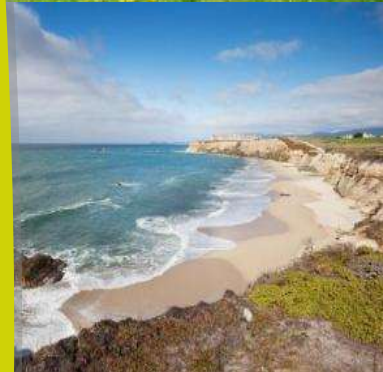




**DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT FOR
THE PROPOSED CLEARANCE OF 210.6353 HECTARES OF
INDIGENOUS VEGETATION FOR THE ESTABLISHMENT OF
POPO MOLEFE TOWNSHIP ON PAARDEKRAAL FARM NO. 279
JQ WITHIN THE RUSTENBURG LOCAL MUNICIPALITY, IN THE
NORTH WEST PROVINCE.**

NO: NWP/EIA/67/2019

DATE: 29 June 2020



Prepared by:

Lesekha Consulting
25 Caroline Close
Rowland Estate
Mafikeng

Contact Person:

Prepared for:

Department of Local Government and Human
Settlements
3366 Bessemmer Street
Telkom Building,
Industrial Site,
Mafikeng, 2735



Lesekha
consulting



Contents	i
Contents	i
DECLARATION OF CONSULTANT INDEPENDENCE	v
TERMS AND DEFINITIONS	v
1. INTRODUCTION	1
1.1 Project Background.....	1
1.2. Proposed project Description	1
1.3 Project Location	2
3. INFRASTRUCTURAL AND SERVICE PROVISION	5
3.1.1 Surrounding Land Uses	8
3.2. Storm water Management.....	11
3.3. Sewerage Treatment	11
3.4. Water and technology	12
3.5. Road access and traffic.....	12
3.6. Solid waste Management.....	13
3.7. Electricity Provision.....	14
4. LEGISLATION, POLICIES AND GUIDELINES CONSIDERED.....	14
4.1 National Environmental Management Act 107 of 1998 (NEMA)	14
4.2 The Constitution of the Republic of South Africa, 1996 (Act no 108 of 1996)	16
4.3 National Environment: Air Quality Act 39 of 2004.....	16
4.3.1 Air Emissions	17
4.3.2 Dust Control.....	17
4.3.3 Vehicular Emissions.....	17
4.4 National Waste Management Strategy (first draft for public comment March 2010)	17
4.5 National Water Act, 1998 (Act No.36 of 1998).....	18
4.5.1 Water Supply	18
4.5.2 Wastewater	19
4.5.3 Pollution	19
4.6 The National Water Act and Riparian Areas.....	20
4.7 National Environmental Management: Waste Act, 2008	21
4.7.1 National Environmental Management: Waste Act, 2008.....	21
4.8 Environment Conservation Act No. 73 of 1989.....	22
4.9 National Forest Act	22
4.10. National Heritage Resources Act	22
4.10.1 Heritage Management.....	23
4.11. Occupational Health and Safety.....	23
4.12. National Environmental Management: Biodiversity Act, (Act No. 10 of 2004).....	24
4.13. National Road Traffic Act (Act 83 of 1996)	24
4.14 Spatial Planning and land use Managements Act 16 of 2013.....	25
4.15 Land use Planning Ordinance (LUPO (Ordinance 15 of 1985).....	25

4.16 National Housing Code (2006)	25
4.17 The Land Reform Programme	26
4.18 White Paper on Local Government (1998)	26
4.19 Municipal Demarcation Act (Act 27 of 1998)	27
4.20 The Municipal Structures Act, 1998 (Act 117 of 1998)	27
4.21 The National Housing Act, 1997 (Act 107 of 1997)	28
4.22 Extension of Security Act of 1993	28
4.23 Municipal Finance Management Act of 2003	28
4.24 Disaster Management Act, 2002 (Act No.57 of 2002)	29
4.26 Promotion of Access to Information Act (Act No. 2 of 2000)	29
4.27 Promotion of Administrative Justice Act (Act No.3 of 2000)	30
4.28 National Development Plan: Vision for 2030	30
4.28 Provincial Spatial Development Framework (PSDF) 2009	30
4.29 Triple Bottom Line (PSDF 2009)	31
4.30 Sustainable Development Criteria for Built Environment Projects requiring Environmental Impact Assessments in Gauteng, 2009 Housing	32
4.31 Spatial form and Urban Management	33
4.37 Policies and guidelines consulted	36
5. PROJECT ALTERNATIVES	36
5.1 Land use Alternative	37
5.1.1 Alternative 1	37
5.1.2 Alternative 2: Agricultural Activity	38
5.2 Layout Alternative	38
5.3 Location and Type of Activity Alternative	38
5.4 No go Alternative	40
5.5 Reasons for the preferred development alternative	41
5.6 Need and Desirability of the proposed activities	42
6. DESCRIPTION OF THE RECEIVING ENVIRONMENT	44
6. DESCRIPTION OF THE RECEIVING ENVIRONMENT	45
6.1 Bio-Physical Environment	45
6.1.1 Climate	45
6.1.2 Wind	46
6.1.3 Air Quality	46
6.1.4 Soil and Land capacity	47
6.1.5 Geology	49
6.1.6 Vegetation	51
6.1.7 Hydrology	54
1.7 Topography	54
6.2 Social Economic Environment	56
6.2.1 Demographic Profile	56

6.2.2 Age and gender profile.....	57
6.2.4 Economic activity	59
6.2.5 Employment.....	60
6.2.10 HOUSEHOLD INFRASTRUCTURE	64
6.2.11 SETTLEMENT PATTERNS	65
7. IMPACT ASSESSMENT	66
7.1 Impact Assessment Methodology	66
7.3.1 PROPOSAL: IMPACTS THAT MAY RESULT FROM THE PLANNING PHASE	71
7.3.2 PROPOSAL: IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION PHASE	76
8. PUBLIC PARTICIPATION PROCESS	134
8.1 Objectives of Public Participation	134
8.2 Identification of I&AP's	135
8.3 Pre-Scoping Notification.....	135
8.4 Register of IAPs.....	136
8.5 Public Participation during Scoping.....	136
8.5.1 Public Participation during the EIA phase	137
8.6 Competent authority's decision on the scoping report	137
11. EAP DECLARATION AND UNDERTAKING	147

DECLARATION OF CONSULTANT INDEPENDENCE

This report has been prepared by Lesekha Environmental Consulting with all reasonable skill, care and diligence within the terms of the contract with the client. Lesekha Environmental consulting is a multidisciplinary environmental management and consulting company with more than 14 years of experience in the field. The technical appointments for this project are detailed below.

Team Member	Qualifications	Project Role
Lesego Senna	Bsc. (Honors) Environmental Sciences	Project Manager
Jennipher Sakaunda	Bsc. (Honors) Environmental Sciences	Environmental Assessment Practitioner

The author of this report, Lesekha Environmental consulting, hereby declares that it is an independent consultant and has no business, financial, personal or other interest in the activity. Neither Lesekha Environmental Consulting nor any of its sub-consultants are subsidiaries of the Department of Local Government and Human Settlement nor Akha Maduna Property. Furthermore, all these parties do not have any interests in secondary developments that may arise out of the authorization of the proposed project. There are no circumstances that compromise the objectivity of the persons performing such work. All opinions expressed in this report are its own.

Date : 29 June 2020

Sign : 

TERMS AND DEFINITIONS

TERM/S	DEFINITION
--------	------------

TERM/S	DEFINITION
Affected environment	Those parts of the socio-economic and biophysical environment impacted on by the development.
Affected public	Groups, organizations, and/or individuals who believe that an action might affect them.
Alternative proposal	<p>A possible course of action, in place of another, that would meet the same purpose and need. Alternative proposals can refer to any of the following but are not necessarily limited thereto:</p> <ul style="list-style-type: none"> • alternative sites for development • alternative projects for a particular site • alternative site layouts • alternative designs • alternative processes • alternative materials
Alternatives	Alternatives are different means of meeting the general purpose and need of a proposed activity. Alternatives may include location or site alternatives, activity alternatives, process or technology alternatives, temporal alternatives or the no-go alternative.
Appeal	Any affected person may appeal a decision of the competent authority to the MEC.
Applicant	An applicant is a person who applies for environments authorization in order to undertake a listed activity lawfully. The applicant must appoint an independent EAP to manage the application process.
Authorities	The national, provincial or local authorities, which have a decision-making role or interest in the proposal or activity. The term includes the lead authority as well as other authorities.
Baseline	Conditions that currently exist. Also called “existing conditions.
Benefits assessment	The objective of the assessment of benefits is to identify and assess all the significant benefits that may arise from the undertaking of an activity.
Best practical environmental option	Means the option that provides the most benefit or causes the least damage to the environment as a whole, at a cost acceptable to society, in the long term as well as in the short term.
Competent authority	The person who makes decisions in respect of applications for environmental authorizations is known as the competent authority. In this instance, the competent authority is the MEC of North West Province. Delegated officials

TERM/S	DEFINITION
	from relevant departments assist the MEC with the final decision.
Cumulative impacts	Cumulative impacts are impacts that result from the incremental impact of the proposed activity on a common resource when added to the impacts of other past, present or reasonably foreseeable future activities. Cumulative impacts can occur from the collective impacts of individual minor actions over a period of time and can include both direct and indirect impacts.
Decision-maker	The person(s) entrusted with the responsibility for allocating resources or granting approval to a proposal.
Decision-making	The sequence of steps, actions or procedures that result in decisions, at any stage of a proposal.
Development footprint	In respect of land means any evidence of physical alteration as a result of the undertaking of any activity.
Direct impacts	Direct impacts are impacts that are caused directly by the activity and generally occur at the same time and at the place of the activity. These impacts are usually associated with the construction, operation or maintenance of an activity and are generally obvious and quantifiable.
Disposal	Licensing, management, capacity, etc. of landfill sites and dump sites.
EAP	An EAP is a person who manages an application for environmental authorisation for an applicant.
Ecology	The study of the inter relationships between organisms and their environments.
Education and Awareness	Public education and awareness initiatives regarding the impact of waste on the environment and people's health and the promotion of sound waste management practices.
EIA process	The scoping and EIA process involves a complex and intensive assessment of the potential impacts of an activity. The process takes place in three broad phases, namely submission of an application form, scoping and the EIA.
Environmental Assessment (EA)	The generic term for all forms of environmental assessment for projects, plans, programmes or policies. This includes methods/tools such as EIA, strategic environmental assessment, sustainability assessment and risk assessment.
Environmental consultant / Assessment	Individuals or firms who act in an independent and unbiased manner to provide information for decision-making.

TERM/S	DEFINITION
Practitioner	
Environmental Impact Assessment	A public process, which is used to identify, predict and assess the potential environmental impacts of a proposed project on the environment. The EIA is used to inform decision-making.
Environmental Management Programme	A working document on environmental and socio-economic mitigation measures that must be implemented by several responsible parties during all the phases of the proposed project.
Impacts	Impacts are the changes in an environmental parameter that result from undertaking an activity. The change is the difference between the effects on the environmental parameter where the activity is undertaken compared to that where the activity is not undertaken. Impacts may be positive or negative and may be categorized as being direct (primary), indirect (secondary) or cumulative impacts.
Impacts assessment	The objective of the assessment of impacts is to identify and assess all the significant impacts that may arise from the undertaking of an activity.
Independent	In relation to an EAP or a person compiling a specialist report or undertaking a specialised process or appointed as a member of an appeal panel, means – That such EAP or person has no business, financial, personal or other interest in the activity, application or appeal in respect of which that EAP or person is appointed in terms of these Regulations other than fair remuneration work performed in connection with that activity, application or appeal; or that there are no circumstances that may compromise the objectivity of that EAP or person in performing such work.
Indirect impacts	Indirect impacts of an activity are indirect or induced changes that may occur as a result of the activity. These types of impacts include all the potential impacts that do not manifest immediately when the activity is undertaken or which occur at a different place as a result of the activity.
Integrated Waste Management Plan	An Integrated Waste Management Plan provides a framework within which local municipalities can deliver a waste management service to all residents and businesses.
Interested and affected parties (I&APs)	Individuals, communities or groups, other than the proponent or the authorities, whose interests may be positively or negatively affected by a proposal or activity and/or who are concerned with a proposal or activity and

TERM/S	DEFINITION
	its consequences. These may include local communities, investors, business associations, trade unions, customers, consumers and environmental interest groups. The principle that environmental consultants and stakeholder engagement practitioners should be independent and unbiased excludes these groups from being considered stakeholders.
Mitigate	The implementation of practical measures to reduce adverse impacts.
Mitigation measures	Mitigation measures are the steps that are taken to reduce the identified impacts as far as possible. Mitigation measures will address the predicted factors of the impacts clearly to demonstrate how the impacts will be reduced through mitigation.
Municipal solid waste	Solid waste resulting from or incidental to municipal, community, commercial, institutional and recreational activities, and includes garbage, rubbish, ashes, street cleanings, abandoned automobiles, and all other solid wastes except hazardous waste, industrial solid waste, oilfield waste and biomedical wastes.
No-go alternative	The no-go alternative is the option of not undertaking the proposed activity or any of its alternatives. The no-go alternative also provides the baseline against which the impacts of other alternatives can be compared.
Plan of Study	A Plan of Study describes how the EIA for the proposed Project will proceed during the EIA phase.
Public participation	Public participation is a key element of both the scoping and EIA processes and must be conducted in accordance with at least the minimum requirements as set out in the Regulations.
Recycle	Means to do anything that results in providing a use for a thing that otherwise would be disposed of or dealt with as waste, including collecting, transporting, handling, storing, sorting, separating and processing the thing, but does not include the application of waste to land or the use of a thermal destruction process.
Role-players	The stakeholders who play a role in the environmental decision-making process. This role is determined by the level of engagement and the objectives set at the outset of the process.
Scoping	The process of determining the spatial and temporal boundaries (i.e. extent) and key issues to be addressed in an environmental assessment. The main purpose of scoping is to focus the environmental assessment on a manageable number of important questions. Scoping should also ensure that

TERM/S	DEFINITION
	only significant issues and reasonable alternatives are examined.
Significant impact	Means an impact that by its magnitude, duration, intensity or probability of occurrence may have a notable effect on one or more aspects of the environment.
Stakeholder engagement	The process of engagement between stakeholders (the proponent, authorities and I&APs) during the planning, assessment, implementation and/or management of proposals or activities. The level of stakeholder engagement varies depending on the nature of the proposal or activity as well as the level of commitment by stakeholders to the process. Stakeholder engagement can therefore be described by a spectrum or continuum of increasing levels of engagement in the decision-making process. The term is considered to be more appropriate than the term “public participation”
Stakeholders	<p>A sub-group of the public whose interests may be positively or negatively affected by a proposal or activity and/or who are concerned with a proposal or activity and its consequences.</p> <p>The term therefore includes the proponent, authorities (both the lead authority and other authorities) and all interested and affected parties (I&APs). The principle that environmental consultants and stakeholder engagement practitioners should be independent and unbiased excludes these groups from being considered stakeholders.</p>
Study area	Refers to the entire study area encompassing the total area as indicated on the study area map.
Visual impact	Changes to the visual character of available views resulting from the development that include: obstruction of existing views; removal of screening elements thereby exposing viewers to unsightly views; the introduction of new elements into the view shed experienced by visual receptors and intrusion of foreign elements into the view shed of landscape features thereby detracting from the visual amenity of the area.

ACCRONYMS AND ABBREVIATIONS

ABBREVIATIONS	DEFINITIONS
BDM	Bojanala District Municipality
CARA	Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)
DLGHS	Department of Local government and Human Settlement
DWS	Department of Water & Sanitation
EAP	Environmental Assessment Practitioner
ECA	Environment Conservation Act, No. 73 of 1989
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
FLISP	Finance Linked Individual subsidy programme
I&APs	Interested and Affected Parties
IDP	Integrated Development Plan
IWMP	Integrated Waste Management Plan
IWMSA	The Institute of Waste Management Southern Africa
LED	Local Economic Development
LUPO	Land Use Planning Ordinance, (Ordinance 15 of 1985)
NEMA	National Environmental Management Act, (Act 107 of 1998)
NEMBA	National Environmental Management Biodiversity Act (Act No. 10 of 2004)
NEMWA	National Environmental Management: Waste Act (No. 59 of 2008)
NGO	Non-Government Organization
NHR	National Heritage Resources Act (No. 25 of 1999)
DEDECT	Department Economic Development, Environment Conservation and Tourism
NWA	National Water Act, 1998 (Act No. 36 of 1998)
NWMS	National Waste Management Strategy
OHSA	Occupational Health and Safety Act (No. 85 of 1993)
POP	Persistent organic pollutant
PPP	Public Participation Process
RLM	Rustenburg Local Municipality
SABS	South African Bureau of Standards
SAHRA	South African Heritage Resources Agency
SANS	South African National Standard
SDF	Spatial Development Framework

ABBREVIATIONS	DEFINITIONS
UNEP	United Nations Environment Programme
WSDP	Water Service Provider Province
WULA	Water Use Licence Authority

1. INTRODUCTION

1.1 Project Background

Lesekha Consulting was appointed by project town planners Akha Maduna Property Developers on behalf of the applicant the Department of Local Government and Human Settlements as an independent Environmental Assessment Practitioner (EAP) responsible for facilitating the legally required Environmental Authorization in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended, read with the Environmental Impact Assessment Regulations, (04 December 2014 as amended).

The applicant, the Department of Local Government and Human Settlements intends to establish low cost houses with basic services (water, electricity, sanitation and roads). The project will consist of 5705 residential erven, together with the necessary non-residential facilities. The proposed project will contribute to alleviating the current housing need in the area and access to social amenities. The proposed township development on Paardekraal No. 279 JQ forms part of the municipality's long-term plan to improve housing in the area since it's very close to Rustenburg Town. The proposed site of development is situated on the following Portions of Paardekraal Farm No. 279 JQ in the Rustenburg Local Municipality:

- Portion 39 of Farm Paardekraal No. 279 JQ
- Portion 109 of Farm Paardekraal No. 279 JQ
- Reminder of Portion 26 of Farm Paardekraal No. 279 JQ

The relevant application has already been lodged with the North West Department of Economic Development, Environment and Tourism (NW DEDECT) for environmental authorization, with the reference number as **NWP/EIA/67/2019**. As such, an Environmental Assessment Application process will be undertaken to obtain an Environmental Authorization for the proposed project.

1.2. Proposed project Description

The applicant, the Department of Local Government and Human Settlements intends to establish low cost houses with basic services with basic services (water, electricity, sanitation and roads. The project will also extend for the provision of 5705 residential erven for lower income groups of Paardekraal. The proposed project will contribute to alleviating the current housing need in the area and access to social amenities. The proposed Development will entail the following:

- 5705 residential units (220 m²)
- 2 municipal

- 17 businesses
- 3 clinics
- 3 community halls
- 2 tax ranks
- 1 secondary school
- 2 primary School
- 10 crèche
- 12 church
- 2 recreation
- 10 public places

-Construction of internal road,

- Water, sewage and electricity reticulation infrastructure for the new development

The proposed site/existing informal settlement of Popo Molefe is currently occupied by approximately 400 informal households with no water supply, sewerage and refuses collection however, electrical connection is available. The extent of the entire site of study is 210.6353 hectare, however 41.003 ha of the land is undevelopable. Portion of 5705 units to be development will be occupied by people currently residing in this informal settlement.

1.3 Project Location

The site is located within an existing informal settlement on Paardekraal Farm No. 279 JQ in the Rustenburg Local Municipality. The site is situated 7 km North East of Rustenburg Town. The area falls within the jurisdiction of the Rustenburg Local Municipality of Bojanala District Municipality in the North West Province. The coordinates of the site are **S 25° 38' 54.9" E 27° 17' 16.1"**.

Property description	SG Digit code of all proposed sites	Proposed site per Hectares
Portion 39 of Farm Paardekraal No. 279 JQ	T0JQ0000000027900039	210.6353 ha
Portion 109 of Farm Paardekraal No. 279 JQ	T0JQ00000000279000109	
Reminder of Portion 26 of Farm Paardekraal No. 279 JQ	T0JQ00000000279000026	

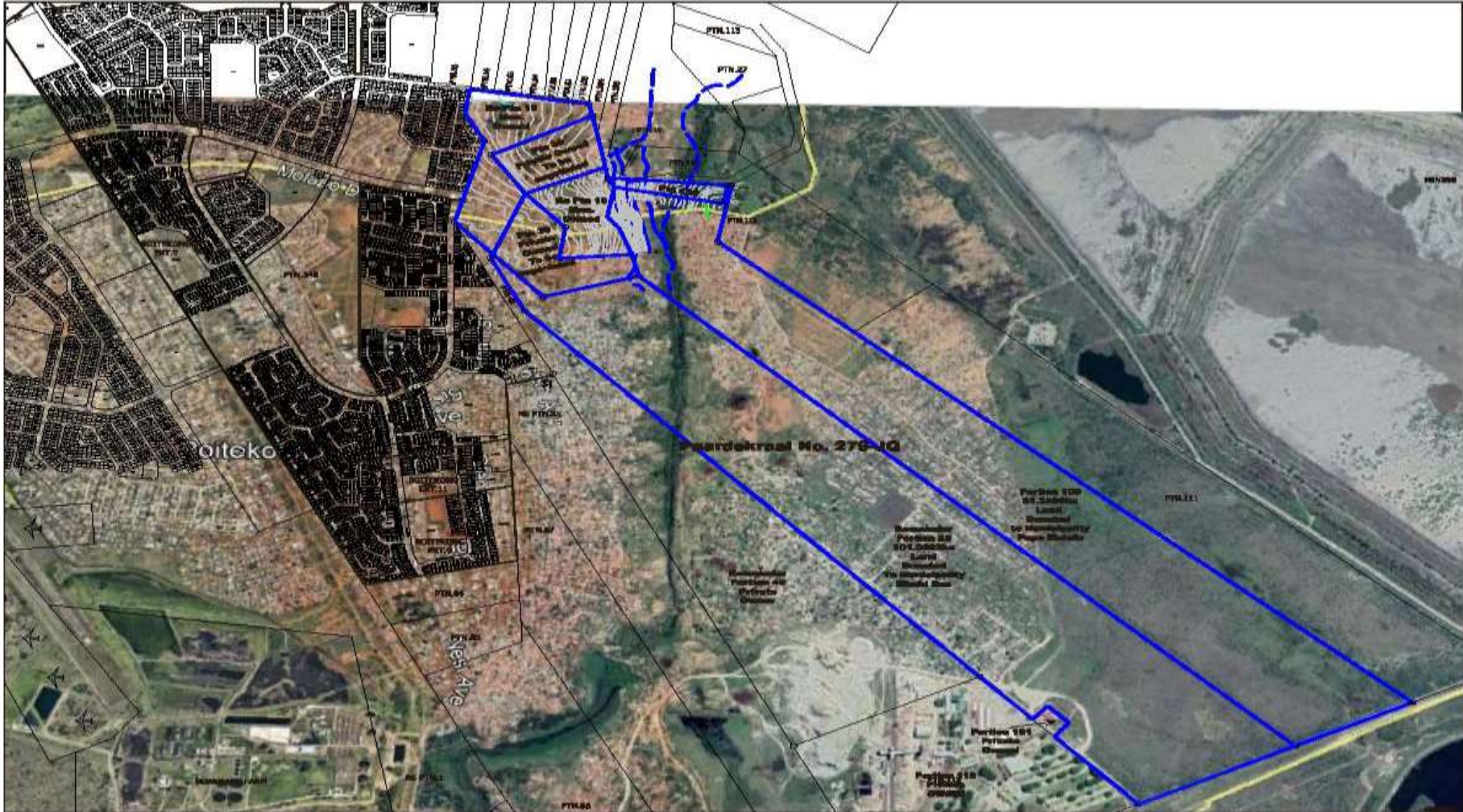


Figure 1: Locality Map

1.4 Details of EAP

Lesego Senna is a qualified Environmental Practitioner who will manage and coordinate the EIA study of the project in discussion. Lesego holds the Bachelor Degree: in Natural Science majoring in Microbiology and Biochemistry. She also holds an Honors Degree: Environmental Sciences, Majoring in Environmental Impact Assessment and Earth Sciences – North West University (Potchefstroom Campus).

Lesego holds a certificate in Environmental Law (NQF level 7) with the following courses: Waste Management, Biodiversity Management, Waste Management, Heritage Assessment, Environmental law & Environmental Impact Assessment obtained from the Centre of Environmental Management at Potchefstroom University). She also holds a certificate in GIS and GPS course (NQF level 5) from the Free State University, with the following Modules: Spatial data Structures; Spatial data symbolization and analysis and interpretation Map design. Lesego is a registered Environmental Scientist registered with the **South African Council of Natural Scientific Profession SACNASP (Reg.No.400165/17)**. The acquired qualifications and experience demonstrated that we are uniquely qualified to undertake this Environmental Impact Assessment Study.

The proposed township development will activate activities under Listing Notice 1 (GN No. R327), Listing Notice 2 (GN No. R325) and Listing Notice 3 (GN No R 324). The process to be followed will therefore be an Environmental Impact Assessment process. The activities being included as part of the environmental authorization are:

Table 1: Listed activities that are going to be triggered as a result of the proposed township establishment.

Indicate the number and date of the relevant notice:	Activity No (s) and Activity Description (in terms of the relevant notice)	Describe each listed activity as per project description
GN. R.324 04 December 2014	<p>Listing Notice No.3 Activity No. 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 plan.</p> <p>h. North West (IV) Areas within a watercourse or wetland, or within 100 metres from the edge of a watercourse or</p>	1 ha of indigenous vegetation will be cleared near a river on site.

Indicate the number and date of the relevant notice:	Activity No (s) and Activity Description (in terms of the relevant notice)	Describe each listed activity as per project description
	wetland.	
GN. R.327, 04 December 2014	Listing Notice No.1 Activity No 28: Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture 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 (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.	The land is currently zoned Agriculture and will be transformed for housing development and Residential, mixed, retail, commercial, industrial or institutional developments.
GN. R. 325, 04 December 2014	Listing Notice No.2: Activity No. 15 Physical alteration of undeveloped vacant or derelict land for residential commercial -recreational, industrial or institutional use where the total area to be transformed is 20 hectares or more; - except where such physical alteration takes place for: ' (i) linear development activities; (ii) Agriculture or afforestation where activity 16 in this Schedule will apply.	The development of a housing project and related facilities will entail the clearance of indigenous vegetation of 210.6353 hectares to allow the development to take place.

3. INFRASTRUCTURAL AND SERVICE PROVISION

The site does not form part of the general plan of the formalized township. There are no constructed roads vehicular access to the site is restricted and access to individual dwelling is primarily through a network of foot path. An Engineering Report prepared is attached as appendix F4. This report details all the service and infrastructure aspects (water, sewerage services and electricity supply) pertaining to the strategic planning of the project.

3.1 Site description

The location of the proposed development (Popo Molefe) is situated approximately 6km North-East of Rustenburg in North West. The site lies east of and borders the existing Boitekong Ext 9, 10 and 11, and is accessed via the R510 Main Road, through Molapo Drive and characterised by an existing informal settlement with tarred access road which are generally in fair to poor condition.

Half of the proposed development site is occupied by informal settlement with no access to basic services. The informal settlement is densely built with mainly corrugate iron shacks though bricks buildings also occur. There is a large cemetery in the north-western corner of the site. The cemetery site is about four hectares large and although it is in a bad condition the cemetery is still in use. The cemetery must be cleaned, fenced in and protected by the Local Municipality. On the western side of the proposed development site is a non-perennial river with dense vegetation. This area is illegally used for dumping for house hold refuse and building rubble. A small section of the informal settlement lies west of the river. In the informal settlement there are a number of large cattle kraals which are still operational. In the south the site shares a boundary with the mine. On the south eastern side shares with the railway and pipe line. The site is located about 500m from the slime dams on the western boundary.



Large cemetery on site that requires cleaning and maintenance



Illegal waste dumping on the dry portion of the river



Cattle kraals on site



Part of Popo Molefe informal settlements



Pipeline and railway network

3.1.1 Surrounding Land Uses

The site is located approximately 6 km north east of Rustenburg town, the site is currently occupied by informal settlements (Popo Molefe) and the surrounding land is used for residential area (Boitekong Ext 9, 10 and 11) East of the site located about 2.2.km. On the

South West direction there is Sibanye Thembelani Mine located which shares a boundary with the proposed site boundaries of the proposed site of development. On the Eastern boundary of the site there are mine slime dams located about 500m from the boundary of the site. There is a non-perennial stream that runs across the site. The proposed development will fit to the site and existing residential area, it will also generate temporary and permanent jobs during the construction phase and operational phase. This development is focused on the surrounding communities and their needs.

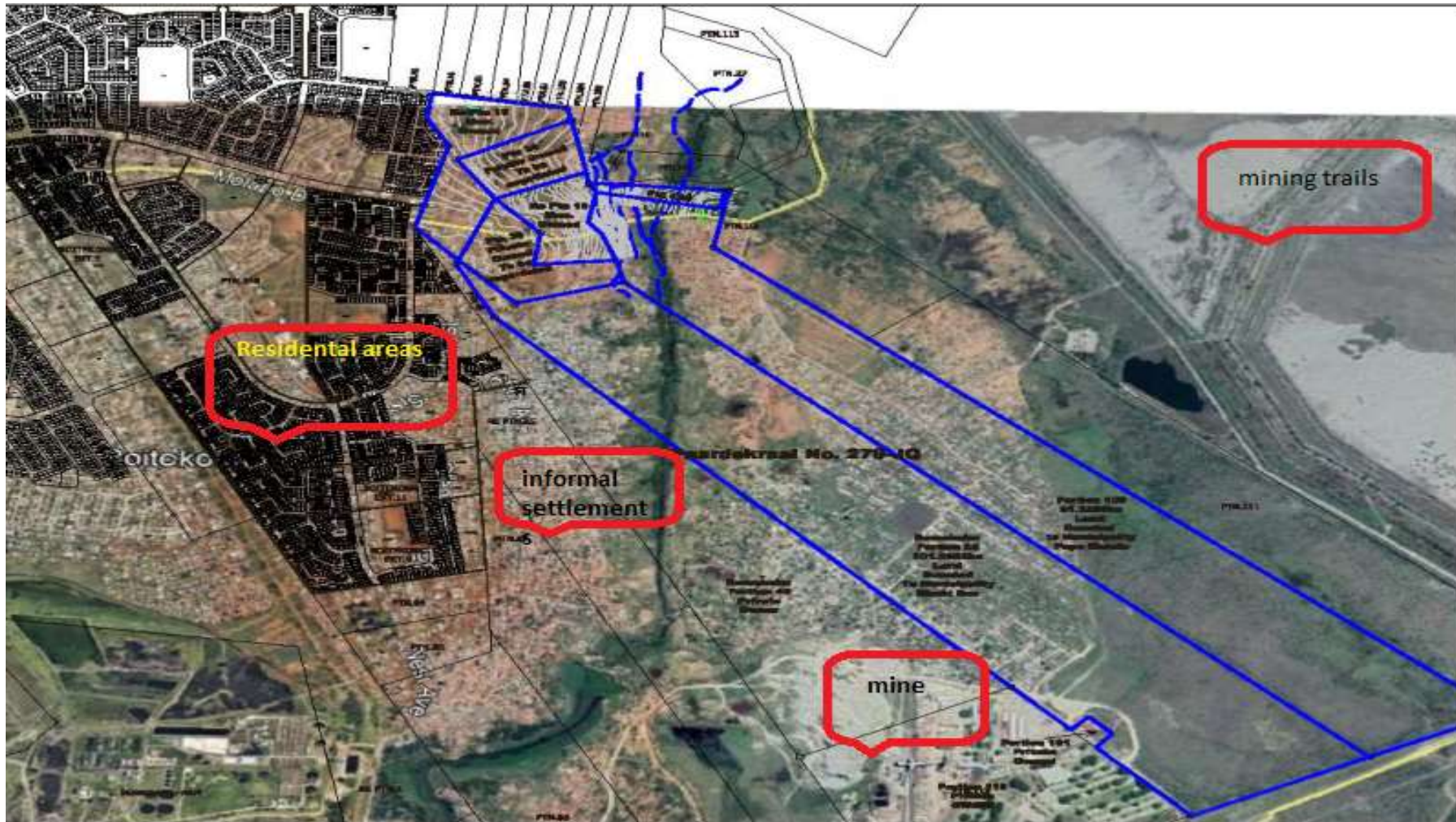


Figure 4: surrounding land use map

3.2. Storm water Management

According to the Engineering Report undertaken for the site the natural topography slopes towards the western and southern boundary of the site from which discharge occurs into natural streams by means of a box culvert crossing Molapo Drive. Storm water generated in the western portion of the proposed development is conveyed by means of an open earth channel / culvert located on the southern border of the Proposed Development. The estimated additional storm water discharge generated by the proposed development is 1.886 m./s and 3.851 m./s for the 1:10 and 1: 100-year floods which is minor compared to the contributing areas. Storm water infrastructure will be designed to accommodate runoff as surface flow in an open system. This will be achieved by designing internal roadways to disperse storm water towards the natural stream located west of the development. The existing residential area (Popo Molefe) does not have bulk storm water drainage. The general principles that guided the design of the stormwater management system:

- to minimise the volumes of stormwater runoff generated by the proposed development through stormwater runoff recycling and infiltration wherever possible;
- to minimise the concentration and velocity of stormwater runoff onsite; and
- to attenuate locally and keep the need, to utilise the drainage lines onsite as attenuation features, to a minimum.
- the local stormwater attenuation regulations must be followed and all paved surfaces must be properly graded to allow stormwater runoff and prevent ponding.

3.3. Sewerage Treatment

There is no waterborne sewage reticulation available, the community of Popo Molefe currently uses long drop toilets or private septic tank. There is no formal connection for wastewater in the informal settlement.

According to the Engineering report there is a sewer treatment plant (Biotekong Water Treatment Plant) which is being upgraded from 12ML/day to 24ML/day design capacity and it is currently operating at 12ML/day. The upgrade will be completed at the end of the 2020/21 financial year (June 2021). Popo Molefe sewage will be accommodated on it.

An internal sewer network of adequate diameter pipes with related connections and inspection eyes will be installed to comply with the minimum specifications stipulate the SANS 0400/89 Building Regulations. Manholes and rodding eyes will be constructed at necessary positions to allow for effective maintenance.

3.4. Water and technology

According to the Engineering Report there is no formal connection for water in the informal settlement. The municipality indicated that water is supplied to the community (Popo Molefe) through water trucks at least twice a week.

Bulk water - bulk water will be supplied from Rustenburg Water Treatment Works as indicated on the Bulk Services Masterplan with 250mm bulk pipeline that ends in Boitekong Ext 11. The anticipated water demand from the formalized settlement will be approximately 2.Ml/day and this will be sufficiently met as there is an upgrade project for the water supply in Rustenburg that will be completed in March 2020 and other future water schemes. The design of internal services will be dependent on the proposed development layout and subsequent approval by the Municipality. The following basic design guidelines will be followed:

- Use of uPVC and HDPE pipe materials of varying diameter according to designs
- of the Civil Engineer,
- Sufficient capacity to comply with fire flow demands,
- Installation of consumer water meters according to municipal policy.
- Provision of isolating valves, fire hydrants and air release valves to comply with the requirements and regulations the Municipality Water saving mechanisms recommended to reduce water consumption (water-saving) includes the following:
 - Dual Flush Toilets
 - Low flow faucets (in future subsidy housing phase) - Low flow faucets use aerators to reduce the flow of the water. These should be built into the faucet rather than be added as an aftermarket product. The faucets in bathrooms should have a peak flow of less than 10 liters per minute.
 - Geyser and pipe insulation - Apart from the savings in terms of energy, insulating geysers and pipes save water, as shorter periods of running the tap to get hot water are required.

3.5. Road access and traffic

The project is situated in Rustenburg Local Municipality (Rustenburg) along the right side of R510 East of Boitekong Ext. 9, 10 and 11 Township. Access to site of development is gained by travelling through Malopo drive and Old Marikana Roads. The Proposed Development has an existing formal access from Molapo Drive, connecting Popo Molefe to R510 along the northern border of the Proposed Development. Alternative access to the

Proposed Development can be provided from Old Marikana Road on the southern border of the property. The design of the roads must comply with municipal 's design standards for residential/commercial townships. All roads and proposed storm-water infrastructure for the proposed township will comply with the minimum standards and requirements as set out by the municipality.



Access to site through Molopo Drive

3.6. Solid waste Management

Currently there is no refuse Collection Service for Popo Molefe Community, the community is continuing with improper waste disposal either by burning, backyard dumping. According to the Engineering Report the existing solid waste disposal site of Boitekong has adequate capacity to accommodate the additional volumes of refuse expected to be generated by the development. The municipal dumping site is operated and maintained by the Community Services Department: Waste Management Division of the Municipality in accordance with the requirements of the Department of Water & Sanitation (DWS).

3.7. Electricity Provision

The existing site has been serviced with electricity provided by Rustenburg Local Municipality. There are high power voltage lines passing through the site. The bulk supply to the proposed 5705 Erven will be connected to the existing supply. According to the electrical engineering Report an existing 22kV overhead network feeding from Eskom's Boitekong 88/22kV Substation currently supplies electricity to the surrounding areas of Boitekong. It is proposed to extend the existing overhead network from the Substation for electrical supply to Boitekong Ext 39 Pope Molefe Informal Settlement. Pole Mounted Transformers with overhead networks will be used to create capacity and to distribute supply to the various MV and LV Households.

Energy saving measures need to be adhered to in order to reduce the consumption of electricity by occupants in accordance with the Department of Energy and Eskom initiatives which include the use of the following:

- Solar water heaters
- Insulation on hot water pipes
- Low flow taps and faucet aerators
- Energy efficient light - no incandescent light should be used; only compact Fluorescent Light (CFL) and sodium Vapour (SV) lamps should be utilized.

4. LEGISLATION, POLICIES AND GUIDELINES CONSIDERED

This section serves to highlight key legislation and policy framework that has implications on the proposed activity. It must be noted that this list is not exhaustive but notes, at high level, the critical laws and policies that have been considered.

4.1 National Environmental Management Act 107 of 1998 (NEMA)

The objective of NEMA is to provide co-operative governance by establishing principles for decision makers on matters affecting the environment, institutions that promote co-operative governance and procedures for coordinating environmental functions exercised by the organs of state. Chapter 1 of the Act establishes a number of principles related to the environment in South Africa. These principles are designed to provide a general framework for environmental planning and guidelines for the interpretation, administration and implementation of the Act. The principles include a number of internationally recognized environmental law norms and some principles peculiar to South Africa, i.e. the:

- Preventive principle;

- Precautionary principle, and
- Polluter pays principle

Environmental management must place people and their needs at the forefront of its concerns, and serve their physical, psychological, developmental, cultural and social interests equitably. Development must be socially, environmentally and economically sustainable. Sustainable development requires the consideration of all relevant factors including the following:

- The disturbance of ecosystems and loss of biological diversity are avoided, or, minimized and remedied;
- Pollution and degradation of the environment are avoided, or, minimized and remedied;
 - Disturbance of landscapes and sites that constitute the nation's cultural heritage is avoided, or, minimized and remedied;
 - Waste is avoided, or, minimized and re-used or recycled where possible and otherwise disposed of in a responsible manner;
 - Use and exploitation of non-renewable natural resources is responsible and equitable;
 - The development, use and exploitation of renewable resources and the ecosystem of which they are part of do not exceed the level beyond which their integrity is jeopardized;
 - A risk-averse and cautious approach is applied, and
 - Negative impacts on the environment and on the people's environmental rights be anticipated and prevented, and where they cannot be altogether prevented, are minimized and remedied.

Implications for the proposed development

- The principles advocated in NEMA serve as guidelines for relevant decision makers in ensuring the protection of the environment. Therefore, the proposed development must be consistent with these principles;
- Where this is not possible, deviation from these principles would have to be very strongly motivated;
- The activity may not take place without the required authorization; and
- Both the Scoping and EIA processes will have to be facilitated with the submission of both a Scoping Report and an Environmental Impact Report.

4.2 The Constitution of the Republic of South Africa, 1996 (Act no 108 of 1996)

The Constitution is the most important piece of legislation that provides a framework for environmental management in South Africa. There are various sections that have implications for environmental management, hence for sustainable development. Section 24(b) (i) encourages prevention of pollution and ecological degradation. Section 24(b) (iii) promotes ecologically sustainable development. According to chapter 2 of the Bill of rights, section 24 says:

Everyone has the right:

- a) To an environment that is not harmful to their health or well-being; and
- b) To have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that
 - i) Prevent pollution and ecological degradation;
 - ii) Promote conservation; and
 - iii) Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

Implications for the proposed development:

- Obligation to ensure that proposed activity will not result in pollution and/or ecological degradation;
- Obligation to ensure that where possible conservation is promoted; and
- Obligation to ensure that the proposed activity is ecologically sustainable, while demonstrating economic and social development.

4.3 National Environment: Air Quality Act 39 of 2004

The objective of this Act is:

- a. *“To protect the environment by providing reasonable measures for -*
 - i. *The protection and enhancement of the quality of air in the Republic;*
 - ii. *The prevention of air pollution and ecological degradation, and*
 - iii. *Securing ecologically sustainable development while promoting justifiable economic and social development; and b. Generally, to give effect to the section 24(b) of the Constitution in order to enhance the quality of ambient air for the sake of securing and environment that is not harmful to the health and well-being of people.”* The Act emphasises that the key to ensuring that

air quality is improved is by the minimisation of pollution through vigorous control, cleaner technologies and cleaner production practices.

4.3.1 Air Emissions

The control of atmospheric emissions of noxious, hazardous and nuisance causing materials is controlled by the Atmospheric Pollution Prevention Act 45 of 1965 and its amendments. The administration of the Act has been assigned to the Air Pollution Control Department under the DEDECT.

4.3.2 Dust Control

In terms of the Atmospheric Pollution Prevention Act 45 of 1965, Section 27 - 35; industries should adopt the “best practicable means” for preventing dust from becoming dispersed or causing a nuisance. The act also empowers owners or occupiers present in the vicinity of the source of dust/nuisance to take or adopt necessary steps or precautions against the nuisance. Where steps have not been prescribed, owners must adopt the “best practicable means” as described by the developer, for the abatement of the nuisance. Should the developer not comply with the necessary steps to prevent owners/occupiers from the effects of dust, the developer would be found guilty and be liable to pay a dust control levy to the minister.

4.3.3 Vehicular Emissions

The Atmospheric Pollution Prevention Act 45 of 1965, Section 36 - 40, regulates atmospheric pollution by fumes emitted by vehicles. The act authorizes local authorities to examine any vehicle that emits noxious and offensive gases. Should the examination process reveal noncompliance, the owners of the vehicle will be advised to take required steps in prevention of air pollution by fumes. Vehicles owners are required by law to take necessary steps for preventing the emission of the noxious or offensive gases. Failure to comply with the requirements of the law is considered an offence.

4.4 National Waste Management Strategy (first draft for public comment March 2010)

The National Waste Management Strategy was first established in 1999 to address South Africa’s waste management challenges, and gave effect to the suite of policies and legislation which preceded it, including the Constitution (1996), the Environmental Management Policy for South Africa (1998), the Draft White Paper on Integrated Pollution & Waste Management (1998), the National Water Act (1998) and NEMA (1998). The overall objective of the strategy was to reduce the generation of waste and reduce the impact of all

forms of waste on economic development, health and the quality of environmental resources. The 1999 NWMS sought to achieve three key goals:

- Develop strategies for integrated waste management;
- Develop action plans to implement the strategies; and
- Build capacity within DEA and DW&S to implement the action.

The new NWMS however will have to deal with the following items:

- Strategies, objectives, plans, guidelines, systems and procedures relating to the protection of the environment and the generation (including avoidance and minimisation of such generation), re-use, recycling, recovery, treatment, disposal, use, control and management of waste in order to achieve the objectives of the Waste Act,
- Mechanisms, systems and procedures for giving effect to the Republic's obligations in terms of international agreements National norms and standards for waste management, including planning and national norms for service delivery,
- Practical measures for achieving co-operative governance in waste management matters,
- Guidance on raising awareness regarding the impacts of waste on health and the environment,
- Approaches for securing compliance with the requirements of the Waste Act.

4.5 National Water Act, 1998 (Act No.36 of 1998)

4.5.1 Water Supply

The National Water Act 36 of 1998 ensures that water resources are adequately protected, used, developed, conserved and controlled. The Act deals with the development of strategies to facilitate the proper management of water resources, provides for the protection of the water resource, the regulation of the use of water, for financial provision, catchment management agencies, water use associations, Advisory committees, international water management, government waterworks, dam safety, access to and rights over water, monitoring and assessment and information, appeals and dispute resolution.

Under the Act, a facility is required to obtain the necessary permits for water usage and the disposal of wastewater from the authority responsible for the administration of the Act, namely the Department of Water & Sanitation (DWS). The Act stipulates that if an industry is acquiring water from a municipality or other local supplier, it is the responsibility of that supplier to obtain the necessary permits. Any private well or borehole sunk for the abstraction of groundwater has to be reported to the regulatory authority.

4.5.2 Wastewater

The National Water Act is the principal piece of South African legislation governing wastewater management. Under the Act there are several important issues to note:

- Industrial and sanitary wastewater cannot be directly or indirectly discharged to stormwater drainage systems, surface or groundwater;
- Persons storing chemicals and oils must take the necessary precautions to prevent leakage into stormwater drains or water courses, unless specifically authorized by the regulatory authority;
- It is generally prohibited to allow stormwater to enter sewer systems;
- Industrial effluents may be discharged to sewer only with the permission of the regulatory authority. There are site effluent discharge limits that if exceeded can result in a fineable offence;
- It is an offence to willfully or negligently pollute surface water or groundwater;
- In the event of a pollution incident, the offending party is obliged to report the incident to the regulatory authority;
- The regulatory authority can take the necessary steps to prevent the pollution of water resources and can recover the costs of clean-up from the polluter. Local by-laws can also require a facility that stores or handles environmentally hazardous materials that could pollute stormwater runoff, rivers, water courses etc. to take 'adequate precautions' to prevent the spillage or seepage of such materials into the environment.

4.5.3 Pollution

Section 19 of the National Water Act deals with pollution prevention and remedying effects, and in particular the situation where pollution of a water resource occurs or might occur as a result of activities on land. The party who owns controls, occupies or uses the land in question is responsible for taking measures to prevent pollution of water resources. If these measures are not taken, the catchment management agency concerned may do whatever is necessary to prevent the pollution or to remedy its effects, and to recover all reasonable costs from the persons responsible for the pollution.

Section 31A of the Environmental Conservation Act empowers the regulatory authority to undertake action if a person or company carries out any activity that results in significant damage to the environment e.g. surface and groundwater pollution. The costs of remedial work can be recovered from the polluter. Currently there are no soil and groundwater clean-up guidelines. For groundwater, DWS uses a range of standards depending on the final use of the water. It is unlikely that the project will affect any groundwater users. For the cleanup of soil, the Department has accepted the use of risk assessments as the basis for establishing remediation criteria.

Implications for the proposed development:

- Any proposed water uses must be specified and registered and/or licensed;
- Any modifications to drainage lines on site must be investigated in terms of water use requirements;
- The developers are responsible for taking reasonable measures to prevent pollution of water resources that it owns, controls occupy or uses on the land in question;
- The developers are required to remedy a situation where pollution of a water resource occurs following an emergency incident and where it is responsible for the incident or owns or is in control of the substance involved;
- The developers must take all reasonable measures to minimise the impacts of the incident, undertake clean-up procedures, remedy the effects of the incident and take measures as directed by the catchment agency; and
- Waste created during construction needs to be controlled adequately to negate the impacts on ground and surface water

4.6 The National Water Act and Riparian Areas

Riparian habitat is afforded protection under the National Water Act in a number of ways. Firstly, reference in the National Water Act to a watercourse includes its banks, on which riparian habitat is encountered. Riparian areas are thus afforded the same degree of protection as the river beds and channels alongside which they occur. Riparian habitat is also important in the context of resource quality objectives that are a critical part of the Act. In terms of Section 13(1) of the Act resource quality objectives must be determined for every significant water resource, and are a central part of data type specifications relating to national monitoring systems and national information systems as determined in Section 137(2) and Section 139(2) of the Act respectively. Resource quality is important in the context of riparian habitat as resource quality as defined in the Act means the quality of all aspects of a water resource and includes the character and condition of the riparian habitat. In terms of Section 26(4) of the Act, the need for the conservation and protection of riparian habitat must be taken into account in the determination and promulgation of regulations under the Act.

4.7 National Environmental Management: Waste Act, 2008

The legislation most pertinent to the management of waste in South Africa is the National Environmental Management Waste Act, (Act 59 of 2008). The Act was promulgated in order to provide for institutional arrangement and planning matters, to provide for national norms and standards for regulating management of waste by all spheres of government, and to provide for the licensing and control of waste management activities and all matters connected therewith. In essence, it provides the much-needed legislative framework for the management of waste in South Africa.

4.7.1 National Environmental Management: Waste Act, 2008

Chapter 1, Section 2 of the Act describes the objectives of the Act as follows:

- a) "to protect health, well-being and the environment by providing reasonable measures for*
 - i) minimising the consumption of natural resources,*
 - ii) avoiding and minimising the generation of waste,*
 - iii) reducing, re-using, recycling and recovering waste,*
 - iv) treating and safely disposing of waste as a last resort;*
 - v) preventing pollution and ecological degradation;*
 - vi) securing ecologically sustainable development while promoting justifiable economic and social development;*
 - vii) promoting and ensuring the effective delivery of waste service;*
 - viii) remediating land where contamination presents, or may present, a significant risk of harm to health or the environment*
 - ix) achieving integrated waste management reporting and planning.*
- b) to ensure that people are aware of the impact of waste on their health, wellbeing and the environment.*
- c) to provide for compliance with the measures set out in paragraph (a)*
- d) generally, to give effect to section 24 of the Constitution in order to secure an environment that is not harmful to health and well-being."*

The Act requires the drafting of a national waste management strategy for achieving the objectives of the Act. The Act sets waste service standards, covering areas such as tariffs, quality of service and financial reporting. The Act requires that each municipality designate a waste management officer. The Act requires each municipality to produce an Integrated Waste Management Plan (IWMP) and to submit this plan to the MEC for approval. The approved IWMP must be included in the municipal Integrated Development Plan (IDP).

Before finalizing the IWMP the municipality is required to follow the consultative process as defined in section 29 of the Municipal Systems Act. This can be done either as a separate process or as part of the consultative process relating to its IDP.

4.8 Environment Conservation Act No. 73 of 1989

The main purpose of this Act is to provide for the protection of the natural environment (Section 16) to control environmental pollution by prohibiting littering and controlling the removal of littering, and controlling waste management (Section 20) where the owner of a disposal site is required to apply for a permit from the minister of Water Affairs to operate such a facility. The Act further provides for the control of activities which may have a detrimental effect on the environment (Section 21). The Act defines a disposal site as:

“A site used for the accumulation of waste with the purpose of disposing or treatment of such waste.” Sections 24 to 28 of the Act contain regulations regarding waste management, littering, noise, vibration and shock, environmental impact reports, limited development areas and general regulatory powers.

4.9 National Forest Act

In terms of The National Forests Act (Act 84, 1998), trees in natural forests or protected tree species (as listed in Government Gazette Notice 1012 of 27 August 2004) may not be cut, disturbed, damaged, destroyed and their products may not be possessed, collected, removed, transported, exported, donated, purchased or sold - except under licence granted by the Department of Agriculture, Forestry and Fisheries.

Implications for the current development

- DAFF would have to be contacted in order to obtain a permit or licence to remove any protected or indigenous trees species.

4.10. National Heritage Resources Act

In terms of Section 38 of the Heritage Resources Act (Act No 25 of 1999), a Heritage Impact Assessment has to be undertaken for the following developments:

- Any development or other activity which will change the character of a site
- Exceeding 5 000 m² in extent; or
- Involving three or more existing erven or subdivisions thereof; or
- Involving three or more erven or divisions thereof which have been consolidated within the past five years; or

- The costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;
- The re-zoning of a site exceeding 10 000 m² in extent; or
- Any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development

4.10.1 Heritage Management

The National Heritage Resource Act (Act No. 25 of 1999) was introduced to ensure protection of South Africa's important heritage features. As such the act covers 4 billion years of history. The act covers the following areas of heritage value:

- Archaeology;
- Paleontology;
- Meteorites.

All the above-mentioned materials that are discovered are thus property of the state. Tools used to conserve and manage these resources are the formal regulated EIA processes as well as permits issued by the South African Heritage and Resources Agency (SAHRA) to restrict and/or regulate development within a heritage environment.

Implications for the proposed development:

- Any artefacts uncovered during the construction phase must be reported to SAHRA;
- No person may alter or demolish any structure or part of a structure, which is older than 60 years or disturb any archaeological or paleontological site or grave older than 60 years without a permit issued by the relevant provincial heritage resources authority. The age of the stable building on site needs to be determined; and
- SAHRA must be informed of the proposed development and provided an opportunity to comment. This may result in the need for a basic heritage assessment.

4.11. Occupational Health and Safety

The Occupational Health and Safety Act of 1993 is South Africa's principle legislation concerning health and safety of employees. It also aims to protect persons who are not at work against hazard to health and safety arising out of or in connection with the activities of a person at work. The Act places the responsibility on the employer to ensure a safe and healthy working environment and to cause every employee to be made conversant with health and safety requirements relevant to their work. At the same time the Act places the

responsibility on the employee to follow its employer's health and safety procedures and instructions. A number of Regulations have been promulgated under the Act including the following:

- General Administrative Regulations, 1994;
- Regulations for Hazardous Chemical Substances, 1995;
- General Safety Regulations, 1986;
- Construction Regulations, 2003.

4.12. National Environmental Management: Biodiversity Act, (Act No. 10 of 2004)

The objective of the act are within the framework of the National biodiversity Act, to provide for, the management and conservation of biological diversity within the republic; the components of such biodiversity, the use of indigenous biodiversity resources in a sustainable manner, and the fair and equitable sharing among stakeholders of benefits arising from bio-prospecting involving indigenous biological resources. To provide for a South Africa National Biodiversity Institute to assist in achieving the objectives of this act.

The National Environmental Management: Biodiversity Act 10 of 2004 currently has negligible influence over environmental assessment and management. Nonetheless it has potentially major significance in terms of introducing mandatory biodiversity considerations at scale to planning and authorization processes relating to land use. Besides giving effect to the Convention on Biological Diversity and other ratified international agreements relating to biodiversity, NEMBA closely details with the IEM aspects of NEMA by providing for the regulation of restricted activities in areas defined by threats to ecosystems or species. In summary, the NEMBA provides for a form of 'tailor-made' environmental impact assessment dispensation in certain areas, or involving specifically listed activities, that is, informed by the prerogatives of the conservation and sustainable use of biodiversity. These provisions, which are contained in sections 52 and 53 are directly linked to the integrated environmental management provisions of the NEM Second Amendment Act. Reference needs to be made to chapter 5 of NEMA in order to illustrate the implications of the NEMBA for the regulation of agricultural land-use change. The most directly-applicable provisions of chapter 5 of NEMA are those that relate to the identification of activities (own emphasis) which may not be commenced without environmental authorization, and the identification of geographical areas (own emphasis) in which specified activities may not be commenced without prior authorization.

4.13. National Road Traffic Act (Act 83 of 1996)

This Act is relevant if the applicant intends to transport, load, off-load or package dangerous goods as listed in SANAS Code of Practice 10228.

4.14 Spatial Planning and land use Managements Act 16 of 2013

SPLUMA sets the principle that all land development applications must be submitted to the municipality as the authority of first instance without actually prescribing in detail how spatial planning and land use management issues are to be dealt with within municipal areas. SPLUMA seeks to promote consistency and uniformity in procedures and decision making for all land development within its authority. SPLUMA is a national framework act that requires provincial legislation to enable municipalities to enact spatial planning and land use management by-laws. The municipal SPLUMA by-laws prescribe how land use applications and appeals are dealt with.

Municipalities all basically have similar spatial planning and land use management by-laws. These by-laws have many requirements and procedures regarding spatial planning and land development. One such requirement is that municipalities are required to issue SPLUMA certificates before a property can be registered or transferred in the deed's office.

4.15 Land use Planning Ordinance (LUPO (Ordinance 15 of 1985))

The Land Use Planning Ordinance (LUPO) (No 15 of 1985) regulates development, and provides for matters incidental thereto. Section 4(6) of LUPO makes provision for the preparation and submission of structure plans to the provincial authority, for approval. The general purpose of a structure plan is to lay down guidelines for the future development of the area to which it relates (including urban renewal, urban design and the preparation of development plans), in such a way as will most effectively promote the order of the area as well as the general welfare of the community concerned.

4.16 National Housing Code (2006)

The National Housing Code (2006) identified the primary role of the municipality as taking all reasonable and necessary steps, within the framework of national and provincial legislation and policy, to ensure that the inhabitants within its area of jurisdiction have access to adequate housing. This entails the following:

- Initiating, planning, facilitating and coordinating appropriate housing development.
- Promoting private sector development and playing the role of developer.
- Preparing a housing delivery strategy and setting up housing development goals.
- Setting aside, planning and managing land for housing.
- Creating a financially and socially viable environment for housing delivery.
- Facilitating the resolution of conflicts arising from housing delivery initiatives.

- Facilitating the provision of bulk services.
- Administering national housing programmes.
- Exploring land for housing development. The aim of this HSSP is to assist the municipality in fulfilling the abovementioned role assigned to it in terms of the National Housing Code.

4.17 The Land Reform Programme

The overall goal of the land reform programme is to redistribute land, rights and economic benefits of land to those sections of society that were forcibly removed from their land from 1913. The programme is implemented under three components, or pillars, namely:

- Restitution, which seeks to restore land ownership or compensate those forced off land during white rule;
- Redistribution, of mainly agricultural land, to redress the discriminatory colonial and apartheid policies by providing the disadvantaged and poor with access to land; and
- Land tenure reform, which seeks to secure tenure for all South Africans, especially the more vulnerable, such as farm labour tenants.

The Department of Land Affairs has implemented the Labour Tenant Strategy in terms of the Land Reform Programme of 1996. An alignment document has also been produced to ensure alignment between this programme and the National Department of Human Settlement housing subsidy programmes.

4.18 White Paper on Local Government (1998)

The White Paper on Local Government adopts development policy guidelines and principles and advocates the developmental role of local government. The guidelines and principles can be summarized as follows:

- Orientation towards people's needs;
- Poverty alleviation with special consideration of marginalized and disadvantaged groups and gender equity;
- Environmentally sustainable development and a safe and healthy environment;
- Economic growth with creation of income and employment opportunities;
- Involvement of residents, communities and stakeholders;
- Sustainability of services, municipalities and settlements.

4.19 Municipal Demarcation Act (Act 27 of 1998)

Demarcation objectives: The Demarcation Board determines a Municipal boundary with the objective that it must be able to enable the municipality for that area to fulfill its constitutional obligations in line with the provision of a democratic and accountable government for communities within a specific geographic area inclusive of:

- The provision of services to the communities in an equitable and sustainable manner.
- The promotion of social and economic development.
- The promotion of a safe and healthy environment.
- Enable effective local governance.
- Enable integrated development.
- Have a tax base as inclusive as possible for the user of municipal services in the municipality.

4.20 The Municipal Structures Act, 1998 (Act 117 of 1998)

The Municipal Structures Act 1998 (Act No. 117 of 1998) provides for the establishment of municipal categories and for the appropriate division of functions and powers between these categories of municipality. A municipality has the functions and powers assigned to it in terms of sections 156 and 229 of the Constitution. They must be divided in the case of a district municipality and the local municipalities within the area of the district municipality, as set out below. A district municipality has the following functions and powers in terms of development planning:

- Integrated development planning for the district municipality as a whole, including a framework for integrated development plans for the local municipalities within the area of the district municipality, taking into account the integrated development plans of those local municipalities.

Furthermore, a district municipality must seek to achieve the integrated, sustainable and equitable social and economic development of its entire area by:

- Ensuring integrated development planning for the district as a whole;
- Promoting bulk infrastructural development and services for the district as a whole;
- Building the capacity of local municipalities in its area to perform their functions and exercise their powers where such capacity is lacking; and
- Promoting the equitable distribution of resources between the local municipalities in its area to ensure appropriate levels of municipal services within the area.

Local municipality has the functions and powers referred to in sections 156 and 229 of the Constitution excluding those functions and powers vested in the district municipality in whose area it falls.

4.21 The National Housing Act, 1997 (Act 107 of 1997)

The National Housing Act (NHA) sets out three general principles, namely: giving priority to the needs of the poor in respect of housing development; consultation with individuals and communities affected by housing development; and ensuring that housing development is economically, fiscally, socially and financially affordable and sustainable. The NHA lays down general principles applicable to housing development in all spheres of government, defines the functions of national, provincial and local governments in respect of housing development, and promotes the role of the state as a facilitator of housing development.

National government must establish and facilitate a sustainable national housing development process, provincial government must do everything in its power to promote and facilitate the provision of adequate housing in its province within the framework of national housing policy, while municipalities must take reasonable and necessary steps within the framework of national and provincial housing legislation and policy to ensure that the right of access to adequate housing is realised on a progressive basis. Section 3(2) of the NHA provides that the Minister must monitor the performance of all spheres of government in relation of housing delivery goals and budgetary goals. Section 3(4) (i) of the NHA provides that the Minister must, in relation to the duties of government, evaluate performance of the housing sector against set goals and requirements, equitableness and effectiveness.

4.22 Extension of Security Act of 1993

The extension of Security of Tenure Act is aimed at promoting the achievement of long-term security to tenure for occupiers of land through the joint efforts of occupiers, landowners and government bodies. Through this Act, the rights of occupiers may be extended while giving due recognition to the rights, duties and legitimate interests of landowners. The long-term security of tenure is facilitated by the minister by granting subsidies:

- To facilitate the planning and implementation of development;
- To enable occupiers in need of long-term security of tenure to
- acquire land or land rights; and
- For the development of land

4.23 Municipal Finance Management Act of 2003

The Municipal Finance Management Act plays a central role in housing delivery because it regulates the procurement of service providers for the planning and implementation of

national housing programmes and projects. Importantly, it also clearly defines the roles and responsibilities of the councilors and officials in the tender process. The purpose of the Municipal Finance Management Act (MFMA) is three-fold:

- To secure sound and sustainable management of the financial affairs of municipalities and other institutions in the local sphere of government;
- To establish treasury norms and standards for the local sphere of government;
- To provide for matters related to the above purpose.

4.24 Disaster Management Act, 2002 (Act No.57 of 2002)

The Disaster Management Act 2002 (Act No.57 of 2002) establishes a multi-tier disaster management system for the Republic. In terms of the prescripts of section 43 of the Act SDM must, establish a disaster management centre for its municipal area in its administration. SDM must further establish and implement a framework for disaster management in the district. The Municipality must, in terms of section 53 of the Act prepare and approve a disaster management plan after which it must submit same to the national disaster management centre, the provincial disaster management centre.

4.25 National Energy Act of 2008 & Electricity Regulation Act

The purpose of the act is ensure that diverse energy resources are available, in sustainable quantities and at an affordable prices and to provide for integrated energy planning, increased generation and consumption of renewable energies, contingency energy planning, holding of strategic fuel stocks and carriers, provide appropriate energy infrastructure, data on energy demand, supply and generation and also establish institutions responsible for energy research.

4.26 Promotion of Access to Information Act (Act No. 2 of 2000)

Section 32 of the Constitution enshrines the right of access to certain information, and the Promotion of Access to Information Act (PAIA) gives effect to that right. The Act maintains and protects South Africans' right to access any information held by the State and/or information held by another person that is needed to protect or exercise any rights. Access to information will be granted once certain requirements have been met. The Act also recognizes that the right of access to information may be limited if the limitations are reasonable in an open and democratic society.

4.27 Promotion of Administrative Justice Act (Act No.3 of 2000)

The Promotion of Administrative Justice Act (PAJA) aims to make the administration effective and accountable to people for its actions. It promotes South African citizens' right to just administration. Section 33 of the Constitution guarantees that administrative action will be reasonable, lawful and procedurally fair and it makes sure that people have the right to ask for written reasons when administrative action has a negative impact on them. The objectives and purpose of PAJA are the as follows:

- It ensures that administrative procedures are fair;
- It gives people the right to ask for reasons; and
- It gives citizens the right to have administrative action reviewed by the courts
- 24 National Spatial Development Perspective (2006).

4.28 National Development Plan: Vision for 2030

The National Planning Commission (NPC) (2011) published the NDP: Vision for 2030. Its contents will impact directly and indirectly on the provision of housing within the national spatial system. Its core focuses include:

- The active efforts and participation of all South Africans in their own development
- Redressing the injustices of the past effectively
- Faster economic growth and higher investment and employment
- Rising standards of education, a healthy population and effective social protection
- Strengthening the links between economic and social strategies
- An effective and capable government
- Collaboration between the private and public sectors
- Leadership from all sectors in society.

4.28 Provincial Spatial Development Framework (PSDF) 2009

The PSDF (2009) purports to be aligned with the National Spatial Development Perspective and endorses the vision of PGWC to create a 'home for all'. In order to achieve this vision the

PSDF claims to:

- be the spatial expression of the Provincial Growth and development Strategy (PGDS); guide (metropolitan, district and local) municipal integrated development plans (IDPs) and spatial development frameworks (SDFs) and provincial and municipal framework plans (i.e. sub-SDF spatial plans);

- help prioritize and align investment and infrastructure plans or other provincial departments, as well as national departments' and parastatals' plans and programs in the Province;
- Provide clear signals to the private sector about desired development directions; increase predictability in the development environment, for example by establishing no-go, conditional and 'go' areas for development; redress the spatial legacy of apartheid.

The PSDF is a policy document that is applied in terms of the conformity principle; it does not create or take away any rights to use land, but on the other hand upgrading of existing rights will have to conform to the PSDF. However, like all guidelines, the PSDF must not be applied rigidly but in a developmental way that takes account of the particular circumstances of each case. The latter goal is achieved through the consistency principle.

The PSDF is implemented in accordance with the consistency principle that applies in the relations between development applications vis-à-vis relevant spatial development frameworks or framework plans, and in the relations between lower- and higher-order spatial development frameworks or framework plans in the plans hierarchy. Furthermore, development applications must be consistent with relevant spatial development frameworks.

The relevant framework and plan that the anticipated development must be measured against, is the SDF. This plan designates the subject property for "new urban development".

4.29 Triple Bottom Line (PSDF 2009)

The three pillars of sustainability also referred to as the "triple bottom line" (PSDF 2009) are:

- Ecological integrity (health of the Planet): This refers to the continued wholeness and success of the environment in terms of providing for and sustaining life on Earth or as a subset thereof such as a region or town, and concerns both the natural and the human-made environment. Due to the fact that the survival of species, including our own, ultimately depends on the ecology, ecological integrity is then the key factor in the environmental sustainability equation.

The Popo Molefe development model is based on an approach whereby the integrity of the ecology and natural environment is respected and where the human-made environment is modeled to ensure a healthy and pleasant environment.

Social equity (situation of the people): Within a secure ecology, society can move towards needs fulfillment for all. Social equity refers to both material human wellbeing (the absence of poverty) and spiritual human wellbeing, i.e. provision of a physical and moral space where the continuity of a complex society and ecology is sought to be maintained and enhanced, and its health attained

The very essence of the this development model is reflected in its structuring of an integrated settlement pattern, social infrastructure and a range of housing opportunities are provided in an ecological environment that is maintained and enhanced, linked to an integrated system of open spaces and creational opportunities to ensure a physical and moral space for human wellbeing.

Economic efficiency (attainment of Prosperity): If human needs are met, society cans seek prosperity through economic efficiency. This refers to the optimization of benefit at the lowest cost, i.e. optimal development must be achieved at the lowest possible cost – and moreover, to comply with the sustainability principle, taking all costs now and in future into consideration.

The whole development model is structured to attain economic efficiency in terms of efficiency for residents (i.e walkable neighborhoods, integrated transport, proximity to community facilities, regional accessibility, etc). It is also structured to ensure the minimum cost to the environment to ensure the long- term sustainability thereof.

4.30 Sustainable Development Criteria for Built Environment Projects requiring Environmental Impact Assessments in Gauteng, 2009 Housing

The norm implicit to our environmental law is the notion of sustainable development (“SD”). SD and sustainable use and exploitation of natural resources are at the core of the protection of the environment. SD is generally accepted to mean development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs. The evolving elements of the concept of SD inter alia include the right to develop; the pursuit of equity in the use and allocation of natural resources (the principle of intra-generational equity) and the need to preserve natural resources for the benefit of present and future generations.

Economic development, social development and the protection of the environment are considered the pillars of SD (the triple bottom line). “Man-land relationships require a holistic perspective, an ability to appreciate the many aspects that make up the real problems. Sustainable planning has to confront the physical, social, environmental and economic challenges and conflicting aspirations of local communities. The imperative of sustainable planning translates into notions of striking a balance between the many competing interests in the ecological, economic and social fields in a planned manner.

The ‘triple bottom line’ objectives of sustainable planning and development should be understood in terms of economic efficiency (employment and economic growth), social equity (human needs) and ecological integrity (ecological capital).” As was pointed out by the Constitutional Court, SD does not require the cessation of socioeconomic development but

seeks to regulate the manner in which it takes place. The idea that developmental and environmental protection must be reconciled is central to the concept of SD - it implies the accommodation, reconciliation and (in some instances) integration between economic development, social development and environmental protection. It is regarded as providing a “conceptual bridge” between the right to social and economic development, and the need to protect the environment. Our Constitutional Court has pointed out that the requirement that environmental authorities must place people and their needs at the forefront of their concern so that environmental management can serve their developmental, cultural and social interests, can be achieved if a development is sustainable. “The very idea of sustainability implies continuity. It reflects the concern for social and developmental equity between generations, a concern that must logically be extended to equity within each generation. This concern is reflected in the principles of intergenerational and intra-generational equity which are embodied in both section 24 of the Constitution and the principles of environmental management contained in NEMA.”

In terms of NEMA sustainable development requires the integration of the relevant factors, the purpose of which is to ensure that development serves present and future generations.² It is believed that the proposed formalisation and upgrade of Popo Molefe Settlement supports the notion of sustainable development by presenting a reasonable and feasible alternative to the existing settlement land use, which has resulted in several associated environmental and health impacts (erosion, poor sanitation, illegal dumping etc.). Furthermore, the proposed formalisation (providing formal, managed erven and services) is in line with the national goal of provision of basic needs, thereby providing long-term benefits to future generations in a sustainable manner.

"Long term goals include:

- On a progressive basis, all residents living in inadequate housing to access affordable, safe and decent accommodation.
- Meet housing needs at all levels of the housing ladder through direct delivery or facilitation (partnerships with private sector, financial institutions, community organisations);
- Quality of the City's existing and future housing stock is enhanced and maintained;
- Increased sustainability and liveability of all residential communities; and
- Access to adequate housing that is suitable, relevant, appropriately located, affordable, and fiscally sustainable.

4.31 Spatial form and Urban Management

Long-term goals include:

- A city with an urban form that is efficient, sustainable, and accessible;
- A city with quality urban environments, providing for integrated and sustainable settlements and well-designed urban spaces;
- An appropriate and efficient land use management system that facilitates investment and continuous regeneration;
- Effective urban management to ensure maintenance of appropriate standards of safety, cleanliness and orderliness across the city; and
- An efficient and effective spatial information service that meets the standards of a World Class African City.

4.32 Comprehensive Rural Development Programme (CRDP) 2009

Comprehensive Rural Development Programme (CRDP) promotes Rural Development in general. Rural development is regarded as the actions and initiatives taken to improve the standard of living of communities in non-urban areas. These areas are usually characterized by a low ratio of inhabitants in wide-open spaces where agricultural activities are prominent, while economic activities relate mainly to the production of food and raw materials. The CRDP forms part of government's Medium-Term Strategic Framework. It has a vision to create vibrant, equitable and sustainable rural communities, through: Coordinated and integrated broad-based agrarian transformation (with a focus on the establishment of rural business initiatives, local markets, co-operatives, etc.); strategically increasing rural development (with a focus on empowering rural people).

4.33 National Rural Tourism Strategy (NTRS) 2012

The National Department of Tourism (NDT) has developed a National Rural Tourism Strategy, a strategy meant to ensure a developmental approach upon packaging rural tourism products and opportunities in South Africa. This approach is also meant to priorities spatial nodes that have a growth potential in order to stimulate growth of the tourism industry in South Africa. The White Paper on the Development and Promotion of Tourism in South Africa (DEAT 1996) contends that prime tourism attractions are not located in the city centers but rather in rural areas. The Comprehensive Rural Development Programme (2009) (CRDP) of the Department of Rural Development and Land Reform states "between 10 – 15 million South Africans live in areas that are characterized by extreme poverty and underdevelopment." In some of these poverty-stricken areas, one can find world heritage sites and other major tourist attractions. This strategy therefore, further reviews product

development, tourism marketing, human development, tourism infrastructure and tourism research and information for equal access of tourism opportunities in rural areas.

4.34 Provincial Spatial Development Framework, 2008

The North West Provincial Spatial Development Framework has been developed in order to achieve the goals and objectives of the PDP in a targeted and spatially coordinated manner. The Provincial Spatial Development Framework includes amongst others the identification of competitive nodes and corridors as indicated in the NDP. Each of the identified zones should in future have an integrated programme of actions developed to help realize potential or deal with problems. The outcome of these planning processes will be that a formal agreement should be reached amongst competing parties and other stakeholders, including relevant spheres of government, on the best optimization model for a resource critical region. These agreements must become a spatial social contract binding on all spheres of government and relevant role-players.

4.35 North West Provincial Growth and Development Strategy

The North West Provincial Growth and Development Strategy (PGDS) provide a framework for integrated and sustainable growth and economic development for the province and its people. It fully prescribes to balanced development of economic sectors and spatial localities in accordance with the demands and potential of the people. It is also aimed at targeted investments in the second economy to offer opportunities to the poor in skills development, employment and improving their quality of life. The PGDS recognizes that there is pressure on the provincial government to become proactive in promoting growth and development and facilitating greater private sector participation and partnerships with special focus on the second economy, however the North West Province is faced with a number of challenges, with the greatest of these being job creation, poverty eradication, and a low level of expertise and skills. Other challenges include: The Province is mostly rural in nature.

4.36 North West Provincial Development Plan (PDP) 2030

The North West Provincial Development Plan (PDP) is predominantly based on the National Development Plan (NDP) in an attempt to align with the objectives and priorities it identifies as well as with the vision for 2030 of a united South Africa. The PDP states that it will place particular focus on the rural economy (due to the predominant rural character of the province) as well as on the upgrading, the provisioning and the maintenance of economic infrastructure as the precondition of overall economic growth and development and for its

significant potential to sustain employment. The main purpose of this PDP document is to begin the process of enabling the province to measure its progress in achieving the accepted growth and development goals. The chosen development priorities with which the North West intends to align to the National Development Plan (NDP) are the following:

- Economy and employment;
- Economic infrastructure;
- An integrated and inclusive rural economy;
- Human settlement and spatial transformation;
- Improving education, training and innovation;

4.37 Policies and guidelines consulted

From the NEMA Environmental Impact Assessment Regulations Guideline and Information Document Series the following guidelines were used:

- Guideline on Public Participation in the Environmental Impact Assessment Process (October 2012);
- Draft Guideline on Need and Desirability in Terms of the Environmental Impact Assessment (EIA) Regulations, 2010 (October 2012);
- Guideline on Alternatives (August 2010);
- Rustenburg City Local Municipality Spatial Development Framework
- White Paper on the Energy Policy of the Republic of South Africa (December 1998);
- Spatial Development Frameworks (where available);
- Integrated Development Plans;
- Relevant provincial, district and local policies and strategies

5. PROJECT ALTERNATIVES

One of the objectives of an EIA is to investigate alternatives to the proposed project. The IEM procedure stipulates that the environmental investigation needs to consider feasible alternatives for any proposed development. Therefore, a number of possible proposals or alternatives for accomplishing the same objectives should be identified and investigated. In order to ensure that the proposed development enables sustainable development, *feasible* alternatives must be explored. The identification, description, evaluation and comparison of alternatives are important for ensuring a sound environmental scoping process. Alternatives should be considered as a *norm* within the Environmental Process. The alternatives considered for the proposed formalization of the Popo Molefe application includes

- land use alternatives;
- layout alternatives;

- location alternative; and
- Technology Alternatives;
- No-go option.

5.1 Land use Alternative

5.1.1 Alternative 1 (*Preferred Alternative*) Mixed Use/integrated human settlement

The present proposed township layout will consist of residential, retail, and educational land uses. Included in the proposed integrated housing development, are public open spaces. Although the emphasis is on housing, complimentary land uses have been included in the development. Mixed-use development is a type of development that blends residential, commercial, cultural, institutional, or entertainment uses, where those functions are physically and functionally integrated, and that provide pedestrian connections. This will help to bring the much need social amenities to the upcoming development as well as the existing settlement. People want easy access to job opportunities shops, banking facilities, clinics, etc. and want their living environment, such as residential areas to be placed at strategic positions with good access routes in close proximity to these amenities. The same applies for their place of work. People wish to have their place of work in close proximity to their homes. A mixed land use development is socially responsible based on the following:

- It covers the mixed and lower income bracket by providing a higher density housing option;
- The development will inevitably support the use of public transport;
- The development will include supporting social infrastructure (schools), as well as some retail or commercial activities;
- The layout of the development must respond to the future road planning for the area, to facilitate and maximize pedestrian and public transport.
- Commercial even can accommodate a shopping Centre, to service the existing formalized and informal settlements in the area. The commercial node will:
 - ✓ Promote entrepreneurial services and products;
 - ✓ Be within walking distance to places of refreshment and trade for residents;
 - ✓ Provide Job opportunities; and
 - ✓ Improve neighborhood quality.

Therefore, the mixed/Popo Molefe's the preferred option for this development.

5.1.2 Alternative 2: Agricultural Activity

Considering that the historic use of the site was for agriculture, the option of agriculture as a land use needs to be considered. However, the greater portion of the site have already been occupied by informal settlements making it not feasible to undertake agricultural activities. Based on development drivers that exist in the area, this would probably only be a short-term outcome, if it is at all feasible. However, a small portion of the land should be allocated to low-income residents to grow vegetables for their own use and commercial purposes.

5.2 Layout Alternative

No layout alternatives have been considered it is guided by existing settlement pattern, only one layout is available as alternative for the proposed development. The preferred layout alternative will consist of the development of the 5705 units. The development of the site would require the establishment and/or upgrading of infrastructure such as the road network, water and sewer pipes and electrical supply equipment. The design variation considerations must include the following:

- Type and slope/angle of retaining wall structures for the terraced Erven platforms;
- Road and pedestrians pathway layout – limited to the existing dwelling and pathway positioning in relation to accessibility to proposed Erven, contour lines and existing roadways.
- Positioning of service connection points limited by the location of existing infrastructure.

5.3 Location and Type of Activity Alternative

The proposed township development on Paardekraal is site specific and therefore there are no feasible site alternatives. It is increasingly acknowledged that incremental in situ upgrading is more likely to improve living conditions and reduce poverty as communities are able to maintain important social networks and livelihood strategies while improvement is made in their physical environment. The design principle applicable to this project is to upgrade the area by creating a layout that will allow a functional infrastructure network with minimum disturbance to existing community. The purpose of this activity as follows:

- to provide the residents with secure tenure on the land on which they currently reside, by means of formalizing the settlement and providing basic services (to improve living and health condition).
- Development of 5705 Erven for housing subsidy for residents.

This is the most preferred location type due to the balance achievable between social, environmental and economic requirements:

- The land for new development is an available vacant land earmarked by the Rustenburg Local Municipality for residential development in the form of affordable housing, thus formalizing it to provide settlement with basic services and decent houses;
- The area adjacent to the proposed site is developed with Municipal services so the proposed site will connect to it.
- The locality of the proposed residential development provides for affordable housing in close proximity to economic opportunities in the Rustenburg town.
- Aligns to the prerequisites of the Rustenburg SDF;
- Situated within the urban realm adjacent to existing and proposed urban infrastructure, service and amenities; and
- Socially inclusive due to its location to numerous communities and along public transport routes.

The proposed development site is situated North West of the Rustenburg town which is a mixed-use business area, and in between residential areas. The proposed development site is ideal for affordable housing based on integrating pockets of development into a coherent hole, and utilising existing bulk infrastructure. It is clear that the proposed residential township is in line with the existing and planned land uses of the area and thus suitable for the planned residential development. Therefore, locality alternatives were not considered.

5.3 Technology Alternative

Energy and water saving technologies associated with the installation of services to existing houses and new Erven. An alternative to these saving technologies would be the installation / implementation of conventional technologies of all water and electrical services i.e. no water / energy saving mechanisms, which is undesirable considering the limited resources available today. Installation of energy and water saving technologies in future houses, and possible mechanisms to promote the recycling of household waste is another alternative. An alternative would be the installation / implementation of conventional technologies of all water and electrical services, and waste disposal i.e. no water / energy saving or waste recycling mechanisms, which is undesirable considering the limited resources and waste disposal space available today.

Water saving mechanisms recommended to reduce water consumption (water-saving) includes the following:

- Dual Flush Toilets
- Low flow faucets in new housing phase) - Low flow faucets use aerators to reduce the flow of the water. These should be built into the faucet rather than be added as

an aftermarket product. The faucets in bathrooms should have a peak flow of less than 10 liters per minute.

- Geysers and pipe insulation - Apart from the savings in terms of energy as detailed below, insulating geysers and pipes save water, as shorter periods of running the tap to get hot water are required.

5.4 No go Alternative

No go alternative implies that the status quo of the settlement with limited service with no development of housing is maintained (not continuing with the activity). This alternative is not considered to be desirable from both social and environmental perspective e.g. continued disturbed ecological ecosystems, erosion, pollution, poor sanitation, poor refuse management, lack of communal water provision and health & Safety risk.

The no-go option is basically a reflection and the continuation of the current situation, which might have a negative impact on the environment if there is no environmental management plan for the area. If this alternative is pursued the sites existing land use will be retained. This option has the following drawbacks:

- A high demand for commercial and employment provision that exists in this area, especially with respect to the proposed developments characteristics as infill development, Should the site not be developed a very viable opportunity to exploit the commercial market in the immediate area will be negated.
- Illegal squatters or vagrants will continue to occupy the area, severe pressure for housing in the lower income brackets also exist and will continue. Due to the presence of extensive development throughout the greater area it is possible that undeveloped, un-managed land may be illegally settled.
- The development does not site remains as undeveloped and unmanaged. Dumping of household refuse and the utilisation of the dense vegetation for criminal activities may continue. No housing will be provided for low –middle income public.
- The proposed site is disturbed as a result of the lack of basic services thus leading to a degraded environment. Should the No-Go alternative be preferred by the decision makers would mean that the proposed housing development would not be constructed at the proposed site and the land would remain vacant.
- If the sites remain undeveloped, the need for formalised housing in the Popo Molefe area will not be addressed.

- The proposed project objectives will not materialise, which implies a significant loss of opportunity for the development the site and creation of a safe living environment for the community residing on the site.
- Many direct and indirect spin-off benefits, such as job creation, capacity building, rates for the municipality and the upgrading and supply of services will not be realised.
- The 2017-2018 SDF has earmarked the site as Future Integrated Development. An informal settlement and a vacant derelict site would definitely not meet this classification.
- Invasive vegetation would probably continue in areas where land is vacant and not actively used.
- Impacts associated with current and previous uses may well result in impacts of a higher significance, especially in terms of pollution risk.

The no-go alternative will only be considered as an alternative if it is concluded that the preferred alternative will have significant negative impacts on the environment which cannot be reduced or managed to an acceptable level. As there it has already been indicated that there is a need and desirability for the proposed development it is anticipated that this development will relieve the demand for housing and basic services in the region. It is anticipated that the no-go alternative will constrain the development planning of the Rustenburg Local Municipality.

5.5 Reasons for the preferred development alternative

The development alternative of the new human settlements is preferred in order to reinforce the vision of the Department Local Government and Human Settlement to promote the achievement of a non-racial, integrated society through the development of sustainable human settlements and quality housing. Within this broader vision, the Department is committed to meeting the following specific objectives:

- Accelerating the delivery of housing as a key strategy for poverty alleviation
- Utilising provision of housing as a major job creation strategy
- Ensuring property can be accessed by all as an asset for wealth creation and empowerment
- Leveraging growth in the economy
- Combating crime, promoting social cohesion and improving quality of life for the poor
- Supporting the functioning of the entire single residential property market to reduce duality within the sector by breaking the barriers between the first economy residential property boom and the second economy slump.

- Utilizing housing as an instrument for the development of sustainable human settlements, in support of spatial restructuring.

The proposed development forms part of a larger development precinct identified by government to address the socio-economic conditions of this marginalised region. The proposed uses that include housing and schools with associated infrastructure will alleviate some of the challenges within this area. It is Important is to note that the proposed uses are aligned with the provisions of the Regional Spatial Development Framework.

5.6 Need and Desirability of the proposed activities.

The formalization on the settlement is pivotal because the installation of basic services (portable water, storm water management, sanitation, waste removal services) will have a positive impact on the health of the people. The visual character of the site and sense of place will not be altered substantial as the proposed development is to formalize an already established settlement. The visual intrusion of the existing settlement may well be improved with the formalization of roads, erven platforms, sanitation and removal of refuse.

The demand for housing is one of the biggest issues in South Africa. The North West Province clearly suffers from a shortage of houses for the local community. Over population is therefore a major concern and this development will provide the needed housing for the local community.

The Department of Local government and Human Settlement is desperate to provide a solution by the formalizing of site. The community is also in need of safe parks and youth orientated activities. Youth centers, day care centers, play grounds and sport facilities are major needs to provide the youth of the community with save and proactive activities. Local sport teams can't improve their skills because of the lack of practicing facilities.

Rustenburg Local Municipality has a duty toward the people in the region to provide them with healthy, save an affordable living condition. The proposed development aims to create a much-needed business node to give the community the opportunity to start and sustain their own businesses and to generate an income for their families.

In order to assess the 'need and desirability" alternatives of the project the following documents relevant to these two aspects that were consulted:

- 1) Rustenburg Local Municipality: Spatial Development Framework (SDF);

- 2) Draft guideline on the information requirements to describe need and desirability in the EIA process (DEAT, 2008). In the following sections this EAP attempts to make an objective assessment of the “need and desirability” of the project and makes a recommendation based on the available documents and information:

Does location favor this land use at this place?

The land use associated with the activity being applied for is located in a land zoned agriculture, however, the agriculture and conservation potential of the site is limited due to the existing disturbance and occupation of the settlement. The proposed development is to take place within the existing disturbed footprint of Popo Molefe. This has been targeted by the municipality and considered to be within the timeframe intended by the existing approved Spatial Development Framework (SDF). The activity will render a service to the local community and will create employment opportunities.

The “desirability” of the project:

As the site is located in an “agricultural zone”, and a rezoning application will be done to the Rustenburg Local Municipality the approval of this application would not compromise the integrity of the existing approved IDP and SDF agreed to by the relevant environmental authority. The project has therefore also been approved by the Municipality.

The approval of this application would not compromise the integrity of the existing environmental management priorities for the area. The activity and the land use associated with the activity applied for will not impact on sensitive natural and cultural areas.

The operation will be designed, constructed and operated according to the required standards set by the authorities and should not impact on people’s health and wellbeing (e.g. in terms of noise, odours, visual character and sense of place, etc). It is not anticipated that the activity will result in unacceptable opportunity costs as it will be integrated with the existing residential suburb in the local area.

Need and desirability in terms of the North West Province

One of the biggest housing concerns within the North West Province is the establishment of informal settlements in the rural / farming areas of the region. These informal settlements are usually established in areas with no basic services and therefore people live and stay in terrible conditions. These informal settlements are also usually far from other services such as shopping centers, clinics, schools and other community facilities. It is for this reason that

Department of Local government and Human settlement is proposing the construction of a proper residential development which will cater for most of the informal settlements within the direct area. There will therefore be proper houses, infrastructure, community facilities, educational and institutional facilities as well as business opportunities.

Need and desirability in terms of socio-economic benefits

The township development is needed and it also forms part of municipality's long-term plan to develop the site. This project will lead to direct & indirect employment opportunity. Employment is expected during construction and the operational phases of the township. Employment in these sectors will be primarily temporary or contractual and permanent during the operational stages of the involvement of unskilled labor will be more. A major part of this labour force will be mainly from local communities which are the Popo Molefe informal settlement and the South Village. This will enhance their income and lead to overall economic growth of the area. The proposed project is therefore a need.

Need and desirability in terms of services

Confirmation by the municipality to ascertain if necessary, service with appropriate capacity is available, or must additional capacity be created to cater for the development.

6. DESCRIPTION OF THE RECEIVING ENVIRONMENT

This section describes the biophysical and socio-economic environment that may be affected and the baseline conditions which are likely to be affected by the proposed activity. This description has not been informed by any specialist studies undertaken for this assessment but includes information obtained from various literature sources and is described at a level deemed appropriate for a Scoping study. A summary of the affected environment is provided and more detailed studies focused on significant environmental aspects of the development will be provided during the impact assessment phase. The three components to the environment are recognised as:

- Physical Environment
- Biological Environment
- Socio-Economic Environment.

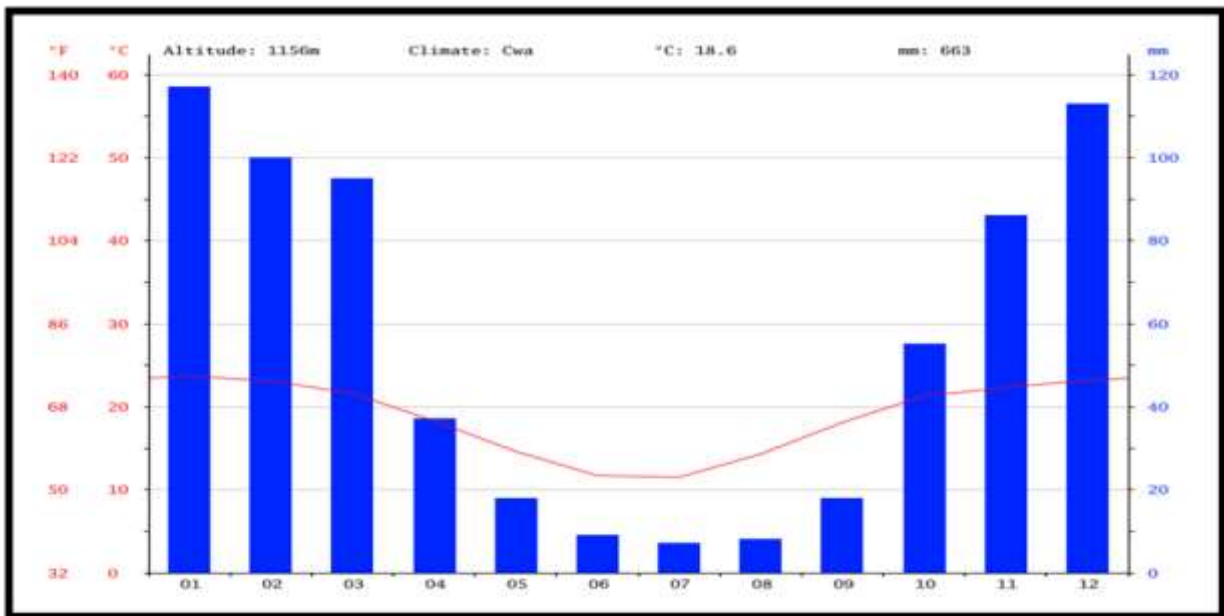
Only those elements of the environment that have a direct bearing on the impact assessment process of the project are discussed. The severity of the potential impacts is largely determined by the state of the receiving environment.

6. DESCRIPTION OF THE RECEIVING ENVIRONMENT

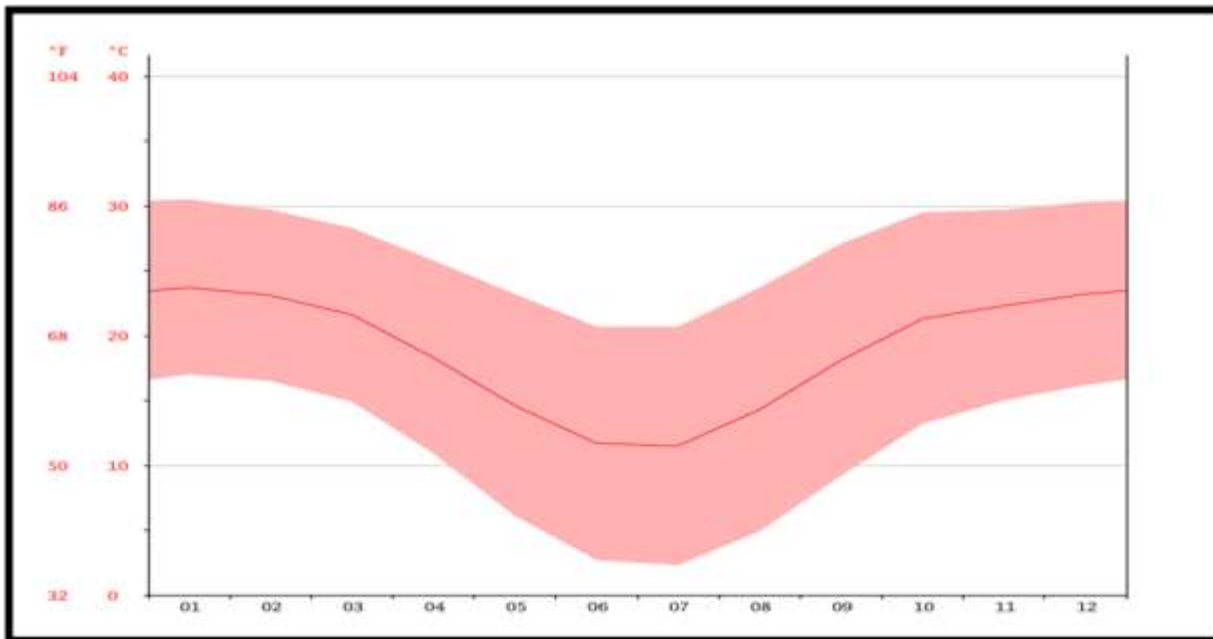
6.1 Bio-Physical Environment

6.1.1 Climate

Climatic conditions are comprised of summer rainfall with very dry winters. The Mean Annual Precipitation ranges from about 500-600 mm. This range has the highest mean annual potential evaporation. According to Mucina and Rutherford (2006), frost is fairly frequent in winter. The area also enjoys a sub-tropical climate with temperatures around 16°C during winter and 31°C during summer. The climate is generally ideal for year-round outdoor activities.



Graph1: Rainfall data (average) for Rustenburg local Municipality, North West Province (200-2012)



Graph 2: Temperature data (averages) for RLM, North West Province (200-2012)

6.1.2 Wind

The prevailing wind direction in Rustenburg is north-to-north easterly and south-westerly (Rimbault, 2012). The Magaliesberg Mountains is the major landscape feature responsible for the South Westerly winds. Increased wind velocities frequently exceed 5m/s. Due to the heavy mining activities in the Rustenburg area, the air quality is generally poor (Eco Assessments, 2003). These include fugitive emissions from quarrying and mining operations (including tailings impoundments). The windy months of September and October are responsible for the increased dispersion of pollutants (Particulate Matter) from mining operations. Potential impacts on the proposed township development as a result of the above climatic conditions include possible formation of an urban heat island as a result of the proposed township development. According to the US EPA (2006), UHI's in townships lead to increased energy consumption, elevated emissions of air pollutants and greenhouse gases, compromised human health and comfort, and impaired water quality.

6.1.3 Air Quality

The air quality in RLM is generally poor due to activities from different land uses in the area. The topography of the area also contributes to poor air quality by trapping air pollutants in the atmosphere under stable atmospheric conditions. The main impacts on air quality result from pollution and dust emissions from mining, agricultural, domestic and industrial activities. The RLM has undertaken an initiative to address the air quality impacts by implementing an Air Quality Management Plan (AQMP) which has been incorporated into the RLM Integrated

Development Plan (IDP). According to the Rustenburg State of Environment report on Air Quality, sources of particulate emissions within the Rustenburg Region include:

- Stack and vent emissions from industrial operations and stack emissions from boiler and incinerator operations
- Emissions from quarrying and mining operations (including tailings impoundments)
- Dust sources, including agricultural activities, wind erosion of open areas, vehicle-entrainment of dust along paved and unpaved roads
- Household fuel combustion including wood and coal
- Biomass burning (i.e. veld fires) that contributes particulates, CO and VOC's. The extent of NO_x emissions depends on combustion temperatures, with minor sulphur oxides being released
- Vehicle tailpipe emissions (minor source of particulate emissions)
- Regionally transported air masses comprising well-mixed concentrations of aged secondary pollutants.
- Illegal Burning and spray painting.

6.1.4 Soil and Land capacity

The development site predominantly comprises of colluvium soils, often underlain by a pebble marker, residuum, and varying degrees of weathered magnetite or gabbronorite. A pebble marker commonly indicates the boundary between transported and residual (in-situ formed) soils. During the construction phase, activities such as topsoil stripping, removal and stockpiling of subsoil, and soil compaction will impact negatively on soils and will consequently impact on the land capability of the study area. Materials lay down areas as well as heavy vehicle and construction vehicle traffic on site will contribute to soil compaction. Areas compacted will lose the soil structure and fertility permanently. Furthermore, there is a risk of pollution by hydrocarbon spillages.

Popo Molefe Soil Map

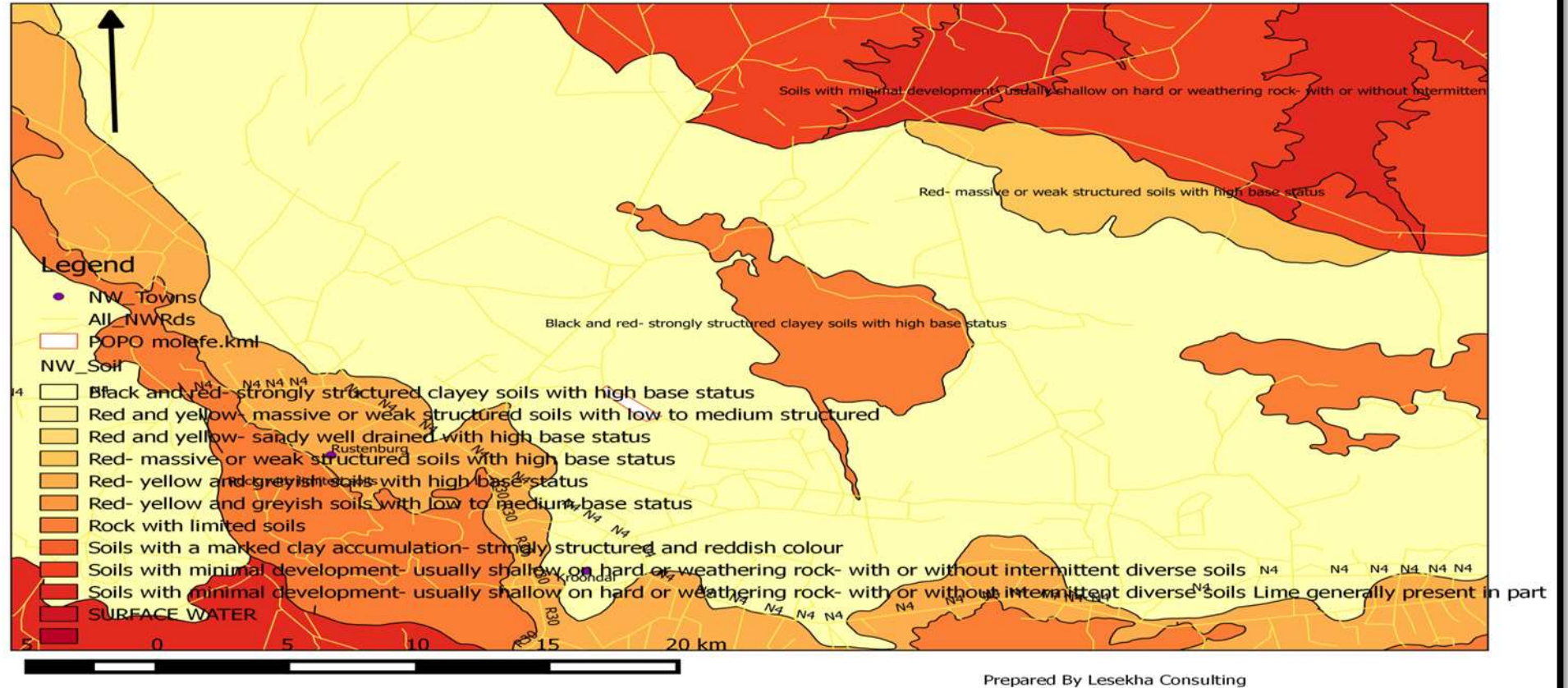


Figure 6: Soil Map

6.1.5 Geology

According to the Environmental Management Framework (2010), the regional geology is dominated by formations of the Pretoria Group of the Transvaal Sequence and consists of different geological types such as quartzite, norite, hybrid rocks, diabase and epidiorite, pyroxenite, norite-anorthosite, slate, shale, hornfels, and gabbro. According to the Geotechnical study attached in Appendix F1, the area is underlain by Mathlagama norite & anorthosite of the Rustenburg Layered Suite, Bushveld Complex. Surficial deposits include quaternary calcrete and colluvium, covering the lithology on site. The geology has subjected Rustenburg to increasing mining pressure with most land uses changing towards mining. The geology which underlies the study sites is considered to be stable and therefore no significant environmental issues with regards to geology is anticipated within the study area.

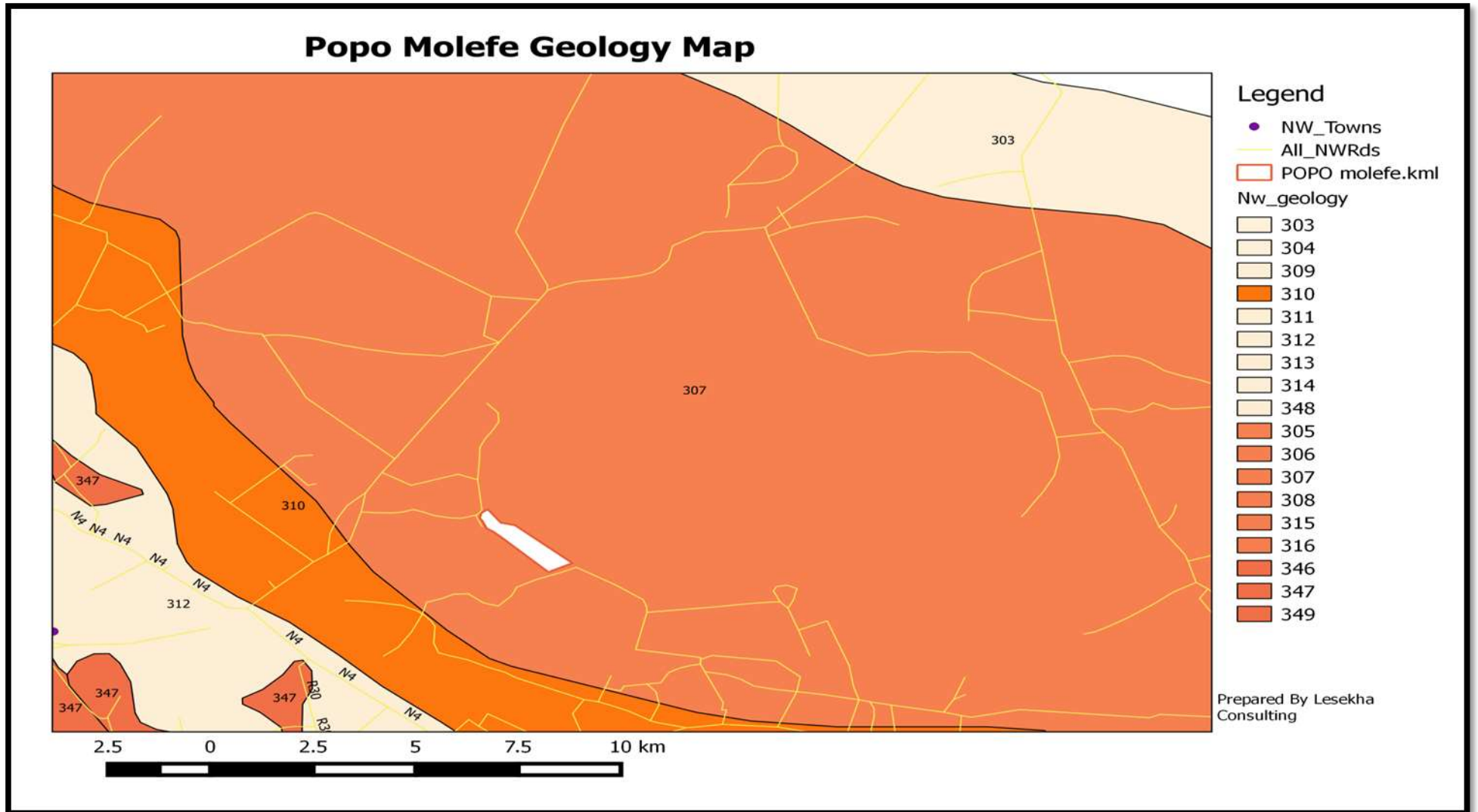


Figure 7: Geology map

6.1.6 Vegetation

The vegetation of the study area falls mainly within the Savanna Biome and a single vegetation unit: the Marikana Thornveld (SVcb 6). Previously the vegetation unit was referred to as Sourish Mixed Bushveld or Other Turf Thornveld (Acocks, 1953) and Clay Thorn Bushveld (Low and Rebelo, 1996). This vegetation type consists of an open and short thornveld with *Acacia tortilis*, and typically grows on black vertic soils, which cover large parts of the site. Two red data species are known in the ¼ ° square, but the required habitat is absent. One protected tree, *Boscia albitrunca*, is listed, but no specimens were observed in the corridor. Two other protected trees were however observed: *Sclerocarya birrea* and *Combretum imberbe*. The riparian vegetation identified on the banks of the Hex River is about 4 – 6 m tall, and dominated by *Searsia lancea*, *Gymnosporia buxifolia* and *Combretum erythrophyllum* trees *Phragmites australis* and *Cyperaceous* often dominates on the water edge and considered to be of high ecological sensitivity and conservation value.

The unit (Marikana Thornveld SVcb 6) is well represented in the study area. It occurs in the North-West and Gauteng provinces, mainly associated with the plains to the east of Rustenburg, around Marikana to Brits and Pretoria. The altitude ranges between 1 050 and 1 450m. The vegetation is dominated by the open *Acacia karroo* woodlands and occurs on the undulating plains, low valleys and lowland hills. The more dense shrubs are present along drainage lines, around the termitaria, rocky outcrops or areas protected from fire (Mucina and Rutherford, 2006).

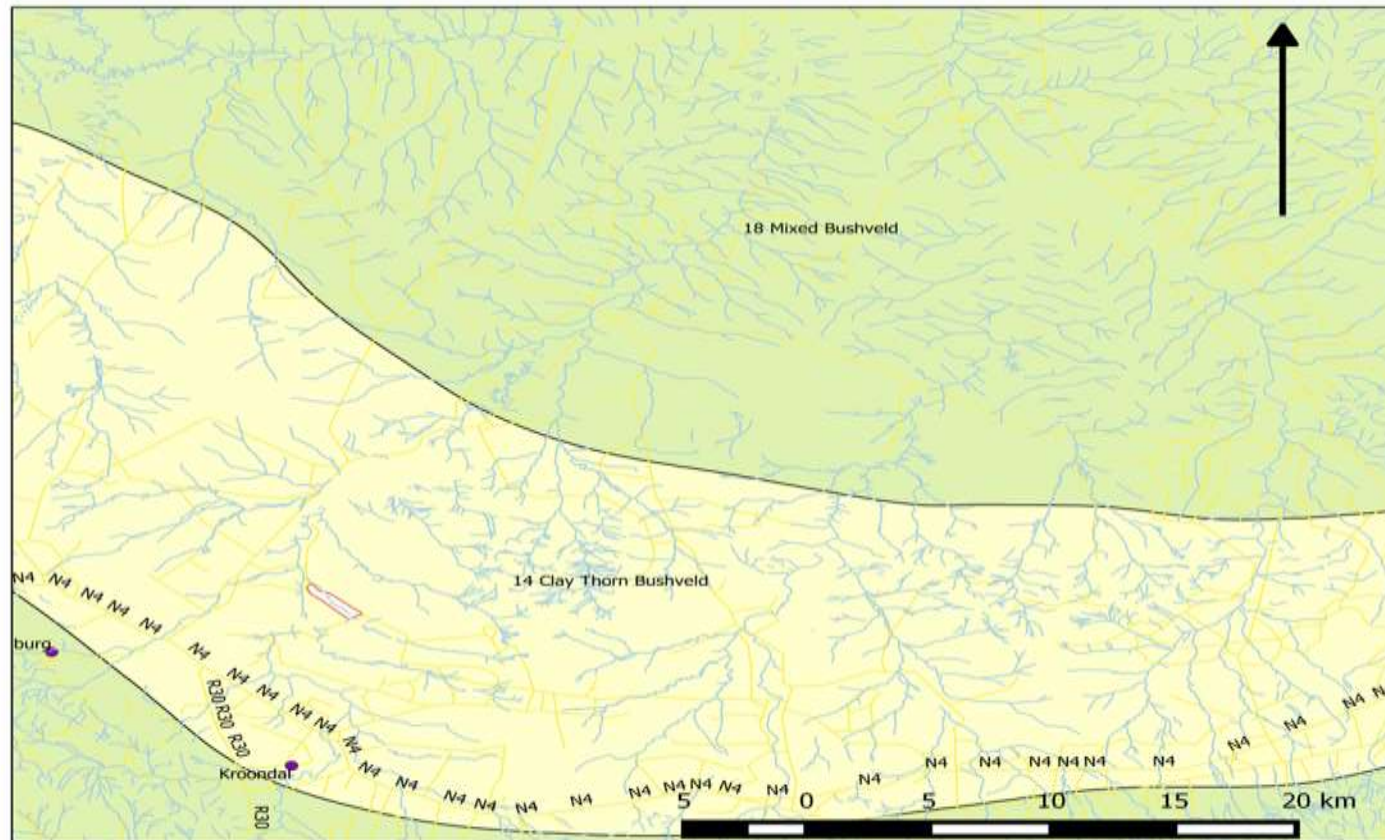
Conservation: The vegetation unit is considered to be endangered (Mucina and Rutherford, 2006) and only 1% of the targeted 19% is protected. Apart from urban development, grazing and cultivation, one must consider the mining activities as being responsible for more than 60% of the unit being transformed. Erosion is low to medium with alien invasive plants being a problem along most drainage lines.

The vegetation in the area is severely modified, therefore the township development project will have a medium to low impact on the ecology of the site. The state of the

vegetation on site has greatly been impacted by the establishment of the informal settlements and overgrazing occurred on the site. Before any clearing commences, an ECO must accompany the contractors must be involved and Permits for cutting/trimming must be acquired before the project can commence.

The following protected tree species are reported to be in the vegetation unit: *Sclerocarya birrea* - approximately 10 were observed. In addition, two small (1m high) *Combretum imberbe* were noted. No red book data plant species is recorded for the site. Although some mammals can occur in the area (suitable habitat), no records on the property is found.

Popo Molefe Vegetation Map



Legend

- NW_river
- NW_Towns
- All_NWRds
- ▭ POPO molefe.kml
- NW_Veg
- ▭ 14 Clay Thorn Bushveld
- ▭ 18 Mixed Bushveld
- ▭ 30 Kalahari Plains Thorn Bushveld
- ▭ 32 Kimberley Thorn Bushveld
- ▭ 33 Kalahari Plateau Bushveld
- ▭ 34 Rocky Highveld Grassland
- ▭ 37 Dry Sandy Highveld Grassland
- ▭ 39 Moist Cool Highveld Grassland

Prepared By Lesekha Consulting

Figure 8: Vegetation map

6.1.7 Hydrology

The primary catchment area falls within the Limpopo River System Drainage Basin (A2). The Hex River is the largest river in the study area and all the drainage lines form part of the catchment of the Crocodile and later the Limpopo River systems. The Bospoort Dam is upstream, north -west from the site in the Hex River, while the Vaalkop Dam occurs downstream, north of the site. The site is situated within the Crocodile (west) & Maricoarea. There is a non- perennial river that crosses the site, measure must be put in place to protect the river from pollution.

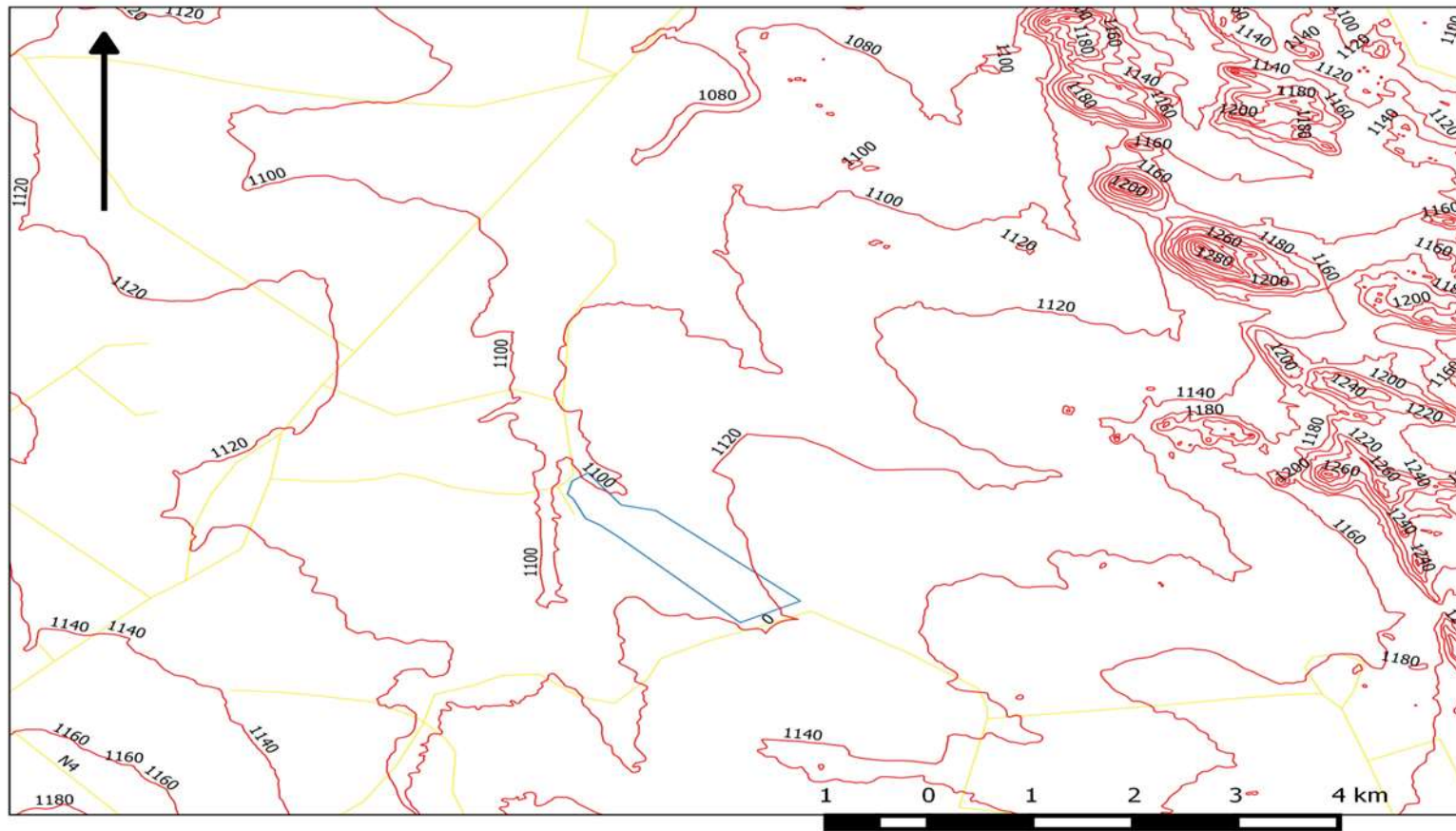
1.7 Topography

The study area generally consists of a relative escarpment with hills and lowlands, and slightly undulating plains. A large series of ridges and koppies dominate the central part of the RLM, with prominent mountain ranges and ridges in the Bafokeng area. The site elevation gradually declines from 1056 m above mean sea level in the North east to 1032 m towards the Hex. The average slope gradient ranges from between 4.6% to 1.6%. Potential impacts include:

- Vegetation clearance on slopes during construction will potentially result in soil erosion and subsequent sedimentation of the non –perennial river on site
- Uncontrolled storm water flowing at high velocity from slopes may erode the banks of natural drainage channels.

The topography of the site will change with the proposed development. The construction of the proposed development, as well as the construction of access roads will result in the alteration of surface topography and drainage patterns. During the construction phase impacts to surface topography and drainage will be caused by the excavation and stockpiling of in situ soils on surface. During the operational phase surface infrastructure will result in the alteration of surface topographic flow patterns as well as the concentration of surface water flow over hard surfaces such as roofs and tarred or concrete surfaces.

Popo Molefe Topography Map



- Legend**
- NW_ctrs_Province
 - NW_Towns
 - All_NWRds
 - POPO molefe.kml

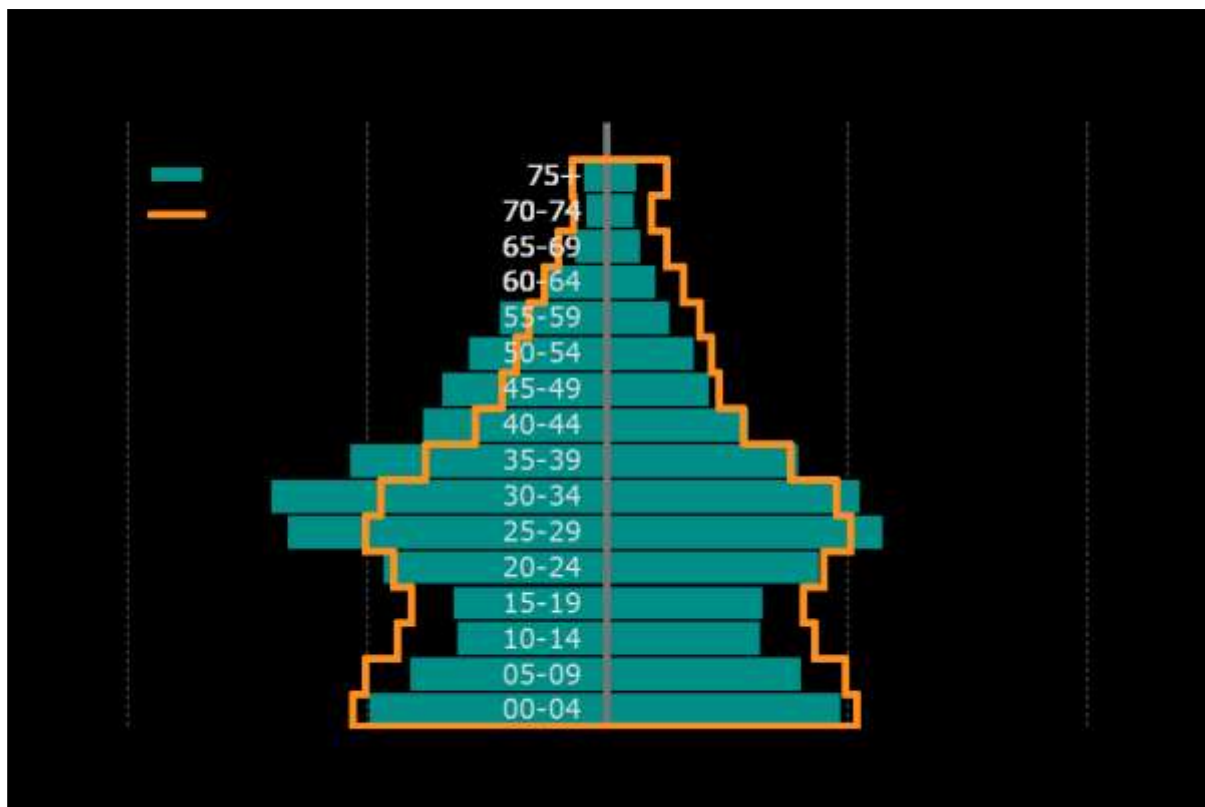
Figure 9: Topography Map

6.2 Social Economic Environment

The Rustenburg Local Municipality is a Category B municipality situated within the Bojanala Platinum District in the North West Province. It is one of the five municipalities in the district. Rustenburg is a large town situated at the foot of the Magaliesberg Mountain Range. This large town is situated some 112km north-west and is a 90-minute drive from both Johannesburg and Pretoria. It is a malaria-free area. It is the fastest growing municipality in South Africa and the most populous municipality in the North West Province.

6.2.1 Demographic Profile

The Rustenburg Local Municipality total population amounts to 631 000 people (2016), which represents 37.8% of the Bojanala District's total population, and in turn 1.2% of the total population of South Africa. The average population growth rate of the LM between 2006 and 2016 is calculated at 3.15%, which is approximately double the growth rate of South Africa (1.5%) as a whole for the same time period. Based on the present age-gender structure and the current fertility, mortality and migration rates, the Rustenburg population is projected to grow at an average annual rate of **1.8%** from 631 000 in 2016 to 690 000 in 2021.



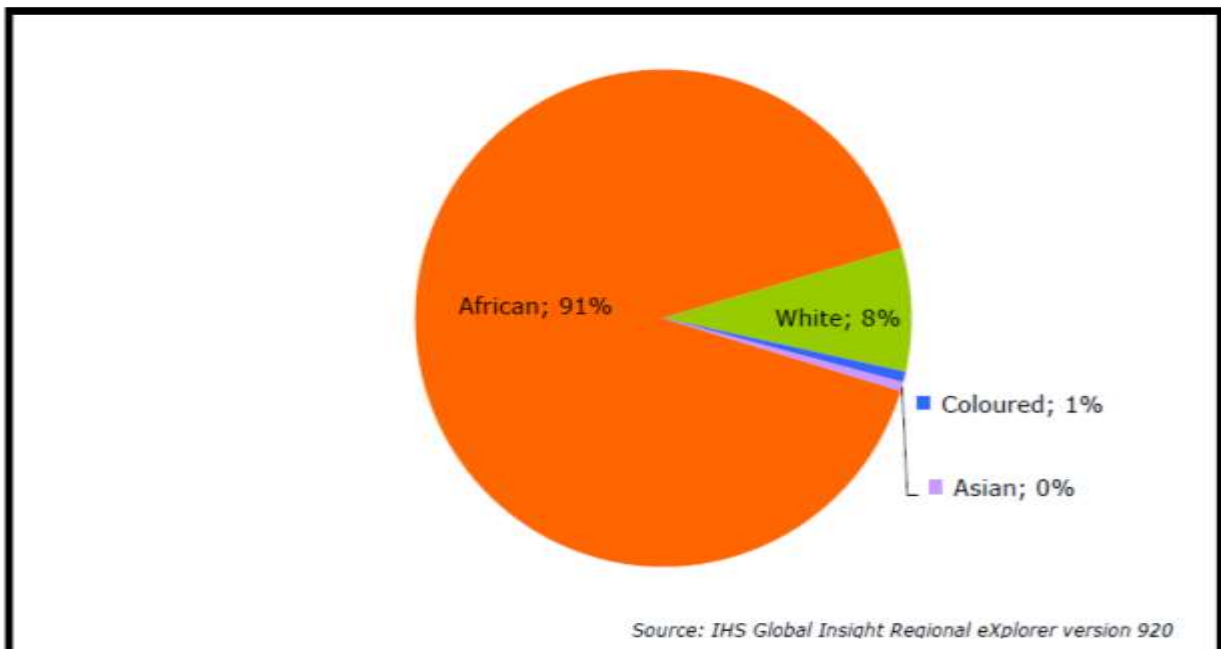
Graph 3: Demographic Indicators

6.2.2 Age and gender profile

Gender, Population and Age Profile Rustenburg Local Municipality's male/female split in population was 118.4 males per 100 females in 2016. The Rustenburg Local Municipality has significantly more males (54.21%) relative to South Africa (48.93%). This is mainly because of physical labour intensive industries such as mining located within the Rustenburg LM area. In total there were 289 000 (45.79%) females and 342 000 (54.21%) males within the LM by 2016.

	Male	Female	Total
Rustenburg	342,000	289,000	631,000
Moretele	94,100	99,500	194,000
Madibeng	287,000	254,000	541,000
Kgetlengrivier	30,600	27,700	58,300
Moses Kotane	123,000	124,000	247,000
Bojanala Platinum	877,000	794,000	1,670,000

In 2016, the Rustenburg Local Municipality's population consisted of 89.73% African (566 000), 8.51% White (53 700), 0.89% Coloured (5 630) and 0.87% Asian (5 480) people.



Graph 4: Population by race Indicators

The population age composition is summarised as follow:

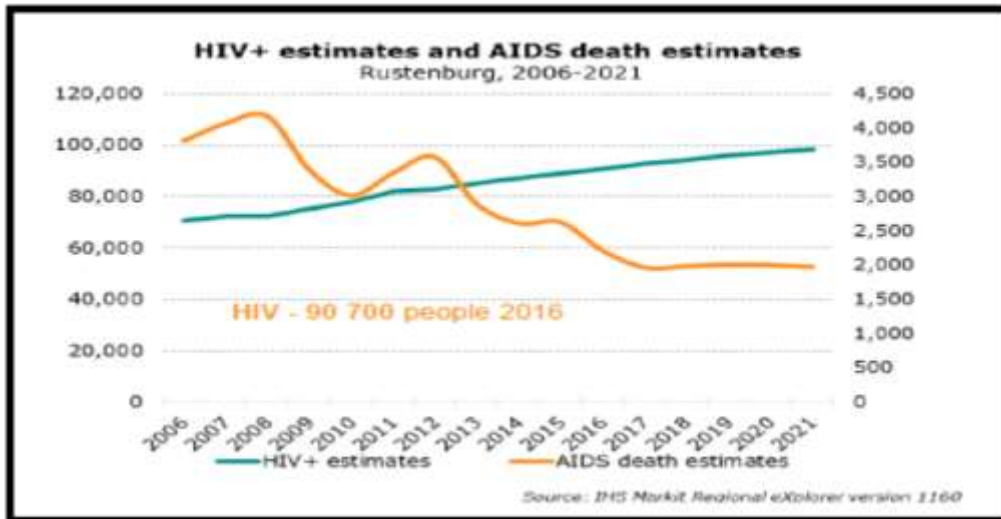
- The largest share of population is within the young working age (25-44 years) category with a total number of 258 000 or 40.8% of the total population.
- The second largest number of people is the babies and kids (0-14 years) age category with a total share of 24.3%.
- The older working age (45-64 years) age category comprise about 101 000 people.

When comparing the population pyramid of the Rustenburg Local Municipality with the national age structure, the most significant differences are:

- There is a significantly larger share of young working age people - aged 20 to 34 (33.7%) - in Rustenburg, compared to the national picture (28.6%).
- The area appears to be a migrant receiving area, with many people migrating into Rustenburg, either from abroad, or from the more rural areas in the country looking for better opportunities.

6.2.3 HIV and AIDS

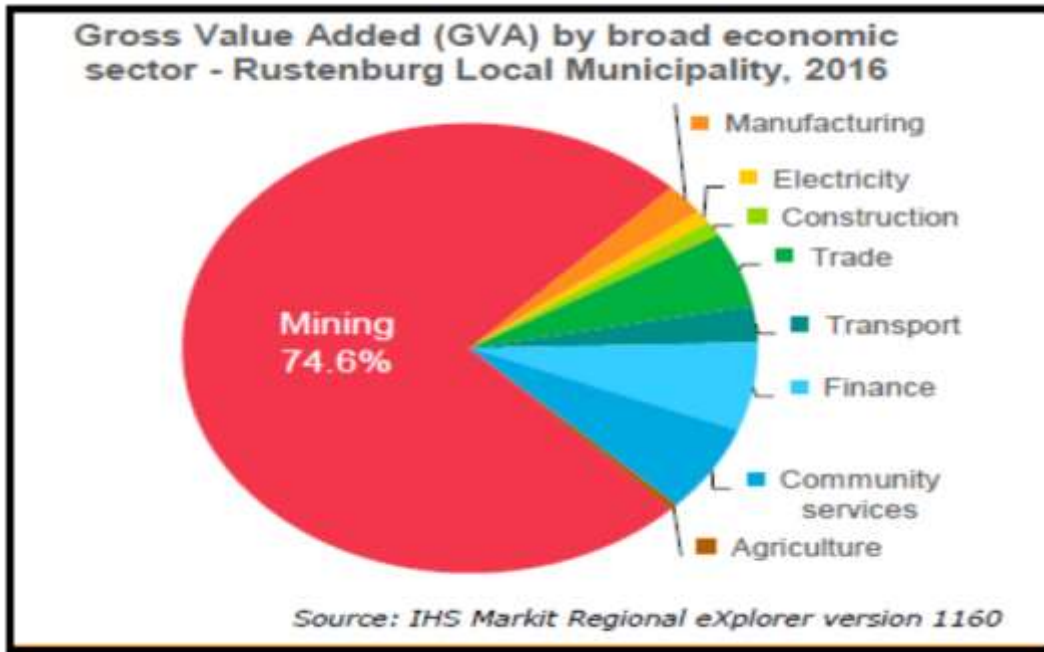
HIV and AIDS can have a substantial impact on the growth of a particular population. The lifespan of people that are HIV+ could be prolonged with modern ARV treatments. In the absence of any treatment, people diagnosed with HIV can live for 10 years and longer before they reach the final AIDS stage of the disease. In 2016, 90 700 people in the Rustenburg Local Municipality were infected with HIV. This reflects an increase at an average annual rate of 2.52% since 2006 (Very High). In 2016 it represented 14.37% of the RLM total population. Bojanala Platinum District Municipality had an average annual growth rate of 1.93% from 2006 to 2016 in the number of people infected with HIV, which is lower than that of the Rustenburg Local Municipality. When looking at South Africa as a whole it can be seen that the number of people that are infected increased from 2006 to 2016 at an average annual growth rate of 1.67%. Presenting the number of HIV+ people against the number of people living with AIDS, the people with AIDS added up to 3810 in 2006 and 2210 for 2016. This number denotes decrease from 2006 to 2016 with a high average annual rate of -5.30% (or -1600 people). For the year 2016, they represented 0.35% of the total population of the entire local municipality.



Graph 5: HIV and AIDS

6.2.4 Economic activity

The Rustenburg Local Municipality economy is intertwined and mutually dependent on the Bojanala District, North-West Province, South African and the world economy. Accordingly, the economic state of Rustenburg Local Municipality is put in perspective by comparing it with its neighbouring local municipalities, Bojanala Platinum District Municipality, North-West Province and South Africa. The Rustenburg Local Municipality had a total GDP of R 55.7 billion (2016) and contributed 40.41% towards the Bojanala Platinum District Municipality GDP total of R 138 billion. Subsequently, it ranks highest compared to all the other municipal economies of the Bojanala Platinum District Municipality. The Rustenburg Local Municipality contributes 21.10% to the GDP of North-West Province and 1.28% the GDP of South Africa. Its contribution to the national economy stayed consistent from 2006 when it contributed 1.33% to South Africa, but it is lower than the peak of 1.38% in 2011. According to Rustenburg Local Municipality (RLM) LED, the main contributor towards total exports within the district municipality is platinum in a semi-manufactured form. Platinum is the largest contributor to exports followed by ferro-chromium (28.2%), rhodium (8.9%) and palladium (6%). Due to the high concentration of platinum mining within RLM, a high concentration occurs within the local municipality. The Local Municipality is too dependent on the mining sector which could cause major problem if the mines are closed or when the strikes persist. The mining sector employs more than half of the economically active people followed by trade (15.3%) and community services (8.3%). The electricity sector employs the least people accounting for 0.2%.



Graph 6: Economic Activity

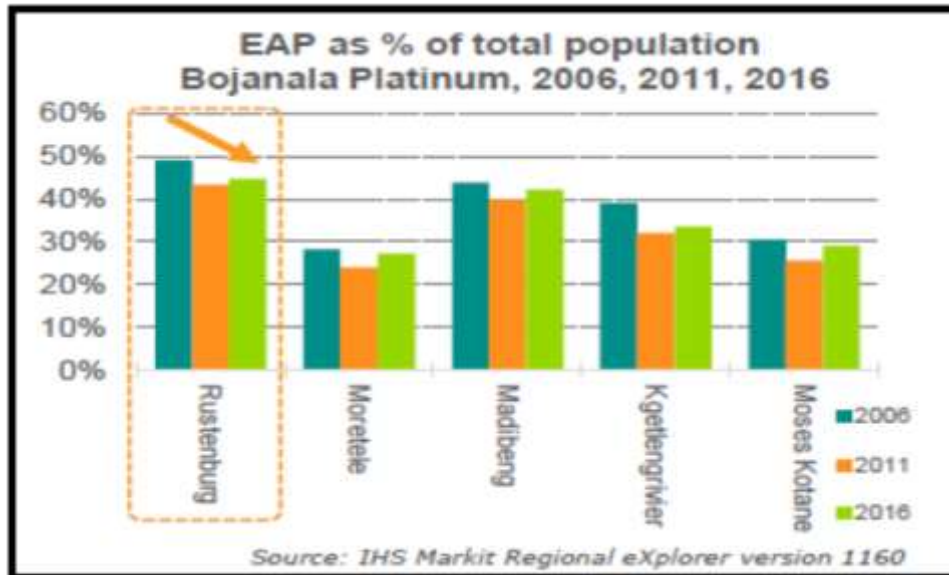
6.2.5 Employment

Rustenburg Local Municipality employs a total number of 221 000 people within its local municipality. Rustenburg Local Municipality also employs the highest number of people within Bojanala District Municipality. The local municipality that employs the lowest number of people relative to the other regions within Bojanala District Municipality is Kgetleng Reviver local municipality with a total number of 18 800 employed people.

In Rustenburg Local Municipality the economic sector that recorded the largest number of employments in 2014 was the mining sector with a total of 81 500 employed people or 36.9% of total employment in the local municipality. The trade sector with a total of 36 000 (16.3%) employs the second highest number of people relative to the rest of the sectors. The electricity sector with 625 (0.3%) is the sector that employs the least number of people in Rustenburg Local Municipality, followed by the transport sector with 6 040 (2.7%) people employed.

6.2.6 Economically Active Population (EAP)

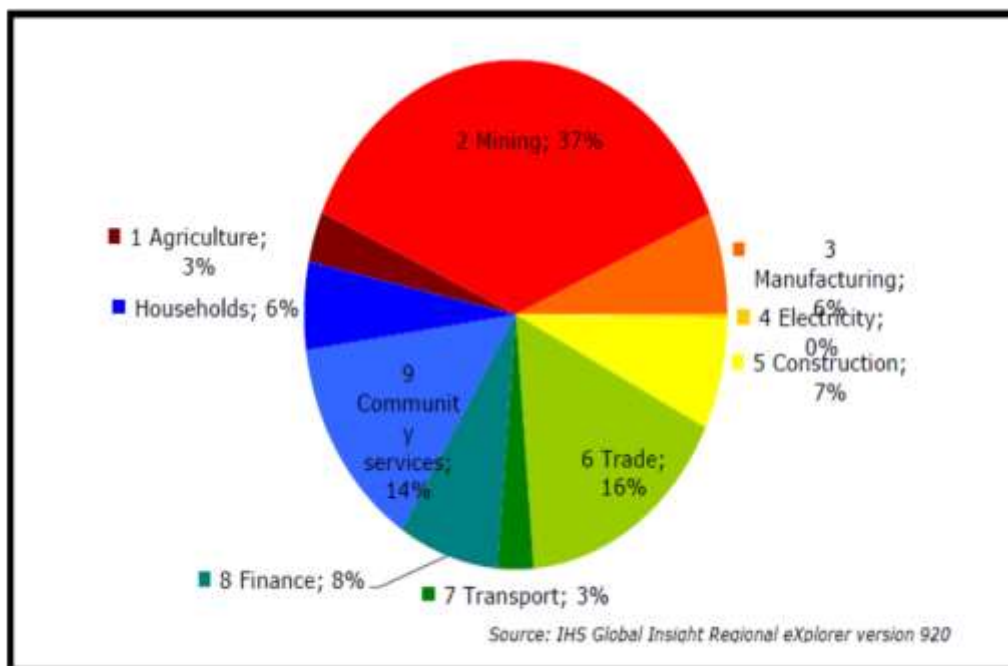
Rustenburg Local Municipality's EAP was 283 000 in 2016, which is 44.8% of its total population of 631 000, and roughly 43.09% of the total EAP of the Bojanala Platinum District Municipality. From 2006 to 2016, the average annual increase in the EAP in the Rustenburg Local Municipality was 2.22%, which is 0.288 percentage points higher than the growth in the EAP of Bojanala Platinum's for the same period.



Graph 7: Economically Active Population

6.2.7. Total Employment

Total employment consists of two parts: employment in the formal sector and employment in the informal sector. By utilising employment data, an estimation of unemployment can be made. In addition, trends in employment within different sectors and industries normally indicate significant structural changes in the economy.

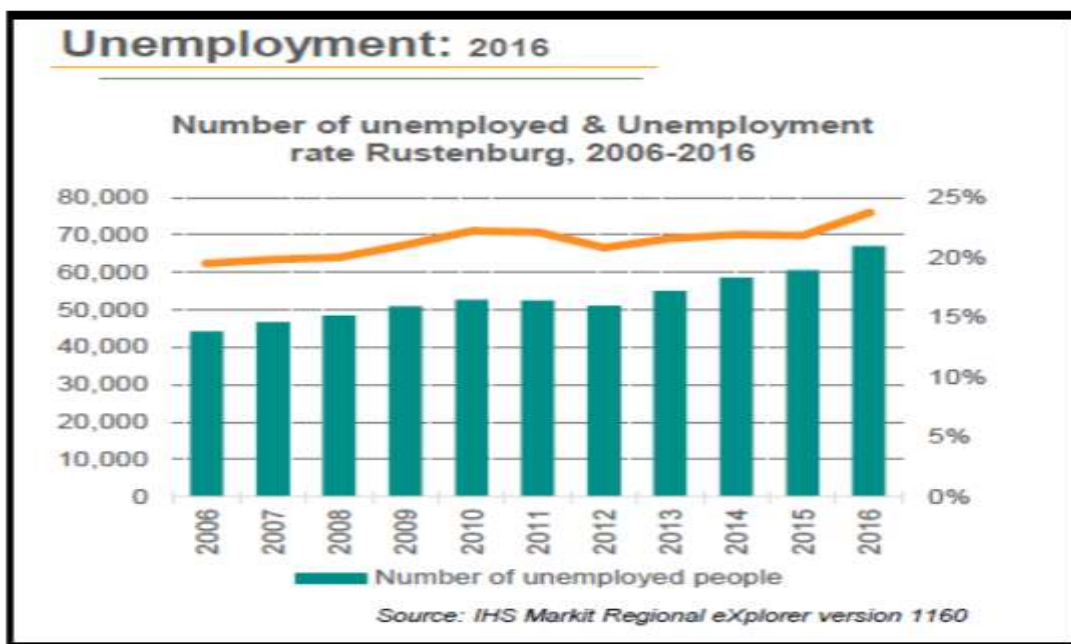


Graph 8: Employment Sectors

6.2.8 Unemployment

The unemployed includes all persons between 15 and 65 who are currently not working, but who are actively looking for work. It therefore excludes people who are not actively seeking work. In 2016, there were a total number of 67 100 people unemployed in Rustenburg, which

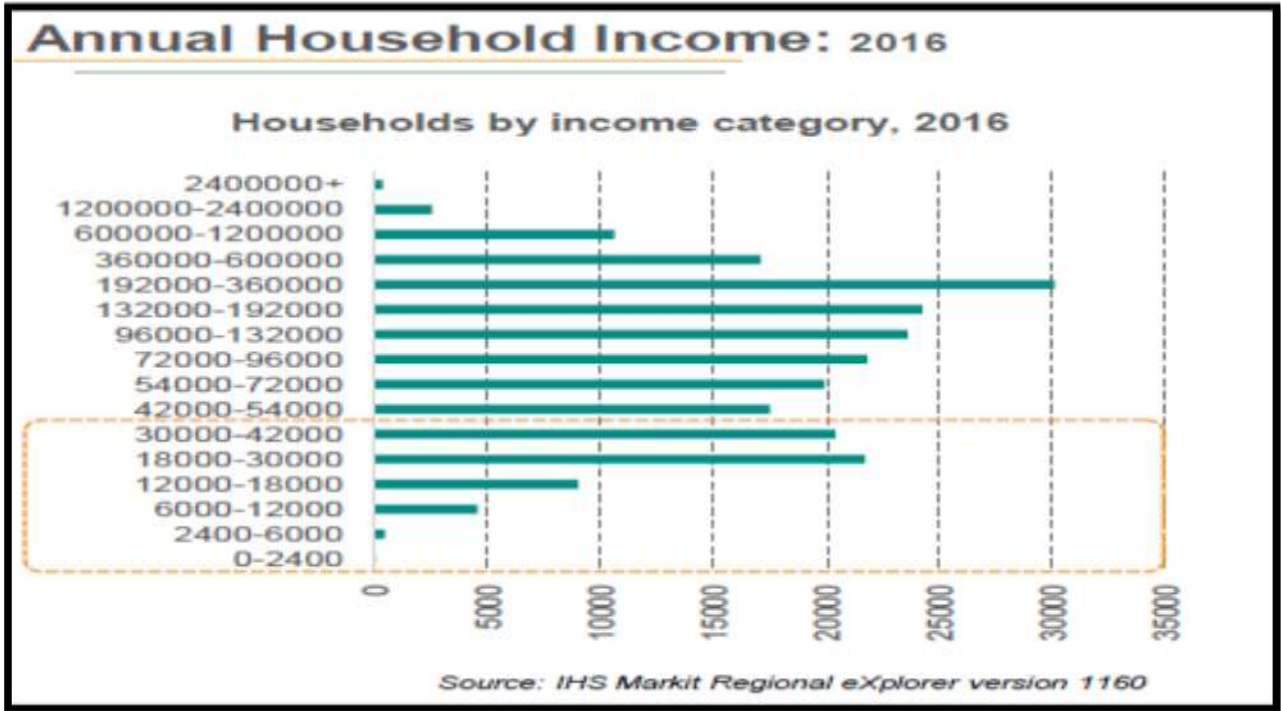
is an increase of 22 800 from 44 300 in 2006. The total number of unemployed people within Rustenburg constitutes 38.81% of the total number of unemployed people in Bojanala Platinum District Municipality. The Rustenburg Local Municipality experienced an average annual increase of 4.24% in the number of unemployed people, which is worse than that of the Bojanala Platinum District Municipality which had an average annual increase in unemployment of 2.62%. In 2016, the unemployment rate in Rustenburg Local Municipality (based on the official definition of unemployment) was 23.74%, which is an increase of 4.23 percentage points.



Graph 9: unemployment

6.2.9 Household Income

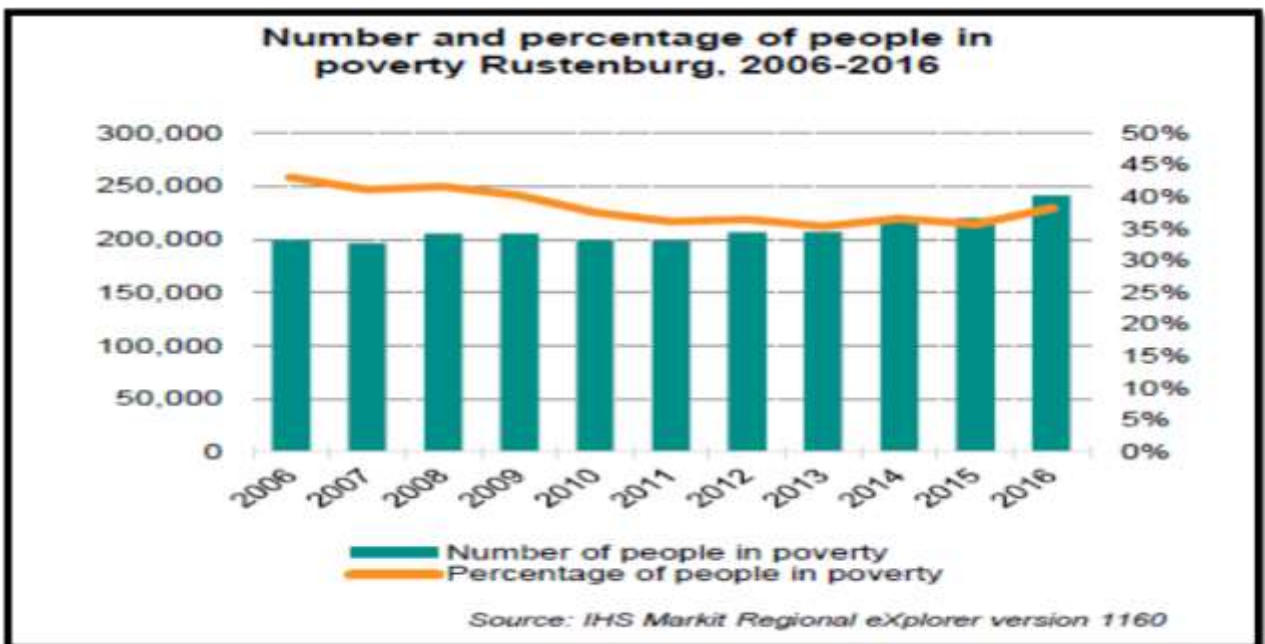
It was estimated that in 2016, 25.1% of all the households in the Rustenburg Local Municipality, were living on R42, 000 or less per annum. For the period 2006 to 2016 the number of households earning more than R30, 000 per annum has increased from 64.36% to 84.06%. It can be seen that the number of households with income equal to or lower than R6, 000 per year has decreased by a significant amount.



Graph 10: household income

6.2.9 Poverty

In 2016, there were 241 000 people living in poverty, using the upper poverty line definition, across Rustenburg Local Municipality - this is 20.89% higher than the 200 000 in 2006. The percentage of people living in poverty has decreased from 43.07% in 2006 to 38.20% in 2016, which indicates a decrease of 4.87 percentage points.



Graph 11: Poverty

6.2.10 HOUSEHOLD INFRASTRUCTURE

House Hold type	Status 2016	Backlog
Households by Dwelling Type	Rustenburg Local Municipality had a total number of 65 200 (29.16% of total households) very formal dwelling units, about 86 900 (38.84% of total households) formal dwelling units and around 68 800 (30.74% of total households) informal dwelling units.	When looking at the formal dwelling unit backlog (number of households not living in a formal dwelling) over time, it can be seen that in 2006 the number of households not living in a formal dwelling were 47 600 within Rustenburg Local Municipality. From 2006 this number increased annually at 4.16% to 71 600 in 2016.
Households by Sanitation Type	Rustenburg Local Municipality had a total number of 133 000 flush toilets (59.47% of total households), 27 800 Ventilation Improved Pit (VIP) (12.45% of total households) and 53 600 (23.97%) of total households pit toilets.	When looking at the <i>sanitation backlog</i> (number of households without hygienic toilets) over time, it can be seen that in 2006 the number of Households without any hygienic toilets in Rustenburg Local Municipality was 60 700, this increased annually at a rate of 0.35% to 62 800 in 2016
Households by Access to Water	Rustenburg Local Municipality had a total Number of 70 800 (or 31.63%) households with piped water inside the dwelling, a total of 112 000 (49.94%) households had piped water inside the yard and a total number of 20 000 (8.92%) households had no formal piped water.	When looking at the water backlog (number of households below RDP level) over time, it can be seen that in 2006 the number of households below the RDP-level were 28 000 within Rustenburg Local Municipality, this increased annually at 0.68% per annum To 30 000 in 2016.
Households by type of Electricity	Rustenburg Local Municipality had a total number of 4 150 (1.85%) households with electricity for lighting only, a total of 185 000 (82.55%) households had electricity for lighting and other purposes and a total number of 34 900 (15.60%)	When looking at the number of households with no electrical connection over time, it can be seen that in 2006 the households without an electrical connection in Rustenburg Local Municipality was 28 700, this increased annually at 1.97% per annum to 34 900 in 2016

House type	Hold	Status 2016	Backlog
		households did not use electricity.	
Households by Refuse Disposal		Rustenburg Local Municipality had a total number of 161 000 (71.85%) households which had their refuse removed weekly by the authority, a total of 7 410 (3.31%) Households had their refuse removed less often than weekly by the authority and a total number of 38 000 (16.97%) households which had to remove their refuse personally (own dump).	When looking at the number of households with no formal refuse removal, it can be seen that in 2006 the households with no formal refuse removal in Rustenburg Local Municipality was 73 100, this decreased annually at -2.71% per annum to 55 600 in 2016.

6.2.11 SETTLEMENT PATTERNS

Four broad types of settlements can be distinguished in the RLM:

Formal Urban Settlements have a formal (proclaimed) layout, are serviced with a full range of municipal services and the households can obtain security of tenure. These include areas such as Rustenburg, Tlhabane, Boitekong, Phatsima, Hartbeesfontein, Kroondal and Marikana.

Tribal Settlements are mainly located on Bafokeng tribal land and the households living in these settlements are considered Bafokeng citizens. Although these households do not own title deeds, they have security of tenure (permission to occupy) through their association with the tribe and are characterised by varying levels of service. Settlements that fall within this category include areas such as Phokeng, Kanana, Luka, Chaneng, Tlaseng, Rankelenyane, Thekwane and Photsaneng.

Rural Settlements are settlements that are similar in nature to the tribal settlements with regard to the residential densities and functions, but they are not located on Bafokeng tribal land.

Informal Settlements have mainly developed along the mining belt and close to mine shafts. These include areas such as Wonderkoppies, Nkaneng, Zakhele, Popo Molefe and Freedom Park. The 24 informal settlements in the RLM area are characterised by a lack of security of tenure and a lack of basic municipal services. Collectively these areas represent at least 24 000 households. (The total number of households residing in informal structures (including

backyard units and informal units in traditional authority areas) in the RLM municipal area is about 68 800 units.

7. IMPACT ASSESSMENT

Specialist studies and integration of findings has been undertaken; for Scoping Report in accordance with Appendix 2 of the Environmental Impact Assessment, Regulation, of 04 December 2014 to cover the following.

7.1 Impact Assessment Methodology

Methodology used in determining the significance of environmental impacts

1) METHODOLOGY OF IMPACT ASSESSMENT

According to the DEA IEM Series guideline on "Impact Significance" (2002), there are a number of quantitative and qualitative methods that can be used to identify the significance of impacts resulting from a development. The process of determining impact significance should ideally involve a process of determining the acceptability of a predicted impact to society. Making this process explicit and open to public comment and input would be an improvement of the BA process. Lesekha Consulting approach to determining significance is generally as follows:

- Use of expert opinion by the specialists ("professional judgment"), based on their experience, a site visit and analysis, and use of existing guidelines and strategic planning documents and conservation mapping (e.g. SANBI biodiversity databases);
- Our approach is more a qualitative approach - we do not have a formal matrix calculation of significance as is sometimes done.

2) SPECIALIST CRITERIA FOR IMPACT ASSESSMENT

The following methodology has been provided by the Lesekha Consulting for incorporation into assessments:

Assessment of Potential Impacts

The assessment of impact significance is based on the following conventions:

Nature of Impact - this reviews the type of effect that a proposed activity will have on the environment and should include "what will be affected and how?"

Spatial Extent - this should indicate whether the impact will be:

- Site specific;
- Local (<2 km from site);

- Regional (within 30 km of site); or
- National.

Duration - The timeframe during which (lifetime of) the impact will be experienced:

- Temporary (less than 1 year);
- Short term (1 to 6 years);
- Medium term (6 to 15 years);
- Long term (the impact will cease after the operational life of the activity); or
- Permanent (mitigation will not occur in such a way or in such a time span that the impact can be considered transient).

Intensity - it should be established whether the impact is destructive or innocuous and should be described as either:

- High (severe alteration of natural systems, patterns or processes such that they temporarily or permanently cease);
- Medium (notable alteration of natural systems, patterns or processes; where the environment continues to function but in a modified manner); or
- Low (negligible or no alteration of natural systems, patterns or processes); can be easily avoided by implementing appropriate mitigation measures, and will not have an influence on decision-making.

Probability - this considers the likelihood of the impact occurring and should be described as:

- Improbable (little or no chance of occurring);
- Probable (<50% chance of occurring);
- Highly probable (50 – 90% chance of occurring); or
- Definite (>90% chance of occurring).

Reversibility - this considers the degree to which the adverse environmental impacts are reversible or irreversible. For example, an impact will be described as low should the impact have little chance of being rectified to correct environmental impacts. On the other hand, an impact such as the nuisance factor caused by noise impacts from wind turbines can be considered to be highly reversible at the end of the project lifespan. The assessment of the reversibility of potential impacts is based on the following terms:

- High - impacts on the environment at the end of the operational life cycle are highly reversible;
- Moderate - impacts on the environment at the end of the operational life cycle are reasonably reversible;
- Low - impacts on the environment at the end of the operational life cycle are slightly reversible; or
- Non-reversible - impacts on the environment at the end of the operational life cycle

are not reversible and are consequently permanent.

Irreplaceability - this reviews the extent to which an environmental resource is replaceable or irreplaceable. For example, if the proposed project will be undertaken on land that is already transformed and degraded, this will yield a low irreplaceability score; however, should a proposed development destroy wetland systems for example, these may be considered irreplaceable and thus be described as high. The assessment of the degree to which the impact causes irreplaceable loss of resources is based on the following terms:

- High irreplaceability of resources (this is the least favourable assessment for the environment);
- Moderate irreplaceability of resources;
- Low irreplaceability of resources; or
- Resources are replaceable (this is the most favourable assessment for the environment).

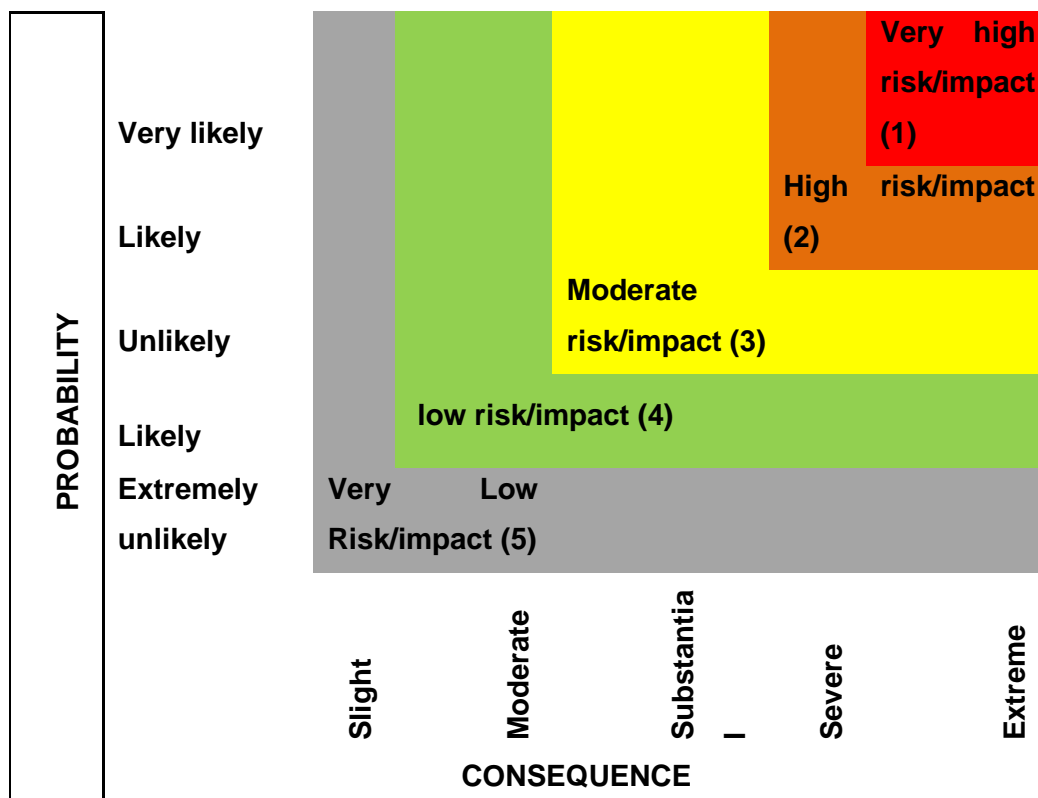


Figure 10: Guide to assessing risk/impact significance as a result of consequence and probability.

The status of the impacts and degree of confidence with respect to the assessment of the significance is stated as follows:

Status of the impact: A description as to whether the impact will be:

- Positive (environment overall benefits from impact);

- Negative (environment overall adversely affected); or
- Neutral (environment overall not affected).

Degree of confidence in predictions: The degree of confidence in the predictions, based on the availability of information and specialist knowledge. This should be assessed as:

- High;
- Medium; or
- Low.

Based on the above considerations, the specialist provides an overall evaluation of the significance of the potential impact, which should be described as follows:

Low to very low: the impact may result in minor alterations of the environment and can be reduced or avoided by implementing the appropriate mitigation measures, and will only have an influence on the decision-making if not mitigated;

Medium: the impact will result in moderate alteration of the environment and can be reduced or avoided by implementing the appropriate mitigation measures, and will only have an influence on the decision-making if not mitigated; or

High: Where it could have a “no-go” implication for the project unless mitigation or re-design is practically achievable. Furthermore, the following must be considered:

Impacts should be described both before and after the proposed mitigation and management measures have been implemented.

All impacts should be evaluated for the construction, operation and decommissioning phases of the project, where relevant.

The impact evaluation should take into consideration the cumulative effects associated with this and other facilities which are either developed or in the process of being developed in the region, if relevant.

Management Actions:

- Where negative impacts are identified, mitigatory measures will be identified to avoid or reduce negative impacts. Where no mitigatory measures are possible this will be stated.
- Where positive impacts are identified, augmentation measures will be identified to potentially enhance these.
- Quantifiable standards for measuring and monitoring mitigatory measures and enhancements will be set. This will include a programme for monitoring and reviewing the recommendations to ensure is ongoing effectiveness.

Monitoring:

Specialists should recommend monitoring requirements to assess the effectiveness of mitigation actions, indicating what actions are required, by whom, and the timing and frequency thereof.

Cumulative Impact:

Consideration is given to the extent of any accumulative impact that may occur due to the proposed development. Such impacts are evaluated with an assessment of similar developments already in the environment. Such impacts will be either positive or negative, and will be graded as being of negligible, low, medium or high impact.

Mitigation:

The objective of mitigation is to firstly avoid and minimise impacts where possible and where these cannot be completely avoided, to compensate for the negative impacts of the development on the receiving environment and to maximise re-vegetation and rehabilitation of disturbed areas. For each impact identified, appropriate mitigation measures to reduce or otherwise avoid the potentially negative impacts are suggested. All impacts are assessed without mitigation and with the mitigation measures as suggested. Briefly describe and compare the potential impacts (as appropriate), significance rating of impacts, proposed mitigation and significance rating of impacts after mitigation that are likely to occur as a result of the construction phase for the various alternatives of the proposed development. This must include an assessment of the significance of all impacts.

Briefly describe and compare the potential impacts (as appropriate), significance rating of impacts, proposed mitigation and significance rating of impacts after mitigation that are likely to occur as a result of the construction phase for the various alternatives of the proposed development. This must include an assessment of the significance of all impacts. Feasible site alternatives (i.e. location and property alternatives) do not exist for the proposed project. The No-Go alternative will be considered.

7.3.1 PROPOSAL: IMPACTS THAT MAY RESULT FROM THE PLANNING PHASE

Nature of Impact (potential)	Extent of Impact	Duration of Impact	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
------------------------------	------------------	--------------------	-------------------------------	----------------------	--------------------	------------------------------	-------------------------------

SITE LAYOUT PLAN

Resettlement Conflicts	Local	Planning (short term)	High	High	<p>The proposed development is currently occupied by approximately 400 informal settlements and within the proposed site of development there is vacant land. The formalisation of this informal settlement will be done in phases. The first phase to be built houses in undeveloped areas and the 400 informal settlements will be the first to occupy the houses this will be done in groups. Any material will be salvaged by the occupants.</p> <p>To avoid social conflicts during planning phases of the project, the contractor should appoint the steering committee and social Facilitator to minimise social issues.</p>	Low	Low
------------------------	-------	-----------------------	------	------	---	-----	-----

INFLUX OF PEOPLE

Commencing of planning phase will attract more people to occupy vacant land to be considered by the development.	Local	Planning (short term)	High	High	<p>The proposed site of development has 400 informal settlements and there is a vacant land of 41 ha, the first 400 informal settlements will be considered first during relocation and settlement to the completed houses. This must be done in terms of registration.</p>	Low	Low
--	-------	-----------------------	------	------	---	-----	-----

HEALTH AND SAFETY

7.3.1 PROPOSAL: IMPACTS THAT MAY RESULT FROM THE PLANNING PHASE

Nature of Impact (potential)	Extent of Impact	Duration of Impact	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
Due to unsafe practices that are being undertaken such as illegal electrical connections, construction of unsafe structures, health and safety issues are likely to arise.	Local	Planning phase (short term)	High	High	Employee's involvement is essential. Employees are required to practice good housekeeping, participate in training, report hazards and injuries, wear full personal protective equipment, and practice safe work habits. The contractor will must ensure that Employees are complying with Health and safety aspects such as the use of Person Protective Equipment and toolkit must be available and accessible during all phases. All the waste dumped along the river must be loaded into tipper tucks and be disposed of at a licenced landfill site.	Low	Low
The site is located close to a mining area health and safety issues are likely to arise.	Local	Planning (short term)	High	High	The site layout should take into account the location of the mining and the mining slimes such that residential areas are located far from the mining slimes The mining slimes should be fenced off. The vegetation established on the slimes will control dust from the mine trailing.	Low	Low
Disturbance of the normal routine and loss of social cultural values	Local	Planning (short term)	High	High	-A signboard must be placed in areas where demolition and construction activities will take place. -Pedestrian conflict with site access and construction vehicles to be managed. -Contractors must ensure that any damage to the pedestrian	Low	Low

7.3.1 PROPOSAL: IMPACTS THAT MAY RESULT FROM THE PLANNING PHASE								
Nature of Impact (potential)	Extent of Impact	Duration of Impact	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation	
					walkway or holding areas are maintained in good condition by attending to any damages (e.g. road signs or stormwater damage etc.) as soon as these develop. -All neighboring landowners and those that are disturbed due to construction activities are to be notified of construction activities and provided with regular feedback on the status of construction. -The Contractor and the steering committee must appointment of local labour and to reduce labour disputes.			
Disturbance of the cemetery	Local	Planning (short term)	High	High	The cemetery must be cleaned and fenced off before the development must take place.	Low	Low	
Pollution of the non-perennial stream on site	Local	Planning (short term)	High	High	No development should take place within 50m from the banks of the river. The river must be delineated the river to protect it from pollution. No riparian vegetation must be cleared	Low	Low	
Interferences with Mining activities.	Local	Planning (short term)	High	High	Consultation regarding the location the mine infrastructure must be done before construction commences. A buffer distance of 100m must be left between the mine the proposed site of development. Construction related disturbances will be kept to a minimum.	Low	Low	
INFRASTRUCTURE AND SERVICES								
Alignments that would interfere with existing and potential future	Local	Planning /Design phase (short	High	High	Minimise alignments that would interfere with existing and potential future and services. Construction related disturbances will be kept to a minimum. Consult with the community regarding impacts on access to site and	Low	Low	

7.3.1 PROPOSAL: IMPACTS THAT MAY RESULT FROM THE PLANNING PHASE

Nature of Impact (potential)	Extent of Impact	Duration of Impact	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
Infrastructure and services.		term)			foreseeable disruptions on infrastructure.		
Compliance with Environmental Legislation, guidelines, by laws and other applicable policies	Local	Planning Phase	High	High	The planning and design of the Township Establishment, must take into account, and comply with all relevant environmental legislation and policies as detailed in of this report.	Low	Low
Disturbance to the cemetery	Local	Planning Phase	High	High	The boundaries of the cemetery must be marked before construction can start. A buffering distance of 10m must be left from the boundaries of the cemetery.	Low	Low
Loss of agricultural land	Local	Planning Phase	High	High	Due to the establishment of the informal settlement on the greater part of the site this impact is insignificant. Alternative grazing areas must be established.	Low	Low
Disturbance Visual. Aspects The removal of large tracts of vegetation can drastically alter the appearance and character of a community.	Local	Planning	High	High	The design and sitting of the Township Establishment must ensure it does not result in a change of the landscape character and possibly, "sense of place" to adjacent property owners. This can be mitigated to some extent through the use of sensitive design, selection of materials and landscaping. It is assumed that the construction of formal housing will result in an in improved visual impact.	Low	Low
Bulk Services	Local	Planning phase	High	High	The development must be designed to make maximum use of existing infrastructure such as roads, electrical connections and substations, etc. in order to minimize environmental	Low	Low

7.3.1 PROPOSAL: IMPACTS THAT MAY RESULT FROM THE PLANNING PHASE

Nature of Impact (potential)	Extent of Impact	Duration of Impact	Probability before mitigation	Mitigatory Potential	Mitigation measure	Probability after mitigation	Significance after mitigation
					disturbances created by construction. Engineering investigation into the availability of such services has been undertaken. The municipality is in the process of upgrading the sewer and bulk water services to have adequate capacity to provide services for the proposed development.		
Stormwater	Local	Planning	High	High	The storm water Infrastructure as per the layout is planned in such a way that it's able to take increased storm water runoff into consideration. Storm water diversion measures such as ponding pools are recommended to control peak flows during thunderstorms. Increased stormwater can cause severe damage in terms of erosion and pollution. Areas of ecological value such as wetlands, downstream of the site, could be sensitive to any alteration of localised drainage patterns. The introduction of roads and impermeable areas of hard standing could increase rates of run-off and therefore the risk of localized flooding and contamination.	Low	Low
Appointment of irrelevant people who might fail to meet the set objectives for the proposed project.	Local	Planning (short term)	High	High	The project managers together with the appointed professionals will ensure that the correct planning has been put into place by appointing all relevant experts to tackle different tasks involved in the proposed project.	Low	Low

7.3.2 PROPOSAL: IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION PHASE

Potential Impacts	Extent	Duration	Probability of impacts	Consequences	Significance of impact/risk	Reversibility of impacts	Irreplaceability	Can impact be avoided	Can impact be managed or mitigated?	Potential mitigation	Significance of residual risk	Ranking
ACCESS TO SITE												
Access to site	Local	Short term	Likely	Slight	Medium	High	low	Yes	Yes	The contractor must ensure that the access roads leading to the construction are in good conditions.	Very Low	5
GEOLOGY AND SOILS												
Destabilisation of surface geology as a result of excavations. Potential erosion, degradation and loss of topsoil due to construction activities as well as stormwater runoff.	local	Short-term	Likely	Moderate	Medium	Moderate	moderate	Yes	Yes	All site disturbances must be limited to the areas where structures will be constructed. Cleared areas are effectively stabilised to prevent and control erosion. Excess rocks and boulders that are excavated from the site can be used for erosion protection work on site. Suitable excavated material is to be stockpiled next to excavations for use as backfill. Excess material as a result of excavation and construction	Moderate	3

7.3.2 PROPOSAL: IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION PHASE

Potential Impacts	Extent	Duration	Probability of impacts	Consequences	Significance of impact/risk	Reversibility of impacts	Irreplaceability	Can impact be avoided	Can impact be managed or mitigated?	Potential mitigation	Significance of residual risk	Ranking
										<p>rubble must be removed, and appropriately disposed of.</p> <p>Areas susceptible to erosion must be protected by installing the necessary temporary and/or permanent protective materials.</p> <p>Any tunnels or erosion channels developing during the construction period shall be backfilled and compacted, and affected areas restored to proper conditions.</p> <p>Soil stockpiling areas must be sufficiently situated away from the drainage areas.</p>		
Excavation may result in the destabilisation of the mine trailing.	Local	Short-term	likely	moderate	Very low	High	Low	Yes	Yes	A geotechnical study that has been undertaken for the site indicates that the geology of the site is stable therefore the impact is expected to be minimal.	Low	4
SOIL EROSION AND POLLUTION												
Erosion of stockpiled material (sand	Local	Short-	likely	mod	Very low	High	Low	Yes	Yes	Material must be stockpiled in	Very low	5

7.3.2 PROPOSAL: IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION PHASE

Potential Impacts	Extent	Duration	Probability of impacts	Consequences	Significance of impact/risk	Reversibility of impacts	Irreplaceability	Can impact be avoided	Can impact be managed or mitigated?	Potential mitigation	Significance of residual risk	Ranking
and steel etc).		term		erate						such a way that it cannot fall or cause injury or damage to properties or the natural environment. Stockpiles must not exceed 2m in height and must be covered if exposed to heavy wind or rain. Alternatively, low walls or berms must be constructed around the stockpiles. On completion of the construction all exposed soil must be re-vegetated, preferably with indigenous vegetation. Implementation of erosion control measures is essential.		
Topography												
Alteration of topography due to excavations, stockpiling of soil, building material, debris and waste material on site.	Local	Short-term	likely	Slightly	Very low	High	Low	Yes	Yes	Limit excavations to areas required for construction purposes. Avoid placing of stockpiles and other services on areas likely to	Very low	5

7.3.2 PROPOSAL: IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION PHASE

Potential Impacts	Extent	Duration	Probability of impacts	Consequences	Significance of impact/risk	Reversibility of impacts	Irreplaceability	Can impact be avoided	Can impact be managed or mitigated?	Potential mitigation	Significance of residual risk	Ranking
										<p>pose obtrusive visual impact</p> <p>Precautionary measures and design from the engineer must be implemented.</p> <p>Re-vegetation of re-profiled slopes;</p> <p>Temporary stabilisation of slopes using geotextiles; and Installation of gabions and re no mattresses.</p>		
Excavations can result in the destabilisation of the mine trails	Local	Short term	Likely	Moderate	Very low	Moderate	Moderate	Yes	Yes	<p>A geo technical study was undertaken to check the stability of the site.</p> <p>-A buffer distance of 500 m must be maintained between the site and the mine dams.</p>	Moderate	3
GROUND AND SURFACE WATER												
Pollution or Contamination of	Local	Short	Likely	Mod	Very low	Moderate	Mod	Yes	Yes	Adequate stormwater drainage	Moderate	3

7.3.2 PROPOSAL: IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION PHASE

Potential Impacts	Extent	Duration	Probability of impacts	Consequences	Significance of impact/risk	Reversibility of impacts	Irreplaceability	Can impact be avoided	Can impact be managed or mitigated?	Potential mitigation	Significance of residual risk	Ranking
<p>surface and groundwater due to excavations, spillages, leakage, incorrect storage and handling of chemicals, oils, lubricants, cement, fuels and other hazardous materials.</p> <p>Erosion of the banks and wetland/water courses pollution.</p>		term		erate		te	erate			<p>must be constructed. Stormwater drains are to be located and covered with metal grids to prevent blockages;</p> <p>All hazardous substances must be stored on an impervious surface in a designated bunded area able to contain 110% of the total volume of materials stored at any given time.</p> <p>All earth moving vehicles and equipment must be regularly maintained to ensure their integrity and reliability. No repairs may be undertaken beyond the contractor lay-down areas or without precautionary measures implemented.</p> <p>Ensure the establishment of stormwater diversion berms around the contractor lay down</p>		

7.3.2 PROPOSAL: IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION PHASE

Potential Impacts	Extent	Duration	Probability of impacts	Consequences	Significance of impact/risk	Reversibility of impacts	Irreplaceability	Can impact be avoided	Can impact be managed or mitigated?	Potential mitigation	Significance of residual risk	Ranking
										<p>area and other potential contaminated areas (e.g. diesel storage tanks or refuelling station).</p> <p>Care must be taken to ensure that no contaminated water from the construction site enters the natural watercourse. Preventative measures including establishing sumps from where contaminated water can be either treated in situ or removed to an appropriate waste site.</p> <p>Excess or spilled concrete must be confined within the works area and then removed to a waste site.</p> <p>Stream banks stabilization and prevention of further erosion to be implemented.</p>		
STORM WATER AND DRAINAGE SYSTEMS												

7.3.2 PROPOSAL: IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION PHASE

Potential Impacts	Extent	Duration	Probability of impacts	Consequences	Significance of impact/risk	Reversibility of impacts	Irreplaceability	Can impact be avoided	Can impact be managed or mitigated?	Potential mitigation	Significance of residual risk	Ranking
Poor storm water Management during construction can lead to erosion and loss of soil.	Local	Short term	Likely	Slight	Very low	High	Low	Yes	Yes	<p>Storm water control must be implemented during construction; however, this is a temporary impact of the proposal. A drainage system must be established for the construction camp. Contaminated stormwater must not be allowed to enter the river. The drainage system must be regularly checked to ensure an unobstructed water flow. To reduce erosion and loss of soil/silt during rain, silt traps should be used on slopes and areas that are likely to erode during development.</p> <p>Storm water drainage systems must be able to control the volume, speed and location of runoff expected. The site surface must be engineered and shaped in such a way that rapid</p>	Very Low	5

7.3.2 PROPOSAL: IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION PHASE

Potential Impacts	Extent	Duration	Probability of impacts	Consequences	Significance of impact/risk	Reversibility of impacts	Irreplaceability	Can impact be avoided	Can impact be managed or mitigated?	Potential mitigation	Significance of residual risk	Ranking
										<p>and efficient evacuation of runoff is achieved. Improve existing alignments and drainage systems. Provide containment areas for potential pollutants at construction camps, refuelling depots, asphalt plants and concrete batching plants. Appropriate waste management practices must be implemented during construction. The transport, storage, handling and disposal of hazardous substances must be adequately controlled and managed.</p> <p>If vegetation is to be removed, it must be done in phases to ensure that a minimum area of soil is exposed to potential erosion at any one time. Storm-water outfalls must be designed to reduce flow velocity and avoid stream bank and soil erosion.</p>		

7.3.2 PROPOSAL: IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION PHASE

Potential Impacts	Extent	Duration	Probability of impacts	Consequences	Significance of impact/risk	Reversibility of impacts	Irreplaceability	Can impact be avoided	Can impact be managed or mitigated?	Potential mitigation	Significance of residual risk	Ranking
										Disturbed surfaces must be re-vegetated immediately after completion of construction activities in each area.		
POLLUTION OF SURFACE AND GROUNDWATER												
Pollution or Contamination of surface and groundwater due to excavations, spillages, leakage, incorrect storage and handling of chemicals, oils, lubricants, cement, fuels and other hazardous materials.	Local	Short term	Likely	Moderate	Very low	Moderate	Moderate	Yes	Yes	<p>Adequate stormwater drainage must be constructed.</p> <p>Stormwater drains are to be located and covered with metal grids to prevent blockages;</p> <p>All hazardous substances must be stored on an impervious surface in a designated bunded area able to contain 110% of the total volume of materials stored at any given time.</p> <p>All earth moving vehicles and equipment must be regularly maintained to ensure their integrity and reliability. No repairs may be undertaken</p>	Very low	4

7.3.2 PROPOSAL: IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION PHASE

Potential Impacts	Extent	Duration	Probability of impacts	Consequences	Significance of impact/risk	Reversibility of impacts	Irreplaceability	Can impact be avoided	Can impact be managed or mitigated?	Potential mitigation	Significance of residual risk	Ranking
										<p>beyond the contractor lay-down areas or without precautionary measures implemented.</p> <p>Ensure the establishment of stormwater diversion berms around the contractor lay down area and other potential contaminated areas (e.g. diesel storage tanks or refuelling station).</p> <p>Care must be taken to ensure that no contaminated water from the construction site enters the natural watercourse. Preventative measures including establishing sumps from where contaminated water can be either treated in situ or removed to an appropriate waste site.</p> <p>Excess or spilled concrete must be confined within the works</p>		

7.3.2 PROPOSAL: IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION PHASE

Potential Impacts	Extent	Duration	Probability of impacts	Consequences	Significance of impact/risk	Reversibility of impacts	Irreplaceability	Can impact be avoided	Can impact be managed or mitigated?	Potential mitigation	Significance of residual risk	Ranking
										<p>area and then removed to a waste site.</p> <p>Stream banks stabilization and prevention of further erosion to be implemented. Enforcement and adherence to speed limits on onsite roads to prevent the liberation of dust. Dust suppression measures including regular application of water must be implemented. Water used for this purpose must be used in quantities that will not result in the generation of run-off. All site workers to wear PPE to avoid any exposure to contaminated dust particles.</p>		
Pollution or Contamination of surface and groundwater due to excavations, spillages, leakage, incorrect storage and handling of chemicals, oils, lubricants, cement,	Local	Short term	Likely	High	Moderate	Moderate	Yes	Yes	Yes	Adequate stormwater drainage should be constructed. Stormwater culverts and drains are to be located and covered with metal grids to prevent	Low	4

7.3.2 PROPOSAL: IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION PHASE

Potential Impacts	Extent	Duration	Probability of impacts	Consequences	Significance of impact/risk	Reversibility of impacts	Irreplaceability	Can impact be avoided	Can impact be managed or mitigated?	Potential mitigation	Significance of residual risk	Ranking
fuels and other hazardous materials. Erosion of the banks and wetland/water courses pollution.										<p>blockages;</p> <p>All hazardous substances must be stored on an impervious surface in a designated bunded area able to contain 110% of the total volume of materials stored at any given time.</p> <p>All earth moving vehicles and equipment must be regularly maintained to ensure their integrity and reliability. No repairs may be undertaken beyond the contractor lay-down areas or without precautionary measures implemented.</p> <p>Ensure the establishment of stormwater diversion berms</p>		

7.3.2 PROPOSAL: IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION PHASE

Potential Impacts	Extent	Duration	Probability of impacts	Consequences	Significance of impact/risk	Reversibility of impacts	Irreplaceability	Can impact be avoided	Can impact be managed or mitigated?	Potential mitigation	Significance of residual risk	Ranking
										<p>around the contractor lay down area and other potential contaminated areas (e.g. diesel storage tanks or refuelling station).</p> <p>Care must be taken to ensure that no contaminated water from the construction site enters the natural watercourse.</p> <p>Preventative measures including establishing sumps from where contaminated water can be either treated in situ or removed to an appropriate waste site.</p> <p>Excess or spilled concrete should be confined within the works area and then removed to a waste site.</p>		

7.3.2 PROPOSAL: IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION PHASE

Potential Impacts	Extent	Duration	Probability of impacts	Consequences	Significance of impact/risk	Reversibility of impacts	Irreplaceability	Can impact be avoided	Can impact be managed or mitigated?	Potential mitigation	Significance of residual risk	Ranking
										Stream banks stabilization and prevention of further erosion to be implemented.		
Erosion and sedimentation impacts are linked to alterations in hydrological regimes as a result of increased storm water flood peaks and altered terrestrial surfaces in the catchment area of wetlands/rivers	Local	Short term	Very likely	Severe	High	Low	Moderate	Yes	Yes	Increases in peak discharge may significantly increase stream power, thereby increasing the risk of erosion (localised scouring and incision) and resultant sedimentation of watercourses. Local site factors such as soil erodibility, vegetation cover, gradient of local slopes and regional rainfall/runoff intensity will affect the probability and intensity of erosion impacts. Typical results of erosion & sedimentation on water resources may include:	Low	5

7.3.2 PROPOSAL: IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION PHASE

Potential Impacts	Extent	Duration	Probability of impacts	Consequences	Significance of impact/risk	Reversibility of impacts	Irreplaceability	Can impact be avoided	Can impact be managed or mitigated?	Potential mitigation	Significance of residual risk	Ranking
										<ul style="list-style-type: none"> - Locally increased channel slopes. - Loss of in-stream biotope diversity due to scouring or blanketing of sites with sediment. - Localised scouring at stormwater discharge points into watercourses. - Lowering of the local water table and subsequent desiccation of adjacent wetland and riparian areas. <p>No development should be done within 50m from the edge of the river.</p>		
IMPACT ON FLORA												
Site clearing for construction activities leading to loss of species	Local	Short term	Very likely	Severe	High	Low	Moderate	Yes	Yes	Conduct a search and rescue operation for all conservation	Low	4

7.3.2 PROPOSAL: IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION PHASE

Potential Impacts	Extent	Duration	Probability of impacts	Consequences	Significance of impact/risk	Reversibility of impacts	Irreplaceability	Can impact be avoided	Can impact be managed or mitigated?	Potential mitigation	Significance of residual risk	Ranking
diversity and habitat characteristics.							e			<p>important plants on the site. This operation must be conducted during the summer period when vegetative and reproductive growth is evident;</p> <p>Appoint an Environmental Control Officer (ECO) prior to commencement of construction phase. Responsibilities must include, but not necessarily be limited to, ensuring adherence to EMPr guidelines, guidance of activities, planning, reporting to authorities, etc.;</p> <p>Compile and implement environmental monitoring programme, the aim of which must be ensuring long-term success of rehabilitation and prevention of environmental degradation.</p>		

7.3.2 PROPOSAL: IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION PHASE

Potential Impacts	Extent	Duration	Probability of impacts	Consequences	Significance of impact/risk	Reversibility of impacts	Irreplaceability	Can impact be avoided	Can impact be managed or mitigated?	Potential mitigation	Significance of residual risk	Ranking
										Limit site clearing to those areas required for construction at a time.		
IMPACT ON FAUNA												
Site clearing for construction activities leading to loss of species and habitat characteristics.	Local	Short term	Very likely	Severe	High	Moderate	Moderate	Yes	Yes	<p>Appoint an Environmental Control Officer (ECO) prior to commencement of construction phase to ensure adherence to EMPr guidelines, guidance of activities, planning, reporting to authorities, etc;</p> <p>Limit site clearing to those areas required for construction at a time Delineation of the conservation area prior to commencement of construction activities.</p> <p>The sensitive drainage line/wetland areas to be fenced off from all construction activities. Disturbance of</p>	Low	4

7.3.2 PROPOSAL: IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION PHASE

Potential Impacts	Extent	Duration	Probability of impacts	Consequences	Significance of impact/risk	Reversibility of impacts	Irreplaceability	Can impact be avoided	Can impact be managed or mitigated?	Potential mitigation	Significance of residual risk	Ranking
										mammals, birds, reptiles, other animals and their habitats must be prevented. If subterranean mammals are found in a construction area, construction must stop and the ECO must arrange for their capture and translocation to a safe area.		
Loss of agricultural land	Local	Short term	Very likely	Slight	Medium	High	low	Yes	Yes	Due to the establishment of the informal settlement on the greater part of the site this impact is insignificant. Alternative grazing areas must be established.	Very low	5
ALIEN VEGETATION												
Risk of alien invasive Encroachment into disturbed areas.	Local	Short term	Very likely	Slight	Medium	High	low	Yes	Yes	At present, a few alien species were identified however it must be controlled during construction, if it will be found. The establishment or spread of alien plant species on site must	Low	4

7.3.2 PROPOSAL: IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION PHASE

Potential Impacts	Extent	Duration	Probability of impacts	Consequences	Significance of impact/risk	Reversibility of impacts	Irreplaceability	Can impact be avoided	Can impact be managed or mitigated?	Potential mitigation	Significance of residual risk	Ranking
										be monitored and the correct removal and disposal of alien plant species must be followed. Rehabilitation of disturbed areas must commence as soon as construction activities are completed in those areas.		
REMOVAL OF ENDANGERED VEGETATION												
Removal of endangered Vegetation	Local	Short term	Likely	Slight	Medium	High	low	Yes	Yes	There are no protected areas, no irreplaceable areas and no reserved areas on site or in the immediate vicinity of the site. No evidence of faunal species was observed during the site visit. It is expected that there is a very low probability of finding any red-data species on the site as the adjacent sites are already occupied by the existing housing and the proposed site is located in a high-density urban area.	Very Low	5

7.3.2 PROPOSAL: IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION PHASE

Potential Impacts	Extent	Duration	Probability of impacts	Consequences	Significance of impact/risk	Reversibility of impacts	Irreplaceability	Can impact be avoided	Can impact be managed or mitigated?	Potential mitigation	Significance of residual risk	Ranking
										<p>Disturbance of indigenous fauna and flora, and the natural ecology in the surrounding areas must be avoided where possible.</p> <p>Gathering of firewood, fruit, medicinal plants, crops or any other natural material or the collecting of animals on site or in areas adjacent to the site is not allowed.</p>		
WASTE MANAGEMENT												
Improper storage and disposal of solid waste	Local	Short term	Likely	Slight	Medium	High	low	Yes	Yes	Due to the nature of the activity, waste is anticipated to be minimal. All solid waste generated during the construction process must be placed in a designated waste collection area within the site camp and must not be allowed to blow around the site, be accessible by animals, or be	Low	4

7.3.2 PROPOSAL: IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION PHASE

Potential Impacts	Extent	Duration	Probability of impacts	Consequences	Significance of impact/risk	Reversibility of impacts	Irreplaceability	Can impact be avoided	Can impact be managed or mitigated?	Potential mitigation	Significance of residual risk	Ranking
										<p>placed in piles adjacent to the skips/bins. All solid waste must then be disposed of at the nearest licensed landfill and safe disposal certificates must be obtained and kept on site at all times during construction. Separate skips/ bins for the different waste streams must be available on site. The waste containers must be appropriate to the waste type contained therein and where necessary must be lined and covered. This must be monitored by the ECO.</p> <p>Littering is not permitted on the site and general housekeeping must be enforced. General waste bins must be readily available for litter disposal and general housekeeping. The EMPr must be followed during</p>		

7.3.2 PROPOSAL: IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION PHASE

Potential Impacts	Extent	Duration	Probability of impacts	Consequences	Significance of impact/risk	Reversibility of impacts	Irreplaceability	Can impact be avoided	Can impact be managed or mitigated?	Potential mitigation	Significance of residual risk	Ranking
										<p>construction.</p> <p>All excess material and rubble must be removed from the site so not to restrict the rehabilitation process. All excess material and rubble must go to an approved designated landfill and a safe disposal certificate must be obtained. Site workers will be trained in avoiding such impacts during induction training and regular toolbox talks.</p>		
Littering around the site.	Local	Short term	Likely	Slight	Medium	High	low	Yes	Yes	Littering is not permitted on the site and general housekeeping must be enforced. General waste bins must be readily available for litter disposal and general housekeeping. The EMPr must be followed during construction	Low	4
Improper disposal of rubble i.e. burying or Neglecting building										All excess material and rubble must be removed from the site	Very Low	5

7.3.2 PROPOSAL: IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION PHASE

Potential Impacts	Extent	Duration	Probability of impacts	Consequences	Significance of impact/risk	Reversibility of impacts	Irreplaceability	Can impact be avoided	Can impact be managed or mitigated?	Potential mitigation	Significance of residual risk	Ranking
rubble resulting in direct Mechanical damage to Surrounding vegetation and untidiness of the site										so not to restrict the rehabilitation process. All excess material and rubble must go to an approved designated landfill and a safe disposal certificate must be obtained. Site workers will be trained in avoiding such impacts during induction training and regular toolbox talks.		
Improper disposal of toilet waste from chemical toilets resulting in contamination of the surrounding environment	Local	Short term	Likely	Slight	Medium	High	low	Yes	Yes	Toilet facilities must be provided for all staff members as standard construction practice. These toilets must be regularly cleaned by a reputable company and maintained in a clean state. This must be monitored in an EMPr.	Low	4
Increase waste to Landfill site.	Local	Short term	Likely	Slight	Medium	High	low	Yes	Yes	Due to the nature of the activity, waste is anticipated to be minimal. Where possible, waste streams will be separated and recycled to limit the amount of	Low	4

7.3.2 PROPOSAL: IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION PHASE

Potential Impacts	Extent	Duration	Probability of impacts	Consequences	Significance of impact/risk	Reversibility of impacts	Irreplaceability	Can impact be avoided	Can impact be managed or mitigated?	Potential mitigation	Significance of residual risk	Ranking
										waste being added to the landfill site.		
Hazardous Substances & Materials <i>(Those hazardous substances and materials which are potentially poisonous, flammable, carcinogenic or toxic. These could include: Diesel, petroleum, oil, bituminous products. Cement, Solvent based paints, Lubricants, Explosives, Drilling fluids. Pesticides, herbicides. Liquid petroleum gas</i>										Hazardous storage and refuelling areas must be underlain with an impermeable liner to protect groundwater quality. If applicable; fuel tanks must meet relevant specifications and must be elevated so that leaks may be detected easily. Storage areas containing hazardous substances and materials must be clearly signed. If applicable; Staff dealing with these Materials and substances must be aware of their potential impacts and follow the appropriate safety measures. Handling, storage and disposal of potential hazardous materials, residues or their containers must be in accordance with		

7.3.2 PROPOSAL: IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION PHASE

Potential Impacts	Extent	Duration	Probability of impacts	Consequences	Significance of impact/risk	Reversibility of impacts	Irreplaceability	Can impact be avoided	Can impact be managed or mitigated?	Potential mitigation	Significance of residual risk	Ranking
										DWS's requirements and specifications. Scheduled hazardous waste such as bitumen, tar, oils, etc., must be disposed of at approved facilities.		
Hazardous Areas due to Construction Activities	Local	Short term	Likely	Slight	Medium	High	low	Yes	Yes	Potentially hazardous areas such as trenches are to be demarcated clearly marked so that warning about these areas is visible during the day and night.		
Handling of Hazardous Materials	Local	Short term	Likely	Slight	Medium	High	low	Yes	Yes	No vehicles transporting, placing or compacting asphalt or any other bituminous product may be washed on site. Powders, e.g. lime, must not be mixed during excessively windy conditions. All concrete mixing must take place on a designated, impermeable surface. No vehicles transporting	Low	4

7.3.2 PROPOSAL: IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION PHASE

Potential Impacts	Extent	Duration	Probability of impacts	Consequences	Significance of impact/risk	Reversibility of impacts	Irreplaceability	Can impact be avoided	Can impact be managed or mitigated?	Potential mitigation	Significance of residual risk	Ranking
										concrete to Construction site may be washed on site. Hazardous substances and materials are to be transported in sealed containers or bags.		
NOISE POLLUTION												
Noise generated by construction workers, machinery and construction vehicles Disturbing surrounding residents.	Local	Short term	Likely	Slight	Medium	High	low	Yes	Yes	Excessive noise must be controlled on site to avoid scaring of animals. Workers will be trained regarding noise generation on site and construction hours will be kept to working hours (07h00 to 17h00). The construction activities will be monitored by an ECO who will ensure compliance with the construction EMP. All precautions must be taken to ensure that noise generation is kept to a minimum. If excessive noise is expected during certain stages of the construction,	Very Low	5

7.3.2 PROPOSAL: IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION PHASE

Potential Impacts	Extent	Duration	Probability of impacts	Consequences	Significance of impact/risk	Reversibility of impacts	Irreplaceability	Can impact be avoided	Can impact be managed or mitigated?	Potential mitigation	Significance of residual risk	Ranking
										<p>nearby residents must be notified prior to the event.</p> <p>All equipment and activities to comply with noise regulations.</p> <p>Adherence to Occupational Health and Safety Act.</p> <p>Ear protection for workers that may be affected by noise.</p>		
VISUAL IMPACT												
Visibility of dust, waste pollution and construction activities from surrounding roads and properties.	Local	Short term	Likely	Slight	Medium	High	low	Yes	Yes	<p>Apply dust control measures diligently, especially on provincial roads.</p> <p>Apply recommendations of specialist regarding colour and construction of site structures during the Construction Phase.</p> <p>Indigenous plants or trees must be retained where appropriate to provide screens to make the construction site less visually intrusive.</p>	Low	4

7.3.2 PROPOSAL: IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION PHASE

Potential Impacts	Extent	Duration	Probability of impacts	Consequences	Significance of impact/risk	Reversibility of impacts	Irreplaceability	Can impact be avoided	Can impact be managed or mitigated?	Potential mitigation	Significance of residual risk	Ranking
										<p>Lighting on site is to be sufficient for safety and security purposes, but shall not be intrusive to neighbouring residents.</p> <p>Part of the site is currently occupied by informal settlements and the other part is still vacant. The proposed development may improve the appearance of the area which will become more visually appealing.</p> <p>During the construction phase, the inadequate storage of material, equipment and waste may result a potential visual impact.</p>		
AIR QUALITY												
Dust pollution on site which would affect adjacent developments as a result of construction activities and	Local	Short term	Likely	Slight	Medium	High	low	Yes	Yes	The only emissions that will be generated will be from construction vehicles which will	Moderate	3

7.3.2 PROPOSAL: IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION PHASE

Potential Impacts	Extent	Duration	Probability of impacts	Consequences	Significance of impact/risk	Reversibility of impacts	Irreplaceability	Can impact be avoided	Can impact be managed or mitigated?	Potential mitigation	Significance of residual risk	Ranking
vehicles on site.										<p>be minimal and is not expected to significantly affect the surrounding communities or the environment.</p> <p>Enforcement and adherence to speed limits on onsite roads to Prevent the liberation of dust.</p> <p>Dust suppression measures including regular application of water must be implemented. Water used for this purpose must be used in quantities that will not result in the generation of run-off. All site workers to wear PPE to avoid any exposure to contaminated dust particles.</p>		
Dust generated from construction vehicles and other onsite activity.										Dust control measures (the use of a water cart / truck) must be used to wet exposed soil and thereby ensure that excessive dust levels		

7.3.2 PROPOSAL: IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION PHASE

Potential Impacts	Extent	Duration	Probability of impacts	Consequences	Significance of impact/risk	Reversibility of impacts	Irreplaceability	Can impact be avoided	Can impact be managed or mitigated?	Potential mitigation	Significance of residual risk	Ranking
										<p>are not experienced on site. The dust levels must be kept below the required SANBS standard to ensure minimal impact on the surrounding community and the environment.</p> <p>Areas that have been stripped of vegetation, existing exposed soil surface and sandy access route must be dampened regularly to avoid excessive dust, particularly during dry and windy conditions.</p> <p>The time that stripped areas are left open to exposure must be minimized wherever possible.</p> <p>Maintenance of existing vegetation helps control dust and prevents soil erosion. The ECO can order areas of vegetation to be fenced off</p>		

7.3.2 PROPOSAL: IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION PHASE

Potential Impacts	Extent	Duration	Probability of impacts	Consequences	Significance of impact/risk	Reversibility of impacts	Irreplaceability	Can impact be avoided	Can impact be managed or mitigated?	Potential mitigation	Significance of residual risk	Ranking
										<p>during construction that remain out of bounds.</p> <p>Construction vehicles must adhere to speed limit to avoid creating excessive dust. A speed limit of 30km/hr must be adhered to on all dirt roads. Contractor must provide appropriate arrangement for cooking and for heating requirements open fires not allowed.</p> <p>Spoil dumps need to be implemented Ensure that building type and design will be compactable to future planned adjacent developments</p>		
SOCIO-ECONOMIC IMPACTS												
Potential temporary Employment during the Construction phase	Local	Short term	Likely	Slight	Medium	High	low	Yes	Yes	Positive impact Jobs will be created in the development phase and must be optimized	Very Low	5

7.3.2 PROPOSAL: IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION PHASE

Potential Impacts	Extent	Duration	Probability of impacts	Consequences	Significance of impact/risk	Reversibility of impacts	Irreplaceability	Can impact be avoided	Can impact be managed or mitigated?	Potential mitigation	Significance of residual risk	Ranking
										<p>during the implementation stages to contribute towards longer term economic sustainability in the project area. Anticipated benefit also includes skill transfer and enhancement.</p> <p>Various ad hoc works may arise during the construction phase and a plan must be developed for obtaining the services of local skills and people where possible.</p> <p>The development will enhance economic opportunities for vulnerable communities. Unskilled labour, such as earth works and establishment, might be sourced from the neighbouring community. Depending on the skills levels required, it is believed that different skills levels will have</p>		

7.3.2 PROPOSAL: IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION PHASE

Potential Impacts	Extent	Duration	Probability of impacts	Consequences	Significance of impact/risk	Reversibility of impacts	Irreplaceability	Can impact be avoided	Can impact be managed or mitigated?	Potential mitigation	Significance of residual risk	Ranking
										<p>differently structured salary packages, thereby creating lower income to higher income opportunities.</p> <p>It is believed that most of the employment opportunities would be restricted to the construction phase. The required skills might not be available in the local area, which means that the appropriate skills might have to be "imported", thereby causing a reduction in the job and income opportunities available to local.</p>		
Various biophysical and sociological impacts due to poor staff conduct of contractor Staff Conduct on Site Social Environment & Affected Parties (I&APs).	Local	Short term	Likely	Slight	Medium	High	low	Yes	Yes	The contractor/developer must ensure proper supervision of employees at all times. Staffs needs to be made aware of the following general rules which must be followed at all times. No alcohol or drugs are to be present on site. No firearms are allowed on site or in vehicles	Low	4

7.3.2 PROPOSAL: IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION PHASE

Potential Impacts	Extent	Duration	Probability of impacts	Consequences	Significance of impact/risk	Reversibility of impacts	Irreplaceability	Can impact be avoided	Can impact be managed or mitigated?	Potential mitigation	Significance of residual risk	Ranking
										transporting staff to/from site, unless used by security personnel. Prevent excessive noise. No harvesting of firewood from the site or from the areas adjacent to it.		
HEALTH AND SAFETY												
Safety during construction is very trenches & excavation must not be left unbaricaded.	Local	Short term	Likely	Slight	Medium	High	low	Yes	Yes	Excavations and open trenches during construction could act as a trap for children, reptiles and animals. Pro-active measures which include the placement and covering of pipelines portion by portion will be done, no excavation areas may be left overnight, as well as the placement of danger tape around open ditches.	Very Low	5
Health Impacts. Temporary accommodation of workers during construction phase would lead to the influx of job seekers to the area. Temporary workers combined with	Local	Short term	Likely	Slight	Medium	High	low	Yes	Yes	Health as a result of possibility of single men engaging in relations with local women, this could lead the increased risk of STD's, HIV and AIDS as well as	Very Low	5

7.3.2 PROPOSAL: IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION PHASE

Potential Impacts	Extent	Duration	Probability of impacts	Consequences	Significance of impact/risk	Reversibility of impacts	Irreplaceability	Can impact be avoided	Can impact be managed or mitigated?	Potential mitigation	Significance of residual risk	Ranking
influx of unsuccessful job seekers can have a number of social impacts.										<p>unwanted pregnancies resulting in fatherless children. A potential increase in criminal and other illegal activities cannot be excluded. Contractors to procure products and services locally as far as possible.</p> <p>To mitigate the above-mentioned impacts local labourers will be hired, and there would be HIV awareness induction to educate labourers about safe sex practices.</p> <p>Influx of people not residing in Popo Molefe looking for employment can be mitigated by requesting information from the project proponent on the construction process and the likely profile of a typical construction worker. Conduct a desk top study to determine the</p>		

7.3.2 PROPOSAL: IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION PHASE

Potential Impacts	Extent	Duration	Probability of impacts	Consequences	Significance of impact/risk	Reversibility of impacts	Irreplaceability	Can impact be avoided	Can impact be managed or mitigated?	Potential mitigation	Significance of residual risk	Ranking
										health profile of the area, including typical indicators such as HIV prevalence, etc. Interviews with municipal officials and other authority figures (such as the South African Police Service) to determine the current extent of social problems in the area and initiatives to combat them.		
SECURITY												
Increase in crime in the area and increase in squatters on vacant land. -Migration of job seekers into the area in search of employment	Local	Short term	Likely	Slight	Medium	High	low	Yes	Yes	Proper management and planning A limited number of workers along with security guards will be allowed to sleep on site, however within a cordoned-off secure area. All staff will carry identification, access control will be enforced and the site will be swept and a	Low	4

7.3.2 PROPOSAL: IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION PHASE

Potential Impacts	Extent	Duration	Probability of impacts	Consequences	Significance of impact/risk	Reversibility of impacts	Irreplaceability	Can impact be avoided	Can impact be managed or mitigated?	Potential mitigation	Significance of residual risk	Ranking
										<p>search will be done each night.</p> <p>The development will have 24-hour access control and security.</p> <p>If necessary, a Community Liaison Officer can be appointed. The CLO (Community Liaison Officer) to be consulted regarding employment of members of the surrounding communities</p>		
FIRE												
Uncontrolled fires from cooking and Veld fires	Local	Short term	Likely	Slight	Medium	High	low	Yes	Yes	A designated area shall be assigned for fire making for the construction workers to prevent run-away veld fires do not occur.	Very Low	5
TRAFFIC												
Increase in construction traffic	Local	Short term	Likely	Slight	Medium	High	low	Yes	Yes	The access of large trucks will be investigated to provide a suitable access route that does not become a nuisance to	Very Low	5

7.3.2 PROPOSAL: IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION PHASE

Potential Impacts	Extent	Duration	Probability of impacts	Consequences	Significance of impact/risk	Reversibility of impacts	Irreplaceability	Can impact be avoided	Can impact be managed or mitigated?	Potential mitigation	Significance of residual risk	Ranking
										<p>existing residents</p> <p>Construction vehicles and activities must aim to avoid peak hour traffic times (weekdays 7-8am and 5-6pm).</p> <p>Establish an all-weather site access and wheel wash or shakedown to prevent soil and materials from being trekked onto the road.</p>		
HOUSEKEEPING AND MAINTENANCE												
Housekeeping Establishment and maintenance of storage areas.	Local	Short term	Likely	Slight	Medium	High	low	Yes	Yes	Storage areas of all the building materials and equipment. must be designed, demarcated and fenced if necessary. Location of storage areas must take into account prevailing winds, distance to water bodies, boreholes and on-site topography. Storage areas must be secure and be safe from	Very Low	5

7.3.2 PROPOSAL: IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION PHASE

Potential Impacts	Extent	Duration	Probability of impacts	Consequences	Significance of impact/risk	Reversibility of impacts	Irreplaceability	Can impact be avoided	Can impact be managed or mitigated?	Potential mitigation	Significance of residual risk	Ranking
										<p>access by children and animals. Fire prevention facilities must be present at all storage facilities.</p> <p>Contractors/Developer must ensure that storage facilities are cleaned and maintained regularly and that leaking containers are disposed of without spillage onto the soil</p>		
HERITAGE AND CULTURE												
All the archaeological, historical, Cultural or paleontological objects found on the development activity must not be disturbed.	Local	Short term	Likely	Slight	Medium	High	low	Yes	Yes	<p>During site visit a cemetery was identified on site, the cemetery must be cleaned and fenced off by the Municipality before construction commences.</p> <p>A Heritage Impact Assessment was undertaken to determine whether any features or artefacts of historical or cultural importance occur within the study area. No artefacts of</p>	Low	4

7.3.2 PROPOSAL: IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION PHASE

Potential Impacts	Extent	Duration	Probability of impacts	Consequences	Significance of impact/risk	Reversibility of impacts	Irreplaceability	Can impact be avoided	Can impact be managed or mitigated?	Potential mitigation	Significance of residual risk	Ranking
										<p>historical or cultural importance were identified onsite.</p> <p>Before construction starts, all staff must be informed regarding possible archaeological, historical or paleontological objects (e.g. tools, human's remains, fossils, etc) of value and what they look like. The engineer or contractor/developer must be notified should such an item be uncovered.</p> <p>All work must cease immediately and SAHRA/PHRA will be notified if any archaeological, historical or paleontological remains are discovered during development.</p>		

Nature of Impacts	Extent	Duration	Probability of impacts	Consequences	Significance of impact/	Reversibility	Irreplaceability of receiving environment/	Can impact be Avoided?	Can impact be mitigated?	Potential Mitigation Measure	Significance of residual risk/impact	Ranking
GEOLOGY AND SOILS												
Possible soil erosion of the banks of the stream and stormwater discharge points.	Local	Long term	Likely	Slight	Very low	High	High	Yes	Yes	Rehabilitation of the stream banks and proper design and construction of the storm water discharge points. All surfaces susceptible to erosion shall be covered with a suitable vegetative cover as soon as construction is completed.	Low	4
SOIL EROSION												
Erosion of surrounding banks due to storm water. Hardened surfaces, as opposed to undeveloped areas natural vegetation, will lead to an increase in runoff, which in turn may lead to increased pressure being exerted on the camp's storm water control system.	Local	Short term	Likely	Slight	Very low	High	High	Yes	Yes	Storm water control measures must be implemented to ensure run off from the buildings and footpath does not cause erosion to the surrounding environment. All storm water must be directed to the surrounding vegetative environment via storm water channels or pipelines without the possibility of	Very low	5

											sediment being picked up or structural damage to the water resources. Impermeable surface will be replaced by a permeable surface, leading to the reduction of storm water runoff. If vegetation is to be removed, it must be done in phases to ensure that a minimum area of soil is exposed to potential erosion at any one time. Storm-water outfalls must be designed to reduce flow velocity and avoid stream bank and soil erosion. Disturbed surfaces must be re-vegetated immediately after completion of construction activities in each area.		
GROUND AND SURFACE WATER													
General usage of water (Household, industries business, etc). Water pollution. No operational activities must impact on the	Local	Long term	Likely	Moderate	Low	High	High	Yes	Yes	Waste water to be recycled and re-used as far as possible. Good monitoring and management measurements to be set in place by facilities	Very low	5	

quantity of groundwater available to surrounding borehole users.											managers. Adequate measures to be put in place to prevent surface and groundwater contamination of any kind. All sewage infrastructures to be maintained and checked at yearly intervals. No French drains allowed.		
AIR QUALITY													
Emissions from vehicles and operations affecting ambient air quality.	Local	Long term	Likely	Slight	Very low	High	High	Yes	Yes	Trucks and vehicles to be properly maintained; Operations to meet air quality standards. Roads will be paved and thus eliminate dust.	Very Low	5	
FLORA													
General human interference and impact leading to loss of species diversity and habitat characteristics.	Local	Short term	Likely	Slight	Very low	High	High	Yes	Yes	Walkways throughout the open spaces and buffer zones will be strategically placed. Landscaping guidelines which include an allowable indigenous vegetation list that attracts fauna is to be formulated and implemented. Minimal to no exotic vegetation will be allowed.	Very Low	5	

											Indigenous vegetation must be maintained on the servitude on an annual basis and all exotics removed as they appear and disposed off appropriately. No faunal and flora species must be harmed by maintenance staff during any routine checks of the infrastructure development		
FAUNA													
General human interference and impact leading to loss of species diversity and habitat characteristics	Local	Long term	Likely	Moderate	Low	High	High	Yes	Yes	Walkways throughout the open spaces and buffer zones will be strategically placed. -Landscaping guidelines which include an allowable indigenous vegetation list that attracts fauna is to be formulated and implemented. -Minimal to no exotic vegetation will be allowed.	Low	4	
The ecological characteristics of the land development area and its surrounding. Habitat fragmentation	Local	Short-term	Likely	Slightly	Medium	Low	Low	Yes	Yes	At present, alien encroachment is minimal but must be controlled during construction. The	Low	4	

and negative impact on the functional contribution to the larger ecosystem Increase and spread of exotic invader species habitat destruction.											establishment or spread of alien plant species on site must be monitored and the correct removal and disposal of alien plant species must be followed. Rehabilitation of disturbed areas must commence as soon as construction activities are completed in those areas.		
ENVIRONMENTAL SENSITIVE AREA													
Loss of valuable landscape and habitat associated with environmental sensitive area or wetland areas.	Local	Short term	Unlikely	Slight	Very low	High	High	Yes	Yes	Walkways that are strategically placed and infrastructure services properly designed and implemented allowed.	Very low	5	
WATER QUALITY													
Impact on water and pollution	Local	Short term	likely	Moderate	Moderate	High	Moderate	Yes	Yes	The sewer reticulation networks infrastructure will be properly maintained on ongoing basis, the municipality will take the responsibility as well. Laying of reticulation pipelines will be according to the municipal standard. Storm water plan designed by the	Low	4	

										engineers will be sent to the municipality to ensure compliance. Water Resource Management is imperative.		
Potential impacts of leaking of pipes, bursting of reticulation pipes	Local	Short term	likely	Slight	Low	High	Low	Yes	Yes	The material that will be used when laying reticulation pipes will be of high quality to sustain the condition of the pipes when it is in operation. The good quality uPVC pipe will be used. They will range from 160mm to 250mm diameter. Leakage of water and sewer pipes must be properly monitored in order to minimise water loss and groundwater pollution.	Very low	5
WASTE MANAGEMENT												
A lack of management with regards to solid waste collection and sanitation could lead to surface. Water contamination.	Local	Short term	likely	Moderate	Very low	High	Low	Yes	Yes	Waste must be sorted for recycling and recyclable waste must be removed from the premises. All other waste must be disposed of in an environmentally responsible manner. Waste disposal must be	Very Low	4

										closely monitored to prevent pollution and other adverse impacts, especially of the water resources. A comprehensive waste management plan with procedures must be developed and implemented for the development.		
Waste Disposal	Local	Short term	Likely	Moderate	Low	High	High	Yes	Yes	Waste must be sorted for recycling and recyclable waste must be removed from the Reserve. All other waste must be disposed of in an environmentally responsible manner. Waste disposal must be closely monitored to prevent pollution and other adverse impacts, especially of the water resources. A comprehensive waste management plan with procedures must be developed and implemented.	Low	4
Littering around the site.	Local	Short term	Likely	Moderate	Low	Medium	Low	Yes	Yes	The municipality must ensure that waste generated is on a	Low	4

										weekly basis collected.		
<p>Aesthetics, Landscape Character and Sense of Place. Irresponsible and/or uncontrolled activity can have.</p> <p>-Higher density development and change in land use.</p> <p>-Change in sense of place of the specific site, however appropriate and good design will result in an improved urban character and will positively enhance the place.</p>	Local	Short term	Likely	Slight	Low	High	low	Yes	Yes	<p>Waste will be properly managed to avoid aesthetic impact and the landscape of the development will be appealing, grass and pavement will be developed.</p> <p>-Architectural guidelines (including aspects of roof and wall finishes, colours, heights of buildings, and lighting), as well as Landscape Architectural guidelines (screening, buffering, functioning, aesthetics etc) for the development will be developed to promote the enhancement of this urban area and therefore creating new and valuable places with a modified and positive urban.</p>	Low	4
Increase waste to Landfill site.	Local	Short term	Likely	Slight	Low	High	High	Yes	Yes	The client will ensure that the development is well maintained.	low	4
SAFETY AND SECURITY												
Active operational phase with residential	Site	Short term	Likely	Slight	Very low	High	High	Yes	Yes	Security provided via passive surveillance	Very low	5

leading to a decrease in crime due to the creation of a more secure environment and minimising of vacant land											-Appropriate environmental design to address safety and security issues -Good accessibility for emergency and police services		
TRAFFIC INCREASE													
Increase of residents and users of the area. Additional vehicles on road servicing industrial and commercial uses.	Local	Long term	Likely	Moderate	Low	High	High	Yes	Yes	All requirements of the municipality to be adhered to. All improvements to road infrastructure as recommended.	Low	4	
SOCIAL IMPACTS													
The socio-economic impact communities in the land development area and its surrounding. Number of employment opportunities will be created during the operation phase. Where possible local people must be employed for this project. Livelihood of civilians will be improved both from a social and economic perspective. More people will be	Local	Short term	Likely	Slight	Moderate	High	Low	Yes	Yes	This would be associated with a positive impact no mitigation required.	Moderate	3	

employed													
ACCESS TO SOCIAL AMENITIES AND ECONOMIC OPPORTUNITIES													
The location of township development encourages new residential developments to be located in a manner that will ensure that these settlements will have reasonable access to social amenities and economic opportunities. This entails the development of community facilities for the upliftment of the communities through sports and recreation, green open spaces and healthy life style.	Local	Long term	Likely	Moderate	Low	High	High	Yes	Yes	The proposed township layout has made provision for such social amenities. The conceptual township layout plan also makes provision for business related land uses such as retail, Business site. This provides access to economic opportunities for the future residents in the planned township. In rural areas, settlement patterns must balance the social, cultural and agricultural needs of families with the need to provide cost-effective services to households.	Low	4	
SOCIAL INFRASTRUCTURE AND LOCAL SERVICES													
Availability of services in the area.	Local	Long term	Likely	Moderate	Low	High	High	Yes	Yes	-All requirements of the municipality to be adhered to regarding service reticulation and delivery.	Low	4	
PROVISION OF SERVICES													
All new residential developments are reliant on access to	Local	Long term	Likely	Moderate	Low	High	High	Yes	Yes	The responsibility of operational and maintain the works, and the	Low	4	

bulk municipal services and these include water supply, separate sewerage and storm water drainage systems, electricity supply, and waste management.										continuity of the service lies with the Local Municipality.		
EMPLOYMENT AND IMPROVED TAX BASE FOR MUNICIPALITY												
-employment of local workers. -Decrease in unemployment and crimes. Employment and opportunities for BEE and local companies.	Site	Short term	Extremely unlikely	Sight	Very low	High	High	Yes	Yes	Local labour and employees to be made use of as far as possible for all aspects of the operational phase. BEE companies to be trained and involved in during the operational phase of the development e.g. Management of retail facilities, maintenance, landscaping, etc.	Very low	5
DEMAND FOR GOODS AND SERVICES												
Increase in demand for local goods and services. -Decrease in unemployment and empowerment of local trade and industry.	Local	Long term	Likely	Substantial	Moderate	High	High	High	Yes	Increase in local population and therefore demand for local products, goods and services.	Moderate	3
Increase in service delivery and number of housing units. -Increase in taxes	Local	Long term	Likely	Substantial	Moderate	High	High	Yes	Yes	No mitigation but vibrant community with access to services.	Moderate	3

raised on property.												
AIR QUALITY												
Health issues that result air pollution form the mining slimes	Local	Long term	Likely	Substantial	Moderate	High	High	Yes	Yes	An annual air quality monitoring, quantification must be implemented and mitigation effort needs to be implemented. The established vegetation helps to control dust from the mining slimes.	Moderate	3
Health issues that may result from exposure to mining waste.	Local	Long term	Likely	Substantial	Moderate	High	High	Yes	Yes	The mining slimes must be fenced to prevent people from accessing them. The proposed community must be educated about the potential health hazards of exposure to mining waste as some would to look for some metals in the mining dumps.	Moderate	3
Consumption of mine waste contaminated surface of ground water.	Local	Short term	Likely	Slight	low	High	High	Yes	Yes	The community must be supplied water from the municipal stream. Water sampling must be done for all the on before the borehole is drilled. Annual water quality monitoring should be	Low	4

										done on all boreholes.		
NOISE POLLUTION												
Noise Pollution. Noisy activities at the development site. Noise from vehicles using the new access	Local	Short term	Likely	Slight	low	High	High	Yes	Yes	Appropriate architectural design measures must be designed into the building. The architectural design consideration must be adequate in order to meet interior noise standards as specified by SANS 10103. Roof mounted fans may further require attenuators and need to be screened from noise sensitive areas. Night-time use of the facility must be kept to a minimum to ensure that no activities and regular operational activities, or movement of facility users to and from the facility disturb adjacent noise sensitive users.	Low	4
ENERGY CONSUMPTION												
During operation of the proposed project, additional energy will be consumed, resulting in a direct medium term	Local	Short term	Likely	Slight	Low	High	Low	Yes	Yes	Electricity provision must be extended to the new facilities that would require electricity connection. The lighting mechanism and bulbs	Low	4

increased demand on this resource. Energy efficiency resources are essential											must be the ones using low voltages. Naturally lit and well-ventilated buildings, that utilise alternative energy sources and those that are designed to offer attractive whole life performance to consumers are more likely to be sound wealth investments than those which are over-dependent on fossil fuels or which ignore the fundamental human need for a healthy and engaging environment. Increasingly, the design and layout of buildings necessitate active measures to maintain conditions which ensure the health and safety.		
ARCHAEOLOGICAL, HISTORICAL, CULTURAL ARTEFACTS													
Interference with archaeological, historical, Cultural or paleontological objects found on the development.	Local	Short term	Likely	Slight	Low	High	Low	Yes	Yes	The presence of the Graves on site is recognised. Recommendation made by the Heritage Specialist must be followed in the management of the	Very low	5	

											heritage sites. A buffer zone must be allowed from the gravel for any other development.		
--	--	--	--	--	--	--	--	--	--	--	--	--	--

7.3.4 IMPACTS THAT MAY RESULT FROM THE DECOMMISSIONING PHASE

Nature of Impacts	Extent of impact	Duration of impacts	Probability of impacts	Consequences	Significance of impacts	Reversibility of impacts	Irreplaceability of receiving environment	Can impact be avoided?	Can impact be mitigated?	Potential mitigation	Significance of residual impact	Ranking of impact/risk
WASTE MANAGEMENT												
All the rubble would need to be removed and disposed of Off-site. As a result, there will be a potential increase in the amount of waste sent to the landfill site.	Local	Long term	likely	Moderate	Moderate	Moderate	Low	Yes	Yes	All permanent buildings must be removed from the site. Removals should be phased so that rehabilitation can begin and soil surfaces are not exposed for too long. All rubble must be removed to a licensed waste disposal facility. Alternative uses for all waste materials should be sorted and recycling should take place where possible. Infrastructure removal must be phased in order to reduce soil exposure and the risk of soil erosion. Rehabilitation should begin as soon as buildings are removed to ensure that soil is stabilised as soon as possible. Any fuel required on site must be stored in a bunded	Low	4

7.3.4 IMPACTS THAT MAY RESULT FROM THE DECOMMISSIONING PHASE

Nature of Impacts	Extent of impact	Duration of impacts	Probability of impacts	Consequences	Significance of impacts	Reversibility of impacts	Irreplaceability of receiving environment	Can impact be avoided?	Can impact be mitigated?	Potential mitigation	Significance of residual impact	Ranking of impact/risk
										area with walls high enough to contain 110% of the total volume of the hazardous material. Care must be taken not to contaminate soils on site. A full rehabilitation plan needs to be compiled in order for the soils to be adequately rehabilitated to their original state		
Decommissioning activities causing erosion.	Local	Long term	Likely	Moderate	Moderate	Low	High	Yes	Yes	The site will need to be rehabilitated and re-vegetated preventing any possible erosion once decommissioning is complete. Control measures must be implemented during decommissioning and care should be taken to prevent any rubble or other waste material entering the river or wetland.	Low	4
Construction rubble / waste entering the water course could lead to increased sedimentation and impact on water quality.	Local	Long term	Moderate	Substantial	Moderate	Low	High	Yes	Yes	Control measures must be implemented during decommissioning and care should be taken to prevent any rubble or other waste material entering the water course.	Low	4
Increase waste to	Local	Long	Mod	Subs	Mod	Low	High	No	Yes	Waste streams will be separated and	Low	4

7.3.4 IMPACTS THAT MAY RESULT FROM THE DECOMMISSIONING PHASE												
Nature of Impacts	Extent of impact	Duration of impacts	Probability of impacts	Consequences	Significance of impacts	Reversibility of impacts	Irreplaceability of receiving environment	Can impact be avoided?	Can impact be mitigated?	Potential mitigation	Significance of residual impact	Ranking of impact/risk
Landfill site.		term	erate	tantial	erate					recycled where possible to limit amount of waste added to the landfill site. Skip bins must be placed on site during the decommissioning phase to accommodate rubble and other waste. As with the construction and operating phases, separating and recycling of waste must be made a priority. All other waste must be removed to the Landfill site.		
AIR QUALITY												
Air pollution impacts	Local	Long term	Moderate	Substantial	Moderate	Moderate	Moderate	Yes	No	Dust created during the removal of the buildings and associated infrastructure could potentially adversely affect nearby landowners. This potential issue must be managed through the damping down of exposed soils. The rehabilitation of the site must be made a priority in order to avoid dust becoming an issue in the surrounding areas.	Low	4
FLORA AND FAUNA IMPACTS												
Flora and Fauna Impacts	Local	Long term	Definite	High	Moderate	Low	High	Yes	Yes	Care must be taken during the decommissioning phase to take account and not disturb any fauna which may have re-	Low	4

7.3.4 IMPACTS THAT MAY RESULT FROM THE DECOMMISSIONING PHASE

Nature of Impacts	Extent of impact	Duration of impacts	Probability of impacts	Consequences	Significance of impacts	Reversibility of impacts	Irreplaceability of receiving environment	Can impact be avoided?	Can impact be mitigated?	Potential mitigation	Significance of residual impact	Ranking of impact/risk
										inhabited the area since the inception of the camp. No fauna must be harmed through the process. Indigenous vegetation must be utilised for the rehabilitation of the site. Vegetation similar to that of the surrounding areas should be used. A full rehabilitation plan is recommended in this regard to ensure that the site is returned to its original state. Any exotic species must be removed immediately during the rehabilitation process. The process should be carried out as quickly as possible to ensure that the disturbance of fauna is kept to a minimum.		
SOCIO-ECONOMIC IMPACTS												
Socio-economic Impacts	Local	Long term	Definite	Moderate	High	Low	High	No	No	Employees working on the site must be given sufficient notification of the closure of the Human Settlement in order for them to search for alternative employment. All employees must be compensated for accordingly.	Moderate	3

8. PUBLIC PARTICIPATION PROCESS

Public Participation Process (PPP) is regarded as an integral part of an EIA process. It allows the public to have access to all information regarding the proposed development in hand through transparency and provision of sufficient and accessible information about the development. Public participation plays an important role in the compilation of a Scoping Report as well as the planning, design and implementation of the project. Public participation is a process leading to informed decision - making, through a joint effort. The PPP for this project will satisfy the requirements stipulated in Chapter 6, Sections 54, 55, 56 and 57 of the NEMA EIA Regulations in terms of the National Environmental Management Act, Act 107 of 1998.

This section provides an overview of the public participation process undertaken to date and that to be undertaken during EIAR phase.

8.1 Objectives of Public Participation

The public consultation process is designed to provide information to and receive feedback from interested and affected parties (I&AP) that feedback is in turn fed into the EIA process. This provides organisations and individuals with the opportunity to raise concerns and make comments and suggestions regarding the proposed activity. By being part of the assessment process, stakeholders have the opportunity to influence the Project Layout, design and the Plan of Study for the EIA.

The approach to communication with the community is aligned with the principles of the NEMA as elaborated upon in General Notice 657, titled *“Guideline4: Public Participation”*(Department of Environmental Affairs and Tourism, 19 May, 2006), which states that: *“Public participation process means a process in which potential interested and affected parties(I&APs) are given an opportunity to comment on, or raise issues relevant to specific matters.”*

Public participation is an essential and regulatory requirement for an environmental authorisation process and must be undertaken in terms of the Environmental Impact Assessment (EIA) Regulations (GN R.326 of 4 December 2014). Public participation is a process that is intended to lead to a joint effort by stakeholders, technical specialists, the authorities and the proponent/developer who work together to produce better decisions than if they had acted independently. During the Scoping Phase the public participation process enables Interested and Affected Parties to:

- Understand the context of the EIA;
- Become informed and educated about the proposed project and its potential impacts;
- Raise issues of concern and suggestions for enhanced benefits;
- Verify that their comments, issues of concern and suggestions have been recorded;
- Assist in identifying reasonable alternatives; and

- Contribute relevant local information and traditional knowledge to the environmental impact assessment process.

During the EIAR phase, the public participation process assists I&AP to:

- Contribute relevant information and local and traditional knowledge to the environmental impact assessment process;
- Verify that their issues and suggestions have been evaluated and considered in the environmental investigations and feedback has been provided;
- Comment on the findings of the EIA; and
- Identify further issues of concern from the findings of the EIA.

During the decision-making phase the process enables I&AP to be advised of the outcome, i.e. the authority decision and how the decision can be appealed.

8.2 Identification of I&AP's

I&APs will be invited to participate in the process through newspaper advertisements, onsite notices and notification of adjacent land owners/occupiers. The notices will request potential I&APs to submit names and comments on any aspect of the application and/or the scoping report. This process is aimed to attract I&APs representing from various sectors of society including:

- Government (national, provincial and local);
- Environmental NGOs;
- Sibanye Thembelani Mine
- Community Representatives and
- Directly affected communities;
- Business and Commerce.

8.3 Pre-Scoping Notification

I&APs will be invited to participate in the process through newspaper advertisements, onsite notices and notification of adjacent land owners/occupiers. The notices will be requested potential I&APs to submit names and comments on any aspect of the application and/or the scoping report. This process aimed to attract I&APs representing from various sectors of society including:

- The Department of Water and Sanitation (DWS);
- Department of Health
- Department of Agriculture and Forestry (DAFF);
- The South African Heritage Resources Agency (SAHRA);
- Rustenburg Local Municipality (RLM).
- Bojanala District Municipality
- Department of Rural Development and Land Affairs;
- Telkom;

- Eskom;
- Department of Public Works and Roads;
- Sibanye Thembelani Mine
- Platinum Mill Resources
- Department of Mineral Resources.

8.4 Register of IAPs

The NEMA EIA Regulations distinguishes between I&APs and registered I&APs. The former, as contemplated in NEMA include: “(a) any person, group of persons or organisation interested in or affected by an activity; and (b) any organ of state that may have jurisdiction over any aspect of the activity”. However, RI&AP is an I&AP whose name is recorded in the register opened for an application. In terms of the Regulations an EAP must open and maintain a register which contains the names, contact details and addresses of:

- (a) All persons who have submitted written comments or attended meetings with the applicant or EAP;
- (b) All persons who have in writing requested the applicant or EAP managing the application, for their names to be placed on the register; and
- (c) All organs of state which have jurisdiction in respect of the activity to which the application relates.

Following the notification process, a Register for I&APs will be opened. This Draft Scoping Report will be submitted to all stakeholders for review. As per the EIA Regulations, future consultation during the Impact Assessment phase will only take place with registered I&APs. All stakeholders who were involved in the consultation process will be added to the register as the I&AP register will be updated throughout the EIA process.

8.5 Public Participation during Scoping

The availability of the Draft Scoping Report (DSR) was announced for comments via an advert in a local Newspaper and email communication to interested and affected parties including government departments as well as site notices. Briefly, the process involved the following:

- Newspaper advert in the Rustenburg Herald
- Distribution of this Draft Scoping Report (DSR) and a letter of invitation to participate to all I&APs;
- Placing of a hard copy of the DSR at the school located close to the study area;
- Distribution of the DSR government departments and to DEDECT at the same time.
- After expiry of the comment period on the DSR, the comment and responses report was generated;
- All comments were attended to and or incorporated into the Final Scoping Report.

- The final report would then be made available to the Registered Interested &Affected parties at the same time it is being submitted to DEDECT.

8.5.1 Public Participation during the EIA phase

The availability of the Draft Environmental Impact Assessment Report will be announced for comments via an advert in local Newspaper and email communication to interested and affected parties including government departments as well as site notices. Briefly, the process involved the following:

- Newspaper advert in the Rustenburg Herald
- Distribution of this Draft Environmental Impact Assessment Report and a letter of invitation to participate to all I&APs;
- Placing of a hard copy of the DEIR at the school located close to the study area;
- Distribution of the DEIR government departments and to DEDECT at the same time.
- After expiry of the comment period on the DEIR, the comment and responses report will be generated;
- All comments will be attended to and or incorporated into the Final Environmental Impact Assessment Report.
- The final report would then be made available to the Registered Interested &Affected parties at the same time it is being submitted to DEDECT.

8.6 Competent authority's decision on the scoping report

According to the Regulations interested and affected parties are expected to comment on the draft scoping report within 30 days of receipt of the report. Should the report be accepted with or without conditions, the plan of study for environmental impact assessment will be implemented. If the scoping report is considered inadequate, then an opportunity will be provided for the report to be amended to comply with Appendix 2 of the Regulations.

9.8 Summary of positive and negative impacts identified

The proposed Integrated Human Settlement results in both positive and negative impacts on the environment and the surrounding community. This final EIAR and the EMPr aims to ensure that the positive impacts of the proposed development are enhanced, while the negative impacts are avoided or minimized. In instances where the negative impacts cannot be avoided nor minimized, with robust consultations with the various specialists measures are put in place that further assist in ensuring that the best practicable methods are applied.

The positive impacts of the proposed development are as follows:

- Temporary/short term employment opportunities, which turns to skills development within the surrounding community.
- Provision of housing to curb the housing backlog within the RLM.
- Creation of open spaces to be incorporated into the development.
- Provision of bulk infrastructure for the RLM on implementation of the proposed bulk services works.

The negative impacts of the proposed development are as follows:

- The development will cause pressure on the municipality's capacity of bulk services; this would be the result on not implementing the proposed bulk service activities.
- The activities associated with the construction phase of the development will result in loss of both Flora and Fauna.
- The activities to be undertaken during the construction phase have potential to impact surface and groundwater resources.
- Construction activities are more likely to cause changes in air quality within the surrounding immediate environment.
- The development will result in a change of land use, which could alternatively be used for agricultural activities.
- Increased traffic and noise due to construction activities.
- For the whole duration of the construction phase, there will be visual impacts as a result of the construction activities.
- There is Health safety risks associated with the construction phase.
- Increase in the generation of waste as a result of construction activities.
- Destruction of the Heritage sites and graves.

It is important to emphasize that the negative impacts can be avoided or minimized through implementation of the EMPr during the project life cycles of the proposed development.

9.9 The possible mitigation measures that could be applied and the level of risk.

The following mitigation measures are some of the proposed methods to manage the proposed Integrated Human Settlement activities at the site in order to prevent and mitigate potential environmental impacts:

1) **Air Quality:** The project's main potential effect on air quality will be dust emission during the construction phase. Wet suppression will be employed on the haul roads and stockpiles areas. The objective will be to maintain a **low** risk.

2) **Soil, Land Capability and Land Use:** The risk of causing a significant degradation of topsoil quality and associated loss of land capability after rehabilitation will be minimised to a **low** level by:

a. Taking care to strip and stockpile topsoil, subsoil and overburden layers selectively and to prevent mixing of especially topsoil with any of the other layers;

b. Analysing the topsoil, fertilising it appropriately and re-vegetating it with local indigenous flora to re-establish the pre-project land use, which was natural veld.

3) **Ecology:** Successful restoration of the land capability will encourage natural re-colonisation of the rehabilitated area by Red data species, but it may require re-introduction of some species over time in order to reduce the risk of a low-functioning or unbalanced ecosystem to a **low** level.

4) **Cultural and Heritage aspects:** The graves site that have been identified must be fenced and protected. Unless unknown graves are unearthed, the expected impact on cultural and heritage resources is likely to be of **negligible** significance;

5) **Socio-economics:** The proposed township development will provide, given the levels of unemployment in the area, the impact is expected to be of **moderate** significance.

Other methods to manage the proposed sand mining activities at the site in order to prevent and mitigate potential environmental impacts:

- Spillages must be cleaned appropriately;
- Implement strict housekeeping measures;
- Store raw materials inside a roofed structure that is not prone to wind-blown dust;
- Make staff aware of potential environmental impacts;
- Waste (general and hazardous) must be correctly managed to prevent nuisance conditions or environmental pollution.
- Develop and implement a waste management plan;
- Appropriate bonding and containment measures will be implemented to prevent contamination of stormwater due to spillages of hazardous substances.
- Restrict the area of impact to as small an area as possible;
- Ensure health and safety of employees during the Construction phase.
- Prevent soil erosion, contamination and undertake appropriate remedial actions.
- Where possible limit the removal of riparian vegetation.
- Dust mask/Face mask will be provided to all employees working in the likely dusty areas.
- Proper maintenance of vehicles will be done, which minimize the pollutants.
- Vehicles should be covered by tarpaulin to reduce spillage on roads.
- Regular checking & Maintenance of vehicles, trucks, dumpers etc, will be conducted and pollution under control (PUC) vehicle will be used during transportation.
- Periodically, water will be sprinkled on haul roads to wet the surface.

9.10 Description of the process undertaken to identify, assess and rank the impacts

1) Project screening and understanding the baseline environment

In order to identify and fatal environmental or social flaws that the project may encounter, an initial project screening was conducted where all knowledge sources of the area are assessed and analysed. Site visits to determine the possible impacts the proposed project may have, and highlights which impacts need to be studied further. The description of the baseline environmental and socio-economic conditions above provides information on receptors and resources that have been identified as having the potential to be significantly affected by the proposed project. It also describes baseline conditions that have been used to make the assessment. The description of the baseline is aimed at providing sufficient detail to meet the following objectives:

- To identify the key conditions and sensitivities in areas potentially affected by the proposed Integrated Human Settlement Project;
- To provide a basis for extrapolation of the current situation, and development of future scenarios without the proposed Project;
- To provide data to aid the prediction and evaluation of possible impacts of the proposed project;
- To understand public concerns, perceptions and expectations regarding the proposed project;
- To allow the proposed Project to develop appropriate mitigation measures; and
- To provide a benchmark to assess future changes and to assess the effectiveness of mitigation measures.

2) Public Participation

The key principle of consultation is to ensure that the views of the public are taken into. The objective is to ensure the assessment is robust, transparent and has considered the full range of issues or perceptions, and to an appropriate level of detail.

3) Specialist studies

Specialist studies *were* commissioned to provide the information necessary to respond to the key issues associated with the proposed project. The Specialist *studies* were used to address issues raised during scoping and provide sufficient information that can be used by decision-makers.

4) Assessment of Impacts and Mitigation

Please see **(VI)** for the Impact Assessment Methodology used to identify, assess and rank the potential impacts associated with the development.

10. Summary of the findings and recommendations of specialist report.

Summary of the findings and recommendations of any specialist report			
Specialist study	Method	Findings	Recommendations
Heritage Impact Assessment	- Desktop study -Site visit	- Half of the proposed development site is an informal settlement which would have destroyed any Cultural Heritage Resources. The rest of the site is Bushveld. The only important Cultural Heritage Resources found is a large cemetery.	-The cemetery must be cleaned, fenced in and protected by the Local Municipality. -If during construction any cultural heritage resources or further graves are unearthed all work has to be stopped until the site has been inspected and mitigated by a cultural heritage practitioner.
Flood line study	Rational Method The conservation of mass and is applicable for catchment areas below 15 km ² . Flood peaks and empirical hydrographs can be determined by this method.	Refer to the map on page 1 of the Flood line Study.	-Detailed design studies should be undertaken in more detail for design purposes of road that any supporting structures located within the flood-lines are designed to withstand the flow velocities. This will necessitate more detailed elevation data to a good resolution even up to 0.5 / 1m.
Geo-technical Study	-Desktop Study - Field Work - Site visit - Lab testing	-The presence of ferricrete or calcrete indicates that perennial fluctuations of ground water will be encountered on site, proving that a seasonal perched water table may exist.	-Special care must be taken to ensure adequate surface drainage to prevent the accumulation of water next to structures. A concrete apron of at least 1,0m around structures are prescribed, and we

Summary of the findings and recommendations of any specialist report			
Specialist study	Method	Findings	Recommendations
		- The sites contain highly to very highly expansive and compressible soil, and foundations will need special treatment to withstand movement associated with the variation in moisture content of the soil.	<p>recommend no gardening around structures to keep the moisture content as stable as possible.</p> <p>-Some problems regarding excavatability can be expected on the site reflected in the R classification of the zones due to the presence of calcrete and some core stones of norite.</p> <p>Retaining walls as well as slope stabilization measures are recommended on all constructed embankments exceeding 1,5m.</p>
Traffic Impact Assessment	<p>-A site visit to observe current travel patterns, road geometry and to gain an understanding of the study area,</p> <p>-Trip generation, trip distribution and assignment,</p> <p>-Traffic Counts,</p> <p>-Capacity analysis,</p> <p>-Sites access,</p> <p>-Throat lengths,</p> <p>-Conceptual layouts,</p>	. The proposed development can be supported from a traffic flow perspective.	<p>-To ensure safe and satisfactory operations, routine maintenance for all roads and at intersections be identified along with improvements to road markings and signage;</p> <p>-A raised median be introduced by the Municipality or Provincial Road, and such scope are not part of this proposed development.</p> <p>-The potential of the 2024 traffic growth will require the intersections B and C to be upgraded/converted.</p>

Summary of the findings and recommendations of any specialist report

Specialist study	Method	Findings	Recommendations
<p>Service and Engineering Investigation Study</p>	<p>-Site visit -Consultation with the Local Municipality -Literature review</p>	<p>- An existing 22kV overhead network feeding from Eskom’s Boitekong 88/22kV Substation currently supplies electricity to the surrounding areas of Boitekong. -It is proposed to extend the existing overhead network from the Substation for electrical supply to Boitekong Ext 39 Pope Molefe Informal Settlement. -The bulk water and sewer for the proposed development has been catered for in the Rustenburg Master Plan and has been accommodated in the existing upgrade of the water system and existing sewage disposal work respectively. Internal water and sewer reticulation needs to be done in line with the finalized layout. -The informal access roads are to be upgraded to acceptable standards inline with proposed roadways and structural layers. - Solid waste management to form part of the prioritized formalization processes.</p>	<p>- Bulk Sewer – the infrastructure is adequate for the development; - Bulk Water – there is adequate infrastructure but the volume of water is low; - Floodline Analysis – to be conducted for the development; - Environmental Impact Assessment – to be conducted for the development; and - A new reservoir to be constructed within the Development.</p>

10.1 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.

In order to achieve appropriate environmental management standards and ensure that the findings of the environmental studies are implemented through practical measures, the recommendations from this study are included within an EMPr.

The EMPr must be used to ensure compliance with environmental specifications and management measures. The implementation of the EMPr for the life cycle phases of the project is considered to be vital in achieving the appropriate environmental management standards as detailed for this project. The proponent is not negated from complying with any other statutory requirements that is applicable to the undertaking of the activity. Relevant key legislation that must be complied with by the proponent includes inter alia:

- Provisions of the National Environmental Management Waste Act (No. 59 of 2008);
- Provisions of the National Water Act, 1998 (Act No 36 of 1998);
- Provisions of the National Heritage Resources Act, 1999 (Act No. 25 of 1999).
- Provisions of the National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004)
- Provisions of the National Environmental Management: Protected area Act , 2003 (Act 57 of 2003)

In addition, the following key conditions should be included as part of the authorisation:

- The proponent must appoint a suitably experienced (independent) Environmental Control Officer (ECO) for the construction phase of the development that will have the responsibility to ensure that the mitigation / rehabilitation measures and recommendations are implemented and to ensure compliance with the provisions of the EMPr.
- A scientifically calculated buffer of 33m is considered appropriate for this site. The delineated wetlands, together with the buffer zones should be considered as a sensitive area and excluded from the development footprint. It is further important to take the position of the watercourse within landscape into consideration when planning development as this is the area where water will flow and accumulate.
- water courses in close proximity of the development must be guarded against direct or indirect pollution of all water courses, especially water and soil pollution through

spillage, run-off, storm-water must be prevented, pollution needs to be contained. All sensitive sites will be rehabilitated.

- The topography of the site is undulating and the site is prone to ponding and flooding therefore Storm water reticulation design and construction of storm water infrastructure should ensure that overall development of the study area does not increase the rate of storm water runoff above that which the natural ground can safely accommodate at any point in the sub catchments thus post development runoff should be equal or less than the pre-development runoff. It is expected that the retention pond(s) will be required to act as a flood control measure to attenuate peak storm water runoff into natural water courses.
- A large cemetery that was recorded at site with graves should be cleaned and fenced in and maintained in a good condition.

10.2 Description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed

- All information provided by Lesekha Consulting and their specialist consultants was correct and valid at the time it was provided;
- The EAP does not accept any responsibility in the event that additional information comes to light at a later stage of the process;
- All data from an unpublished research is valid and accurate; and
- The scope of this investigation is limited to assessing the potential environmental impacts associated with the Proposed township development on Paardekraal.
- These assumptions, uncertainties and knowledge gaps are inclusive of the limitations of each specialist study conducted for the proposed development.

10.1 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;

An Environmental Assessment Practitioner (EAP) has found that the proposed township development on Paardekraal can continue on the basis that the buffer zones as per the specialist's reports and all the mitigation measures in this report and the EMPr will be implemented on site. The studies conducted for the proposed development show that the vegetation on site has been disturbed because the land was previously by the establishment of the informal settlements. All the cultural heritage of the site will be protected as outlined in the Heritage Impact Assessment as it pertains to the cemetery within the study area.

From the outcomes of this assessment it is the view of the EAP that a positive environmental authorisation be issued for this project since it will have positive social and economic contribution, It is however acknowledged that there will be impacts on the biophysical environment; conversely with the implementation of the mitigation measures outlined in this report and the EMPr as well as through adequate environmental monitoring and enforcement those impacts can be successfully mitigated.

11. EAP DECLARATION AND UNDERTAKING

I Lesego Senna 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 and inputs and recommendation from specialist have been correctly recorded in the report.



Lesego Senna

Signature of the environmental assessment practitioner:

Date: 29 June 2020.