The extent of the office and clinic will be less than 15%, therefore their trips were not calculated. The trip generation was based on the main land use of the development, which is manufacturing.

The following intersections in close vicinity to the development were evaluated:

- Simon Vermooten Road / Bronkhorstspruit Road (Traffic signal controlled),
- Alwyn Road / Love Drive (Roundabout controlled),
- Alwyn Road / Bandura Street (Roundabout controlled),
- Simon Vermooten Road / Alwyn Road (Traffic signal controlled),
- Simon Vermooten Road / Waltloo Road (Traffic signal controlled), and
- Waltloo Road / Tsamaya Avenue (Traffic signal controlled).

Existing road network characteristics

The surrounding road network comprise of the following roads whose classification is based on the City of Tshwane Road Master Plan:

- **Tsamaya Avenue/ Stormvoel Road:** Is a U2 Primary Metropolitan distributor road. It changes from a single carriageway with one lane per direction (Stormvoel Road) to a dual carriageway with two lanes per direction (Tsamaya Avenue).
- **Simon Vermooten Road:** Is a U2 Metropolitan distributor road. The existing cross section is a dual carriageway, three lanes per direction with pedestrian sidewalks.
- **Bronkhorstspuit Road:** Is a U2 Metropolitan distributor road. The existing cross section is a single carriageway, one lane per direction and gravel shoulders on both sides.
- **Waltloo Road:** Is a U3 District distributor road. The existing cross section is a dual carriageway, two lanes per direction with pedestrian sidewalks.
- **Alwyn Road:** Is a U3 District distributor road. The existing geometry is a single carriageway with one lane per direction.
- **Love Drive:** Is a U4 collector road. The existing cross section is a single carriageway, one lane per direction.

Access to the proposed development

The proposed development will have regional access from the N1 & N4, as well as the class 2 roads in the vicinity of the development. The proposed development will gain direct access from a proposed new access road, which is planned as a class U3 District distributor road located approximately 800 m from the Simon Vermooten Road / Alwyn Road intersection. This proposed access road is planned to, in future, be a dual carriageway with two lanes per direction. The following two accesses are proposed along this Proposed Access Road:

- Access 1 (intersection 8 in the schematic figures) is located approximately 500 m from the Alwyn Road / Proposed Access Road intersection (intersection 4 in the schematic figures).
- Access 2 (intersection 9 in the schematic figures) is located approximately 500 m from the Proposed Access Road / Access 1 intersection (intersection 8 in the schematic figures).

The access intersection geometry and control is shown Figure 42. Each access will be constructed to the appropriate design standards of the road's authority.

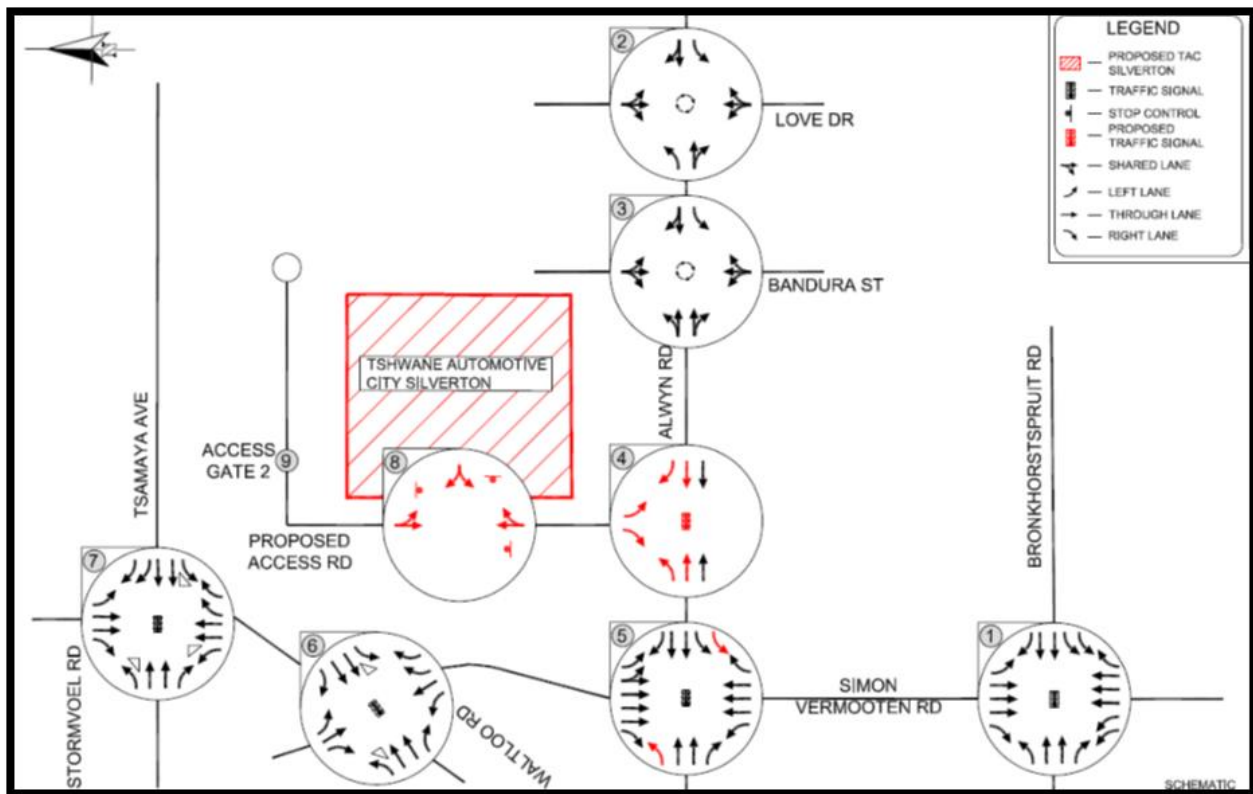


Figure 42: Surveyed Intersections

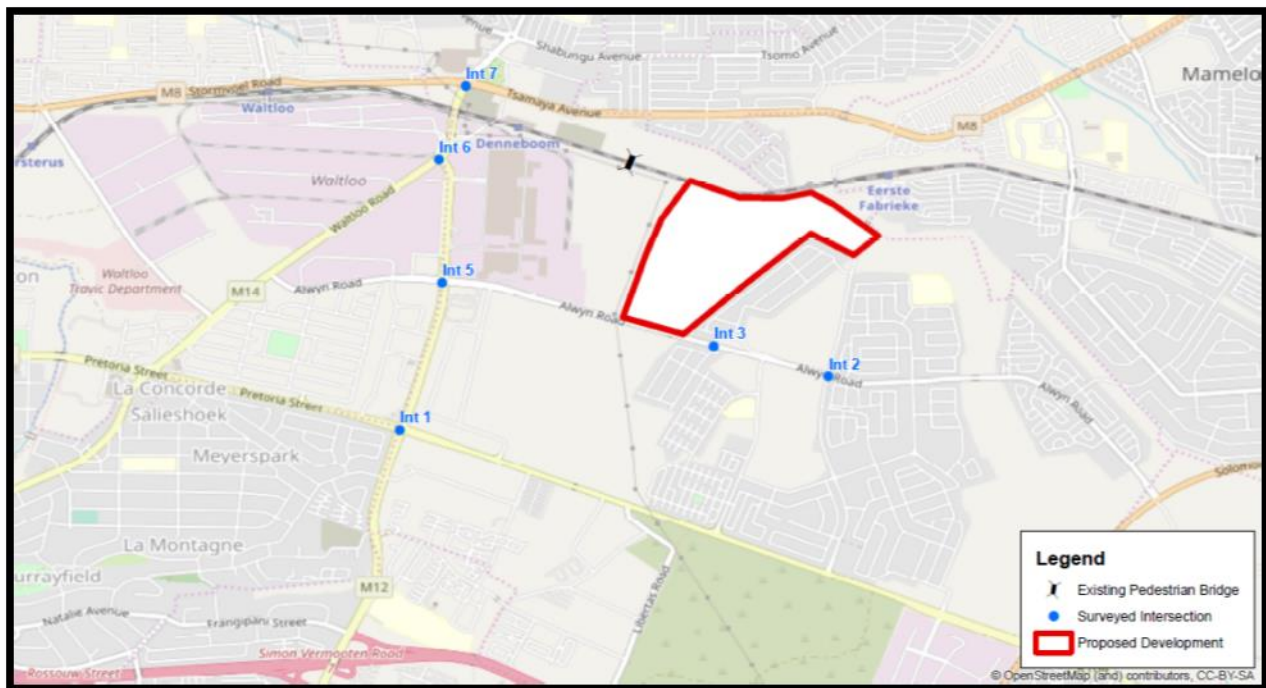


Figure 43: Intersection geometry and controls

Background and Future Traffic Demand

To establish the background traffic volumes manual traffic counts were conducted during the peak periods on Thursday 21st February 2019. The critical peak hour is between 06:30 - 07:30 during the morning (AM) peak and 16:00 - 17:00 during the afternoon (PM) peak. The trip distribution was based on the current land use around the proposed development. Since the proposed SEZ will create job opportunities, it was assumed that the trips in the AM and PM peak hour would be between the residential areas and the development. The expected trip assignment for the development was based on the shortest routes between the development and the nearby residential areas.

The study indicated that the proposed development is expected to generate 592 vehicles per hour during both the AM and PM peak hour. A combined trip adjustment factor for low vehicle ownership and transit mode was applied to the land use trip rates. The development is close to public transport node (Denneboom intermodal facility) and a public transport facility will be provided within the boundaries of the development. Additional measures to promote the use of public transport and measures to link the development to existing transport nodes will be investigated.

Since it is planned to develop the entire development over five years, the following traffic scenarios were assessed:

- **Base Year 2019:** The base year existing traffic volume counts were counted on the existing road network.
- **Horizon year 2024:** Horizon year background traffic with the full development traffic demand.

A traffic growth rate of 2.5% per annum was applied to estimate the 2024 background traffic demand. The area is already dense with few pockets of open land. Taking that into consideration it is believed that the growth rate per annum used is conservative. It was therefore assumed that the growth rate takes into consideration unknown latent rights.

Analysis scenarios and capacity Analysis

To assess the impact of the proposed development on the surrounding road network, three scenarios were analysed. Traffix 8.0 software was used to determine the intersection capacity.

- The capacity analysis results show that three intersections will operate at unacceptable level of service due to the **background traffic demand**.
- The capacity analysis results further show that one existing intersection will operate at unacceptable level of service due to the **development traffic demand**.

It is expected that the analysed intersection will operate at acceptable LOS for all scenarios with proposed upgrades in place.

ROAD AND/OR INTERSECTIONS IMPROVEMENTS

The following intersections will have to be upgraded to accommodate both the background traffic demand and the development traffic demand:

Upgrades required due to background traffic

- Simon Vermooten Road / Bronkhorstspuit Road (Traffic signal controlled),

Upgrades required due to Development Traffic

- Simon Vermooten Road / Alwyn Road (Traffic signal controlled),
- Alwyn Road / Proposed Access Road intersection (Roundabout controlled),
- Access 1 and internal access road intersection (Stop Controlled).

The proposed road upgrades are indicated in Table 25 below.

Table 25: Proposed road upgrades

Intersection	Approach	Proposed Upgrades
Background Traffic Upgrades		
Intersection 1: Simon Vermooten Road / Bronkhorstspuit Road	Eastern	1. An additional left turn lane
Development Upgrades		
Intersection 4: Alwyn Road / Proposed Access Road	Western	2. A dedicated left turn lane
		3. An additional through lane
	Eastern	4. A dedicated right turn lane
		5. An additional through lane
	Northern	6. A dedicated right turn lane
		7. A dedicated left turn lane
Intersection 5: Simon Vermooten Road / Alwyn Road	All	8. Erect a traffic signal
Intersection 5: Simon Vermooten Road / Alwyn Road	Western	9. An additional left turn lane
	Eastern	10. An additional left turn lane
Intersection 8: Proposed Access	All	11. Erect stop signs

Road / Access 1		12. A shared left, through and right turn lane
-----------------	--	--

NON-MOTORISED & PUBLIC TRANSPORT

➤ Public Transport

It is expected that taxis and buses, as well as passenger trains, will provide public transport for this development. The Denneboom intermodal facility is approximately 1 km from the proposed development. It will be accessed via a pedestrian bridge over the rail line, located north- west of the development. Further to that the developer will make provision for a public transport facility within the development's boundaries.

It is proposed that public transport lay-bys be provided at the following intersections:

- Alwyn Road / Proposed Access Road; and
- Proposed Access Road / Access 1.

➤ Non-Motorised Transport

Sidewalks have been provided along Alwyn Road west of the proposed access intersection. The following sidewalks are proposed:

- Along the Proposed Access Road on the eastern side of the road;
- Along the northern side of Alwyn Road between the Proposed Access Road and Bandura Street; and
- Between the existing pedestrian bridge and the development.

PARKING REQUIREMENTS

The proposed development will provide 1 435 parking bays, which is 40 bays over the required 1 395 parking bays.

8.13.4 Storm water drainage

Description of the drainage areas

The site is mainly vegetated with grass, bush and trees. Apart from an old test tract and a stormwater channel draining stormwater run-off from the Samcor Park site, there are no other infrastructure on the site. The site slopes predominantly in an eastern direction towards the Willow Spruit on the eastern boundary of the site. The slopes range from 0.5% to 2.5%. The bulk of the stormwater run-off from Samcor Park currently drains through a channel and a series of storm attenuation ponds to discharge into the Willow Spruit. The remaining stormwater from Samcor Park drains overland across the site to the Willow Spruit. Waltloo on the western side of Samcor Park drains in a northern direction, with none of its run-off draining to the Willow Spruit. The area to the south of Alwyn street also drain in an easterly direction towards the Willow Spruit, but does not affect the site.

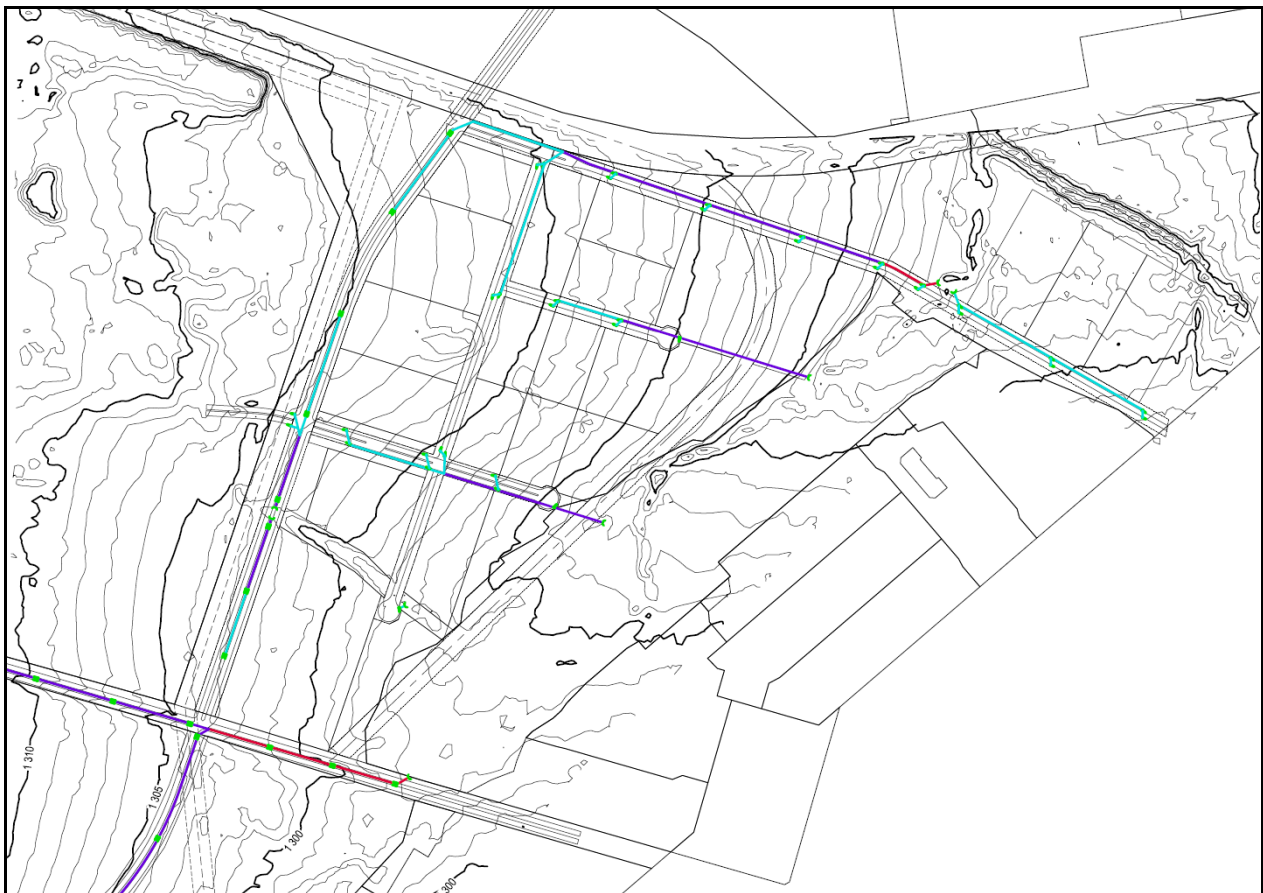


Figure 44: Stormwater Drainage Areas

The main stormwater elements are:

- The Willow Spruit, which is situated on the eastern boundary of the site. Willow Spruit is a tributary of the Pienaars rivier. It originates in Equestria to the south and joins the Pienaarsrivier on the north eastern side of the development.
- A stormwater channel, with attenuation facilities draining stormwater run-off from the Samcor Park development to the west of the site to the Willow Spruit to the east of the site.

The proposed formal drainage system for the development will consist primarily of a combination of surface and sub-surface drainage system. The streets also support an important drainage function within built-up areas. The shift toward sustainable forms of development has seen the emergence of Sustainable Urban Drainage systems (SUDs). SUDs consist of a range of measures that emulate a natural drainage process to reduce the concentration of pollutants and reduce the rate and volume of urban run-off into natural water systems (and thus the pollutants it carries).

SUDS are considered to be environmentally beneficial, and are often regarded as a sequence of management practices, control structures and strategies designed to efficiently and sustainably drain surface water, while minimising pollution and managing the impact on water quality of local water bodies. The incorporation of SUDs elements into the fabric of the street itself can also serve to increase legibility and add value to place.

The following two SuDS elements should ideally be accommodated in the road reserves in the development:

- **Swales:** usually shallow grassed or vegetated channels used to collect and/or move water. The shallow side slopes and flat bottom mean that for most of the time water flows in a thin layer. Some of them can be under-drained with the use of perforated pipe. Swales can also provide storage and filtration.
- **Bioretention areas:** vegetated areas with specially designed engineering soils and sand layers, which filter out pollutants from surface water runoff. Bioretention features have an aesthetic and biodiversity value as they can be planted to enhance

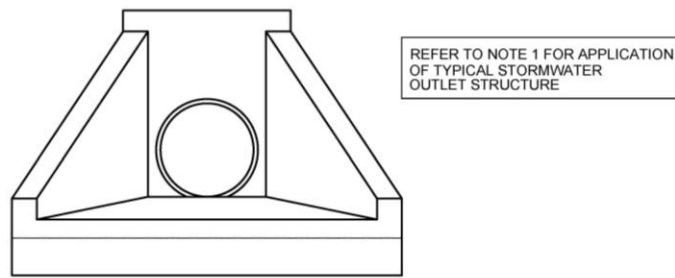
identity and are attractive landscape features. Bioretention areas are often depressions in the ground to create opportunities for storage and attenuation. The filtration layers are usually under-drained using a perforated pipe system and where appropriate can allow infiltration. Trees can also be incorporated into bioretention systems and they can therefore be integrated with streetscapes and other public realm areas.

The design of the stormwater system is according to the criteria and parameters as set out in Table 26 below.

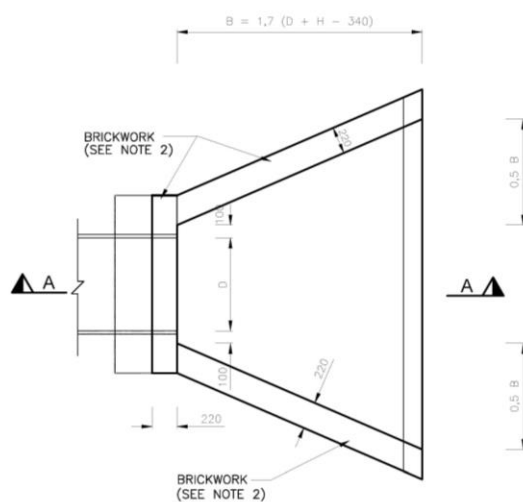
Table 26: Design criteria and parameters

Mean Annual Precipitation	692 mm
Design Storm Recurrence Interval	Major System 1:20 year Minor System 1:2 – 5 year
Design Calculation Programs	PCSWWM Stormwater Modelling Software Utility Programs for Drainage (University of Pretoria)
% Imperviousness	Building roofs 100 Roads 90 - 100 Lawns 5 - 15 Open veld 5 – 20
Open drains	
Type	Unlined V-drains or trapezium drains.
Maximum slope	1:50
Minimum slope	1:200
Minimum side slopes	1:1.5
Energy dissipaters	Provide where super-critical flow manifests
Underground System	
Type Culvert	Concrete pipe or box culverts
Minimum Size	600 mm diameter/height
Minimum grade	1:200
Minimum cover	As per design
Bedding	SANS 1200 LB
Pollution Control Dam	Sized to accommodate the 1:50 year flood event based on the 24h rainfall method
Pollution Control Dam Freeboard	Minimum 800mm
Pollution Control Dam Lining	2mm thick HDPE liner

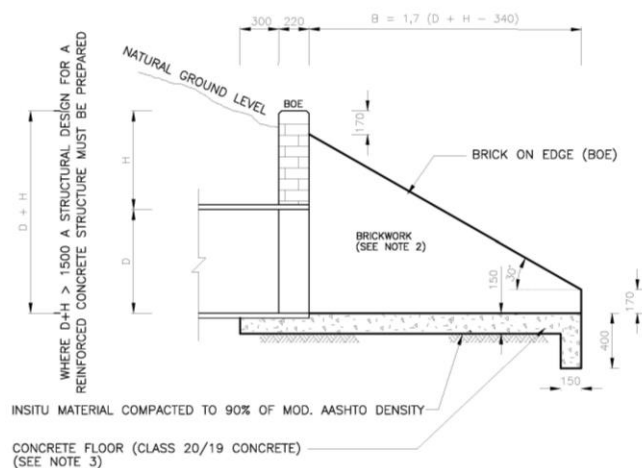
The storm water outlet designs has to conform to the City of Tshwane Metropolitan Municipality standards. The storm water outlet designs are presented below



ELEVATION OF TYPICAL STORMWATER OUTLET STRUCTURE

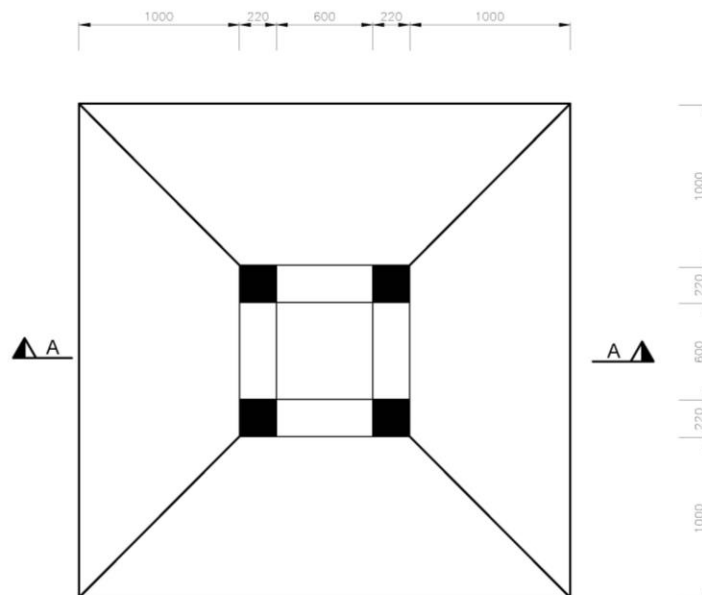


PLAN OF TYPICAL STORMWATER OUTLET STRUCTURE

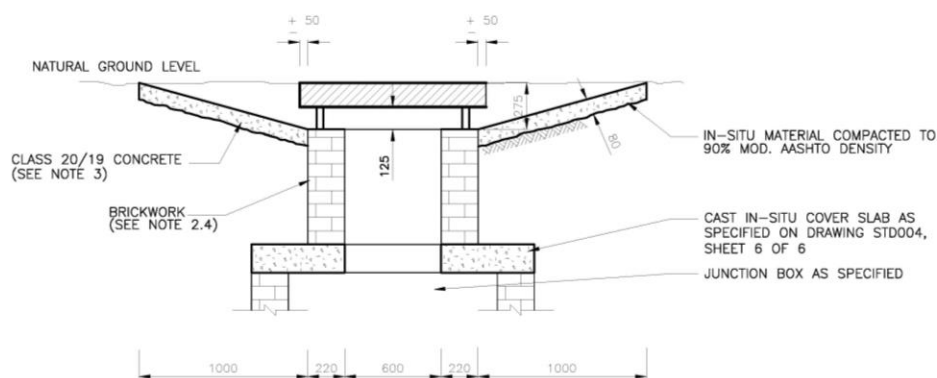


SECTION A-A

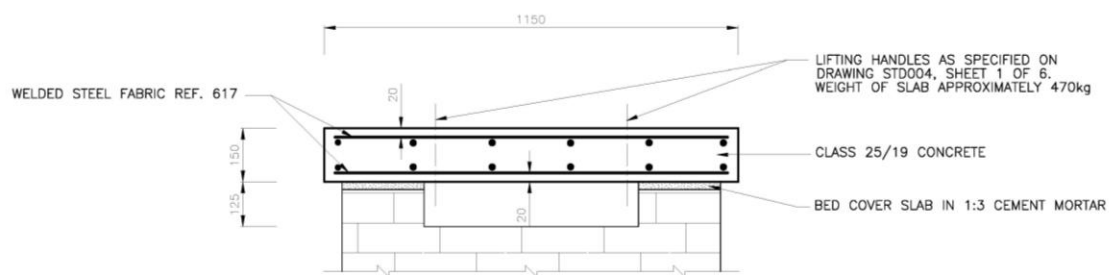
Figure 45: Stormwater Drainage designs



PLAN OF FIELD INLET (Without cover slab)



SECTION B-B



DETAIL OF PRECAST COVER SLAB

Figure 46: Stormwater Drainage designs (cont.)

8.14 MAMMALS HABITAT ASSESSMENT

A field investigation was undertaken on 11 May 2019 to supplement and confirm several findings from the desktop study. This mainly served as a fatal flaw analyses to determine whether any major ecological concerns exist with regards to the study area surface infrastructure establishment.

During the field investigation the observed and derived presence of mammals associated with the recognised habitat types of the study site, were recorded. In addition, mammals were also identified by means of tracks, droppings, burrows, or shelters. No trapping or mist netting was conducted, as the scope of work did not require such intensive work.

8.14.1 Species of conservation concern

It is noted that not all of the species listed in this section of the report may necessarily occur on the study site, as suitable habitats or microhabitats may not be present, or the levels of disturbance may be too high. Conversely, it is equally likely that additional species, not listed here, may be present within the study area. The information provided here is based on the greater area and not specifically to the study area. The main purpose of this report is therefore to determine the level of site sensitivity based on the likelihood of important or sensitive species to occur. This section of the report focusses specifically on red data species potentially occurring within the study area. To compile a list of conservation worthy species, numerous literature sources were investigated.

- The **Aardvark** (*Orycteropus afer*) is listed by the Mammal Red List (2016) as Least Concern. However, is still protected by the TOPS List. Although widespread throughout South Africa, Aardvarks are nowhere common and occur at low densities. The reproductive rates of Aardvarks are low (maximum one offspring/year), which makes them vulnerable to disturbance. For example, the effects of the bushmeat and traditional medicine trade, as well as persecution for damaging fences and croplands, may cause local population declines and extinctions. As such, their numbers undoubtedly are reduced in areas where their habitat is altered by human activities or where there is high human density.
- **Servals** (*Leptailurus serval*) are wetland specialists, mostly found in and around marshland, well-watered savannah and long-grass environments, and are particularly

associated with reedbeds and other riparian vegetation types. As indicated by the Mammal Red List, they appear to be adaptable to rural agricultural and/or industrial areas where appropriate wetland habitat is conserved or created, and thus areas where prey species thrive. The major threat to Serval is loss and degradation of wetland and associated grassland. Of secondary importance is the degradation and loss of grasslands through several factors including annual burning followed by over-grazing by livestock, intensive wildlife/livestock farming and transformation with changing land-use, increased anthropogenic structures (roads, buildings) and invasive alien plants. The trade in Serval skins for ceremonial traditions is another important threat and contributes to a suspected ongoing decline in mature individuals. Hybridisation with feral cats may be a minor threat, although this is not as severe as with other species.

- All **Caracal** (*caracal*) populations (except for the Asia population) are included under Appendix II of CITES. Appendix II of CITES includes species not necessarily threatened with extinction, but in which trade must be controlled to avoid utilisation incompatible with their survival. An international trade exists for Caracals to be kept as pets, especially in the USA, Russia, Canada and the Netherlands. In South Africa the Caracal is listed as Least Concern by the Mammal Red List (2016). They are considered highly adaptable and, within their distribution area, are found in virtually all habitats except the driest part of the Namib. They also tolerate high levels of human activity and persist in most small stock areas in southern Africa, despite continuously high levels of persecution over many decades.
- The **Honey Badger** (*Mellivora capensis*) is listed under Appendix III of CITES. This Appendix contains species that are protected in at least one country, which has asked other CITES Parties for assistance in controlling the trade. In South Africa the Honey Badger is listed as Least Concern by the Mammal Red List (2016) and has a wide habitat tolerance and a large area of occupancy. However, the body parts (particularly paws, skin and organs) of this species are commonly used locally in traditional medicine because of the species' reputation for fearlessness and tenacity. They are also hunted as trophy animals and exported.
- The Vulnerable **White-tailed Rat** (*Myodomys albicaudatus*) occur within dryer grassland areas. It has an extremely patchy and fragmented area of occupancy due to its preference for microhabitats within vegetation types and transitory habitats created after fire. There is an inferred continuing decline from grassland habitat loss (due to

expansion in crop agriculture, urban and industrial development, and climate change) and grassland habitat degradation, primarily from suppression of natural fire regimens. Suppression of natural fire results in microhabitats required by the species not being created or recycled.

- Although the Near Threatened **Southern African Hedgehog** (*Atelerix frontalis*) has a wide range and occurs across a variety of habitats, there is a suspected continuing decline in the population. As indicated by the Mammal Red List (2016), many anecdotal reports from landowners across the country suggest a decline of some sort over the past 10-20 years due to predation by domestic pets, fire frequency, pesticide usage, electrocution on game fences, and ongoing illegal harvesting for the pet trade and traditional medicine trade. It is therefore suspected that the declining population is indicative of increasing threat levels associated with domestic animals, harvesting and restricted movement, rather than urban and rural expansion *per se*.
- The Vulnerable **Maquassie Musk Shrew** (*Crocidura maquassiensis*) and the Near Threatened Swamp Musk Shrew (*Crocidura mariquensis*) both rely on moist grassland habitats in the savannah and grassland biomes. The species is suspected to have a low dispersal capacity and exists in fragmented habitat. The main threats to shrews are the loss or degradation of moist, productive areas such as wetlands and rank grasslands within suitable habitat due to continuing rates of urban and rural expansion which may have increased overgrazing and surface water abstraction. This in turn may reduce the suitability of patches and the corridors between them. Suppression of natural ecosystem processes, such as fire, can also lead to habitat degradation through bush encroachment or loss of plant diversity through alien invasive infestation, and is suspected to be increasing with human settlement expansion.
- Similarly, the Near Threatened **African Marsh Rat** (*Dasymys incomtus*) and the Near Threatened **Vlei Rat** (*Otomys auratus*) is dependent on intact rivers and wetland ecosystems, as they have not been found in artificial or degraded wetlands. Both species are therefore patchily distributed. Wetlands are continuing to be lost with agricultural and human settlement expansion, which in turn increases wetland degradation from overgrazing, water abstraction, pollution and invasive alien plant sprawl.
- The Near Threatened **Brown Hyena** (*Hyena brunnea*) is widespread in South Africa and is found in a variety of habitats. Brown Hyena densities are highest in protected areas compared to neighbouring unprotected rangelands. Private protected areas also

contribute to Brown Hyena conservation. Brown Hyenas are typically able to penetrate most game fences by utilising holes dug by other mammals and as such habitat fragmentation in areas of cattle or game ranching is lessened. Causes of fragmentation include urbanisation or land given to arable production which Brown Hyena rarely frequent. Most Brown Hyenas in the northwest of South Africa, and assumedly across the country, live on private land outside of protected areas where they may come into conflict with humans. They are often shot, poisoned, trapped, snared and hunted with dogs in an attempt to reduce livestock predation events. Brown Hyenas are furthermore often killed on roads and small isolated subpopulations in reserves surrounded by predator-proof fencing may be at risk of inbreeding depression impacting the populations.

- The Vulnerable **Spotted-necked Otter** (*Hydrictis maculicollis*) is restricted to areas of permanent fresh water offering good shoreline cover and an abundant prey base (lakes and larger rivers). The Near Threatened Cape Clawless Otter (*Aonyx capensis*) is more habitat tolerant and found in a wide variety of aquatic settings, including riverside, wetland and coastal habitats where access to freshwater is available. Overall otter populations may be declining as river habitat is lost to development and infestations of alien species in riparian areas, and riverside vegetation degradation from overgrazing. Habitat loss and degradation is exacerbated by human disturbance, including both direct and indirect persecution and/or hunting, reduction of denning sites and diminishment of the species' prey base which may be attributed to decreasing river quality from agricultural and industrial run-off.

8.14.2 Species identified and derived to reside within the study area

Table 27 below summarises mammal species positively identified or derived to reside or temporarily enter the study area and surroundings. It should be noted that potential occurrences are interpreted as being possible over a period of time. All feral mammal species expected to occur on the study site (e.g. horses, cats, dogs, cattle etc.) were omitted from Table 27 since these species are normally associated with residential settings.

Table 27: Mammal species identified and derived to reside within the study area

Class	Scientific Name	Common Name
Mammalia	<i>Sylvicapra grimmia</i>	Common Duiker

Class	Scientific Name	Common Name
Mammalia	<i>Canis mesomelas</i>	Black-backed Jackal
Mammalia	<i>Atelerix frontalis</i>	Southern African Hedgehog
Mammalia	<i>Graphiurus murinus</i>	Forest African Dormouse
Mammalia	<i>Graphiurus platyops</i>	Rock Dormouse
Mammalia	<i>Cynictis penicillata</i>	Yellow Mongoose
Mammalia	<i>Herpestes sanguineus</i>	Slender Mongoose
Mammalia	<i>Mungos mungo</i>	Banded Mongoose
Mammalia	<i>Hystrix africaeaustralis</i>	Cape Porcupine
Mammalia	<i>Lepus saxatilis</i>	Scrub Hare
Mammalia	<i>Elephantulus myurus</i>	Eastern Rock Elephant Shrew
Mammalia	<i>Aethomys ineptus</i>	Tete Veld Aethomys
Mammalia	<i>Micaelamys namaquensis</i>	Namaqua Rock Mouse
Mammalia	<i>Dasymys incomtus</i>	Common Dasymys
Mammalia	<i>Lemniscomys rosalia</i>	Single-Striped Lemniscomys
Mammalia	<i>Mastomys coucha</i>	Southern African Mastomys
Mammalia	<i>Mastomys natalensis</i>	Natal Mastomys
Mammalia	<i>Mus indutus</i>	Desert Pygmy Mouse
Mammalia	<i>Mus minutoides</i>	Southern African Pygmy Mouse
Mammalia	<i>Mus musculus</i>	House Mouse
Mammalia	<i>Otomys angoniensis</i>	Angoni Vlei Rat
Mammalia	<i>Otomys auratus</i>	Vlei Rat
Mammalia	<i>Otomys irroratus</i>	Southern African Vlei Rat
Mammalia	<i>Rattus rattus</i>	Roof Rat
Mammalia	<i>Rhabdomys pumilio</i>	Xeric Four-striped Grass Rat
Mammalia	<i>Rhabdomys dilectus</i>	Mesic Four-striped Mouse
Mammalia	<i>Gerbilliscus brantsii</i>	Highveld Gerbil

Class	Scientific Name	Common Name
Mammalia	<i>Gerbilliscus leucogaster</i>	Bushveld Gerbil
Mammalia	<i>Saccostomus campestris</i>	Southern African Pouched Mouse
Mammalia	<i>Steatomys pratensis</i>	Common African Fat Mouse
Mammalia	<i>Crocidura hirta</i>	Lesser Red Musk Shrew
Mammalia	<i>Crocidura maquassiensis</i>	Makwassie Musk Shrew
Mammalia	<i>Crocidura mariquensis</i>	Swamp Musk Shrew
Mammalia	<i>Suncus lixus</i>	Greater Dwarf Shrew
Mammalia	<i>Suncus varilla</i>	Lesser Dwarf Shrew
Mammalia	<i>Thryonomys swinderianus</i>	Greater Cane Rat
Mammalia	<i>Neoromicia capensis</i>	Cape Serotine
Mammalia	<i>Genetta genetta</i>	Small spotted Genet
Mammalia	<i>Leptailurus serval</i>	Serval
Mammalia	<i>Mystromys albicaudatus</i>	White-tailed Rat
Mammalia	<i>Felis silvestris</i>	African Wild Cat
Mammalia	<i>Orycteropus afer</i>	Aardvark
Mammalia	<i>Mellivora capensis</i>	Honey Badger
Mammalia	<i>Aonyx capensis</i>	Cape Clawless Otter
Mammalia	<i>Hydriactis maculicollis</i>	Spotted-necked Otter
Mammalia	<i>Civettictis civetta</i>	African Civet
Mammalia	<i>Species: Ictonyx striatus</i>	Stiped Polecat

8.14.3 Sensitivity assessment

As indicated by the Red List literature review for this assessment, numerous mammal species of conservation concern could potentially occur within the vicinity of the study area. The habitat types available for sensitive species to reside is mainly focussed on the Wetland/Riparian vegetation. However, as mentioned earlier, the Wetland/Riparian area found on site is over-run with invasive plant species and problematic plants. It is therefore unlikely that sensitive species would permanently reside within this area. However, sensitive species might occasionally wander into these areas while foraging and could utilise the wetland/river area as a corridor for moving through the landscape. These areas should therefore be protected. Not only benefiting aquatic species, but also terrestrial species which requires the occasional visit to the aquatic habitats.

The little remaining savannah woodland patches are fragmented and highly impacted by anthropogenic activity (dumping and wood chopping). These areas are not seen sufficient to host sensitive mammal species. Similarly, the secondary grassland areas seem to be regularly burned and is not expected to be a permanent residence for sensitive mammal species. These areas are impacted by gravel/tar roads and concrete structures typical of vehicle testing grounds. An artificial step channel is furthermore found in the western section of the study site. It is uncertain what the purpose of this channel is/was. However, it seems that water is/was released from a dam on the western adjacent property toward the drainage line transecting the study site.

The sensitivity assessment determines the status and ecological quality of the study area. Areas consisting of natural vegetation of conservation concern, high species diversity, habitat complexity, red list organisms and/or systems vital to sustaining ecological function are considered sensitive. In contrast, areas that are transformed and have little importance for ecological functioning are considered to be of low sensitivity.

Smaller sensitive mammal species might potentially reside within the wetland areas within the study area, whether temporary or permanent. Mammal species (smaller and larger) might furthermore use these wetland areas as corridors for movement through the landscape. Taking all relevant criteria into account, the sensitivity indicated in Figure 47 was compiled.

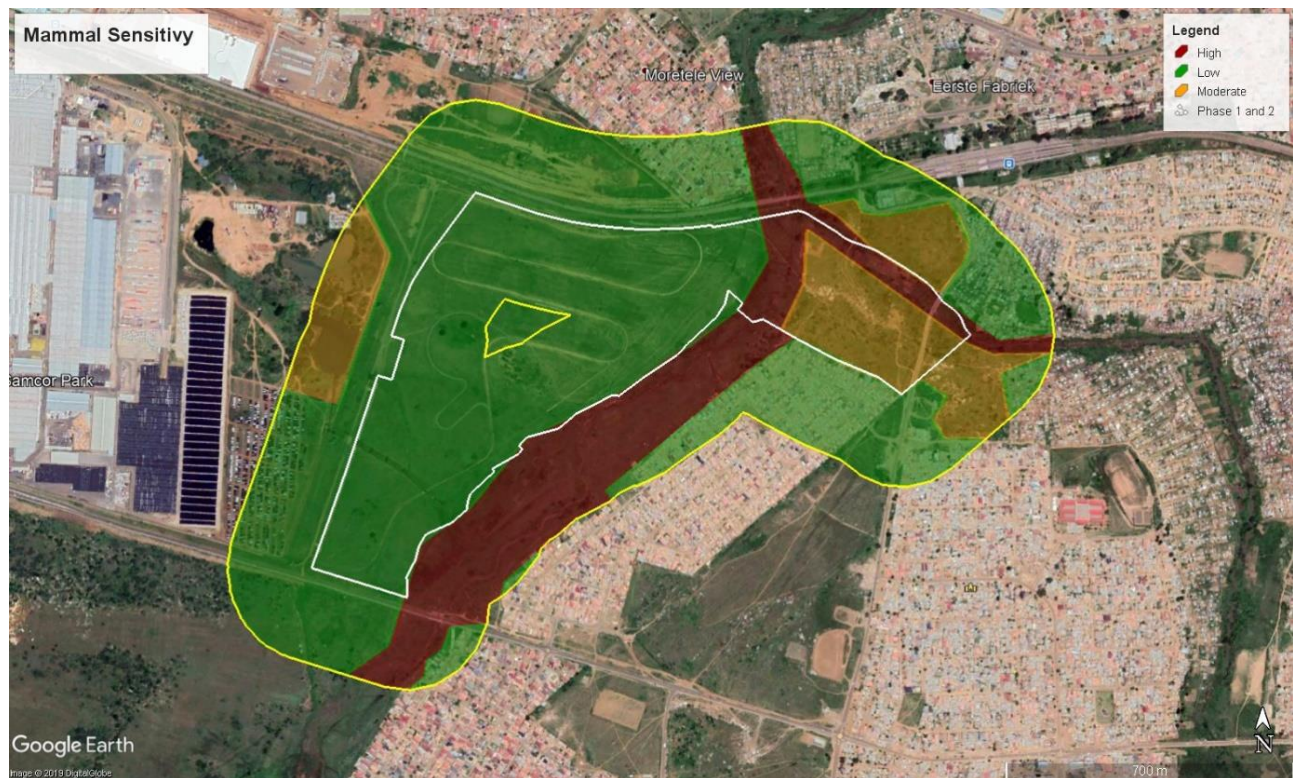


Figure 47: Mammal sensitivity map for the study area.

8.14.4 Conclusion and recommendations

Without any mitigation, the proposed development is expected to have a Moderate to High impact on mammal habitat and species. However, with the implementation of the mitigation measures recommended in this report, the impact will be reduced to a Moderate significance and will be limited to the development footprint area as far as possible.

Although the study site is situated within an Ecological Support Area (as indicated by the GDARD C-plan) the field investigation confirmed the study area to mainly comprise secondary grassland vegetation of low biodiversity significance.

The potential habitat available within the study area is somewhat fragmented. It is highly unlikely that larger mammals would permanently reside within the study area. The wetland to the east does however act as a corridor for movement of mammal species taking the larger region into account. The wetlands have historically been encroached by anthropogenic activity and burnt, which, taking the regional land uses into account, could potentially be a regular practise. At the time of the field

investigation these wetland areas did not provide sufficient habitat for sensitive species. However, these conditions might potentially improve as the summer season progresses and should therefore be considered able to host sensitive species at some point or another. It is important that the wetland areas together with a 50 m buffer zone be protected and improved if possible. If these areas cannot be avoided, the appropriate wetland offset strategies must be implemented. Smaller sensitive mammal species might potentially reside within the wetland areas within the study area, whether temporary or permanent.

The Environmental Management Plan (EMPr) should make adequate provision to protect local mammal species and habitat. This will be ensured by taking all mitigation measures listed in this report into account to control the impacting activities of the proposed development on the site. An Environmental Control Officer (ECO) must be appointed prior to construction to oversee mitigation measures during construction and whom will be responsible for the monitoring and auditing of the Contractor's compliance.

9. ACTIVITIES, IDENTIFIED IMPACTS AND PRELIMINARY ASSESSMENT

9.1 INTRODUCTION

This section of the Scoping Report provides a list of the biophysical and social issues that can be expected as a result of the proposed road development. Some of the issues are localised in their effects, whilst others could influence a more extensive area. In light of the aim of the Scoping report is that issues needs to be identified.

The identification and brief descriptions of the relevant physical, biological, socio-economic and heritage issues were conducted under the following headings in Table 6:

- Environmental aspects: defined as those actions on site that may potentially have an environmental impact;
- Environmental component to be impacted upon;
- Locality / applicable zone of the impact; and
- Nature and description of the impact or issue

An impact significance rating and evaluation, for the listed aspects, will form part of the EIA process/report to follow the environmental scoping process. The methodology of impact assessment and its significance rating is included in the attached Plan of Study for EIA. Most of the identified and anticipated negative impacts listed below will only take effect once the construction of the development commences; the main period of positive impact occurrence is during the long term “operational” phase when it is felt that the broader community will benefit from the project in terms of effectiveness of transport infrastructure and road safety. The long term negative operational impacts however will also be experienced by the close by residence in terms of Noise, and other traffic issues such as access to and from the plant.

9.2 METHODOLOGY

The impact assessment methodology used to determine the significance of impacts prior and after mitigation is presented below

Impact Significance Methodology

The **Significance** of Environmental Impacts is to be assessed by means of the following method:

Significance is the product of probability and severity. Probability describes the likelihood of the impact actually occurring, and is rated as follows:

- Improbable - Low possibility of impact to occur either because of design or historic experience.

1.1.1.1 Rating = 2

- Probable - Prominent possibility that impact will occur.

1.1.1.2 Rating = 3

- Highly probable - Most likely that impact will occur.

1.1.1.3 Rating = 4

- Definite - Impact will occur regardless of any prevention measures

1.1.1.4 Rating = 5

1.1.1.5 The severity rating is calculated from the factors given to intensity and duration. Intensity and duration factors are awarded to each impact, as described below.

The **Intensity factor** is awarded to each impact according to the following method:

- Low intensity - Nature and/or manmade functions not affected and a minor impact may occur.

1.1.1.6 Factor 1

- Moderate intensity
 - Environment affected but natural functions and processes can continue though often in a slightly altered manner.

1.1.1.7 Factor 2

- High intensity
 - Environment affected to the extent that natural functions are altered to the extent that it will temporarily or permanently cease.

1.1.1.8 Factor 4

Duration is assessed and a factor awarded in accordance with the following:

- Short term
 - ≤ 1 to 5 years

1.1.1.9 Factor 2

- Moderate term
 - 5 – 15 years

1.1.1.10 Factor 3

- Long term
 - Impact will only cease after the operational life of the activity, either because of natural process or by human intervention.

1.1.1.11 Factor 4

- Permanent
 - 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.

1.1.1.12 Factor 5

The **severity rating** is obtained from calculating a severity factor, and comparing the severity factor to the rating in the table below, for example:

The Severity factor	Intensity factor X Duration factor
	$2 \times 3 = 6$

A Severity factor of 6 (six) equals a Severity Rating of Moderate severity (Rating 3) as per table below:

Table 28: Severity Ratings

	FACTOR
Low Severity (Rating 2)	Calculated values 2 to 4
Moderate Severity (Rating 3)	Calculated values 5 to 8
High Severity (Rating 4)	Calculated values 9 to 12
Very High Severity (Rating 5)	Calculated values 13 to 16 and more
Severity factors below 3 indicate no impact	

1.1.1.13 A Significance Rating is calculated by multiplying the Severity Rating with the Probability Rating:

1.1.1.14 The significance rating should influence the development project as described below:

- Low significance (calculated Significance Rating 4 to 6)
 - Positive impact and negative impacts of low significance should have no influence on the proposed development project
- Moderate significance (calculated Significance Rating ≥ 7 to 12)
 - Positive impact

1.1.1.15 Should indicate that the proposed project should be approved

Negative impact:

Should be mitigated or mitigation measures should be formulated before the proposed project can be approved

- High significance (calculated Significance Rating ≥ 13 to 18)

-

Positive impact:

Should points towards a decision for the project to be approved and should be enhanced in final design

Negative impact:

Should weigh towards a decision to terminate proposal, or mitigation should be formulated and performed to reduce significance to at least low significance rating.

Very High significance (calculated Significance Rating ≥ 19 to 25 and more)

9.3 ACTIVITIES, IMPACTS AND PRELIMINARY ASSESSMENT

The description and identification of anticipated impacts is based on the listing of **environmental aspects**. Environmental aspects, for the purposes of this document, is the term used to *describe the actions that may have an impact on one or more of the environmental components listed*. It is important to note that aspects that are clearly definable have been used in preference to those that are duplicative, redundant, difficult to measure, and/or obscure.

An impact is defined as any change in the physical, chemical, biological, cultural, and/or socio-economic environmental system that can be attributed to human activities relative to alternatives under study for meeting a project need. Therefore, the identified environmental aspects are said to have an impact on the components listed above if they result in change.

One of the most important objectives of conducting an Environmental Impact Assessment is to identify and evaluate these aspects and impacts. Consequently, the environmental management programme (EMPr) will consist of the preferred mitigation and management options for the identified impacts assessed as being significant. These will be described within the EIA (and EMP) report to follow.

The environmental aspect and the resultant impact can become manifest during the **construction phase (C)** and/or the **operational phase (O)**, which is the stage when the proposed upgrading of the road is complete and fully functional.

9.4 ISSUE / IMPACT ASSESSMENT FOR THE PROPOSED DEVELOPMENT

The following table provides a list of activities (environmental aspects) that will occur on site and it provides an outline of the potential impacts that these actions will have on the environment, the anticipated effects on the biophysical and social aspects. The identification of the aspects and impacts may be expanded as more information becomes available when the specialist study in noise is completed. At this stage, the table below provides a list of impacts and issues.

9.4.1 Construction phase

ASSESSMENT OF POTENTIAL IMPACTS DURING THE CONSTRUCTION PHASE					
ACTIVITY	ENVIRONMENTAL ASPECT	POTENTIAL IMPACT	SIGNIFICANCE BEFORE MITIGATION	MITIGATION TYPE	SIGNIFICANCE AFTER MITIGATION
Construction of access road and internal roads	Soils	Soils will be stripped to construct proper roads. This could lead to and mixing of topsoil. Due to the presence of vehicles and equipment hydro-carbon spills may occur impacting on the quality of the soils.	Medium	- Roads will be constructed with clean rock material not containing any carbonaceous rock. - Spill kits to be stored on site, and staff trained to act when spills occur. - Contaminated soil to be removed and transported to a facility for remediation. - Drip trays to be used for vehicles that stand overnight.	Low
	Vegetation	Vegetation will be removed during the <i>construction</i> of the roads	Medium	- Removal and storage of all usable soils to be used in rehabilitation. - Access roads to avoid sensitive areas	Low
	Surface water	Loose material can contaminate surface water in the event of a storm water run-off occurring during the construction of the roads. Runoff from areas where hydro-carbon spills are present may also cause deterioration in surface water quality.	Medium	- All hydrocarbon spills to be contained and soils removed. - Proper storm water measures to be put in place to prevent contamination of surface water.	Low
	Air quality	Construction activities may cause dust that will influence the quality of air. Vehicle emissions can also cause deterioration in air quality.	Medium	Dust depressing methods to be implemented while construction of the access roads and internal roads take place. Water cars to be used to make sure dust	Low

				impact are minimized.	
	Background noise levels-	Construction activities may cause an increase in background noise levels.	Medium	Servicing of all vehicles to be undertaken on a regular basis to prevent excessive noise from machinery.	Low
	Wetland	Construction activities may cause deterioration of the wetland.	High	Avoid wetlands by adhering to the determined wetland edge and buffer	Medium
Clearance of indigenous vegetation	Soils	Topsoil will be stripped and stockpiled within the construction phase. This may cause deterioration in soil quality. During the stripping process topsoil may be mixed. Due to the presence of vehicles and equipment hydro-carbon spills may occur impacting on the quality of the soils.	Medium	- Topsoil and subsoil to be stockpiled separately and documented. - Stockpiles should not be allowed to be higher than 2.5 metres to preserve any potential seeds and regrowth potential - Contaminated soil to be removed and transported to a facility for remediation. - Drip trays to be used for vehicles that stand overnight.	Low
	Vegetation	Vegetation will be removed for construction phase activities	Medium	No mitigation for loss of vegetation. Proper storm management to be implemented to stop the formation of erosion.	Medium
	Land use	Stripping of vegetation and topsoil will result in the current possible land use to cease completely.	Medium	Land use currently vacant. Land use change could be beneficial for the area.	Low
	Surface water	Loose material can contaminate surface water in the event of a storm water run-off occurring during the stripping and stockpiling of topsoil. Runoff from areas where hydro-carbon spills are present may also cause deterioration in surface water quality.	Medium	- All hydrocarbon spills to be contained and soils removed. - Proper storm water measures to be put in place to prevent contamination of surface water. This will	Low

				include the activity of stripping and stockpiling of topsoil.	
	Air quality	Stripping and vegetation and stockpiling of topsoil may cause dust due to vehicle movement that will influence the quality of air. Material handling (topsoil) will generate dust and this and vehicle emissions can potentially cause deterioration in air quality.	Medium	- Dust depressing methods to be implemented while construction of the access roads and internal roads take place. - Water cars to be used to make sure dust impact are minimized. - Material handling has to be limited to as little as possible to prevent the generation of dust.	Low
	Background noise levels	Stripping and stockpiling activities may cause an increase in background noise levels.	Medium	- Construction activities to be limited top specified times. - Area of activity to be in an industrial area	Low
Development of facilities for storage of dangerous goods	Vegetation	Loss of vegetation due to transformation of land	Medium	Pick a site that falls within historically transformed areas	Low
	Soil	Construction will lead to soil excavation for installation of areas with bund walls for dangerous goods such as Diesel and petrol storage to refuel trucks and for the generators up to 0.5 metres.		Avoid loss of topsoil, soil erosion, soil contamination. Storage of topsoil and subsoil in separate piles. Use subsoil and topsoil for rehabilitation and prevent soil degradation or loss.	Low
The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation,	Wetland	The potential degradation of the present wetland	Medium	- No unnecessary destruction of vegetation will be allowed or removal of soils from the wetland areas. - Wetland to be avoided as far as possible - Development to be located outside of the 30m buffer around any delineated wetland. - All paving on the site should be permeable	Low

removal or moving of soil, shells, shell grit, pebbles or rock of more than 5 cubic metres from a watercourse.				- The design of stormwater outfalls should ensure that 1/ the flow velocity at the point of discharge is reduced, 2/ the flow is not discharge as a stream but spread as shallow flow over the ground and 3/ that there is good vegetation cover to prevent erosion and further reduce the velocity. - Invasive vegetation should be controlled.	
	Surface water	Increased soil sediment loads via surface water runoff into the adjacent wetlands and river due to the release of storm water from the construction sites.		- The area of land to be disturbed and isolated for the purpose of construction activities will be limited, as far as practical, to the minimum required for safe and efficient operation. - Storm water release systems will have to incorporate flow reduction measures to ensure that erosion does not occur into the close situated wetlands during the construction phase.	Low
	Mammals	Disturbance of site as result of increased traffic and construction vehicles or machinery as well as construction personnel.	Medium	- Only areas targeted for the proposed development should be cleared of vegetation, no other areas. - Storage of any waste material/chemicals (petroleum etc.) must be restricted to the transformed, already disturbed, areas or must be kept on lined/bunded areas to minimise the potential for pollution. - Oil, diesel, petroleum or any other harmful spillages must be cleaned immediately. Oil trays must be placed under construction vehicles likely to leak substances.	Low
		Site clearing and destruction of faunal habitat leading to increased habitat loss, disturbance of sensitive species and alteration of natural food webs.	Medium		Medium
		Invasion of alien plants and weeds in disturbed areas might migrate to adjacent areas which will reduce the natural faunal habitat.	Medium		Low
		Increased erosion risk due to inadequate storm water management.	Medium		Low
		Pollution of adjacent wetlands due to inadequate storm water and	High		Medium

	waste management practices.		- Access to the site must only be through existing roads or temporary roads approved by the engineer and the Environmental Control Officer (ECO). - Continuous rehabilitation and maintenance of the construction site should occur during construction. Seed mixes should match the surrounding vegetation types. - Animals may under no circumstances be handled, removed, killed or interfered with by the Contractor, his employees, his Sub-Contractors or his Sub-contractors' employees. This includes foraging, food and wood collecting outside of the construction site. - If animals become trapped in trenches and diggings, a specialist must be contacted to adequately and safely remove these and relocate them to the adjacent habitat. - The establishment of alien invasive plant species should be prevented and dealt with as indicated in Vegetation Specialist Study. - Implement speed limits on access roads to prevent unnecessary killing of animals by vehicles. - No burning of material will be allowed on site. - The Environmental Management Programme (EMPr) must be kept on site at all times and must strictly be adhered to. - Suitable terrestrial movement corridors such as the wetland areas should be demarcated as no-go areas	
	Fire hazards as result of cooking by either construction or operational personnel will lead to loss in habitat, especially if an overnight construction camp will be located on the site and also if security is allowed to make fires during night patrols.	Medium		Low
	Inadequate solid waste management could attract scavenging animals into the footprint area.	Medium		Low
	Continuous added human activity over a long period may further impact on faunal communities as result of increased noise, the smell of humans, lighting etc. may lead to ever declining populations.	Medium		Medium
	Reduction in natural migratory and faunal dispersal routes (corridors) and associated fragmentation of species and habitats.	Medium		Medium

				to facilitate safe movement of animals. • Adequate storm water management should be implemented during construction and operation to prevent increased silted runoff to the wetland areas as result of erosion. • Measures must be taken to ensure that workers are aware of laws and restrictions governing the hunting, capturing or trapping of animals and should be advised on the penalties associated with the needless destruction of wildlife. • Conservation orientated clauses should be built into contracts for construction and operational personnel, complete with penalty clauses for non-compliance. • The surface infrastructure site should be well demarcated and workers (both construction and operational) should not enter into adjacent areas, especially the wetland areas. • Limit artificial lighting, which attracts faunal species. Yellow Sodium lighting is recommended as they do not attract invertebrates at night and will not disturb the existing wildlife within the study area. • The site must be kept clean and tidy and free from litter that could attract rodents and other animal species. • Fencing the footprint area will prevent movement into the natural veld areas and keep the impacts	
--	--	--	--	--	--

				regulated within a controlled environment.	
Construction of the Silverton SEZ	Air Quality	Site clearing, removal of topsoil During this activity, a number of operations take place such as land clearing, topsoil removal, loading of material. Initially, topsoil and subsoil will be removed with large scrapers. The topsoil will be stockpiled for rehabilitation in the infrastructure area. It is anticipated that each of the above-mentioned operations will have its own duration and potential for dust generation.	Medium	- Topsoil should not be removed during windy months (August to January) due to associated wind erosion heightening dust levels in the atmosphere. - The area of disturbance must be kept to a minimum and no unnecessary clearing of vegetation must occur. - Topsoil should be re-vegetated to reduce the exposure areas. - When using bulldozers and graders, there is need to minimise travel speed and distance and volume of traffic on the roads. - Stockpiles should not be left for prolonged periods as wind energy generates erosion and causes more dust to form. - It should be noted that emissions generated by wind are also dependent on the frequency of disturbance of the erodible surface. - All stockpiles should be damped down, especially during dry weather or re-vegetated (hydroseeding is a good option for slope revegetation).	Low
	Air Quality	Construction of surface infrastructure (e.g. access roads, pipes, storm water diversion berms, change houses, admin blocks. During this phase, it is anticipated there will be construction of infrastructure. This will include access roads, pipes, storm water diversion berms, change houses, admin blocks etc. Activities of vehicles on access roads, levelling and compacting of surfaces will have implications on ambient air quality.	Medium	- Dust emitted during bulldozing activity can be reduced by increasing soil dampness by watering the material being removed thus increasing the moisture content. - Blasting should also not take place when poor atmospheric dispersion is expected i.e. early morning and late evening.	Low

				- Material need to be removed to dedicated stockpiles to be used during rehabilitation. - Movement of materials should take place on roads which is being watered and/or sprayed with dust suppressant. - Constricting the areas and time of exposure of pre-strip clearing in advance of construction to limit exposed soil surfaces	
	Noise	General rise in ambient noise levels During construction phase increased noise levels can be expected at directly adjacent households to the proposed development.	Medium	- Communication between the receptors and the developer need to be implemented and maintained, highlighting the outcome of this study. The developer should consider co-ordinate the working time with periods when the receptors are likely not at home. An example would be to work within the 7 am to 4 pm timeslot to minimise the significance of the impact due to: - Potentially receptors are most likely at school or at work, minimizing the probability of an impact happening; and - Normal daily activities will generate other noises that would most likely mask construction noises, minimizing the probability of an impact happening. Ensure a good working relationship between the project representative and all potentially sensitive receptors. Communication channels should be established to ensure prior notice to the sensitive receptor if work is to take place close to them. Information that should be provided to the	Medium

				potentially sensitive receptor(s) include: o Generally construction activities should not take place before 8am and after 5pm and not on Sundays and public holidays. This would however not always be realistic, as deadlines and specific construction activities could take 12+ hours.	
	Heritage	A graveyard is situated within the proposed project area. The project could therefore have an impact on the graves.	High	- The graveyard is to be fenced and documented. - A Heritage impact assessment is to be undertaken with specific recommendations. - Any artefacts or graves found at the subsoil level must be reported and work stopped for investigation	Medium
	Biodiversity	Loss of species of conservation concern Construction activities in or near wetland habitat will result in permanent removal of habitat considered to be of increased ecological importance and sensitivity. Species of concern includes mammals with special reference to <i>Lutra maculicollis</i> and plants with special reference to <i>Habenaria kraenzliniana</i>.	Low	- The recommendations of the ecological and botanical specialist studies must be strictly implemented as soon as these studies are concluded. - Sensitive areas such as obvious wetlands and drainage lines need to be avoided where possible. - Preventing the unnecessary destruction of any natural habitat and animal life within the boundaries of the proposed area of development and adjacent areas. - Animals may under no circumstances be handled, removed, killed or interfered with by the Contractor, his employees, his Sub-Contractors or his Sub-contractors' employees. This includes foraging, food and wood collecting outside of the	Low

				construction site. - Conservation orientated clauses should be built into contracts for construction personnel, complete with penalty clauses for non-compliance. - Measures must be taken to ensure that workers are aware of laws and restrictions governing the hunting, capturing or trapping of animals and should be advised on the penalties associated with the needless destruction of wildlife.	
	Surface water	Temporary diversion of drainage lines. Construction of water diversion channels to reduce stormwater flow over the construction area.	Medium	Silt-traps/screens to be implemented to limit siltation in the wetland and surrounding water resources. Adherence to the Storm Water Management Plan as compiled by an accredited engineer is crucial. Storm water outflows to be designed to minimize erosion.	Low
		Construction of all project infrastructure Construction activities of the final storm water management infrastructure.	Medium	Storm water management plan adherence and stormwater attenuation structures to attenuate flow and increase groundwater infiltration. Ground around the outlet should be vegetated with grass to reduce erosion.	Low
		Increase of impermeable surfaces Concrete surfaces, paving, roads and buildings/roof construction.	Medium	- Storm water management plan adherence) and stormwater attenuation structures to attenuate flow and increase ground water infiltration. Construction of permeable surfaces to permit infiltration into ground water, reducing runoff. Ground around the outlet should be vegetated with grass to reduce erosion. - Silt screens/sandbags could be employed on	Low

				exposed areas. The construction contractor must monitor the formation of erosion channels and must repair these as required. All erosion channels which develop during construction should be backfilled and consolidated as required. Construction should take place during the dry season. Grass and vegetation removal should be limited to the footprint of the proposed project. Impacted areas should be revegetated as soon as possible, where feasible. • Watering and compacting of exposed surfaces where dust is generated must be conducted and strictly monitored. Vegetation removal should be limited to the footprint of the proposed project. A speed limit of 20 km/h must be imposed on construction vehicles. Impacted areas should be revegetated as soon as possible, where feasible. • Mobile sanitary facilities must be inspected regularly and adequately maintained by an approved contractor to prevent any spills/leaks from occurring. Mobile sanitary facilities must be located outside the applicable buffer/sensitive zones. Ensure that an adequate number of mobile toilets are available for workers on site. • Spills resulting from vehicle maintenance or as result of the storage of hydrocarbon materials must immediately be cleaned and properly disposed of. Petroleum (and other hazardous materials) storage areas should be effectively banded and applicable safety standards must be adhered to. Hazardous	
--	--	--	--	---	--

				materials and chemicals must be stored on solid concrete surfaces. - Storage containers must be inspected regularly for leaks and repaired as needed. Maintain parking areas and roads in good conditions for the duration of operations. In case of accidental spillages, specialized equipment should be available on site to dispose these pollutants before irreversible damage is caused. Else, specialized contractors may be used to fulfil this function. - Uncontrolled disposal of waste near any construction site must be communicated to all contractors and personnel as unacceptable. - All waste should be placed in a central collection point and removed from the site. Encourage and implement the separation and recycling of general waste. - Place refuse bins on strategic places to encourage the disposal of litter to these bins. Erect notices to inspire the staff to keep their environment clean and hazardous free. Inspect all on-site disposal sites regularly to ensure adherence to all legal requirements. - Inspect all contractors and disposal agents, premises and sites regularly to ensure that all environmental and legal requirements are adhered to. Waste management plan, recycling and removal of waste to registered landfill site during	
--	--	--	--	---	--

				construction.. • An appointed Environmental Control Officer (ECO) must always be available to ensure implementation of the recommended mitigation/management measures during the construction of the project. • The ECO is to be on site twice a month - once for site visit or project progress meeting and once for auditing. These visits must be two weeks apart. • Must be able to make recommendations on the ground as the project unfolds and possible new aspects arrive. • Ensure all activities comply with the relevant mitigation measures. • Identify any potential risks from the project on the surface water resource. • Enforce the protection and conservation the aquatic and surface water environment from any impacts. • Prevent the aquatic and surface water environment from degrading due to the construction activities. • Avoid sensitive areas through all activities and phases. • Storm water management will be based on the objective of limiting erosion and sedimentation. The following objectives will apply: • Limit the area of impact during the construction phase.	
--	--	--	--	---	--

				• Utilise best-practice erosion mitigation methods. • Rehabilitate and revegetate any area impacted during construction, operation and ongoing maintenance. • Implement attenuation measures. • Construction of permeable surfaces (paving) to permit infiltration into ground water, reducing runoff.	
	Vegetation	Impacts on Indigenous vegetation	Low	• Current erosion should be limited by the installation of water flow speed reducing outlets into the wetland and stream system. • Unnecessary impacts on surrounding natural vegetation must be avoided. • No vehicle movement within the wetland area will be allowed. • No un-authorized roads may be constructed within the wetland area to gain access to the proposed development site or storm water outlets. • No unapproved or unknown clearance of vegetation will be allowed within the remaining primary vegetation situated east of the river. • Any spillages of hydrocarbon materials must be prevented from reaching drainage ways and the wetland vegetation.	Low

		Loss of individual or threatened plants	Low	• Unnecessary impacts on surrounding natural vegetation must be avoided. • The construction impacts must be contained within the footprint of the development. Disturbed areas beyond the footprint of the development must be rehabilitated as quickly as possible. • Any onsite recordings of plants with distinctive character should first be confirmed before trampling or removal of such plants. Most red o orange data plants are distinctive from normal vegetation.	Low
		Establishment and spread of declared weeds and alien invader plants.	High	• An alien invasive plan must be compiled and implemented to ensure that current declared invader • plant species be controlled before they spread further. • Any alien plants must be immediately controlled. • An on-going monitoring programme should be implemented to detect and quantify any aliens that may become established and provide information for the management of aliens. • All disturbed areas must be monitored for the establishment of invasive plant species.	Low
	Socio- Economic Local Economic	As a result of construction of buildings and other infrastructure, supply chain opportunities will be created that will benefit local suppliers		• Procurement of suppliers must be as per strict requirements • Apply employment/procurement policies and	

	Impacts			procedures (e.g. do not employ at the gate) to prevent unnecessary influx by jobseekers;	
	Socio- Economic Local Economic Impacts		Low Positive	- Address concerns with and ensure local job and procurement opportunities; - Ensure compliance with socio-economic tools and legal requirements (BBBEE)	Medium Positive
		Impacts on local employment Approximately 8 000 temporary employment opportunities will manifest over the construction period.	High Positive	Maximise the local content of the construction phase by using local labour, local contractors, SMMEs and local service providers wherever possible and make this compulsory for the main Contractor by including minimum thresholds in the Contractor Services Management plan (CSMP).	High Positive
		Impacts on local economy Definite positive impacts for the local economy during the construction phase may occur It could be expected that the majority of construction material requirements will need to be sourced	Medium Positive	- Do a Value Chain analysis of skills and services required for the construction phase. Communicate this with the local Ward Councillors and communities at least 4 months in advance to ensure that local groups are prepared to tender once the tender process commences. - Once appointed, monitor the social performance of Contractors and determine how Contractors fair on each KPI.	Medium Positive
	Socio- Economic Impact Skills development	Skills development, capacity building and social responsibility Due to the short duration of the construction period, skills development and capacity building is more focused on hands-on experience and on-site skills transfer.	High Positive	Skills upgrading providing a greater pool of appropriately qualified people for new positions or to start their own businesses. This should be achieved by training provided by SEZ businesses and by other education and training institutions leveraged by the SEZ. On the job experience is also	High Positive

				likely to play an important role.	
				Technology transfer benefits allowing local enterprises to add value in the longer term and reduce the need for imports where appropriate. These benefits are likely to materialise to the extent that businesses locating in the SEZ introduce and are willing to share new forms of technology.	
	Surface water	Removal of vegetation and exposure of soils The removal of vegetation for site clearance and for the development and establishment of infrastructure will expose soils to erosion elements. Eroded material may cause sedimentation in the river downstream. The movement of heavy machinery and vehicles during the construction phase may cause compaction of soils resulting in reduced infiltration of surface water and reduced baseflow. A further impact as a result of this interaction is the alteration in current surface water drainage patterns. This is also applicable to areas where impermeable surfaces such as offices and workshops will be developed. Increased runoff velocity as a result of impermeable surfaces and compaction may further result in erosion and sedimentation.	Medium	- Development of the storm water management structures. - Soils compacted by heavy machinery in areas that are not utilised post construction can be ripped to allow infiltration. - Roads should be maintained regularly to ensure that surface water drains freely off the road preventing erosion; and - Ensure that storm water management structures are within good working condition through regular inspection, especially after large storm events.	Low
	Traffic	The proposed project will require various road upgrades	Medium	- The proposed road upgrades should be implemented as proposed in the Traffic Impact Assessment report - Sidewalks should be provided within the development to accommodate pedestrian movements. - Public transport lay-bys should be provided at the proposed Access 1 intersection and Alwyn Road / Proposed Access Road intersection.	Low

				• Pedestrian sidewalks should be provided as follows: • Along the Proposed Access Road on the eastern side of the road; and • Along the northern side of Alwyn Road between the Proposed Access Road and Bandura Street. • A pedestrian sidewalk should be provided to link the development with the existing pedestrian bridge. This should be done to accommodate pedestrians walking to the Denneboom intermodal public transport facility as well as the township east of the development. • The Proposed Class 3 Access Road be constructed as a single carriageway with one lane per direction until such time when a dual carriageway with two lanes per direction is necessary.	
	Geotech	General founding Foundations need to be developed to suite the site characteristics of the proposed construction areas.	Medium	• Detailed structural loads and foundation requirements for the development are unknown at this stage, but it is understood that the development will comprise a variety of industrial buildings (typically portal frame or light brick) with foundations of varying forms and sizes. • In order to give the recommendations meaning, general foundation sizes were assumed	

9.4.2 Operational Phase

ASSESSMENT OF POTENTIAL IMPACTS DURING THE OPERATIONAL PHASE					
ACTIVITY	ENVIRONMENTAL ASPECT	POTENTIAL IMPACT	SIGNIFICANCE BEFORE MITIGATION	MITIGATION TYPE	SIGNIFICANCE AFTER MITIGATION
Operation of the Silverton SEZ	Socio-Economic Impacts: on employment	Employment opportunities During the operation phase it is, at this stage, anticipated that a total of 3500 employment opportunities of various skill levels will need to be filled permanently.	MEDIUM POSITIVE	- Local employment is once again emphasised and workers that reside closest to the area should first be considered for employment. - Establish a labour desk in collaboration with the Ward Councillor and local Municipality to determine the skills that are available locally before considering “outsiders”.	MEDIUM POSITIVE
		Local employment It is likely that all or the majority of the unskilled and semi-skilled workforce be sourced from the local and affected ward. However, the skilled positions require specialised training and a level of higher education, which could be sourced from the broader Metro. Benefits of employment for locals will increase if people from the direct impact sphere are considered for all levels of occupational categories. Due to existing limitations in local education and skill levels this might not be practical or feasible in the short term.	Few Benefits	- Establish a labour desk and do skills analysis of the local labour force before considering people from outside the project’s primary impact sphere. - Involve the COTMM LED Unit, Ward Councillors and other community groups (Youth groups, Community development workers, etc.) - Make gender-based issues a definite focus of the needs assessment and ensure that equity of minority groups (women, youth and the disabled) are included.	Some benefits
		Employment equity Youth, women and the disabled generally fall under the category of minority groups. In South Africa, despite the perception that	Few Benefits		Some benefits

ASSESSMENT OF POTENTIAL IMPACTS DURING THE OPERATIONAL PHASE

ACTIVITY	ENVIRONMENTAL ASPECT	POTENTIAL IMPACT	SIGNIFICANCE BEFORE MITIGATION	MITIGATION TYPE	SIGNIFICANCE AFTER MITIGATION
		women are more reliable and less likely to misuse drugs and alcohol while in employment, it is very rare that females are hired for more physically challenging jobs. The result is a growing group of young people with severely limited access to formal sector employment, and limited means to do anything about this.			
	Socio-Economic Impacts: Skills development and social responsibility	Skills development, training and capacity building Structured training and development of employees on an on-going basis to enable them to perform their duties efficiently and effectively is required to achieve the company's strategic objectives and optimizing the capabilities and potential of all employees.	MEDIUM POSITIVE	- Do a skills analysis of the local community members in collaboration with the local Municipality and Ward Councillor to ensure that locals are considered for employment and training. - Legislation stipulates that specific levels of training and skills are required. Only if skills are not available locally (nearby settlements and local Municipal area) will personnel be sourced elsewhere.	MEDIUM POSITIVE
	Socio-Economic Impacts: Community / Institutional arrangements	Attitude formation and mobilisation against the project At this stage no negative attitude formation that would result in negative community mobilisation has been observed Mismanagement of the operations and a lack in communication with local communities and landowners has the potential to result in negative impacts and community mobilisation against the project.	LOW	- Ensure that land owners and affected communities are continuously updated with regards to new developments that might affect them. - Use a single line of communication and make the communication channels known to the affected parties, in case they want to raise complaints or make enquiries. - Attend to issues as soon as they are being reported.	LOW

ASSESSMENT OF POTENTIAL IMPACTS DURING THE OPERATIONAL PHASE

ACTIVITY	ENVIRONMENTAL ASPECT	POTENTIAL IMPACT	SIGNIFICANCE BEFORE MITIGATION	MITIGATION TYPE	SIGNIFICANCE AFTER MITIGATION
				Be vigilant not to raise unrealistic expectation amongst the local communities with regards to employment, skills requirements and new community projects. Continuously engage with the local communities and involve the Local Councillors and existing community structures in the processes.	
	Surface water	Increase in traffic to the site and additional logistics Parking areas which will be used during the operational phase.	Medium	Maintain parking areas and roads in good conditions for the duration of operations. In case of accidental spillages, specialized equipment should be available on site to dispose these pollutants before irreversible damage is caused. Else, specialized contractors may be used to fulfil this function.	Low
		Increase in personnel to the site. Increase in solid and domestic waste during the operation phase.	Medium	- Uncontrolled disposal of waste near any construction site and during operation must be communicated to all contractors and personnel as unacceptable. All waste should be placed in a central collection point and removed from the site. - Encourage and implement the separation and recycling of general waste. - Place refuse bins on strategic places to encourage the disposal of litter to these bins. - Erect notices to inspire the staff to keep their	Low

ASSESSMENT OF POTENTIAL IMPACTS DURING THE OPERATIONAL PHASE

ACTIVITY	ENVIRONMENTAL ASPECT	POTENTIAL IMPACT	SIGNIFICANCE BEFORE MITIGATION	MITIGATION TYPE	SIGNIFICANCE AFTER MITIGATION
				environment clean and hazardous free. - Inspect all on-site disposal sites regularly to ensure adherence to all legal requirements. - Inspect all contractors and disposal agents, premises and sites regularly to ensure that all environmental and legal requirements are adhered to. - Waste management plan, recycling and removal of waste to registered landfill site during continued operation. - Municipal waste removal services to be implemented during operational phase.	
		Increase in personnel to the site. Increase of sewage and wastewater generated on site.	Medium	- Sewerage infrastructure which complies with municipal standards to be in place. - No discharge of sewage or wastewater of any kind should be discharged in the surrounding water resources.	Low
	Air Quality	General transportation and vehicle movement on site Transportation of the workers and materials in and out of the site will be a constant feature during the operational phase. The planned park is a commercial and light industrial park.	MEDIUM	- Transporting of materials and transportation should take place in regularly serviced trucks and busses to prevent excessive smoke emissions. - Speed limits need to be observed and adhered to. - All vendors inside of the park must use the most	LOW

ASSESSMENT OF POTENTIAL IMPACTS DURING THE OPERATIONAL PHASE

ACTIVITY	ENVIRONMENTAL ASPECT	POTENTIAL IMPACT	SIGNIFICANCE BEFORE MITIGATION	MITIGATION TYPE	SIGNIFICANCE AFTER MITIGATION
		Activities to be undertaken will include boilers, welding, moulding and various other industries. The activities to be undertaken will not be enough to warrant an Air Emissions License.		advanced technology to prevent excessive air pollution. All vendors that will have a likely air pollution impact must implement a pollution monitoring programme. Records must be kept for 10 years.	
	Wetlands	Wetlands The wetland will be closely situated to the proposed development site	HIGH	- A wetland assessment, wetland delineation, wetland risk assessment and wetland buffer will be undertaken and implemented. - The 30 m wetland buffer will determine a zone in which no development may be undertaken. - The wetland system should form part of a monitoring programme to ensure that the wetland is not degraded by the proposed development. - Storm water should be guided and structures put in place to ensure that storm water does not enter the wetland area in a concentrated flow, which could potentially cause erosion of the wetland system.	Medium
		People living in the catchment are careless with the disposal of wastes	HIGH	Raise the awareness of the residents of the wetland/pan's catchment to maintain a high standard of stewardship of environmental quality.	MEDIUM

9.4.3 Closure and Decommissioning Phase

ASSESSMENT OF POTENTIAL IMPACTS DURING THE OPERATIONAL PHASE					
ACTIVITY	ENVIRONMENTAL ASPECT	POTENTIAL IMPACT	SIGNIFICANCE BEFORE MITIGATION	MITIGATION TYPE	SIGNIFICANCE AFTER MITIGATION
Closure of the Silverton SEZ	General	Closure of the SEZ is not anticipated in the near future. This area is a SEZ and the nature of the development is to house vendors in a commercial park. Even after the initial idea is no longer applicable, the SEZ will be utilised in future for whatever market it is needed.	n/a	The closure phase of this Supplier park will not realise for many years to come. When closure is needed in the future, all legislation from that time will need to be reviewed to ensure that adherence to all legislation is in line.	n/a

9.5 SITE SELECTION

The site that was chosen is situated within a piece of land adjacent to Ford SA and is owned by the Municipality. The aim is to lease the land from the municipality which is currently vacant. Therefore, no other site was considered as an agreement could be reached with the owner of the land.

9.6 MOTIVATION FOR NOT CONSIDERING ALTERNATIVES

Alternative locations and technologies were not considered in this report. This does not mean that they were not taken into consideration. Proper planning and research from the applicant made it possible to identify the current potential site long before the EIA was to be undertaken. Technological alternatives have already been built into the project description. The No-Go alternative was assessed as part of the application to include a baseline situation where the environmental conditions will stay the same.

10. ASPECTS WHICH ARE TO BE INCLUDED AS CONDITIONS OF ANY EA

- The development of the Silverton SEZ needs to incorporate all mitigation measures as stipulated in the EMPr, and as per the various specialist studies undertaken.
- The wetland rehabilitation plan as developed by Dr. Steve Mitchell should be incorporated into the project development to ensure the future protection of the wetland areas.
- The Silverton SEZ should obtain the required Water Use License Application from the Department of Water and Sanitation (DWS). This study is currently in progress.
- The incorporation of the design guidelines must ensure development in a sustainable matter, by using indigenous plants for landscaping and to incorporate energy saving designs and strategies into the design.
- The wetland area should be protected and fenced off to indicate the 30m wetland buffer as determined by the wetland delineation study compiled by Dr. Steve Mitchell.

- Job creation for the immediate surrounding community should be prioritised.

11. ASSUMPTIONS, UNCERTAINTIES AND GAPS IN KNOWLEDGE

Assumptions, uncertainties and gaps in knowledge is adopted from the various specialist studies.

11.1 SURFACE WATER STUDY

- Due to the extent of the areas that form part of the study area, use was made of aerial photographs, digital satellite imagery as well as provincial and national databases to identify areas of interest prior to the field survey. Any additional drainage lines noted during the field survey were also assessed as part of the surface water and aquatic ecology study. Although all possible measures were undertaken to ensure all riparian zones and drainage lines were assessed and delineated, some smaller ephemeral drainage lines may have been overlooked.
- Aquatic, wetland and riparian ecosystems are dynamic and complex. Some aspects of the ecology of these systems, some of which may be important may have been overlooked. The findings of this study were largely based on a single site visit. A more reliable assessment would have required that seasonal assessments take place.
- During the assessment, it was observed that the watercourse had certain limitation such as domestic pollution as well as industrial pollution within the stream. This could be attributed to the high-density residential areas in close proximity to the stream. The stream also had certain habitat limitation such as marginal vegetation and aquatic vegetation being of poor quality. This could be due to the dry season taking effect on the natural habitat conditions. The stream also had limited stream velocity and some ponding has been observed during the assessment in certain parts of the stream.
- The limitations may have had an impact on the overall scores obtained and may therefore not be a true representation of the condition of the aquatic system. It is recommended that a second aquatic assessment be conducted during the wet season (summer months).

- A Storm Water Management Plan will not form part of this assessment, it is assumed that a Storm Water Management Plan will be drawn up for the project by a professional engineer.

11.2 VEGETATION ASSESSMENT

- The study was carried out during March 2019. To target flowering seasons of plant species of interest that may occur onsite the study should include a site visit with seasonal variances.
- Red and orange list species are, by their nature, very rare and difficult to locate. Suitable habitat for listed red data plant species exist. It is important to note that, although the predicted impacts are mostly concerned with Red Data species, any sensitive non-Red Data species will also benefit from the proposed mitigation measures as they share the same habitat and face the same potential impacts as the Red Data species. The KEMS team has appropriate training and as well as practical experience and access to wideranging data bases to consider the derived species lists with high limits of accuracy. In instances where uncertainty exists regarding the presence of a species it is listed as a potential occupant, which renders the suggested mitigation measures and conclusions more vigorous.
- Even though every care is taken to ensure the accuracy of this report, environmental assessment studies are limited in scope, time and budget. Discussions and proposed mitigations are to some extent made on reasonable and informed assumptions built on bone fide information sources, as well as deductive reasoning. Deriving a 100% factual report based on field collecting and observations can only be done over several years and seasons to account for fluctuating environmental conditions and migrations. Since environmental impact studies deal with dynamic natural systems additional information may come to light at a later stage. KEMS can thus not accept responsibility for conclusions and mitigation measures made in good faith based on own databases or on the information provided at the time of the directive.
- This report should therefore be viewed and acted upon with these limitations in mind.

11.3 MAMMALS ASSESSMENT

- While every care is taken to ensure that the data presented is qualitatively adequate, inevitably conditions are never of such a nature that the data is entirely satisfactory. To conduct a comprehensive, completely factually based mammal study, requires an extensive amount of time over different seasons. Unfortunately, such comprehensive studies are generally limited by budget constraints and most importantly by time constraints subject to submission of EIA Applications. As a result, typical surveys provide only a snapshot of the existing mammal community and should/can only be used as a general guideline.
- It should be noted that the findings of this study were largely based on desktop/historical assessments and findings and a single site visit within which to identify mammal habitat availability. Visibility of fauna indicators vary throughout seasons and it is therefore noted that, if in future, any further indicators are found on site, the author cannot be held liable for conclusions deducted in good faith based on the available resources and information provided at the time of the study. Furthermore, this study, mainly focuses on the mammal habitat directly related to the study area and does not include any areas outside of this scope.

11.4 WETLAND ASSESSMENT

There is no evidence of wastewater discharge from the site. The drainage from Samcor Park is in good condition. I could not determine, however, whether there was any ingress of water or wastewater upstream of the site.

12. OPINION IF THE ACTIVITY SHOULD BE AUTHORISED AND ANY CONDITIONS

REC Services was appointed to undertake the scoping and EIA phases for the proposed Silverton SEZ. After the completion of specialist studies, various measures were undertaken to ensure that environmental sensitivities are taken into consideration. The proposed project layout was amended to exclude activities that was planned within the 30m buffer area of the wetland and all project designs were undertaken with the Urban Design guidelines in place that ensures development within environmental consideration.

All critical aspects, mitigations and recommendations to alleviate environmental impact was included in the EMPr and especially into the EMPr. The project will benefit the community and the economy tremendously as it will contribute extensively to direct and indirect job creation, local GDP and the GDP of Gauteng as a whole.

If all mitigation measures as presented in this report are taken into consideration and adopted into a legally binding EMPr, it is my opinion that this project can be authorised. No impacts anticipated for this project cannot be mitigated. No net loss of any wetland system or primary vegetation will occur and measures were included to protect the existing wetland by the proposed implementation of the wetland rehabilitation plan.

The project can therefore be authorised in the view of the EAP.

13 CONCLUSIONS

The EIA report was compiled and gives an overview of the environmental characteristics of the site, the proposed project description and potential impacts and mitigation measures of any identified aspects onto the environment. When the impact assessment is considered, it is clear that most of the impacts that is anticipated in the Construction phase can be mitigated to a low or very low significant rating. These measures will therefore be included in the EMPr to be compiled in the EIA phase of this project. Activities that remained on a medium significance after mitigation includes

- the impact of construction of roads on the wetland,
- Site clearing and destruction of faunal habitat,
- pollution of adjacent wetlands due to inadequate storm water and waste management practices,
- clearance of indigenous vegetation and
- noise with the construction activities.
- Potential impact on the graves.
- The socio-economic impact significance is rated as having a positive impact significance.

The assessment undertaken for the operational phase revealed that potential surface water contamination could lead to a medium significance after mitigation. The impact on the wetland in the operational phase is also rated as medium after mitigation due to the increased storm water that will be generated from the site, which would impact on the wetland. The operational phase will have an overall positive significance on Socio-Economic activities

The site assessed in this assessment was the preferred alternative and no other alternatives were assessed as part of this process. The chosen alternative is a result of a process of elimination to determine the best alternative before a formal process was lodged.

14. UNDERTAKING UNDER OATH OR AFFIRMATION BY THE EAP-

I, Arno van den Berg, as EAP on the project for the Silverton SEZ hereby declare:

- (i) that the information provided in the reports are correct according to my knowledge and the information presented to me at the time;
- (ii) that all comments and inputs from stakeholders and I&Aps have been included;
- (iii) that all recommendations of specialists have been included in the report; and
- (iv) that all information have been presented to stakeholders and I&Aps.



Arno van den Berg

Pr. Sci. Nat. Environmental Sciences

Date: 12 September 2019

15 APPENDIXES

Appendix 1A:
Locality Map-Attached

Appendix 1B1:
Layout plan - Attached

This is the original layout developed before the specialist studies were undertaken.

Appendix 1B2:
Layout plan - Attached

This is the new layout with incorporation of all sensitivity buffers.

Appendix 1C:
Combined Sensitivity and layout plan

Appendix 2:
Public Participation information - Attached

Appendix 2A: Site photos

Appendix 2B: Background information documents copies

Appendix 2C: Public meeting attendance register

Appendix 2D: Proof of Press Advertisements

Appendix 2E: Proof of site notice placements and copies of the notices

Appendix 2F: Comment and Registration forms including Email Registrations

Appendix 2G: Comments received from I&APS

Appendix 2H: Comments and response sheet

Appendix 2I: Proof of delivery of draft Scoping Report

Appendix 2J_ Comments received from Stakeholders on the Scoping Report

Appendix 2K_ Proof of delivery of EIAR and EMPr for public view

Appendix 2A: Site photos

Appendix 2B: Background information documents copies

Appendix 2C: Public meeting register

The community was informed of the EIA process by means of a public meeting scheduled for 22 June 2019 at 10:00. The meeting was held at the Silverton Recreational Centre at 513 Pretoria Road, Silverton.

Appendix 2D: Proof of Press Advertisements

Two press advertisements were placed in the Pretoria News. The adverts advertised the Scoping and EIA process to be undertaken.

The advert informed all stakeholders and Interested and Affected parties of the availability of the Scoping report for public view and advertise the public meeting scheduled for 22 June 2019 at 10:00.

Appendix 2E: Proof of site notice placements and copies of the notices

Appendix 2F: Comment and Registration forms including Email Registrations

No registration forms were received. All comments were community based and sourced from community interactions. No BIDs were distributed as per the request of the ward councillor.

Appendix 2G: Comments received from I&APS

Not applicable

Only one comment was raised in the public participation meeting regarding access to the graveyard after the development have been undertaken. Please see the comments and response sheet in Appendix 2H.

Appendix 2H: Comments and response sheet

Appendix 2I: Proof of opportunity for comment of 30 days for all stakeholders and I&APs on Scoping

Appendix 2J_Comments received from Stakeholders on the Scoping Report

Appendix 2K_ Proof of delivery of EIAR and EMPr for public view

Appendix 2I_ Comments received from Stakeholders on the EIAr and EMPr

Appendix 3:

Specialist reports:

Appendix 3a-Roads and Storm Water

Appendix 3b-Water and Sanitation

Appendix 3c-Township establishment Draft

Appendix 3d- Traffic Assessment

Appendix 3e- Geo-technical assessment

Appendix 3f- Vegetation Impact Assessment

Appendix 3g- Heritage Impact Assessment

Appendix 3h- Mammals Assessment

Appendix 3i- Surface water assessment and aquatic ecology assessment

Appendix 3j- Wetland Assessment and Risk Assessment

Appendix 3- Wetland rehabilitation plan

Appendix 3a-Roads and Storm Water

Appendix 3b-Water and Sanitation

Appendix 3c-Draft Motivational Memo

Appendix 3d- Traffic Assessment

Appendix 3e- Geo-technical Assessment

Appendix 3f- Vegetation Impact Assessment

Appendix 3g- Heritage Impact Assessment

Appendix 3h- Mammals Assessment

This assessment will be included in the EIA phase

Appendix 3i- Surface water assessment and aquatic ecology assessment

Appendix 3j- Wetland Assessment and Risk Assessment

Appendix 4:
Environmental Management
Programme (EMPr)

ATTACHED

Appendix 5:

CV of EAP

ATTACHED

Appendix 6:
Other information

Appendix 6A- Proof of Water use license application

Appendix 6B- Approval of the Scoping report