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Unitas Park – Extension 16

Draft Environmental Impact Assessment Report

Version – Draft for Public Review

19 July 2021

Phumaf Engineering Solutions

GCS Project Number: 19.0921

Client Reference: 034RFP/7001/2019

GDARD Reference: 002/20-21/E0042

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Final Version – Draft for Public Review

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	Name	**Signature**	**Date**
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Document Reviewer	Gerda Bothma		16 July 2021

EXECUTIVE SUMMARY

Background

The Department of Human Settlements (DHS) aims at fast tracking the release of serviced stands from State owned land to qualifying beneficiaries through the Gauteng Rapid Land Release Programme (GRLRP). Phumaf Holdings (Pty) Ltd (Phumaf) was appointed as the responsible Engineers to undertake all preliminary planning, planning, design and construction management to enable the release of the identified stands. As part of the GRLRP, the Unitas Park Extension 16 Development has been identified for implementation.

GCS Water and Environmental Consultants (Pty) Ltd (GCS) has been appointed by Phumaf to undertake the environmental authorisation and associated Public Participation Processes (PPP) required for the individual projects in order for compliance to the National Environmental Management Act (NEMA) (Act 107 of 1998, as amended) and/or Supporting Environmental Management Acts (SEMA's).

Project Description

The site was originally planned to have a township layout, with 2680 residential erven, two primary and one high school, three social/commercial facility erven and three open space erven. This layout was approved; however, not proclaimed or registered as this "standard layout" did not accommodate different residential densities and it did not comply with the latest environmental and geotechnical requirements. The new strategy for this site is a proposed 7 250 units comprising of mixed high density and to achieve the proposed yield, the existing layout will have to be withdrawn and a new application submitted.

The area is currently zoned as agriculture on a dolomitic zone in terms of Geophysics. The site is approximately 149 hectares in extent and is owned by the Gauteng Provincial Government. The proposed site is currently vacant, with immediate adjacent land portions also being vacant. There is evidence of watercourses on the site, as well as to the southeast of the site. A drainage line appears to run from the site towards Houtkop Road to the southwest, where the surface water drains under the road and continues to flow into a National Freshwater Ecosystem Protection Area (NFEPA). The buffer of the NFEPA includes a portion of the southwest of the site.

The proposed project entails the phased establishment of a mixed use residential development inclusive of the following land uses: low, medium and high density residential; student village; mixed use; innovation hub; social/educational; public open space and sports facility.

Due to capacity constraints identified during the preliminary investigations, the applicant is proposing to include an on-site above ground biological wastewater treatment facility (WWTF) as part of the proposed development. it is envisaged that the proposed WWTF will be designed and constructed in a phased manner, directly aligned with the capacity demand of the implementation of the phased development. The final design of the proposed steel

tank aboveground biological WWTF is estimated to treat to general discharge standards with a combined peak capacity of 20Ml/day (with these being phased in two stages of 10Ml/day respectively).

The Unitas Park project triggers listed activities in terms of the NEMA, as contained in the amended 2014 EIA Regulations. The identified listed activities are presented in the table below and require that a Scoping and Environmental Impact Reporting (S&EIR) process to be followed in order to obtain the necessary Environmental Authorisation (EA) in terms of the NEMA.

LISTING NOTICE	ACTIVITY NO	ACTIVITY DESCRIPTION	PROJECT ACTIVITY WHICH TRIGGERS THE LISTED ACTIVITY:
1	12	The development of — (ii) *infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs —* *a)* within a watercourse; or *b)* in front of a development setback; or *c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse;*	The proposed development site is situated within 32 meters of a water resource.
1	25	*The development and related operation of facilities or infrastructure for the treatment of effluent, wastewater or sewage with a daily throughput capacity of more than 2 000 cubic metres but less than 15 000 cubic metres.*	The development of a sewage treatment package plant which is estimated at being phased in two phases with an expected capacity of 10 mega-liters respectively.
1	27	*The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation…..*	Site clearance of indigenous vegetation highly likely to exceed 1 ha.
1	28	*Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such development:* *(i) will occur inside an urban area, where the total land to be developed is bigger than 5 hectares;….*	The proposed development is a Residential Development of 149 ha in extent, on land currently zoned as agriculture.
2	15	*The clearance of an area of 20 hectares or more of indigenous vegetation…..*	The site is 149ha in extent. It is likely that indigenous vegetation is to be cleared in excess of 20 ha.
2	25	*The development and related operation of facilities or infrastructure for the treatment of effluent, wastewater or sewage with a daily throughput capacity of 15 000 cubic metres or more.*	The development of a sewage treatment package plant which is estimated at being phased in two parts with an expected capacity of 10 mega-liters respectively, i.e. potential total of 20 000 cubic meters.
3	4	*The development of a road wider than 4 meters with a reserve less than 13.5 meters in (c.) Gauteng within* *(i) A protected area identified in terms of NEMPAA, excluding conservancies;* *(ii) National Protected Area Expansion Strategy Focus Areas;*	The site is zoned for agriculture and is classified as having a very high sensitivity in respect to the terrestrial biodiversity.

LISTING NOTICE	ACTIVITY NO	ACTIVITY DESCRIPTION	PROJECT ACTIVITY WHICH TRIGGERS THE LISTED ACTIVITY:
			Soweto Highveld Grassland = Vu.
3	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, in (c.) Gauteng within* *(ii) Within Critical Biodiversity Areas or Ecological Support Areas identified in the Gauteng Conservation Plan or bioregional plans*	Site is in 149ha in extent, currently zoned for agriculture and it is highly likely that indigenous vegetation of more than 300 m^2 will be cleared.
3	14	*The development of—(ii) infrastructure or structures with a physical footprint of10 square metres or more; where such development occurs—* *(a) within a watercourse;* *(b) in front of a development setback; or* *(c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse;*	Site is in close proximity of NFEPA system, is currently zoned as agriculture and falls within a very high sensitivity of terrestrial biodiversity due to a vulnerable ecosystem.
3	15	*The transformation of land bigger than 1000 square metres in size to residential, commercial, retail, industrial or institutional used where such land was zoned open space, conservation or had an equivalent zoning, on or after 02 August 2010.*	The site is 149ha in extent and is currently zoned as agriculture.

Please note: Activity 6 from GNR 325 was erroneously included within the application form. This activity is excluded as per sub-item (iii) and is covered with Activity 25 within GNR 327 and GNR 327 respectively.

A detailed Scoping Phase Assessment has been undertaken and subsequently approved by the Competent Authority, the Gauteng Department of Agriculture, and Rural Development (GDARD).

The following specialist investigations have been undertaken:

- Dolomite Stability Investigation
- Agricultural Agro-Ecosystem Specialist Assessment
- Hydrological Impact Assessment
- Ecological Study
- Heritage Impact Assessment
- Palaeontological Impact Assessment
- Socio-Economic Impact Assessment
- Traffic Impact & Access Study
- Market Study

Project Motivation

The Department of Human Settlement (DHS) seeks to address the “housing backlog” which is deemed a National Priority. The proposed project falls within Priority Housing Development Area (Figure 3-1). The Priority Housing Development Areas (PHDA) are intended to advance

the departments Spatial Transformation and consolidation by ensuring that the delivery of housing is used to restructure and revitalize towns and cities, strengthen the livelihood prospects of households and overcome apartheid special patterns by fostering integrated urban forms and introducing sustainable urban areas.

Furthermore, according to the Sedibeng IDP 2019-2020, there is a great need to improve the quality of housing in the municipality under The Housing Act (Act 207 of 1997), whereby the development of a housing programme is provided and promoted. This project will form one such provision, to promote Urban renewal and modernize urban development, as well as reduce the housing backlog in the district.

Emfuleni Local Municipality (ELM) is one of the municipalities identified by the department to be considered for National Upgrading Support Programme technical assistance and capacity building support, in agreement with the department. Building houses remains the competency of DHS with the principle role of facilitation being lying with the local municipality, ELM. In line with the local municipalities mandate, ELM's IDP demonstrates the departments mission to address socio-economic needs and upholding the Batho Pele principles.

According to the Emfuleni Spatial Development Framework 2017-2025, 2017 Unitas Park Ext 16 falls within a 'Low Density Residential Zone' (Zone 3). The aim and objective of a low-density residential zone is defined as:
"to develop and maintain the residential character of typical suburban residential neighbourhoods. This involves the management of land use development within these residential areas and curbing the proliferation of noxious and disturbing land uses within these areas. Zone 3 does also allow for the establishment of micro enterprises with the aim to support and promote SMMEs within this zone. However, consent for the establishment of micro enterprises are strictly managed by the micro enterprises management system in order to curb the proliferation of noxious and disturbing land uses within this zone. ***A maximum residential density of 30 units per hectare*** *should be supported in Zone 3. Residential supporting facilities to be accommodated within this zone include schools, social facilities and recreational facilities."*

The site is also indicated as a 2020 residential expansion area. According to the SDF, *"the period 2020-2025 aims to further consolidate and densify the development triangle situated between the Vanderbijlpark, Sebokeng and Vereeniging CBDs. This includes residential expansion in the Cyferpan, Sonlandpark and Boipatong areas. The further densification of agricultural holdings areas, such as Mantevrede and Unitas Park during the period 2020 to 2025, is also encouraged. Thedensification of the agricultural holdings and residential expansion areas in the Sonlandpark area will further strengthen the Vereeniging-Johannesburg commuter railway line corridor, as envisaged in the Development Concept.*

Industrial area expansion within the period 2020 to 2025 involves expansion of the industrial belt stretching from Mittal up to the Vereeniging-Johannesburg railway line".

Environmental Impact Assessment Report

This Environmental Impact Assessment Report illustrates the risk assessment undertaken of potential biophysical and socio-economic aspects and impacts of the proposed development on the receiving environment. This report summarises the risks and findings of various specialist studies undertaken and outlines avoidance, mitigation and management actions which will assist in minimising the impact of the project as far as possible.

Public Participation Process

A public announcement was published in January 2021 including a Background Information Document, together with the availability of the Draft Scoping Report (DSR), was announced through a newspaper advertisement, emails to the I&APs and site notices at various locations around the site. A stakeholder database has been compiled and were updated as the process unfolded and as more Interested and Affected Parties (I&APs) registered. Due to COVID-19 restrictions, no hard copies of the report will be available for review at public venues. However, the report was available electronically via the GCS Website (link provided above) or a CD was made available upon request. A record of the comments received thus far is included as part of the CRR, which is available with the Final Scoping Report.

The availability of this Draft Environmental Impact Report (DEIR) has been announced through advertisements, emails and SMS's. Due to COVID-19 restrictions the report will only be available electronically on the GCS website and / or request electronic copies of the report by prior arrangement.

All comments which will be received during the integrated application process will be captured in a Comments and Responses Report (CRR). The CRR will be updated on a continuous basis and will be presented to the authorities and other I&APs together with the consultation and final reports as a full record of issues raised, including responses on how the issues were considered during the integrated application process.

Environmental Impact Statement

It is the opinion of the EAP that although the establishment of the proposed development will cause some negative environmental impacts, provided that the proposed mitigation measures are implemented effectively and in line with the EMP, it is foreseen that these will be outweighed by the long-term positive impacts of the provision of suitable housing for communities in need. Based on the findings of the Impact Assessment and provided all

mitigation measures and recommendations as outlined in the report and supporting documentation are implemented, the EAP do not foresee any reason why environmental authorisation should not be granted for the proposed Unitas Park Extension 16 Development.

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ABBREVIATIONS

BID	Background Information Document
CA	Competent Authority
CBA	Critical Biodiversity Areas
CR	Critically Endangered
CRR	Comments and Responses Report
CV	Curriculum Vitae
DEFF	Department of Environment, Forestry and Fisheries
DEIR	Draft Environmental Impact Report
DHS	Department of Human Settlements
DHSWS	Department of Human Settlement, Water and Sanitation
DSR	Draft Scoping Report
du	Dwelling units
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EC	Electrical conductivity
EGSAs	Ecosystem Goods and Service Areas
EIA	Environmental Impact Assessment
ELM	Emfuleni Local Municipality
EMPr	Environmental Management Programme
EN	Endangered
ESAs	Ecological Support Areas
FSA	Fish Support Area
FSR	Final Scoping Report
GCS	GCS Water and Environmental Consultants (Pty) Ltd
GDARD	Gauteng Department of Agriculture and Rural Development
GIS	Geographic Information Systems
GRLRP	Gauteng Rapid Land Release Programme
GPEMF	Gauteng Spatial Development Framework
GPS	Global Positioning System
GSDF	Gauteng Spatial Development Framework
Ha	hectares
HDI	Human Development Index
I&Aps	Interested and Affected Parties
IDP	Integrated Development Plan
IUCN	International Union for Conservation of Nature
IWULA	Integrated Water Use Licence Application
Km	kilometers
MAE	Mean Annual Evaporation
mamsl	Meters above mean sea level
NEMA	National Environmental Management Act, 1998 (Act 107 of 1998)
NEM:WA	National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)
NFEPA	National Freshwater Ecosystem Priority Areas
NHRA	National Heritage Resources Act

NWA	National Water Act
PES	Present Ecological State
PHRA	Provincial Heritage Resources Agency
PPP	Public Participation Process
QDS	Quarter Degree Square
S&EIR	Scoping and Environmental Impact Reporting
SABAP	South African Bird Atlas Project
SABIS	SANBI Biodiversity Information System
SAFAP	South African Frog Atlas Project
SAHRA	South African Heritage Resources Agency
SARCA	South African Reptile Conservation Atlas
SAWS	South African Weather Services
SCP	Systematic Conservation Plan
SDF	Spatial Development Framework
SPLUMA	Spatial Planning and Land Use Management Act
SWMP	Stormwater Management Plan
TDS	Total dissolved solids
TSCP	Terrestrial Systematic Conservation Plan
VU	Vulnerable
WUL	Water Use Licence

CONTENT OF THIS ENVIRONMENTAL IMPACT ASSESSMENT REPORT FOR PUBLIC PARTICIPATION

The contents of an environmental impact assessment report are required to contain information as outlined in Table 0-1 below. These requirements are regulated under Appendix 3, Regulation 28 of GNR 326 (2014, as amended)

Table 0-1-1: Contents of an Environmental Impact Assessment Report

Regulation		Content of Environmental Impact Assessment Report (EIR)	Reference
A3 R3-1 (a)		**Details of:**	-
	(i)	*The EAP who prepared the report; and*	Table 1-2
	(ii)	*The expertise of the EAP, including a curriculum vitae*	Appendix B
A3 R3-1 (b)		***The location of the development footprint of the activity on the approved site as contemplated in the accepted scoping report, including:***	Section 1.4 Table 1-4, Figure 1-4
	(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*	-
A3 R3-1 (c)		***A plan which locates the proposed activity or activities applied for as well as the associated structures and infrastructure at an appropriate scale, or, if it is—***	Figure 1-5 Figure 1-6
	(i)	*a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken;*	-
	(ii)	*on land where the property has not been defined, the coordinates within which the activity is to be undertaken;*	-
A3 R3-1 (d)		***A description of the scope of the proposed activity, including—***	-
	(i)	*all listed and specified activities triggered and being applied for; and*	Section 2.1 Table 2-3
	(ii)	*a description of the associated structures and infrastructure related to the development;*	Section 4.1 Table 4-1
A3 R3-1 (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 2.1 Table 2-1 Table 2-2
A3 R3-1 (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 3.1 Section 3.2
A3 R3-1 (g)		***A motivation for the preferred development footprint within the approved site as contemplated in the accepted scoping report;***	Section 3.1 Section 3.2
A3 R3-1 (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:***	-
	(i)	*details of the development footprint alternatives considered;*	Section 5
	(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 6 Appendix D
	(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;*	Appendix D8
	(iv)	*the environmental attributes associated with the development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;*	Section 6

	(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—* *(aa) can be reversed;* *(bb) may cause irreplaceable loss of resources; and* *(cc) can be avoided, managed or mitigated;*	Section 9
	(vi)	*the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks;*	Section 10
	(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;*	Section 10
	(vii)	*the possible mitigation measures that could be applied and level of residual risk;*	Section 10
	(ix)	*if no alternative development footprints for the activity were investigated, the motivation for not considering such; and*	Section 5
	(x)	*a concluding statement indicating the location of the preferred alternative development footprint within the approved site as contemplated in the accepted scoping report;*	Section 5
A3 R3-1 (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—***	Section 10
	(i)	*a description of all environmental issues and risks that were identified during the environmental impact assessment process; and*	Section 10
	(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 10
A3 R3-1 (j)		***An assessment of each identified potentially significant impact and risk, including—***	-
	(i)	*cumulative impacts;*	Section 10
	(ii)	*the nature, significance and consequences of the impact and risk;*	Section 10
	(iii)	*the extent and duration of the impact and risk;*	Section 10
	(iv)	*the probability of the impact and risk occurring;*	Section 10
	(v)	*the degree to which the impact and risk can be reversed;*	Section 10
	(vi)	*the degree to which the impact and risk may cause irreplaceable loss of resources; and*	Section 10
	(vii)	*the degree to which the impact and risk can be mitigated;*	Section 10
A3 R3-1 (k)		***An environmental awareness plan describing the manner in which-***	-
	(i)	*The applicant intends to inform his or her employees of any environmental risk which may result from their work; and*	-
	(ii)	*risks must be dealt with in order to avoid pollution or the degradation of the environment;*	-
A3 R3-1 (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 7 Section 8
A3 R3-1 (l)		***An environmental impact statement which contains—***	-
	(i)	*a summary of the key findings of the environmental impact assessment:*	Section 12
	(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; and*	Figure 12-1
	(iii)	*a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;*	Section 12

A3 R3-1 (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 7 Appendix B
A3 R3-1 (n)		***The final proposed alternatives which respond to the impact management measures, avoidance, and mitigation measures identified through the assessment;***	N/A
A3 R3-1 (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 12.4
A3 R3-1 (p)		***A description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed;***	Section 11
A3 R3-1 (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 12.2
A3 R3-1 (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;***	N/A
A3 R3-1 (s)		***An undertaking under oath or affirmation by the EAP in relation to—***	Section 15
	(i)	*the correctness of the information provided in the reports;*	Section 15
	(ii)	*the inclusion of comments and inputs from stakeholders and I&APs;*	Section 15
	(iii)	*the inclusion of inputs and recommendations from the specialist reports where relevant; and*	Section 15
	(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;*	Section 15
A3 R3-1 (t)		***Where applicable, details of any financial provision for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts;***	-
A3 R3-1 (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*	N/A
	(ii)	*a motivation for the deviation;*	N/A
A3 R3-1 (v)		***Any specific information that may be required by the competent authority; and***	Section 13
A3 R3-1 (w)		***Any other matters required in terms of section 24(4)(a) and (b) of the Act.***	N/A
A3 R2		***Where a government notice gazetted by the Minister provides for any protocol or minimum information requirement to be applied to an environmental impact assessment report the requirements as indicated in such notice will apply.***	N/A

1 INTRODUCTION

1.1 Background

The Department of Human Settlements (DHS) aims at fast tracking the release of serviced stands from State owned land to qualifying beneficiaries through the Gauteng Rapid Land Release Programme (GRLRP). Phumaf Holdings (Pty) Ltd (Phumaf) was appointed as the responsible Engineers to undertake all preliminary planning, planning, design and construction management to enable the release of the identified stands. As part of the GRLRP, the Unitas Park Extension 16 Development has been identified for implementation.
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The area is currently zoned as agriculture on a dolomitic zone in terms of Geophysics. The site is approximately 149 hectares in extent and is owned by the Gauteng Provincial Government. The proposed site is currently vacant, with immediate adjacent land portions also being vacant. There is evidence of watercourses on the site, as well as to the southeast of the site. A drainage line appears to run from the site towards Houtkop Road to the southwest, where the surface water drains under the road and continues to flow into a National Freshwater Ecosystem Protection Area (NFEPA). The buffer of the NFEPA includes a portion of the southwest of the site.

The proposed project entails the phased establishment of a mixed use residential development inclusive of the following land uses: low, medium and high density residential; student village; mixed use; innovation hub; social/educational; public open space and sports facility. (Refer to Figure 1-1 below for the draft proposed layout)

Due to capacity constraints identified during the preliminary investigations, the applicant is proposing to include an on-site above ground biological wastewater treatment facility (WWTF) as part of the proposed development. it is envisaged that the proposed WWTF will be designed and constructed in a phased manner, directly aligned with the capacity demand of the implementation of the phased development. The final design of the proposed steel tank aboveground biological WWTF is estimated to treat to general discharge standards with a combined peak capacity of 20Ml/day (with these being phased in two stages of 10Ml/day respectively). (Refer to Figure 1-2 for an illustration of a typical aboveground WWTF).

This final effluent is guaranteed to be within general limits as required from the Department of Water and Sanitation (DWS), which is suitable for discharge into reservoirs and water bodies with no potential for environmental damage. The proposed final water usage is envisaged for irrigation and/or environmental discharge.

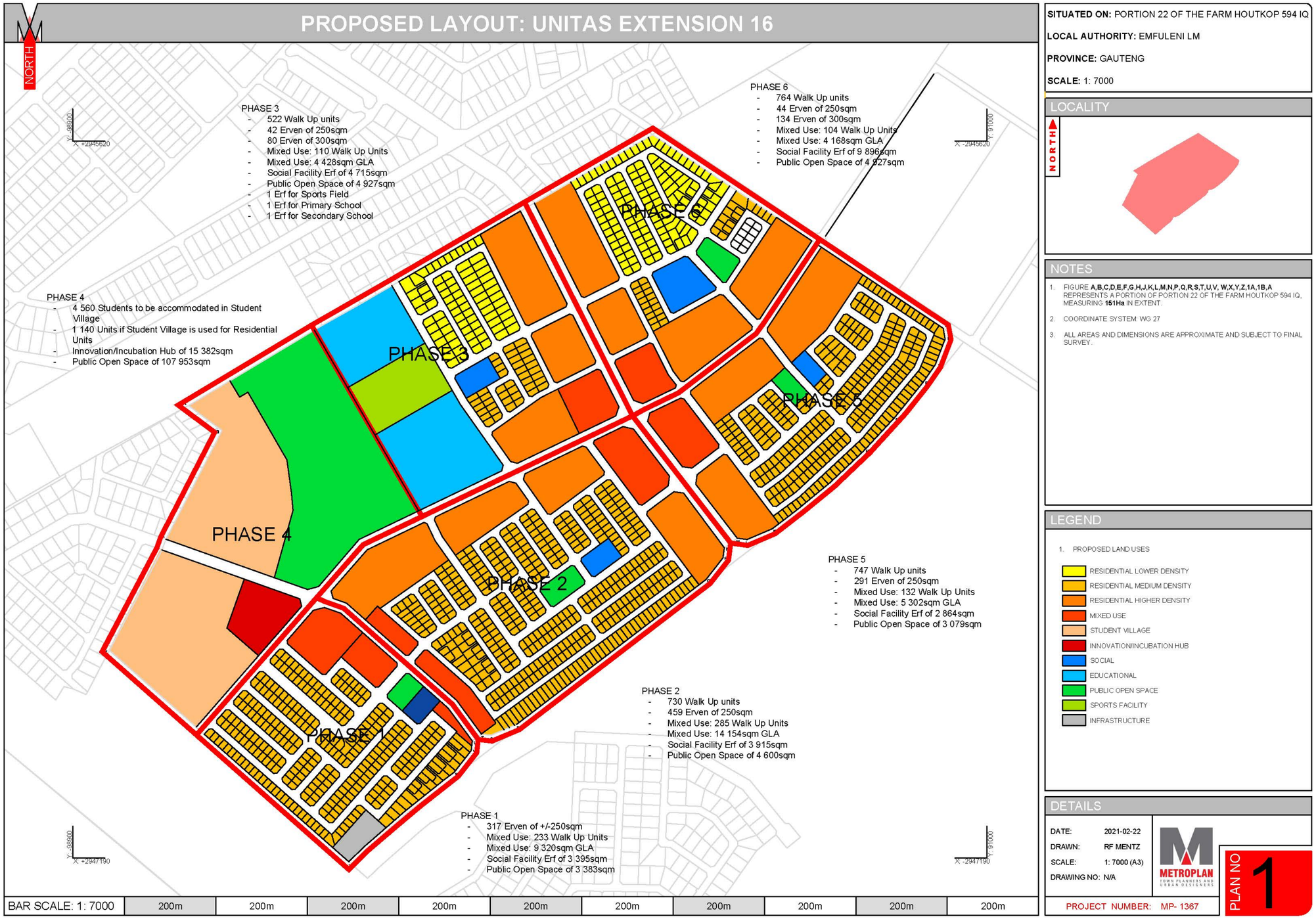

Figure 1-1: Proposed Draft Layout

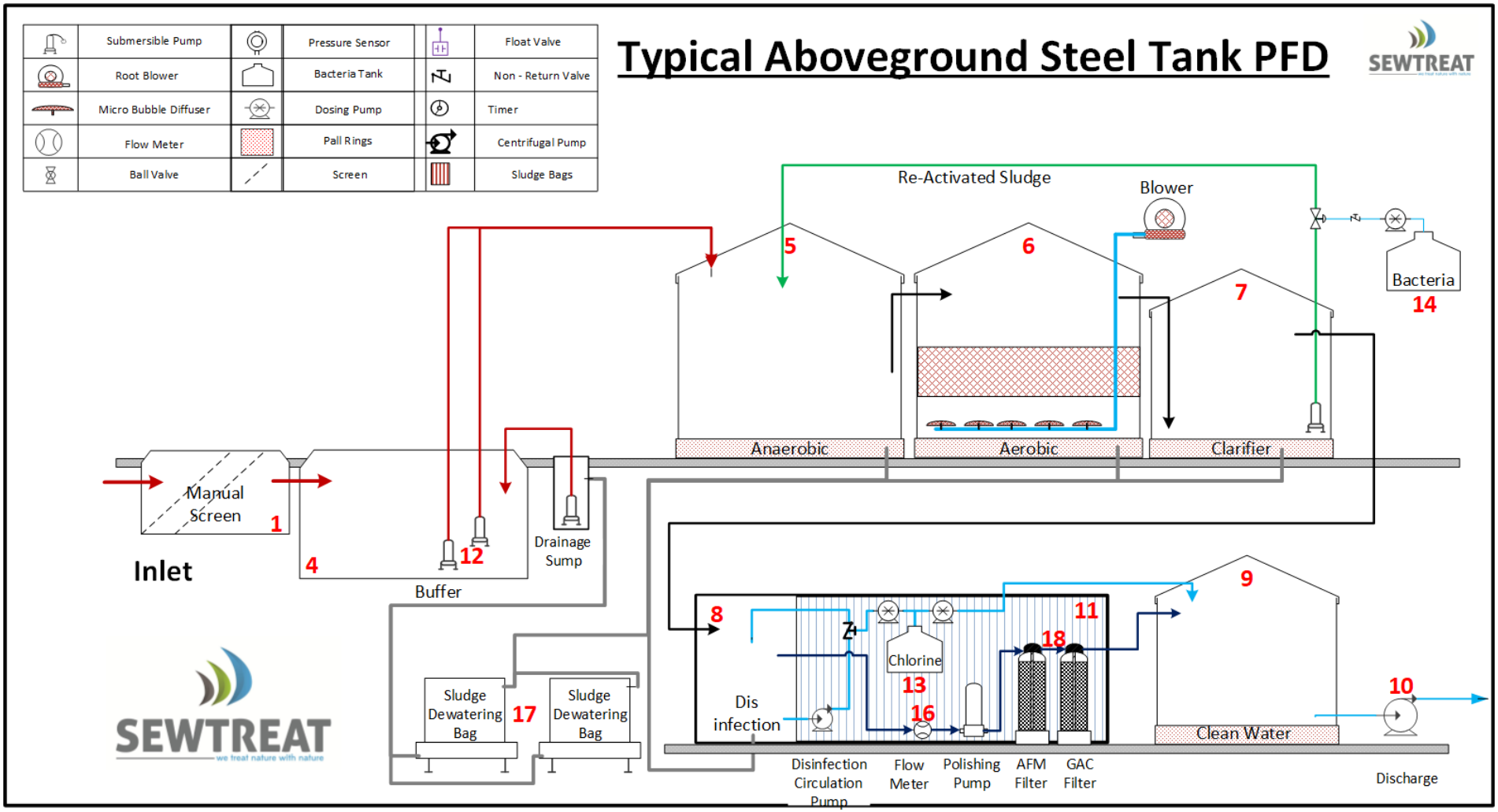

Figure 1-2: Typical Aboveground Steel Tank WWTF

1.3 Details of the Applicant and EAP

The details of the applicant are provided in Table 1.1.

Table 1-1: Name and Address of Applicant

ITEM	COMPANY CONTACT DETAILS
Company Name:	Department of Human Settlements – Gauteng Provincial Government
Company Representative:	Daniel Molokomme
Telephone No.:	011 085 2593
Facsimile No.:	011 355 6211
E-mail Address:	Daniel.Molokomme@gauteng.gov.za
Postal Address:	Private Bag X79, Marshalltown, 2001

GCS has been appointed as the independent Environmental Assessment Practitioner (EAP) to undertake the environmental processes required to obtain approval for the proposed listed activities, as requested by the relevant competent authorities.

GCS is an independent consultancy providing expertise in earth sciences, environmental sciences/management, Geographic Information Systems (GIS) and water resources management. The GCS team consists of highly trained staff who have extensive experience in the fields of hydrogeology, hydrology and environmental science. GCS is an independent environmental consulting firm and declares itself an independent EAP which has no vested interest in the outcomes of the applications. GCS furthermore asserts that, under no circumstances will objectivity be compromised in the carrying out of the environmental authorisation application processes. All the relevant specialist investigations, project material, reports as well as the issues and response report resulting from the public consultation process will be submitted to the competent authorities to allow for informed decisions to be made.

The contact details of the EAP are provided in Table 1-2. The details and expertise of each representative of the EAP involved can be found in Table 1-3.

Table 1-2: Name and address of environmental assessment practitioner.

ITEM	COMPANY CONTACT DETAILS
Company Name:	GCS Water and Environment (Pty) Ltd
Company Representative:	Gerda Bothma
Telephone No.:	+27 (0)11 803 5726
Facsimile No.:	+27 (0)11 803 5745
E-mail Address:	gerdab@gcs-sa.biz
Postal Address:	PO Box 2597, Rivonia, 2128

Ms Gerda Bothma has over 20 years' experience within the environmental management field and strives to deliver custom environmental services to clients. She began her career in the

environmental field within the government sector, managing environmental aspects and impacts as well as reviewing environmental assessments with the view of authorizing or declining authorization of the developments.

After six years within the government sector she joined a consulting engineering firm where she was ultimately responsible for the Management of the Environmental Sub-Division. Ms Bothma has experience in project and client management, financial management and the compilation and costing of project proposals and tenders. She has been involved in several engineering projects as the Environmental Assessment Practitioner as well as the Environmental Control Officer during construction working closely with the Occupational Health and Safety Officer. Environmental auditing and compliance monitoring of waste disposal sites also forms part of her experience gained.

Table 1-3: Details and expertise of people who helped prepare the report

Name	Education qualifications	Role in the Project	Experience (years)
Magnus van Rooyen	MPhil Pr.Sci.Nat	Technical Director	18
Gerda Bothma	BSc Hons Microbiology Pr.Sci.Nat	Senior EAP, Technical Review, Project Management.	22
Karin Loukes	MSc Environmental Management Pr.Sci.Nat	EAP, Report Compilation	7
Lehlogonolo Mashego	MSc Environmental Science	EAP, Stakeholder Liaison and Engagement, Assistance and Support	4

The curriculum vitae (CV) of the relevant members of the project team can be found in Appendix A.

1.4 Project Location

The area is located within Unitas Park, Vereeniging within the Sedibeng District Municipality and Emfuleni Local Municipality (ELM), 6 km north-west of the Vereeniging central business district (CBD), sandwiched between roads R54 and R42. The R82 is runs north-south approximately 2.3km to the east of the site. The N1 is about 11 km to the west of the site and R54 runs through the site. Sebokeng lies to the northwest of the site, with Vereeniging to the south east. The closest towns include Homer (3.1 km from the proposed site), Roods Gardens (3.3 km from the proposed site), Steelpark (4.9 km from the proposed site), Vereeniging (8.8 km from the proposed site) and Houtkop (9.6 km from the proposed site). Access to the site is via Skippie Botha and Langraad Roads and the predominant adjacent land use is residential and agricultural. Additionally, various similar projects is under investigation within the municipal area and several housing developments have been

confirmed, as can be seen in Figure 1-3 below. Please refer to Figure 1-5 and Figure 1-6 for the locality of the site.

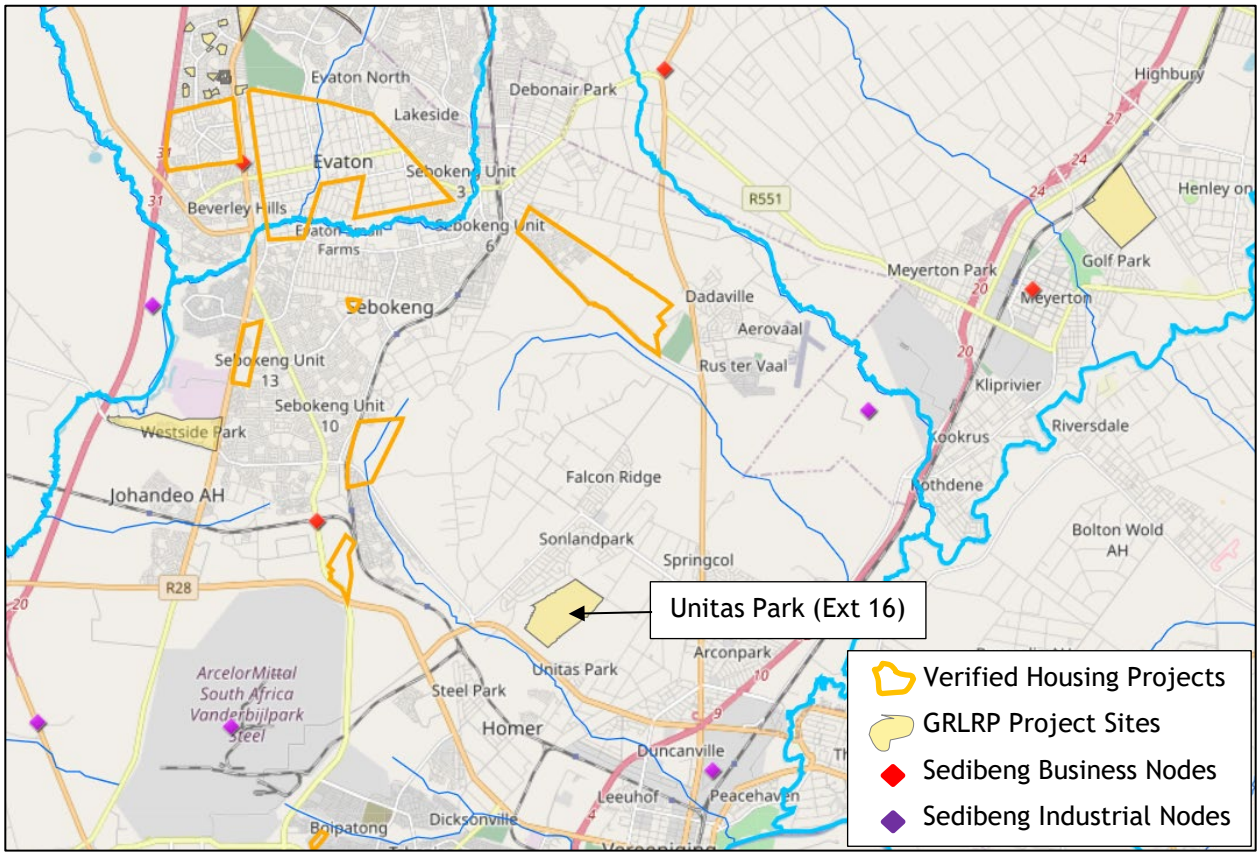

Figure 1-3: Regional Locality of Unitas Park Ext. 16 in relation to other GRLRPs and housing developments ***(courtesy of Gauteng Spatial Master Plan: GIS Portal)***

The Global Positioning System (GPS) coordinates of the proposed development are provided in Table 1-4 with a corresponding map of GPS points in Figure 1-4. The approximate mid-point of the proposed area to be developed is at 26°37'28.21"S and 27°54'11.43"E.

Table 1-4: GPS coordinates.

Point	Latitude	Longitude
Point 1	26°37'4.82"S	27°54'23.36"E
Point 2	26°37'20.89"S	27°54'48.00"E
Point 3	26°37'54.19"S	27°53'58.08"E
Point 4	26°37'40.62"S	27°53'40.26"E
Point 5	26°37'25.92"S	27°53'49.26"E
Point 6	26°37'23.85"S	27°53'46.62"E

Figure 1-4: Map indicating GPS points

UNITAS PARK: REGIONAL LOCALITY

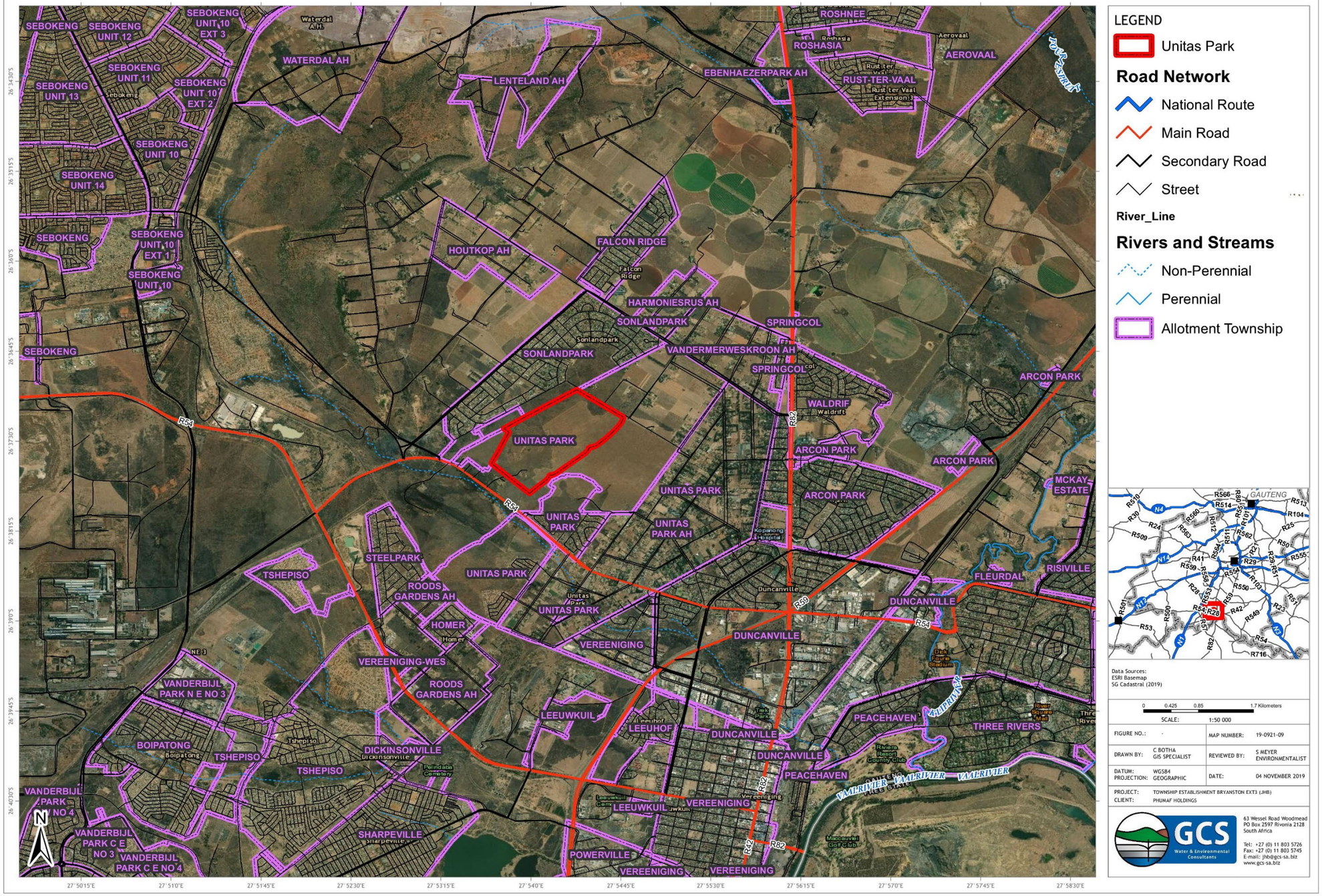

Figure 1-5: Regional Locality of Unitas Park Ext. 16

Figure 1-6: Locality of Unitas Park Ext. 16

2 LEGISLATIVE CONTEXT

The policy and legislative context applicable to the Unitas Park project is summarised in Table 2-1 and penalties applicable to non-compliance to the legislation are detailed in Table 2-2.

Table 2-1: Legislation and guidelines applicable to the Unitas Park project

LEGISLATION/ GUIDELINES	APPLICABILITY
The Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996)	All developers are duty-bound to constitutional, legislative, and other measures to prevent pollution and ecological degradation, promote conservation and to develop in a sustainable manner as far as is reasonably possible. The constitutional environmental right elevates the importance of environmental protection and conservation and emphasises the significance that South Africans attach to an environment that is not harmful to their health or well-being.
National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA)	NEMA provides for co-operative environmental governance by establishing principles for decision-making on matters affecting the environment, institutions that will promote co-operative governance and procedures for co-ordinating environmental functions exercised by State Departments and to provide for matters connected therewith. These principles serve as guiding principles for a project, and they are binding, enforceable and justiciable. In terms of the EIA Regulations of 2014 (as amended in 2017) published in terms of NEMA, an Application for Environmental Authorisation for listed activities is required to be submitted to either the Provincial Environmental Competent Authority, or the National Competent Authority.
National Environmental Management: Waste Act, 2008 (Act No 59 of 2008) (NEM: WA)	The National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) (NEMWA), as amended, aims to protect health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development, to provide for specific waste management measures, to provide for the licensing and control of waste management activities, to provide for compliance and enforcement, to name but a few of the purposes of the Act.
National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEM:BA)	The purpose of the Biodiversity Act is to provide for the management and conservation of South Africa's biodiversity within the framework of the NEMA and the protection of species and ecosystems that warrant national protection. This Act is applicable to this application for environmental authorisation, in the sense that it requires the project applicant to consider the protection and management of local biodiversity.
Conservation of Agricultural Resources Act 43 of 1983 (CARA)	To provide for control over the utilization of the natural agricultural resources of the Republic in order to promote the conservation of the soil, the water sources and the vegetation and the combating of weeds and invader plants; and for matters connected therewith. In terms of the amendments to the regulations under the Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983), landowners are legally responsible for the control of alien species on their properties.
National Water Act, 1998 (Act No. 36 of 1998) (NWA)	The NWA is the primary legislation regulating both the use of water and the pollution of water resources. A person can only be entitled to use water if the use is permissible under the Act. Water Use is defined broadly and must be licensed unless it is listed in Schedule 1 as an existing water use or is permissible under general authorization.

LEGISLATION/ GUIDELINES	APPLICABILITY
The National Heritage Resources Act, (Act No. 25 of 1999) (NHRA)	NHRA governs the management of heritage resources which are of cultural significance. The South African Heritage Resources Agency (SAHRA) is the national body responsible for the protection of South Africa's cultural heritage resources. A Notice of Intent to Develop is required to be submitted to SAHRA for this project.
Spatial Planning and Land Use Management Act, 2013 (Act No. 16 of 2013) (SPLUMA)	In 2013, land use planning was influenced by the promulgations of the Spatial Planning and Land Use Management Act (2013) (SPLUMA) which outlines a set of principles to influence spatial planning, land use management and land development. The general principles of SPLUMA are that spatial planning, land use management and land development must promote and enhance spatial justice, spatial sustainability; efficiency; spatial resilience, and good administration. Integrated Development Plans (IDP) and Spatial Development Frameworks (SDF) are the key planning instruments used by municipalities for new developments (whether residential or commercial). While this does not form part of this document, it is required and will be applied for separately.
Gauteng Environmental Management Framework	Site falls within Zone 1 of the Gauteng Environmental Management Framework, which pertains to the Urban Development Zone. The intention thereof is to concentrate Urban Development to minimise urban sprawl and create a more effective and efficient city area.
Strategic Transmission Corridor – Central Corridor	Site falls within the Central Corridor for the Strategic Transmission Corridor, associated with the Renewable Energy Development Zones.
Air Quality – Vaal Triangle Airshed Priority Area	The Vaal Triangle Airshed Priority Area (VT APA) is the first priority area in South Africa and was declared such due to the concern of elevated pollutant concentrations within the area, specifically particulates. The Vaal Triangle is a highly industrialised area housing numerous industries, a coal fired power station, and various smaller industrial and commercial activities in addition to a few collieries and quarries giving rise to noxious and offensive gasses

Table 2-2: Penalties applicable to non-compliances under the legislation tabulated above

LEGISLATION	SECTION	FINE
NEMA	Section 49A (1) (a), (b), (c), (d), (e), (f) and (g)	Fine not exceeding R 10 million or imprisonment for a period not exceeding 10 years, or both such fine and such imprisonment.
	Section 49A (1) (i), (j) or (k)	Fine not exceeding R 5 million, or imprisonment for a period not exceeding 5 years. In the case of a second or subsequent conviction: fine not exceeding R 10 million, or to imprisonment for a period not exceeding 10 years. Or in both instances to both such fine and such imprisonment.
	Section 49A (1) (h), (l), (m), (n) (o) or (p)	Fine or imprisonment for a period not exceeding one year, or to both a fine and such imprisonment.
NWA	Section 15 and Item 31 of Schedule 4	First conviction: Fine or imprisonment for a period not exceeding 5 years, or both a fine and such imprisonment. Second or subsequent conviction: Fine or imprisonment for a period not exceeding 10 years, or both a fine and such imprisonment.

LEGISLATION	SECTION	FINE
NEM: WA	Section 67 (1) (a), (g) or (h)	Fine not exceeding R 10 million or imprisonment for a period not exceeding 10 years, or both such fine and such imprisonment, in addition to other penalties that may be imposed in terms of NEMA.
	Section 67 (1) (b), (c), (d), (e), (f), (i), (j), (k) or (l), and Section 67 (2) (a), (b), (c), (d) or (e)	Fine not exceeding R 5 million or imprisonment for a period not exceeding 5 years, or both such fine and such imprisonment, in addition to other penalties that may be imposed in terms of NEMA.
	Section 67 (1) (m)	Fine or imprisonment for a period not exceeding 6 months or both a fine and such imprisonment.

Please note that a separate application to the Department of Human Settlement, Water and Sanitation, for a Water Use License in terms of Section 21 of the NWA has been initiated for this proposed development.

2.1 Listed Activities Triggered

The Unitas Park project triggers listed activities in terms of the NEMA, as contained in the amended 2014 EIA Regulations. The identified listed activities are presented in Table 2-3 and require that a Scoping and Environmental Impact Reporting (S&EIR) process to be followed in order to obtain the necessary Environmental Authorisation (EA) in terms of the NEMA.

Table 2-3: NEMA Listed Activities triggered by the Unitas Park project.

LISTING NOTICE	ACTIVITY NO	ACTIVITY DESCRIPTION	PROJECT ACTIVITY WHICH TRIGGERS THE LISTED ACTIVITY:
1	12	The development of — (i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres; or (ii) *infrastructure or structures with a physical footprint of 100 square metres or more;* *where such development occurs —* *d)* within a watercourse; or *e)* in front of a development setback; or *f) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse;* excluding — aa) the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour; (bb) where such development activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies; (cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies; (dd) where such development occurs within an urban area; (ee)where such development occurs within existing roads, road reserves or railway line reserves; or (ff) the development of temporary infrastructure or structures where such infrastructure or structures will be removed within 6 weeks of the commencement of development and where indigenous vegetation will not be cleared.	The proposed development site is situated within 32 meters of a water resource.
1	25	*The development and related operation of facilities or infrastructure for the treatment of effluent, wastewater or sewage with a daily throughput capacity of more than 2 000 cubic metres but less than 15 000 cubic metres.*	The development of a sewage treatment package plant which is estimated at being phased in two phases with an expected capacity of 10 mega-liters respectively.
1	27	*The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation,* except where such clearance of indigenous vegetation is required for — (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.	Site clearance of indigenous vegetation highly likely to exceed 1 ha.
1	28	*Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such development:* *(i) will occur inside an urban area, where the total land to be developed is bigger than 5 hectares; or*	The proposed development is a Residential Development of 149 ha in extent, on land currently zoned as agriculture.

LISTING NOTICE	ACTIVITY NO	ACTIVITY DESCRIPTION	PROJECT ACTIVITY WHICH TRIGGERS THE LISTED ACTIVITY:
		(ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare; excluding where such land has already been developed for residential, mixed, retail, commercial, industrial or institutional purposes.	
2	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; or *(ii)* maintenance purposes undertaken in accordance with a maintenance management plan.	The site is 149ha in extent. It is likely that indigenous vegetation is to be cleared in excess of 20 ha.
2	25	*The development and related operation of facilities or infrastructure for the treatment of effluent, wastewater or sewage with a daily throughput capacity of 15 000 cubic metres or more.*	The development of a sewage treatment package plant which is estimated at being phased in two parts with an expected capacity of 10 mega-liters respectively, i.e. potential total of 20 000 cubic meters.
3	4	*The development of a road wider than 4 meters with a reserve less than 13.5 meters in* *c. Gauteng within* *(iii) A protected area identified in terms of NEMPAA, excluding conservancies;* *(iv) National Protected Area Expansion Strategy Focus Areas;*	The site is zoned for agriculture and is classified as having a very high sensitivity in respect to the terrestrial biodiversity. Soweto Highveld Grassland = Vu.
3	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, in* *c. Gauteng within* *(iii) Within Critical Biodiversity Areas or Ecological Support Areas identified in the Gauteng Conservation Plan or bioregional plans*	Site is in 149ha in extent, currently zoned for agriculture and it is highly likely that indigenous vegetation of more than 300 m^2 will be cleared.
3	14	*The development of—* *(ii) infrastructure or structures with a physical footprint of10 square metres or more;* *where such development occurs—* *(a) within a watercourse;* *(b) in front of a development setback; or* *(c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse;*	Site is in close proximity of NFEPA system, is currently zoned as agriculture and falls within a very high sensitivity of terrestrial biodiversity due to a vulnerable ecosystem.
3	15	*The transformation of land bigger than 1000 square metres in size to residential, commercial, retail, industrial or institutional used where such land was zoned open space, conservation or had an equivalent zoning, on or after 02 August 2010.*	The site is 149ha in extent and is currently zoned as agriculture.

Please note: Activity 6 from GNR 325 was erroneously included within the application form. This activity is excluded as per sub-item (iii) and is covered with Activity 25 within GNR 327 and GNR 327 respectively.

3 PROJECT MOTIVATION, NEED AND DESIRABILITY

The Department of Human Settlement (DHS) seeks to address the "housing backlog" which is deemed a National Priority. The proposed project falls within Priority Housing Development Area (Figure 3-1). The Priority Housing Development Areas (PHDA) are intended to advance the departments Spatial Transformation and consolidation by ensuring that the delivery of housing is used to restructure and revitalize towns and cities, strengthen the livelihood prospects of households and overcome apartheid special patterns by fostering integrated urban forms and introducing sustainable urban areas.

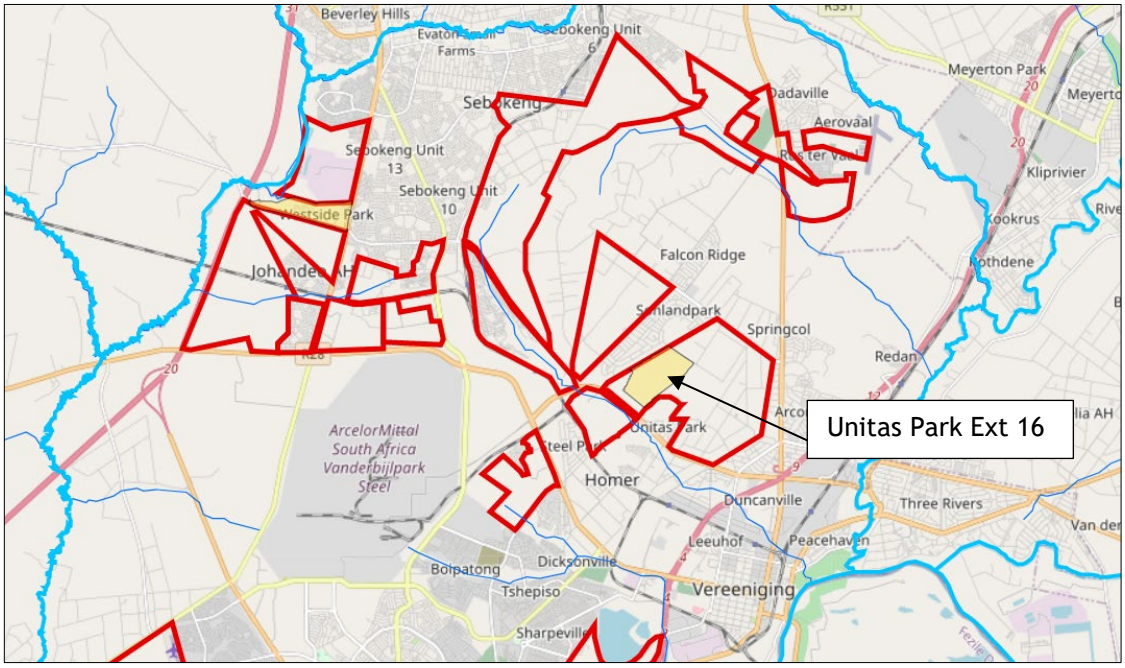

Figure 3-1: PHDA Areas

In achieving the primary objective set by DHS, the following recommendations in urban areas are expressed in the National Development Plan:

- Upgrading all informal settlements on suitable, well-located land by 2030;
    - The proposed development seeks to introduce a housing development and service infrastructure which ought to further alleviate issues within the municipality. The feasibility of the area has been assessed with a range of Specialist Assessments conducted to ensure that the relevant impacts are identified and appropriated mitigation measures presented.
- Increased urban densities to reduce sprawl and costs;
    - The location of the proposed development is away from a city centre which promotes the reduction of urban sprawl.
- Initiatives to shift jobs and investment to the urban townships on the peripheries;

    - The development has made provision for business facilities and economic activities.
- Substantial investments in safe, reliable and affordable public transport and better co-ordination among the various modes; and
    - A detailing Traffic Impact Assessment (Appendix B) was conducted to ensure efficient connection and promotion between the existing and planned traffic migrations.
- A comprehensive review of the grant and subsidy regime for housing to ensure diversity in product and finance options and spatial mix.
    - The conducted Market Study recommended that subsidised housing contribute 53% to the total of bonded housing development whereas FLISP, middle income and affordable housing contribute 24%, 11% and 10% respectively to the total bonded housing development. It is further recommended that Social Housing (primary and secondary market) contribute 46% to the total of the rental housing development whereas, CRU, middle income and affordable housing should contribute 23%, 15%, and 14% respectively.

Furthermore, according to the Sedibeng IDP 2019-2020, there is a great need to improve the quality of housing in the municipality under The Housing Act (Act 207 of 1997), whereby the development of a housing programme is provided and promoted. This project will form one such provision, to promote Urban renewal and modernize urban development, as well as reduce the housing backlog in the district.

The Sedibeng District Municipality SDF also includes the following as matter of importance:

- Transform Human Settlements and the National Space Economy
    - This ought to address the housing backlog and build sustainable households that will contribute towards the economy. The proposed land uses include: low, medium and high density residential; student village; mixed use; innovation hub; social/educational; public open space and sports facility.
- Build Safer Communities
    - The design of the proposed development seeks to introduce a community that is safe, desirable, allows for long term investment and promotes community building. Bringing sustainability, green spaces business facilities and a range of social facilities that primarily make up a community.
- Build a Capable and Developmental State
    - The provision for business facilities was critical in the design to allow for entrepreneurs to practice their desired business ventures and allow for new

markets that ought to serve the proposed community and further existing community.

- Nation Building and Social Cohesion
    - The design of the proposed development accounted for sustainable alternatives, green areas and desirability to enhance the household and community livelihoods.
    - In addition, the National Strategy for Sustainable Development, alternatively referred to as Breaking New Ground (2020), is a comprehensive plan for the development of sustainable human settlements. Commissioned by the DHS, the plan promotes the creation of a non-racial, integrated society through the development of sustainable human settlements and quality housing. Within this, the Department mandates the specific objectives: Accelerate housing delivery; Improve the quality of housing products and environments; Ensure asset creation; Ensure a single, efficient formal housing market; and Restructure and integrate human settlements.

Emfuleni Local Municipality (ELM) is one of the municipalities identified by the department to be considered for National Upgrading Support Programme technical assistance and capacity building support, in agreement with the department. Building houses remains the competency of DHS with the principle role of facilitation being lying with the local municipality, ELM. In line with the local municipalities mandate, ELM's IDP demonstrates the departments mission to address socio-economic needs and upholding the Batho Pele principles by:

- Ensuring cost effective and affordable services;
    - This links with the National and Districts objective.
- Being responsive and sensitive to the social and housing needs of our communities;
    - This links with the National and Districts objective. Further engagement with the Market Study may be perused for more detailing information (Appendix B).
    - The proposed development has also been guided by the Social Housing Act (Act 16 of 2008).
- Providing a range of affordable shelter options, and
    - This links with the National and Districts objective. Further engagement with the Market Study may be perused for more detailing information (Appendix B).
- Identifying suitable land for the establishment of new housing projects, to reduce the housing backlog on the Gauteng Waiting List.
    - This links with the National and Districts objective.

According to the Emfuleni Spatial Development Framework 2017-2025, 2017 Unitas Park Ext 16 falls within a 'Low Density Residential Zone' (Zone 3). The aim and objective of a low-density residential zone is defined as:

"to develop and maintain the residential character of typical suburban residential neighbourhoods. This involves the management of land use development within these residential areas and curbing the proliferation of noxious and disturbing land uses within these areas. Zone 3 does also allow for the establishment of micro enterprises with the aim to support and promote SMMEs within this zone. However, consent for the establishment of micro enterprises are strictly managed by the micro enterprises management system in order to curb the proliferation of noxious and disturbing land uses within this zone. ***A maximum residential density of 30 units per hectare*** *should be supported in Zone 3. Residential supporting facilities to be accommodated within this zone include schools, social facilities and recreational facilities."*

The site is also indicated as a 2020 residential expansion area. According to the SDF, *"the period 2020-2025 aims to further consolidate and densify the development triangle situated between the Vanderbijlpark, Sebokeng and Vereeniging CBDs. This includes residential expansion in the Cyferpan, Sonlandpark and Boipatong areas. The further densification of agricultural holdings areas, such as Mantevrede and Unitas Park during the period 2020 to 2025, is also encouraged. Thedensification of the agricultural holdings and residential expansion areas in the Sonlandpark area will further strengthen the Vereeniging-Johannesburg commuter railway line corridor, as envisaged in the Development Concept. Industrial area expansion within the period 2020 to 2025 involves expansion of the industrial belt stretching from Mittal up to the Vereeniging-Johannesburg railway line".*

4 OBJECTIVES OF THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

In accordance with the Appendix 3 Regulation 2 of GNR. 326 of the NEMA EIA Regulations (2014 as amended) the objective of the environmental impact assessment process is to, through a consultative process: -

- Identify the policies and legislation relevant to the activity;
- Motivate the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location and layout;
- Identify and confirm the preferred activity and technology alternative through an impact and risk assessment and ranking process;
- Identify and confirm the preferred site, through a detailed site selection process, which includes an identification of impacts and risks inclusive of identification of cumulative impacts and a ranking process of all the identified alternatives focusing on the geographical, physical, biological, social, economic, and cultural aspects of the environment;
- Discuss the nature, significant consequence, extent, duration and probability of the impacts occurring and the degree to which the impacts can be reversed, cause irreplaceable loss, and whether these can be avoided, managed or mitigated;
- Identify the most ideal location for the activity within the development footprint based on the levels of environmental sensitivity identified through various specialist studies in the assessment phase;
- Identify, assess and rank the impacts the activity will impose on the development footprint throughout its lifetime;
- Identify measures to avoid, manage or mitigate identified impacts; and
- Identify cumulative and residual risks that need to be managed and monitored.

5 PROJECT ALTERNATIVES

Development alternatives are defined in relation to a proposed activity as different means of meeting the general purposes and requirements of the activity, which may include alternatives to –

- The property on which, or location where it is proposed to undertake the activity;
- The type of activity to be undertaken;
- The design or layout of the activity;
- The technology to be used in the activity;
- The operational aspects of the activity; and
- The option of not implementing the activity.

5.1 Alternate Development Sites

This site was selected as it was identified as particularly well suited for the proposed activity (provision of serviced residential stands), in accordance with the GRLRP. This GRLRP aims at fast tracking the release of serviced stands from State owned land (in this instance land owned by Gauteng Provincial Government) to qualifying beneficiaries.

Based on the above, no alternative sites were investigated as these would not meet the general purpose and need of the proposed activity.

5.2 Alternate Development Types

No alternate development types have been proposed or investigated as the project aims to fulfil the housing requirements of the ELM, in line with DHS standards.

5.3 Alternate Designs

No alternate design types have been proposed or investigated as the project aims to comply with the design standards of the ELM and DHS.

5.4 Alternative Technologies

Standard brick and mortar technology will be used in the construction of the housing units. This technology has been tried and tested and the most cost effective in supplying housing. In the final design of the building's energy saving technologies/sustainable technology alternatives such as solar water heating and grey water harvesting will be considered. Resource demand reducing technologies have been included in the preferred option and include:

- Low flow showerheads;
- Dual flush toilets;
- Low energy lighting; and

- Thermal insulation of the ceilings.

Based on the information presented within this DEIR, it is reasonable to suggest that above-mentioned technology alternatives have been investigated and comprise the preferred alternative.

5.5 No-Go Alternative

It is required that all development alternatives be included into the investigation process. The no-go option will be comparatively assessed against the above mentioned alternative during the environmental impact assessment phase and will act as a baseline against which all the other development alternatives are measured.

The "no-go" option would result in the proposed activity not being implemented and the status quo on the property remaining. The No Go alternative usually implies the continuation of the status quo in terms of development potential, zoning and management. The No-Go Alternative would not achieve the general purpose and requirements of the activity, which is to provide services stands for residential purposes.

The no-go option would result in a significant opportunity loss for the site, provision of housing opportunities in the local area and importantly, the Communities which could potentially be involved in the Project.

5.6 Preferred Alternative

In determining the preferred alternative it must be noted that the mandate of Department of Human Settlement is to maximise the development opportunities by making use of the available stands for township establishment. The number of available sites and their proximity make it even more challenging considering the consistent nature of characteristics and prospects for development.

Given the aforementioned, one site was identified for the proposed development being the preferred based on the assessments conducted, engagement and departmental mandate. The basis for the concept layout was mainly driven by the need analysis and economic environment of the site. The layout took into consideration environmental aspects; accounting for the environmental sensitivities, social; accounting for the demographic make-up and social dynamics, and finally economics; accounting the economic value and prospect opportunities. More so, a technical criteria and evaluation was managed to ensure sustainability for the proposed development and feasibility in what is proposed. It is imperative to note that the developed Urban Development Framework (UDF) added value in determining the site layout. The UDF further accounted for the following design principles in proposing the different site layouts:

- Mixed-use – the primary aim is to address a range of needs within walking distance thus reducing the need for vehicular travel and secondly to ensure a 24-hour city.
- Mixed residential typology – aimed at addressing the needs of different income groups and different household types thereby creating socio-economic integration.
- Permeability - necessitates direct routes and short walking distances.
- Sense of place – the aim being to addresses aspects such as gateways, landmarks, vistas.
- Multi-functionality/ adaptability – aimed at using space for more than one function and the ability to use space in different ways over time.
- Human scale – The primary aim being to ensure that the environment fits to the scale of its users.

The Preferred Alternative for this Project is described below and illustrated in Figure 1-1.

It is proposed to develop a mixed use residential development inclusive of the following land uses: low, medium and high density residential; student village; mixed use; innovation hub; social/educational; public open space and sports facility.

Due to the scale of the project, it is proposed that the development be phased. Phasing is guided by feasible points of access, viable development pockets and the need to balance a combination of land uses and typologies within one phase.

Phase 1 is proposed in the south-eastern portion of the site. Access can be obtained by the construction of the first 700m of the K55. This phase entails the following:

- 317 residential erven of 250m2
- Mixed Use: 233 walk-up residential units
- Mixed Use: 9 320m2 GLA retail
- Social Facility Erf of 0.4ha
- Public Open Space of 0.4ha

Phase 2 is proposed to the north of Phase 1. In this phase walk-up flats are proposed in addition to the single residential erven, as well as some retail and social facilities. This portion will be accessible via the extension of the main north-south road in the development or the construction of a further 700m of the K55. This phase entails the following:

- 459 residential erven of 250m2
- 730 Walk-up residential units
- Mixed Use: 285 Walk-up residential units
- - Mixed Use: 14 154m2 GLA retail

- - Social Facility Erf of 0.4ha
- - Public Open Space of 0.46ha

Phase 3 is proposed to the west of Phase 2. This phase contains extensive social facilities, as the demand for such facilities, such as a primary and high school, would have been created by the development of Phases 1 and 2. Phase 3 can be accessed via the main north-south road constructed to service Phase 2 or through an access to Sonland Park. This phase entails the following:

- 42 residential erven of 250m2
- 80 residential erven of 300m2
- 522 Walk-up residential units
- Mixed Use: 110 Walk-up residential units
- Mixed Use: 4 428m2 GLA retail
- Social Facility Erf of 0.47ha
- Public Open Space of 0.49ha
- 1 Sports Field erf
- 1 Primary School erf
- 1 Secondary School erf

Phase 4 to the west of Phase 1 contains the student village and the innovation/ incubation hub. Access will be obtained from the main north-south road and the southern entrance from the K55. This phase entails the following:

- 4 560 Students to be accommodated in Student Village
- 1 140 units if Student Village is used for residential units
- Innovation/Incubation Hub of 1.5382ha
- - Public Open Space of 107 953sqm

Phase 5 and 6 are located in the northern portion of the site. These phases also contain a mix of single residential erven and walk-ups and social facilities. These phases will only become accessible over the long-term. They will obtain access from the main north-south road in the development, from the northern access onto the K55, to the north onto Frederick Road and to the west from Sonland Park.

Phase 5 entails the following:

- 291 residential erven of 250m2
- 747 Walk-up residential units
- Mixed Use: 132 Walk-up residential units
- Mixed Use: 5 302m2 GLA retail
- Social Facility Erf of 0.28ha

Phase 6 entails the following:

- 44 residential erven of 250m2
- 134 residential erven of 300m2
- 764 Walk-up residential units
- Mixed Use: 104 Walk-up residential units

- Public Open Space of 0.3ha

- - Mixed Use: 4 168m2 GLA retail
- - Social Facility Erf of 1ha
- - Public Open Space of 0.49ha

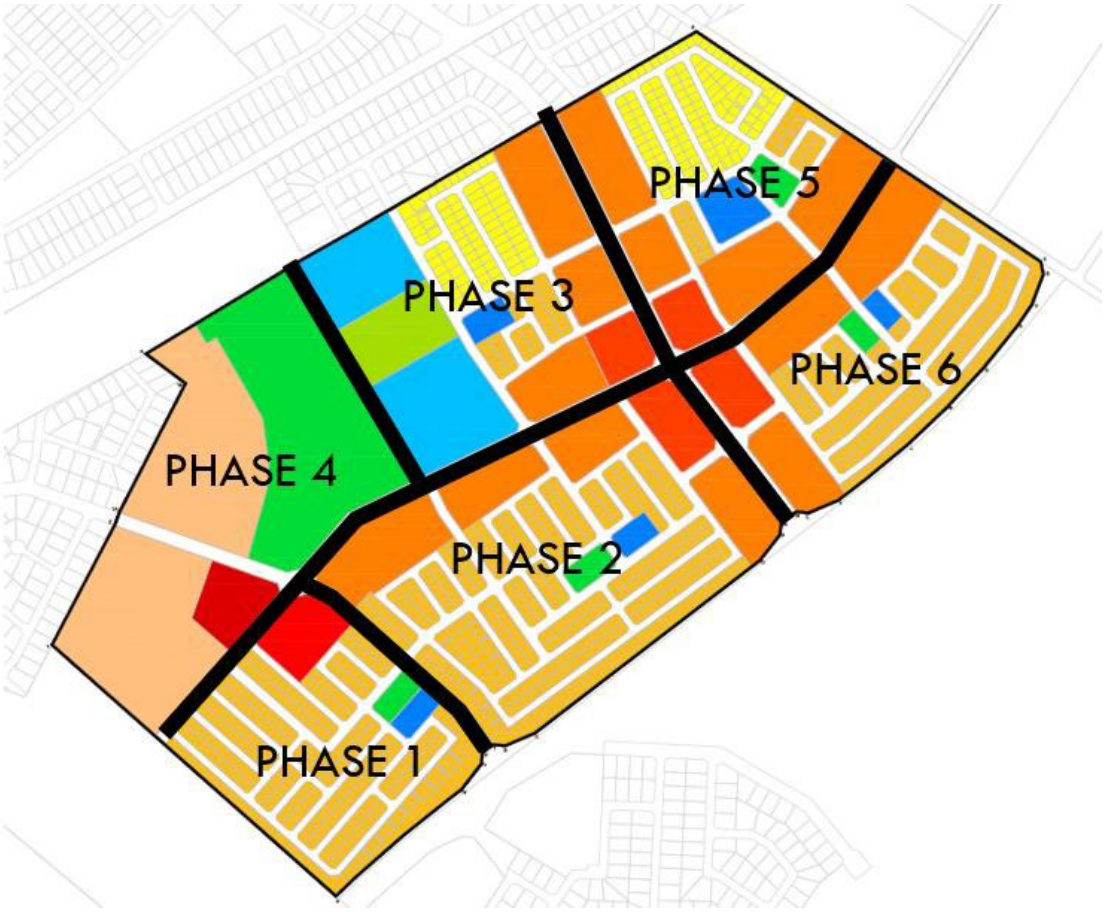

Figure 5-1: Proposed Phasing of Unitas Park Ext. 16

The Preferred Alternative is deemed the most feasible and reasonable alternative and has been thoroughly assessed in this Report. Please kindly refer to Section 10 for the impact assessment.

6 BASELINE ENVIRONMENTAL DESCRIPTION

The environmental, social and economic context within which Unitas Park Ext 16 is located is described in the sections that follow. It is necessary to understand this context in order to accurately assess the risks associated with the proposed development.

6.1 Geology and soils

The site is found to be underlain by a layer of transported material which in turn is underlain by residual chert and potential residual shale. This is underlain by chert bedrock and potential shale bedrock that has been intruded by syenite. This is underlain by dolomite bedrock of the Malmani Subgroup, Chuniespoort Group, Transvaal Supergroup at between 13 m and >60 m below EGL. The dolomite bedrock described above is solid with penetration rates greater than 3 min/m. There appears to be a mantle of weathered & altered dolomite (WAD) just above the dolomite bedrock (GCS, 2021).

6.1.1 Soil Types

Six different soil forms (Carolina, Cullinan, Dresden, Glencoe, Lichtenburg and Mispah) were identified within the proposed development site. Both the Cullinan and Carolina soil forms are newly described soil forms of the new Natural and Anthropogenic Soil Classification System of South Africa (Soil Classification Group, 2018). The natural soil forms identified on site include soil of the Carolina, Dresden, Glencoe, Lichtenburg and Mispah forms while the Cullinan form is an anthropogenic soil form.

Approximately 95.6ha of the 154ha study site consists of yellow-brown and red sandy-clayloam soil profiles of the Carolina, Glencoe and Lichtenburg forms with soil depth of 1m or deeper than 1m. These soil profiles are located in the northern, eastern, south-eastern and centre of the study area. A small portion (1ha) of shallow Dresden soil profiles is located in the south of the study area. More than 95% of the areas of Carolina, Dresden, Glencoe and Lichtenburg soil forms have been used for maize cultivation the past growing season (2019 – 2020).

The western section of the proposed development area consists of shallow Mispah profiles with soil depth between 0.1 and 0.35m where evidence of a derelict old farmhouse was found. Two areas of previous soil excavations are present in the western section of the site (Cullinan form). The Cullinan form soil form has been described as large, exposed excavations without backfilling (Soil Classification Working Group, 2018).

6.2 Topography

From a southerly to northerly direction, the topography across the study area is relatively undulating with a steady rise from the south to the north. A similar topographic profile is evident from the west to the east of the proposed development area. There is a steady undulating decrease of the topographic slope west to east (GCS,2020).

6.3 Climate

The red line in Figure 6-1 below indicates the mean daily maximum temperature, ranging between 18°C in winter and 29°C in summer, while the blue line indicates the mean daily minimum temperature, which ranged between 2°C in winter and 15°C in summer months. The maximum temperatures in summer can reach approximately 35°C, while in winter, the number of days that frost occurs can reach up to 8 days in July. The mean annual precipitation ranges from a minimum of 1mm per month in winter to a maximum of 107mm per month in summer (Meteoblue, 2020).

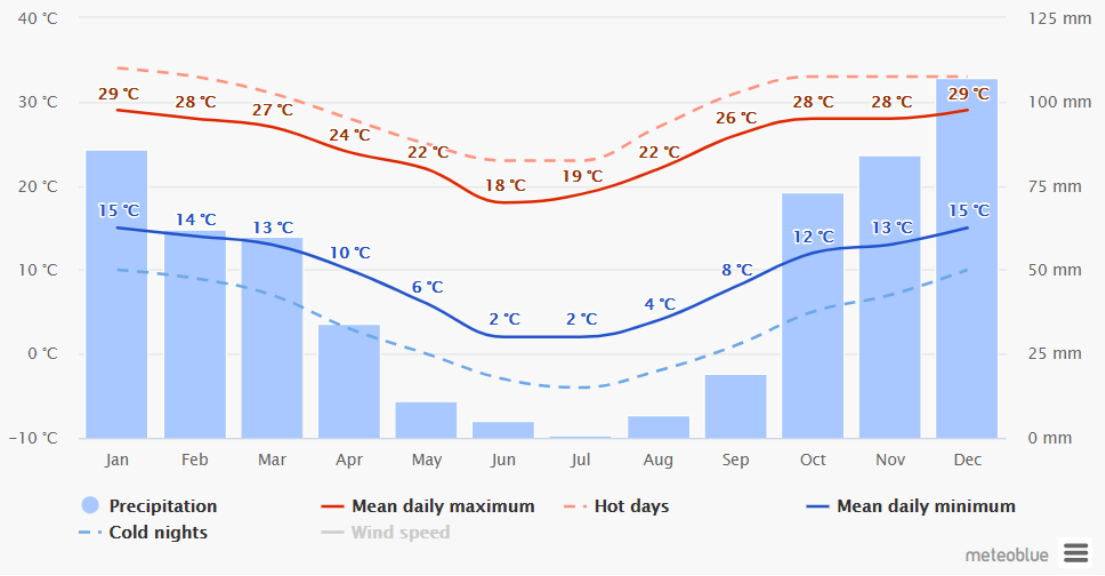

Figure 6-1: Mean monthly temperatures and precipitation in the Vanderbijlpark area (Meteoblue, 2020)

6.4 Land Use, Capability and Agricultural Potential

Land use, capability and agricultural potential data has been sourced from the Agricultural Agro-Ecosystem Specialist Assessment undertaken by TerraAfrica (2020) (Appendix B2).

6.4.1 Land Use

The area is zoned for farming/agricultural. Evidence was found of a derelict farmstead surrounded by what may be the remains of a garden around the house (TerraAfrica, 2020). The current land use of the site largely consists of rainfed production of grains (maize was

planted for the 2019-2020 growing season) as well natural veld that may be used for livestock production (will be confirmed when information is received from farmer who leases the property). Within the south-western section of the study site, there are evidence of two areas of previous soil excavation in where gravel and fractured rock was removed without any backfill or active rehabilitation of the area.

Land outside the proposed development site consist of a mixture of land uses, including residential areas and a school to the north-west of the site as well as rainfed crop production and farmsteads towards the north-east, east and south-east of the study site. The R54 (Houtkop Road) is located south of the study site.

6.4.2 Land Capability

Using the soil classification data, the project site can be divided into three different land capability classes i.e., soil with either Moderate-High (Class 10), Moderate (Class 08) and Moderate-Low (Class 07) land capability (Refer to Figure 6-2). The largest portion of the proposed development area consist of soil with Moderate-High (Class 10) land capability with medium-high to high potential for rainfed crop production. The highest land capability is 9.4 ha of land in the middle section of the site that has Moderate- High (Class 10) land capability. The shallower Glencoe profiles to the east has Class 09 land capability and the areas where the Hutton and Clovelly profiles have already been affected by anthropogenic activities, have Moderate (Class 08) land capability.

6.4.3 Agricultural potential and activities

Following the soil and land capability classification of the site, it was found that 96.6ha of the 154ha study site, have high suitability for rainfed crop production of grains such as maize. It is estimated that the average yield in this area ranges between 6 and 9 ton/ha, therefore contributing approximately 580 to 870 tons of maize per annum to the total crop volumes of Gauteng Province.

In addition to crop production, the remaining 57.4ha that is not cultivated can be used for livestock grazing at a long-term grazing capacity of 7.5ha/LSU. This area not used for crop cultivation can therefore provide feed to approximately 8 head of cattle. Although 8 head of cattle may not be a viable production unit by itself, the crop remains after harvesting are also used as feed supplement for cattle during the winter months and may therefore allow for a larger cattle herd.

The proposed development area borders on other areas with grazing veld and grain production and may therefore be part of a larger farming unit that produces food and provide agricultural employment.

Figure 6-2: Land capability classification of the proposed development area.

6.5 Hydrology

6.5.1 Catchment Characteristics

The proposed development area falls within the C22F Quaternary Catchment and the Upper Vaal Water Management Area (WMA). (Figure 6-3). The ephemeral drainage line which falls within the study area, and which is approximately 426 m south of the proposed development sites drains south east towards the Vaal River.

The catchment gently slopes towards the stream, with a ridge to the north of the valley marking the high point of the catchment. Leeukuildam is a large pan located in the catchment but is not close to the stream and therefore is assumed not to have any direct hydrological effect on it. Land use in the catchment is a mixture of agricultural, residential and industrial and extends from Vereeniging to Vanderbijlpark.

6.5.2 Water users in the catchment

The only water use registered for this catchment is the abstraction of raw water from the Vaal River for Lethabo power station (urban industrial use). The power station is situated on the opposite side of the Vaal River to Unitas Park and therefore would not be impacted by a change in water quantity or quality resulting from the proposed development.

It can therefore be assumed that all other water used in the catchment is potable Schedule 1 usage supplied by the municipality to residents. There is no evidence of farm dams of stream abstraction for agricultural use. This indicates that impacts to water users in the catchment would not be a concern as there are no direct abstractions taking place from the stream of interest.

6.5.3 Sensitivity of the catchment

An unchannelled valley bottom wetland also forms part of the catchment. Wetlands are considered environmentally sensitive areas in terms of the National Water Act (Act No 36 of 1998). Environmentally sensitive means that a large disturbance to functioning results from a small impact. The wetland study found that the present ecological state of the system is C: slightly modified and that it is of functional importance in terms of providing ecosystem goods and services (GCS, 2020). Please refer to Section 6.6 for further information in this regard.

6.5.4 Water quality status of the catchment

The water quality of the catchment will not be pristine as it is a developed catchment with mixed-use of commercial agriculture and residential occupation.

It was found though water quality sampling and testing, that all pollutants are below or within the DWS general discharge limits, aside from faecal coliforms which were on average measured to be 2 500 per 100 ml of water. This indicates that the wetland is serving to purify

water and that the catchment is not highly compromised. This can be attributed to the low percentage of urban or industrial development within the contributing catchments.

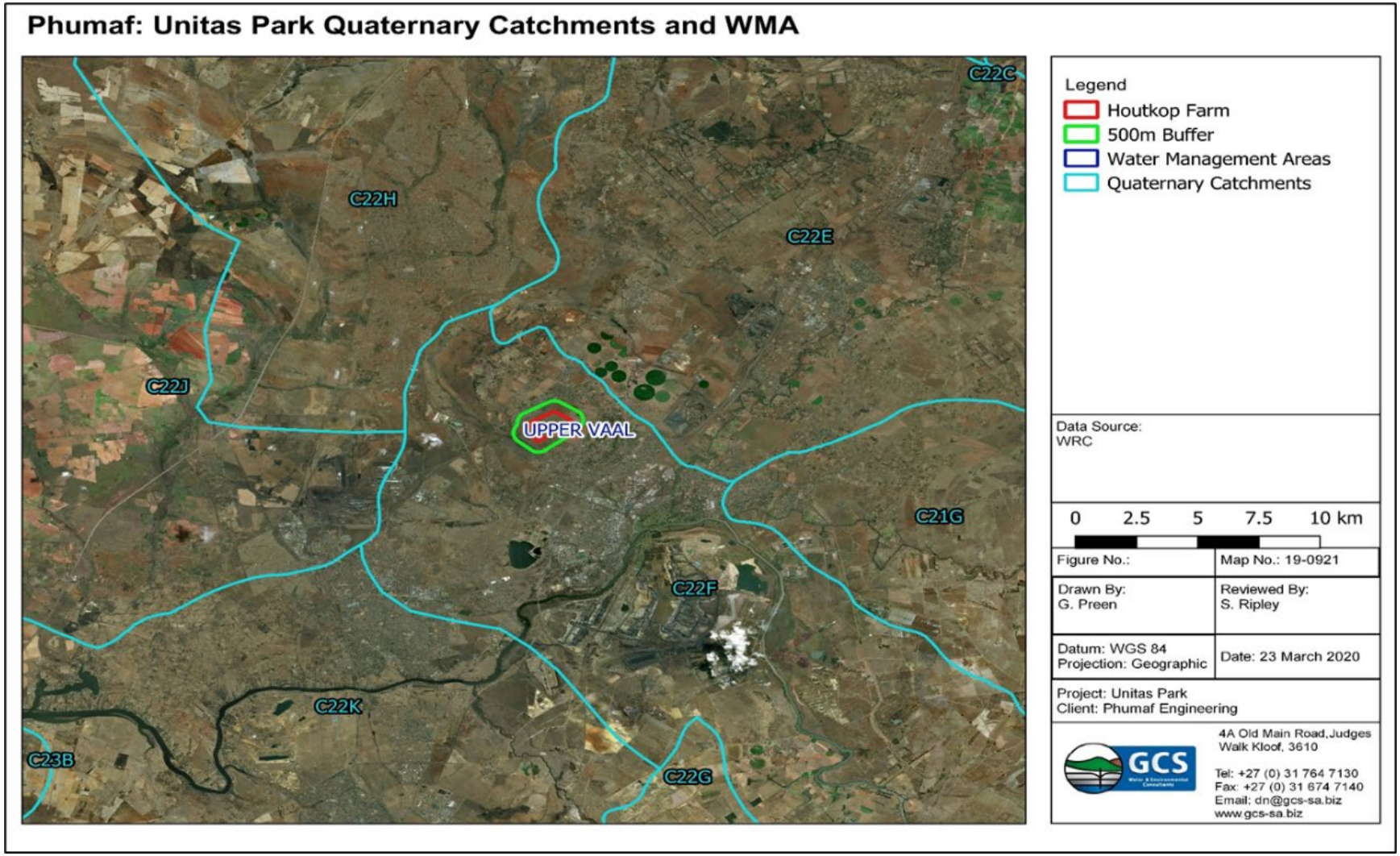

Figure 6-3: Map illustrating the quaternary catchments and WMAs

6.6 Ecological Environment

This section is based on the ecological study undertaken by GCS in March 2020 and updated in May 2021. The report is available in **Appendix B4.**

6.6.1 Wetlands

One unchanneled valley bottom wetland within the 500 m regulated area was identified. The wetland is located within a valley bottom with no clearly defined stream channel or banks. The topography through the wetland system was noted to be gently sloping with water entering mainly from a channel entering the system and from adjacent slopes (Figure 6-4). In accordance with the Classification System (SANBI, 2009), this wetland was classified as an unchanneled valley bottom wetland and will hereafter be referred to as UVB01.

UVB01 is located within a relatively gentle valley bottom receiving water inputs from the adjacent slopes as well as an ephemeral drainage line. The system has experienced significant canalisation at the head and toe areas. The surrounding catchment area has been subject to large scale, commercial agriculture which has altered the natural vegetation of the area as well as the surface runoff regime. Although the ephemeral drainage line that runs through UVB01 is not considered to be a priority area, the sub-catchment in which it occurs drains into a FEPA River. As such, the sub-catchment and the wetland systems occurring within should be considered as ecologically important.

The present ecological state (PES) of the wetland systems was defined as 'Moderately Modified' (D) which describes a situation in which a moderate change in ecosystem processes and loss of natural habitats has taken please but the natural habitat remains predominantly intact. The hydrological component has been 'Seriously Modified' (E) due to the canalisation of the stream channel as well as impeding feature such as informal road infrastructure. The geomorphology of the system has been 'slightly modified' (C) as a result of the changes to the runoff regime of the surrounding area. This is due to the large-scale agriculture taking place within the surrounding area. The vegetation within the wetland system was assessed to be 'largely natural' (B) with few dispersed areas of invasive alien plants.

The overall goods and services provided by UVB01 were assessed to be moderate to low. The highest service provided by the system is erosion control. This is likely due to the diffuse flow which dominates the system as well as the level of vegetation within the system. Diffuse flow and vegetation allow for the reduction in flow velocity thus mitigating erosivity. The system also scored high for phosphate trapping. Due to the diffuse flow and vegetation, the system is able to trap phosphates originating from the surrounding agricultural practices. The system is not significant in terms of tourism, education or socio-cultural due to the lack of

endangered species and the small size of the system. This is likely due to its ability to trap phosphate arising from the surrounding commercial agriculture.

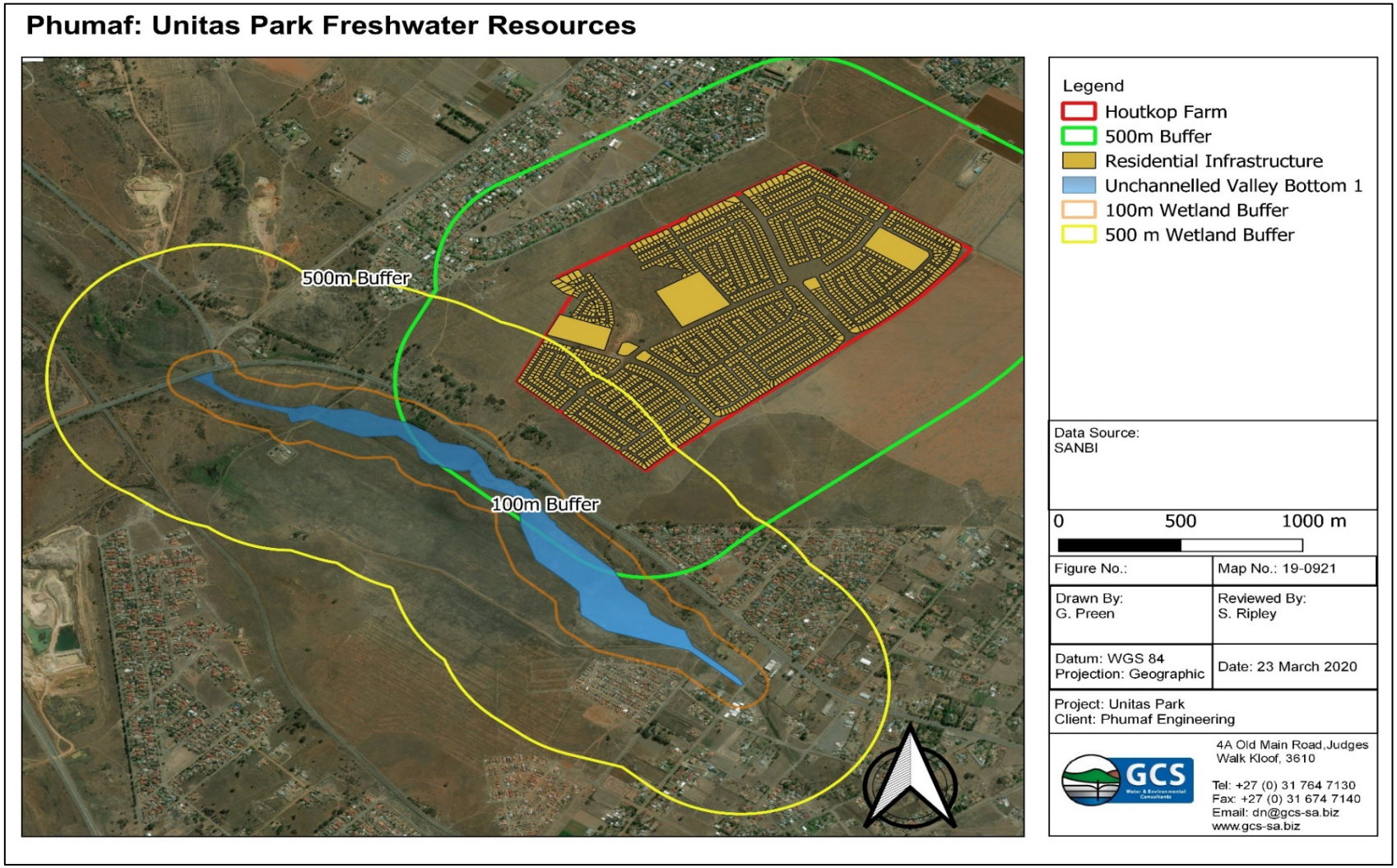

Figure 6-4: Map illustrating the location of UVB01.

6.6.2 Flora

The significant transformation of land cover in the study area has resulted in the large-scale loss of suitable habitat for a variety of flora and fauna. It was estimated that 80% of the study area has been transformed from natural habitat due to agriculture and urban sprawl.

The biodiversity assessment identified three (3) habitat types as listed below and illustrated in

- Open grassland;
- Degraded grassland; and
- Freshwater hydrophytes.

The open and degraded grassland were determined to have low to very low naturalness due to the extensive commercial agriculture taking place within the study area. During the infield floral assessment, no species of conservation concern were observed. The study area falls within the Soweto Highveld Grassland (Mucina et al 2006) which is considered to be endangered. However, very small and scattered areas of open grassland was identified.

Small patches of IAPS were observed within the study area. Majority of the species observed were categorized as 1a while only one species observed is categorized as 3 according to the NEMBA. Species categorized as 1b require some control as part of an invasive species control programme. Species under this category must be removed and destroyed. Category 3 species may be retained as long as reasonable steps are taken to prevent their spread such as an invasive management plan.

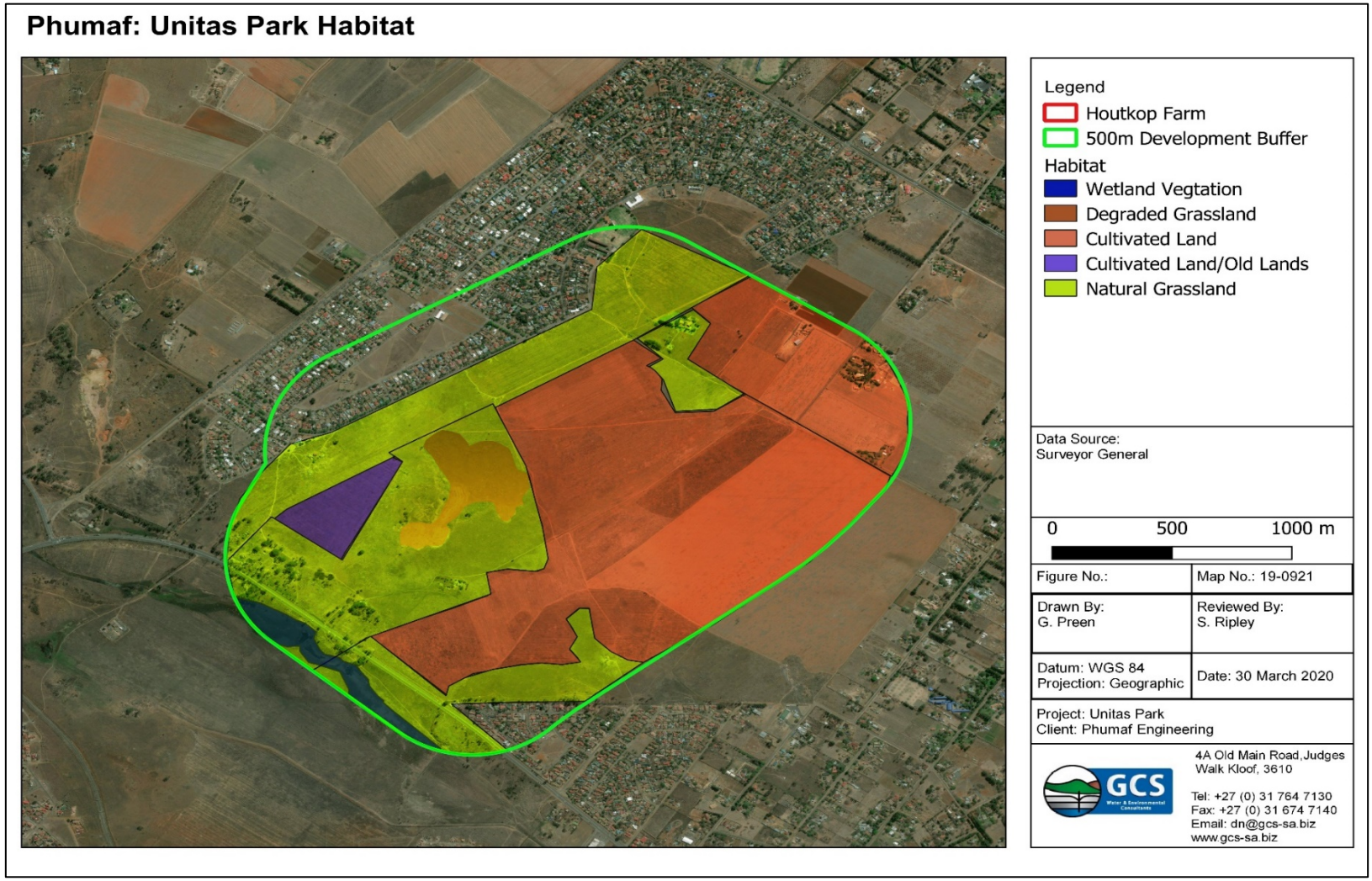

Figure 6-5: Map illustrating the different habitats

6.6.3 Fauna

Mammals

It was determined that the proposed development site has the potential to support minimal biodiversity due to the impacts of agriculture and urban sprawl on suitable habitat. According to the IUCN and Virtual Museum, there are approximately 81 mammal species which are likely to occur or have been recorded within the proposed development site, however the Virtual Museum website indicates that there have been 16 recorded sightings of listed mammals in the area. During the field assessment, 1 mammal was observed, namely the *Lepus saxtilis* (Scrub hare) which has been classed as being of 'Least Concern'.

Amphibians

Based on desktop information, there are 20 amphibian species which have occurred or are likely to occur within the study area. Of these 20 species, 1 has been classified as being 'Near Threatened', namely the *Pyxicephalus adspersus* (Giant Bull Frog). However, no amphibian species were observed during the infield assessment likely due to the transformed nature of the site and the surrounding area.

Reptiles

During the infield, investigation, no reptile species were observed but desktop information sources revealed that 32 species are likely to occur or have occurred within the study area. 31 of these species have been classed as being of 'Least Concern' while 1 species is 'Data Deficient'. According to the Virtual Museum website, there have been 22 recorded sightings of the various reptile species which are likely to occur within the study area.

Dragonflies and Damselflies

The Virtual Museum website indicates that there are eighteen dragonfly and damselfly species which have been recorded within the study area. Sixteen of these species have been classed as 'Least Concern' while two are 'Data Deficient'. The Virtual Museum indicates that there have been forty-five recorded sightings of the various species that are likely to be present in the study area.

Avifauna

Based on desktop information approximately 40 avifauna species have been recorded to occur within the study area. During the infield assessment, large flocks of *Streptopelia decipiens* (African Dove) were observed. This species has been classed as being of 'Least Concern'. This species feeds predominantly on grasses, seeds and small fruit. In respect of this species only, it is likely that the maize fields present at the time of the assessment is providing some

source of food. The remaining grassland around the maize fields will also be a food source for the African Dove.

6.7 Air Quality

The air quality in the Emfuleni LM is very poor, largely due to the high level of industrialisation in the area, with the greater Sedibeng DM being the most polluted municipality. The sources of emissions include industrial processes, domestic fuel burning, vehicle exhaust emissions and waste facilities. As a result, Emfuleni LM and Midvaal LM are part of the first national priority area in the Vaal Air-Shed Priority Area. PM10 is regarded as the pollutant of most concern, due to its health implications (Sedibeng IDP, 2019). The region's Air Quality Management plan informs management of the air quality in the region, which assists in the issuing of Air Emissions Licences and aims to achieve cleaner air for residents. At present, there are two Ambient Air Quality Monitoring Stations: one in Meyerton and one in Vanderbijlpark (Sedibeng IDP, 2019).

6.8 Noise

The site earmarked for the proposed development, is presently not impacted by any sources of noise. The R54, which occurs towards the southern boundary of the site, can be characterised as having "medium" traffic volumes, and the noise generated from traffic flows from similar roads has been classified as having negligible impacts. The present activity on the site is cultivated fields, and thus significant noise levels do not emanate from this activity, apart from machinery used for agricultural practices.

6.9 Heritage and Paleontological Importance

A Heritage study was undertaken by HCAC (2020) and a paleontological study by Marion Bamford (2020) to determine the character of the site in terms of cultural resources. These studies are available in **Appendix B5** and **Appendix B6** respectively.

The study area is mainly used for the growing of maize which makes a large portion of the study area inaccessible. The southwestern portion of the study area has been extensively dug out as part of an old quarry and these activities would have impacted on surface indicators of heritage resources in the study area. Large cement foundation blocks are located in the northern portion of the study area and could possibly be attributed to infrastructure such as raised pipeline foundations.

Due to the area being ranked of high significant by SAHRIS (Figure 6-6), a paleontological study was undertaken. The non-intrusive field survey identified some scatted Stone Age artefacts, a stone cairn of unknown purpose and a partially demolished homestead. The

paleontological study concluded that, as the site lies on soils that overlay deposits of siltstones, mudstones, shales and possible coal seams of the Vryheid Formation, there is a possibility of fossils being preserved. However, these rocks are only potentially present more than 50m below the surface. It is therefore unlikely that fossils will be unearthed.

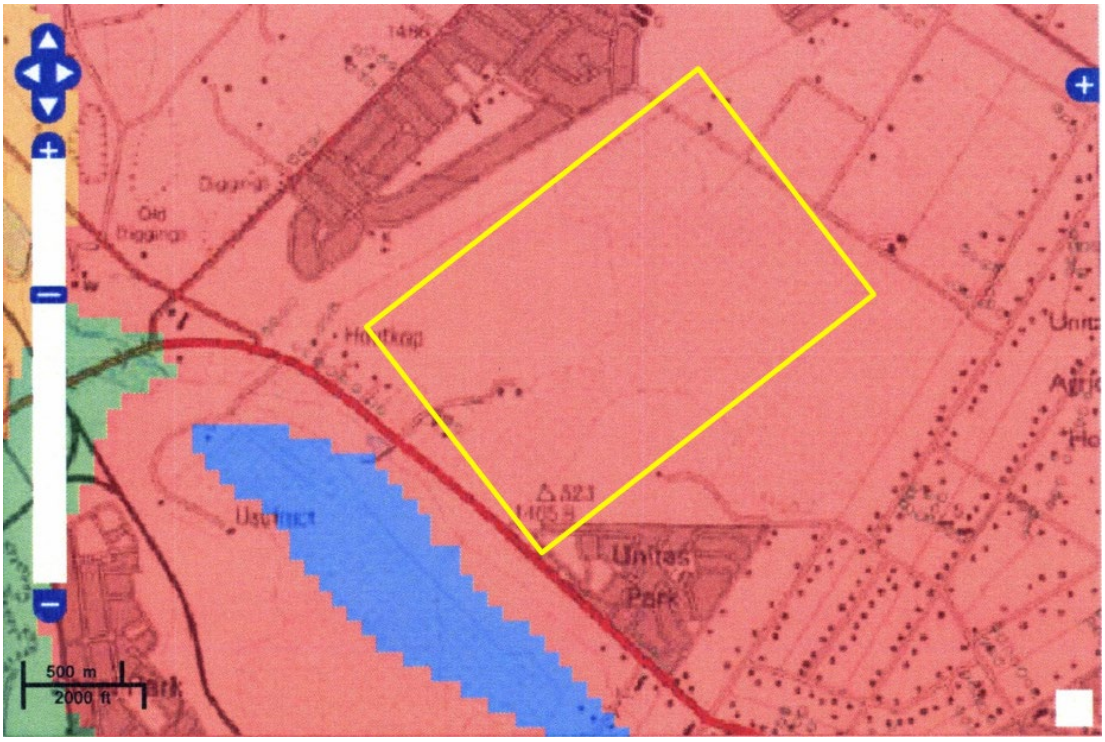

Figure 6-6: SAHRIS palaeo-sensitivity map for the proposed development in Unitas Park Ext 16 shown within the yellow rectangle.

(Background colours indicate the following degrees of sensitivity: red = very highly sensitive; orange/yellow = high; green = moderate; blue = low; grey = insignificant/zero)

6.10 Socio-Economic Conditions

Information for this section has been summarised from the Socio-economic study completed by Urban-Econ and the report is available in **Appendix B7.**

6.10.1 Demographic Profile

Based on the 2011 Census data the total population in Unitas Park was 2 579 and consist of 717 households. The study area predominantly consists of females (50,9%) than males (49,1%) and the dominant gage group in the area are young people between 0 to 14 years as well as those aged 31 to 45 years (Refer to Figure 6-7).

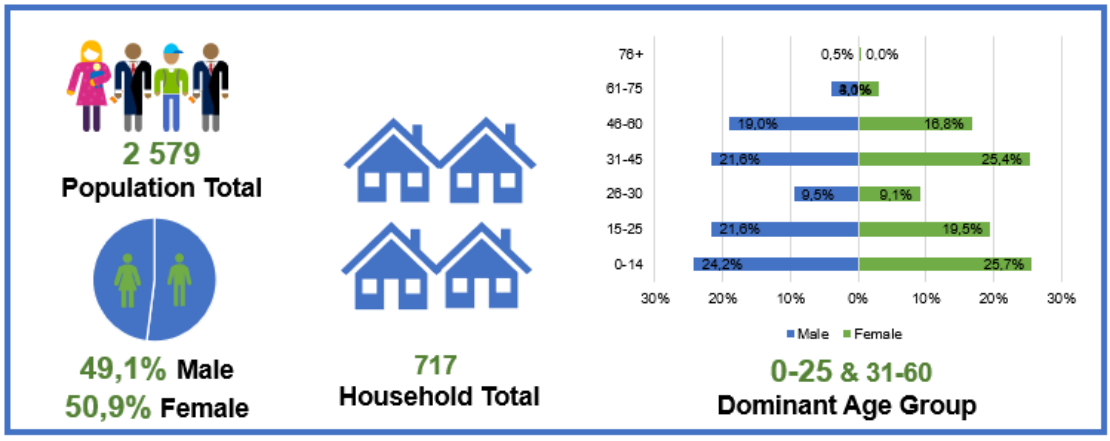

Figure 6-7: Demographic profile of Unitas Park (Urban-Econ calculations based on Census, 2011 data)

The population and household size provide an indication of how the area is growing and developing overtime. The population size is anticipated to increase by 0,5% and the household size is anticipated to increase by 0,7% over ten-years for Unitas Park. The increases in population and household size will potentially lead to an increased need for housing for which the proposed development can cater.

6.10.2 Economy

The economy of the ELM is predominately driven by the secondary and tertiary sectors. The top three economic sectors in the local municipality include, manufacturing, general government and the finance and business services sector. Overall, the below sectors are anticipated to be positively impacted by the proposed mixed high-density development:

- Construction;
- Wholesale, and retail trade, catering and accommodation; and
- Transport, storage and communication.

Construction workers who come from other areas are anticipated to spend their disposable income on accommodation, retail goods and services during the construction phase, thereby contributing positively to the wholesale and retail trade sector of the area. The transportation of building material and equipment is anticipated to increase the activities in the transport sector of the local economy, thereby resulting in a positive impact on the transport sector.

6.10.3 Employment Status and level of skills

In the study area, 54,2% of the working age population are employed, while 45,7% of the working age population includes those who are unemployed and economically inactive. The

employment status in the study area is an important factor that indicates individuals or households' level of access to income and the ability to access goods and services. Essentially, the employment status provides a significant indication of the standard of living in the study area.

The proposed mixed high-density development is anticipated to create employment opportunities during the construction and operational phases. The employment of construction workers during the construction phase forms part of the direct employment creation that is anticipated to take place. Indirect employment will be realised through developers who will potentially require intermediate goods and services to utilise in the construction phase of the development. Employment opportunities are anticipated to generate income for individuals and households. Individuals and households will spend this income on goods and services, and this is anticipated to have a positive effect on business profits and businesses may have an incentive to create more job opportunities. This is therefore anticipated to result in a multiplier effect and potentially improve the socio-economic status of Unitas Park.

The ELM has the highest unemployment rate throughout the ten-year period compared to the Gauteng Province and the Sedibeng District Municipality. The ELM unemployment rate was recorded at 31,5% in 2018. The high unemployment rate in the local municipality indicates low employment prospects in the local economy. Unemployment in the local area is above the national average. The national unemployment rate in the fourth quarter of 2019 was 29,1% and remined the same as the third quarter of 2019 (Statistics South Africa , 2019). The proposed development is anticipated to improve employment prospects within the local area through temporary employment opportunities during the construction phase of the development. Moreover, long-term and sustainable employment opportunities are anticipated to be realised during the operational phase.

The level of skill of the labor force in the Emfuleni local municipality in 2018 consisted of 46.7% semi-skilled labour, 30.9% low skilled labor and 22,4% skilled labour.

6.10.4 Household income and Expenditure

The household income distribution in Unitas Park was found that more than half of the households are low income earning households (55,9%), while there is an almost equal proportion of middle (22,5%) and high income earning households (21,6%). The proposed development is anticipated to contribute positively to household income.

Household expenditure is illustrated in Figure 6-8 below.

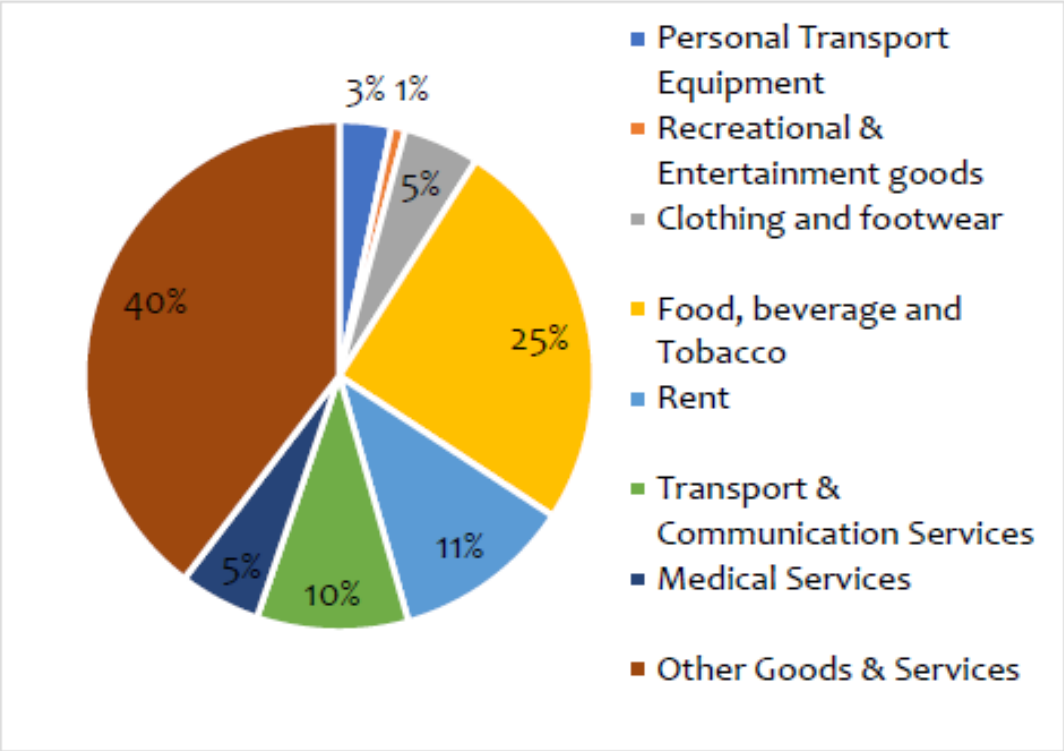

Figure 6-8: Household expenditure in The Emfuleni Local Municipality in 2018 (Urban-Econ calculations based on Quantec data, 2018)

6.10.5 Access to basic services

Figure 6-9 below indicates the level of access that households have to basic services in the ELM in 2018.

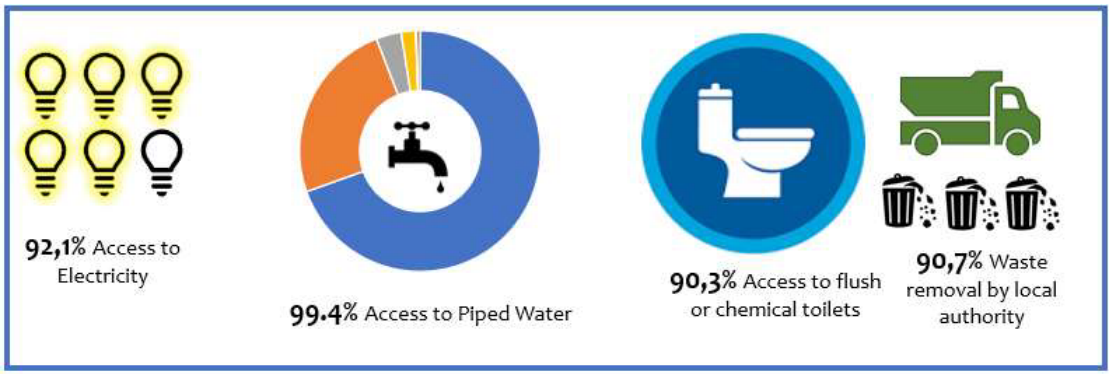

Figure 6-9: Access to basic services in Emfuleni Local Municipality in 2018 (Quantec data, 2018)

6.10.6 Housing trends

The various dwelling types in Unitas Park based on the Census 2011 data, indicates that the

majority of the households in the study area primary reside in house or brick structure houses on a separate stand or yard (80%) and a considerable percentage of households that reside in a house or flat in the backyard (17,6%). The housing stock in Unitas Park is predominantly freeholds (99,75%) and most of the households in Unitas prefer to own their homes as opposed to renting. Of the households that own their homes, 64,9% have not yet paid them off 64,9% while the remaining 22,6% have fully paid them off. There is a relatively minute number of households renting in the study area (8,9) as well as those who occupy homes without paying rent 2,8%.

6.11 Traffic

The information presented in this section is from the Traffic Impact & Access Study Report prepared by Phumaf Engineering (2020). This report is available in **Appendix B8.**

6.11.1 Background

The site is well-connected on a regional scale. To the south is Houtkop Road (R54), to the south-west is the R28 and to the east is the R59 (Old Johannesburg Road). The proposed PWV 20 runs to the west of the site and the proposed K55 abuts the site on its eastern boundary. On a more local level, the extension of Houtkop Road, Skippie Botha Road, and Langrand Road provides connectivity to the north, east, and west.

A strong movement of people occurs between Vanderbijlpark, Vereeniging, and Meyerton towards Johannesburg along the P156 freeway. A strong movement also occurs between Sebokeng and Johannesburg, especially during the morning and afternoon peak hours, as commuter access employment opportunities in Johannesburg and surrounding areas. A strengthening of movement in the future can be expected between Vereeniging and Sebokeng, as urban development and densification occur along this corridor. Movement along the corridor between Vereeniging, Sebokeng, and Johannesburg is supported by the existing commuter railway line.

6.11.2 Rail Network

Emfuleni is served by a rail network that connects Emfuleni to neighbouring areas in Gauteng and the Free State. This rail network consists of three (3) lines.

- The first rail line stretches along with the P156 (R59) freeway and links Sasolburg to Vereeniging, Meyerton, and Germiston. This rail line is primarily a freight line but does contain commuter railway stations along sections of the line.
- The second railway line stretches from Sasolburg, via Vereeniging towards Sebokeng, Orange Farm, and Johannesburg. This railway line also functions as a freight railway line, although it also fulfils a significant commuter railway line function.

- The third railway line stretches from Sebokeng towards Westonaria. This railway line is exclusively used for rail freight purposes.

6.11.3 Road Network

Emfuleni comprises of an extensive bus network that serves the municipal area. A prominent bus route is the bus route linking Vereeniging to Sebokeng along with the K53 (Moshoeshoe Road) and the K45 (Golden Highway). This bus route links Evaton and Sebokeng to the Vereeniging CBD and the industrial areas located within Vereeniging. Equally so, the area comprises of an extensive mini-bus taxi network. This network largely uses the same routes as of the bus routes and serves the same areas within the municipal area. The only significant exception is that the minibus route links Vanderbijlpark CBD to Sebokeng via Mittal Steel; a route that the bus network does not serve.

The proposed development will generate an estimated 566 trips during the weekday AM and weekday PM peak periods, respectively. Whilst this has been identified, it is to be noted that the site is currently underdeveloped and existing capacity constraints, as such the development needs to meet this along with the increased traffic impacts. As a precautionary measure the analysis performed, found that the impact of the proposed developments can be mitigated by means of several road and intersection improvements

6.12 Visual Aspects

The Unitas Ext. 16 site is visible from the R54 as well as the surrounding peripheral streets. The areas surrounding the site under investigation, are residential in nature, varying between formal residential areas (e.g. Unitas Park, Sonland Park, Van Der Merwes Kroon) to agricultural holdings (e.g. Unitas AH, Houtkop SH) utilized for residential purposes.

The proposed development's land use, although involving a change in land use from agricultural to residential, is thus in line with the surrounding land use, as it is aimed at being transformed into student accommodation, businesses and housing. Consequently, it is not envisaged that the visual character and sense of place of the area will be significantly altered.

7 SUMMARY OF SPECIALIST INVESTIGATIONS

This section provides an overview of the specialist studies undertaken for the project, including the following information regarding each study:

- The details of the specialist who prepared the report;
- An overview of the scope of each study; and
- An overview of each specialist's findings and the implications of those on the project.

7.1 Dolomite Stability Investigation

7.1.1 Specialist Details

GCS was appointed to undertake a Dolomite stability study in January 2021. The report is attached as **Appendix B1.**

7.1.2 Scope

The purpose of the dolomite stability report was to provide the following information:

- Establish the nature and engineering properties of the underlying soil strata for the entire site;
- Make preliminary recommendations in respect of the foundation design and construction of the proposed new pump station in terms of dolomite stability;
- Draw attention to pertinent ground water conditions;
- Provide an assessment of the dolomite stability using current percussion boreholes over the entire site; and
- Comment on the suitability of the proposed new pump station as it is in relation to the dolomite stability and Inherent Hazard Class (IHC).

7.1.3 Findings

The Dolomite stability data have revealed that there is a low to medium risk for small to large sinkholes referring to IHC 1-4//1-4 (D2-D4) to occur on the site. However it is recommended that a high level of priority be placed on the provision of sound water management procedures in the long term for the site. It is also important to ensure that the procedures adopted for the development do not interfere with the regional water table. **Thus, pumping from boreholes or otherwise lowering of the water table should be discouraged.**

7.2 Agricultural Agro-Economic Assessment

7.2.1 Specialist Details

TerraAfrica completed the Agricultural Agro-Ecosystem Specialist Assessment in October 2020. The report is available in **Appendix B2.**

7.2.2 Scope

The following scope of work was completed:

- Consider all the baseline data that was gathered during the site survey together with all the relevant spatial data to understand the in-situ soil properties and agricultural production value of the site;
- Identify and assess potential impacts on both agricultural potential as well as soil, resulting from the proposed residential and mixed land use development;
- Identify and describe potential cumulative soil, agricultural potential and land capability impacts resulting from the proposed development in relation to proposed and existing developments in the surrounding area; and
- Recommend mitigation, management and monitoring measures to minimise impacts and/or optimise benefits associated with the proposed project.

7.2.3 Findings

The study found that the soil has moderate-high to moderate potential for rainfed crop production. During the site visit, it was evident that that maize is successfully produced on 96.6ha. The remaining 57.4 is covered with a mixture of veld grass and a few trees and shrubs. This area has the potential for feeding 8 head of cattle while maintaining the long-term grazing capacity.

Unfortunately, requirements for housing and infrastructure limits the possibility to completely avoid areas with high agricultural sensitivity. It is anticipated that the impact on the agricultural production of the study site will be high with the current infrastructure layout and that the crop production within the proposed development areas as well as in a 50m buffer area around the site, will not be able to continue.

7.3 Hydrological Impact Assessment

7.3.1 Specialist Details

The Hydrological Imapact Assessment was compiled by GCS (July 2021) and is available as **Appendix B3.**

7.3.2 Scope

The scope of work to carry out the hydrological impact assessment will include the following activities:

- Assessment of background documents and pertinent literature
- Site visit
- Hydrological screening study
- Identify any gaps and determine any additional activities required
- Compile and submit a Hydrological Impact Assessment.

The hydrological impact assessment report will cover the following:

- Stormwater Management Plan for the development (developed by Phumaf)
- Floodline delineation of receiving watercourse
- Capacity of the river to handle the discharge
- Water quality assessment
- Impact assessment and mitigation measures

7.3.3 Findings

The development has two waste streams that will potentially have hydrological impacts: stormwater runoff and sewage effluent discharge. The scenario is further complicated because the receiving watercourse is a wetland. Wetlands are sensitive areas that are ecologically vulnerable and require protection from detrimental impacts.

The stormwater runoff impacts the downstream receiving environment as runoff volumes from an impervious urban development will be in the order of 60% higher than the current agricultural land use of the site. The proposed stormwater management plan was assessed and was found to be a typical, conventional system whereby all runoff is concentrated and released at one point.

It was found that the impacts resulting from this would include erosion, higher volumes of runoff being released at higher velocities and frequencies from the site, and decreased water quality all of which negatively impact the wetland (from low to moderately negative).

It is recommended that a sustainable urban drainage system be implemented in order to adjust the runoff hydrograph from the development to simulate that of pre-development flows. The outlet structure where the stormwater discharge enters the environment musrt be a suitably design hydraulic structure that will prevent erosion of the receiving wetland.

The effluent discharge to the environment was found to pose a high risk of negative impact. A hydrological screening study was carried out – this found that a full investigation would be required. An effluent discharge investigation ensued in order to predict the effect of the effluent discharge on the wetland. The findings of the study was that the ecological and hydrological impacts to the wetland would be severe and would compromise the healthy functioning of the system.

It is therefore recommended that the effluent be piped from the development to the existing stormwater canal, downstream of the wetland, and be discharged at a constant rate into this infrastructure. This means that the effluent bypasses the wetland, and the impact can be reduced to negligible.

7.4 Ecological and Wetland Assessment

7.4.1 Specialist Details

An Ecological Impact Assessment was undertaken in March 2020 and updated in June 2021 by GCS, for the proposed Unitas Park Extension 16 (**Appendix B4**).

7.4.2 Scope

The scope of work to undertake the wetland and biodiversity assessments are as follows:

Wetland Study

- Desktop delineation and illustration of the wetland systems within the study area utilising available satellite imagery and relevant geospatial data sources;
- Infield ground truthing and delineation of wetland boundaries in accordance with the methodologies outlined in 'A Practical Field Procedure for the Identification and Delineation of Wetland and Riparian Areas' (DWAF, 2009);
- Classification of the Hydrogeomorphic (HGM) setting of the wetlands identified on site using the National Wetland Classification System by the South African National Biodiversity Institute (SANBI) (2009);
- Assessment of the Present Ecological State (PES) and Ecological Goods and Services (EcoServices) of the Wetland;
- Identification, prediction, and description of the potential impacts of the proposed development on the wetland systems within the study area;
- Mitigation measures for the identified potential impacts;
- Rehabilitation guidelines for disturbed areas associated with the proposed development; and
- Monitoring protocol for the proposed development.

Biodiversity Study

- Desktop assessment of relevant internet based and geospatial data sources;

- Phytosociological classification to identify dominant vegetation species;
- Visual based survey of fauna species within the study area;
- Identification, prediction and description of the potential impacts of the proposed development on biodiversity within the study area;
- Mitigation measures for the identified potential impacts;
- Rehabilitation guidelines for disturbed areas associated with the proposed development; and
- Monitoring protocol for the proposed development.

7.4.3 Findings

Wetlands

The wetland impact assessment identified one (1) unchanneled valley bottom wetland within the 500m regulated area. Further assessment of the wetland determined the wetland to be moderately modified (Class C) and providing moderate low ecosystem goods and services. The results of the RAM indicated that the proposed residential development poses a low risk of impact on the wetland. However, the proposed construction of a WWTP and direct discharge of effluent into the wetland poses high risk of permanent impact on the wetland. It was determined that the PES of the wetland will reduce to largely modified with a loss of 4.89 Ha of functional wetland. Additionally, the ability of the wetland to provide ecosystem goods and services will be measurably negatively impacted.

Biodiversity

The open and degraded grassland were determined to have low to very low naturalness due to the extensive commercial agriculture taking place within the study area. During the infield assessment, no species of conservation concern were observed.

Although the area has the potential to provide habitat for a diverse range of fauna species in a natural state, the degraded nature resulted in very few fauna species being observed with a small chance of more species likely to be present.

7.5 Heritage Impact Assessment

7.5.1 Specialist Details

HCAC was appointed to undertake a Heritage Impact Assessment in March 2020. The report is attached as **Appendix B5.**

7.5.2 Scope

The following scope of work was undertaken:

- Conduct a field study;

- Locate, identify, record, photograph and describe sites of archaeological, historical or cultural interest;
- Identify potential areas of significance;
- Determine the level of significance of the various types of heritage resources potentially affected by the proposed development; and
- Report on the identification of anticipated and cumulative impacts the operational units.

7.5.3 Findings

Due to the site being used for the cultivation of maize, a large portion of the site was inaccessible. Although artefacts were identified in the areas that could be accessed, they are rated as having low heritage significance. It is recommended that the area is monitored during the construction phase.

Potential risks to the proposed project identified include the occurrence of unknown and unmarked graves. The possibility exists that the study area could contain graves of which surface indicators have been destroyed or obscured by vegetation and subsurface material could be uncovered during earth works. These risks must be mitigated to an acceptable level as described in the Heritage Impact Assessment Report.

7.6 Paleontological Impact Assessment

7.6.1 Specialist Details

A Palaeontological Impact Assessment was undertaken by Heritage Contracts and Archaeological Consulting in March 2020. The report is available in **Appendix B6.**

7.6.2 Scope

The scope of work for this study were to undertake a PIA and provide feasible management measures to comply with the requirements of SAHRA and included the consultation of geological maps, literature, paleontological databases, published and unpublished records to determine the likelihood of fossils occurring in the affected areas.

7.6.3 Findings

Based on experience and the lack of any previously recorded fossils from the area, it is extremely unlikely that any fossils would be preserved in the overlying soils and sands of the Vryheid Formation. Dolerite does not preserve fossils and the uppermost potentially fossiliferous layer is more than 50 m below the surface so would not be affected by any urban development.

7.7 Socio-economic Assessment

7.7.1 Specialist Details

Urban-Econ completed a Socio-Economic Impact Assessment for the proposed development in April 2020. The report is available in **Appendix B7**.

7.7.2 Scope

The following scope of work was undertaken:

- Determine the social and economic impact on the surrounding community; and
- Identify and analyse the intended and unintended social and economic consequences, both positive and negative, of the proposed development, together with the ecological impact and propose management/mitigation strategies.

7.7.3 Findings

The proposed mixed high-density development is anticipated to yield more positive socio-economic impacts than negative. The proposed development aligns with national, provincial and local policies and strategies in the promotion of broader objectives and goals for spatial integration, inclusivity and the creation of employment opportunities and the stimulation of economic growth. Employment creation, the simulation of the local and regional economy as well as access to household income are key benefits that the proposed development is anticipated to yield. The utilisation of the site for a mixed high-density development is anticipated to yield positive economic and social benefits than its current use, as it is currently vacant. Overall, the anticipated positive impacts outweigh the anticipated negative impacts more so with mitigative measures put in place to enhance the positive impacts as well as to minimise the negative impacts.

7.8 Market study

7.8.1 Specialist Details

The Unitas Park Extension 16 Highest and Best Use Market Study was completed by Urban-Econ in February 2020 and is available in **Appendix B9**.

7.8.2 Scope

The main focus of this assessment was to undertake a specialised analysis to determine the capacity of the local market to absorb a new residential development with complementary developments. This study will be used to calculate the current demand for, and market feasibility of a new residential development located in Vereeniging, Gauteng Province.

7.8.3 Findings

The proposed development will be a mixed-use development with the potential to add significant value to the area and will complement the existing urban fabric by providing supplementary services, activities, and other complementary land uses. The identified area is not popular in terms of office space, and due to the low number of offices in the primary market area, it is suggested that office space for the proposed mixed-use development be limited to a small portion of the development site. It was also found that the lack of clinics within the immediate area of the proposed development indicates the need for a clinic to serve the population, especially in Unitas Park and Sonland Park. In addition to housing development, the most viable supplementary land uses have been identified as student housing, retail, schools, clinics, and government department offices.

7.9 Traffic impact assessment

7.9.1 Specialist Details

The Traffic Impact & Access Study Report was prepared by Phumaf Engineering in November 2020 and is available in **Appendix B8.**

7.9.2 Scope

The scope of work included the determination of the extent of the expected additional traffic that may be generated by the proposed development.

7.9.3 Findings

Access to the site is problematic as there are currently no constructed roads linking to the site. The only current feasible options to obtain access to the site is the construction of the southern portion of the K55 up to the boundary of the site. The alternative option in regard to the upgrading Frederik Road will not be feasible as this road will not be able to cope with the increase in traffic. Approval for the concession to grant access to Proposed Mixed Use Residential Development Unitas Park Ext.16 from Municipality Road is required form the ELM and Gauteng Department of Roads and Transport .

8 INFRASTRUCTURE AVAILABILITY AND REQUIREMENTS

The following section summarises findings of the Bulk Services Report (**Appendix C1**), the Bulk Electrical Services Report (**Appendix C2**), Electrical Engineering Services Report (**Appendix C3**) and the Civil Engineering Services Outline Scheme Report (**Appendix C4**).

8.1.1 Water Supply

The proposed development area falls within the Emfuleni Local Municipality Metsi-A-Lekoa Water jurisdiction and the Municipality serves as both the Water Service Authority as well as the Water Service Provider.

8.1.1.1 Availability

The majority of households that reside in Emfuleni have access to piped water. A relatively small number of households acquire water from other sources, such as boreholes. The water system consists of pipe networks, 9 reservoirs, and a small potable water treatment plant. Emfuleni borders the Vaal River and therefore extracts water from the river for consumption within Emfuleni. However, only a small amount of the required quantity is extracted from the Vaal River and purified at 0.2 Ml/day. Emfuleni, except for Vaaloewer, receives its bulk water supply from Rand Water (205 Ml/day).

The distribution system for Unitas Park consist of a supply from the Helenasrust Rand Water connection. The pressures in the Rand Water pipes are limited (± 1550 m), The Rand Water connection is sufficient, but the network pipes must be augmented. No balancing and storage facilities are provided for.

8.1.1.2 Requirements

The estimated average water demand for the proposed development will be 349537/day. A topographical survey indicates that there are no signs of existing pipes within the proposed site which is currently vacant land being used for crops plantation. A full water network, with individual connections to all erven will have to be installed.

The potable water supply reticulation will also be designed to cater for the firefighting water requirements and hydrants and other control fittings will be suitably positioned. The geometric design of the roads will cater for a range of emergency response vehicles.

8.1.2 Sanitation

8.1.2.1 Availability

Flush toilets are the most common form of sanitation provision within Emfuleni. The only other significantly used sanitation system in use in Emfuleni is pit latrines, which is most probably

used in the informal settlement of Emfuleni. The sanitation system consists of gravity pipelines and, due to the flat terrain; it also consists of 49 sewage pump stations. The wastewater system consists of 3 wastewater treatment works. The Sebokeng wastewater treatment works, located in Sebokeng next to the Rietspruit, is the largest wastewater treatment works within Emfuleni. This wastewater treatment facility has a capacity of 119 Ml/day.

It must be noted that existing sanitation infrastructure has reached the end of its lifespan and can only be kept operational with a high risk of sewer spills. New infrastructure needs to be constructed in order to prevent future sewer spills.

8.1.2.2 Requirements

The estimated daily sewer demand for Unitas Park Extension 16 development will be 4530000 l/day. The proposed development will require a full waterborne sewerage system with individual connections to all erven. All pipes used must conform to SANS 1200 L and all other standards referred to in SANS 1200 L. This will include the use of uPVC, mPVC, steel and HDPE pipes.

8.1.3 Stormwater management

The proposed development of land use is agriculture and currently is being used for farming crop purposes which means there is no stormwater infrastructure within the site. There is existing stormwater infrastructure to the north in Sonland Park and the southwestern side of the site in Unitas Park AH.

8.1.3.1 Availability

There is currently no information available regarding existing stormwater infrastructure on existing areas adjacent to the planned developments. In order to tie into these existing systems, the positions, levels of these existing systems need to be confirmed in order to confirm functional designs.

8.1.3.2 Requirements

The Rational Method will be used to calculate the stormwater runoff for this site. The stormwater will be drained along the road reserve, mainly in open, unlined V-drain channels, with underground / piped systems only where surface drainage is not possible or deemed to be impractical.

Designs will be such that the canals can accommodate the 1:2-year minor storm and the 1:25 year major storm is accommodated in the road structure without overtopping.

8.1.4 Domestic Solid Waste

Domestic solid waste will be collected by the Municipality which will be established as part of this project. It is further envisaged that this will be an on-street collection system operating once a week using a Municipal Waste collection truck.

Disposal of collected waste will be via Emfuleni Local Municipality Waste Disposal who collect generated waste at pre-determined locations on the site and disposes it at their Landfill / Waste Disposal facility on a weekly basis.

Waste reduction through recycling at source will be encouraged to reduce the waste pile (e.g. bottles, tins and paper and cardboard) however given the nature of the development, it is not expected that there will be a huge reduction in volume.

8.1.5 Electrical services

8.1.5.1 Availability

The project site is part of an existing township which falls under the jurisdiction of the Emfuleni Local Municipality. In terms of electricity supply the proposed development will be supplied directly by the Emfuleni Local Municipality.

The Sonland Milan 88/11kV Substation, Vereeniging is situated about 1 kilometre from the proposed Unitas Park Extension 16 development. This substation has recently been upgraded from 5MVA to 10MVA to cater for the proposed Unitas Park Extension 16 development. However this will not be adequate, and a further upgrade will be required.

8.1.5.2 Requirements

The total bulk electricity requirements for the project are 25,965 kVA. The required bulk capacity is currently not available for the development. Major capital works will have to be undertaken.

There is no MV reticulation to the proposed development and this will have to be installed from the substation to the new township and will entail crossing the existing Houtkop Road via underground cable.

The installation of street and area lighting will be done as part of the LV reticulation work package to the housing units. This will be carried out in line with Emfuleni Local Municipality specifications and standards.

9 PUBLIC PARTICIPATION PROCESS

This section of the report documents the process, which was and will be followed with respect to consultation of Interested and Affected Parties (I&APs)/stakeholders and the Government Authorities.

9.1 Purpose of Public Participation

The most important objective of public participation is to provide sufficient and accessible information to potential Interested and Affected Parties ("I&APs") in an objective manner and to provide a platform for constructive participation in the application process, thereby assisting I&APs to:

- Gain an understanding of the Project, the various components and the potential impacts (positive and negative);
- Raise issues of concern and suggestions for enhanced benefits;
- Comment on reasonable alternatives;
- Verify that their issues have been recorded in the Comments and Responses Report ("CRR") and considered in investigations; and
- Contribute relevant local information and traditional knowledge to the process.

9.2 Pre-Application Consultation

A pre-application meeting was held with Mr Dan Motaung from the Gauteng Department of Agriculture and Rural Development (GDARD) on 19 August 2020. The purpose of the meeting was to introduce the project, explain the project details and obtain input and clarity from the authorities regarding the required legislative processes to be followed for this application. Please refer to **Appendix D1** for the minutes of this Pre-Application Meeting.
Subsequently, an application for environmental authorisation has been submitted to GDARD. Please refer to **Appendix D2** for a copy of the application as submitted.

9.3 Public Participation Process during the Scoping Phase

This section provides a short summary of the various activities of the public consultation process to be undertaken in support of the application process.

9.3.1 Stakeholder database

A stakeholder database or list of I&APs was compiled and will be updated as the process unfolds and as more I&APs register. The database was compiled: a) using lists of contact details of previous applications in the area; b) using information provided by the applicant's community liaison officers; and c) including responses from I&APs.

The current I&AP database is attached as **Appendix D3** to this Report. The I&AP database is the means through which information will be conveyed to stakeholders as part of the announcement of the applications and the availability of the consultation and final reports as these become available for public review. For this Project, I&APs typically include the following:

- Owners or persons in control of the land where the proposed Project activities are to be undertaken ("Project Area");
- Occupiers of the property where the activities are to be undertaken;
- Owners and occupiers of land adjacent to the Project Area;
- Provincial (Gauteng) and local government (Emfuleni Local Municipality and Sedibeng District Municipality);
- Organs of state, other than the competent authorities, which is the Department of Human Settlements, such as the Gauteng Department of Agriculture and Rural Development, Department Public Works and Roads, SANRAL, etc. having jurisdiction in respect of any aspect of the proposed activities;
- Relevant residents' associations, agricultural unions, community based organisations, water user associations, and any catchment management authority and Non-Governmental Organisation ("NGOs");
- Environmental organisations, forums, groups and associations; and
- Private sector (businesses, industries) in the vicinity.

9.3.2 Announcement of the application process

The integrated application process was announced to I&APs by means of the following:

- An advertisement was placed in the Sedibeng Ster on the 14 January 2021 (**Appendix D4**);
- A Background Information Document ("BID") was compiled and distributed to all I&APs on the stakeholder database (**Appendix D5**);
- Site Notices were placed all around the Project Area (**Appendix D6**);
- Placement of all notices and the BIDs on the GCS website (http://www.gcs-sa.biz/documents/). The GCS website is used to make documents electronically available to stakeholders. The website address was published in the advertisement, BIDs, site notices and all other communication; and
- A Registration and Comment Sheet was distributed with every BID, inviting stakeholders to register as I&APs and to provide their comments on the proposed application.

9.3.3 Comments and Responses Report

All comments received during the integrated application process was captured in a CRR (**Appendix D8**). This CRR will be updated on a continuous basis and will be presented to the authorities and other I&APs together with the consultation and final reports as a full record of issues raised, including responses on how the issues were considered during the application process.

9.3.4 Review of the Draft Scoping Report

The announcement of the integrated application process also introduced the availability of the Draft Scoping Report for public review and comments. The Draft Scoping Report (DSR) was made available for public comment for 30 days. The DSR was submitted for public review from 15 January 2021 until 15 February 2021 (30 days). Due to COVID-19 restrictions, no hard copies of the report were available for review at public venues. However, the report was available electronically via the GCS Website (link provided above) or a CD was available upon request. The availability of the Report was announced via the publishing of advertisements (**Appendix D4**), and on-site notices (**Appendix D6**). Emails with notification letters (**Appendix D7**) were sent to all I&APs registered on the stakeholder database, providing the direct link to an electronic version of the Draft Scoping Report and its appendices.

9.3.5 Review of the Final Scoping Report

The Final Scoping Report was submitted to the Competent Authority on 01 March 2020 and the Report was available to I&APs for their final comments for a 30-day period. Stakeholders were requested to provide their comments on the final reports directly to the competent authority, GDARD, in a notification letter sent to them before the review of the Final Scoping Report commenced. Stakeholders were requested to copy their comments to the public participation office.

The Scoping report was accepted by the Competent Authority on 19 March 2021. The acceptance letter is available in **Appendix D9**.

9.4 Public Participation during the EIA Phase

During the Scoping Phase the need for additional investigations were identified. As such, a request for extension in terms of Section 3(7) of the EIA Regulations (as amended) was submitted to GDARD on 27 May 2021 (**Appendix D10**). The investigations have been concluded and incorporated into the Draft Environmental Impact Report (EIR), this report.

The review of the Draft EIR will take place from 20 July 2021 to 19 August 2021. The main objectives of public participation during this phase are:

a) to verify that stakeholder issues have been considered by the EIA Specialist Studies and in the reports which will be compiled and

b) to provide stakeholders the opportunity to comment on the findings of the EIR/EMP Report and other associated reports, including the measures that have been proposed to enhance positive impacts and reduce or avoid negative ones. The initial public participation activities during the EIA phase of the integrated regulatory process included:

- Email notifications to stakeholders to inform them of the opportunity to review the Draft EIR;
- The Draft EIR will be made available for review. Stakeholders will be requested to download the report from the GCS website and / or request electronic copies of the report by prior arrangement;
- An Advertisement to notify stakeholders of the availability of the draft report was published in the Sedibeng Ster on the 15 July January 2021.

The Final EIR report will be available to stakeholders for their review on the GCS website. A notification letter will be sent to all stakeholders informing them of the submission of the report to the competent authority and their opportunity to comment on the report directly to the competent authority.

9.5 Public Participation during the Authorisation Phase

Once the Competent Authority provided information with regards to their decision in terms of the integrated application process, their decision and the detail thereof will be communicated to I&APs according to the conditions stipulated. I&APs will be made aware of their rights to appeal the decision and the proposed process to follow in such regard. The legislative and required public participation activities will end once the appeal periods have lapsed.

10 EIA PROCESS AND APPROACH

10.1 Impact Assessment Methodology

10.1.1 Impact Assessment for proposed site

The assessment of potential impacts will be addressed in a standard manner to ensure that a wide range of impacts were comparable. The ranking criteria and rating scales will be applied to all specialist studies for this project. The following methodology will be used to rank these impacts. Clearly defined rating and rankings scales (**Table 10-1** - **Table 10-7**) will be used to assess the impacts associated with the proposed activities. The impacts identified by each specialist study and through public participation will be combined into a single impact rating table for ease of assessment.

Table 10-1: Severity or magnitude of impact.

Insignificant/non-harmful	1
Small/potentially harmful	2
Significant/slightly harmful	3
Great/harmful	4
Disastrous/extremely harmful/within a regulated sensitive area	5

Table 10-2: Spatial Scale – extent of area being impacting upon.

Area specific (at impact site)	1
Whole site (entire surface right)	2
Local (within 5km)	3
Regional/neighbouring areas (5km to 50km)	4
National	5

Table 10-3: Duration of activity.

One day to one month (immediate)	1
One month to one year (Short term)	2
One year to 10 years (medium term)	3
Life of the activity (long term)	4
Beyond life of the activity (permanent)	5

Table 10-4: Frequency of activity - how often activity is undertaken.

Annually or less	1
6 monthly	2
Monthly	3
Weekly	4
Daily	5

Table 10-5: Frequency of incident/impact - how often activity impacts environment.

Almost never/almost impossible/>20%	1
Very seldom/highly unlikely/>40%	2
Infrequent/unlikely/seldom/>60%	3
Often/regularly/likely/possible/>80%	4
Daily/highly likely/definitely/>100%	5

Table 10-6: Legal Issues – governance of activity by legislation.

No legislation	1
Fully covered by legislation	5

Table 10-7: Detection - how quickly/easily impacts/risks of activity on environment, people and property are detected.

Immediately	1
Without much effort	2
Need some effort	3
Remote and difficult to observe	4
Covered	5

Each identified impact will be assessed in terms of severity, spatial scale and duration (temporal scale). Consequence is then determined as follows:

Consequence = Severity + Spatial Scale + Duration

The risk of the activity is then calculated based on frequencies of the activity and impact, whether the activity is governed by legislation and how easily it can be detected:

Likelihood = Frequency of Activity + Frequency of Impact + Legal issues + Detection

The risk of each identified impact is then based on the product of consequence and likelihood.

Risk = Consequence x likelihood

Impacts will be rated as either of high, moderate or low significance on the basis provided in Table 10-8. Each impact was also assessed in terms of the level to which there is an irreplaceable loss of resources and its degree of reversibility. The ratings as described in **Table 10-9** and **Table 10-10**.

Table 10-8: Impact significance ratings

SIGNIFICANCE RATING	CLASS (NEGATIVE IMPACT)	CLASS (POSITIVE IMPACT)
1 – 55	(L) Low Significance	(L) Low Significance
56 – 169	(M) Moderate Significance	(M) Moderate Significance
170 – 600	(H) High Significance	(H) High Significance

Table 10-9: Irreplaceability of resource caused by impacts

No irreplaceable resources will be impacted (the affected resource is easy to replace/rehabilitate)	**Low**
Resources that will be impacted can be replaced, with effort	**Medium**
Project will destroy unique resources that cannot be replaced	**High**

Table 10-10: Reversibility of impacts

Low reversibility to non-reversible	**Low**
Moderate reversibility of impacts	**Medium**
High reversibility of impacts	**High**

10.2 Project Activities Potentially Resulting in Environmental Impacts

An array of activities will be undertaken during construction and operation of the proposed Unitas Park Extension 16 mixed use residential development which by nature will have the potential to cause on and off-site environmental damage. These activities are listed in the following sections.

10.2.1 Construction Phase impacts

- Setting up of a construction camp site at the proposed site.
- Clearing of vegetation including crops on large areas of land.
- Use of available roads and tracks, and creation of new roads for transportation of equipment materials and for construction site access.
- Traffic congestion and disruption during construction of the new intersections and road upgrades.
- Dust generation from earth moving activities.
- Use of transportation and construction vehicles and equipment.
- Refuelling and maintenance of construction vehicles and equipment.
- Resourcing, introduction, storage and use of construction material such as water, concrete, brick, fuel, oils, steel structures and other equipment
- Noisy construction activities, such as heavy vehicles, jack hammers, hoists, cranes, etc.
- Use of hazardous substances such as fuels, oils, paints, solvents, etc.
- Use of temporary ablution facilities on site for construction workers.
- Hydrological regime change, affecting functioning of wetland.
- Erosion and sedimentation, affecting the movement of water through soils within the wetland.
- Disposal of construction rubble and excess spoil material.
- Waste generation, handling and storage during construction.
- Municipal water and sewerage infrastructure to be installed.
- Stormwater management on the construction site which could result in erosion and soil loss.
- Visual impact as the landscape changes through the construction phase.

10.2.2 Operational Phase Impacts

- Increased traffic as a result of influx of residents.
- Maintenance of the open space areas on site for conservation and visual buffer purposes.

- Spill of sewerage or wastewater from treatment plant if not maintained.
- Decreased water quality - discharge of treated effluent to the watercourse.
- Increased inundation of wetland during wet seasons.
- Reduction in flood mitigation capacity due to additional flow volumes from the development.
- Urban stream syndrome.
- Solid waste littering.
- Stormwater management on site with discharge into the surrounding natural environment.

10.3 Environmental Impact Assessment – Construction Phase

10.3.1 Impacts on Geological Stability

Impacts

Earthworks will take place during the construction phase and sinkholes can be encountered due to the nature of the geology which is underlain with dolomite bedrock that is susceptible to water erosion.

Activity	Impact	Significance		Irreplaceable loss of resources	Degree of reversibility	Confidence
		Before mitigation	After mitigation			
Earthworks and ingress of water	Sinkholes	Medium	Medium	High	Low	100%

Mitigation measures

Ensure implementation of the recommendations of the Dolomite Stability Report (**Appendix B1**).

10.3.2 Impacts on Soil Resource, Land Use and Land Capability

Impacts

Once construction commences and soil is stripped, the current land capability of all areas where the surface infrastructure will be constructed, will be lost. The impact will remain the same throughout the operational phase and it is not expected that the infrastructure will be decommissioned.

Activity	Impact	Significance		Irreplaceable loss of resources	Degree of reversibility	Confidence
		Before mitigation	After mitigation			
Earthworks of development	Loss of current land capability	High	High	High	Low	100%
Earthworks of development	Loss of agricultural production and	High	High	High	Low	100%

	agricultural-related employment					
Earthworks of development	Loss of soil ecosystem services and soil fertility in areas where topsoil is stripped	High	High	High	Low	100%
Earthworks of development	Soil contamination with hydrocarbons and solid waste	Medium-Low	Low	Low	High	100%
Earthworks of development	Soil compaction and surface sealing	High	High	Low	High	100%

Mitigation Measures

- The mitigation measures are limited as the project infrastructure is considered to become a permanent feature of the landscape.
- The project infrastructure footprint should be kept to the project layout as provided by the client.
- The mitigation measures are limited as the topsoil will necessarily be removed for the purpose of infrastructure construction.
- The project infrastructure footprint should be kept within the site boundaries as provided by the client.
- Any topsoil stockpiles must be protected against wind and water erosion until vegetation has established on the exposed topsoil surfaces.
- If it is observed that topsoil stockpile surfaces remain bare, natural vegetation must be established on the topsoil stockpiles.
- High level maintenance must be undertaken on all vehicles and construction/maintenance machinery to prevent hydrocarbon spills.
- Impermeable and bunded surfaces must be used for storage tanks and to park vehicles on.
- Site surface water and wash water must be contained and treated before reuse or discharge from site.
- Spills of fuel and lubricants from vehicles and equipment must be contained using a drip tray with plastic sheeting filled with adsorbent material.
- Spill kits should be available on site and should be serviced regularly.
- Waste disposal at the construction site and during operation must be avoided by separating, trucking out and recycling of waste.
- Potentially contaminating fluids and other wastes must be contained in containers stored on hard surface levels in bunded locations.

- Accidental spillage of potentially contaminating liquids and solids must be cleaned up immediately by trained staff with the correct equipment and protocols.
- Restrict traffic and vehicle movement to access roads and within the site boundaries.
- Demarcate parking areas and monitor those vehicles and equipment are not parked outside of these areas in nearby fields during the construction phase.

10.3.3 Impacts on Surface Water and Aquatic Systems

Impacts

The following impacts on the surface water and aquatic systems have been identified based on various activities of the proposed mixed use development.

Activity	Impact	Significance		Irreplaceable loss of resources	Degree of reversibility	Confidence
		Before mitigation	After mitigation			
Soil excavation, blasting and earth moving (removal and storage of soil)	• Erosion and sedimentation of the downslope aquatic systems • Loss / degradation of instream habitat and aquatic biota • Impaired water quality • Disturbing vadose zone • Compacting of soils	Low	Low	Low	High	100%
Earthworks of development	•Increased runoff, erosion and sedimentation of the aquatic systems • Alteration of natural drainage lines which may lead to ponding or increased runoff patterns (i.e. may cause stagnant water levels or increase erosion). • Change in hydrodynamics of the project area • Loss / degradation of instream habitat and aquatic biota • Impaired water quality • Solid waste production • Loss of ephemeral streams	Medium	Low	Medium	Medium	100%
Contamination through the storage and handling of chemicals, fuels & other	• Contamination risk if spills occur • Impaired water quality • Change in aquatic fauna communities	Medium	Low	Low	High	100%

hazardous materials	•Change/deterioration of the ecological status of rivers/streams					
Contamination through inadequate waste management (including ablutions)	•Contaminated stormwater runoff entering aquatic habitats • Impaired water quality. • Change in aquatic fauna communities. Change/deterioration of the ecological status of rivers/streams	Medium	Low	Low	High	100%
Contamination through inadequate stormwater management	• Increased runoff, erosion and sedimentation of the aquatic systems • Change in hydrodynamics of the project area and aquatic systems • Change in aquatic fauna communities. Change/deterioration of the ecological status of rivers/streams	Medium	Low	Medium	Medium	100%

Mitigation Measures

- The wetland system must be demarcated as a no-go zone.
- Only excavate areas applicable to the project area.
- Adhere to the wetland and watercourse buffers.
- The footprint of the WWTWs must be kept to a minimum, to ensure there is no unnecessary intrusion into surrounding habitats.
- Cover excavated soils with a temporary liner to prevent contamination.
- Any proposed associated stormwater infrastructure must be positioned at areas where concentrated flows will not result in erosion of the surrounding environment.
- A stormwater management plan (SMP) must be composed and implemented. Additionally, it is essential that the site-specific SMP be strictly adhered to on-site throughout the construction and operation of the WWTWs.
- The mitigation of impacts should focus on managing the runoff generated by the concrete surfaces and introducing it responsibly into the receiving environment. Therefore, the stormwater infrastructure must not be positioned where concentrated flows will enter these systems without efficient energy dissipaters positioned downslope within the flow-path.
- Stockpile areas of raw materials and other construction materials must be clearly identified and demarcated prior to materials being brought onto site. None of these

areas must be on or near slopes or water resources (within 50 m). All stockpiling areas must be approved by the site ECO before stockpiling occurs.

- Existing roads should be used as far as practical to gain access to the site and crossing the streams in areas where no existing crossing is apparent should be unnecessary, but if it is essential crossings should be made at right angles.
- All staff are to be trained in on-site activities and their environmental responsibilities clearly outlined before commencing work. All new staff are to be trained before they start work on-site. This should be adequately covered within the site-specific EMPr and should not require input from a freshwater habitat specialist (above what is detailed within this report).
- The contractor must utilise a SMP (which may form part of the construction method statement) to ensure that all construction activities do not cause, or precipitate, soil erosion which may result in sediment input into the surrounding environment. The designated responsible person on site, as indicated in the stormwater control plan (usually the contractor/ECO) must ensure that no construction work takes place before the stormwater control measures are in place and must include post-construction/operational phase stormwater requirements.
- The drainage plan must ensure no downstream erosion occurs through increased stormwater inputs and that the stormwater system has sufficient capacity for water inputs and drainage. Soft engineering (grassed swales) instead of hard gutters should be used where possible.
- Erosion and sedimentation must be monitored closely, and erosion and sedimentation management measures must be implemented. After every heavy rainfall event, the contractor must check the site for erosional damage and rehabilitation in the form of in situ infilling, compaction and revegetation, or the placement of temporary flow-energy dissipaters must occur immediately if damage is found. Energy dissipators should be implemented at the discharge outlet point to prevent erosion of the wetland.
- Install a temporary cut off trench to contain poor quality runoff (if observed).
- Construct temporary silt traps at drainage points to allow sediment settlement from runoff prior to release to the environment.
- A construction method statement is required to be compiled by the applicant/contractor for all activities associated with the proposed WWTWs. This method statement must include the phases of the WWTW, activities associated with the WWTW, and all mitigation measures stipulated within this report, all specialist reports and the project-specific EMPr. The applicant, engineer, contractor and ECO must agree and approve the statement as this will become a binding document to be implemented on-site. The independent ECO must ensure this document is continuously

implemented on-site to ensure no unnecessary disturbance to the surrounding environment.

- A serial plan of construction must be developed:
    - Construction must be immediately followed by rehabilitation;
    - Soil replacement must be conducted in same sequence as excavated;
    - Soil surfaces must not be left open for lengthy periods to prevent erosion.
    - Affected surface vegetation must be removed, appropriately stored then reinstated, immediately post-construction, as close to their original position as possible, to reduce the possibility of longer-term change to the vegetation community. The vegetation must be removed keeping the root systems intact as far as possible.
    - If required vegetation plugs can be sorted from areas adjacent to the construction site, under the supervision of the ECO.
- Removal of vegetation must only be done if necessary for the continuation of the development. Do not allow any disturbance to the adjoining natural vegetation cover or soils. All disturbed areas must be prepared and then re-vegetated to the satisfaction of the ECO as per the relevant method statement and EMPr.
- Where feasible, construction activities should be conducted during the drier months of the year (April – August) to minimise the possibility of erosion, sedimentation and transport of suspended solids associated with disturbed areas and rainfall events.
- Existing access routes must be utilised during construction. All access points, roads and turning areas must be agreed upon by the engineer and ECO prior to commencement of construction. No ad hoc haulage roads or turning areas may be created.
- All potential stormwater contaminants must be bunded in the site camp to prevent run-off into the surrounding environment. A drainage system must be established for the construction camp. The drainage system must be regularly checked to ensure an unobstructed water flow.
- No contaminated runoff or grey water is allowed to be discharged from the construction camp.
- Designated areas for stockpiling of raw materials must be identified before material is brought onto site. All stockpiling areas must be approved by the ECO before stockpiling occurs.
- Care must be taken to avoid the introduction of invasive alien plant species to the site. Alien vegetation re-growth must be controlled throughout the entire site during the construction and rehabilitation periods. This must be done through the utilisation of an alien and invasive plant control plan.
- All exposed surfaces within the construction site must be checked for alien invasive plant species on a monthly basis and any identified alien species must be removed by

hand pulling/uprooting and appropriately disposed of. Herbicides should only be utilised where manually removing is not possible. Herbicides utilised are restricted to products which have been certified safe for use by an independent testing authority. The ECO must be consulted before the purchase of any herbicide.

- Water used on site must be from an approved source. Should the water be extracted from a natural source the relevant authorisation must be acquired from DWS before abstraction. Water use on the site must be recorded and monitored.
- The digging of pit latrines is not allowed under any circumstances.
- None of the open areas or the surrounding environment may be used as ablution facilities.
- Portable toilets must be situated outside of the 1:100-year floodline of all rivers, tributaries and wetlands. A maintenance plan for the servicing of these toilets must be drawn up and strictly adhered to, to prevent malfunctioning and neglect resulting in environmental contamination.
- Should any spills of hazardous materials occur on the site or in the storage area, the relevant clean-up specialists must be contacted immediately. Materials that absorb fuel and oil, such as Drizit or earth should be placed over the spill. This contaminated material must be uplifted, placed within impermeable container and disposed of at a registered disposal site.
- In the event of a spillage that cannot be contained, and which poses a serious threat to the local environment, the following Departments must be informed of the incident in accordance with Section 30 of the National Environmental Management Act (Act no. 107 of 1998) within forty-eight (48) hours.
- An incident record must be completed for all spills that do occur on-site.
- Topsoil must be stored on a level area at least 50 m away from any river, tributary and/or wetland, and outside the 1:100-year flood line. The furthest threshold must be adhered to.
- The harvesting of firewood, medicinal plants, tree bark, flowers or other natural materials is forbidden on the site and from the surrounding environment.
- The Contractor must, as an initial and on-going exercise, implement erosion and sedimentation control measures to the satisfaction of the ECO. Stabilisation of cleared areas to prevent and control erosion and/or sedimentation must be actively managed.
- A designated waste area must be utilised at all times. Bins must be provided and emptied at no less than monthly intervals.
- All solid waste generated during the construction process (including packets, plastic, rubble, cut plant material, waste metals etc.) must be placed in the waste collection area in the construction camp and must not be allowed to blow around the site, be accessible by animals, or be placed in piles adjacent the skips / bins.
- Burying of waste, rubble on site, or dumping on site is prohibited.

- Material Safety Data Sheets (MSDSs) must be readily available on site for all chemicals and hazardous substances to be used on site. Where possible and available, MSDSs should additionally include information on ecological impacts and measures to minimize negative environmental impacts during accidental releases or escapes.
- Hazardous material storage areas must not be within 50 m of any watercourse or within the 1:100-year flood line. The furthest threshold must be adhered to. Hazardous storage areas to be hard surfaced and bunded with an impermeable liner to protect groundwater quality and undercover. The bunded catch pit must have at least 110% the storage capacity of the total stored quantity.
- During the planning phase, a vegetation rehabilitation and invasive alien plant species management plan must be compiled and implemented.
- A surface and groundwater quality monitoring programme must be drawn up to ensure that the quality of treated water is suitable. The wastewater must be continuously monitored during the construction and operation phases.
- The pipeline from the WWTW to the wetland must be encased in concrete or constructure using appropriate technology to prevent leaks or damage during flood events.
- Routine inspections of the infrastructure must be undertaken during the construction and operation phases. If any leaks or system failures are identified, these must be repaired immediately.
- All personnel operating and maintaining the WWTW must be appropriately trained.
- The downstream stormwater infrastructure must be upgraded where possible to compensate for increased flows and flood peaks.

10.3.4 Impacts on Groundwater

Impacts

The following impacts have been identified based on various activities of the proposed mixed use development.

Activity	Impacts	Significance		Irreplaceable loss of resources	Degree of reversibility	Confidence
		Before mitigation	After mitigation			
Poor quality seepage from temporary stockpiles	•Excavation and stockpiling of materials • Runoff from stockpile areas	Medium	Low	Low	High	100%
Contamination through the storage and	Impaired water quality	Low	Low	Low	High	100%

handling of chemicals, fuels & other hazardous materials						

Mitigation measures

- Cover stockpiles with geomembrane to reduce rainfall infiltration and hence, poor quality percolation into groundwater.
- Stockpiles should be placed on impermeable surfaces.
- Reduce footprint areas to minimise the reaction flow path of rainfall water.
- Park construction vehicles in areas lined with concrete or fitted oil traps.
- Ensure vehicles are in good condition and not leaking fuel or oil when entering the mining areas.

10.3.5 Impacts on Vegetation

Impacts

The following impacts on the vegetation have been identified based on various activities of the proposed mixed use development.

Activity	Impacts	Significance		Irreplaceable loss of resources	Degree of reversibility	Confidence
		Before mitigation	After mitigation			
Earthworks	Clearing or damage to vegetation	Medium	Low	Low	Medium	100%
Soil disturbance during and presence of bare soil areas following construction	Introduction of IAPS	Medium	Low	Low	High	100%

Mitigation Measures

- The construction site must be clearly marked and should not exceed the boundaries of the construction site plan.
- The unnecessary removal of vegetation outside of the construction site plan is not permitted.
- All construction machinery, vehicles and personnel movement must be limited to the existing informal tracks around the site.
- No fires are permitted on site.
- An IAPS management plan must be compiled by a suitable specialist prior to the commencement of construction activities. This must be implemented throughout the

construction and operational phase. This must be monitored by the Environmental Control Officer (ECO).

- The open grassland identified and demarcated within this report must be avoided as far as practicable.
- A waste management plan must be compiled prior to the commencement of the construction phase.
- Suitable waste receptacles must be placed around the site and must be demarcated. Waste receptacles must be wind and scavenger proof. This must be addressed in waste management plan.
- Dust control measures such as a water cart must be implemented throughout the construction phase.
- The IAPS management plan must be implemented throughout the construction and operational phase and must be monitored by the ECO on a regular basis.

10.3.6 Impacts on Fauna

Impacts

The site identified for the proposed development is largely under crop plantations and may not be able to support a high diversity of fauna. The following impacts were identified.

Activity	Impact	Significance		Irreplaceable loss of resources	Degree of reversibility	Confidence
		Before mitigation	After mitigation			
Vegetation Clearance for the establishment of infrastructure	Habitat Loss	Medium	Low	High	Low	100%
Construction activities creating noise	Disturbance	Low	Low	Low	High	100%
Vehicle Movement	Dust	Low	Low	Low	High	100%
Vehicle Movement	Road Mortalities	Medium	Low	Medium	Low	100%

Mitigation Measures

- Apply vegetation mitigation measures provided in Section 10.3.4.
- Demarcate footprint areas clearly.
- Restrict construction activity to the footprint area only.
- Consider surfacing road.
- Use dust-minimizing procedures on access road.
- Restrict construction activity to the footprint area only.
- Control vehicle speeds.
- Implement speed control measures (e.g. speed limits, traffic calming measures)

- Any instances of road mortalities must be recorded and reported to the ECO.
- Implement alien and invasive plant control and monitoring programme.

10.3.7 Impacts on Heritage and Palaeontological Resources

Impacts

The area is of low heritage sensitivity and the possibility of unearthing subsurface heritage resources is small. The following impacts have been identified.

Activity	Impacts	Significance		Irreplaceable loss of resources	Degree of reversibility	Confidence
		Before mitigation	After mitigation			
Earthworks	Destroy, damage, alter, or remove from its original position archaeological and paleontological material or objects as well as graves	Medium	Low	High	Low	100%
Earthworks	Damage or destroy fossil heritage resources	Medium	Low	High	Low	100%

Mitigation Measures

To mitigate the impact of the proposed project on the recorded heritage resources the following recommendations apply as a condition of authorisation (part of the EMPr) and based on approval from SAHRA.

- Feature 1, 2, 4, 5 and 6 (as described in the Heritage Impact Assessment Report) must be monitored during construction to determine if *in-situ* subsurface layers are present.
- It is recommended that Feature 3 should be monitored during earthworks in the area.
- No mitigation is required for Feature 7, unless it is proven that the site is older than 60 years,

In addition to the site-specific recommendations outlined above the following applies:

- Confirmation of any grave sites in the study area as part of the social consultation process.
- Graves should ideally be retained *in-situ* in open spaces.
- Implementation of a chance find procedure for the project.

10.3.8 Air quality

Impacts

It is possible that air quality will be affected during the construction phase where dust generating activities such as vegetation-clearing, earth-moving activities, creation of access roads and construction of buildings and associated infrastructure will take place. Also there will be an increase in vehicular emissions because of increased truck traffic and the presence of earth-moving vehicles.

Activity	Impacts	Significance		Irreplaceable loss of resources	Degree of reversibility	Confidence
		Before mitigation	After mitigation			
Earthworks	Dust generated by wind blowing over exposed soils / unprotected stockpiles	Low	Low	Low	High	100%
Operation of Machinery	Vehicular emissions produced	Medium	Medium	Low	Medium	100%
Movement of construction vehicles / equipment	Dust generation	Medium	Medium	Low	High	100%

Mitigation Measures

The following measures to mitigate the above impacts have been proposed:

- Regulate the speed at which vehicles and heavy machinery move by implementing speed limitations (guideline: 40km/h in working areas).
- Ensure good housekeeping.
- Implementation of dust suppression measures.
- All machinery employed on site will be maintained in good running order.

10.3.9 Noise

Impacts

Noise levels and noise disturbance in the immediate vicinity of the site will increase during construction activities due to:

- The large number of plant machinery to be used to excavate and shape the site;
- The movement of construction and earth-moving vehicles for creation of platforms;
- Increased traffic entering and exiting the site;
- Operation of generators;
- Noise from hydraulic hammers and winches; and

- General construction noise.

Activity	Impacts	Significance		Irreplaceable loss of resources	Degree of reversibility	Confidence
		Before mitigation	After mitigation			
Movement of construction vehicles / equipment	Noise disturbance	Medium	Medium	Low	High	100%
Operation of Machinery		Medium	Medium	Low	High	100%

Mitigation measures

The following measures to mitigate the above impacts have been proposed:

- Restrict movement of employees outside of mining areas.
- Limit working hours.
- Restrict vehicles to travelling only on designated roadways.
- Ensure all equipment and vehicles are regularly serviced.
- Ensure a complaints register is available on site and that all noise complaints are addressed.
- Installation and maintenance of noise monitoring equipment.

10.3.10 Socio-economic impacts

Impacts

The following impacts on the socio-economic environment have been identified based on the construction activities of the proposed mixed use development.

Activity	Impact	Significance		Irreplaceable loss of resources	Degree of reversibility	Confidence
		Before mitigation	After mitigation			
Construction activities	Demographic shift- influx of migrant workers	Medium	Medium	Low	High	100%
Construction activities	Change in the sense of place	Medium	Medium	Low	Medium	100%
Construction activities	Stimulation of the local and regional economy	High	High	Low	Medium	100%
Construction activities	Creation of temporary employment opportunities	High	High	Low	High	100%

Construction activities	Impact on household income	High	High	Low	High	100%

Mitigation Measures

- Prioritise employment of construction workers coming from the nearby residential settlements.
- Ensure the transfer of skills. Highly skilled construction workers must collaborate with low to medium skilled workers in order to facilitate the skills sharing and transfer process.
- Establish skills desks in Unitas Park to identify the labour force with the correct skills that could be employed immediately or could be trained for specific positions during construction.
- Create strict controls on the roads leading to the facility and prevent people from parking on the side of the roads, driveways, and other public areas that may inconvenience other road users and cause traffic congestion.
- Vehicles should be towed away if parked in the non-designated areas and such practices should be made abundantly clear among the construction workers and construction managers to avoid unnecessary conflicts.
- There are however limited mitigative measures that can be taken to mitigate the potential noise impacts that may arise from the construction, such as the sound of the building machinery and equipment.
- The construction of the development should take place during the day when most of the residents in the area are anticipated to be at school or work or occupied by other activities.
- Utilise domestically produced building material and equipment.
- Prioritise the procurement of goods and services from the local SMMEs and particularly SMMEs located in the study area.
- Prioritise employment of construction workers coming from the nearby residential settlements particularly those in the primary market area.
- The labourers employed during the construction and the operational phase must be given a contract that stipulates the required hours of work as well as the pay rate/wage or salary amount.
- The contract of employment should stipulate the duration of employment (temporal or permanent) depending on the phase of the development.
- The salary must be competitive or adhere to the minimum wage standards.

10.3.11 Traffic Impacts

Impacts

A substantial increase in traffic volumes on the road network surrounding the proposed development will be experienced during the construction phase. The impact created during construction is expected to have an influence on both the local and regional area despite the proposed road upgrades required which will add carrying capacity to the system.

Activity	Impacts	Significance		Irreplaceable loss of resources	Degree of reversibility	Confidence
		Before mitigation	After mitigation			
Increased human activity	Traffic congestion	Medium	Medium	Low	High	100%
Movement of construction vehicles / equipment	Increased heavy vehicle traffic	Medium	Medium	Low	High	100%

Mitigation Measures

- Ensure implementation of the recommendations of the Traffic Impact Assessment in consultation with the eThekwini Transport Authority.

10.3.12 Visual

Impacts

During the construction phase, earth-moving activities, the creation of cut-to-fill platforms, and the construction of light industrial and retail buildings and infrastructure may result in a visual intrusion to sensitive receptors.

Activity	Impacts	Significance		Irreplaceable loss of resources	Degree of reversibility	Confidence
		Before mitigation	After mitigation			
Movement of construction vehicles / equipment	Changes in natural landscape Visual intrusion Dust generation	Medium	Medium	Low	High	100%
Increased human activity	Visual intrusion	Medium	Medium	Low	High	100%

Mitigation Measures

The following measures to mitigate the above impacts have been proposed:

- Limit vehicle/equipment and employee movement to designated working areas.
- Utilise natural earth colours to best blend in.
- Utilise vegetation and the natural landscape to naturally screen activities.
- Alternatively utilise shade cloth to create an artificial buffer.

- Dust suppression, as needed.
- Detailed lighting plan to minimise light pollution.

10.4 Environmental Impact Assessment – Operational Phase

10.4.1 Impacts on Soil Resource, Land Use and Land Capability

Impacts

Solid waste generation within the residential and mixed-land use areas, can result in soil pollution of nearby fields. Stormwater run-off from surfaced roads can also contain pollutants such as petroleum hydrocarbons that spilled on sealed surfaces inside of the site. Both solid waste and stormwater run-off can result in elevated levels of soil contaminants in nearby soil, including the agricultural crop-fields.

Activity	Impact	Significance		Irreplaceable loss of resources	Degree of reversibility	Confidence
		Before mitigation	After mitigation			
Waste from Mixed used development.	Soil pollution of soil outside the site boundaries, including agricultural fields	Low	Low	Low	High	100%
Accidental discharge from the WWTW	Soil pollution	Medium	Low	Low	High	75%
Vehicular traffic	Soil contamination with hydrocarbons	Medium-Low	Low	Low	High	100%

Mitigation Measures

- Soil contamination levels must be monitored annually in a zone of 500m around the site.
- High level maintenance must be undertaken on all vehicles and construction/maintenance machinery to prevent hydrocarbon spills.
- Impermeable and bunded surfaces must be used for storage tanks and to park vehicles on.
- Site surface water and wash water must be contained and treated before reuse or discharge from site.
- Spills of fuel and lubricants from vehicles and equipment must be contained using a drip tray with plastic sheeting filled with adsorbent material.

- Potentially contaminating fluids and other wastes must be contained in containers stored on hard surface levels in bunded locations.
- Accidental spillage of potentially contaminating liquids and solids must be cleaned up immediately by trained staff with the correct equipment and protocols.

10.4.2 Impacts on Surface Water and Aquatic Systems

Impacts

The following impacts have been identified based on various activities of the proposed mixed use development.

Activity	Impacts	Significance		Irreplaceable loss of resources	Degree of reversibility	Confidence
		Before mitigation	After mitigation			
Operation of the proposed development	Increased runoff or stormflow from the site could lead to: • riverbank erosion as well as pollution of downstream water bodies • riparian degradation (urban river syndrome) Riparian degradation leads to loss of ecosystem functioning and altering of hydrological regimes.	Medium	Low	Low	High	100%
Net result of earthworks and development	Potential sedimentation several months after the site has been constructed. It is anticipated that the sediment load will decrease with time to pre-construction levels as vegetation becomes established.	Low	Low	Low	High	100%

Accidental discharge from the WWTW	Pollution of water resources	High	Low	Low	High	100%
Direct discharge of treated effluent to the wetland	Inundation of wetland Change in ecological health and functioning of the wetland	High	Low	High	Medium	100%

Mitigation measures

- The wetland system must be demarcated as a no-go zone.
- A stormwater management plan (SWMP) must be composed and implemented.
- Design the SWMP to ensure that the velocities of stormwater runoff flow are kept to a minimum.
- Release structures for stormwater runoff from the site should dissipate energy and disperse flow to ensure minimal impact to the receiving environment.
- Stormwater management plan for the site should be designed such that outflow from the site is equivalent to pre-development flows in terms of magnitude and frequency of occurrence.
- Sustainable urban drainage systems (SuDS) should be included in stormwater system throughout the site to counter runoff from impervious surfaces by providing infiltration capacity.
- Release structures for stormwater runoff from the site should incorporate silt traps to allow for settlement of sediments.
- Silt traps to be regularly cleaned.
- SuDS should be implemented and maintained holistically throughout the site to intercept and treat water to remove contaminants at source.
- Oil traps at restaurants, petrol stations and parking areas.
- Maintenance of sewage network to prevent leaks.
- Education of the community not to throw dirty water on the ground but dispose of to sewage.
- Pipe the effluent from the WWTP to the stormwater system downstream of the wetland, by-passing the wetland completely.
- Discharge effluent at a constant rate by including a balancing tank in the WWTP process to attenuate peaks.

10.4.3 Impacts on Vegetation

Impacts

The following impact on the vegetation have been identified based on various activities of the proposed mixed use development during the operational phase.

Activity	Impacts	Significance		Irreplaceable loss of resources	Degree of reversibility	Confidence
		Before mitigation	After mitigation			
Operation of the proposed development	Proliferation of alien vegetation	Medium	Low	Low	High	100%

Mitigation measures

- The IAPS management plan must make provision for the operational phase and must be implemented. The ECO should monitor the site for 6 months following the completion of the proposed development.

10.4.4 Air Quality

Impacts

Operational activities may result in reduced air quality on and around the property as a result of the increased volumes of emissions from increased traffic within and in the vicinity of the site.

Activity	Impacts	Significance		Irreplaceable loss of resources	Degree of reversibility	Confidence
		Before mitigation	After mitigation			
Increased traffic	Vehicular emissions produced	Medium	Medium	Low	Medium	100%

Mitigation measures

- Adherence to all traffic laws.

10.4.5 Noise

Impacts

Noise disturbances during the operational phase of the project will be on a long term basis and will be caused by increase residential traffic.

Activity	Impacts	Significance		Irreplaceable loss of resources	Degree of reversibility	Confidence
		Before mitigation	After mitigation			
Increased traffic	Noise disturbance	Medium	Medium	Low	High	100%

Mitigation Measures

- Adherence to municipal by-laws.

10.4.6 Socio-economic Impacts

Impacts

The following impacts on the socio-economic environment have been identified based on the operational activities of the proposed mixed use development.

Activity	Impact	Significance		Irreplaceable loss of resources	Degree of reversibility	Confidence
		Before mitigation	After mitigation			
Operational activities	Demographic shift - immigration of middle-income households	Medium	Medium	Low	High	100%
Operational activities	Service delivery and infrastructure upgrades	Medium	Medium	Low	High	
Operational activities	Change in the sense of place	Medium	Medium	Low	Medium	100%
Operational activities	Stimulation of the local and regional economy through the multiplier effect	High	High	Low	Medium	100%
Operational activities	Creation of sustainable employment opportunities	High	High	Medium	High	100%
Operational activities	Impact on household income	Medium	Medium	Low	High	100%

Mitigation Measures

- Ensure that the bulk of services that will occur as a result of the project will be extended to the primary communities (Sebokeng, Falcon Ridge, Arcon Park and Unitas Park) as well as the secondary areas (Evaton and Bophelong).
- Ensure that the road conditions are improved, and necessary expansion of the road networks (additional lanes) are made to avoid worsening the road congestion in the area particularly during peak hours.
- Upgrade the stormwater infrastructure in the area to benefit existing residents as wells as those who will occupy the proposed development Ensure that the parking capacity on site is adequate to accommodate the number of people in the development.
- Ensure that the facility is designed in such a way as to limit any noise pollution outside its site, as well as noise pollution that can reach the commercial and other sections surrounding the site.
- Ensure that the facility and its surrounding developments have adequate security and that it is visible to any onlooker as a preventative measure.
- Ensure that no people are allowed to sleep on the roads leading to the facility as well as on site itself.
- The proposed development is anticipated to be high-density. The height of the development may obstruct some of the residents' exposure to the sun and certain views. There are however no mitigation measures that can be taken to avoid such an impact.
- Prioritise the procurement of goods and services from the local SMMEs and particularly SMMEs located in the study area.
- Establish relationships with local businesses/SMMEs and purchase building material from local businesses to increase business activity and profits which will provide an incentive for businesses to hire more workers.
- Establish skills desks in Unitas Park Extension 16 to identify the labour force with the correct skills that could be employed immediately or could be trained for specific positions during operation.
- Create employment opportunities for labors with different skills set and incorporate labour intensive components during the construction phase which will provide employment opportunities and the inclusion of low-skilled labour.
- The laborer's employed during the operational phase must be given a contract that stipulates the required hours of work as well as the pay rate/wage or salary amount.
- The contract of employment should stipulate the duration of employment (temporal or permanent) during the operational phase of the proposed development.
- The salary must be competitive or adhere to the minimum wage standards.

10.4.7 Traffic Impacts

Impacts

A substantial increase in traffic volumes on the road network surrounding the proposed development will be experienced during the construction phase. The impact created during construction is expected to have an influence on both the local and regional area despite the proposed road upgrades required which will add carrying capacity to the system.

Activity	Impacts	Significance		Irreplaceable loss of resources	Degree of reversibility	Confidence
		Before mitigation	After mitigation			
Increased population	Traffic congestion	Medium	Medium	Low	High	100%

Mitigation Measures

- Ensure implementation of the recommendations of the Traffic Impact Assessment in consultation with the eThekwini Transport Authority.
- Ensure implementation of appropriate upgrades required for the existing road network.
- Ensure that the road links and intersections in the vicinity of the development have adequate capacity to accommodate the estimated additional trips generated by the proposed development and from all other known proposed developments in the studied road network.

10.4.8 Visual

Impacts

The change in visual character in the operational phase will be permanent, highly probable and will affect the immediate surrounds of the site.

Activity	Impacts	Significance		Irreplaceable loss of resources	Degree of reversibility	Confidence
		Before mitigation	After mitigation			
Mixed use development buildings	Changes in natural landscape	Medium	Medium	Low	High	100%
Increased human activity	Visual intrusion	Medium	Medium	Low	High	100%

Mitigation Measures

- Maintain the verges free of overgrowing vegetation.
- Keep area litter free.

10.5 Environmental Impact Assessment – Decommissioning Phase

It is expected that the infrastructure will remain on site and there will be no decommissioning. and closure phases.

10.6 Environmental Impact Assessment – Cumulative and Residual Impacts

Full impact assessments can be found within the various specialist' reports. A summary of the cumulative and residual impacts is presented in this section.

10.6.1 Heritage Impacts

Cumulative impacts occur from the combination of effects of various impacts on heritage resources. The importance of identifying and assessing cumulative impacts is that the whole is greater than the sum of its parts. The area is of low heritage sensitivity and the possibility of unearthing subsurface heritage resources is small. Thus the significance of cumulative impact on the potential heritage resources was found to be low.

10.6.2 Traffic

The current traffic impacts relating to traffic congestion will, when coupled with anticipated increased traffic arising from the construction activities and nearby existing developments (such as Evaton), have a cumulative negative impact in terms of increased traffic volumes. In both the construction and the operational phases is there a moderate probability of this impact occurring with the impact extending to the immediate surrounding area permanently.

10.6.3 Increased pressure on Municipal Services

Requirements for municipal services relating to water, sewer electricity and waste management will, when coupled with anticipated increased pressure from the Unitas Park Extension 16 development and nearby developments, have a cumulative impact of increased pressure on municipal services. The increased need for municipal services, if not managed correctly, could place unnecessary pressure on service provision to other businesses and residents. The probability of this occurring is fair, but should it occur, it would extend beyond the boundaries of the site on local scale. The impact would have a permanent impact.

11 KNOWLEDGE GAPS, ASSUMPTIONS AND LIMITATIONS

The EIA Regulations require that an account of any assumptions, uncertainties and gaps in knowledge applicable to the preparation of this report is provided.

An impact assessment is a predictive tool to identify aspects of a development that need to be prevented, altered or controlled in a manner to reduce the impact to the receiving environment, or determine where remediation activities will need to be incorporated into the overall development/activity plan. This does not mean that the impact will occur at the predicted significance but provides guidance on the formulation of the management and monitoring requirements which need to be incorporated to prevent/reduce/manage the impact.

Several specialist reports were used to define the baseline environment and predict the impacts of this project. The assumptions and limitations applicable to the relevant specialist studies are outlined below.

Findings, recommendations and conclusions provided in this report, and all specialist reports, are based on the authors' best scientific and professional knowledge and understanding of the proposed development, based on the information available at the time of compilation.

11.1 Dolomite Stability Investigation

It is a requirement that this report be presented to the Council for Geoscience for perusal, archiving and the provision of an official Record of Decision. Furthermore, construction supervision by approved dolomite practitioners (geo-professionals and engineers) will be required and also the design and implementation of the required DRMS and DRMP in accordance with SANS 1936-4.

If a RN1 & RL1 type development is considered necessary on IHC 3-4//3-4 land, then a dolomite D4 specialist will be required to oversee the design, construction, preparation and implementation of the required DRMS and DRMP.

11.2 Agricultural Agro-Ecosystem Assessment

At the time of submission of the Version 1 report, no data has been obtained from the farmer(s) that cultivate the land on any historical production figures of the project area for the past five years. It is likely that this data will become available as the public participation process commences. No anticipated employment figures have yet been received from the developer and will be included in the report when available. Similarly, it is expected that the farmer who leases the land from the Gauteng Department of Human Settlements will be

identified during the public participation process. He will then be asked to discuss the current employment opportunities created by his farming activities on the property.

It was also assumed that the desktop grazing capacity and field crop boundary data obtained from DAFF, has high correlation with the actual conditions on site. No other uncertainties and gaps have been identified that may affect the conclusions made in this report.

11.3 Heritage Impact Assessment

The only limitation identified for the heritage assessment was the inaccessibility to the majority of the site. The Chance Find Protocol has been recommended, should any artefacts or structures of interest arise.

11.4 Paleontological Impact Assessment

Based on the geology of the area and the paleontological record, it can be assumed that the formation and layout of the sandstones, shales, coal, dolomites, cherts, basalts and lavas of the early Proterozoic Transvaal Supergroup and Palaeozoic Karoo Supergroup, are typical for the country. As a result, it is not anticipated these formations will contain fossils in the early Proterozoic Transvaal Supergroup, and could contain fossils in the Palaeozoic Karoo Supergroup. No fossils have been reported from this area. Borehole cores for the coalmines indicate that the coal seams are far below the surface.

11.5 Socio-Economic Assessment

In terms of the primary data, information could be gathered due Corona Virus pandemic and the lockdown that was announced on March 26, 2020. While all due care was taken to ensure that the assessment of impacts is accurate (and follows the conservative approach), provision of additional data could potentially impact the assessment of the significance of some impacts. Project-related information supplied by the team involved in the project for the purpose of the analysis is assumed to be reasonably accurate. Thus, all impacts are analysed based on this information. Any changes hereon cannot be accounted for in the analysis.

The secondary data sources used to compile the economic baseline (dynamics of the economy and labour force), although not exhaustive, can be viewed as being indicative of broad trends within the study area. Possible impacts, as well as stakeholder responses to these impacts, cannot be predicted with complete accuracy, even when circumstances are similar, and these predictions are based on research and years of experience, taking the specific set of circumstance into account.

12 ENVIRONMENTAL IMPACT STATEMENT

12.1 Key Findings of Impact Assessment

The results of the impact assessment indicated that the most significant impacts on the receiving environment from the proposed Mixed Use Residential Development Unitas Park Ext.16 would those listed below in Table 12-1 and Table 12-2. As the structures are existing, the impacts are predicted to be moderate as no further construction will take place. The sensitivity of the receiving environment is depicted in Figure 12-1.

The correct implementation of the mitigation measures outlined in the EMPr will ensure that all impacts are managed, mitigated or avoided as far as practicably possible.

Table 12-1: Key impacts during the construction phase

Environmental Aspect	Impacts
Geology	• Sinkholes
Soil Resource, Land Use and Land Capability	• Loss of current land capability • Loss of agricultural production and agricultural-related employment • Loss of soil ecosystem services and soil fertility in areas where topsoil is stripped • Soil contamination with hydrocarbons • Soil compaction and surface sealing
Surface Water and Aquatic Systems	• Erosion and sedimentation of the downslope aquatic systems • Loss / degradation of instream habitat and aquatic biota • Impaired water quality • Disturbing vadose zone • Compacting of soils • Increased runoff, erosion and sedimentation of the aquatic systems • Alteration of natural drainage lines which may lead to ponding or increased runoff patterns (i.e. may cause stagnant water levels or increase erosion). • Loss of ephemeral streams • Contamination risk if spills occur • Change in aquatic fauna communities • Change/deterioration of the ecological status of rivers/streams

	• Contaminated stormwater runoff entering aquatic habitats • Change in hydrodynamics of the project area and aquatic systems • Change in aquatic fauna communities. • Change in ecological health and functioning of the wetland due to ddischarge of treated effluent to the wetland
Groundwater	• Excavation and stockpiling of materials • Runoff from stockpile areas • Impaired water quality
Vegetation	• Clearing or damage to vegetation • Introduction of IAPS
Fauna	• Habitat Loss • Disturbance of fauna • Excess dust • Road mortalities
Heritage and Palaeontological Resources	• Destroy, damage, alter, or remove from its original position archaeological and paleontological material or objects as well as graves. • Damage or destroy fossil heritage resources
Air Quality	• Dust generated by wind blowing over exposed soils / unprotected stockpiles • Vehicular emissions produced • Dust generation by movement of mine vehicles / equipment
Noise	• Noise disturbance from the movement of mine vehicles / equipment and the operation of machinery
Social	• Demographic shift- influx of migrant workers • Change in the sense of place • Stimulation of the local and regional economy • Creation of temporary employment opportunities • Impact on household income
Traffic	• Traffic congestion • Increased heavy vehicle traffic
Visual	• Changes in natural landscape • Visual intrusion • Dust generation

Table 12-2: Key impacts during the operational phase

Environmental Aspect	Impacts
Soil	• Soil pollution of soil outside the site boundaries, including agricultural fields
Surface Water and Aquatic Systems	• Increased runoff or stormflow from the site could lead to o Riverbank erosion as well as pollution of downstream water bodies o riparian degradation (urban river syndrome) Riparian degradation leads to loss of ecosystem functioning and altering of hydrological regimes. • Potential sedimentation several months after the site has been constructed. • It is anticipated that the sediment load will decrease with time to pre-construction levels as vegetation becomes established. • Pollution of water resources due to accidental spillages from the WWTW • Direct discharge of treated effluent to the wetland resulting in wetland inundation, change in ecological health and functioning of the wetland
Vegetation	• Proliferation of alien vegetation
Air Quality	• Vehicular emissions produced
Noise	• Noise disturbance from increased traffic
Socio-economic	• Demographic shift - immigration of middle-income households • Service delivery and infrastructure upgrades • Change in the sense of place • Stimulation of the local and regional economy through the • multiplier effect • Creation of sustainable employment opportunities • Impact on household income
Social	• Economic upliftment • Continued employment • Nuisance factors eg dust, noise
Traffic	• Increased heavy vehicle traffic
Visual	• Changes in natural landscape • Visual intrusion • Dust generation

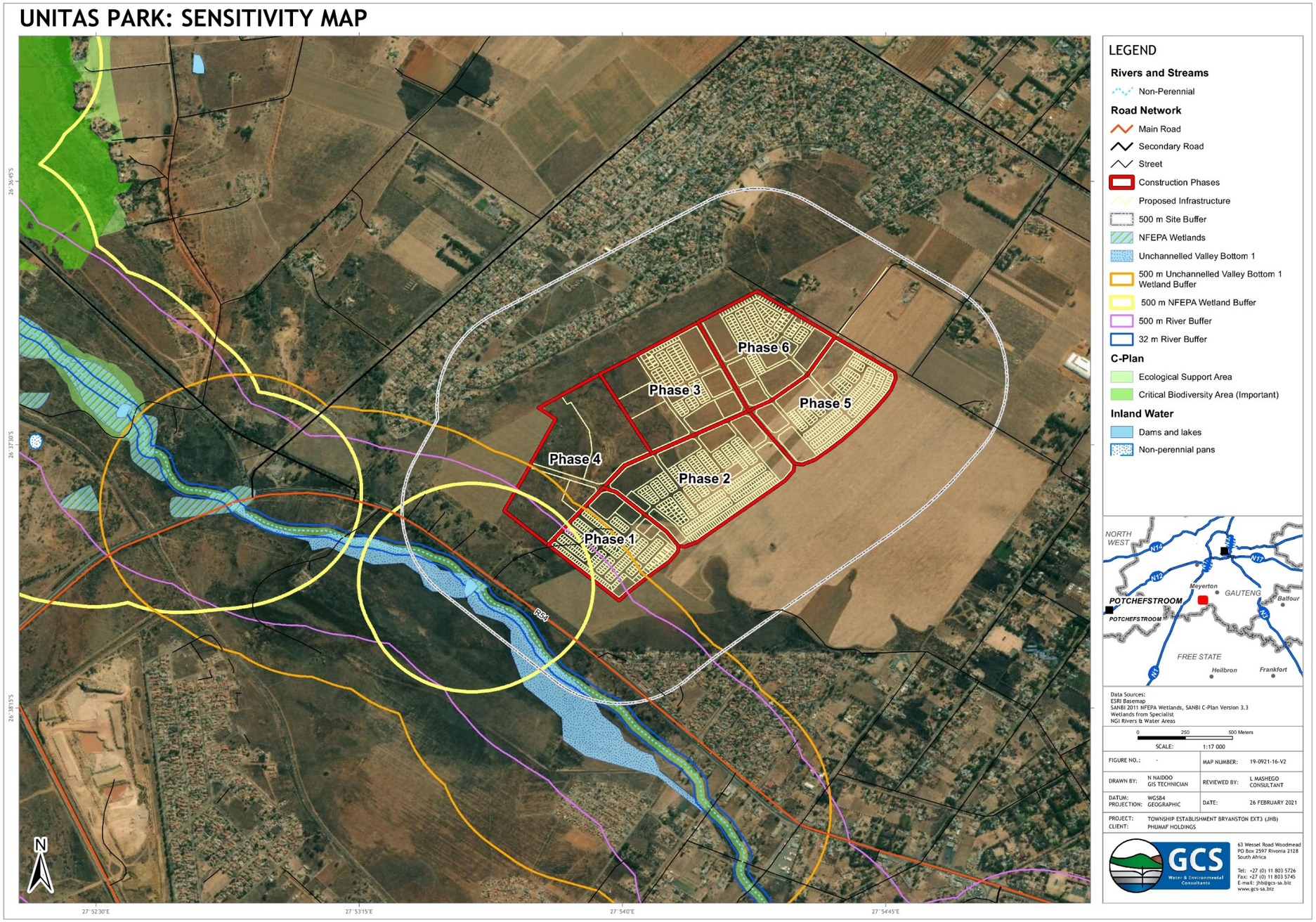

Figure 12-1. Sensitive areas on relation to the proposed development

12.2 Opinion regarding authorization of activity/ies

It is the opinion of the EAP that the proposed Mixed Use Residential Development Unitas Park Ext.16, should be authorised, provided that the proposed mitigation measures are implemented effectively and in line with the EMPr. The loss of land capability and use due to the proposed residential project will be outweighed by the long-term positive impacts of socio-economic effects of the expanding residential facilities within the project area. Based on the findings of the Impact Assessment, the EAP sees no reason why the Environmental Authorization should not be granted for the proposed project to proceed.

12.3 EMPr

GCS has prepared a Final Draft EMPr (**Appendix E**) which is required as part of the EIA submission (Regulation 33). The purpose of the EMPr is to guide and control the impacts of construction and operational activities and will be amended if significant changes take place. The effective implementation of an EMPr will ensure that the required works are conducted in an environmentally sound manner and that the potential negative impacts of construction and operational activities are minimised and/or prevented. The Draft EMPr document details the responsibilities and authority of the various parties involved in the project and contains environmental specifications to which the Contractor is required to adhere throughout the duration of the construction and operational phases.

The Draft EMPr is also considerate of all of the recommendations of each of the relevant specialist studies to ensure the development of the site is appropriate, optimal and effective in reducing impacts to the environment of construction and operation but also achieves environmental promotion and protection sustainable for the life of the project.

12.4 Proposed conditions of Authorisation

Following the findings of the EIA, it is suggested that the CA include the following conditions in the EA, should they decide to grant such:

- Correct implementation of the existing approved EMPr; and
- Continued auditing as per the various authorisations.

13 INFORMATION REQUESTED BY THE COMPETENT AUTHORITY

The scoping report was accepted on 19 march 2021. All the conditions stipulated within the acceptance letter and listed in Table 13-1 has been fulfilled.

Table 13-1: Conditions required by the competent authority

Condition	Reference
The EIAR must comply with Appendix 3 of the Environmental Impact Regulations (EIAR), 2014 as amended.	Table 0-1-2
A description of all the activities to be undertaken must be listed, specified and must be inclusive of all associated structures and infrastructures such as access routes and bulk services connection.	Section 8
The proposed development must correspond with activities applied for under the Environmental Impact Assessment (EIA) Regulations, 2014 as amended.	Section 2.1
The development footprint size of the proposed activity must be clearly defined in relation to the site development and layout plan.	Figure 1-4
The report indicates the presence of unchanneled valley bottom 1 within the study area. However, the Sensitivity Map Number 19-0921-16-V2 drawn by N Naidoo and reviewed by L Mashego dated 26 February 2021 indicate that the proposed development intrudes the edge of the 500m River Buffer, but located outside the 32m buffer zone measured from the edge of a riparian zone.	Figure 12-1
A detailed site development and layout plan dated 2021-02-22 attached as Appendix D in the report must be overlain by the sensitivity map number 19-0921-16-V2 dated 26 February 2021. This plan must be an A3 size and take into consideration all activities listed inclusive of associated infrastructure such as access routes and bulk services connection and must reflect proper legend.	Figure 12-1
Phases 1 and 4 of the proposed development as indicated in the site development and layout plan are affected by a dolomite in terms of the Department's Geographic Information System. Therefore, the Department recommend that a dolomite stability assessment be conducted and form part of this application for an environmental authorisation.	Appendix B1
Comparative assessment of all alternatives taking into consideration, the sensitive areas on the site, surrounding land uses, nature and scale of activity components must be done, and outcomes reported.	Section 5

A credible method of impact assessment, impact identification, rating and mitigation must be used to determine the impact of the proposed development inclusive of the proposed on-site above ground biological wastewater treatment facility on the biophysical environment on the site.	Section 10
A detailed master storm water management plan for the site (including storm water management measures to be implemented temporarily during the construction phase and permanent measures to be installed for the operational phase) must be developed by a suitably qualified engineer and approved by the Local Municipality.	Section 8 Appendix C
A site (project) specific Environmental Management Programme (EMPr) which is practical and enforceable is attached the scoping report. However, the EMPr must be in line with the content requirements as stipulated in Appendix 4 of the Environmental Impact Assessment (EIA) Regulations, 2014, and must incorporate management and mitigation measures to impacts identified during the assessment and in the specialist studies.	Section 12.3 Appendix E
The Public Participation process must be carried out in accordance with the minimum requirements of Chapter 6, Public Participation, GN. R326, of the EIA Regulations 2014 as amended.	Section 9
A confirmation from the relevant authority with regards to provision of bulk services (e.g. water supply, sewerage and waste disposal, energy, storm water) and related services such as road infrastructures is required. This must include a description of the infrastructure, specifications, layout, capacity and the planned routes.	Appendix C
The following Specialist Reports which are attached as Appendix C "Specialist Reports" in the draft scoping report and any other Specialist Studies recommended must form part of the environmental impact assessment report: • Ecological Impact Assessment Report prepared by Gareth Preen dated 24 March • 2020. • Bulk Services Availability Report prepared by Rofhiwa Maboho dated 17 October 2019. • Bulk Electrical Services Report prepared by Kenneth Chitenhe dated 25 September 2019. • Outline Scheme Report prepared by Kenneth Chitenhe dated 22 May 2020. Traffic Impact and Access Study Report prepared by Sikelela Mnguni dated 2 November 2020. • Civil Engineering Services Outline Scheme Report prepared by Edward Williams dated 20 May 2020.	Appendix B

• Heritage Impact Assessment Report prepared by Mr. J. van der Walt dated March 2020. • Palaeontological Impact Assessment Report prepared by Prof Marion Bamford dated 9 March 2020. • Agricultural Agro-Ecosystem Specialist Assessment Report prepared TerraAfrica Consult cc dated 22 October 2020. • Socio-Economic Impact Assessment Study prepared by Urban-Econ dated April 2020.	

14 CONCLUSION AND RECOMMENDATIONS

A Draft EIA Report has been compiled where the potential impacts on the environment of listed activities associated with the proposed Mixed Use Residential Development Unitas Park Ext.16 were considered, investigated and assessed in compliance with the NEMA and EIA Regulations. The report contains all information that is necessary for the competent authority to consider the application and to reach a decision regarding the application and includes an assessment of each identified potential impact, including biophysical, ecological, socio-economic and cumulative impacts of the proposed development on the environment. The impact assessment is more detailed than the preliminary assessment undertaken in the scoping phase, by incorporating all of the conditions required by the EIA regulations, to provide a thorough investigation into all potential impacts.

Although the proposed development was found to have, in some instances, significant environmental impacts specifically pertaining to loss of agricultural land for example, when taking cognisance of the associated positive socio-economic impacts, whereby the provision of housing is deemed one of the municipal priority areas, these negative impacts are deemed to be overshadowed by the positive impacts with the proposed establishment of the development. Additionally, it must be considered that the proposed site is within an area under pressure of urbanisation with residential premises right next to it and most other negative impacts can be mitigated to acceptable levels. GCS therefore recommends that an Environmental Authorisation granted for the proposed Mixed Use Residential Development Unitas Park Ext.16, provided all proposed mitigation measures within the specialist investigations and EMPr are implemented, and the recommendations are considered.

15 UNDERTAKING BY EAP

15.1 UNDERTAKING REGARDING CORRECTNESS OF INFORMATION

I, Gerda Bothma, herewith undertake that the information provided in the foregoing report is correct, and that the comments and inputs from stakeholders and Interested and Affected Parties received since project announcement, have been correctly recorded in the report.

Signature of the EAP

Date: July 2021

15.2 UNDERTAKING REGARDING LEVEL OF AGREEMENT

I, Gerda Bothma, herewith undertake that the information provided in the foregoing report is correct, and that the level of agreement with Interested and Affected Parties and stakeholders since announcement of the project, has been correctly recorded and reported herein.

Signature of the EAP

Date: July 2021

16 REFERENCES

GCS (2021) Report on a Dolomite Stability Investigation for Unitas Park Ext 16 in Unitas Park, Gauteng, GCS Geotechnical.

GCS (2021) Proposed Residential and Mixed-Use Development in Unitas Park Extension 16, Emfuleni Local Municipality Gauteng: Ecological Impact Assessment Report.

GCS (2021) Proposed Residential and Mixed-Use Development in Unitas Park Extension 16, Emfuleni Local Municipality Gauteng: Preliminary Hydrological Assessment.

GCS (2021) Proposed Residential and Mixed-Use Development in Unitas Park Extension 16, Emfuleni Local Municipality Gauteng: Effluent discharge Investigation.

HCAC (2020) Heritage Impact Assessment for the Proposed Unitas Park Ext 16 Township Development Located in Unitas Park, Gauteng Province Report.

Heritage Contracts and Archaeological Consulting (2020) Palaeontological Impact Assessment for the proposed development in Unitas Park Ext 16, Gauteng Province.

Mucina, L. and Rutherford, M. C. (eds) 2006. The Vegetation of South Africa, Lesotho and Swaziland. Strelitzia 19. South African National Biodiversity Institute, Pretoria.

Phumaf Holdings (2019) Bulk Services Availability Report Unitas Park Extension 16 Project No.: G18110017/1.

Phumaf Holdings (2019) Bulk Electrical Services Report Unitas Park Extension 16 Project No.: G18110017/1.

Phumaf Holdings (2020) Electrical Engineering Services Unitas Park Extension 16 Project No.: G18110017/1.

Phumaf Holdings (2020) Civil Engineering Services Outline Scheme Report Unitas Park Ext. 16 Project N□.: 7001.

Phumaf Holdings (2020) Traffic Impact & Access Study Report Unitas Park Extension 16- Final Report.

TerraAfrica (2020) Agricultural Agro-Ecosystem Specialist Assessment for the proposed Residential and Mixed-Use Development in Unitas Park Extension 16 Version 1.

Sedibeng (2019) Integrated Development Plan 2019/2020.

Urban-Econ (2020) Unitas Park Extension 16 Socio-Economic Impact Assessment Study.

Urban-Econ (2020) Unitas Park Extension 16 Highest And Best Use Market Study.

APPENDIX A - CV'S OF SPECIALISTS

APPENDIX B – SPECIALIST STUDIES

- B1: Dolomite Stability Investigation
- B2: Agricultural Agro-Ecosystem Specialist Assessment
- B3: Hydrological Impact Assessment
- B4: Ecological Study
- B5: Heritage Impact Assessment
- B6: Palaeontological Impact Assessment
- B7: Socio-Economic Impact Assessment
- B8: Traffic Impact & Access Study
- B9: Market Study

APPENDIX C – INFRASTRUCTURE STUDIES

- C1: Bulk Services Report
- C2: Bulk Electrical Services Report
- C3: Electrical Engineering Services Report

APPENDIX D - PUBLIC PARTICIPATION PROCESS

- D1: Pre-application Meeting
- D2: NEMA Application
- D3: I&AP database
- D4: Advert 2020
- D5: BID and Comment Sheet
- D6: Site notices
- D7: Email notification
- D8: Comments and Response Report
- D9: Acceptance letter of Final Scoping report

APPENDIX E – UNITAS PARK EXT 16 EMPR