

SCOPING REPORT

In terms of Section 24 and 24(D) of NEMA (Act No. 107 of 1998)

for:

ENVIRONMENTAL IMPACT ASSESSMENT FOR THE PROPOSED CLEARANCE OF 387.41768HA OF INDIGENOUS VEGETATION, OF WHICH 21 829 M2 IS LOCATED WITHIN 100 METRES FROM THE EDGE OF 2 PANS, IN ORDER TO ESTABLISH A MIXED USE TOWNSHIP, LOCATED ON PORTION 54 OF THE FARM MMABATHO TOWN AND TOWNLANDS

Report Date: October 2022



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Compiled for:

Mahikeng Local Municipality




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Report type	Draft Scoping Report (DSR)		
Project Title	<i>Environmental Impact Assessment for the proposed clearance of 387.41768ha of indigenous vegetation, of which 21 829 m² is located within 100 meters from the edge of 2 pans, in order to establish a mixed use township, located on Portion 54 of the farm Mmabatho Town and Townlands 301-JO.</i>		
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EXECUTIVE SUMMARY

The land owner **Mahikeng Local Municipality** has appointed **AB Enviro Consult CC**, an independent environmental consultancy, to undertake an Environmental Impact Assessment for the proposed clearance of 387.41768ha of indigenous vegetation, of which 21 829 m² is located within 100 meters from the edge of 2 pans, in order to establish a mixed use township, located on Portion 54 of the farm Mmabatho Town and Townlands 301-JO.

The local municipality intends to promote a more compact city in order to prevent the expansive provision of social and engineering services, as well as to prevent the economic decline of the traditional city centre. The Spatial Development Framework (SDF) addresses the scale of urban growth through planned extensions, infill and redevelopment strategies. The local municipality is aware of the need to integrate urban settlements, with a view to reduce travel distances to the areas of employment opportunities. It also addresses measures to promote compact and connected growth opportunities, such as the identification of revitalisation zones, densification and mixed land use zones. For any development to be sustainable and viable, land development and planning should ensure that communities are located close to job opportunities, social facilities and basic services.

The SDF and the Land Use Management system of the Local Municipality have identified certain areas that must address previously disadvantaged areas and historically disadvantaged residents. There is a definite need for the residents to have reasonable access to opportunities and facilities that supports living in the urban Settlement. It is the responsibility of the local municipality to ensure that the residents have reasonable access to community services and amenities, as well as employment opportunities and that the form of land development need to provide for basic needs in an affordable way. The proposed development will be in line with this principle by ensuring that people living the area do in fact have reasonable access to opportunities and facilities.

The proposed development aims to address the need identified by the Mahikeng Local Municipality, for the provision of additional business properties, to be alienated by means of full title and will provide for a mixed land use and social mix, such as the availability of housing in different price ranges

The activity is listed in terms of the Regulations (in force since 4 December 2014) in terms of Section 24(M) and 44 made under section 24(5) of the National Environmental Management Act (NEMA) 1998 (Act 107 of 1998) as amended and published in Government Notice No. R 326 of 2017. The proposed development triggers the following regulations and listed activities:

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	Time for construction to be completed applied for
GN.R. 983, 4 December 2014	28	<i>Residential, mixed, retail, commercial and institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such development:</i>	10 years

		<i>(i) will occur inside an urban area, where the total land to be developed will be 387.41768ha;</i>	
GN.R. 984, 4 December 2014	15	<i>The clearance of an area of 387.41768ha hectares or more of indigenous vegetation, in order to establish a mixed use township located on Portion 54 of the farm Mmabatho Town and Townlands.</i>	10 years
GN.R. 985, 4 December 2014	12 (h)(vi)	<i>The clearance of an area of 21 829 m² of indigenous vegetation</i> <i>h) In Northwest province:</i> <i>(vi) within 100 metres from the edge of 2 pans</i>	10 years

The purpose of the study is therefore to determine the impacts that the environment may have on the proposed activity, as well as the possible impacts that the activity may have on the environment.

The study is being conducted according to normal scientific practices. A theoretical background review was compiled for the different variables by using available information from the literature. Field verification was undertaken and visits paid to the site to gather further information and/or to verify information. It also includes the identification of *key interest groups*, both governmental and non-governmental, and to establish good lines of communication. Specialist studies were undertaken to determine the impacts on sensitive areas and to determine whether the proposed project can be sustainably implemented. The specialists will also advise on mitigation measures where applicable.

Although this is only the Scoping phase of the proposed development, no “fatal flaws” has been encountered as of yet. All the issues envisaged at this stage can be mitigated.

1. INTRODUCTION

The land owner **Mahikeng Local Municipality** has appointed **AB Enviro Consult CC**, an independent environmental consultancy, to undertake an Environmental Impact Assessment for the proposed clearance of 387.41768 ha of indigenous vegetation, of which 21 829 m² is located within 100 meters from the edge of 2 pans, in order to establish a mixed use township, located on Portion 54 of the farm Mmabatho Town and Townlands 301-JO.

The local municipality intends to promote a more compact city in order to prevent the expansive provision of social and engineering services, as well as to prevent the economic decline of the traditional city centre. The Spatial Development Framework (SDF) addresses the scale of urban growth through planned extensions, infill and redevelopment strategies. The local municipality is aware of the need to integrate urban settlements, with a view to reduce travel distances to the areas of employment opportunities. It also addresses measures to promote compact and connected growth opportunities, such as the identification of revitalisation zones, densification and mixed land use zones. For any development to be sustainable and viable, land development and planning should ensure that communities are located close to job opportunities, social facilities and basic services.

The SDF and the Land Use Management system of the Local Municipality have identified certain areas that must address previously disadvantaged areas and historically disadvantaged residents. There is a definite need for the residents to have reasonable access to opportunities and facilities that supports living in the urban Settlement. It is the responsibility of the local municipality to ensure that the residents have reasonable access to community services and amenities, as well as employment opportunities and that the form of land development need to provide for basic needs in an affordable way. The proposed development will be in line with this principle by ensuring that people living the area do in fact have reasonable access to opportunities and facilities

1.1 THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

The purpose of this document is to adhere to the requirements for compilation of Environmental Impact Assessment Reports as amended and published in *Government Notice 517 in Government Gazette 44701 dated 11 June 2021*, Appendix 2, and the National Environmental Management Act (Act 107 of 1998) (NEMA).

1.2 DESCRIPTION OF THE PROCESS FOLLOWED

In order to assess a proposed development it is important to take into consideration the principles of NEMA. These principles are outlined in Chapter 1 and read as follows:

- 1) *“The principles set out in this section apply throughout the Republic to the actions of all organs of state that may significantly affect the environment and—*
 - a. *shall apply alongside all other appropriate and relevant considerations, including the State’s responsibility to respect, protect, promote and fulfil the social and economic rights in Chapter 2 of the Constitution and in particular the basic needs of categories of persons disadvantaged by unfair discrimination;*
 - b. *serve as the general framework within which environmental management and implementation plans must be formulated;*
 - c. *serve as guidelines by reference to which any organ of state must exercise any function when taking any decision in terms of this Act or any statutory provision concerning the protection of the environment;*
 - d. *serve as principles by reference to which a conciliator appointed under this Act must make recommendations; and*

- e. *guide the interpretation administration and implementation of this Act, and any other law concerned with the protection or management of the environment.*
- 2) *Environmental management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural and social interests equitably.*
- 3) *Development must be socially, environmentally and economically sustainable.*
- 4) (a) *Sustainable development requires the consideration of all relevant factors including the following:*
 - (i) *That the disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimised and remedied;*
 - (ii) *that pollution and degradation of the environment are avoided, or, where they cannot be altogether avoided, are minimised and remedied;*
 - (iii) *that the disturbance of landscapes and sites that constitute the nation's cultural heritage is avoided, or where it cannot be altogether avoided, is minimised and remedied;*
 - (iv) *that waste is avoided. or where it cannot be altogether avoided, minimised and re-used or recycled where possible and otherwise disposed of in a responsible manner;*
 - (v) *that the use and exploitation of non-renewable natural resources is responsible and equitable, and takes into account the consequences of the depletion of the resource;*
 - (vi) *that the development use and exploitation of renewable resources and the ecosystems of which they are part do not exceed the level beyond which their integrity is jeopardised;*
 - (vii) *that a risk-averse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions; and*
 - (viii) *that negative impacts on the environment and on people's environmental rights be anticipated and prevented, and where they cannot be altogether prevented, are minimised and remedied.*
- (b) *Environmental management must be integrated, acknowledging that all elements of the environment are linked and interrelated, and it must take into account the effects of decisions on all aspects of the environment and all people in the environment by pursuing the selection of the best practicable environmental option.*
- (c) *Environmental justice must be pursued so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons.*
- (d) *Equitable access to environmental resources, benefits and services to meet basic human needs and ensure human well-being must be pursued and special measures may be taken to ensure access thereto by categories of persons disadvantaged by unfair discrimination.*
- (e) *Responsibility for the environmental health and safety consequences of a policy, programme, project, product, process, service or activity exists throughout its life cycle.*
- (f) *The participation of all interested and affected parties in environmental governance must be promoted, and all people must have the opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation and participation by vulnerable and disadvantaged persons must be ensured.*

- (g) *Decisions must take into account the interests, needs and values of all interested and affected parties, and this includes recognizing all forms of knowledge, including traditional and ordinary knowledge.*
- (h) *Community wellbeing and empowerment must be promoted through environmental education, the raising of environmental awareness, the sharing of knowledge and experience and other appropriate means.*
- (i) *The social, economic and environmental impacts of activities, including disadvantages and benefits must be considered, assessed and evaluated and decisions must be appropriate in the light of such consideration and assessment.*
- (j) *The right of workers to refuse work that is harmful to human health or the environment and to be informed of dangers must be respected and protected.*
- (k) *Decisions must be taken in an open and transparent manner, and access to information must be provided in accordance with the law.*
- (l) *There must be intergovernmental co-ordination and harmonisation of policies, legislation and actions relating to the environment.*
- (m) *Actual or potential conflicts of interest between organs of state should be resolved through conflict resolution procedures.*
- (n) *Global and international responsibilities relating to the environment must be discharged in the national interest.*
- (o) *The environment is held in public trust for the people, the beneficial use of environmental resources must serve the public interest and the environment must be protected as the people's common heritage.*
- (p) *The costs of remedying pollution, environmental degradation consequent adverse health effects and of preventing, controlling or minimizing further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment.*
- (q) *The vital role of women and youth in environmental management and development must be recognised and their full participation therein must be promoted.*
- (r) *Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries, wetlands and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure."*

The above mentioned principals and the applicable legislation, Policies and Guidelines as described in Paragraph 5 of this Report were taken into account in the assessment of the Environmental Impacts for the proposed development. The process followed can be described as follows:

- 1) The EAP was contracted by the land owner, **Mahikeng Local Municipality** as their Independent Environmental Assessment Practitioner.
- 2) A Geotechnical Engineer was appointed to determine whether the Geology and Soils of the site is suitable for the proposed development
- 3) A Town Planner has developed the layout in conjunction with the surveyor
- 4) The Civil Engineer was appointed to determine the capability of existing infrastructure to be linked to proposed development and readily available bulk services. He also designed the proposed infrastructure.
- 5) A Flood line specialist has determined the 1:100 year flood line of the stormwater canals that intersects the site to the south and north-western corner.

- 6) A SAHRA Specialist has been appointed to determine the possible impact of the development on Archaeological and Cultural features.
- 7) A Fauna and Flora and Wetland specialist has been appointed to determine the impact of the proposed development on the Fauna and Flora and wetlands of the area. He was also appointed to delineate the extent watercourses on site.
- 8) An Environmental Screening Process was conducted by the EAP to ensure that all the relevant Environmental Legislation is taken into consideration.
- 9) Desk top studies were conducted and alternatives assessed.
- 10) Site inspections were carried out to verify the outcomes of the desktop studies, and the preferred alternative defined.
- 11) A full Public Participation Process is being followed to obtain inputs from interested and affected parties.
- 12) All the information obtained from the above mentioned processes is being used to assess the Environmental Impact that the proposed development may have on the Environment and vice versa.
- 13) The inputs from Specialists, interested and affected parties, together with the knowledge of the EAP is being used to determine measures to avoid, mitigate and manage potential impacts. These measures are described in the Environmental Management Programme.

1.3 SCOPING PHASE

The Scoping phase includes the necessary investigations to assess the suitability of the identified site and its surrounding environment, for the development proposal. The scoping exercise describes the “status quo” of the bio-physical, social, economical and cultural environment, and identifies the anticipated environmental aspects associated with the proposed development. Scoping includes the identification of key interest groups, (both government and non-government), and to establish efficient and effective communication. Identifying and informing Interested and affected parties of the proposed development may have an impact on the focus of the EIA. (S. Cliff, 2015)

The purpose of the Scoping Report is to document the outcome of the Scoping Phase of the project. This report fulfils the requirement of the EIA Regulations (2014) for the documentation of the scoping phase. The Scoping Report is compiled in accordance with Section 21(3) of NEMA’s 2014 EIA Regulation (GN R. 982) as amended and published in Government Notice 517 in Government Gazette 44701 dated 11 June 2021. Table 1 below provides a summary of the legislative requirements in terms of a Scoping Report as stipulated in Section 21(3) of the EIA Regulations of December 2014 as amended and published in *Government Notice 517 in Government Gazette 44701 dated 11 June 2021*. Cross-references are provided in terms of the relevant section within this Scoping Report where the NEMA and Scoping Report requirements have been addressed.

Table 1: Scoping Report content as per Section 21(3) of NEMA’s 2014 EIA Regulations of December 2014 as amended and published in *Government Notice 517 in Government Gazette 44701 dated 11 June 2021*, Appendix 2.

Section of the EIA Regulations, 2014	Description of EIA Regulations Requirements for Scoping Reports	Location in this Scoping report
Appendix 2, section 2 (1)(a)	Details of - (i) the EAP who prepared the report; and (ii) the expertise of the EAP, including a curriculum vitae;	Paragraph 2
Appendix 2, section 2 (1)(b)	The location of the activity, including – (i) The 21 digit Surveyor General code of each cadastral land parcel; (ii) Where available, the physical address and farm name;	Paragraph 4 Paragraph 4

Section of the EIA Regulations, 2014	Description of EIA Regulations Requirements for Scoping Reports	Location in this Scoping report
	(iii) Where the required information in items (i) and (ii) is not available, coordinates of the boundary of the property or properties	Paragraph 4
Appendix 2, section 2 (1)(c)	<p>A plan which locates the proposed activity or activities applied for, at an appropriate scale, or, if it is –</p> <p>(i) A linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or</p> <p>(ii) On land where the property has not been defined, the coordinates within which the activity is to be undertaken; or</p> <p>(iii) On land where the property has not been defined, the coordinates</p>	Figure 1 and Figure 2, 3 and 4
Appendix 2, section 2 (1)(d)	<p>A description of the scope of the proposed activity, including –</p> <p>(i) All listed and specified activities triggered;</p> <p>(ii) A description of the activities to be undertaken, including associated structures and infrastructure.</p>	Paragraph 3 Paragraph 3
Appendix 2, section 2 (1)(e)	A description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process.	Paragraph 5
Appendix 2, section 2 (1)(f)	A motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location.	Paragraph 6
Appendix 2, section 2 (1)(g)	<p>A full description of the process followed to reach the proposed preferred activity, site and location within the site, including-</p> <p>(i) Details of all alternatives considered;</p> <p>(ii) Details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;</p> <p>(iii) A summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them;</p> <p>(iv) The environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;</p> <p>(v) The impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration, and probability of the impacts, including the degree to which the impacts-</p> <p>(aa) can be reversed;</p> <p>(bb) may cause irreplaceable loss of resources; and</p> <p>(cc) can be avoided, managed, or mitigated.</p> <p>(vi) The methodology used in deterring and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives;</p> <p>(vii) Positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographic, physical, biological, social, economic, heritage and cultural aspects;</p> <p>(viii) The possible mitigation measures that could be applied and level of residual risk;</p>	Paragraph 7 Paragraph 10 Paragraph 10 Paragraph 8 Paragraph 9 Paragraph 9 Paragraph 9 Paragraph 9 Paragraph 9 Paragraph 9

Section of the EIA Regulations, 2014	Description of EIA Regulations Requirements for Scoping Reports	Location in this Scoping report
	(ix) The outcome of the site selection matrix;	Not Applicable
	(x) If no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such and;	Not Applicable
	(xi) A concluding statement indicating the preferred alternatives, including preferred location of the activity.	Paragraph 11
Appendix 2, section 2 (1)(h)	A plan of study for undertaking the environmental impact assessment process to be undertaken including- (i) A description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity; (ii) A description of the aspects to be assessed as part of the environmental impact assessment process; (iii) Aspects to be assessed by specialists; (iv) A description of the proposed method of assessing the environmental aspects, including aspects to be assessed by specialists; (v) A description of the proposed method of assessing duration and significance; (vi) An indication of the stages at which the competent authority will be consulted; (vii) Particulars of the public participation process that will be conducted during the environmental impact assessment process; (viii) A description of the tasks that will be undertaken as part of the environmental impact assessment process; (ix) Identify suitable measures to avoid, reverse, mitigate or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored.	Paragraph 12 Paragraph 12.1 Paragraph 12.2 Paragraph 12.3 Paragraph 12.4 Paragraph 12.5 Paragraph 12.6 Paragraph 12.7 Paragraph 12.8 Paragraph 12.9
Appendix 2, section 2 (1)(i)	An undertaking under oath or affirmation by the EAP in relation to- (i) The correctness of the information provided in the report; (ii) The inclusion of the comments and inputs from stakeholders and interested and affected parties; and (iii) Any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties.	Paragraph 13 Paragraph 13 Paragraph 13
Appendix 2, section 2 (1)(j)	An undertaking under oath or affirmation by the EAP in relation to the level of agreement between the EAP and interested and affected parties on the plan of study for undertaking the environmental impact assessment.	Paragraph 13
Appendix 2, section 2 (1)(k)	Where applicable, any specific information required by the competent authority.	To be included in final Scoping Report
Appendix 2, section 2 (1)(l)	Any other matter required in terms of section 24(4) (a) and (b) of the Act.	Not Applicable

1.4.3 Assumptions, uncertainties, limitations and gaps in knowledge:

This report is based on current available information and, as a result, the following limitations and assumptions are implicit –

The report is based on the *project description* provided by the Applicant as a result of reports that was compiled by the following Specialists:

- A Geotechnical Engineer was appointed to determine whether the Geology and Soils of the site is suitable for the proposed development
- A Town Planner has developed the layout in conjunction with the surveyor
- The Civil Engineer was appointed to determine the capability of existing infrastructure to be linked to proposed development and readily available bulk services. He also designed the proposed infrastructure.
- A Flood line specialist has determined the 1:100 year flood line of the stormwater canals that intersects the site to the south and north-western corner.
- A SAHRA Specialist has been appointed to determine the possible impact of the development on Archaeological and Cultural features.
- A Fauna and Flora and Wetland specialist has been appointed to determine the impact of the proposed development on the Fauna and Flora and wetlands of the area. He was also appointed to delineate the extent watercourses on site.
- An Environmental Screening Process was conducted by the EAP to ensure that all the relevant Environmental Legislation is taken into consideration.
- Desktop studies were conducted and alternatives assessed.

Descriptions of the biophysical and social environments are based on specialist fieldwork, investigations, and the Public Participation Process

2. DETAILS AND EXPERTISE OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

AB Enviro Consult (CC) is a registered consultancy, owned and operated as an independent unit by the registered owner and consultant: **Prof. A.B. de Villiers**

- **Mr J.P. De Villiers** joined the consultancy during 2004
- **Mrs J.E. du Plooy** is a consultant since 2001

Over a period of 26 years (1996-2022) this consultancy has successfully applied for, and obtained positive ROD's and EA's for more than 390 projects. Environmental Control Officer's duties are also performed on various projects.

Mr. JP de Villiers holds a M.Sc. in Geography from the North West University's Department of Geography and Environmental Management. He started as a junior EAP in 2004 with AB Enviro Consult and was promoted in 2007 to senior EAP. During 2011 he was appointed as the Manager of the North West University, EIA Pro-Bono Office. This office is an initiative of, and funded by, the DEA. (This was a three year contract between DEA and NWU that was extended by one year) As Manager of this office, Mr. de Villiers had the following responsibilities:

- Conduct Environmental Impact Assessments for municipalities on a pro-bono basis.
- Provide environmental management training to North West Municipalities.
- Provide environmental assistance to North West Municipalities.
- Undertake research related to Environmental Impact Management within the North West Municipal Context.
- Marketing for stakeholder 'pro-bono' expert donations.
- Marketing for corporate 'pro-bono' funding.

As EAP, Mr. de Villiers has been directly involved in obtaining 307 Environmental Authorizations and has performed the duties of Environmental Control Officer (ECO) for 39 developments. His responsibilities as Senior EAP includes the following:

Duties pertaining to Basic Assessments, EIA and Scoping and Section 24 G Applications:

- Marketing and communication with clients
- Communication with authorities, source and analyse relevant baseline information and undertake site inspections
- Compile Environmental Application Form for the project and submit to the authorities
- Compile an *information requirements list* that is distributed to the project team. The Information required would assist with completion of the Report.
- Identify key interested and affected parties (I&APs)
- Compilation of terms of reference for specialist studies
- Commission specialist studies
- Compile and publish media notices in relevant newspapers
- Compile and place poster/s along the boundary of the site
- Hold a public meeting / Open House / focus meeting with I&APs
- Receive and address comments from public
- Undertake assessment phase by assessing and evaluating potential impacts identified.
- Review and manage specialist studies.
- Compile and distribute Draft Reports (Including Environmental Management Programmes)
- Should the Reports require substantial changes, these changes are incorporated into the final reports and distributed
- Address comments received on the final Report, finalise Report and submit to authorities
- Once the decision is issued, all I&Ps are formally informed of the decision

Duties pertaining to Environmental Control Officer

- Preparation (Compilation) and submission of Environmental Control Document.
- Training of and leasing with the Engineers Representative.
- Communicate with the Contractor.
- A monthly visit to the site during the construction period. Should any Environmental incident occur, an immediate site visit is undertaken.
- Monitoring and auditing according to the approved EMP and EA.
- Compilation of a written audit report for each site visits during the construction phase
- Liaising with the Compliance section of the Competent Authority

ACADEMIC AND PROFESSIONAL QUALIFICATIONS PROF DE VILLIERS

Post-Matric Qualifications

<u>YEAR</u>	<u>Qualification</u>	<u>Institution</u>	<u>Field of Study</u>
1968	B.Sc.	PU FOR CHE	Geography, Geology
1970	HONNS. B.Sc.	PU FOR CHE	Soil Science
1974	M.Sc.	PU FOR CHE	Geography
1981	Ph.D.	UOFS	Geography

ACADEMIC AND PROFESSIONAL QUALIFICATIONS MR J.P. DE VILLIERS

<u>YEAR</u>	<u>Qualification</u>	<u>Institution</u>	<u>Field of Study</u>
1993	BA	PU FOR CHE	Geography, Economics
1994	HED	PU FOR CHE	Geography Economics
2006	B.Sc.(Honns) Cum Laude	North-West University	Environmental Management
2007	M.Sc.	North-West University	Geography

PROFESSIONAL QUALIFICATIONS AND REGISTRATIONS MR J.P. DE VILLIERS

<u>YEAR</u>	<u>Qualification/ Registration</u>	<u>Institution</u>	<u>Field of Study</u>
2008	Basic Principles of Ecological Rehabilitation and Mine Closure	Centre for Environmental Management (North West University)	Ecological Rehabilitation
2019	Registered as Environmental assessment Practitioner	EAPASA Registration number: 2019/808	

ACADEMIC AND PROFESSIONAL QUALIFICATIONS MRS J.E. DU PLOOY

<u>YEAR</u>	<u>Qualification</u>	<u>Institution</u>	<u>Field of Study</u>
1999	BA	PU FOR CHE	Geography, Tourism
2000	BA (Honns) Cum Laude	PU FOR CHE	Geography
2003	Masters degree in Environmental Management	PU FOR CHE	Environmental Management
2001	Aquabase Intro	AQUABASE	Hydrology
2001	Geomedia Professional	INTERTECH	GIS
2001	Map Info	SPATIAL TECHNOLOGY	GIS
2020	Registered as Environmental assessment Practitioner	EAPASA Registration number: 2019/1573	

3. DESCRIPTION OF THE ACTIVITY

The land owner **Mahikeng Local Municipality** has appointed **AB Enviro Consult CC**, an independent environmental consultancy, to undertake an Environmental Impact Assessment for the proposed clearance of 387.41768ha of indigenous vegetation, of which 21 829 m² is located within 100 meters from the edge of 2 pans, in order to establish a mixed use township, located on Portion 54 of the farm Mmabatho Town and Townlands 301-JO.

The site is influenced by a number of design factors that were considered for the proposed layout plan to be acceptable. These factors include the slope of the site, flood lines, environmental sensitivity, service provision, erf size, access, road layout and community facilities as well as the geotechnical features presented in the Geotechnical Report. To ensure that the proposed development do not infringe on any design principles and the environmental sensitive areas, development of residential units will only be allowed to take place according to the prescribed methods. The Applicant intends to rezone and subdivide the site in order to utilize the concerned property for a variety of purposes. The township will consist of a mixed use, including: (See Figure 1 for a copy of the proposed Layout Plan.)

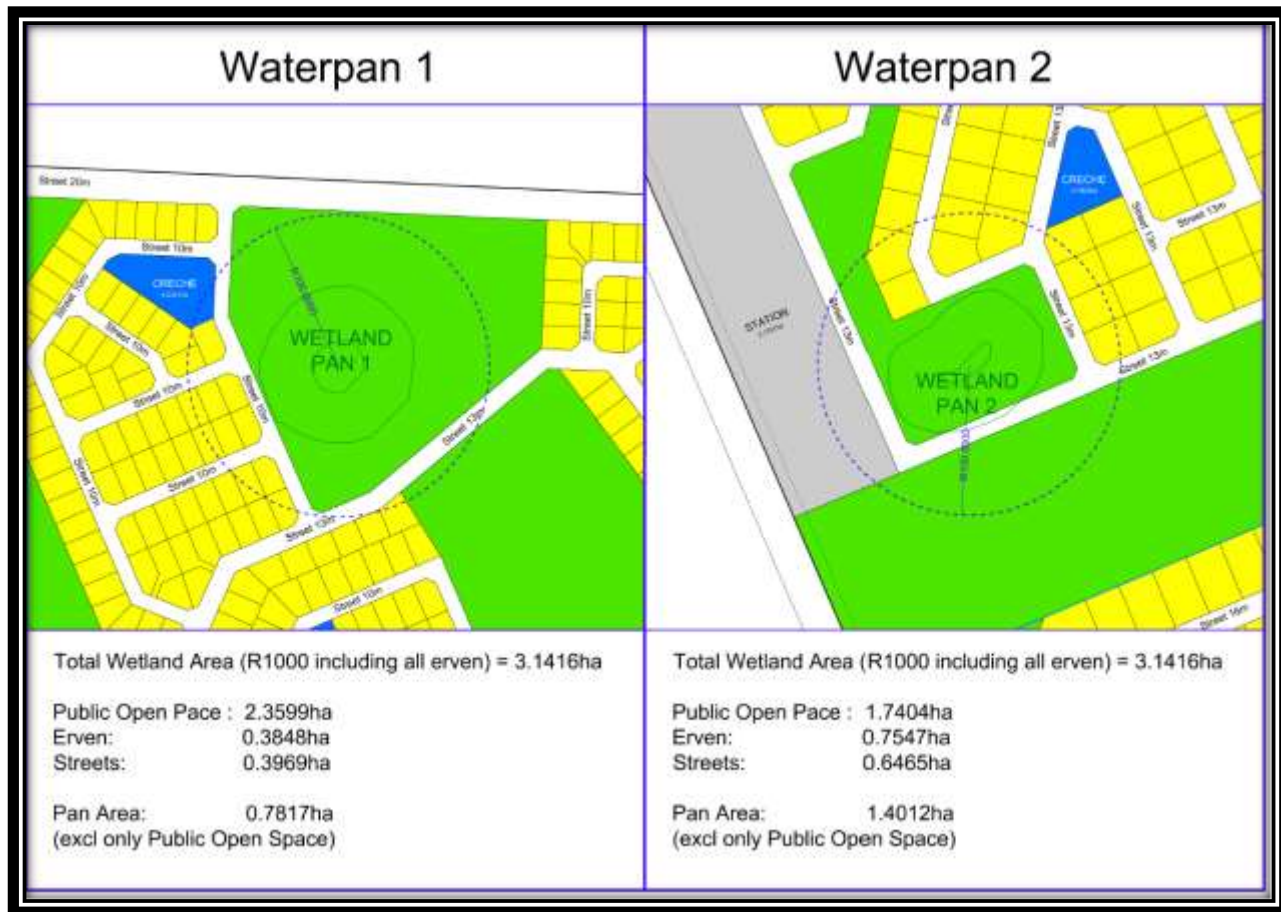
Proposed Zoning	Proposed Land use	No. of Erven	Area in hectares
Residential 1 A	Residential Stands (Average 300m ² – 400m ²)	2 334	85.5356 ha
	Residential Stands (Average 500m ² – 600m ²)	763	41.9092 ha
	Residential Stands (Average 600m ² – 800m ²)	360	26.7053 ha
	Residential Stands (Average 800m ² – 1 000m ²)	366	34.7679 ha
Residential 3	Medium density (80 units per ha)	15	41.3116 ha
Municipal	Community Facility	1	0.4454 ha
	Cemetery (To accommodate existing graves found on site)	4	2.5273 ha
Business 2	Business	6	3.7409 ha
Special	Mixed land uses	37	15.0573 ha
Industrial 2	Light Industrial	29	11.0068 ha
Institutional	Clinic	1	0.9517 ha
	Primary School	2	7.7388 ha
	Secondary School	1	4.8006 ha
	Crèche	7	1.7080 ha
	Church	4	1.1546 ha
Transportation	Train Station	1	2.1752 ha
Public Open Space	Public Open Space	35	104.1665 ha
Recreational	Sports Field	1	16.2862 ha
Street	Refer to table below		79.8250 ha
TOTAL		3 967	481.8139 ha

STREETS	
Reserve Width	Length in metre
6m Street	62m
10m Street	29 882m
13m Street	10 385m
16m Street	11 506m
20m Street	7 114m
25m Street	1 115m
TOTAL	59 864m

Determination of area to be cleared of indigenous vegetation:

Description	Area in hectares	Calculation	Calculated area
Total site area	481.8139 ha		
Open Spaces	104.1665 ha	Subtract	377.6474 ha
Canal in Open Space	9.77028 ha	Add	387.41768 ha
Total Area to cleared of indigenous vegetation			387.41768 ha

Determination of area to be cleared of indigenous vegetation within 100 meters from the Pans



Area to cleared for within 100 meters from Pan 1: 7 817 square meters
Area to cleared for within 100 meters from Pan 2: 14 012 square meters
Total area to be cleared within 100 meters from a Pan: **21 829 square meters (2.1829 ha)**

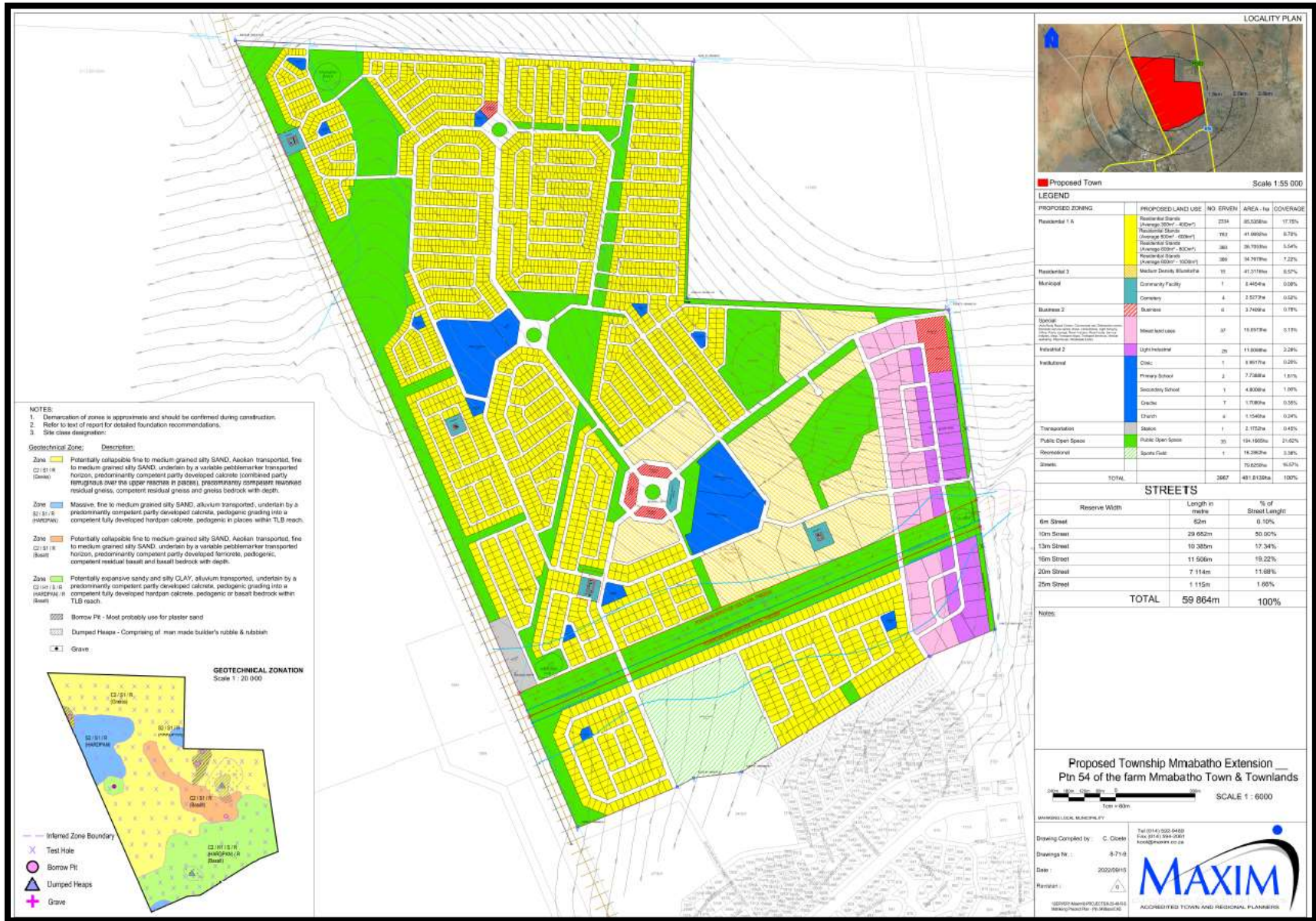


FIGURE 1: PROPOSED TOWNSHIP LAYOUT: PORTION 54 OF THE FARM MMABATHO TOWN AND TOWNLANDS

Bulk Services Water

The Mafikeng Bulk Water Master Plan was undertaken by the Ngaka Modiri Molema District Municipality in 2013, being the proclaimed Water Service Authority for Mafikeng. The masterplan included provision for water supply to the Portion 54 area, referred to in the masterplan as Demand Zone 17, as well as the remainder the Greater Mafikeng, up until 2042. The Mmabatho Water Treatment Works (WTW), supplied from the Setumo Dam, is currently in the process of being upgraded from 20 to 30 Mℓ/d, including the provision of processes for dealing with the water quality available from the dam. The upgrading proposed also includes construction of a new 25 Mℓ reservoir at Lokaleng, as well as a trunk main from this reservoir to supply the western part of the City, which will ensure that the Signal Hill supply system, which will supply the Portion 54 area, will have adequate capacity to do so. (This upgrading does not form part of this application.)

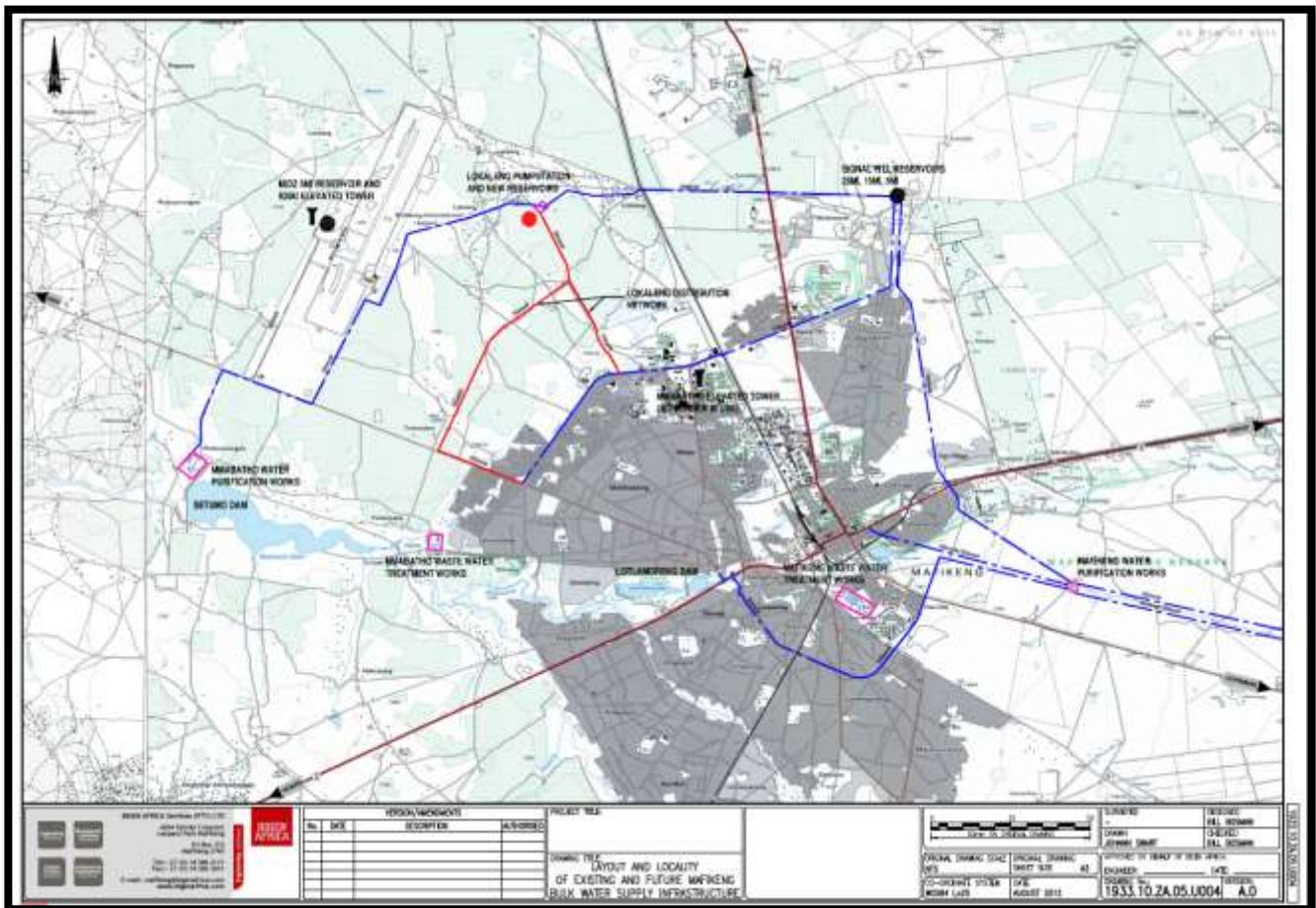


FIGURE 2: LAYOUT AND LOCALITY OF EXISTING AND FUTURE MAFIKENG BULK WATER SUPPLY SERVICES

The total Gross Average Annual Daily Demand (GAADD) estimate for the development is 5,432 kℓ/d, with a peak (summer) daily demand estimated at 7,411 kℓ/d, and a maximum instantaneous flow rate for the entire development of 238 ℓ/s. It is recommended that the entire development be supplied from a trunk main to be laid from the Signal Hill reservoirs, some 3 km west of the proposed development site, to the north eastern corner of the site. It is envisaged that a 500 mm diameter steel trunk main 3,500 m long will be required to be laid from the reservoirs to the site to meet the instantaneous peak flow rate required

The pipeline will be laid parallel to the access road currently running from the North University School of Agriculture to the N18, which runs along the northern side of the development site, and along the Signal Hill reservoir access road, with a 350 mm diameter branch 920 m long running down the N18 to the eastern side of the site.

The proposed locality of the bulk supply pipeline is indicated in Figure 3 below.



FIGURE 3 – PROPOSED BULK WATER SUPPLY PIPELINE LOCALITY

Sewer

The maximum bulk wastewater discharge for the entire development is expected to amount to 3,531 kℓ/d, based on the water demand calculated above, and the prevailing wastewater return flow rate for the city. The Mafikeng Bulk Sanitation Master Plan was undertaken by the Ngaka Modiri Molema District Municipality (NMMDM) in 2009, being the proclaimed Water Service Authority for Mafikeng. The masterplan included provision for wastewater removal from the Portion 54 development area, reflected in the masterplan as drainage zone 17, as well as the remainder the Greater Mafikeng, up until 2030. The most suitable facility to drain the site will be the Mmabatho Central Outfall Sewer, which has adequate capacity to handle the total estimated flow from the Portion 54 development.

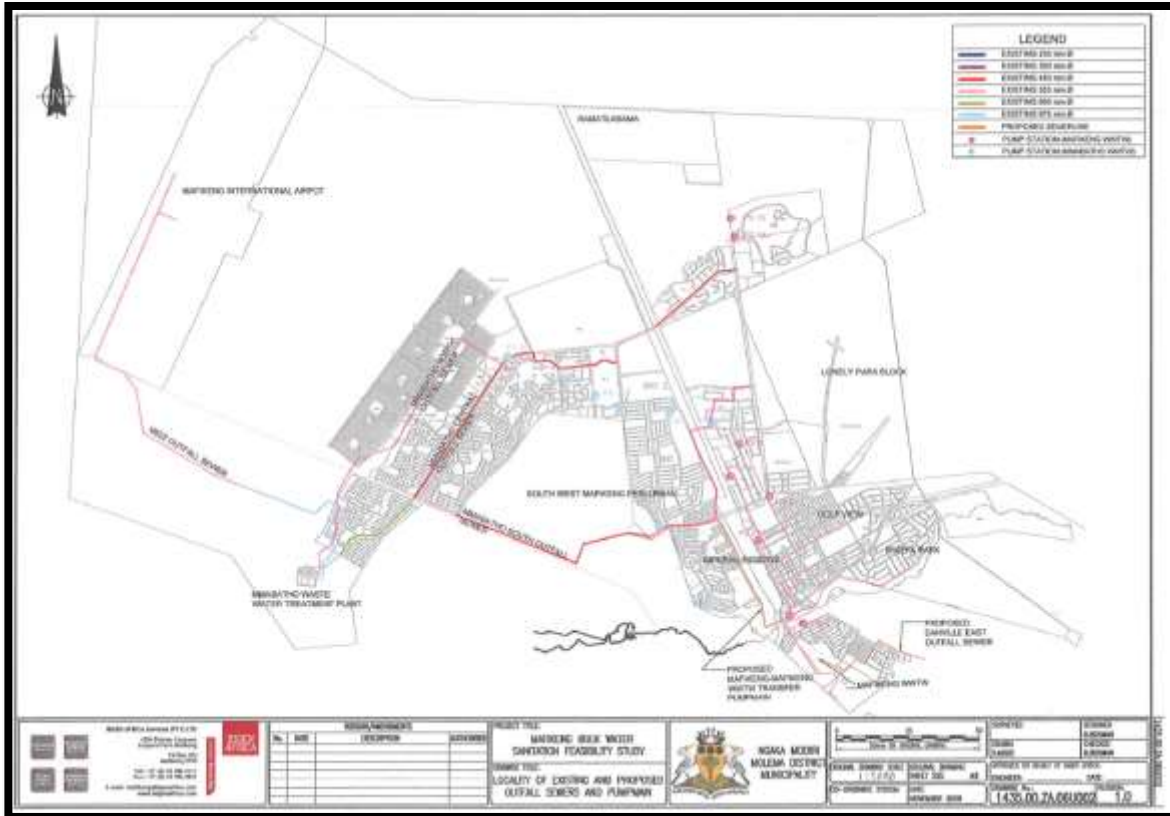


FIGURE 4: LOCALITY OF EXISTING AND PROPOSED OUTFALL SEWERS AND PUMPMAN

The wastewater outfall sewer from the Portion 54 development site will need to be laid from the south western corner of the site, parallel to the railway reserve, to join the existing Mmabatho Central Outfall sewer just before it crosses the railway line. It is anticipated that a 500 mm diameter sewer outfall pipeline approximately 1 km long will be adequate to serve the development.



FIGURE 5 – PROPOSED BULK SEWER OUTFALL PIPELINE LOCALITY

It is considered likely that a number of sewage lifting pump stations may be required within the site, since the topography along the southern portion of the western perimeter of the site is exceptionally flat. The Mmabatho Central Outfall Sewer drains to the Mmabatho Wastewater Treatment Works, which has adequate capacity for all future flows.

Electrical

The electrical supply authority for the area is Eskom as MLM currently does not have an electricity distribution license. The proposed development falls in an area that is not currently serviced by existing electrical distribution networks, but there is an existing 88kV overhead line crossing the proposed development that is feeding the existing 88/33/11kV Mmabatho Main Substation, situated south of the proposed development, from the Mmabatho Bulk Substation, situated south-east of the proposed development.

In light of the above, Bigen completed an in-house investigation into the existing bulk infrastructure in the vicinity of the proposed development. The existing 88kV overhead line traversing the proposed development currently feeds the existing 88/33/11kV Mmabatho Main Substation from its origin at the Mmabatho Bulk Substation and continues on to the Unit 13, Montshiwa and finally the Lotlhakane Substations.

The existing Mmabatho Main Substation has an installed firm capacity of 30MVA (2 X 30MVA transformers) and will therefore not be able to supply the estimated maximum demand of the proposed development. It could be upgraded to supply the required bulk capacity, but would in principle have to be doubled in size to avail the required capacity.

A more technically sound solution would be the construction of a new 88/11kV, 40MVA substation on the proposed development next to the existing overhead line and to supply the new substation by construction of a new loop-in / loop-out connection from the line. From the new substation the entire proposed development could then be electrified. The substation can be phased to reduce the initial cost implication on the development, by initially only constructing the

substation to a 20MVA level and then installing the remaining equipment to increase the capacity to 40MVA when it is needed in future.

Whether the existing overhead line has enough spare capacity to supply the proposed new substation will only be verified by Eskom once the aforementioned formal application has been logged and the required Cost Estimate Fee has been paid, but we believe that even if the existing line does not have enough spare capacity, it can be upgraded by re-stringing the existing conductors with conductors that can handle the increased current required to supply the proposed substation. The length of line that will have to be re-strung is approximately 12km in length, which in terms of 88kV overhead lines is relatively short.

Roads and Access

Primary access to site will be onto the Nelson Mandela Free Way between Mafikeng and the Ramatlabama Border Post, forming part of the N18 National Route. This road was upgraded to a dual carriageway standard passing the site in 2007, and is expected to have adequate capacity for all requirements for the foreseeable future, with a design traffic load of 20,000 vehicles/hr.

Only 3 access points are presently provided onto this road from the west at present in the vicinity of the site, which are indicated by the white arrows in Figure 7 below.

These are as follows:-

- Immediately across from the Leopard Park Golf Course Estate Entrance;
- Into the Sector 10 Military Base
- Onto the School of Agriculture / Lokaleng Access Road.

The proposed access points into the Portion 54 Development are indicated by the red arrows in Figure 4, described as follows:-

- From Unit 3 on the southern perimeter of the site, via an existing street between the Sol Plaatjie Primary and High Schools.
- From a new access point onto the N18 immediately to the south the existing Military access point,
- From a new access point onto the N18 approximately halfway between the existing Leopard Park and Sector 10 Military Base access points, to the north of the existing powerline crossing, and;
- From the School of Agriculture / Lokaleng access road on the northern perimeter of the site.



FIGURE 6 – PORTION 54 ROAD TRAFFIC ACCESS POINTS AND STORMWATER RAILWAY CROSSING

Storm Water

The topography of the site is such that the northern portion has a substantial slope up to the north. The southerly portion is however very flat, with a marginally east ward slope. The low point of the site is along the railway line forming the western perimeter of the site, approximately halfway along its length.

Two streams draining stormwater to the study area has been identified (Figure 7 below) and the 1:100 year flood line for these have been determined (Figure 8)

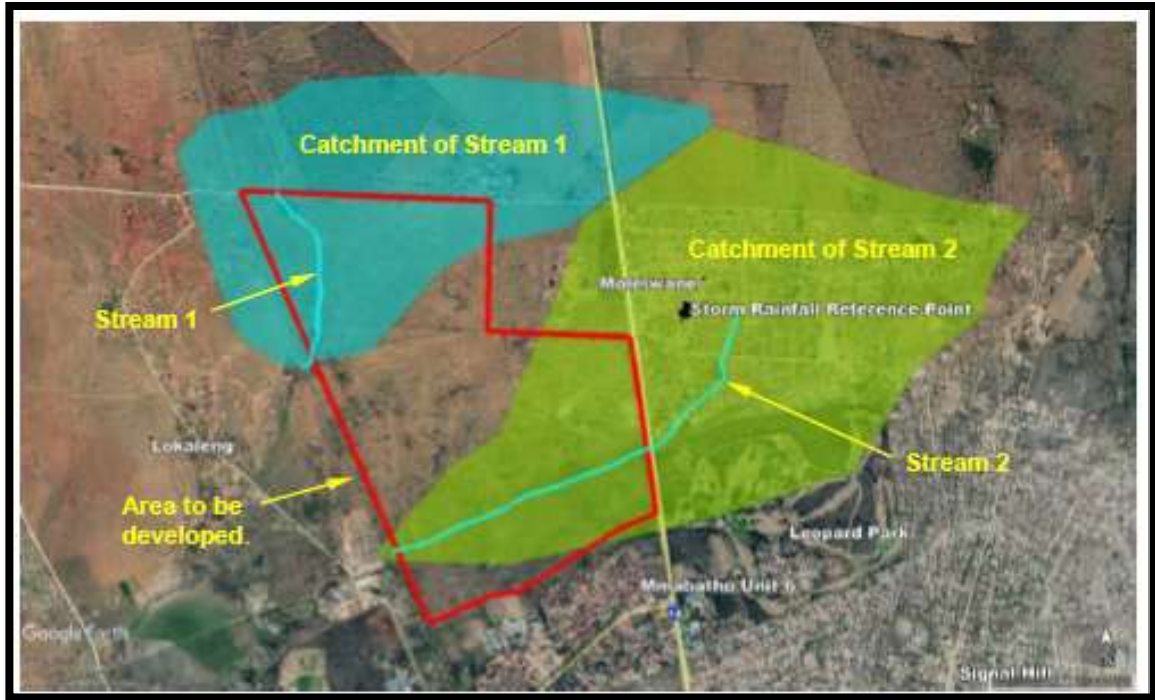


FIGURE 7: TWO STORM WATER DRAINAGE LINES



FIGURE 8: 1:100 YEAR FLOODLINE OF THE TWO STORM WATER DRAINAGE LINES

It is anticipated that the stormwater drainage philosophy for the development site as a whole will be to collect stormwater along a drainage structure running parallel with the railway reserve, which will then drain across the railway at a point in the vicinity of the Matlalong Cemetery, draining into a pan on the northern side of the University.

A substantial culvert is installed beneath the railway at this point, which is adequately sized to serve the drainage requirements of the site.

A canal is proposed to transport stormwater through the southern part of the site and a cross section is shown below.



FIGURE 9 – PROPOSED CANAL DESIGN

The total top width of the canal is **52 meter**.

The depth of the canal is **1,5 meter**.

The length of the canal is **1 878,9 m** – including the inlet and outlet.

The **longitudinal bed slope** of the canal must **not be steeper than 0,0045 m/m**.

The **side slopes** of the canal are **0,25 m/m** on both sides of the canal and are hardened with grass blocks constructed in accordance to the manufacturer's specifications. The bed of the canal is to be planted with approved grass such as the **Kikuyu** type of grass.

This canal has been incorporated on the Town Planner's layout plan:

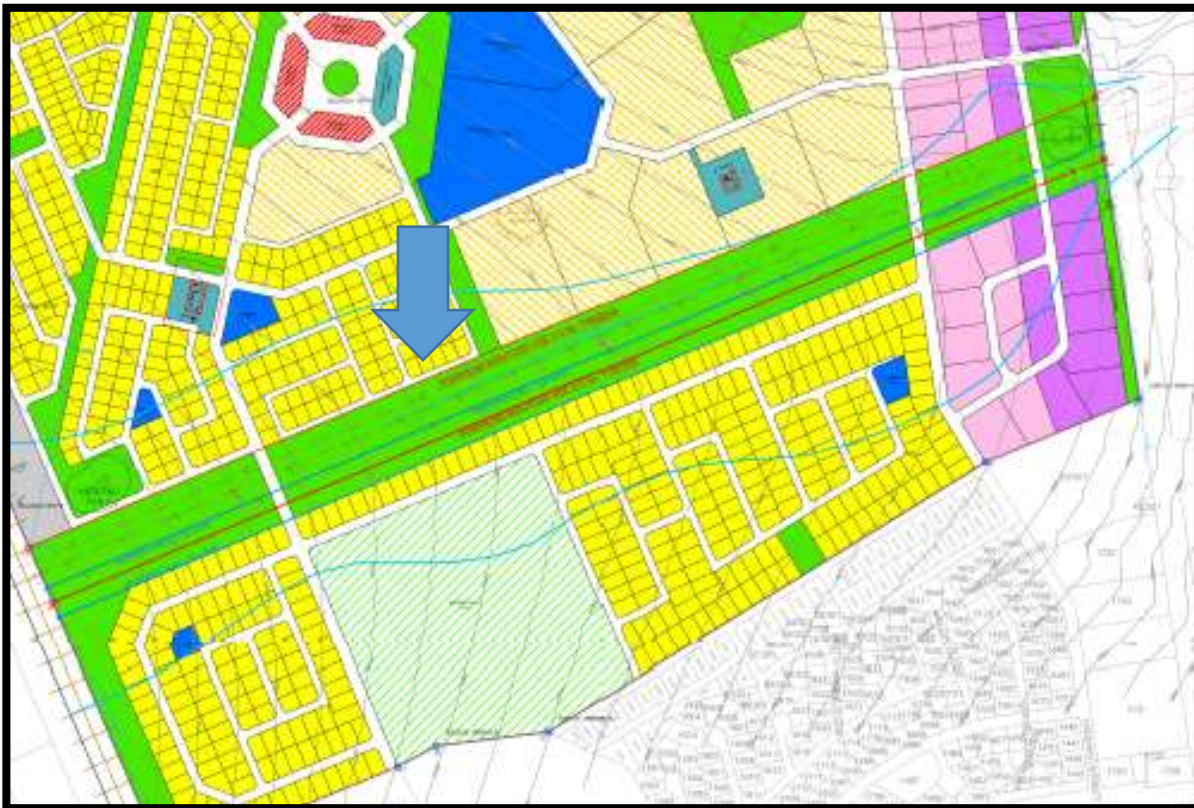


FIGURE 10- PROPOSED CANAL LOCATION

Solid Waste

Waste collection and removal will be the responsibility of the Local Municipality, once the township has been established.

4. DESCRIPTION OF THE PROPERTY

The property is located on Portion 54 of the Farm Mmabatho Town and Townlands 301, JQ, North West Province and is owned by the Mahikeng Local Municipality. The site is situated to the west of the N18 Road (Nelson Mandela Drive) (See Photograph 1), between the Mmabatho Unit 6 and of the Joint Tactical Headquarters of the North West Province. The Mmabatho railway line is located on the western boundary of the site. See Photograph 2. There is existing power lines crossing the site from the N18 in the east towards the railway line in the west. See Photograph 3.

The site falls within an area that falls under the jurisdiction of the Mahikeng Local Municipality. See Figure 14 for a copy of the Locality Map.

The site does not fall within any critical endangered zones as defined in the 2015 North West Biodiversity map. See Figure 13.

Photograph 4 is an illustration of the general view of the site. Vegetation at the site appears to be degraded, modified or in some areas transformed. Disturbances that have caused extensive impacts to vegetation include numerous tracks and small dirt roads, excavations/illegal borrow pits (See Photograph 5), and extensive informal dumping (See Photograph 6). According to the Precinct Plan, there is an existing bulk water pipeline that crosses the center of the site.



Photograph 1: N18 Road (Nelson Mandela Drive)



Photograph 2: The Mmabatho railway line is located on the western boundary of the site



Photograph 3: Existing power lines on site



Photograph 4: General view of the site



Photograph 5: Excavations/illegal borrow pits



Photograph 6: Extensive informal dumping

The area lies within the drainage basin of the Molopo River. Most of the study area is situated on an area drained by overland flow. A small storm water drainage line (See Photograph 7) enters the site via a culvert that diverts water underneath the N18 from east to west. The Flood line Engineer has also identified a storm water drainage line in the north western corner of the site. These drainage lines do not appear on the 1:50 000 map of the area but the southerly line is however indicated on the “Land Use Maps” as represented in the Precinct Plan. See Figures 11 and 12. The north western drainage line has been identified whilst determining stormwater runoff as indicated in Figure 7. The Wetland Specialist’s field verification has found that the drainage lines found on site are in fact as a result of storm water drainage and is **not classified as water courses**.



Photograph 7: Small drainage line to the south of the site

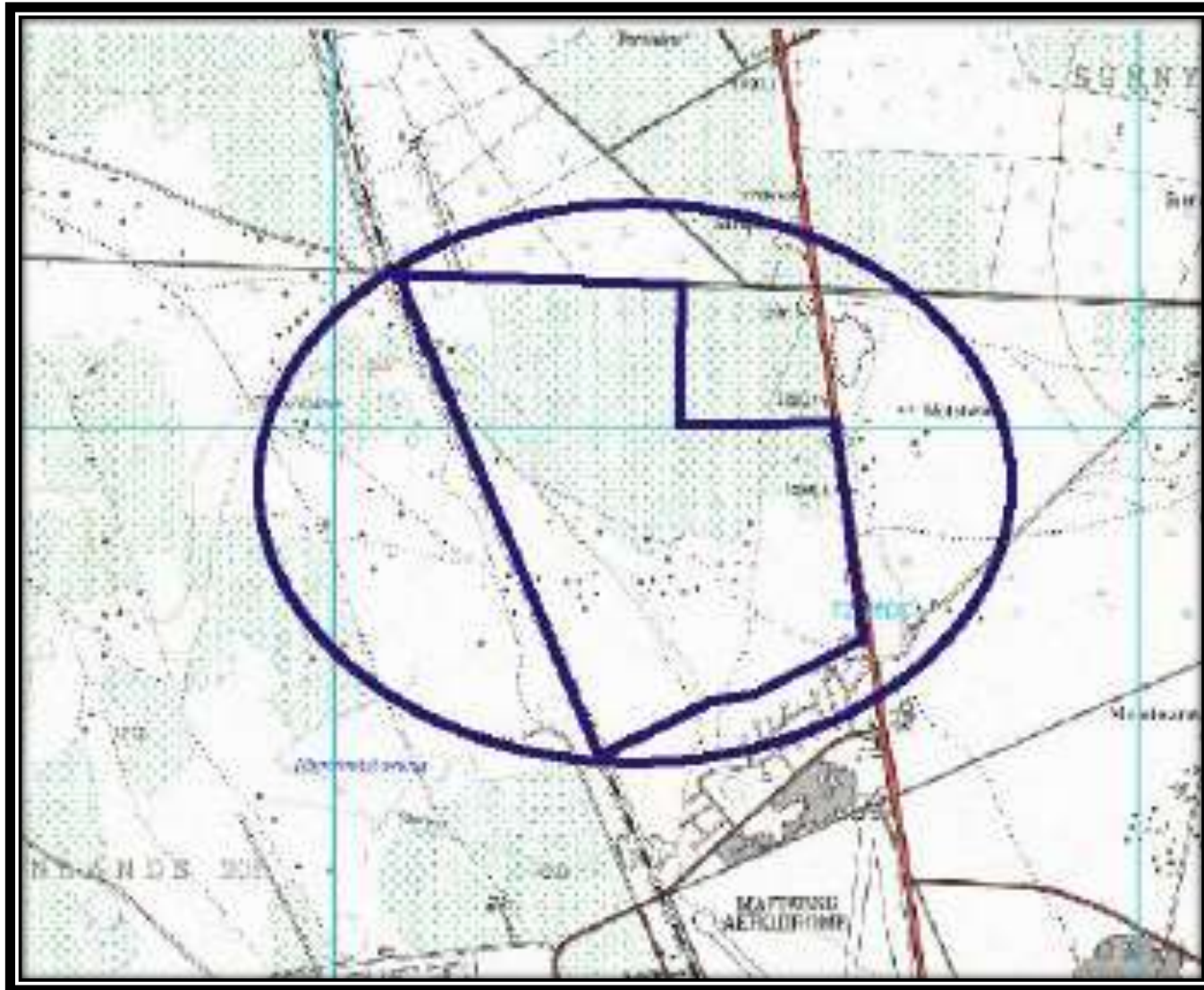


Figure 11: 1:50 000 map of the area does not indicate the presence of a stream on site.

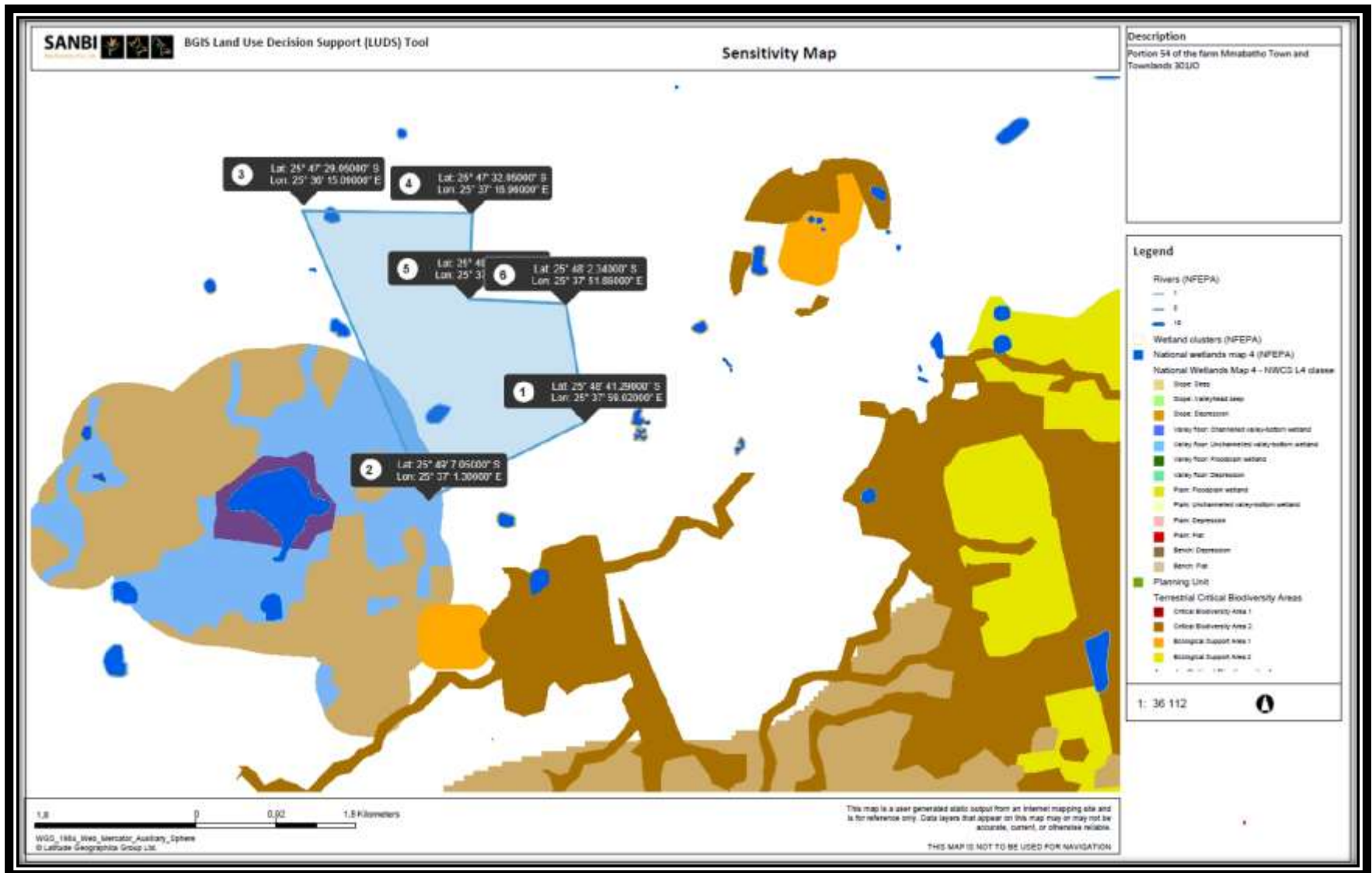


Figure 13: Extract from the sensitivity map indicating the presence of two wetlands on site, outside CBA's

The Sensitivity map also indicates two areas that are classified as wetlands. See Figure 13. The wetland specialist has confirmed two small wetland depressions as identified in Figure 14 of which Pan 1 (photograph 8 & 9) and Pan 2 (photograph 10 & 11), are present at the site and have been accommodated on the layout plan.



Figure 13: Indication of the small wetland depressions Pan 1 and Pan 2, as well as their buffer zones (32 m) at the site.

- Light blue outline and shading Wetlands at the site
- Green outline Outer edge of buffer zone (32 m)



Photograph 8: The small wetland depression, Pan 1, at the site.
Photo: R.F. Terblanche.



Photograph 9: Soil with mottles at the seasonal zone of Pan 1, at the site.
Photo: R.F. Terblanche.



Photograph 10: Pan 2 at the site, a wetland depression which is not very well defined and of which the origins are difficult to determine at present

Photo: R.F. Terblanche



Photograph 11: Soil at the seasonal zone of Pan 2 at the site.

Photo: R.F. Terblanche

Site Co-ordinates

Latitude (S):

Longitude (E):

Alternative S1 (preferred or only site alternative)

25°	48'	19.43"	25°	37'	07.71"
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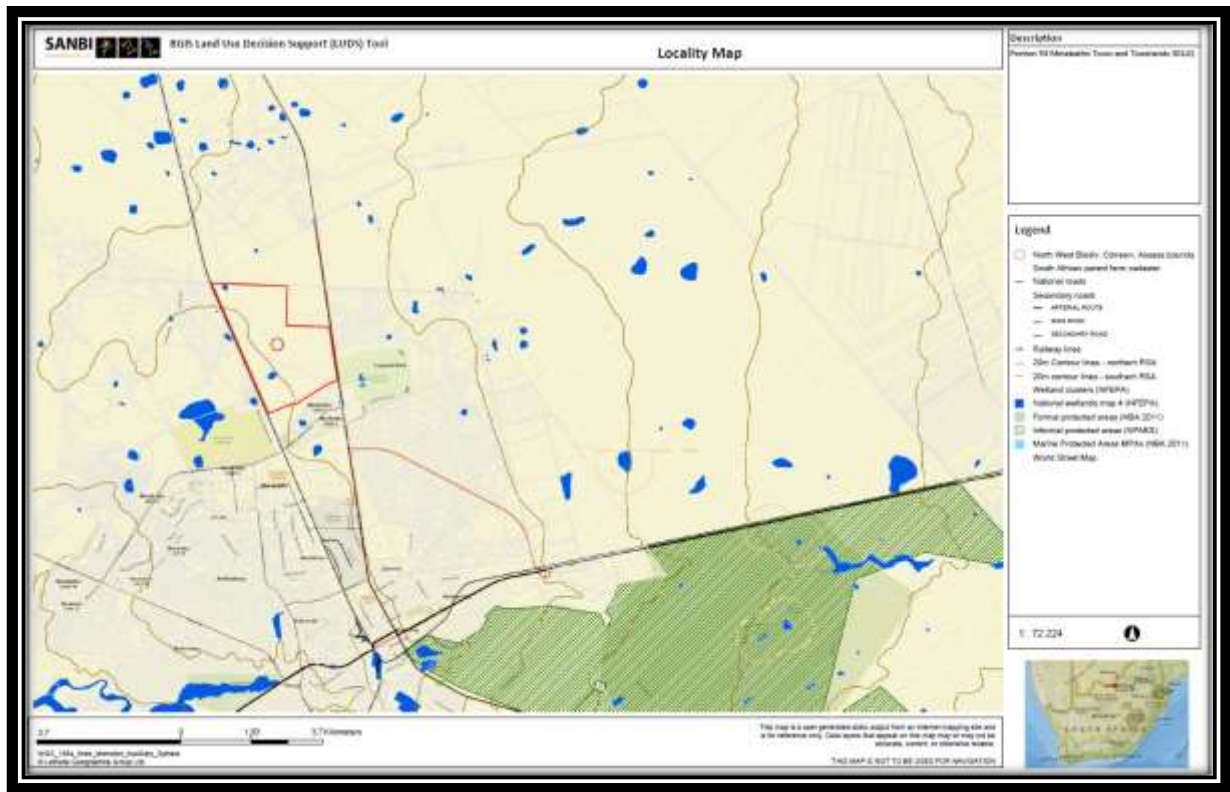


FIGURE 14: LOCALITY MAP

5. LEGAL AND OTHER REQUIREMENTS

Title of legislation, policy or guideline	Applicability to the project	Administering authority	Date
National Environmental Management Act No. 107 of 1998 as amended.	NEMA is the guiding legislation that has been considered during the Environmental Impact Assessment process and the compilation of this Scoping Report.	National & Provincial (DEA And Gauteng GDARD)	27 November 1998
The Bill of Rights, Constitution of South Africa, Section 27 (1)(b)	<p>The Constitution of the Republic of South Africa is the legal source of all law, including environmental law, in South Africa. The Bill of Rights is fundamental to the Constitution of South Africa and in, section 24 of the Act, it is stated that:</p> <p>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.</p> <p>Given that environmental management is founded partly on the principles of public participation, Section 195 of the Constitution is of primary relevance:</p> <p>(1) Public administration must be governed by the democratic values and principles enshrined in the constitution, including the following principles: (a) (b) (c) (d) (e) Peoples needs must be responded to, and the public must be encouraged to participate in policymaking. (f) Public administration must be accountable. (g) Transparency must be fostered by providing the public with timely, accessible and accurate information (Government Gazette, 1996).</p>	National Government	1994
New Regulations 2014 in terms of NEMA	Legislation consulted during the environmental impact assessment process to determine whether any listed activities would be triggered. The Regulations were also consulted to determine inter alia the requirements regarding the contents of Scoping reports and the public participation process that should be followed.	National & Provincial (DEA And Gauteng GDARD)	7 April 2017
National Water Act (36 OF 1998)	National Water Act (NWA), 1998 (Act 36 of 1998) is the primary statute providing the legal basis for water management in South Africa and has to ensure ecological	Department of water and sanitation	1998

Title of legislation, policy or guideline	Applicability to the project	Administering authority	Date
	<p>integrity, economic growth and social equity when managing and using water.</p> <p>The major objectives of the National Water Act are to:</p> <ul style="list-style-type: none"> •Aid in providing basic human needs; •Meet the growing demand of water in a sustainable manner; •Ensure equal access to water and use of water resources; •Protect the quality of water of natural resources; •Ensure integrated management of water resources; •Foster social and economic development; and •Conserve aquatic and related ecosystems. <p>Section 19 of the National Water Act states that the person responsible for land upon which any activity is or was performed which causes, has caused or is likely to cause, pollution of a water resource, must take all reasonable measures to prevent any such pollution from occurring, continuing or recurring.</p>		
<p>National Environmental Management: Biodiversity Act (NEMBA) (ACT NO. 10 OF 2004)</p>	<p>The National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004), provides for the management and conservation of South Africa's biodiversity within the framework of the National Environmental Management Act, 1998; the protection of species and ecosystems that warrant national protection; the sustainable use of indigenous biological resources; the fair and equitable sharing of benefits arising from bio-prospecting involving indigenous biological resources; the establishment and functions of a South African National Biodiversity Institute; and for matters connected therewith.</p> <p>In terms of Chapter 4 of the Above Act:</p> <p>52. (1) (a) The Minister may, by notice in the Gazette, publish a national list of ecosystems that are threatened and in need of protection.</p> <p>(b) An MEC for environmental affairs in a province may, by notice in the Gazette, publish a provincial list of ecosystems in the province that are threatened and in need of protection.</p> <p>(2) The following categories of ecosystems may be listed in terms of subsection:</p>	<p>National & Provincial (DEA And Gauteng GDARD)</p>	<p>2004</p>

Title of legislation, policy or guideline	Applicability to the project	Administering authority	Date
	<p>(a) critically endangered ecosystems, being ecosystems that have undergone severe degradation of ecological structure, function or composition as a result of human intervention and are subject to an extremely high risk of irreversible transformation;</p> <p>(b) endangered ecosystems, being ecosystems that have undergone degradation of ecological structure, function or composition as a result of human intervention, although they are not critically endangered ecosystems;</p> <p>(c) vulnerable ecosystems, being ecosystems that have a high risk of undergoing significant degradation of ecological structure, function or composition as a result of human intervention, although they are not critically endangered ecosystems or endangered ecosystems; and</p> <p>(d) protected ecosystems, being ecosystems that are of high conservation value or of high national or provincial importance, although they are not listed in terms of paragraphs (a), (b) or (c).</p> <p>(3) A list referred to in subsection (1) must describe in sufficient detail the location of each ecosystem on the list.</p> <p>53 (1) The Minister may, by notice in the Gazette, identify any process or activity in a listed ecosystem as a threatening process.</p> <p>(2) A threatening process, identified in terms of subsection (1) must be regarded as a specified activity contemplated in section 24(2)(b) of the National Environmental Management Act (1998) and a listed ecosystem must be regarded as an area identified for the purpose of that section.</p>		
National Environmental Management: Protected Areas Act (ACT NO. 57 OF 2003)	This Act aims to provide for a national system of protected areas in South Africa as part of a strategy to manage and conserve its biodiversity. The Protected Areas Act tries to ensure the protection of the entire range of biodiversity, referring to natural landscapes and seascapes. The Act makes express reference to the need to move towards Community Based natural Resource Management (CBNRM) as its objectives include promoting the participation of local communities in the	National & Provincial	2003

Title of legislation, policy or guideline	Applicability to the project	Administering authority	Date
	<p>management of protected areas. The purpose of the Act is:</p> <ul style="list-style-type: none"> •To protect ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes and their ecological integrity. •To conserve biodiversity in those areas; •To protect South Africa's rare species; •To protect vulnerable or ecologically sensitive areas; •To assist in ensuring the sustained supply of environmental goods and services; •To provide for the sustainable use of natural and biological resources; •To create or augment destinations for nature-based tourism; •To manage the interrelationship between natural environmental biodiversity, human settlement and economic development; •To contribute to human, social, cultural, spiritual and economic development; •To rehabilitate and restore degraded ecosystems and promote the recovery of endangered and vulnerable species. <p>This Act further stipulates various criteria which must be met before an area can be declared as a special nature reserve, national park, nature reserve and protected environment. It also prescribes a range of procedures, including consultation and public participation procedures which must be followed before any of the kinds of protected areas are declared.</p>		
National Heritage Resources Act, Act No. 25 of 1999	Legislation consulted during the impact assessment process, to determine the legal requirements relating to the management of heritage resources that are present in and around the site.	SAHRA	1999
National Environmental Management: Waste Act, Act No. 59 of 2008, read together with the List of Waste Activities that Have, or are Likely to Have, a Detrimental Effect on the Environment, GN No. 921 of 29 November 2013	Legislation consulted to determine whether a waste licence will have to be obtained for the development.	National & Provincial (DEA And Gauteng GDARD)	2008
<i>Mineral and Petroleum Resources Development Act (MPRDA), Act 28 of 2002</i>	<p>The Act distinguishes between mining permits and mining rights as follows:</p> <p>Mining Permit: Required where the activity will last less than two years and affects an area of less than 1.5ha in extent (valid for 3 years). In terms of the Act a mining permit requires a submission of an Environmental</p>	Relevant Provincial Authorities.	2002

Title of legislation, policy or guideline	Applicability to the project	Administering authority		Date
	<p>Management Plan (EMP to DME for approval prior to the onset of activities).</p> <p>Mining Right: Required for larger mining operations (renewable and valid for 30 years). In terms of the Act a mining right requires the submission of an Environmental Management Programme (EMProg) to DME for approval prior to the onset of activities.</p> <p>In light of their limited spatio-temporal extent, borrow pits (for the provision of construction material) and quarry operations would typically require a mining permit.</p> <p>The closure of borrow pits requires the submission of a closure application; this must be submitted within 180 days after ceasing operations. It is important to recognise that the mining right/permit holder's liability persists until such time as a Closure Certificate has been issued by DME.</p>			
<i>National Environmental Management: Air Quality Act (Act 39 of 2004)</i>	To protect the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development while promoting justifiable economic and social Development. Construction activities may cause some air pollution.	Relevant Authorities.	Provincial	2004
<i>The Conservation of Agricultural Resources Act (Act 43 of 1983)</i>	This Act regulates the flow pattern of runoff water, control of weeds and invader plants.	Relevant Authorities.	Provincial	1983
<i>National Veldt and Forest Fire Act (Act 101 of 1998)</i>	Chapter 4 places a duty on owners to prepare and maintain firebreaks.	Relevant Authorities.	Provincial	1998
<i>National Forests Act, Act 84 of 1998 (NFA) read with GN1602 of December 2016.</i>	During the construction phase of the development certain protected trees may be affected. Licences will have to be obtained from the Minister before the affected trees may be cut, disturbed, damaged or destroyed. GN1602 of December 2016 contains the list of protected trees.	National and Provincial authorities.		1998
<i>Occupational Health and Safety Act (Act 85 of 1993)</i>	To provide for the health and safety of persons at work and for the health and safety of persons in connection with the use of plant and machinery and the protection of persons other than persons at work against hazards to health.	Relevant Authorities.	Provincial	1993

The study is conducted in such a way as to comply with the instructions regarding such studies and reports (as contained within the above-mentioned documents).

**The following aspects will be dealt with:
SCHEDULE**

Actions	Timeframe
1. Project Initiation and Scoping Phase	
1.1 Communication with authorities and source and analyse relevant baseline information and undertake site inspections	5 days
1.2 Identify key interested and affected parties (I&APs)	1 day
1.3 Compilation of terms of reference for specialist studies	2 days
1.4 Commission specialist studies	1 day
1.5 Compile Environmental Application Form for the project and submit to the authorities	Once the Environmental Application form has been submitted, the scoping report which has been subject to public participation (30 days) needs to be submitted within 44 days
1.6 Compile draft Scoping Report (SR) and make available to the public for a 30 day commenting period	5 days for compilation and 30 days for commenting period
1.7 Prepare an Information Sheet (summary of the draft SR) and distribute to I&APs	1 day
1.8 Compile and publish media notices (for the EIA) in relevant newspapers	7 days
1.9 Compile and place poster/s along the boundary of the site	1 day
1.10 Receive and address first round of comments from public	3 days
1.11 Should the draft SR require substantial changes, these changes will be incorporated into the final SR and distributed	The competent authority must within 43 days of receipt of the scoping report accept / refuse the report with our without conditions
1.12 Address comments received on the SR, finalise Scoping Report and submit to authorities	As above
1.13 Compile a Plan of Study for the assessment phase and submit to authorities for approval	As above
The total time allowed for the Scoping phase of the application	87 days
2. Assessment Phase	
2.1 Undertake assessment phase by assessing and evaluating potential impacts identified in the Scoping phase.	5 days
2.2 Review and manage specialist studies required.	Ongoing
2.3 Compile a draft Environmental Impact Report (EIR).	5 days
2.4 Compile a draft Environmental Management Plan for the Construction phase.	Included above
2.5 Compile an Information Sheet (summary of EIR) and distribute to identified I&APs	1 day
2.6 Distribute DEIR to I&APs	1 day
2.7 Allow the identified public to provide comment within a 30 day period on above report.	3 days for compilation and 30 days for commenting period
2.8 Address comments received and finalise EIR	3 days
2.9 Should the draft EIR require substantial changes, these changes will be incorporated into the final EIR and distributed for a 21 day commenting	3 days plus 21 day commenting period
2.10 Finalise EIR and update comments and response table for submission to authorities	5 days
2.11 Submit EIR to authorities for a final decision	1 day (The department requires the submission of the Final EIR within 106 days of the approval of the Scoping report), therefore all information from the client's side must be provided within this timeframe to ensure the application is not withdrawn)
2.12 Once the decision is issued, all I&Ps must be formally informed of the decision	The Competent Authority has 107 days from the date of receipt of the

	EIR and EMPr to determine the application
Total number of days allowed for the compilation and consideration of the EIR	213 (may require additional 50 days public participation and consideration)
TOTAL AMOUNT OF DAYS:	300-350 days

6. NEED AND DESIRABILITY

The local municipality intends to promote a more compact city in order to prevent the expansive provision of social and engineering services, as well as to prevent the economic decline of the traditional city centre. The Spatial Development Framework (SDF) addresses the scale of urban growth through planned extensions, infill and redevelopment strategies. The local municipality is aware of the need to integrate urban settlements, with a view to reduce travel distances to the areas of employment opportunities. It also addresses measures to promote compact and connected growth opportunities, such as the identification of revitalisation zones, densification and mixed land use zones. For any development to be sustainable and viable, land development and planning should ensure that communities are located close to job opportunities, social facilities and basic services.

The SDF and the Land Use Management system of the Local Municipality have identified certain areas that must address previously disadvantaged areas and historically disadvantaged residents. There is a definite need for the residents to have reasonable access to opportunities and facilities that supports living in the urban Settlement. It is the responsibility of the local municipality to ensure that the residents have reasonable access to community services and amenities, as well as employment opportunities and that the form of land development need to provide for basic needs in an affordable way. The proposed development will be in line with this principle by ensuring that people living the area do in fact have reasonable access to opportunities and facilities.

The planning practices of the past have resulted in sprawling urban areas that are un-economical. Today, planning policies are transformed to mainly encourage infill development on vacant land within the urban environment, in order to combat urban sprawl. The proposed development falls in line with these principals, as it is located within the urban area and is surrounded by urban development.

The Council of the Mahikeng Local Municipality took a decision to investigate the development potential of Portion 54 of the farm Mmabatho Town and Townlands- 301 JO. Portion 54, falls within the urban edge of the Greater Mafikeng area and have been identified as an area in need of a precinct plan in terms of the Local Spatial Development Framework (2019).

Part E of Chapter 4 of SPLUMA sets out the required content of a MSDF. It is here where it is stipulated in clause (l) that MSDFs must “identify local plans that must be developed”. This refers to the identification and prioritisation of more detailed local area plans of which precinct plans are such a tool.

Precinct plans, within the framework of higher-level plans such as PSDFs, RSDFs, MSDFs), therefore provide more detailed proposals for areas where significant development and change is anticipated, so as to avoid having to prepare very detailed local planning policies and objectives for many specific areas within SDFs.

By setting more localised policy contexts for individual planning decisions, precinct plans are important policy instruments by which local authorities can promote specific objectives e.g. economic renewal, in the case of regenerating city and town centers, or ensuring protection of environmental qualities such as bio-diversity).

The primary mandate and focus of precinct plans is therefore towards ensuring for the implementation of broader strategic spatial objectives (as reflected in the relevant PSDFs, RSDFs and MSDFs) at the local level. These plans thus serve as a means for the planning system to incentivise development in a way that meets a whole range of locally specific policy objectives while ensuring for “on the ground” manifestation and implementation of these spatial objectives.

Defining a Precinct

According to the SDF Guidelines (2017), precinct plan may be prepared for a local area within a municipality within an urban or rural context. The specific scale and extent should be identified through the municipal SDF process. Typically a precinct is a geographically smaller area with specific characteristics (areas that require economic, physical and social renewal, or areas likely to be subject to large scale development within the planning horizon of an SDF – such as Portion 54).

The locally specific emphasis of a precinct plan will vary based on the specific context and local issues. It should however contain sufficient detail to:

- a) Indicate desired patterns of land use within the precinct and set out basic guidelines for implementation
- b) Identify programmes, projects and restructuring elements for the development of land within the precinct
- c) Set out a clear implementation plan and the associated costs
- d) Identify where public investment should be prioritized while also identifying 3rd party investment

In order to capitalize on its position as a first order town in the provincial hierarchy of towns and cities, and its locality on provincial corridors, it is important that Mahikeng should be proactive in creating an environment that is conducive for development. This include inter alia proper spatial planning, planning and provision of bulk services and the availability of developable land for various types of land uses including industrial land and land for mix land use development.

Therefore the focus on Portion 54 should be viewed as part of an integrated process to enhance local economic development and to improve the absorptive capacity of Mahikeng in terms of housing provision, the availability of quality infrastructure and job-creation.

7. 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 (S. Cliff, 2015).

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 (S. Cliff, 2015).

The alternatives considered for the proposed development includes land use alternatives (including the No-go option). The various alternatives will be assessed in the EIAR, in terms of environmental, social and technical feasibility.

7.1 Land Use Alternatives

7.1.1 Mixed land use township (Alternative 1)

Alternative Site layouts have been developed for the proposed development.

The appointed Town and Regional planner have produced the proposed layout plan.

The proposed Township will consist of the following:

Proposed Zoning	Proposed Land use	No. of Erven	Area in hectares
Residential 1 A	Residential Stands (Average 300m ² – 400m ²)	2 334	85.5356 ha
	Residential Stands (Average 500m ² – 600m ²)	763	41.9092 ha
	Residential Stands (Average 600m ² – 800m ²)	360	26.7053 ha
	Residential Stands (Average 800m ² – 1 000m ²)	366	34.7679 ha
Residential 3	Medium density (80 units per ha)	15	41.3116 ha
Municipal	Community Facility	1	0.4454 ha
	Cemetery (To accommodate existing graves found on site)	4	2.5273 ha
Business 2	Business	6	3.7409 ha
Special	Mixed land uses	37	15.0573 ha
Industrial 2	Light Industrial	29	11.0068 ha
Institutional	Clinic	1	0.9517 ha
	Primary School	2	7.7388 ha
	Secondary School	1	4.8006 ha
	Crèche	7	1.7080 ha
	Church	4	1.1546 ha
Transportation	Train Station	1	2.1752 ha
Public Open Space	Public Open Space	35	104.1665 ha
Recreational	Sports Field	1	16.2862 ha
Street	Refer to table below		79.8250 ha
TOTAL		3 967	481.8139 ha

And streets:

STREETS	
Reserve Width	Length in metre
6m Street	62m
10m Street	29 682m
13m Street	10 385m
16m Street	11 506m
20m Street	7 114m
25m Street	1 115m
TOTAL	59 864m

Although the emphasis is on housing, complimentary land uses have been included in the township. People want easy access to job opportunities, shops, banking facilities, clinics, etc. and want their living environment, such as residential townships to be placed at strategic positions with good access routes in close proximity to these amenities.

Therefore the focus on Portion 54 should be viewed as part of an integrated process to enhance local economic development and to improve the absorptive capacity of Mahikeng in terms of housing provision, the availability of quality infrastructure and job-creation.

7.1.2 Single land use: Housing only (Alternative 2)

By providing only one land use type (i.e., housing), mixed income development and social integration across race and income levels, cannot be achieved.

A Commercial node on site is commonly utilised as a “Multi-Purpose Community Centre/Rural Service Centre” which is defined as “a focal point at which a range of essential services can be obtained by people living in its vicinity”. In turn, a commercial node acts as a pool of human and physical resources from which the inputs necessary for development can be distributed efficiently, and from which a community can draw to promote their development”.

By restricting a township to one land use only, the above benefits to the local community, and subsequent council area, cannot be realised, and hence, is not a preferred land use option.

7.1.3 No-go Alternative

The only other alternative that exists for the proposed development is the “no-go” option which will imply that the status quo will prevail. This is unacceptable as Informal settlements consist of non-conventional housing built without complying with legal building procedures. Broadly, these crude dwellings mostly lack proper indoor infrastructure, such as water supply, sanitation, drainage, waste disposal and proper road access. There is also a bond between poor housing and environmental conditions in informal settlements which also reflects poverty. Linking basic services such as water to health is viewed as a false separation as these services are ‘intimately related to housing’. It becomes a housing issue if children playing outside the house contract diarrhoea via ingesting pathogens from faecal matter which contaminates the land on which they play. Otherwise, it is the house which provides for shelter against injury, weather and disease. Improving the surroundings of the house is to limit severe health risks existing within poor quality housing.

8. DESCRIPTION OF THE ENVIRONMENT THAT MAY BE AFFECTED BY THE PROJECT

8.1 BIO-PHYSICAL ASPECTS

8.1.1 GEOLOGY

The site is underlain by basaltic amygdaloidal lava, agglomerate & tuff of the Allanridge Formation (Ra), and amygdaloidal lava & tuff of the Rietgat Formation (Rr), Platberg Group, of the Ventersdorp Supergroup, and the site is covered by Kalahari sand and calcrete. Surficial deposits include the quaternary aeolian Kalahari sand and limestone, covering the lithology.

No dolomite occurs in the area and no stability investigation is required.

On account of the field observations, laboratory results, previous experience and engineering properties of the soil, the Geo-Technical Engineer anticipates the following Geological Zonation.

Special Development:

Site Class C2/2A:

Highly collapsible soil of aeolian origin with thickness from 0,7m up to 1,4m, with more than 10mm movement measured at surface characterizes this zone and almost the entire site. Foundations will therefore require special foundation techniques such as proper compaction techniques combined with lightly reinforced strip footings with articulation joints at all internal and external doors and openings with light reinforcement (brickforce) in masonry or even soil replacement by an engineered fill soil raft. Site drainage and plumbing and service precautions must be used. It is classified as C2 in terms of the SAIEG & NHBRC guidelines (1995) or the SAICE Code of practice (1995), and 2A according to the classification for urban development (Partridge, Wood & Brink).

Site Class C1H1/2A2C:

Medium collapsible soil of aeolian origin underlain by medium expansive and compressible soil with up to 15mm movement measured at surface characterizes this zone. Foundations will therefore require modified normal foundation techniques such as proper compaction techniques and lightly reinforced strip footings with articulation joints at all internal and external doors and openings with light reinforcement (brickforce) in masonry or even soil replacement by an engineered fill soil raft. Site drainage and plumbing and service precautions must be used. It is classified as C1H1 in terms of the SAIEG & NHBRC guidelines (1995) or the SAICE Code of practice (1995), and 2A2C after the classification for urban development (Partridge, Wood & Brink).

Site Class C1H2H3/2A2C:

Medium collapsible soil of aeolian origin underlain by highly expansive and compressible soil with up to 30mm movement measured at surface characterizes this zone. Foundations will therefore require modified normal foundation techniques such as proper compaction techniques and lightly reinforced strip footings with articulation joints at all internal and external doors and openings with light reinforcement (brickforce) in masonry or even soil replacement by an engineered fill soil raft. Site drainage and plumbing and service precautions must be used. It is classified as C1H2H3 in terms of the SAIEG & NHBRC guidelines (1995) or the SAICE Code of practice (1995), and 2A2C after the classification for urban development (Partridge, Wood & Brink).

Site Class PQ:

Old borrow pits and quarries or areas where spoil or building rubble were dumped need to be rehabilitated by backfilling them with an engineered fill compacted in layers. Any quarry or borrow pit must be backfilled with a controlled fill to engineers specification before any development can take place.

Undevelopable:**Site Class PD/2F:**

A drainage feature towards a small pan within the 1:100 year flood line, and development should be restricted to outside these areas that may also exhibit a more clayey soil with medium expansive properties.

8.1.2 TOPOGRAPHY

The site is located on a shallow slope towards the southeast. Excavations as a result of diggings and borrow pits are found

A detailed site survey has been carried out to establish levels. The Engineering report and the Layout plan will address issues regarding storm water. As the proposed development will be in close proximity to residential areas, safety of children and people need to be taken into consideration.

8.1.3. CLIMATE

The climate of the area is typical of the South African interior. In the discussion of this variable, certain aspects of rainfall, temperature and wind that can influence the project will be highlighted.

It must be noted that the climatic data are recorded in the Department of Environmental Affairs (1988) climatic data records. Data for Mafikeng weather station (0508/261 0) is available. The station has continuous records since 1920.

8.1.3.1. Rainfall

The average annual rainfall for the area is 553mm per annum. The highest annual rainfall recorded during the period for which the record is available is 868 mm (1918), while a yearly low of 265mm was recorded in 1930. Of note is the maximum-recorded daily rainfall of 101mm that was recorded on 16/12/1942.

The highest recorded monthly rainfall was recorded during January 1976 namely 360mm. Of importance is the fact that monthly minima of zero rainfall have been recorded for 6 months of the year.

The variability of rainfall as well as the high intensity events will definitely influence the project. On average however, the impact of rainfall can be considered as positive, as sufficient water is generally available for sustaining vegetation. Extreme dry conditions during dry spells will negatively affect the project due to the secondary effects on vegetation as well as the possibility of fire hazards. Extreme maximum events can also have a negative effect on the project during all its phases.

The overall impact can therefore be considered to be "variable" during the construction and operational phases (local in extent and long term in duration). The likelihood that these impacts may occur is probable, medium in intensity and significance. Steps to mitigate negative effects will be described in various sections of the Management Plan.

Due to the scale of the operation, the rainfall of the area cannot be affected by the project and is therefore "Not Applicable:

8.1.3.2. Temperature

The average daily maximum temperature for the winter months for the area is approximately 20° C. The average daily minimum for that time of the year is in the order of 4,5° C.

During the summer months, the average daily maximum is in the order of 29° C and the daily average minimum approximately 16°C. The highest daily maximum recorded was 40,2°C while the lowest recorded temperature was -2,5°C.

In combination with a dry spell, such hot temperatures may be favourable for the spreading of veldt fires.

The general impact of this variable on the project can be considered as positive during the construction and operational phases. The impacts can however be considered as having low intensity impacts of low significance. The extent is local and short term in duration.

Due to the scale of the project, it is clear that it will have no impact on the environment”.

8.1.3.3. Wind

The average wind direction for the area during the summer months is from the north-to-north easterly quadrant, while during the early spring the direction is more north westerly. Southerly winds generally occur during the winter, but are not frequent. Normally very little wind is experienced during the winter due to the presence of the high-pressure cell situated over the country during that time of the year.

The wind speeds are normally fairly low, but high wind speeds may occur during early spring and during of thundershowers.

Wind can be considered as having a low intensity, and a low significance negative impact on the construction and operational phases of the project. The probability is probable and the impacts are local but short in duration. The project can have no influence on the wind and is therefore “not applicable.

Climate Change

According to: WIREs Climate Change 2014, 5605-620. Doi:10.1002/wcc.295: “Climate change is a key concern within South Africa. Mean annual temperatures have increased by at least 1.5 times the observed global average of 0.65°C over the past five decades and extreme rainfall events have increased in frequency. These changes are likely to continue. Climate change poses a significant threat to South Africa’s water resources, food security, health, infrastructure, as well as its ecosystem services and biodiversity. Considering South Africa’s high levels of poverty and inequality, these impacts pose critical challenges for national development. In relation to water, impact studies for the water resources sector have begun to look beyond changes in streamflow to changes in the timing of flows and the partitioning of streamflow into base flows and stormflows, reservoir yields, and extreme hydrological events. Spatially the eastern seaboard and central interior of the country are likely to experience increases in water runoff. Higher frequencies of flooding and drought events are projected for the future. Complexities of the hydrological cycle, influences of land use and management and the linkages to society, health, and the economy indicate far higher levels of complexity in the water resources sector than in other sectors. What has emerged is that land uses that currently have significant impacts on catchment water resources will place proportionally greater demands on the catchment’s water resources if the climate were to become drier. The influence of climate change on water quality is an emerging research field in South Africa, with assessments limited to water temperature and non-point source nitrogen and phosphorus movement. A critical interaction that has not been explored is between

changes in water quality and quantity and the combined impacts, such changes might have impact on various types of water use, e.g., irrigation, domestic consumption, or aquatic ecosystems support”.

8.1.4. SURFACE DRAINAGE AND WETLANDS

The area lies within the drainage basin of the Molopo River. Most of the study area is situated on an area drained by overland flow. There are two stormwater drainage lines that traverses the site. One small stormwater drainage line crosses the site in the south and drains from west to east. (See Photograph 7) while the other stormwater drainage line is found in the north western corner of the site. These drainage lines do not appear on the 1:50 000 map of the area but the southerly line is however indicated on the “Land Use Maps” as represented in the Precinct Plan. See Figures 11 and 12. The north western drainage line has been identified whilst determining stormwater runoff as indicated in Figure 7. The Wetland Specialist’s field verification has found that the drainage lines found on site are in fact as a result of storm water drainage and is not classified as water courses.



Photograph 7: Small drainage line to the south of the site

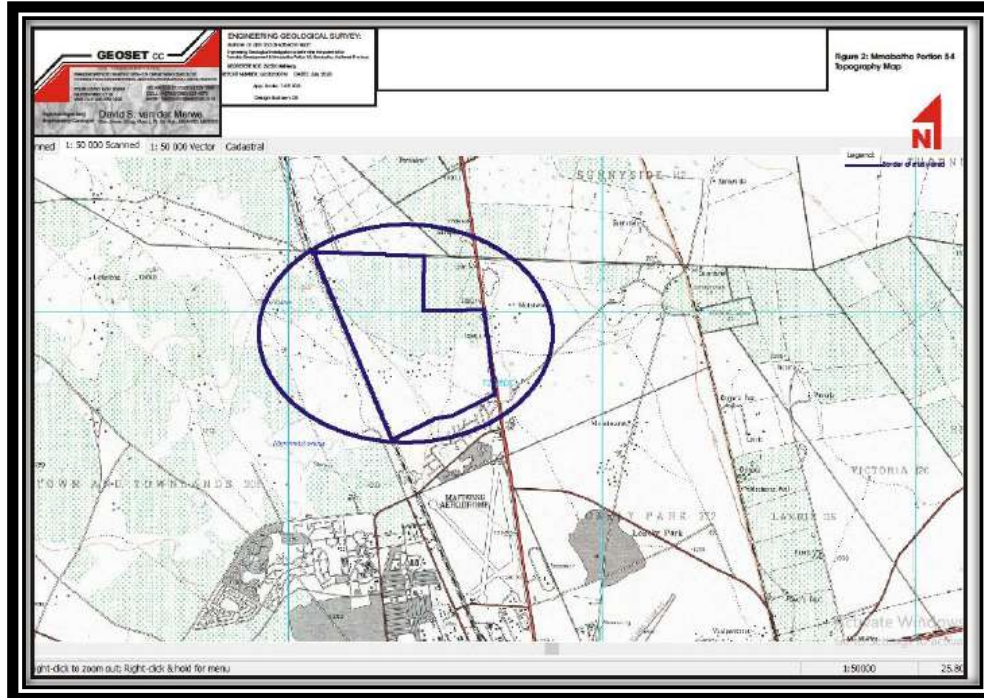


Figure 11: 1:50 000 map of the area does not indicate the presence of a stream on site.

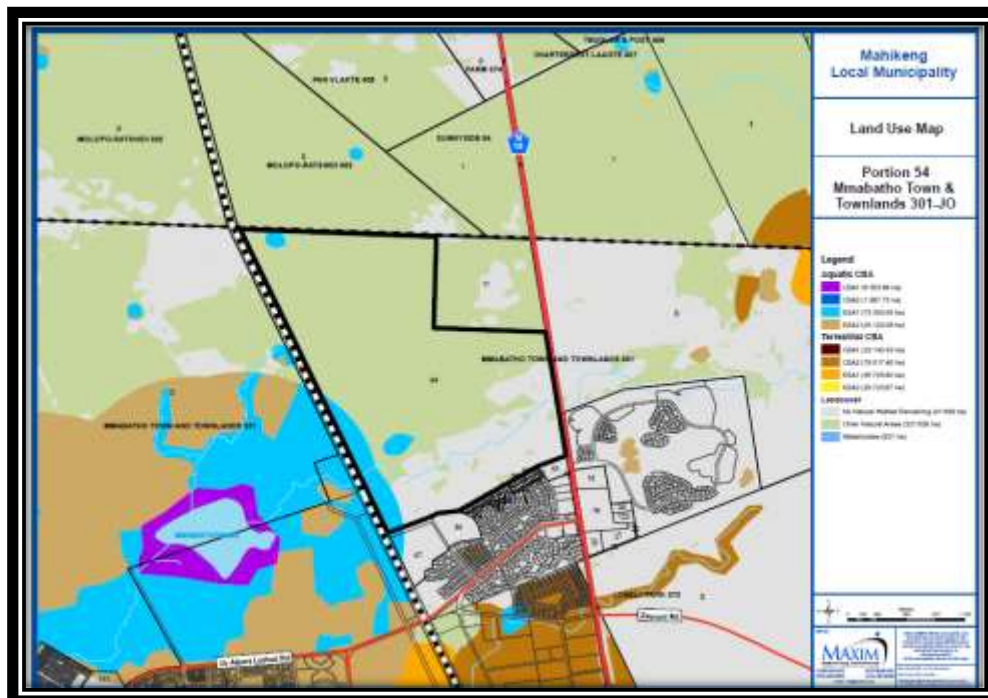


Figure 12: The non-perennial stream is indicated on the “Land Use Maps” as represented in the Precinct Plan

The Sensitivity map also indicates two areas that are classified as wetlands. See Figure 13. The wetland specialist has confirmed two small wetland depressions as identified in Figure 14 of which Pan 1 (photograph 7 & 8) and Pan 2 (photograph 9 & 10), are present at the site and have been accommodated on the layout plan.

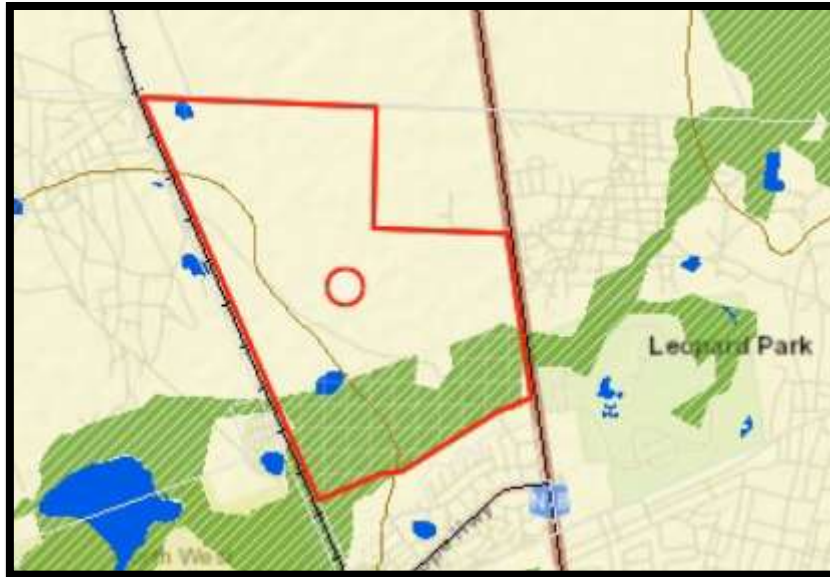


Figure 13: Extract from the sensitivity map indicating the presence of two wetlands on site.



Figure 14: Indication of the small wetland depressions Pan 1 and Pan 2, as well as their buffer zones (32 m) at the site.

- Light blue outline and shading Wetlands at the site
- Green outline Outer edge of buffer zone (32 m)



Photograph 7: The small wetland depression, Pan 1, at the site.
Photo: R.F. Terblanche.



Photograph 8: Soil with mottles at the seasonal zone of Pan 1, at the site.
Photo: R.F. Terblanche.



Photograph 9: Pan 2 at the site, a wetland depression which is not very well defined and of which the origins are difficult to determine at present

Photo: R.F. Terblanche



Photograph 10: Soil at the seasonal zone of Pan 2 at the site.

The Wetland specialist concluded:

- Two small wetland depressions, Pan 1 and Pan 2, are present at the site.

- These two wetland depressions occur at plain on gentle slopes. No conspicuous inlets or outlets could be found. The wetland depression (pan) is probably endorheic, so that water that flows in during rainfall events leaves mostly through evaporation and infiltration.
- The small wetland depression, Pan 1, is found at the northwestern part of the site. The grass species *Leptochloa fusca* is conspicuous at Pan 1 as well the herbaceous *Panicum* species. Megagraminoids (reeds) are absent at Pan 1.
- Present ecological status (PES) of Pan 1 at the site is CATEGORY C which means the wetland is moderately modified but with some loss of natural habitats (Table 4.2 and Table 4.3). Ecological Importance and Sensitivity (EIS) of Pan 1 at the site is Category C which is Moderate and refers to watercourses that are considered to be ecologically important and sensitive on a provincial or local scale. The biodiversity of these floodplains is not usually sensitive to flow and habitat modifications. They play a small role in moderating the quantity and quality of water of major rivers (Table 4.4 and Table 4.5).
- The wetland depression, Pan 2, is present at the southwestern part of the site. Wetland vegetation at wetland depression Pan 2 appears to be poorly represented and encroachment of terrestrial vegetation is noticeable. The indigenous tree species *Vachellia karroo* and *Ziziphus mucronata* are found at the edge of Pan 2. The grass species *Leptochloa fusca* is present at the seasonal zone of the wetland. Megagraminoids (reeds) are absent at both pans at the site.
- Present ecological status (PES) of Wetland Depression Pan 2 at the site is CATEGORY C which means this wetland is moderately modified, but with some loss of natural habitats. Ecological Importance and Sensitivity (EIS) of Pan 2 is CATEGORY D which is low/marginal and which refers to floodplains or wetlands which are not ecologically important and sensitive at any scale. The biodiversity of these floodplains is ubiquitous and not sensitive to flow and habitat modifications. They play an insignificant role in moderating the quantity and quality of water of major rivers.
- The site is part of the Crocodile (West) and Marico Lower Vaal Water Management Area (WMA 4). The site is not part of a Freshwater Ecosystem Priority Area (FEPA) or wetland cluster (Nel et al., 2011a; Nel et al., 2011b). The site is part of a Fish Support Area & Associated Sub-Quaternary Catchment which means that there should be no further deterioration in the condition of the watercourses in the sub-Quaternary catchment.
- The small wetland depressions at the site, all with their buffer zones (32 m) excluded from the proposed footprint are important as part of a stepping stone biodiversity corridor system in the larger area.
- These small wetland depressions, Pan 1 and Pan 2 and their buffer zones are excluded from the footprint proposed for the development. If the development is approved the construction at the footprint proposed for the development (which exclude wetlands) should be planned in such a manner that surface flow function well while erosion is limited. There is no distinct indication that interflow plays an important role in the maintenance of the wetlands at and near the footprint proposed for the development. The geomorphological setting and flow regime of the wetlands are unlikely to be impacted. Loss of any sensitive wetland animal or plant species of particular conservation importance is not expected.
- Pollution of soils by hydrocarbon and unwanted chemical spills are unlikely to take place directly at the wetlands because of their exclusion. These impacts should still be avoided as not to contaminate soils near the wetlands.
- Impacts associated with moving vehicles, machinery or equipment are unlikely as these will not be allowed to operate at the wetland depressions or their buffer zones.
- Continued monitoring and eradication of alien invasive plant species are imperative at the footprint proposed for the development so that these do not become source areas from which alien invasive species could spread to wetlands in the area.
- The Negative Risk Rating in accordance with a risk matrix based on Section 21 c and (i) water use Risk Assessment Protocol and Notice 509 of 2016 (Government Gazette No. 40229: 105-133; Republic of South Africa) at the footprint proposed for the development, also when the wetland in the vicinity is taken in consideration, is Low.

8.1.5. GROUND WATER

The permanent or perched water table on site is deeper than 1,5 m below ground surface. The underground water table in the area is normally very deep because of the geology of the area. The likelihood of problems arising from it is not very large if proper steps are taken to prevent possible pollution infiltration into the groundwater. The impact and significance of this variable is considered low, probable but with a low significance.

The project could adversely affect ground water if proper steps are not implemented in order to prevent pollution from reaching the groundwater. If proper mitigation and pollution prevention steps are taken during the planning, implementation and post-construction phases it is highly unlikely that the groundwater will be affected. The eventual influence should therefore be one of low significance, probability and intensity.

Possible infiltration into the groundwater have been taken into account. During the construction phase, no spills of lubricants or construction worker sewage should be allowed to pollute the ground water. Special care must be taken to ensure adequate surface drainage to prevent the accumulation of water next to structures, especially within these relative flat areas.

8.1.6. FLORA

Vegetation at most of the site appears to be degraded or modified. No rocky ridges are present. The terrestrial vegetation is a grassland with some indigenous tree species of which *Vachellia tortilis* is most conspicuous. Other indigenous tree species at the site includes *Searsia lancea*, *Searsia pyroides*, *Vachellia karroo*, *Ziziphus mucronata*, *Grewia flava* and *Vachellia erioloba*. Shrub-height *Vachellia hebeclada* occurs as clumps in particular at areas that appeared to have been disturbed in the past. Alien invasive tree species such as *Melia azedarach* and *Eucalyptus camaldulensis* as well as alien invasive succulents such as *Opuntia ficus-indica* and *Agave americana*, are found at the site. Indigenous grass species include *Heteropogon contortus*, *Aristida congesta*, *Cynodon dactylon*, *Eragrostis lehmanianna*, *Chloris virgata*, *Eragrostis superba*, *Tragus berteronianus*, *Melinis repens* and *Eragrostis rigidior*. Indigenous forbs and dwarf shrubs include *Acrotome inflata*, *Berkheya onopordifolia*, *Chascanum pinnatifidum*, *Selago densiflora*, *Gazania krebsiana*, *Bulbine narcissifolia*, *Euphorbia inaequilatera*, *Felicia muricata*, *Pollichia campestris* and *Nidorella microcephala*.

Alien invasive weed species are visible at previously cleared and previously cultivated areas. These alien invasive weeds include *Datura ferox*, *Verbena aristigera*, *Flaveria bidentis*, *Argemone ochroleuca*, *Gomphrena celosioides*, *Schkuhria pinnata*, *Tagetes minuta*, *Verbesina encelioides* and *Xanthium strumarium*.

The grass species *Leptochloa fusca* is conspicuous at Pan 1 as well the herbaceous *Persicaria* species. The indigenous tree species *Vachellia karroo* and *Ziziphus mucronata* are noticeable at the edge of Pan 2. The grass species *Leptochloa fusca* is visible at Pan 2. Megagraminoids (reeds) are absent at both pans at the site

Disturbances include extensive excavations of the past which are accompanied by erosion, tracks, dirt roads and clearings. Informal dumping is conspicuous at many areas in particular close to roads and tracks. Indigenous trees are chopped at some places at the site. Alien invasive weeds are widespread at disturbed areas at the site.

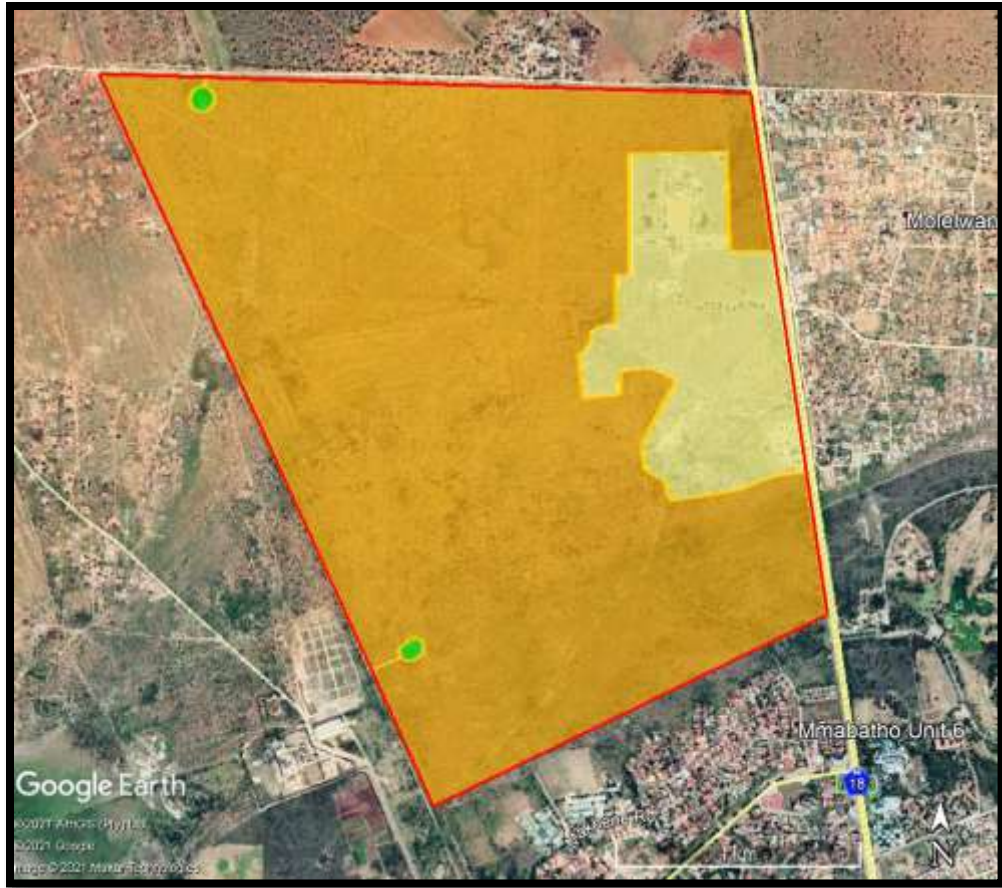






Figure 15 Indications of ecological sensitivity at the site.

	Red outline	Boundaries of the site
	Light yellow outline and shading	Low Sensitivity
	Orange outline and shading	Medium Sensitivity
	Green outline and shading	High Sensitivity

The Ecological Specialist Concluded in his report:

- Vegetation at most of the site appears to be degraded or modified. The terrestrial vegetation is a grassland with some indigenous tree species of which *Vachellia tortilis* is most conspicuous. Other indigenous tree species at the site includes *Searsia lancea*, *Searsia pyroides*, *Vachellia karroo*, *Ziziphus mucronata*, *Grewia flava* and *Vachellia erioloba*. Shrub-height *Vachellia hebeclada* occurs as clumps in particular at areas that appeared to have been disturbed in the past. Alien invasive tree species such as *Melia azedarach* and *Eucalyptus camaldulensis* as well as alien invasive succulents such as *Opuntia ficus-indica* and *Agave americana*, are found at the site. Indigenous grass species include *Heteropogon contortus*, *Aristida congesta*, *Cynodon dactylon*, *Eragrostis lehmanianna*, *Chloris virgata*, *Eragrostis superba*, *Tragus berteronianus*, *Melinis repens* and *Eragrostis rigidior*. Indigenous forbs and dwarf shrubs include *Acrotome inflata*, *Berkheya onopordifolia*, *Chascanum pinnatifidum*, *Selago densiflora*, *Gazania krebsiana*, *Bulbine narcissifolia*, *Euphorbia inaequilatera*, *Felicia muricata*, *Pollichia campestris* and *Nidorella microcephala*.

- Alien invasive weed species are visible at previously cleared and previously cultivated areas. These alien invasive weeds include *Datura ferox*, *Verbena aristigera*, *Flaveria bidentis*, *Argemone ochroleuca*, *Gomphrena celosioides*, *Schkuhria pinnata*, *Tagetes minuta*, *Verbesina encelioides* and *Xanthium strumarium*.
- Disturbances include extensive excavations of the past which are accompanied by erosion, tracks, dirt roads and clearings. Informal dumping is conspicuous at many areas in particular close to roads and tracks. Indigenous trees are chopped at some places at the site. Alien invasive weeds are widespread at disturbed areas at the site.
- Two wetland depressions Pan 1 and Pan 2 are present at the site. The grass species *Leptochloa fusca* is conspicuous at Pan 1 as well the herbaceous *Persicaria* species. The indigenous tree species *Vachellia karroo* and *Ziziphus mucronata* are noticeable at the edge of Pan 2. The grass species *Leptochloa fusca* is visible at Pan 2. Megagraminoids (reeds) are absent at both pans at the site.
- There are no rocky ridges at the site.
- Grassland at the site is represented by the Klerksdorp Thornveld (Gh 13) which is not listed as a Threatened Ecosystem according to the National List of Threatened Ecosystems (2011).
- No Threatened or Near Threatened plant or animal species appear to be resident at the site.
- The site contains the Protected Tree species *Vachellia erioloba* (Camel Thorn). In terms of a part of section 15(1) of the National Forests Act No. 84 of 1998, no person may cut, disturb, damage or destroy any protected tree or possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, except under a license granted by the Minister.
- Apart from *Vachellia erioloba* which is a Protected Tree species, none of the other plant species of particular conservation priority appear to occur at the site.



Photograph 11: The protected tree species *Vachellia erioloba* (Camel Thorn) tree occurs at various locations on the site

- There is little scope for most of the site to be part of a corridor of particular conservation importance, excluding the two pans with their buffer zones. These two pans at the site, with their buffer zones, are part of a stepping stone corridor of particular conservation importance in the larger area.
- Ecological sensitivity at the site is medium or low at most of the site. Ecological sensitivity at the buildings, areas that surround the buildings and at diggings is low. Ecological sensitivity at the wetland depressions Pan 1 and Pan 2 as

well as their buffer zones is high owing to the importance of these wetlands as part of stepping stone corridors of particular conservation importance (Figure 5).

- Following the mitigations which will be upheld and planned footprint for development all the impact risks listed above are moderate or low.
- If the development is approved a key issue would be continued monitoring and eradication of alien invasive plant species. It is in particular alien invasive species such as *Melia azedarach* (Syringa Berrytree) and invasive *Prosopis glandulosa* (Mesquite) which should not be allowed to establish.
- If the development is approved an opportunity presents itself to cultivate indigenous plant species which would benefit urban nature conservation.

If the development is approved an opportunity presents itself to establish and cultivate indigenous vegetation

8.1.7. FAUNA

The fauna of the area is highly disturbed by the people living in the adjoining suburbs. The likelihood of the presence of larger mammals is doubtful. No listed species were identified during the fieldwork phase.

VERTEBRATES

Mammals

Since the site falls outside reserves, threatened species such as the black rhinoceros (*Diceros bicornis*) and the African wild dog (*Lycaon pictus*) are obviously not present. No smaller mammals of particular high conservation significance are likely to be found on the site as well.

Birds

With bird species which often have a large distributional range, their presence does not imply that they are particularly dependent on a site as breeding location. Therefore, the emphasis in the right-hand columns of Table 4.12 and Table 4.13 are on the particular likely dependence or not of bird species on the site. Literature sources that were mainly consulted are Barnes (2000), Hockey, Dean & Ryan (2005) and Chittenden et. al. (2016). No threat to any threatened bird species or any bird species of particular conservation importance are foreseen.

Reptiles

Main Source used for the conservation status and identification of reptiles are Bates, Branch, Bauer, Burger, Marais, Alexander & de Villiers (2014). Alexander & Marais (2007) as well as Tolley & Burger 2007) give useful indications of distributions, habitats and identification of the reptile species. There appears to be no threat to any reptile species of particular high conservation importance if the site is developed.

Amphibians

No frog species that occur in the North West are listed as Threatened species (Vulnerable, Endangered or Critically Endangered) or Near Threatened species according to IUCN Amphibian Specialist Group (2013). Table 4.17 lists *Pyxicephalus adspersus* (Giant Bullfrog) as Least Concern globally.

INVERTEBRATES

Butterflies

Studies relating to the vegetation and habitat of threatened butterfly species in South Africa showed that ecosystems with a unique combination of features are selected by these often localised threatened butterfly species (Deutschländer and Bredenkamp 1999; Edge 2002, 2005; Terblanche, Morgenthal & Cilliers 2003; Lubke, Hoare, Victor & Ketelaar 2003; Edge, Cilliers & Terblanche, 2008). Threatened butterfly species in South Africa can then be regarded as bio-indicators of rare ecosystems.

Four species of butterfly in Gauteng Province and North West Province combined are listed as threatened in the recent butterfly conservation assessment of South Africa (Mecenero et al., 2013). The expected presence or not of these threatened butterfly species as well as species of high conservation priority that are not threatened.

Assessment of threatened butterfly species

***Aloeides dentatis* (Roodepoort Copper)**

The proposed global red list status for *Aloeides dentatis* according to the most recent IUCN criteria and categories is Endangered (Mecenero et al., 2013). *Aloeides dentatis* colonies are found where one of its host plants *Hermannia depressa* or *Lotononis eriantha* is present. Larval ant association is with *Lepisiota capensis* (S.F. Henning 1983; S.F. Henning & G.A. Henning 1989). The habitat requirements of *Aloeides dentatis* are complex and not fully understood yet. See Deutschländer and Bredenkamp (1999) for the description of the vegetation and habitat characteristics of one locality of *Aloeides dentatis* subsp. *dentatis* at Ruimsig, Roodepoort, Gauteng Province. There is not an ideal habitat of *Aloeides dentatis* subsp. *dentatis* on the site and it is unlikely that the butterfly is present at the site.

***Chrysochrysis aureus* (Golden Opal/ Heidelberg Copper)**

The proposed global red list status for *Chrysochrysis aureus* according to the most recent IUCN criteria and categories is Endangered (Mecenero et al., 2013) *Chrysochrysis aureus* (Golden Opal/ Heidelberg Copper) is a resident where the larval host plant, *Clutia pulchella* is present. However, the distribution of the butterfly is much more restricted than that of the larval host plant (S.F. Henning 1983; Terblanche, Morgenthal & Cilliers 2003). One of the reasons for the localised distribution of *Chrysochrysis aureus* is that a specific host ant *Crematogaster liengmei* must also be present at the habitat. Fire appears to be an essential factor for the maintenance of suitable habitat (Terblanche, Morgenthal & Cilliers 2003). Research revealed that *Chrysochrysis aureus* (Golden Opal/ Heidelberg Copper) has very specific habitat requirements, which include rocky ridges with a steep slope and a southern aspect (Terblanche, Morgenthal & Cilliers 2003). Owing to a lack of habitat requirements and ideal habitat the presence of the taxon is highly unlikely.

***Lepidochrysis praeterita* (Highveld Blue)**

The proposed global red list status for *Lepidochrysis praeterita* according to the most recent IUCN criteria and categories is Endangered (G.A. Henning, Terblanche & Ball, 2009; Mecenero et al., 2013). *Lepidochrysis praeterita* is a butterfly that occurs where the larval host plant *Ocimum obovatum* (= *Becium obovatum*) is present (Pringle, G.A. Henning & Ball, 1994), but the distribution of the butterfly is much more restricted than the distribution of the host plant. *Lepidochrysis praeterita* is found on selected rocky ridges and rocky hillsides in parts of Gauteng, the extreme northern Free State and the south-eastern Gauteng Province. No ideal habitat appears to be present for the butterfly on the site. It is unlikely that *Lepidochrysis praeterita* would be present on the site and at the footprint proposed for the development.

***Orachrysis mijburghii* (Mijburgh's Blue)**

The proposed global red status for *Orachrysis mijburghii* according to the most recent IUCN criteria and categories is Endangered (Mecenero et al., 2013). *Orachrysis mijburghii* favours grassland depressions where specific *Indigofera* plant species occur (Terblanche & Edge 2007). The Heilbron population of *Orachrysis mijburghii* in the Free State uses *Indigofera evansiana* as a larval host plant (Edge, 2005) while the Suikerbosrand population in Gauteng uses *Indigofera*

dimidiata as a larval host plant (Terblanche & Edge 2007). There is no suitable habitat for *Orachrysops mijburghi* on the site and it is unlikely that *Orachrysops mijburghi* would be present on the site.

Conclusion on threatened butterfly species

There appears to be no threat to any threatened butterfly species if the site is developed.

Assessment of butterfly species that are not threatened but also of high conservation priority

***Colotis celimene amina* (Lilac tip)**

Colotis celimene amina is listed as Rare (Low density) by Mecenero et al. (2013). In South Africa *Colotis celimene amina* is present from Pietermaritzburg in the south and northwards into parts of Kwa-Zulu Natal, Gauteng, Limpopo, Mpumalanga and the North West Provinces (Mecenero et al. In press.). Reasons for its rarity are poorly understood. It is highly unlikely that *Colotis celimene amina* would be present at the site.

***Lepidochrysops procera* (Savanna Blue)**

Lepidochrysops procera is listed as Rare (Habitat specialist) by Mecenero et al. (2013). *Lepidochrysops procera* is endemic to South Africa and found in Gauteng, KwaZulu-Natal, Mpumalanga and North West (Mecenero et al., 2013). Owing to a lack of habitat requirements and ideal habitat the presence of the taxon at the site is highly unlikely.

***Metisella meninx* (Marsh Sylph)**

Henning and Henning (1989) in the first South African Red Data Book of Butterflies, listed *Metisella meninx* as threatened under the former IUCN category Indeterminate. Even earlier in the 20th century Swanepoel (1953) raised concern about vanishing wetlands leading to habitat loss and loss of populations of *Metisella meninx*. According to the second South African Red Data Book of butterflies (Henning, Terblanche & Ball, 2009) the proposed global red list status of *Metisella meninx* has been Vulnerable. During a recent large scale atlasing project the Conservation Assessment of Butterflies of South Africa, Lesotho and Swaziland: Red List and Atlas (Mecenero et al., 2013) it was found that more *Metisella meninx* populations are present than thought before. Based on this valid new information, the conservation status of *Metisella meninx* is now regarded as Rare (Habitat specialist) (Mecenero et al., 2013). Though *Metisella meninx* is more widespread and less threatened than perceived before, it should be regarded as a localised rare habitat specialist of conservation priority, which is dependent on wetlands with suitable patches of grass at wetlands (Terblanche In prep.). Another important factor to keep in mind for the conservation of *Metisella meninx* is that based on very recent discoveries of new taxa in the group the present *Metisella meninx* is species complex consisting of at least three taxa (Terblanche In prep., Terblanche & Henning In prep.). The ideal habitat of *Metisella meninx* is treeless marshy areas where *Leersia hexandra* (rice grass) is abundant (Terblanche In prep.). The larval host plant of *Metisella meninx* is wild rice grass, *Leersia hexandra* (G.A. Henning & Roos, 2001). Owing to a lack of habitat requirements and ideal habitat the presence of the taxon at the site is highly unlikely.

***Platylesches dolomitica* (Hilltop Hopper)**

Platylesches dolomitica is listed as Rare (Low density) by Mecenero et al. (2013). Historically the conservation status of *Platylesches dolomitica* was proposed to be Vulnerable (Henning, Terblanche & Ball 2009). However this butterfly which is easily overlooked and has a wider distribution than perceived before. *Platylesches dolomitica* has a patchy distribution and is found on rocky ledges where *Parinari capensis* occurs, between 1300 m and 1800m (Mecenero et al. 2013, Dobson Pers comm.). Owing to a lack of habitat requirements and ideal habitat the presence of the taxon at the site is highly unlikely.

Fruit chafer beetles

No *Ichnestoma stobbiai* or *Trichocephala brincki* were found during the surveys. There appears to be no suitable habitat for *Ichnestoma stobbiai* or *Trichocephala brincki* at the site. There appears to be no threat to any of the fruit chafer beetles of particular high conservation priority if the site were developed.

Mygalomorph Spiders

The baboon spider species (Araneae: Teraphosidae) that are of known high conservation priority in the Gauteng Province. The assessment of the conservation status of baboon spiders in South Africa is in process but as a pre-caution the species listed has been included. None of the above baboon spider species were found on the site, or are likely to be resident at the site. There appears to be no threat to the baboon spider species of high conservation significance if the study site is developed

Scorpions

None of the rock scorpions have been found at the site and the habitat does not appear to be optimal.

8.2 SOCIO ECONOMIC FACTORS

8.2.1 SOCIAL AMENITIES

The local municipality intends to promote a more compact city in order to prevent the expansive provision of social and engineering services, as well as to prevent the economic decline of the traditional city centre. The Spatial Development Framework (SDF) addresses the scale of urban growth through planned extensions, infill and redevelopment strategies. The local municipality is aware of the need to integrate urban settlements, with a view to reduce travel distances to the areas of employment opportunities. It also addresses measures to promote compact and connected growth opportunities, such as the identification of revitalisation zones, densification and mixed land use zones. For any development to be sustainable and viable, land development and planning should ensure that communities are located close to job opportunities, social facilities and basic services.

The SDF and the Land Use Management system of the Local Municipality has identified certain areas that must address previously disadvantaged areas and historically disadvantaged residents. There is a definite need for the residents to have reasonable access to opportunities and facilities that supports living in the urban Settlement. It is the responsibility of the local municipality to ensure that the residents have reasonable access to community services and amenities, as well as employment opportunities and that the form of land development need to provide for basic needs in an affordable way. The proposed development will be in line with this principle by ensuring that people living the area do in fact have reasonable access to opportunities and facilities.

The planning practices of the past has resulted in sprawling urban areas that are un-economical. Today, planning policies are transformed to mainly encourage infill development on vacant land within the urban environment, in order to combat urban sprawl. The proposed development falls in line with these principals, as it is located within the urban area and is surrounded by urban development.

The main objective of the precinct plan is to formulate detail proposals for the implementation of residential and mixed land use development. This objective is in line with the Spatial Development Framework proposals for this specific area.

More specific objectives include inter alia:

- Unlocking economic growth (6.1% for NW by 2020) by integration of aspiring economic activities.
- Job creation
- Spatial sustainability, resilience, quality and spatial efficiency
- Guide and inform infrastructure investment and prioritization
- Manage contemporary economic and demographic shifts.
- Enhance intergovernmental coordination
- Enhance corridor development along a national road (N18)
- Opportunity to create world class infrastructure, services and amenities to attract investment in line with the “smart city concept”.
- Address poverty, unemployment and inequality
- Improve the living environments of households in sustainable human settlements
- Protection and enhancement of environmental assets and natural resources

The design concept capitalizes on the advantages the locality of the development area has to offer. These include inter alia:

- The development area’s locality and accessibility on and from the N18 transnational development corridor. The N18 is being earmarked by the Northwest Provincial Development Framework (2017) to be prioritized by continuously increasing its mobility. The good accessibility and free marketing along the corridor will make this area an attractive opportunity for industrialists and the business community to invest in, contributing to economic growth and the provision of job opportunities.
- The development area offers an opportunity to extend the existing medium to high income residential area in Mmabatho Unit 6 in a northern direction up to the power line servitude. The new medium to high income area will be linked with to the existing area by way of two urban collector roads.
- Class 3-order collector roads provide access to a centrally located neighborhood node that will provide business and community facilities. In close proximity to the business node, medium density housing could be provided that is all within walking distance from these services, as well as job opportunities on the periphery of the residential area (along the N18).
- An opportunity exist to provide an intra-urban railway linkage between the precinct and the Mahikeng CBD-area. Provision could be made for a suburban station that is also in close proximity of the Northwest University.
- The open space system was designed to create an integrated and responsive landscape system with the emphasis on pedestrian circulation and connectivity. A well designed open space system will contribute to enhance the quality of living and should be unique to the development.
- The precinct can be expanded to the area North of the development area. This area also falls within the urban edge of the Greater Mahikeng area

During the construction phase, temporary employment will be created. The increased employment in the area during the construction phase will also result in increased expenditure, which, in addition, will mean that more than just the proposed jobs required for the construction on the site will be created due to economic spin-offs that will result.

8.2.2. AIR QUALITY

“The extent and toxicity of emissions is not necessarily a concise indicator of contributions to ground-level air pollution concentrations or of risks to health and the environment. Such contributions are also a function of the height of emission, temporal variations in the release of pollutants, and the proximity of the source to the people or the environment affected by exposure to the pollutant (such as, for instance, children, or the elderly, or people who are ill, or others who may be particularly sensitive receptors to a specific pollutant above a certain concentration). If an industry is operating close to a

school or hospital or centre for the elderly, the potential exposure (in combination with the other contributing factors) is high.

Three factors govern the significance of household fuel-burning emissions:

- (i) the low level of emissions (that is, their height above the ground is generally about 3 m, within people's breathing zone);*
- (ii) the simultaneous occurrence of peak emissions (during the coldest months of winter and in the early mornings and throughout the evenings) and poor atmospheric dispersion (stable atmosphere with low wind speeds, with the possible development of temperature inversions); and*
- (iii) the release of such emissions within high human exposure areas, given that such emissions generally occur in dense, low-income settlements where population density is high (in addition, the pollution is not only outdoors, but frequently indoors as well, due to poor ventilation, so it affects the whole family).*

The significance of vehicle emissions as contributors to air-pollutant concentrations and health risks is similarly increased by the low level (close to the ground) of the emissions, and their proximity to highly populated areas – on highways, for example, with emissions being particularly high when traffic is congested. Vehicle emissions tend to peak early in the morning and in the evenings, when the potential for atmospheric dispersion is reduced (for example, wind speeds are generally low in the early mornings and evenings, reducing their potential for dispersing pollution).

Given the high volumes of pollutants emitted from fuel-burning within the industrial and power-generation sectors, their contribution to ambient concentrations and public health risks is often lower than might be expected. This is because these sources are generally characterized by constant releases, relatively high above ground level, and further away from residential settlements than are household fuel-burning and vehicle emissions.

Ranking the significance of different sources of pollution on the basis of the total emissions for which each source is responsible would, for example, place industrial emissions above household fuel-burning. If the aim is to reduce impacts on human health, however, then household fuel-burning would need to be targeted as a top priority (Scorgie et al., 2004d).

Historically, air pollution control in South Africa has primarily emphasized the implementation of 'command and control' measures in the industrial sector. The shift from source-based control, to the management of the air that people breathe, emphasizes the importance of targeting a wider range of sources and using more flexible and varied approaches. It means paying greater attention to ambient air quality, as it is more important (and more cost-effective, in many cases) to make sure that the ambient air complies with air quality standards. This approach ensures that human and environmental health is protected and that the cumulative impact of pollution from a number of sources is addressed.

Approaches adopted or considered for future implementation have included: regulation (for example, the use of Atmospheric Emission Licences for Listed Activities); market instruments (such as atmospheric user-charges and pollution taxes); the potential for voluntary agreements, education and awareness raising; and emissions trading. International experience shows that adopting a mix of instruments and interventions is more effective than using a single instrument to improve air quality across various types of source. Although direct regulation remains important in controlling industrial sources, there is evidence that specifying emission limits is more effective than specifying the use of particular technologies, so as to give companies flexibility in selecting the method of achieving success that suits them best. This approach is advocated as being more cost-effective and more likely to stimulate technological advances in pollution control methods and production processes.

For large point sources (that is, sources of pollution that are concentrated on one site, but that have large, constant volumes of many types of pollution) that are few in number, instruments such as emissions trading have been advocated as an effective way to manage pollutant emissions and reduce the costs of compliance.

Implementing an efficient social protection system to alleviate poverty is central to maintaining conditions that facilitate not only economic growth but also environmental sustainability. Many South African households – including those with access to electricity – use coal, wood, and paraffin, due to the relative cost-effectiveness of such fuels for heating (that is, space heating) and cooking purposes.

Many low-cost housing developments and informal settlements are located close to industrial and mining operations, as such land is both available and inexpensive. Poorer communities are more likely to suffer from poor service delivery, including inadequate waste removal that sometimes results in refuse being set alight illegally. These examples show that poverty alleviation could help to improve air quality by enabling people to choose practices that are friendlier to the environment.”

https://www.environment.gov.za/sites/default/files/docs/stateofair_airqualityand_sustainable_development.pdf Date visited: 17/03/2020.

The proposed development is planned and will eventually be developed with the above mentioned in mind. The alleviation of poverty (Jobs that will be created) and the provision of proper accommodation facilities (Which has been designed to be as energy efficient as possible) will contribute towards lessening air pollution in the area.

In addition to the above, it should be noted that the project will however create a certain amount of dust during the construction phase. If proper dust suppression measures are implemented this variable will have very little impact (low in intensity and significance during the construction phase).

8.2.3 NOISE

It is a fact that a certain amount of noise will be generated during the construction phase of the project. Noise levels should however rarely exceed the allowable limits. It is unlikely that the project will create any more noise during the operational phase than that already experienced on site.

8.2.4 ARCHAEOLOGY AND CULTURAL SITES

A SAHRA Specialist has been appointed to conduct a Phase I HIA and have found the following:

Over and above the single undecorated piece of Iron Age-type pottery found, numerous historical sites, features or objects of cultural significance dating to the recent historic period were identified in the study area. These included destroyed, dilapidated and run down houses and structures of brick, mortar and stone. No other structures or features were noted beyond those mapped. Four (4) burial grounds were also identified in the study and proposed development area footprint.

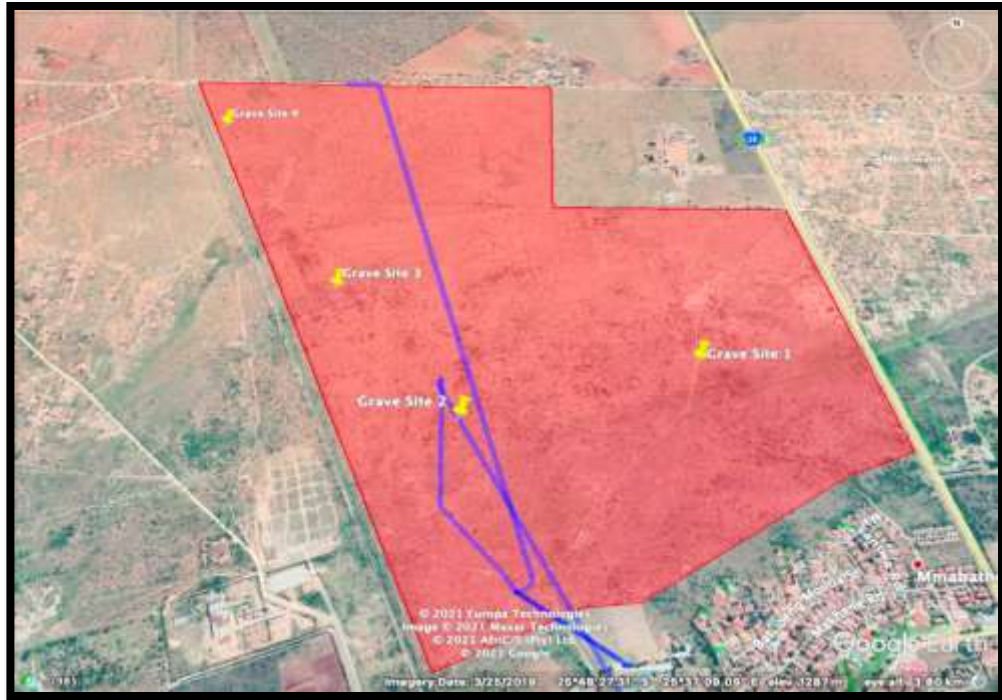


Figure 16: Location of the 4 burial grounds/cemeteries in the area (Google Earth 2021 – courtesy Reach Archaeology)

Grave Site 1

Grave Site 1 contains 10 visible Graves. The graves are demarcated with stones and none has any headstones. No grave goods were visible. The graves have a south-west alignment. The age of the graves are unknown and could be older than 60 years of age. The site is not fenced-in. According to information provided the site is visited by descendants and the graves are linked to the Ramarumo family.

Grave Site 2

There are 5 visible Graves at Site 2. Once again the graves are only demarcated with stones without any headstones, while no grave goods were identified at the site. The graves are also linked to the Ramarumo family whose descendants do visit the site. Some of the graves have been destroyed by people digging them up for the obtaining of skeletal remains for use in traditional medicines since 2020. The age of the graves are not known and could be older than 60 years of age. The site is not fenced-in and the graves also have a south-west alignment.

Grave Site 3

Site 3 has 6 visible Graves. The graves are stone-packed without any headstones and are also in a south-west alignment. No grave goods could be seen. Again, the site is not fenced-in, but is well maintained by descendants visiting the site from time to time. The age of the graves are not known.

Grave Site 4

Site 4 contains 9 visible Graves. Most of the graves are only demarcated with stones, but two with granite headstones are situated here as well. Some of the unmarked graves could be older than 60 years of age. The graves have a south-west alignment and the site is not fenced-in.

The sites recorded indicate that the area had a recent historic settlement. The occupants also had designated burial grounds, with some currently being maintained. Grave Site 2 is in need of urgent intervention to mitigate the 4 disturbed and destroyed graves. There are no fencing or formal demarcation of the burial grounds. Locals know the descendants and families of the deceased buried here as well as the individuals buried. The former occupants of the houses and structures found in the area have relocated outside of the immediate area into the larger Mahikeng town.

The SAHRA specialist concluded and recommended the following:

Background research indicates that there are some cultural heritage sites and features in the larger geographical area within which the study area falls. The assessment of the study area identified a number of sites, features or material of cultural heritage (archaeological and/or historical) origin or significance located here.

Over and above the single undecorated piece of Iron Age-type pottery found, numerous historical sites, features or objects of cultural significance dating to the recent historic period were identified in the study area. These included destroyed, dilapidated and run down houses and structures of brick, mortar and stone. No other structures or features were noted beyond those mapped. Four (4) burial grounds were also identified in the study and proposed development area footprint.

The following mitigation measures are recommended:

- That a “Chance find Protocol” to be implemented and adhered to should any cultural heritage structures, objects, materials, features or graves of significance be uncovered during earth-moving activities in the construction phase of the project.
- That a Public Participation and/Stakeholder Engagement process to be undertaken for the possible relocation of the graves/burial grounds identified on the site prior to construction and development commencing. If the Grave Sites can be avoided by the proposed development then their in situ conservation to protect them against any negative impacts is highly recommended
- The urgent and immediate application for a rescue permit application from SAHRA for the graves located at Grave Site 2 which is at a high risk of further destruction. Some graves have been disturbed and destroyed and their conservation and protection needs to be prioritized.

It should be noted that although all efforts are made to locate, identify and record all possible cultural heritage sites and features (including archaeological remains) there is always a possibility that some might have been missed as a result of grass cover and other factors. The subterranean nature of these resources (including low stone-packed or unmarked graves) should also be taken into consideration. Should any previously unknown or invisible sites, features or material be uncovered during any development actions then an expert should be contacted to investigate and provide recommendations on the way forward.

Finally, from a Cultural Heritage point of view the proposed township development on Portion 54 of Mmabatho Town & Townlands 301JO should be allowed to continue taking into consideration the mitigation measures put forward above.

8.2.5 AESTHETICS

The topography of the study area is relatively flat and open, with little or no rocky ridges or outcrops present. Although there are tree and grass cover, dumping of building rubble and household refuse also occurs throughout the study area. The study area is surrounded by existing urban residential developments including housing, the Military Joint Tactical HQ, Businesses, roads and other urban infrastructure.

Visual Intrusion is defined as the level of compatibility or congruence of the project with the particular qualities of the area, or its 'sense of place'. This is related to the idea of context and maintaining the integrity of the landscape or townscape.

High visual intrusion – results in a noticeable change or is discordant with the surroundings;

Moderate visual intrusion – partially fits into the surroundings, but clearly noticeable;

Low visual intrusion – minimal change or blends in well with the surroundings.

The proposed development will change the scenic resources of the local area from an undeveloped area to a formal residential area. The visual intrusion is considered to be low as the proposed development will have minimal change and blends in well with the surroundings.

The proposed development will require additional lighting on and in buildings and possibly along roads. This will change the night landscape from unlit to lit.

AGRICULTURAL POTENTIAL

There is no irrigated land or water licences issued for abstraction from a registered source and will therefore not automatically qualify as high potential in terms of the *National policy on the protection of high potential and unique agricultural land*.

The main objective of Act 70 is to manage the sub-division of agricultural land to prevent injudicious fragmentation of agricultural land and the creation of uneconomical units. In terms of the Draft Bill, *high potential cropping land* means land best suited to, and capable of, consistently producing acceptable levels of goods and services for a wide range of agricultural enterprises.

Land in capability classes i to iii, unique agricultural land and land under irrigation will qualify from a resource perspective.

The farm should also be an economic unit. It must, therefore be accepted that the income derived from farming should be sufficient for the farmer to cover a living wage, to fund and maintain production infrastructure and equipment and for farming overhead costs. **The property is not considered a viable farming unit**

9. ENVIRONMENTAL IMPACT ASSESSMENT

9.1 ASSESSMENT CRITERIA

Impacts were rated using the following methodology:

Nature of the potential impact		Description of the effect, and the affected aspect of the environment
Duration (time scale)	Short term	Up to 5 years
	Medium term	6 – 15 years
	Long term	More than 15 years
Extent (area)	Local	Confined to study area and its immediate surroundings
	Regional	Region (cadastral, catchment, topographic)
	National	Nationally (The country)
	International	Neighboring countries and the rest of the world.
Magnitude (Intensity)	Low	Site-specific and wider natural and/or social functions and processes are negligibly altered. ((A low intensity impact will not affect the natural, cultural, or social functions of the environment).
	Medium	Site-specific and wider natural and/or social functions and processes continue albeit in a modified way. (Medium scale impact will alter the different functions slightly).
	High	Site-specific and wider natural and/or social functions and processes are severely altered. (A High intensity impact will influence these functions to such an extent that it will temporarily or permanently cease to exist).
Probability	Improbable	Possibility of occurrence is very low. (Such an impact will have a very slight possibility to materialise, because of design or experience).
	Possible	There is a possibility that the impact will occur
	Probable	It is most likely that the impact will occur
	Definite	The impact will definitely occur
Significance	Insignificant	Impact is negligible and will not have an influence on the decision regarding the proposed activity (No mitigation is necessary)
	Very Low	Impact is very small and should not have any meaningful influence on the decision regarding the proposed activity (No mitigation is necessary)
	Low	The impact may not have a meaningful influence on the decision regarding the proposed activity (No mitigation is necessary)
	Medium	The impact should influence the decision regarding the proposed activity (The project can only be carried through if certain mitigatory steps are taken)
	High	The impact will influence the decision regarding the proposed activity
	Very High	The proposed activity should only be approved under special circumstances
Reversibility	Low	There is little chance of correcting the adverse impact
	Medium	There is a moderate chance of correcting the adverse impact

Nature of the potential impact		Description of the effect, and the affected aspect of the environment
	High	There is a high chance in correcting the adverse impact
Risk	Low	Assessing a risk involves an analysis of the consequences and likelihood of a hazard being realized. In decision-making, low-consequence / low-probability risks (green) are typically perceived as acceptable and therefore only require monitoring.
	Medium	Other risks (amber) may require structured risk assessment to better understand the features that contribute most to the risk. These features may be candidates for management
	High	High-consequence / high-probability risks (red) are perceived as unacceptable and a strategy is required to manage the risk.

Attributes associated with the alternatives were assessed and is outlined below:

Geographical attributes

The Geographical attributes of an area relates to the characteristics of a particular region, area or place. It influences the determination of site alternatives as it relates to the location of a site in relation to relevant features in the area.

Physical attributes

Physical attributes of an area relates to the processes and patterns in the natural environment. For the purpose of this assessment, the following processes and patterns have been investigated. Geology, soil, topography and landforms, climate and meteorology, surface water and ground water.

Biological attributes

Biological attributes for the purpose of this study includes the distribution of species and ecosystems in geographic space and through geological time. Organisms and biological communities often vary in a regular fashion along geographic gradients of latitude, elevation, isolation and habitat area. The two main branches assessed will be:

Phytogeography is the branch of biogeography that studies the distribution of plants.

Zoogeography is the branch that studies distribution of animals.

Social attributes

Social attributes is closely related to social theory in general and sociology in particular, dealing with the relation of social phenomena and its spatial components.

Economic attributes

Economic attributes includes the location, distribution and spatial organization of economic activities and also takes into account social, cultural, and institutional factors in the spatial economy of the development.

Heritage attributes

The broad generic term Cultural Heritage Resources refers to any physical and spiritual property associated with past and present human use or occupation of the environment, cultural activities and history. The term includes sites, structures, places, natural features and material of paleontological, archaeological, historical, aesthetic, scientific, architectural, religious, symbolic or traditional importance to specific individuals or groups, traditional systems of cultural practice, belief or social interaction.

Cultural attributes

Cultural attributes relates to the specific characteristics such as language, religion, ethnic and racial identity, and cultural history & traditions of people. These attributes influences family life, education, economic and political structures, and, of course, business practices.

It should be noted that the above mentioned attributes do not occur in isolation and it is not uncommon for an identified impact to overlap with two or more of these attributes. Also note, not all risks require comprehensive and detailed assessment. Solid problem formulation should allow decision-makers to evaluate the extent of subsequent analysis required. The level of effort put into assessing each risk should be proportionate to its significance and priority in relation to other risks, as well as its complexity, by reference to the likely impacts. Consideration should be given to stakeholders' perceptions of the nature of the risk.

ENVIRONMENTAL IMPACT ASSESSMENT (Planning and design phase)					
ALTERNATIVE 1: Mixed land use township (Preferred Alternative)					
Environmental Attribute	Potential impacts and risks	Assessment criteria	Assessment rating (With mitigation)	Proposed mitigation	Assessment rating (Without mitigation)
DIRECT IMPACTS:					
Geographical Physical Social Economic	387.41768 ha of indigenous vegetation will be cleared in order to establish the development. A Protected tree species <i>Vachellia erioloba</i> (Camel Thorn) occurs at the site In terms of a part of section 15(1) of the National Forests Act No. 84 of 1998, no person may cut, disturb, damage or destroy any protected tree or possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, except under a license granted by the Minister.	Duration	Long term	Obtain the necessary environmental authorization for the development.	Long term
		Extent	Local		Local
		Magnitude (Intensity)	High	Conduct a Fauna and Flora Habitat survey to determine the sensitivity of the area.	High
		Probability	Definite		Definite
		Significance	Medium		Medium
		Reversibility	Low	Should any of the <i>Vachellia erioloba</i> (Camel Thorn) have to be removed or trimmed, a Permit.license must be obtained.	Low
		Risk	Low		Medium
		2 Pans have been identified on site and a 32m buffer area has been designated. 21 829 m ² of the proposed development is located within 100 metres from the edge of 2 pans and the vegetation will be cleared.	Duration	Long term	Obtain the necessary environmental authorization for the development.
	Extent		Local	Local	
	Magnitude (Intensity)		High	Conduct a Fauna and Flora Habitat survey to determine the sensitivity of the area.	High
	Probability		Definite		Definite
	Significance		Medium		High
	Reversibility		Low	Implement the mitigation measures as described in the Environmental Management Plan.	Low
	Risk		Low		High
	Plan for the provision of services for the development.		Duration	Long term	Appoint a Civil Engineer to assess the availability and design of services to ensure a sustainable development.
		Extent	Local	Local	
		Magnitude (Intensity)	High		High
		Probability	Definite		Definite
		Significance	Medium		Medium
		Reversibility	Low	Risk	Low
		Risk	Medium		Medium
		Plan to rehabilitate disturbed surfaces which can lead to erosion and dust pollution. Prepare method statements to this effect.	Duration	Short term	Start the rehabilitation of disturbed surfaces as soon as possible.
	Extent		Local	Local	
	Magnitude (Intensity)		Low	Spray bare surfaces with water to prevent dust pollution.	Medium
	Probability		Definite		Definite
	Significance		Medium		Medium
	Reversibility		High	Risk	High
	Risk		Low		Medium

ENVIRONMENTAL IMPACT ASSESSMENT (Planning and design phase)

ALTERNATIVE 1: Mixed land use township (Preferred Alternative)

Environmental Attribute	Potential impacts and risks	Assessment criteria	Assessment rating (With mitigation)	Proposed mitigation	Assessment rating (Without mitigation)
	Plan for the eradication of foreign and invader plant species which are likely to invade disturbed areas.	Duration	Short term	Start the extermination of any invasive species as soon as possible and maintain the eradication programme.	Medium term
		Extent	Local		Local
		Magnitude (Intensity)	Low		Low
		Probability	Definite		Definite
		Significance	Medium		Medium
		Reversibility	High		High
		Risk	Low		Medium
	Plan for the provision and maintenance of ablution facilities for construction workers to prevent pollution of surface and underground water.	Duration	Short term	Provide portable ablution facilities that will not cause pollution during the construction phase. There should be 1 Chemical toilet for every 15 workers on site.	Short term
		Extent	Local		Local
		Magnitude (Intensity)	Medium		Medium
		Probability	Definite		Definite
		Significance	Medium		Medium
		Reversibility	High		High
		Risk	Low		Medium
	Plan to manage possible impacts that the project can have on the soil and geology.	Duration	Long term	Properly plan the construction phase in such a manner that impacts on the soil and geology of the area can be minimised. The findings of the Geotechnical Engineer must be incorporated into the design of the project. Plan to prevent spills of lubricants/oils that can take place on bare soil. This will include the use of drip trays for vehicles that are standing for more than 24 hours.	Long term
		Extent	Local		Local
		Magnitude (Intensity)	Low		Medium
		Probability	Definite		Definite
		Significance	Medium		Medium
		Reversibility	High		High
		Risk	Low		Medium
	Plan for the removal of vegetation (which will lead to the destruction of faunal and floral habitats) during the construction phase.	Duration	Short term	Start with the rehabilitation of vegetation to minimize the negative effects of the removal of plants. The rule must be to minimize the disturbance of animal life by keeping the footprint as small as possible. No snares may be set.	Short term
		Extent	Local		Local
		Magnitude (Intensity)	Medium		Medium
		Probability	Definite		Definite
		Significance	Medium		Medium
		Reversibility	High		High
		Risk	Low		Medium
	The development might have an impact on graveyard that was found adjacent to the site.	Duration	Permanent	Public Participation and/Stakeholder Engagement process to be undertaken for the possible relocation of the graves/burial grounds identified on the site prior to construction and development commencing. If the Grave Sites can be avoided by the proposed development then their in situ conservation to protect them against any negative impacts is highly recommended. The urgent and immediate application for a rescue permit application from SAHRA for the graves located at Grave	Permanent
		Extent	Local		Local
		Magnitude (Intensity)	Medium		Medium
		Probability	Definite		Definite
		Significance	Medium		Medium
		Reversibility	High		High
		Risk	Low		High

ENVIRONMENTAL IMPACT ASSESSMENT (Planning and design phase)					
ALTERNATIVE 1: Mixed land use township (Preferred Alternative)					
Environmental Attribute	Potential impacts and risks	Assessment criteria	Assessment rating (With mitigation)	Proposed mitigation	Assessment rating (Without mitigation)
				Site 2 which is at a high risk of further destruction. Some graves have been disturbed and destroyed and their conservation and protection needs to be prioritized.	
	Plan to safeguard open trenches in order to alleviate the danger of collapse on people or on equipment and people- especially small children who may fall into it.	Duration	Short term	Ensure that the trenches are dug according to specifications as prescribed by the Civil Engineer.	Short term
		Extent	Local		Local
		Magnitude (Intensity)	Medium		Medium
		Probability	Definite	Ensure that the trenches stay open for as short a time as possible.	Definite
		Significance	Medium		Medium
		Reversibility	High		High
		Risk	Low	Ensure that open trenches are demarcated as required by the Occupational Health and Safety Act.	Medium
Indirect impacts:					
Geographical Physical Social Economic	Plan to control dust generation from the proposed project which could impact on the surrounding area.	Duration	Short term	Spray water on open surfaces to ensure that dust does not cause air pollution during construction.	Short term
		Extent	Local		Local
		Magnitude (Intensity)	Low		Low
		Probability	Probable	Start the rehabilitation of disturbed surfaces as soon as possible	Probable
		Significance	Medium		Medium
		Reversibility	High		High
		Risk	Low		Medium
	Plan and compile method statements to implement measures for the prevention and or handling of spills of lubricants / oils that can take place on bare soil.	Extent	Local	Prevent spills of lubricants/oils that can take place on bare soil. This will include the use of drip trays for vehicles that are standing for more than 24 hours.	Local
		Magnitude (Intensity)	Low		Low
		Probability	Probable		Probable
		Significance	Medium	Ensure that all construction vehicles are in good working order and not leaking oil and or fuel. No vehicles may be serviced on site.	Medium
		Reversibility	High		High
		Risk	Low		Medium
	Plan to provide method statements on the handling of waste materials such as glass, plastic, metal or paper which may present a possible pollution hazard	Extent	Local	Implement the management plan to ensure that: All construction rubble is disposed of in a safe and environmentally acceptable manner. NO concrete, gravel or other rubbish will be allowed to remain on site after the construction phase.	Local
		Magnitude (Intensity)	Low		Low
		Probability	Probable		Probable
		Significance	Medium	All cement is housed as to prevent spills (due to rain and or handling errors). NO glass, plastic, metal, or paper shall be allowed to pollute the area.	Medium
		Reversibility	High		High
		Risk	Low		Medium
	Plan to ensure all involved is aware of the possible social and environmental problems that may be experienced as a	Extent	Local	Ensure that contractors (construction phase) abide by all the requirements of the Occupational Health and Safety Act.	Local
		Magnitude (Intensity)	Medium		Medium
Probability		Probable	Probable		
Significance		Medium	Medium		

ENVIRONMENTAL IMPACT ASSESSMENT (Planning and design phase)						
ALTERNATIVE 1: Mixed land use township (Preferred Alternative)						
Environmental Attribute	Potential impacts and risks	Assessment criteria	Assessment rating (With mitigation)	Proposed mitigation	Assessment rating (Without mitigation)	
	result of non-compliance to the relevant legislation.	Reversibility	High	Ensure that all contractors are aware of the consequences of non-compliance to the relevant legislation regarding the above-mentioned act as well as with regard to the environment (acts, regulations, and special guidelines).	High	
		Risk	Low		Medium	
	Plan to create new employment opportunities. Plan to use local labour to ensure local skills development will take place.	Extent	Local	No mitigation measures needed apart from the fact that contractors will have to ensure that they abide to the requirements of the Occupational Health and Safety Act and the Employment Equity Act.	Local	
		Magnitude (Intensity)	Medium		Medium	
		Probability	Definite		Definite	
		Significance	Medium		Medium	
		Reversibility	Medium		Medium	
	Risk	Low	Medium			
	Cumulative impacts:					
	Geographical Physical Social Economic	Plan the development to ensure the social well-being of the community for which the development is intended	Extent	Local	Ensure that the development is constructed as planned.	Local
Magnitude (Intensity)			Medium	Medium		
Probability			Definite	The demand for housing will be partially addressed in the area.	Definite	
Significance			Medium		Medium	
Reversibility			Medium		Medium	
Risk			Low		Medium	
Plan to ensure that the services (Solid waste, bulk water supply water, sewage, electricity and storm water) are designed and constructed in such a manner that it will not cause Environmental degradation.		Extent	Local	Appoint a Civil Engineer to assess the availability and design of services to ensure a sustainable development.	Local	
		Magnitude (Intensity)	Medium		Medium	
		Probability	Definite	Ensure that the development is constructed as planned.	Definite	
		Significance	High		High	
		Reversibility	High		High	
		Risk	Low		Medium	
Plan for the increase in traffic volumes that will result from the proposed development		Extent	Local	The Town and Regional Planner will have to design the layout of the development in such a way that accessibility will not become a problem.	Local	
		Magnitude (Intensity)	Medium		Medium	
		Probability	Definite		Definite	
		Significance	Medium		High	
		Reversibility	Low		Low	
		Risk	Medium		Medium	
Loss of indigenous vegetation.		Extent	Local	No mitigation measures possible.	Local	
		Magnitude (Intensity)	Medium		Medium	
		Probability	Definite		Definite	
		Significance	High		High	
		Reversibility	Low		Low	
		Risk	Medium		Medium	
Loss of Agricultural Land	Extent	Local	No mitigation measures possible.	Local		
	Magnitude (Intensity)	Low		Low		
	Probability	Definite		Definite		
	Significance	Low		Low		
	Reversibility	Low		Low		

ENVIRONMENTAL IMPACT ASSESSMENT (Planning and design phase)					
ALTERNATIVE 1: Mixed land use township (Preferred Alternative)					
Environmental Attribute	Potential impacts and risks	Assessment criteria	Assessment rating (With mitigation)	Proposed mitigation	Assessment rating (Without mitigation)
		Risk	Low		Low

ENVIRONMENTAL IMPACT ASSESSMENT (Planning and design phase)						
ALTERNATIVE 2: Single land use: Housing only						
Environmental Attribute	Potential impacts and risks	Assessment criteria	Assessment rating (With mitigation)	Proposed mitigation	Assessment rating (Without mitigation)	
DIRECT IMPACTS:						
Geographical Physical Social Economic	387.41768 ha of indigenous vegetation will be cleared in order to establish the development. A Protected tree species <i>Vachellia erioloba</i> (Camel Thorn) occurs at the site In terms of a part of section 15(1) of the National Forests Act No. 84 of 1998, no person may cut, disturb, damage or destroy any protected tree or possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, except under a license granted by the Minister.	Duration	Long term	Obtain the necessary environmental authorization for the development.	Long term	
		Extent	Local		Local	
		Magnitude (Intensity)	High		High	
		Probability	Definite	Conduct a Fauna and Flora Habitat survey to determine the sensitivity of the area.	Definite	
		Significance	Medium		Medium	
		Reversibility	Low		Low	
		Risk	Low	Should any of the <i>Vachellia erioloba</i> (Camel Thorn) have to be removed or trimmed, a Permit.license must be obtained.	Medium	
				Implement the mitigation measures as described in the Environmental Management Plan.		
		2 Pans have been identified on site and a 32m buffer area has been designated. 21 829 m ² of the proposed development is located within 100 metres from the edge of 2 pans and the vegetation will be cleared.	Duration	Long term	Obtain the necessary environmental authorization for the development.	Long term
			Extent	Local		Local
			Magnitude (Intensity)	High		High
			Probability	Definite	Conduct a Fauna and Flora Habitat survey to determine the sensitivity of the area.	Definite
			Significance	Medium		High
Reversibility	Low		Low			
Risk	Low		Implement the mitigation measures as described in the Environmental Management Plan.	High		
		The construction camp shall not be located within 100m of any watercourse.				
Plan for the provision of services for the development.	Duration	Long term	Appoint a Civil Engineer to assess the availability and design of services to ensure a sustainable development.	Long term		
	Extent	Local		Local		
	Magnitude (Intensity)	High		High		
	Probability	Definite		Definite		
	Significance	Medium		Medium		
	Reversibility	Low		Low		
	Risk	Medium		Medium		

ENVIRONMENTAL IMPACT ASSESSMENT (Planning and design phase)

ALTERNATIVE 2: Single land use: Housing only

Environmental Attribute	Potential impacts and risks	Assessment criteria	Assessment rating (With mitigation)	Proposed mitigation	Assessment rating (Without mitigation)
	Plan to rehabilitate disturbed surfaces which can lead to erosion and dust pollution. Prepare method statements to this effect.	Duration	Short term	Start the rehabilitation of disturbed surfaces as soon as possible. Spray bare surfaces with water to prevent dust pollution.	Medium term
		Extent	Local		Local
		Magnitude (Intensity)	Low		Medium
		Probability	Definite		Definite
		Significance	Medium		Medium
		Reversibility	High		High
		Risk	Low		Medium
	Plan for the eradication of foreign and invader plant species which are likely to invade disturbed areas.	Duration	Short term	Start the extermination of any invasive species as soon as possible and maintain the eradication programme.	Medium term
		Extent	Local		Local
		Magnitude (Intensity)	Low		Low
		Probability	Definite		Definite
		Significance	Medium		Medium
		Reversibility	High		High
		Risk	Low		Medium
	Plan for the provision and maintenance of ablution facilities for construction workers to prevent pollution of surface and underground water.	Duration	Short term	Provide portable ablution facilities that will not cause pollution during the construction phase. There should be 1 Chemical toilet for every 15 workers on site.	Short term
		Extent	Local		Local
		Magnitude (Intensity)	Medium		Medium
		Probability	Definite		Definite
		Significance	Medium		Medium
		Reversibility	High		High
		Risk	Low		Medium
	Plan to manage possible impacts that the project can have on the soil and geology.	Duration	Long term	Properly plan the construction phase in such a manner that impacts on the soil and geology of the area can be minimised. The findings of the Geotechnical Engineer must be incorporated into the design of the project. Plan to prevent spills of lubricants/oils that can take place on bare soil. This will include the use of drip trays for vehicles that are standing for more than 24 hours.	Long term
		Extent	Local		Local
		Magnitude (Intensity)	Low		Medium
		Probability	Definite		Definite
		Significance	Medium		Medium
		Reversibility	High		High
		Risk	Low		Medium
	Plan for the removal of vegetation (which will lead to the destruction of faunal and floral habitats) during the construction phase.	Duration	Short term	Start with the rehabilitation of vegetation to minimize the negative effects of the removal of plants. The rule must be to minimize the disturbance of animal life by keeping the footprint as small as possible. No snares may be set.	Short term
		Extent	Local		Local
		Magnitude (Intensity)	Medium		Medium
		Probability	Definite		Definite
		Significance	Medium		Medium
		Reversibility	High		High
		Risk	Low		Medium
	The development might have an impact on graveyard that was found adjacent to the site.	Duration	Permanent	Public Participation and/Stakeholder Engagement process to be undertaken for the possible relocation of the graves/burial grounds identified on the site prior to construction and	Permanent
		Extent	Local		Local
		Magnitude (Intensity)	Medium		Medium
		Probability	Definite		Definite

ENVIRONMENTAL IMPACT ASSESSMENT (Planning and design phase)						
ALTERNATIVE 2: Single land use: Housing only						
Environmental Attribute	Potential impacts and risks	Assessment criteria	Assessment rating (With mitigation)	Proposed mitigation	Assessment rating (Without mitigation)	
		Significance	Medium	development commencing. If the Grave Sites can be avoided by the proposed development then their in situ conservation to protect them against any negative impacts is highly recommended.	Medium	
		Reversibility	High		High	
		Risk	Low		High	
	Plan to safeguard open trenches in order to alleviate the danger of collapse on people or on equipment and people- especially small children who may fall into it.	Duration	Short term	Ensure that the trenches are dug according to specifications as prescribed by the Civil Engineer. Ensure that the trenches stay open for as short a time as possible. Ensure that open trenches are demarcated as required by the Occupational Health and Safety Act.	Short term	
		Extent	Local		Local	
		Magnitude (Intensity)	Medium		Medium	
		Probability	Definite		Definite	
		Significance	Medium		Medium	
		Reversibility	High		High	
		Risk	Low		Medium	
	Indirect impacts:					
	Geographical Physical Social Economic	Plan to control dust generation from the proposed project which could impact on the surrounding area.	Duration	Short term	Spray water on open surfaces to ensure that dust does not cause air pollution during construction. Start the rehabilitation of disturbed surfaces as soon as possible	Short term
			Extent	Local		Local
			Magnitude (Intensity)	Low		Low
Probability			Probable	Probable		
Significance			Medium	Medium		
Reversibility			High	High		
Risk			Low	Medium		
Plan and compile method statements to implement measures for the prevention and or handling of spills of lubricants / oils that can take place on bare soil.		Extent	Local	Prevent spills of lubricants/oils that can take place on bare soil. This will include the use of drip trays for vehicles that are standing for more than 24 hours. Ensure that all construction vehicles are in good working order and not leaking oil and or fuel. No vehicles may be serviced on site.	Local	
		Magnitude (Intensity)	Low		Low	
		Probability	Probable		Probable	
		Significance	Medium		Medium	
		Reversibility	High		High	
Risk		Low	Medium			
Plan to provide method statements on the handling of waste materials such as glass, plastic, metal or paper which may present a possible pollution hazard		Extent	Local	Implement the management plan to ensure that: All construction rubble is disposed of in a safe and environmentally acceptable manner. NO concrete, gravel or other rubbish will be allowed to remain on site after the construction phase.	Local	
		Magnitude (Intensity)	Low		Low	
		Probability	Probable		Probable	
		Significance	Medium		Medium	
		Reversibility	High		High	
Risk	Low	Medium				

ENVIRONMENTAL IMPACT ASSESSMENT (Planning and design phase)

ALTERNATIVE 2: Single land use: Housing only

Environmental Attribute	Potential impacts and risks	Assessment criteria	Assessment rating (With mitigation)	Proposed mitigation	Assessment rating (Without mitigation)
				All cement is housed as to prevent spills (due to rain and or handling errors). NO glass, plastic, metal, or paper shall be allowed to pollute the area.	
	Plan to ensure all involved is aware of the possible social and environmental problems that may be experienced as a result of non-compliance to the relevant legislation.	Extent	Local	Ensure that contractors (construction phase) abide by all the requirements of the Occupational Health and Safety Act. Ensure that all contractors are aware of the consequences of non-compliance to the relevant legislation regarding the above-mentioned act as well as with regard to the environment (acts, regulations, and special guidelines).	Local
		Magnitude (Intensity)	Medium		Medium
		Probability	Probable		Probable
		Significance	Medium		Medium
		Reversibility	High		High
	Plan to create new employment opportunities. Plan to use local labour to ensure local skills development will take place.	Risk	Low		Medium
		Extent	Local	No mitigation measures needed apart from the fact that contractors will have to ensure that they abide to the requirements of the Occupational Health and Safety Act and the Employment Equity Act.	Local
		Magnitude (Intensity)	Medium		Medium
		Probability	Definite		Definite
		Significance	Medium		Medium
	Reversibility	Medium	Medium		
		Risk	Low		Medium
Cumulative impacts:					
Geographical Physical Social Economic	Plan the development to ensure the social well-being of the community for which the development is intended	Extent	Local	Ensure that the development is constructed as planned. The demand for housing will be partially addressed in the area.	Local
		Magnitude (Intensity)	Medium		Medium
		Probability	Definite		Definite
		Significance	Medium		Medium
		Reversibility	Medium		Medium
		Risk	Low		Medium
	Plan to ensure that the services (Solid waste, bulk water supply water, sewage, electricity and storm water) are designed and constructed in such a manner that it will not cause Environmental degradation.	Extent	Local	Appoint a Civil Engineer to assess the availability and design of services to ensure a sustainable development. Ensure that the development is constructed as planned.	Local
		Magnitude (Intensity)	Medium		Medium
		Probability	Definite		Definite
		Significance	High		High
		Reversibility	High		High
		Risk	Low		Medium
	Plan for the increase in traffic volumes that will result from the proposed development	Extent	Local	The Town and Regional Planner will have to design the layout of the development in such a way that accessibility will not become a problem.	Local
		Magnitude (Intensity)	Medium		Medium
		Probability	Definite		Definite
		Significance	Medium		High
		Reversibility	Low		Low
		Risk	Medium		Medium
	Loss of indigenous vegetation.	Extent	Local	No mitigation measures possible.	Local
		Magnitude (Intensity)	Medium		Medium
Probability		Definite	Definite		
Significance		High	High		

ENVIRONMENTAL IMPACT ASSESSMENT (Planning and design phase)					
ALTERNATIVE 2: Single land use: Housing only					
Environmental Attribute	Potential impacts and risks	Assessment criteria	Assessment rating (With mitigation)	Proposed mitigation	Assessment rating (Without mitigation)
		Reversibility	Low	No mitigation measures possible.	Low
		Risk	Medium		Medium
	Loss of Agricultural Land	Extent	Local		Local
		Magnitude (Intensity)	Low		Low
		Probability	Definite		Definite
		Significance	Low		Low
		Reversibility	Low		Low
		Risk	Low		Low

ENVIRONMENTAL IMPACT ASSESSMENT (Planning and design phase)					
ALTERNATIVE 3: (No-Go Option)					
Environmental Attribute	Potential impacts and risks	Assessment criteria	Assessment rating (With mitigation)	Proposed mitigation	Assessment rating (Without mitigation)
DIRECT IMPACTS:					
Geographical Physical Social Economic Cultural	No indigenous vegetation will be removed.	Duration	Long term	No mitigation measures required.	Long term
		Extent	Local		Local
		Magnitude (Intensity)	Medium		Medium
		Probability	Definite		Definite
		Significance	High		High
		Reversibility	Low		Low
		Risk	Medium		Medium
	No impact on the watercourses in the area.	Duration	Long term	No mitigation measures required.	Long term
		Extent	Local		Local
		Magnitude (Intensity)	Medium		Medium
		Probability	Definite		Definite
		Significance	High		High
		Reversibility	Low		Low
		Risk	Medium		Medium
	Loss of Agricultural Land	Extent	Local	No mitigation measures possible.	Local
		Magnitude (Intensity)	Low		Low
		Probability	Definite		Definite
		Significance	Low		Low
		Reversibility	Low		Low
		Risk	Low		Low
		Indirect impacts:			
Geographical Physical Social Economic Cultural	No new employment opportunities will be created during the planning and design phase.	Extent	Local	Ensure that the development is constructed and operated as planned.	Local
		Magnitude (Intensity)	Medium		Medium
		Probability	Definite		Definite
	No skills enhancement will take place	Significance	Medium		Medium
		Reversibility	Medium		Medium
		Risk	High		High

ENVIRONMENTAL IMPACT ASSESSMENT (Planning and design phase)					
ALTERNATIVE 3: (No-Go Option)					
Environmental Attribute	Potential impacts and risks	Assessment criteria	Assessment rating (With mitigation)	Proposed mitigation	Assessment rating (Without mitigation)
	If this option is implemented, the projected boost to the local and regional economy will not take place.				
Cumulative impacts:					
Geographical Physical Social Economic Cultural	If this option is implemented, the projected boost to the local and regional economy will not take place. No new employment opportunities will be created. No improvement to local skills development will take place. No broadened Tax base for the Mahikeng Local Municipality .	Extent	Local	Ensure that the development is constructed and operated as planned.	Local
		Magnitude (Intensity)	Medium		Medium
		Probability	Definite		Definite
		Significance	High		High
		Reversibility	High		High
		Risk	Medium		Medium

ENVIRONMENTAL IMPACT ASSESSMENT (Construction phase)					
ALTERNATIVE 1: Mixed land use township (Preferred Alternative)					
Environmental Attribute	Environmental Attribute	Environmental Attribute	Environmental Attribute	Environmental Attribute	Environmental Attribute
DIRECT IMPACTS:					
Geographical Physical Social Economic	387.41768 ha of indigenous vegetation will be cleared in order to establish the development. A Protected tree species <i>Vachellia erioloba</i> (Camel Thorn) occurs at the site in terms of a part of section 15(1) of the National Forests Act No. 84 of 1998, no person may cut, disturb, damage or destroy any protected tree or possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, except under a license granted by the Minister.	Duration	Long term	Obtain the necessary environmental authorization for the development. Implement the findings of the Fauna and Flora Habitat survey. Should any of the <i>Vachellia erioloba</i> (Camel Thorn) have to be removed or trimmed, a Permit/license must be obtained. Implement the mitigation measures as described in the Environmental Management Plan.	Long term
		Extent	Local		Local
		Magnitude (Intensity)	High		High
		Probability	Definite		Definite
		Significance	Medium		Medium
		Reversibility	Low		Low
		Risk	Low		Medium
	2 Pans have been identified on site and a 32m buffer area has been designated. 21 829 m ² of the proposed development is located within 100 metres from the edge of 2 pans and the vegetation will be cleared.	Duration	Long term	Obtain the necessary environmental authorization for the development. Implement the findings of the Fauna and Flora Habitat survey.	Long term
		Extent	Local		Local
		Magnitude (Intensity)	High		High
		Probability	Definite		Definite
		Significance	Medium		Medium
		Reversibility	Low		Low
		Risk	Low		Medium

ENVIRONMENTAL IMPACT ASSESSMENT (Construction phase)

ALTERNATIVE 1: Mixed land use township (Preferred Alternative)

Environmental Attribute	Environmental Attribute	Environmental Attribute	Environmental Attribute	Environmental Attribute	Environmental Attribute
				Implement the mitigation measures as described in the Environmental Management Plan.	
Rehabilitate disturbed surfaces which can lead to erosion and dust pollution.	Duration	Short term		Start the rehabilitation of disturbed surfaces as soon as possible.	Medium term
	Extent	Local			Local
	Magnitude (Intensity)	Low			Medium
	Probability	Definite			Definite
	Significance	Medium			Medium
	Reversibility	High			High
	Risk	Low			Medium
Eradicate foreign and invader plant species which are likely to invade disturbed areas.	Duration	Short term		Start the extermination of any invasive species as soon as possible and maintain the eradication programme.	Medium term
	Extent	Local			Local
	Magnitude (Intensity)	Low			Low
	Probability	Definite			Definite
	Significance	Medium			Medium
	Reversibility	High			High
	Risk	Low			Medium
Poorly planned ablation facilities for construction workers may cause pollution of surface and underground water.	Duration	Short term		Provide portable ablation facilities that will not cause pollution during the construction phase. There should be 1 Chemical toilet for every 30 workers on site	Short term
	Extent	Local			Local
	Magnitude (Intensity)	Medium			Medium
	Probability	Definite			Definite
	Significance	Medium			Medium
	Reversibility	High			High
	Risk	Low			Medium
The proposed project can impact on the soil and geology.	Duration	Long term		Implement the findings of the Geo-Technical Engineer. Prevent spills of lubricants/oils that can take place on bare soil. This will include the use of drip trays for vehicles that are standing for more than 24 hours.	Long term
	Extent	Local			Local
	Magnitude (Intensity)	Low			Medium
	Probability	Definite			Definite
	Significance	Medium			Medium
	Reversibility	High			High
	Risk	Low			Medium
The vegetation of the area will be removed during the construction phase, which will destroy floral and faunal habitats.	Duration	Short term		Start with the rehabilitation of vegetation to minimize the negative effects of the removal of plants. The rule must be to minimize the disturbance of animal life by keeping the footprint as small as possible.	Short term
	Extent	Local			Local
	Magnitude (Intensity)	Medium			Medium
	Probability	Definite			Definite
	Significance	Medium			Medium
	Reversibility	High			High
	Risk	Low			Medium

ENVIRONMENTAL IMPACT ASSESSMENT (Construction phase)

ALTERNATIVE 1: Mixed land use township (Preferred Alternative)

Environmental Attribute	Environmental Attribute	Environmental Attribute	Environmental Attribute	Environmental Attribute	Environmental Attribute
				No snares may be set.	
	Open trenches can be dangerous as they can either collapse on people or on equipment and people- especially small children, can fall into them.	Duration	Short term	Ensure that the trenches are dug according to specifications as prescribed by the Civil Engineer.	Short term
		Extent	Local		Local
		Magnitude (Intensity)	Medium		Medium
		Probability	Definite		Definite
		Significance	Medium		Medium
		Reversibility	High		High
		Risk	Low		Medium
				Ensure that the trenches stay open for as short a time as possible.	
				Ensure that open trenches are demarcated as required by the Occupational Health and Safety Act.	
Indirect impacts:					
Geographical Physical Social Economic	Dust generation from the proposed project could impact on the surrounding area.	Duration	Short term	Spray water on open surfaces to ensure that dust does not cause air pollution during construction.	Short term
		Extent	Local		Local
		Magnitude (Intensity)	Low		Low
		Probability	Probable		Probable
		Significance	Medium		Medium
		Reversibility	High		High
		Risk	Low		Medium
	Spills of lubricants / oils can take place on bare soil.	Extent	Local	Prevent spills of lubricants/oils that can take place on bare soil. This will include the use of drip trays for vehicles that are standing for more than 24 hours.	Local
		Magnitude (Intensity)	Low		Low
		Probability	Probable		Probable
		Significance	Medium		Medium
		Reversibility	High		High
		Risk	Low		Medium
		Waste materials such as glass, plastic, metal or paper present a possible pollution hazard	Extent		Local
	Magnitude (Intensity)		Low	Low	
	Probability		Probable	Probable	
	Significance		Medium	Medium	
	Reversibility		High	High	
	Risk		Low	Medium	

ENVIRONMENTAL IMPACT ASSESSMENT (Construction phase)

ALTERNATIVE 1: Mixed land use township (Preferred Alternative)

Environmental Attribute	Environmental Attribute	Environmental Attribute	Environmental Attribute	Environmental Attribute	Environmental Attribute
				site after the construction phase. All cement is housed as to prevent spills (due to rain and or handling errors). NO glass, plastic, metal, or paper shall be allowed to pollute the area.	
	Non-compliance to the relevant legislation may cause social and environmental problems.	Extent	Local	Ensure that contractors (construction phase) abide by all the requirements of the Occupational Health and Safety Act. Ensure that all contractors are aware of the consequences of non-compliance to the relevant legislation regarding the above-mentioned act as well as with regard to the environment (acts, regulations, and special guidelines).	Local
		Magnitude (Intensity)	Medium		Medium
		Probability	Probable		Probable
		Significance	Medium		Medium
		Reversibility	High		High
		Risk	Low		Medium
	New employment opportunities will be created. Local skills development will take place.	Extent	Local	No mitigation measures needed apart from the fact that contractors will have to ensure that they abide to the requirements of the Occupational Health and Safety Act and the Employment Equity Act.	Local
		Magnitude (Intensity)	Medium		Medium
		Probability	Definite		Definite
		Significance	Medium		Medium
		Reversibility	Medium		Medium
		Risk	Low		Medium
Cumulative impacts:					
Geographical Physical Social Economic	Enhancement of the social well-being of the local communities for which the development is intended	Extent	Local	Ensure that the development is constructed as planned. The demand for housing will be partially addressed in the area.	Local
		Magnitude (Intensity)	Medium		Medium
		Probability	Definite		Definite
		Significance	Medium		Medium
		Reversibility	Medium		Medium
		Risk	Low		Medium
	Solid waste: The proposed development will add additional solid waste into the existing waste stream of the Mahikeng Local Municipality .	Extent	Local	Ensure that the development is constructed as planned by the Civil Engineer.	Local
		Magnitude (Intensity)	Medium		Medium
		Probability	Definite		Definite
		Significance	High		High
		Reversibility	High		High

ENVIRONMENTAL IMPACT ASSESSMENT (Construction phase)

ALTERNATIVE 1: Mixed land use township (Preferred Alternative)

Environmental Attribute	Environmental Attribute	Environmental Attribute	Environmental Attribute	Environmental Attribute	Environmental Attribute
	<p><u>Sewage:</u> The proposed development will add additional sewage into the existing sewage stream of the Mahikeng Local Municipality.</p> <p><u>Water supply:</u> The proposed development will add pressure to the water supply of Mahikeng Local Municipality's Water.</p>	Risk	Low		Medium
	<p><u>Traffic:</u> The proposed development will result in an increase in traffic in the immediate surroundings of the proposed development.</p>	Extent	Local	Ensure that the development is constructed as planned by the Town and Regional Planner	Local
		Magnitude (Intensity)	Medium		Medium
		Probability	Definite		Definite
		Significance	Medium		High
		Reversibility	Low		Low
		Risk	Medium		Medium
	<p>Indigenous vegetation will be removed.</p>	Extent	Local	No mitigation measures possible.	Local
		Magnitude (Intensity)	Medium		Medium
		Probability	Definite		Definite
		Significance	High		High
		Reversibility	Low		Low
		Risk	Medium		Medium
		Extent	Local		Local

ENVIRONMENTAL IMPACT ASSESSMENT (Operational Phase)

ALTERNATIVE 1: Mixed land use township (Preferred Alternative)

Environmental Attribute	Environmental Attribute	Environmental Attribute	Assessment rating (With mitigation)	Proposed mitigation	Assessment rating (Without mitigation)
DIRECT IMPACTS:					
Geographical Physical Social Economic Cultural	Poorly maintained and serviced infrastructure may cause environmental problems.	Extent	Local	It will be the responsibility of the Local Municipality to maintain the infrastructure.	Local
		Magnitude (Intensity)	Medium		Medium
		Probability	Definite		Definite
		Significance	Medium- high		High
		Reversibility	High		Medium
		Risk	High		High
Indirect impacts:					
Geographical Physical Social Economic Cultural	Lack of rehabilitation may cause problems	Extent	Local	It will be the responsibility of the Local Municipality to ensure that the rehabilitation plan is implemented	Local
		Magnitude (Intensity)	Medium		Medium
		Probability	Definite		Definite
		Significance	Medium- high		High
		Reversibility	High		Medium
		Risk	High		High
Cumulative impacts:					

ENVIRONMENTAL IMPACT ASSESSMENT (Operational Phase)

ALTERNATIVE 1: Mixed land use township (Preferred Alternative)

Environmental Attribute	Environmental Attribute	Environmental Attribute	Assessment rating (With mitigation)	Proposed mitigation	Assessment rating (Without mitigation)
Geographical Physical Social Economic Cultural	Enhancement of the social well-being of the local communities for which the development is intended	Extent	Local	No mitigation measures required.	Local
		Magnitude (Intensity)	Medium		Medium
		Probability	Definite		Definite
		Significance	High		High
		Reversibility	High		High
		Risk	Medium		Medium
Geographical Physical Social Economic Cultural	Broadened tax base: The proposed development will generate more income for the Mahikeng Local Municipality.	Extent	Local	No mitigation measures required.	Local
		Magnitude (Intensity)	Medium		Medium
		Probability	Definite		Definite
		Significance	High		High
		Reversibility	High		High
		Risk	Medium		Medium

10. PUBLIC PARTICIPATION.

10.1 ADVERTISEMENT AND NOTICE

Publication name	Mafikeng Mail	
Date published	14/10/2022	
Site notice 1 position Site notice 2 position Site Notice 3 Position	Latitude	Longitude
	25°48'20.38"S	25°37'54.50"E
	25°48'1.97"S	25°37'51.49"E
	25°47'29.94"S	25°36'14.72"E
Date placed	13/10/2022	

PLEASE SEE PROOF BELOW

TO FOLLOW

PROOF OF NEWSPAPER ADVERTISEMENT:

TO FOLLOW

10.2 DETERMINATION OF APPROPRIATE MEASURES

Details of the measures taken to include all potential I&APs as required by Regulation 41(2)(e) and 41(6) of GN R.982.

Key stakeholders (other than organs of state) identified in terms of Regulation 40(2)(d) of GN R.982:

Title, Name and Surname	Affiliation/ key stakeholder status	Contact details (tel number or e-mail address)
N/A	Neighbour	See photo evidence

10.3 AUTHORITY PARTICIPATION

Authorities and organs of state identified as key stakeholders. Key stakeholders identified in terms of Regulation 7(1) and (2) and Regulation 40(2) (a)-(c) of GN R.982:

Authority/Organ of State	Contact person (Title, Name and Surname)	Tel No	Fax No	e-mail	Postal address
Department of Water and Sanitation	Ms Theunissen	012 253 1093 / 012 253 1098	NA		Old Rustenburg Rd Hartbeespoort Brits 0216
Head of Department: North-West Department of Agriculture and Rural Development	Mr P Mokaila	018-3895723	018-389 5090		Private Bag X2039 Mmabatho 2735
North West Department of Biodiversity	D Seshabela	018 389 5719/ 5431/ 5688	018 392 4377	DSeshabela@nwpg.gov.za	Private Bag X2039 Mmabatho 2735
North West Department of public works and roads	Mr. JJ Tselane	018 388 1435 / 1377 / 1250	018 388 4021		Private Bag X2080 Mmabatho 2735
Ngaka Modiri Molema District Municipality	The District Municipal Manager: A. Losaba	018 381 9400	018 381 0561		Private Bag X2167 Mahikeng 2745
Mahikeng local municipality	The Municipal Manager: Ms. D. I. Mongwaketse	018 389 0111	018 384 4830		Private Bag X63, Mmabatho, 2735
Councillor Ward 6 Mahikeng local municipality	Councilor Morulaganyi Cultulator SegoE	018 389 0111	018 384 4830		Private Bag X63, Mmabatho, 2735
Transnet	Mr. R Nair	+27 11 351 9001	+27 11 351 9023		P.O. Box 72501 Parkview 2122
SANRAL	Mr. P. Hlahla	012 844 8000	012 844 8200		PO Box 415 Pretoria

					0001
Eskom	Mr. M Dala	083 735 9327		DalaME@eskom.co .za	
SAHRA	SAHRIS			https://sahris.sahra. org.za	https://sahris.sahra. org.za



AB ENVIRO-CONSULT CC

Reg no. 2000/016653/23

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Potchefstroom, 2531
Tel: + 27 (83) 5488 105
Fax: + 27 (18) 293 0671
E-mail: jp@abenviro.co.za

14/10/2022

FAO: Cornia Theunissen
North West Provincial Operations
Water Resource Management
Old Rustenburg Rd
Hartbeespoort
Brits
0216

Tel: 087-943-3741

Dear Sir/Madam

Environmental Impact Assessment for the proposed clearance of 387.41768ha of indigenous vegetation, of which 21 829 m² is located within 100 metres from the edge of 2 pans, in order to establish a mixed use township, located on Portion 54 of the farm Mmabatho Town and Townlands 301-JO.

AB ENVIRO CONSULT was appointed by Mahikeng Local Municipality to submit an application to the Department of Economic Development, Environment and Tourism, North West Province for the above mentioned proposed development. Attached please find a notification of the proposed development and a copy of the Scoping report for your comments. You are requested to comment within 30 days from the date of this letter.

In the event of your organisation/department not wishing to comment on this matter, it would be appreciated if we could receive written confirmation thereof to enable us to continue with the finalisation of the application. If no response is however received from your Department/organisation within the said time, it will be assumed that your department/organisation does not wish to comment on this matter and the application will be processed further.

Please be advised, in accordance with POPIA and NEMA, personal data is collected and processed by the applicant/EAP and shared with the Competent Authority to enable informed decision-making.

Please do not hesitate to contact us should any further information or clarification be required.

Yours sincerely,

Mr JP de Villiers
EAP-EAPASA: 2019/808

PROF A B DE VILLIERS (M Sc, Ph D, SACNASP)
MR.J.P. DE VILLIERS (M Sc, EAP-EAPASA, IAIA); MRS.J.E. DU PLOOY (M.E.M; EAP-EAPASA, IAIA)



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AB ENVIRO-CONSULT CC

Reg no. 2000/016653/23

14/10/2022

Dr. P. Mokaila
North-West Department of Agriculture and rural development
Private Bag X2039
Mmabatho
2735

Dear Sir/Madam

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14/10/2022

The Manager

Directorate: Biodiversity Management and Conservation

North West Department: North West Department Economic Development, Environment, Conservation and Tourism

DSeshabela@nwpg.gov.za

Dear Sir/Madam

Environmental Impact Assessment for the proposed clearance of 387.41768ha of indigenous vegetation, of which 21 829 m² is located within 100 metres from the edge of 2 pans, in order to establish a mixed use township, located on Portion 54 of the farm Mmabatho Town and Townlands 301-JO.

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Reg no. 2000/016653/23

14/10/2022

Ngaka Modiri Molema District Municipality
The Municipal Manager:
Mr Allan Olehile Losaba
Private Bag X2167
Mahikeng
2745

Dear Sir/Madam

Environmental Impact Assessment for the proposed clearance of 387.41768ha of indigenous vegetation, of which 21 829 m² is located within 100 metres from the edge of 2 pans, in order to establish a mixed use township, located on Portion 54 of the farm Mmabatho Town and Townlands 301-JO.

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14/10/2022

Mahikeng Local Municipality
The Municipal Manager:
Ms. D. I. Mongwaketse
Private Bag X63,
Mmabatho
2735

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Please do not hesitate to contact us should any further information or clarification be required.

Yours sincerely,

Mr JP de Villiers
EAP-EAPASA: 2019/808

PROF A B DE VILLIERS (M Sc, Ph D, SACNASP)
MR.J.P. DE VILLIERS (M Sc, EAP-EAPASA, IAIA); MRS.J.E. DU PLOOY (M.E.M; EAP-EAPASA, IAIA)



AB ENVIRO-CONSULT CC

Reg no. 2000/016653/23

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Tel: + 27 (83) 5488 106
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E-mail: jp@abenviro.co.za

14/10/2022

The Councillor Ward 6:
MORULAGANYI CULTULATOR SEGOE
Mafikeng Local Municipality
Private Bag X63
Mmabatho
2735

Dear Sir/Madam

Environmental Impact Assessment for the proposed clearance of 387.41768ha of indigenous vegetation, of which 21 829 m² is located within 100 metres from the edge of 2 pans, in order to establish a mixed use township, located on Portion 54 of the farm Mmabatho Town and Townlands 301-JO.

AB ENVIRO CONSULT was appointed by Mafikeng Local Municipality to submit an application to the Department of Economic Development, Environment and Tourism, North West Province for the above mentioned proposed development. Attached please find a notification of the proposed development and an electronic copy of the Scoping report for your comments. You are requested to comment within 30 days from the date of this letter.

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14/10/2022

SANRAL
Mr. P. Hlahla
PO Box 415
Pretoria
0001

Dear Sir/Madam

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Yours sincerely,

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EAP-EAPASA: 2019/808

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MR.J.P. DE VILLIERS (M Sc, EAP-EAPASA, IAIA); MRS.J.E. DU PLOOY (M.E.M; EAP-EAPASA, IAIA)



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AB ENVIRO-CONSULT CC

Reg no. 2000/016653/23

14/10/2022

Mr Ravi Nair
Transnet freight rail
P.O. Box 72501
Parkview
2122

Dear Sir/Madam

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Yours sincerely,

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EAP-EAPASA: 2019/808

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Reg no. 2000/016653/23

14/10/2022

North West Department of public works and roads
Director: Ngaka Modiri Molema District
Mr. JJTselane
Private Bag X2080
Mmabatho
2735

Dear Sir/Madam

Environmental Impact Assessment for the proposed clearance of 387.41768ha of indigenous vegetation, of which 21 829 m² is located within 100 metres from the edge of 2 pans, in order to establish a mixed use township, located on Portion 54 of the farm Mmabatho Town and Townlands 301-JO.

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14/10/2022

Eskom
Mr. Dala
DalaME@eskom.co.za

Dear Sir/Madam

Environmental Impact Assessment for the proposed clearance of 387.41768ha of indigenous vegetation, of which 21 829 m² is located within 100 metres from the edge of 2 pans, in order to establish a mixed use township, located on Portion 54 of the farm Mmabatho Town and Townlands 301-JO.

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10.4 ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

Summary of main issues raised by I&APs	Summary of response from EAP
To Follow	

10.5 COMMENTS AND RESPONSE REPORT

I&AP registered:	Comment received:	Response by the EAP:
To follow	To follow	

11. CONCLUDING STATEMENT.

In the National Framework for Sustainable Development (NFSD) it is stated that *"the achievement of sustainable development is not a once-off occurrence and its objectives cannot be achieved by a single action or decision. It is an ongoing process that requires a particular set of values and attitudes in which economic, social and environmental assets that society has at its disposal, are managed in a manner that sustains human well-being without compromising the ability of future generations to meet their own need.* The NFSD further continues to emphasize that South Africa's current development path in certain instances reflects signs of being unsustainable in the long-term. It highlights that a large percentage of growth in economic activity (measured in terms of its contribution to the GDP) is achieved by *"consuming' natural resources and degrading our habitat at accelerating rates with the inevitable consequence that future economic growth and development objectives will be prejudiced."*

Consistent with national priorities, environmental authorities must support *"increased economic growth and promote social inclusion"*, whilst ensuring that such growth is *"ecologically sustainable"*. In the National Spatial Development Perspective (NSDP) it is highlighted that, to achieve the goal of stimulating sustainable economic activities and to create long-term employment opportunities, it is required that spending on economic infrastructure is focused in priority areas with potential for economic development, with development to serve the broader societies' needs equitably.

The local municipality intends to promote a more compact city in order to prevent the expansive provision of social and engineering services, as well as to prevent the economic decline of the traditional city centre. The Spatial Development Framework (SDF) addresses the scale of urban growth through planned extensions, infill and redevelopment strategies. The local municipality is aware of the need to integrate urban settlements, with a view to reduce travel distances to the areas of employment opportunities. It also addresses measures to promote compact and connected growth opportunities, such as the identification of revitalisation zones, densification and mixed land use zones. For any development to be sustainable and viable, land development and planning should ensure that communities are located close to job opportunities, social facilities and basic services.

The SDF and the Land Use Management system of the Local Municipality has identified certain areas that must address previously disadvantaged areas and historically disadvantaged residents. There is a definite need for the residents to have reasonable access to opportunities and facilities that supports living in the urban Settlement. It is the responsibility of the local municipality to ensure that the residents have reasonable access to community services and amenities, as well as employment opportunities and that the form of land development need to provide for basic needs in an affordable way. The proposed development will be in line with this principle by ensuring that people living the area do in fact have reasonable access to opportunities and facilities.

The planning practices of the past has resulted in sprawling urban areas that are un-economical. Today, planning policies are transformed to mainly encourage infill development on vacant land within the urban environment, in order to combat urban sprawl. The proposed development falls in line with these principals, as it is located within the urban area and is surrounded by urban development.

As in the rest of South Africa, there is a housing shortage in the area. The proposed development addresses the need identified by the Mahikeng Local Municipality, for the provision of a Township that provides people with easy access to job opportunities shops, banking facilities, clinics, etc. and a living environment, such as residential townships placed at strategic positions with good access routes in close proximity to these amenities

The identification, description, evaluation and comparison of alternatives are important for ensuring a sound environmental scoping process.

The alternatives considered for the proposed development includes “Mixed land use township” (Alternative 1), “Single land use: Housing only” (Alternative 2) and the “No-go option” (Alternative 3).

Although the emphasis is on housing, complimentary land uses have been included in the township. People want easy access to job opportunities shops, banking facilities, clinics, etc. and want their living environment, such as residential townships to be placed at strategic positions with good access routes in close proximity to these amenities.

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 maximise pedestrianisation and public transport.
- Commercial erven can accommodate a shopping centre, to service the existing formalised 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 neighbourhood quality.

By providing only one land use type (i.e., housing), mixed income development and social integration across race and income levels, *cannot be achieved*. By restricting a township to one land use only, the above benefits to the local community, and subsequent council area, cannot be realised, and hence, is not a preferred land use option.

The only other alternative that exists for the proposed development is the “no-go” option which will imply that the status quo will prevail. This is unacceptable as Informal settlements consist of non-conventional housing built without complying with legal building procedures. Broadly, these crude dwellings mostly lack proper indoor infrastructure, such as water supply, sanitation, drainage, waste disposal and proper road access. There is also a bond between poor housing and environmental conditions in informal settlements which also reflects poverty. Linking basic services such as water to health is viewed as a false separation as these services are ‘intimately related to housing’. It becomes a housing issue if children playing outside the house contract diarrhoea via ingesting pathogens from faecal matter which contaminates the land on which they play. Otherwise, it is the

house which provides for shelter against injury, weather and disease. Improving the surroundings of the house is to limit severe health risks existing within poor quality housing.

The proposed development will address this shortage.

Although this is only the Scoping phase of the proposed development, no "fatal flaws" has been encountered as of yet. All the issues envisaged at this stage can be mitigated.

12 PLAN OF STUDY FOR EIA

12.1 Description of the alternatives to be considered and assessed

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 (S. Cliff, 2015).

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 (S. Cliff, 2015).

The alternatives considered for the proposed development includes land use alternatives (including the No-go option). The various alternatives will be assessed in the EIAR, in terms of environmental, social and technical feasibility.

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12.1.1 Land Use Alternatives

12.1.1.1 Mixed land use township (Alternative 1)

Alternative Site layouts have been developed for the proposed development.

The appointed Town and Regional planner have produced the proposed layout plan.

The proposed Township will consist of the following:

Proposed Zoning	Proposed Land use	No. of Erven	Area in hectares
Residential 1 A	Residential Stands (Average 300m ² – 400m ²)	2 334	85.5356 ha
	Residential Stands (Average 500m ² – 600m ²)	763	41.9092 ha
	Residential Stands (Average 600m ² – 800m ²)	360	26.7053 ha
	Residential Stands (Average 800m ² – 1 000m ²)	366	34.7679 ha
Residential 3	Medium density (80 units per ha)	15	41.3116 ha
Municipal	Community Facility	1	0.4454 ha
	Cemetery	4	2.5273 ha

Proposed Zoning	Proposed Land use	No. of Erven	Area in hectares
	(To accommodate existing graves found on site)		
Business 2	Business	6	3.7409 ha
Special	Mixed land uses	37	15.0573 ha
Industrial 2	Light Industrial	29	11.0068 ha
Institutional	Clinic	1	0.9517 ha
	Primary School	2	7.7388 ha
	Secondary School	1	4.8006 ha
	Crèche	7	1.7080 ha
	Church	4	1.1546 ha
Transportation	Train Station	1	2.1752 ha
Public Open Space	Public Open Space	35	104.1665 ha
Recreational	Sports Field	1	16.2862 ha
Street	Refer to table below		79.8250 ha
TOTAL		3 967	481.8139 ha

And streets:

STREETS	
Reserve Width	Length in metre
6m Street	62m
10m Street	29 682m
13m Street	10 385m
16m Street	11 506m
20m Street	7 114m
25m Street	1 115m
TOTAL	59 864m

Although the emphasis is on housing, complimentary land uses have been included in the township. People want easy access to job opportunities, shops, banking facilities, clinics, etc. and want their living environment, such as residential townships to be placed at strategic positions with good access routes in close proximity to these amenities.

Therefore the focus on Portion 54 should be viewed as part of an integrated process to enhance local economic development and to improve the absorptive capacity of Mahikeng in terms of housing provision, the availability of quality infrastructure and job-creation.

12.1.1.2 Single land use: Housing only (Alternative 2)

By providing only one land use type (i.e., housing), mixed income development and social integration across race and income levels, cannot be achieved.

A Commercial node on site is commonly utilised as a "Multi-Purpose Community Centre/Rural Service Centre" which is defined as "a focal point at which a range of essential services can be obtained by people living in its vicinity". In turn, a commercial node acts as a pool of human and

physical resources from which the inputs necessary for development can be distributed efficiently, and from which a community can draw to promote their development”.

By restricting a township to one land use only, the above benefits to the local community, and subsequent council area, cannot be realised, and hence, is not a preferred land use option.

12.1.1.3 No-go Alternative

The only other alternative that exists for the proposed development is the “no-go” option which will imply that the status quo will prevail. This is unacceptable as Informal settlements consist of non-conventional housing built without complying with legal building procedures. Broadly, these crude dwellings mostly lack proper indoor infrastructure, such as water supply, sanitation, drainage, waste disposal and proper road access. There is also a bond between poor housing and environmental conditions in informal settlements which also reflects poverty. Linking basic services such as water to health is viewed as a false separation as these services are ‘intimately related to housing’. It becomes a housing issue if children playing outside the house contract diarrhoea via ingesting pathogens from faecal matter which contaminates the land on which they play. Otherwise, it is the house which provides for shelter against injury, weather and disease. Improving the surroundings of the house is to limit severe health risks existing within poor quality housing

12.2 Description of the aspects to be assessed as part of the environmental impact assessment process

In order to assess a proposed development it is important to take into consideration the principles of NEMA. These principles are outlined in Chapter 1 and read as follows:

- 1) *“The principles set out in this section apply throughout the Republic to the actions of all organs of state that may significantly affect the environment and—*
 - a. *shall apply alongside all other appropriate and relevant considerations, including the State’s responsibility to respect, protect, promote and fulfil the social and economic rights in Chapter 2 of the Constitution and in particular the basic needs of categories of persons disadvantaged by unfair discrimination;*
 - b. *serve as the general framework within which environmental management and implementation plans must be formulated;*
 - c. *serve as guidelines by reference to which any organ of state must exercise any function when taking any decision in terms of this Act or any statutory provision concerning the protection of the environment;*
 - d. *serve as principles by reference to which a conciliator appointed under this Act must make recommendations; and*
 - e. *guide the interpretation administration and implementation of this Act, and any other law concerned with the protection or management of the environment.*
- 2) *Environmental management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural and social interests equitably.*
- 3) *Development must be socially, environmentally and economically sustainable.*
- 4) *(a) Sustainable development requires the consideration of all relevant factors including the following:*

- (i) *That the disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimised and remedied:*
- (ii) *that pollution and degradation of the environment are avoided, or, where they cannot be altogether avoided, are minimised and remedied;*
- (iii) *that the disturbance of landscapes and sites that constitute the nation's cultural heritage is avoided, or where it cannot be altogether avoided, is minimised and remedied;*
- (iv) *that waste is avoided. or where it cannot be altogether avoided, minimised and re-used or recycled where possible and otherwise disposed of in a responsible manner;*
- (v) *that the use and exploitation of non-renewable natural resources is responsible and equitable, and takes into account the consequences of the depletion of the resource;*
- (vi) *that the development. use and exploitation of renewable resources and the ecosystems of which they are part do not exceed the level beyond which their integrity is jeopardised;*
- (vii) *that a risk-averse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions; and*
- (viii) *that negative impacts on the environment and on people's environmental rights be anticipated and prevented, and where they cannot be altogether prevented, are minimised and remedied.*
- (b) *Environmental management must be integrated, acknowledging that all elements of the environment are linked and interrelated, and it must take into account the effects of decisions on all aspects of the environment and all people in the environment by pursuing the selection of the best practicable environmental option.*
- (c) *Environmental justice must be pursued so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons.*
- (d) *Equitable access to environmental resources, benefits and services to meet basic human needs and ensure human well-being must be pursued and special measures may be taken to ensure access thereto by categories of persons disadvantaged by unfair discrimination.*
- (e) *Responsibility for the environmental health and safety consequences of a policy, programme, project, product, process, service or activity exists throughout its life cycle.*
- (f) *The participation of all interested and affected parties in environmental governance must be promoted, and all people must have the opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation and participation by vulnerable and disadvantaged persons must be ensured.*
- (g) *Decisions must take into account the interests, needs and values of all interested and affected parties, and this includes recognizing all forms of knowledge, including traditional and ordinary knowledge.*

- (h) *Community wellbeing and empowerment must be promoted through environmental education, the raising of environmental awareness, the sharing of knowledge and experience and other appropriate means.*
- (i) *The social, economic and environmental impacts of activities, including disadvantages and benefits must be considered, assessed and evaluated and decisions must be appropriate in the light of such consideration and assessment.*
- (j) *The right of workers to refuse work that is harmful to human health or the environment and to be informed of dangers must be respected and protected.*
- (k) *Decisions must be taken in an open and transparent manner, and access to information must be provided in accordance with the law.*
- (l) *There must be intergovernmental co-ordination and harmonisation of policies, legislation and actions relating to the environment.*
- (m) *Actual or potential conflicts of interest between organs of state should be resolved through conflict resolution procedures.*
- (n) *Global and international responsibilities relating to the environment must be discharged in the national interest.*
- (o) *The environment is held in public trust for the people, the beneficial use of environmental resources must serve the public interest and the environment must be protected as the people's common heritage.*
- (p) *The costs of remedying pollution, environmental degradation consequent adverse health effects and of preventing, controlling or minimizing further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment.*
- (q) *The vital role of women and youth in environmental management and development must be recognised and their full participation therein must be promoted.*
- (r) *Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries, wetlands and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure."*

The following aspects and their possible impacts will be assessed

- ❖ Geology -structure and rock-type
- ❖ Topography- macro and micro-relief
- ❖ Climate: Temperature, rainfall, and wind.
- ❖ Soil
- ❖ Fauna
- ❖ Flora
- ❖ Surface Water
- ❖ Underground water
- ❖ Air Quality
- ❖ Noise
- ❖ Archaeology
- ❖ Cultural Sites
- ❖ Aesthetics

- ❖ Technical issues
 - ❖ Sociological Issues
 - ❖ Economic Issues
- The evaluation of concerns in order to assign priority to the important issues: The study is designed to address concerns as well as to prioritise issues as part of the process.
 - Developing a strategy for addressing and resolving each issue: All relevant issues will be addressed in order of priority. In this sense the inputs of all I&APs, as well as all other socio-economic factors of importance will be resolved in order of priority.
 - Providing feedback at regular intervals in which comments by authorities have been incorporated: Feedback to I&APs is the only logical way by which eventual acceptance can be achieved. It is therefore a standing practise in all studies conducted by the consultant that feedback is provided on a continuous basis.

12.3 Aspects to be assessed by specialists

The process followed can be described as follows:

- 1) The EAP was contracted by the land owner, Mahikeng Local Municipality as their Independent Environmental Assessment Practitioner.
- 2) A Geotechnical Engineer was appointed to determine whether the Geology and Soils of the site is suitable for the proposed development
- 3) A Town Planner has developed the layout in conjunction with the surveyor
- 4) The Civil Engineer was appointed to determine the capability of existing infrastructure to be linked to proposed development and readily available bulk services. He also designed the proposed infrastructure.
- 5) A Flood line specialist has determined the 1:100 year flood line of the stormwater canals that intersects the site to the south and north-western corner.
- 6) A SAHRA Specialist has been appointed to determine the possible impact of the development on Archaeological and Cultural features.
- 7) A Fauna and Flora and Wetland specialist has been appointed to determine the impact of the proposed development on the Fauna and Flora and wetlands of the area. He was also appointed to delineate the extent watercourses on site.
- 8) An Environmental Screening Process was conducted by the EAP to ensure that all the relevant Environmental Legislation is taken into consideration.
- 9) Desk top studies were conducted and alternatives assessed.
- 10) Site inspections were carried out to verify the outcomes of the desktop studies, and the preferred alternative defined.
- 11) A full Public Participation Process is being followed to obtain inputs from interested and affected parties..
- 12) All the information obtained from the above mentioned processes is being used to assess the Environmental Impact that the proposed development may have on the Environment and vice versa.
- 13) The inputs from Specialists, interested and affected parties, together with the knowledge of the EAP is being used to determine measures to avoid, mitigate and manage potential impacts. These measures are described in the Environmental Management Programme.

The inputs from Specialists, interested and affected parties, together with the knowledge of the EAP will be used to determine measures to avoid, mitigate and manage potential impacts. These measures will be described in the Environmental Management Programme.

12.4 Description of the proposed method of assessing the environmental aspects, including a description of the proposed method of assessing the environmental aspects including aspects to be assessed by specialists,

And

12.5 Description of the proposed method of assessing duration and significance

Impacts will be rated using the following methodology:

Nature of the potential impact		Description of the effect, and the affected aspect of the environment
Duration (time scale)	Short term	Up to 5 years
	Medium term	6 – 15 years
	Long term	More than 15 years
Extent (area)	Local	Confined to study area and its immediate surroundings
	Regional	Region (cadastral, catchment, topographic)
	National	Nationally (The country)
	International	Neighboring countries and the rest of the world.
Magnitude (Intensity)	Low	Site-specific and wider natural and/or social functions and processes are negligibly altered. ((A low intensity impact will not affect the natural, cultural, or social functions of the environment).
	Medium	Site-specific and wider natural and/or social functions and processes continue albeit in a modified way. (Medium scale impact will alter the different functions slightly).
	High	Site-specific and wider natural and/or social functions and processes are severely altered. (A High intensity impact will influence these functions to such an extent that it will temporarily or permanently cease to exist).
Probability	Improbable	Possibility of occurrence is very low. (Such an impact will have a very slight possibility to materialise, because of design or experience).
	Possible	There is a possibility that the impact will occur
	Probable	It is most likely that the impact will occur
	Definite	The impact will definitely occur
Significance	Insignificant	Impact is negligible and will not have an influence on the decision regarding the proposed activity (No mitigation is necessary)
	Very Low	Impact is very small and should not have any meaningful influence on the decision regarding the proposed activity (No mitigation is necessary)
	Low	The impact may not have a meaningful influence on the decision regarding the

Nature of the potential impact		Description of the effect, and the affected aspect of the environment
		proposed activity (No mitigation is necessary)
	Medium	The impact should influence the decision regarding the proposed activity (The project can only be carried through if certain mitigatory steps are taken)
	High	The impact will influence the decision regarding the proposed activity
	Very High	The proposed activity should only be approved under special circumstances
Reversibility	Low	There is little chance of correcting the adverse impact
	Medium	There is a moderate chance of correcting the adverse impact
	High	There is a high chance in correcting the adverse impact
Risk	Low	Assessing a risk involves an analysis of the consequences and likelihood of a hazard being realized. In decision-making, low-consequence / low-probability risks (green) are typically perceived as acceptable and therefore only require monitoring.
	Medium	Other risks (amber) may require structured risk assessment to better understand the features that contribute most to the risk. These features may be candidates for management
	High	High-consequence / high-probability risks (red) are perceived as unacceptable and a strategy is required to manage the risk.

Attributes associated with the alternatives will be assessed and is outlined below:

Geographical attributes

The Geographical attributes of an area relates to the characteristics of a particular region, area or place. It influences the determination of site alternatives as it relates to the location of a site in relation to relevant features in the area. A surveyor has been appointed to map the area and determine site levels.

Physical attributes

Physical attributes of an area relates to the processes and patterns in the natural environment. For the purpose of this assessment, the following processes and patterns have been investigated. Geology, soil, topography and landforms, climate and meteorology, surface water and ground water. Various Specialists are involved in assessing different aspects including Civil Engineer, Electrical Engineer, Surveyor, Town Planner, Botanical Specialist, Wetland Specialist, SAHRA Specialist and the EAP.

Biological attributes

Biological attributes for the purpose of this study includes the distribution of species and ecosystems in geographic space and through geological time. Organisms and biological communities often vary in a regular fashion along geographic gradients of latitude, elevation, isolation and habitat area. The two main branches assessed will be:

Phytogeography is the branch of biogeography that studies the distribution of plants. Zoogeography is the branch that studies distribution of animals. The Botanical Specialist will determine the sensitivity and distribution of flora and associated fauna, and the wetland specialist will ensure that the relevant aquatic ecosystems are assessed.

Social attributes

Social attributes is closely related to social theory in general and sociology in particular, dealing with the relation of social phenomena and its spatial components. EAP, Town Planner, Civil Engineer and SAHRA specialist.

Economic attributes

Economic attributes includes the location, distribution and spatial organization of economic activities and also takes into account social, cultural, and institutional factors in the spatial economy of the development. . EAP, Town Planner, Civil Engineer and SAHRA specialist.

Heritage attributes

The broad generic term Cultural Heritage Resources refers to any physical and spiritual property associated with past and present human use or occupation of the environment, cultural activities and history. The term includes sites, structures, places, natural features and material of paleontological, archaeological, historical, aesthetic, scientific, architectural, religious, symbolic or traditional importance to specific individuals or groups, traditional systems of cultural practice, belief or social interaction. SAHRA Specialist.

Cultural attributes

Cultural attributes relates to the specific characteristics such as language, religion, ethnic and racial identity, and cultural history & traditions of people. These attributes influences family life, education, economic and political structures, and, of course, business practices. It should be noted that the above mentioned attributes do not occur in isolation and it is not uncommon for an identified impact to overlap with two or more of these attributes. Also note, not all risks require comprehensive and detailed assessment. Solid problem formulation should allow decision-makers to evaluate the extent of subsequent analysis required. The level of effort put into assessing each risk should be proportionate to its significance and priority in relation to other risks, as well as its complexity, by reference to the likely impacts. Consideration should be given to stakeholders' perceptions of the nature of the risk. SAHRA Specialist.

The inputs from Specialists, interested and affected parties, together with the knowledge of the EAP will be used to determine measures to avoid, mitigate and manage potential impacts. Inputs from I&APs will be considered for all the above in order to ensure a sustainable development.

12.6 Stages at which the competent authority will be consulted

- 1) The first consultation will be in the form of the application submission
- 2) A Draft Scoping report will be submitted to the Department.
- 3) 40 Days after this draft has been submitted, the final Scoping report will be submitted to the Department.
- 4) Once the Final Scoping report has been accepted, a Draft EIA Report will be submitted to the Department.

- 5) 30 Days after this draft EIA Report has been submitted, the final EIA Report will be submitted to the Department.

12.7 Particulars of the public participation process that will be conducted during the environmental impact assessment process

Public and stakeholder involvement in the EIA process is widely recognised as being an *essential* component of the EIA process. The input and contribution added to the process, by public comment and involvement, leads to better and more acceptable decision-making. The involvement of interested parties, adjacent land owners, NGO bodies and others, can help to identify whether all impacts have been included and whether all risk groups have been identified.

The engagement process will provide stakeholders with the opportunity to raise their issues and concerns and to interact on a one-on-one basis with the project team.

Registered I&APs shall be informed of the approval or rejection of the scoping report, and will be encouraged to continue their active participation in the EIA process by staying involved in the process, and commenting on the scoping report approval conditions / requirements.

The PPP to be conducted during the EIA phase will entail the following:

- ❖ Update the existing stakeholder database, following the review of the draft and final scoping reports by registered IAP's and READ
- ❖ Announcement of the EIA phase of the project, which entails the following:
 - 1) Distribution of Letters, notices, the Draft and final EIAR to all registered I&APs via email, fax or post;
 - 2) Hosting Public Meetings (if necessary);
 - 3) Integration of comments into a Comments and Response Report;

12.8 Description of the tasks that will be undertaken as part of the environmental impact assessment process

Actions
1. Assessment Phase
1.1 Undertake assessment phase by assessing and evaluating potential impacts identified in the Scoping phase.
1.2 Review and manage specialist studies required.
1.3 Compile a draft Environmental Impact Report (EIR).
1.4 Compile a draft Environmental Management Plan for the Construction phase.
1.5 Compile an Information Sheet (summary of EIR) and distribute to identified I&APs
1.6 Distribute DEIR to I&APs
1.7 Allow the identified public to provide comment within a 30 day period on above report.
1.8 Address comments received and finalise EIR
1.9 Should the draft EIR require substantial changes, these changes will be incorporated into the final EIR and distributed.

1.10 Submit EIR to authorities for a final decision

1.11 Once the decision is issued, all I&Ps must be formally informed of the decision
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12.9 Measures to avoid, reverse, mitigate or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored

An EIA involves *prediction* and thus a certain degree of *uncertainty* is an integral part. There are two types of uncertainty associated with environmental impact assessments: those associated with the process and, those associated with predictions. With the former the uncertainty is whether the most important impacts have been identified and whether recommendations will be acted upon or ignored. For the latter, the uncertainty is in the accuracy of the findings. The main types of uncertainty and the ways in which they can be minimized are summarized as follows:

- ❖ **Uncertainty of prediction:** this is important at the data collection stage and the final certainty will only be resolved once implementation commences. Research can reduce the uncertainty;
- ❖ **Uncertainty of values:** this reflects the approach taken in the EIA process. Final certainty will be determined at the time decisions are made. Improved communications and extensive negotiations should reduce this uncertainty;
- ❖ **Uncertainty of related decision:** this affects the decision making element of the EIA process and final certainty will be determined by post evaluation. Improved coordination will reduce uncertainty.

The importance of *wide consultation* cannot be overemphasized in minimizing the risk of missing important impacts. The significance of impacts is subjective, but the value judgments required are best arrived at by consensus: public participation and consultation with a wide sector of the community will reduce uncertainty.

The accuracy of predictions is dependent on a variety of factors such as lack of data or lack of knowledge. Prediction capabilities are generally good in the physical and chemical sciences, moderate in ecological sciences and poor in social sciences.

The results of the EIA should indicate the level of uncertainty with the use of confidence limits and probability analyses wherever possible. Sensitivity analysis similar to that used in economic evaluation, could be used if adequate quantifiable data are available. A range of outcomes can be found by repeating predictions and adjusting key variables.

An EIA cannot give a precise picture of the future. The EIA enables uncertainty to be managed and, as such, is an aid to better decision making. (S. Cliff, 2015, P92.)

13. AFFIRMATION BY EAP

- I **Mr Jean Pierre De Villiers** declare under oath that I:
- a. act as the independent environmental practitioner in this application ;
 - b. do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed;
 - c. do not have and will not have a vested interest in the proposed activity proceeding;
 - d. have no, and will not engage in, conflicting interests in the undertaking of the activity;
 - e. undertake to disclose, to the competent authority, any material information that has or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required;
 - f. will ensure that information containing all relevant facts in respect of the application is distributed or made available to interested and affected parties and the public and that participation by interested and affected parties is facilitated in such a manner that all interested and affected parties will be provided with a reasonable opportunity to participate and to provide comments on documents that are produced to support the application;
 - g. will ensure that the comments of all interested and affected parties are considered and recorded in reports that are submitted to the competent authority in respect of the application, provided that comments that are made by interested and affected parties in respect of a final report that will be submitted to the competent authority may be attached to the report without further amendment to the report;
 - h. will keep a register of all interested and affected parties that participated in a public participation process; and
 - i. will provide the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not.

Signature of the Environmental Assessment Practitioner:

Name of company:

Date:

Signature of the Commissioner of Oaths:

Date

Designation

Official stamp:

14. LIST OF REFERENCES

Department of Environmental Affairs and Tourism. 1992. Integrated Environmental Management. Pretoria, DEAT.

Department of Environmental Affairs and Tourism. 1998. *Guideline Document - EIA Regulations.* Pretoria, DEAT.

Department of Environmental Affairs. 1988. *Climate of South Africa, climate statistics up to 1984.* Weather Bureau (WB40). Pretoria, Government Printer.

Department of Transport, 19--. *Climate of South Africa Part 1 Climate statistics.* Weather Bureau (WB20). Pretoria Government Printer.

S. Cliff. 2015. Environmental Scoping report for the proposed high density residential township "Tanganani extension 7", to be located on a part of Portion 119 of the farm Diepsloot 388 JR, City of Johannesburg Municipality, Gauteng

APPENDIX A

**PROOF THAT THE DRAFT SCOPING REPORT HAS BEEN SENT TO DEPARTMENT OF
WATER AND SANITATION**

