

ENVIRONMENTAL IMPACT ASSESSMENT 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 123,0452 HA OF INDIGENOUS VEGETATION, LOCATED WITHIN A CRITICAL BIODIVERSITY AREA, THE CONSTRUCTION OF THREE ROADS WITHIN A WATERCOURSE, FOR THE PROPOSED TOWNSHIP ESTABLISHMENT LOCATED ON A PORTION OF THE REMAINING EXTENT OF ERF 2048, STEINKOPF, NAMA KHOI LOCAL MUNICIPALITY, NORTHERN CAPE PROVINCE.

Report Date: April 2021



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DRAFT REPORT

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EXECUTIVE SUMMARY

The Applicant, the **Nama Khoi Local Municipality** has appointed **AB Enviro Consult CC**, an independent environmental consultancy, to undertake an Environmental Impact Assessment for the proposed clearance of 123,0452 ha of indigenous vegetation, located within a critical biodiversity area, the construction of three roads within a watercourse, for the proposed township establishment located on a Portion of the remaining extent of Erf 2048,Steinkopf, Nama Khoi Local Municipality, Northern Cape Province.

As in the rest of South Africa, there is a housing shortage in the area. 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 new "Human Settlements Plan" promotes the achievement of a non-racial, integrated society through the development of sustainable human settlements and quality housing. Housing is to be utilized for the development of sustainable human settlements in support of spatial restructuring.

The aim is to move beyond the provision of basic shelter towards achieving the broader vision of sustainable human settlements and more efficient towns, cities and regions.

The integrated human settlement project from the onset aims at providing a proper integrated human settlement that ascribes to the BNG Principles set out above. This will be achieved as follows:

- This project makes provision for a variety of erven that can be utilized for various housing typologies. The largest proportion of the township areas will however be aimed at both the subsidized housing sector through the implementation of one of Government's subsidized housing programmes as well as the need that exists for people that does not qualify for a Government subsidy, due to either already owning other property or earning in excess of the threshold household income prescribed in respect of the various housing subsidy programmes, but who still wishes to acquire an affordable stand where they can construct their own home. This project will also aim at alleviating the plight of people that live in informal settlement areas and in squalid conditions.
- The location of the proposed township area directly adjacent to the existing urban area, thereby further enhances integration and will offer inhabitants the opportunity to access the existing social and commercial facilities on offer within the existing village area whilst also providing social and business opportunities within the proposed development area itself that can in turn be utilized by and to the benefit of the inhabitants of the existing village area.

The development of the integrated human settlement represents a definitive move away from providing housing-only township areas and towards the provision of a proper integrated human

settlement that offers a magnitude of social, educational and commercial support facilities and infrastructure in close proximity to the inhabitants

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 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:

Detailed description of listed activities associated with the project		
Listed activity as described in GN R.327 and 324.	Description of project activity that triggers listed activity	Anticipated years to complete construction (From date of commencement)
GN.R. 327 Item 9: <i>The development of infrastructure exceeding 1 000 meter in length for the Bulk transportation of water or storm water-</i> <i>i. With an internal diameter of 0,36 meters or more; or</i> <i>ii. With a peak throughput of 120 litres per second or more;</i>	Existing Connection to Sedibeng Water Main It is recommended that an application be submitted to Sedibeng Water for the upgrading of the existing 160 mm Ø connection to a 200 mm Ø connection. Existing Trunk Main to Reservoir It is recommended that the 160 mm Ø existing trunk main be upgraded to a 200 mm Ø uPVC class 16 pipeline. This upgraded pipeline will follow the same rout of the existing 160 mm Ø pipeline at an estimated length of 1.8 km.	10 Years
GN.R. 327 Item 12: <i>The development of— infrastructure or structures with a physical footprint of 100 square meters or more; where such development occurs— (a) within a watercourse."</i>	The development of structures (roads) with a physical footprint of 3 750 m ² within a watercourse.	10 Years
GN.R. 327 Item 19: <i>The infilling or depositing of any material of more than 10 cubic meters into, or the</i>	The infilling and depositing of 30 680 m ³ of concrete and compacted backfill material and the excavation 24 000m ³ sand and soil,	10 Years

dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse;”	within a watercourse in order to construct three 3 750 m ² roads.	
GN.R. 325 Item 15: “The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.”	The clearance of 123.0452 ha of indigenous vegetation in order to establish a township.	10 Years
GN.R. 324 Item 12. g. ii. “The clearance of an area of 300 square meters or more of indigenous vegetation, except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan. g. Northern Cape ii. Within critical biodiversity areas identified in bioregional plans	The clearance of 123.0452 ha of indigenous vegetation, located within a critical Biodiversity area (CBA) in order to establish a township.	10 Years
GN.R. 324 Item 14. g. ii. ff “The development of (ii) infrastructure or structures with a physical footprint of 10 square meters or more where such development occurs- (a) within a watercourse (c) if no development setback exists within 32 meters of a watercourse, measured from the edge of a watercourse. g. Northern Cape ii Outside urban areas: (ff) Critical biodiversity areas or ecosystem service areas as	The development of structures (roads) with a physical footprint of 3 750 m ² within a watercourse.	10 Years

<i>identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans</i>		
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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.

No “fatal flaws” has been encountered as of yet. All the issues envisaged at this stage can be mitigated.

1. INTRODUCTION

The Applicant, the **Nama Khoi Local Municipality** has appointed **AB Enviro Consult CC**, an independent environmental consultancy, to undertake an Environmental Impact Assessment for the proposed clearance of 123,0452 ha of indigenous vegetation, some located within a critical biodiversity area and Ecological Support Area, the construction of three roads and the installation of bulk services within a watercourse, for the proposed township establishment located on a Portion of the remaining extent of Erf 2048,Steinkopf, Nama Khoi Local Municipality, Northern Cape Province.

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 in terms of the 2014 EIA Regulations, as amended and published in Government Notice R. 326 of 7 April 2017, 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 Applicant, the Nama Khoi 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) 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.
- 4) A SAHRA Specialist has been appointed to determine the possible impact of the development on Archaeological and Cultural features.
- 5) A Fauna and Flora and Wetland specialist has been appointed to determine the impact of the proposed development on the Fauna and Flora of the area.
- 6) A Civil Engineer was appointed to determine the 1:100 year flood line affecting the proposed development.
- 7) An Environmental Screening Process was conducted by the EAP to ensure that all the relevant Environmental Legislation is taken into consideration.
- 8) Desk top studies were conducted and alternatives assessed.
- 9) Site inspections were carried out to verify the outcomes of the desktop studies, and the preferred alternative defined.
- 10) A full Public Participation Process is being followed to obtain inputs from interested and affected parties.
- 11) 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.
- 12) 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 included the necessary investigations to assess the suitability of the identified site and its surrounding environment, for the development proposal. The scoping phase described the “status quo” of the bio-physical, social, economic and cultural environment, and identifies the anticipated environmental aspects associated with the proposed development. Scoping included the identification of *key interest groups*, (both government and non-government), and strived 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 was to document the outcome of the Scoping Phase of the project. The report fulfilled the requirements of the EIA Regulations (2014) for the documentation of the scoping phase. The Scoping Report was compiled in terms of the 2014 EIA Regulations, as amended in accordance with Section 21(3) as amended and published in Government Notice R. 326 of 7 April 2017.

Following approval of the Draft Scoping Report, the Final Scoping Report was approved on 25 March 2021.

1.4 EIA PHASE

The EIA phase determines the *significance of the impact* of the proposed activity on the surrounding Environment. During the EIA phase, an Environmental Impact Assessment Report (EIAR) is compiled, and, following public review, is submitted to the approving authority – the DACE.

The EIA process is undertaken in accordance with the 2014 EIA Regulations, as amended and published in Government Notice R. 326 of 7 April 2017.

The EIAR (including all specialist reports) will be made available to all registered interested and affected parties (I&APs), providing them an opportunity to comment and to verify that the issues raised through the process have been captured and adequately addressed and considered within the study.

1.4.1 Objective of the environmental impact assessment process

The objective of the environmental impact assessment process is to, through a consultative process-

1. determine the policy and legislative context within which the activity is located and document how the proposed activity complies with and responds to the policy and legislative context;
2. describe the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the development footprint on the approved site as contemplated in the accepted scoping report;
3. identify the location of the development footprint within the approved site as contemplated in the accepted scoping report; based on an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects of the environment;
4. determine the –
 - i. nature, significance, consequence, extent, duration and probability of the impacts occurring to inform identified preferred alternatives; and
 - ii. degree to which these impacts-
 - (aa) can be reversed;
 - (bb) may cause irreplaceable loss of resources, and
 - (cc) can be avoided, managed or mitigated;
5. identify the most ideal activity within the development footprint of the approved site as contemplated in the accepted scoping report based on the lowest level of environmental sensitivity identified during the assessment;

6. identify, assess, and rank the impacts the activity will impose on the development footprint on the site as contemplated in the accepted scoping report through the life of the activity;
7. identify suitable measures to avoid, manage or mitigate identified impacts; and identify residual risks that need to be managed and monitored.

1.4.2 Scope of assessment and content of environmental impact assessment reports

The EIA assesses those identified potential environmental impacts and benefits (direct, indirect and cumulative impacts) associated with the project design, construction, and operation phases, and recommends appropriate mitigation measures for potentially significant environmental impacts. The Environmental impacts are assessed both before and after mitigation to determine:

- The significance of the impact despite mitigation; and
- The effectiveness of the proposed mitigation measures.

The EIA addresses potential environmental impacts and benefits associated with all phases of the project, including design, construction and operation, and aims to provide the environmental authorities with sufficient information to make an informed decision regarding the proposed project.

Table 1 below provides a summary of the legislative requirements in terms of an EIA Report as stipulated in Section 23 of the 2014 EIA Regulations, as amended and published in Government Notice R. 326 of 7 April 2017. Cross-references are provided in terms of the relevant section within this DEIA Report where the NEMA and DEIA Report requirements have been addressed.

Table 1: DEIA Report content as per Section 23 of the 2014 EIA Regulations, as amended and published in Government Notice R. 326 of 7 April 2017 Appendix 3.

3. (1) *An environmental impact assessment report must contain the information that is necessary for the competent authority to consider and come to a decision on the application, and must include:*

Section of the EIA Regulations, 2014	Description of EIA Regulations Requirements for EIA Reports	Location in this EIA report
Appendix 3, section 3 (a)	Details of the EAP who prepared the report; and the expertise of the EAP, including a curriculum vitae;	Paragraph 2
Appendix 3, section 3 (b)	The location of the development footprint of the activity on the approved site as contemplated in the accepted scoping report, including – (i) The 21 digit Surveyor General code of each cadastral land parcel; (ii) Where available, the physical address and farm name; (iii) Where the required information in items (i) and (ii) is not available, coordinates of the boundary of the property or properties	Paragraph 4 Paragraph 4 Paragraph 4
Appendix 3, section 3 (c)	A plan which locates the proposed activity or activities applied for, at an appropriate scale, or, if it is – (i) A linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or (ii) On land where the property has not been defined, the coordinates within which the activity is to be undertaken;	Appendix A1 and Appendix A2 Paragraph 4

Section of the EIA Regulations, 2014	Description of EIA Regulations Requirements for EIA Reports	Location in this EIA report
Appendix 3, section 3 (d)	A description of the scope of the proposed activity, including – (i) all listed and specified activities triggered and being applied for; and (ii) a description of the associated structures and infrastructure related to the development;	Paragraph 3 Paragraph 3
Appendix 3, section 3 (e)	A description of the policy and legislative context within which the development is located and an explanation of how the proposed development complies with and responds to the legislation and policy context	Paragraph 5
Appendix 3, section 3 (f)	A motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred development footprint within the approved site as contemplated in the accepted scoping report.	Paragraph 6
Appendix 3, section 3 (g)	a motivation for the preferred development footprint within the approved site as contemplated in the accepted scoping report	Paragraph 4
Appendix 3, section 3 (h)	A full description of the process followed to reach the proposed development footprint within the approved site as contemplated in the accepted scoping report, including- (i) Details of all alternatives considered; (ii) Details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs; (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; (iv) The environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; (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- (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed, or mitigated. (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; (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; (viii) The possible mitigation measures that could be applied and level of residual risk; (ix) If no alternatives, including alternative footprints for the activity were investigated, the motivation for not considering such and; (x) A concluding statement indicating the location of the preferred alternatives, including preferred footprint within the approved site as contemplated in the accepted scoping report.	Paragraph 8 Paragraph 10 Paragraph 10 Paragraph 8 Paragraph 9 Paragraph 9 Paragraph 9 Paragraph 9 Paragraph 9 Paragraph 9 Paragraph 9 Not Applicable Paragraph 12
Appendix 3, section 3 (i)	A full description of the process undertaken to identify, assess and rank the impacts the activity and associated structures and infrastructure will impose on the	Paragraph 9

Section of the EIA Regulations, 2014	Description of EIA Regulations Requirements for EIA Reports	Location in this EIA report
	<p>preferred development footprint on the approved site as contemplated in the accepted scoping report through the life of the activity, including-</p> <p>(i) a description of all environmental issues and risks that were identified during the environmental impact assessment process; and</p> <p>(ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures;</p>	<p>Paragraph 8</p> <p>Paragraph 9</p>
Appendix 3, section 3 (j)	<p>An assessment of each identified potentially significant impact and risk, including-</p> <p>(i) cumulative impacts;</p> <p>(ii) the nature, significance and consequences of the impact and risk;</p> <p>(iii) the extent and duration of the impact and risk;</p> <p>(iv) the probability of the impact and risk occurring;</p> <p>(v) the degree to which the impact and risk can be reversed;</p> <p>(vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and</p> <p>(vii) the degree to which the impact and risk can be mitigated;</p>	<p>Paragraph 9</p> <p>Paragraph 9</p> <p>Paragraph 9</p> <p>Paragraph 9</p> <p>Paragraph 9</p> <p>Paragraph 9</p>
Appendix 3, section 3 (k)	<p>Where applicable, a summary of the findings and recommendations of any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final assessment report;</p>	<p>Paragraph 11</p>
Appendix 3, section 3 (l)	<p>An environmental impact statement which contains-</p> <p>(i) a summary of the key findings of the environmental impact assessment;</p> <p>(ii) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred development footprint on the approved site as contemplated in the accepted scoping report indicating any areas that should be avoided, including buffers; and</p> <p>(iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;</p>	<p>Paragraph 12.2 and 12.2 Figure 2</p> <p>Paragraph 12</p>
Appendix 3, section 3 (m)	<p>Based on the assessment, and where applicable, recommendations from specialist reports, the recording of proposed impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation</p>	<p>Paragraph 11 and 12</p>
Appendix 3, section 3 (n)	<p>The final proposed alternatives which respond to the impact management measures, avoidance, and mitigation measures identified through the assessment</p>	<p>Paragraph 12</p>
Appendix 3, section 3 (o)	<p>Any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation</p>	<p>Paragraph 3.1.2.1</p>
Appendix 3, section 3 (p)	<p>A description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed</p>	<p>Paragraph 1.4.3</p>
Appendix 3, section 3 (q)	<p>A reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation</p>	<p>Paragraph 12.4</p>
Appendix 3, section 3 (r)	<p>Where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required and the date on which the activity will be concluded and the post construction monitoring requirements finalised</p>	<p>Not Applicable</p>
Appendix 3, section 3 (s)	<p>An undertaking under oath or affirmation by the EAP in relation to-</p> <p>(i) The correctness of the information provided in the report;</p>	<p>Paragraph 13</p> <p>Paragraph 13</p>

Section of the EIA Regulations, 2014	Description of EIA Regulations Requirements for EIA Reports	Location in this EIA report
	(ii) The inclusion of the comments and inputs from stakeholders and interested and affected parties; and (iii) the inclusion of inputs and recommendations from the specialist reports where relevant; and (iv) Any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties.	Paragraph 13 Paragraph 13
Appendix 3, section 3 (t)	Where applicable, details of any financial provision for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts.	Not Applicable
Appendix 3, section 3 (u)	An indication of any deviation from the approved scoping report, including the plan of study, including- (i) any deviation from the methodology used in determining the significance of potential environmental impacts and risks; and (ii) a motivation for the deviation;	Not Applicable
Appendix 3, section 3 (v)	Any specific information that may be required by the competent authority.	Not Applicable
Appendix 3, section 3 (w)	Any other matters 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.
- 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 Town and Regional Planner designed the proposed development in such a way that the layout of the proposed development satisfies the needs of future occupiers of the site
- A SAHRA Specialist has been appointed to determine the possible impact of the development on Archaeological and Cultural features.
- An ecologist has been appointed to determine the impact of the proposed development on the Fauna and Flora of the area.
- A Wetland Specialist was appointed to determine the impact of the proposed development on wetlands and riparian zones in the area.
- 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 25 years (1996-2021) this consultancy has successfully applied for, and obtained positive ROD's and EA's for more than 380 projects. Environmental Control Officer's duties are also performed on various projects.

The company was involved (from 1992-1994) in evaluation of 114 applications for the subdivision of land, 23 applications for resort developments, and 54 applications for business rights for the Department of Agriculture, Conservation and the Environment - North West Province.

The consultancy is qualified to undertake professional studies in waste management and is still involved in the development of waste disposal- (solid and liquid effluent), and emission studies. These studies are conducted both academically and practically. This work relates to mine waste, domestic waste and effluent as well as to the monitoring of waste disposal. Environmental audits in this respect are undertaken on a regular basis

ACADEMIC AND PROFESSIONAL QUALIFICATIONS OF PROF DE VILLIERS

Post-Matric Qualifications

YEAR	Qualification	Institution	Field of Study
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

PROFESSIONAL QUALIFICATIONS AND REGISTRATIONS

YEAR	Qualification/ Registration	Institution	Field of Study
1986	Professional Natural Scientist	S.A. Council for Natural Scientists	Environmental Science
1994	Quality Auditor	ESKOM	Auditing
1998	Personnel & Verifying Auditor	SAATCA	Environmental Auditing
2006	Environmental Assessment Practitioner	Interim Certification Board EAPSA	Environmental Science

MEMBERSHIP AND PARTICIPATION IN SOCIETIES, COUNCILS, ETC.

Name of professional societies	YEAR	Capacity

S.A. Geographical Society.	1967-1996	Board Member
Society for Geography	1968-2004	Member
SAGS Western Transvaal	1985-1989 1987-1989 1996	Chairman
Africa Geographical Association	1993-1995	Vice-President.
Society for the Vaal River Catchment	1980-1999	Member
S.A. Society for Photogrammetry, Remote Sensing and Cartography	1984-1996	Member
Dendrological Society	1986-2005	Member
Birdlife South Africa	2003-present	Member
British Geomorphological Research Group	1985-1997	Member
Int Com on Water Resource Systems	1985-1997	Member
Int Com on Continental Erosion	1986-1990	Member
Int Com on Remote Sensing and Data Transmission	1986-1991	Member
Society for S.A. Geographers	1995-2005	Member
SA Photogrammetrical and Geo. Info.	1995-2003	Member
S.A. Association of Geomorphologists	1994-1999	Board Member and member
SADC Mine Dump Study Group	1996-2005	Member

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

<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 Environmental Assessment Practitioner 2019/808	Environmental Assessment Practitioners of South Africa	

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

PROFESSIONAL QUALIFICATIONS AND REGISTRATIONS

<u>YEAR</u>	<u>Qualification/ Registration</u>	<u>Institution</u>
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2020	Registered Environmental Assessment Practitioner 2019/1573	Environmental Assessment Practitioners of South Africa
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3. DESCRIPTION OF THE ACTIVITY

The Applicant, the **Nama Khoi Local Municipality** has appointed **AB Enviro Consult CC**, an independent environmental consultancy, to undertake an Environmental Impact Assessment for the proposed clearance of 123,0452 ha of indigenous vegetation, located within a critical biodiversity area, the construction of three roads and the installation of bulk services within a watercourse, for the proposed township establishment located on a Portion of the remaining extent of Erf 2048, Steinkopf, Nama Khoi Local Municipality, Northern Cape Province.

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. 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: subsequently no residential development may take place beyond the 1:100 year flood line.

The proposed Township will consist of the following (See Figure 1 for a copy of the Layout Plan):

Residential	1 500 Stands
Business	6 Stands
Churches	6 Stands
Crèche	3 Stands
School	1 Stand
Sports Field	1 Stand
Municipal	1 Stand
Parks	11 Stands
Area of township	123,0452 ha

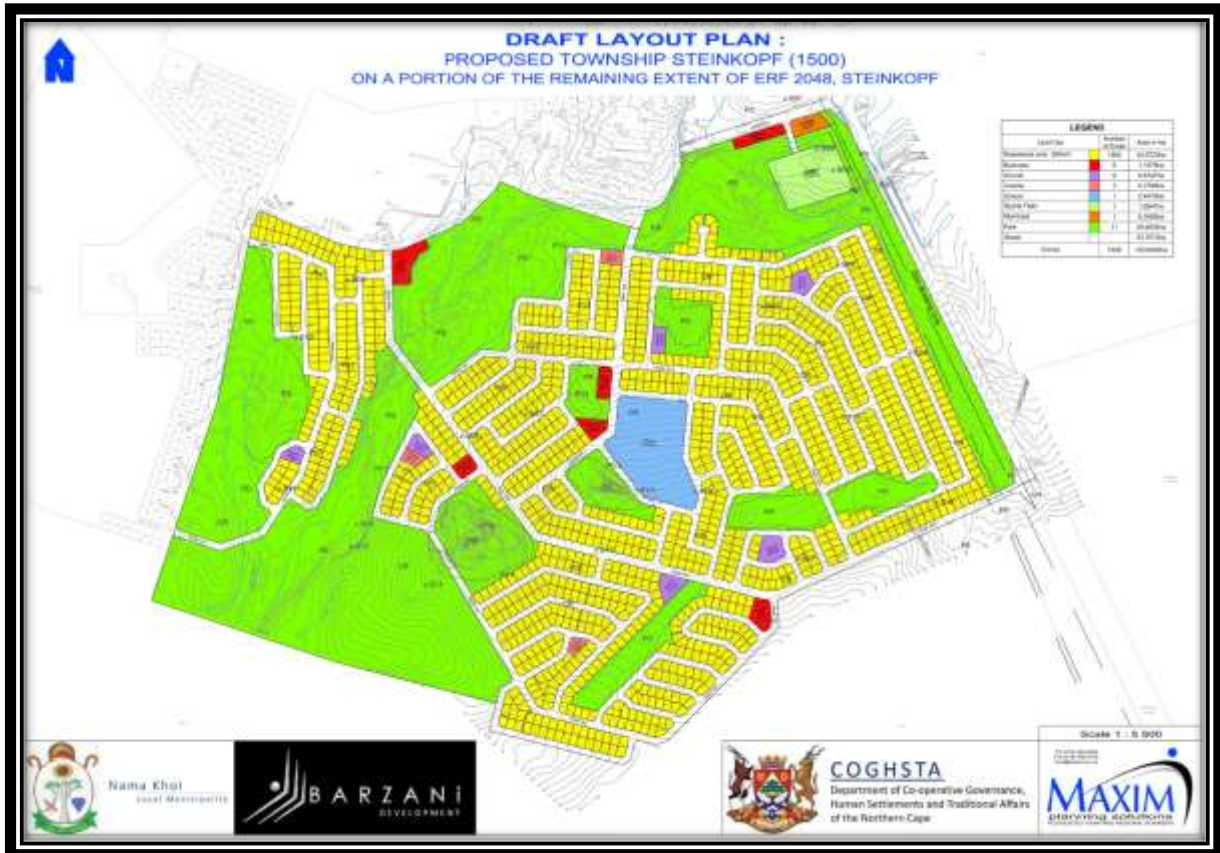


Figure 1: Layout Plan

CIVIL SERVICES

Bulk services will be connected to Municipal infrastructure. A Civil Engineer has been appointed to assess the availability and design of services in the area.

WATER

According to the Civil Engineer, the current bulk services for Steinkopf does not contain sufficient capacity to serve the addition of a further 8250 people (1500 erven at 5.5 people/erf), with a resultant negative deficit when the additional populations is applied to the reserve capacity.

Bulk Infrastructure	Maximum Effective Capacity (people)	Current Capacity Served (people)	Reserve Capacity (people)	Proposed Additional Capacity (people)	Remainder (people)
160 mm Ø Bulk Water Connection and Trunk Main	17280	10081	7199	8250	-1051
Reservoir	5563	10081	-4518	8250	-12768

Table 1: Summary of bulk infrastructure capacity

It must be noted that in the case of the reservoir the capacity available for domestic use, as a result of the reserved volume of water for fire demand, is insufficient to serve the current domestic demand within a single day. However, if the fire demand is ignored, the reservoir capacity increases to an estimated 11781 people for a period of 48 hours. This situation however does not fall in line with the accepted standards for water storage. Furthermore, the reservoir will still not contain sufficient capacity to serve both the existing population and the additional erven, with a resultant negative deficit of 6550 people. *With regards to the bulk water connection to the Sedibeng line, as stated previously little to no information is forthcoming, thus no evaluation can be made at this time. However, in light of telecoms with Ms A Botes of Sedibeng Water Springbok Region, applications for additional capacity and changes to the current connection may be considered. Considering the existing 160 mm trunk main, the resultant negative deficit as seen in Table 1 is indicative of insufficient capacity to serve the total volume of additional water. It must be noted that the negative deficit is relatively small (1051 people). This may be offset by increasing the allowed velocity within the trunk main by approximately 0.1m/s to 1.3m/s. This increase will have an impact on the operational properties in the form of greater friction loss but will allow the accommodation of the 1051 shortfall within the existing infrastructure. Considering the lack of information in this regard (i.e. available pressure), this may result in too great a head loss within the pipeline, with no water reaching the reservoir as a result.*

Recommendations for Bulk infrastructure:

Upgrade existing connection to Sedibeng water main.

- Upgrade existing trunk main to site of reservoir.
- New concrete reservoir to serve the proposed development.
- New bulk main to proposed development.

The existing reservoir does not contain sufficient capacity to serve the additional proposed erven. Thus, the necessity exists to increase the available storage capacity. It is recommended that a new reservoir to serve the proposed development be constructed in position at the site of the existing reservoir. The capacity of the new reservoir will be 48 hours of the AADD of the negative population deficit assuming no fire demand in the existing reservoir, thus **6550 people**.

It is proposed that a new trunk main to serve the proposed development be installed from the site of the new and existing reservoir, within the road reserve of the existing municipal road network, to the north-west corner of the proposed development. The new bulk main will be sized to serve the total domestic demand for the town of Steinkopf, including the proposed 1500 erven.

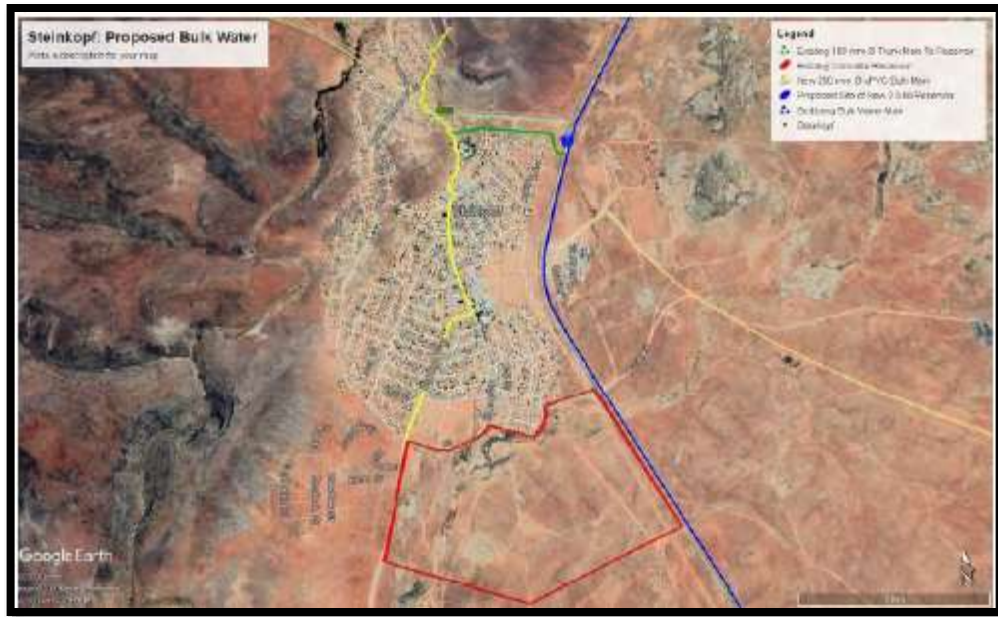


Figure 2: Proposed bulk water

Summary of recommendations:

- Upgrade existing connection to Sedibeng pipeline to 200mmØ.
- Upgrade existing 1.8km trunk main to reservoir site to 200mmØ uPVC Class 16.
- New 2.5 Ml concrete reservoir at site of existing reservoir.
- New 250 mm Ø bulk water main to site of the proposed development approximately 2.990kms in length.

SEWER

The maximum capacity for the bulk infrastructure may be summarised as indicated in Column 1 of Table 8 in the form of the total population that may be served. The population that may be served for the WTW is the least amount across all components of the WTW, thus 19938 people.

Bulk Infrastructure	Maximum Effective Capacity (people)	Current Capacity Served (people)	Reserve Capacity (people)	Proposed Additional Capacity (people)	Remainder (people)
300 mm Ø pipeline	25686	10081	15605	8250	7355
WTW	19938	10081	9857	8250	1607

Table 2: Bulk Sewer Capacity

It can be seen that the 300 mm Ø bulk sewer main and the WTW has sufficient capacity to serve the addition of a further 8250 people (1500 erven at 5.5 people/erf), with a residual capacity of 7355 and 1607people for the bulk pipeline and WTW respectively.

Recommendation for Bulk Sewer Infrastructure:

It is recommended that all parts of the proposed new development be drained to the existing Wastewater Treatment Works, via the 300 mm Ø bulk sewer main, as there is sufficient capacity to accommodate the new development. Based on the limited information received we anticipate that a small pump station (Lifting Station) with a short section of rising main (300m) will be required to accommodate a portion of the development situated to the north as it is evident that there is a low lying area.

CONSTRUCTION OF NEW INTERNAL WATER AND SEWAGE PIPELINES WITHIN THE WATERCOURSE OF THE PROPOSED DEVELOPMENT

The pipes will be encased in 200 mm mass concrete and the area on top of the concrete will be soilcrete that will be compacted in 150mm layers to natural ground level.

In the planning for the design phase of the pipelines, cognisance is taken of the following reference documents;

- Red Book – Guidelines for Human Settlement Planning and Design
- SABS 1200 – Standardized Specification for Civil Engineering Construction
- Local Municipal standards

When planning or designing the pipelines, a holistic approach that adheres to all the tenets of the reference or policy documents listed above will be adopted.

The approach to design and construction will encompass the following:

- Appropriate and adequate protection of the river/stream/wetland banks in the vicinity of the pipeline will be incorporated into the design.
- The existing river/stream bank structure will be maintained to reduce disturbance to the river/stream flow.
- Where crossing or running alongside river or stream courses, the existing river/stream bank structure will be maintained to reduce disturbance to the river flow.
- Where the pipeline crosses storm water channels these will be designed to have no impact on normal storm water flow in that all pipes and concrete casing will be buried at least 1.0m below natural channel level in the case of soft material, and level with the natural channel in the case of hard rock material.
- In the case of sewer pipelines, man holes will be provided at all changes in grade and direction and at intervals not exceeding 80m to facilitate maintenance during the lifetime of the pipelines.
- The pipe crossing has been designed to have no impact on normal river/stream flow
- Where pipes are laid through a flood plain (1:100-year flood line), a minimum cover level of 1.0m will be maintained.

Construction Methodology

- Conduct a competent site investigation to build up an informed picture of the task
- Conduct a topographical survey of the pipeline route
- Adequate design of all the stages of construction
- All environmental and Health and Safety requirements and good practice to be adhered to.
- Remove topsoil and stockpile for later use
- Excavate trench for pipeline to the design level
- If the material is firm, normal excavation techniques will apply. In soft material shoring of the trench sides may be required. In hard rock material trench excavation may require the use of pneumatic breakers or blasting
- Install temporary dewatering pumps to keep the excavation dry (if required due to ground water ingress)
- Construct storm water diversion berms where required
- Place concrete to encasement if required. The top level will be determined by the storm water channel level
- Place bedding, lay pipe, place and compact selected fill over the pipeline
- Construct manholes where required. Manholes will be constructed along the pipeline route at changes in grade and direction
- Backfill to specification of drawings.
- Dress backfill, topsoil and revegetate all exposed areas.

See Figure 3 below:

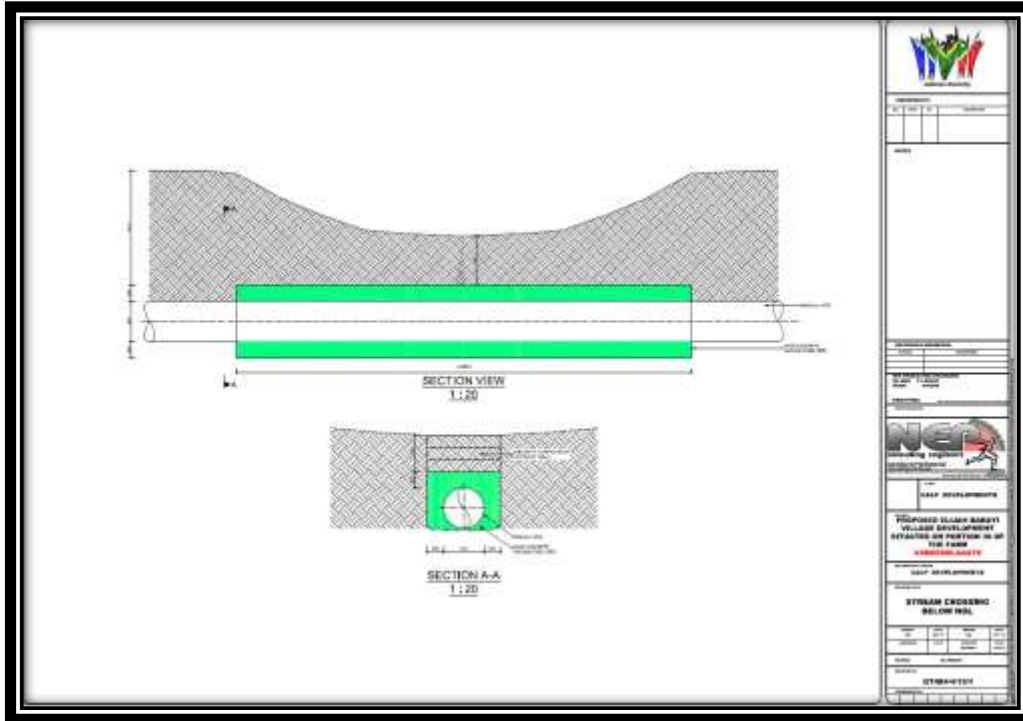


FIGURE 3: PIPELINE INSTALLATION DESIGN

ROADS

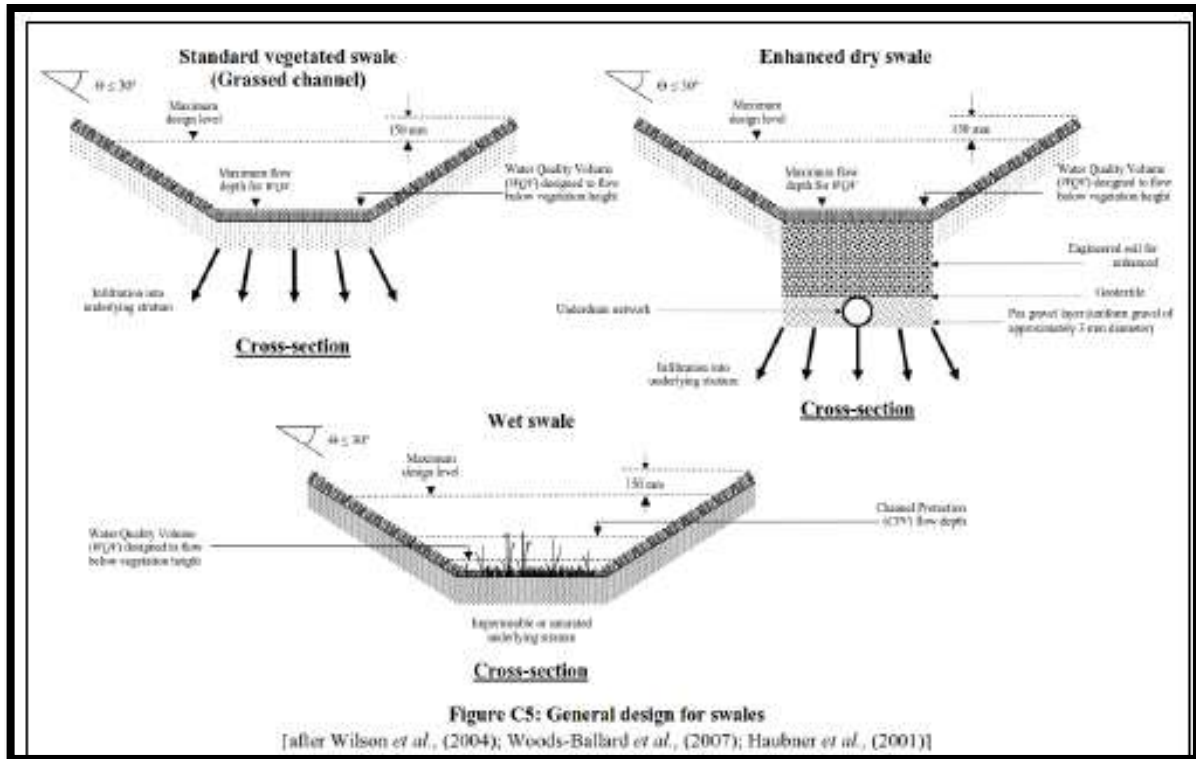
Currently Steinkopf has two main point of access from the N7 national road with one arterial road linking these two points of access, one in the northeast and one in the south-east. The arterial road linking the two points of access is a surfaced road, while the remainder of the municipal roads' infrastructure is gravel roads.

Access:

Currently the site of the proposed development is bordered by existing municipal roads infrastructure to the north and west, as well as the N7 national route to the east. It is recommended that access to the proposed development be provided from the existing roads network situated to north and west of the proposed development. Internal roads that are proposed as part of the development will cross the streams

SUSTAINABLE DRAINAGE SYSTEMS

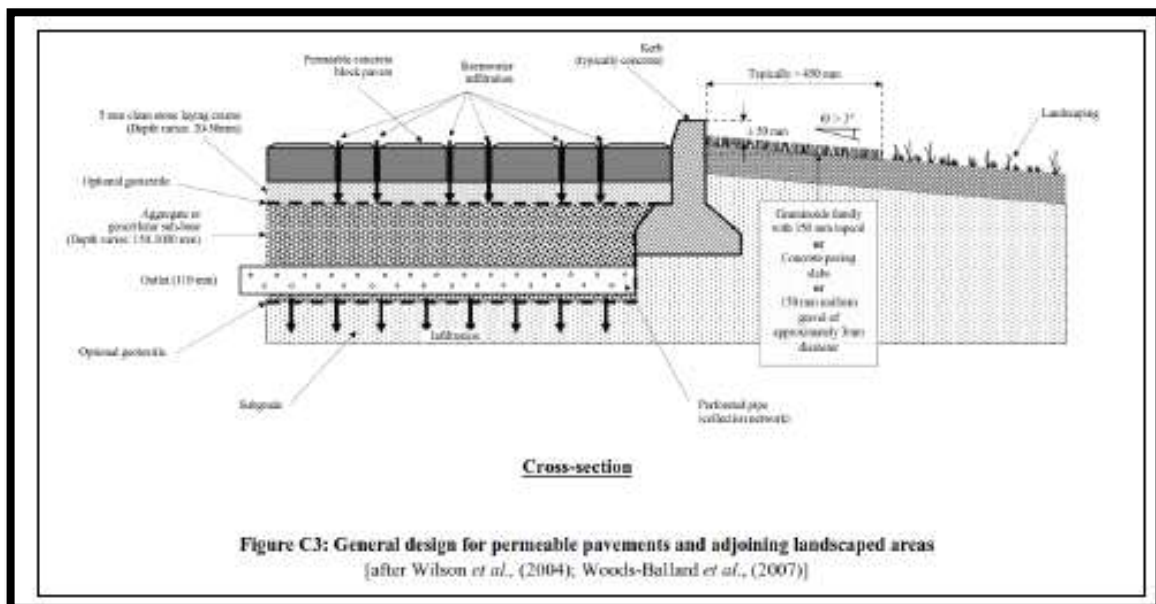
According to L. Soobiah (2020): Swales and biofiltration can be considered for implementation of 'green building' principles, adjacent the roadways, footpaths and for the proposed outlet channels into the main drainage courses. Swales (shallow vegetated channels which collect runoff and then releases it into the drainage system or back to surface at a reduced peak discharge and volume). Swales are constructed with permeable / gravel bases to promote infiltration to the sub-soil and improve run-off quality.



Typical swale design

Permeable paving:

The use of permeable pavers for footpaths, roadways and parking areas could be considered to provide reduced runoff and promote infiltration. The use of permeable paving can be implemented in tandem with swales constructed adjacent to the paved surfaces to intercept any surface flow as well as discharge from the underlying sub-base (Soobiah; L. 2020).



Typical Permeable paving design.

4. DESCRIPTION OF THE PROPERTY

The property is located on a Portion of the remaining extent of Erf 2048, Steinkopf, Nama Khoi Local Municipality, Northern Cape Province. The site is located towards the southern boundary of the existing residential area of Steinkopf and towards the West of the N7 national route towards Namibia. See Figure 4 for a copy of the Locality Map.

The site is located within a Critical Biodiversity area (CBA 1). See Figure 5 for a sensitivity map.

The site is trampled and overgrazed (See Photograph 1) with numerous tracks (See Photograph 2), clearings (See Photograph 3) and diggings (See Photograph 4). Various dirt roads cross the active channel (streambed) (See Photograph 5) and riparian zone that is present on site. Informal homesteads and paddocks have been erected. See Photograph 6. As mentioned above, the Northern boundary of the site is located adjacent to residential area of Steinkopf. See Photograph 7. Extensive informal dumping occurs at many parts (See Photograph 8). Various alien invasive weeds are widespread at the site. (Photograph 9).

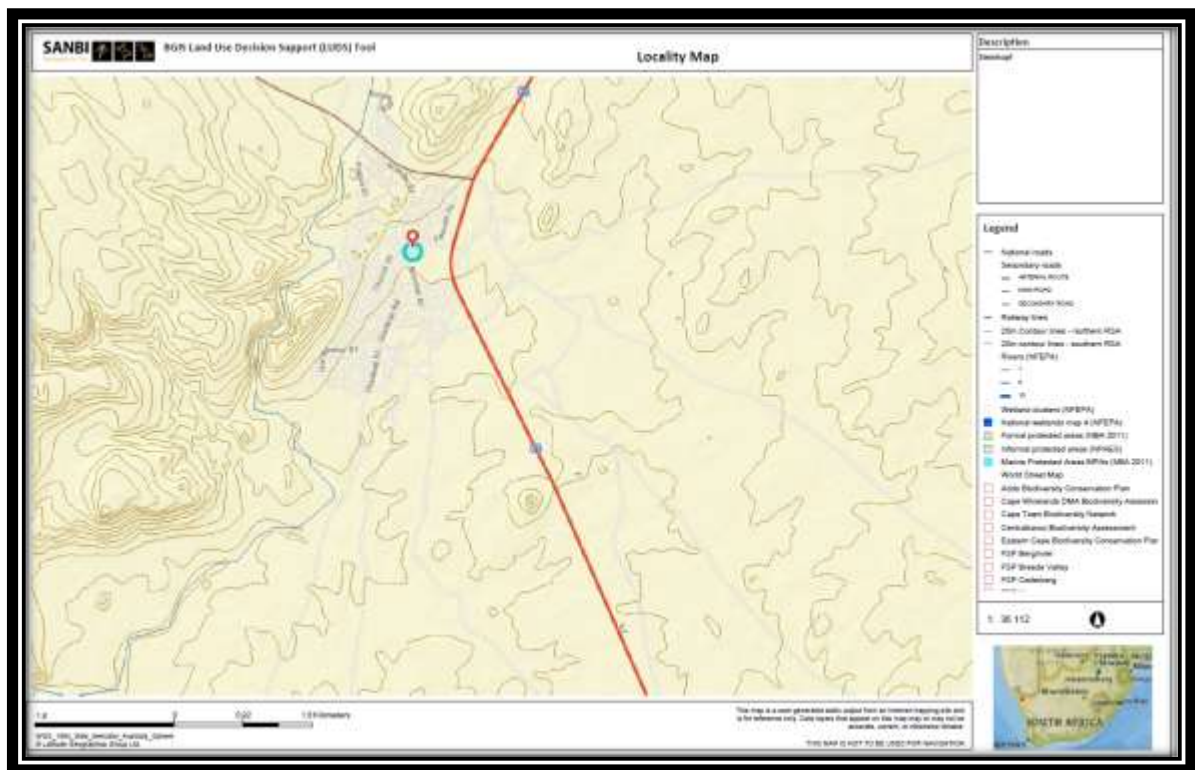


Figure 4: Locality Map.

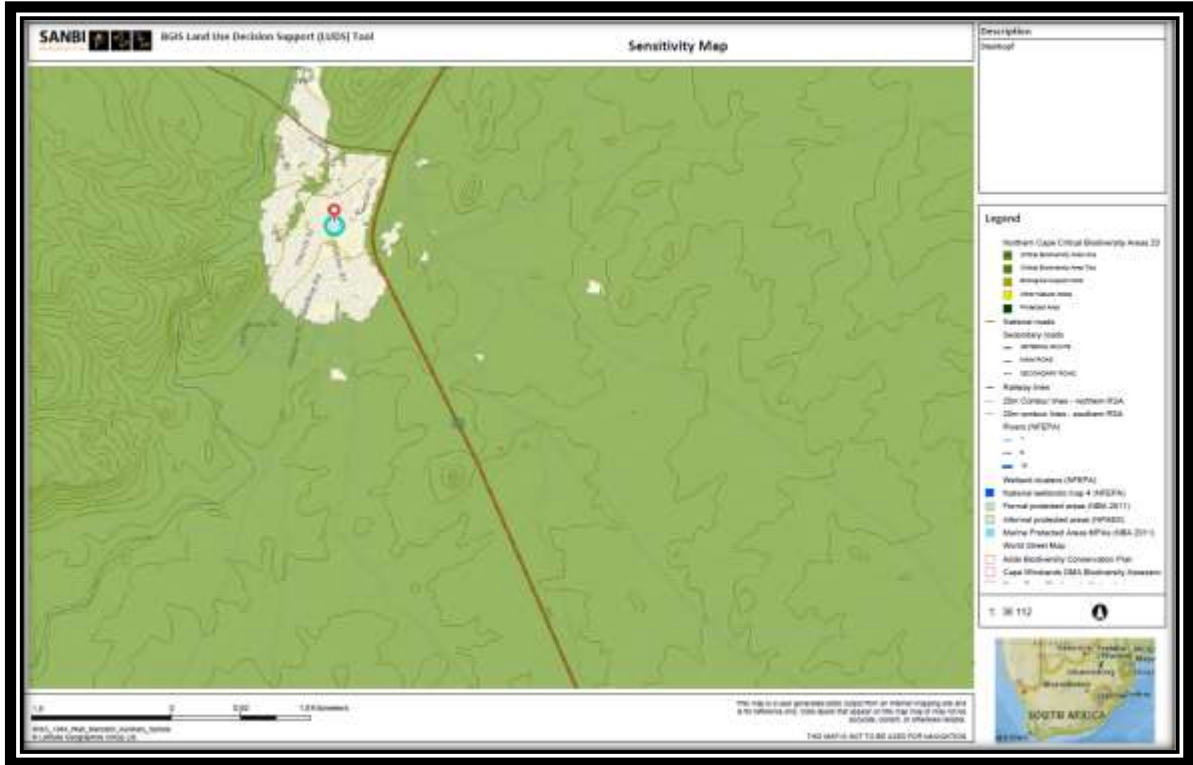


Figure 5: Sensitivity Map.



Photograph 1: The site is trampled and overgrazed.



Photograph 2: Numerous tracks and informal roads are found on site.



Photograph 3: Clearings on site.



Photograph 4: Diggings on site.



Photograph 5: Roads within the streambeds.



Photograph 6: Informal homesteads.



Photograph 7: Residential area located adjacent to the site.



Photograph 8: Informal Dumping takes place.



Photograph 9: Alien invasive species. *Datura stramonium*, at the site.

Photo: R.F. Terblanche.

WATER COURSES

Wetlands such as those that could be classified as Floodplain Wetlands, Channelled Valley-bottom Wetlands, Unchannelled Valley-bottom Wetlands, Depressions (Pans), Seeps or Wetland Flats appear to be absent at site.

Site is situated in the Lower Orange Water Management Area (WMA 14). Site falls outside any FEPA (Freshwater Ecosystem Priority Area) (Nel *et al.*, 2011a, 2011b). The site is part of an Upstream


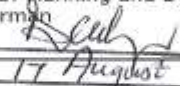
Management Area which are sub-quaternary catchments in which human activities need to be managed to prevent degradation of downstream river FEPAs and Fish Support Areas.

At present the functioning of the active channel (streambed) and riparian zone at the site is extensively compromised by informal dumping, likely severe overgrazing, roads and tracks crossing the streambed and visibly high concentrations of alien invasive plant species - all these factors to the extreme. The riparian area has also been modified in the past by diggings.

These features have been incorporated into the Layout Plan and only services will cross the water course.

ZONING

According to the zoning certificate issued by the Nama Khoi Municipality on 17 August 2020 (See copy of this certificate below) the site is currently zoned as Agricultural zone 1.

Nama Khoi Municipality		
Zoning Certificate		
Date: 2020/08/17		Fax No: (027)718-8100 Tel No: (027)712-1635 Address: Private bag X22 Springbok 8240
Property description:	2048, STEINKOPF	
Registered area:	1893.1512-H	
Municipality:	Nama Khoi Municipality	
District:	Namakwa	
Zoning:	Agricultural zone I	
Primary use:	Agriculture;	
Consent use:	Animal clinic; Animal hospital; Guest house; Nursery; Riding school; Second residential unit; Tourist facilities;	
Consent uses approved:	None recorded (confirm with municipality)	
Restrictions:	See annexure	
Relaxations of restrictions:	None recorded (confirm with municipality)	
<p>This information is in accordance with the Nama Khoi Municipality Town Planning Scheme as on above date, and may be amended from time to time. This information is also given in respect of Land Use Management requirements only and must not be construed as indicating requirements in terms of any By-Laws, the National Building Regulations, Environmental Legislations or any restrictive conditions in Title Deeds.</p>		
<p>NAMA KHOI MUNICIPALITEIT MUNICIPALITY GOEDGEKEUR APPROVED DE PLANING EN ONTWIKKELING - PLANNING DEVELOPMENT Divisional Head: Planning and Development Mr Deon Magerman Handt Sign:  Datum Date: 17 August 2020</p>		

Maxim Planning Solutions has been appointed to apply for rezoning of the site according to the Layout Plan and will be for:

Zoning	Number of Erven
Residential Zone I	1500
Business Zone I	3
Business Zone II	2
Institutional Zone I	5
Institutional Zone II	6
Institutional Zone III	1
Open Space Zone I	15
Open Space Zone II	1
Transport Zone I	41
Authority Zone I	1
Special Zone I	1
Total	1576

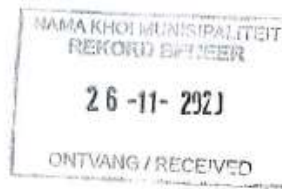
The image below is the cover page of the letter that was submitted to the Municipality for the town planning application submission and is stamped by the Municipality as "Received" proving that the application has been submitted to the Municipality on 26 November 2020.



Unit 35 Corpus Novem Office Park
35 Dr. Yusuf Dadoo Avenue, Wilkoppies,
Klerksdorp, 2571
P.O. Box 6846, Flamwood, 2572
Tel: (018) 468-6306
Fax: (018) 468-6378
Fax to e-mail: 086 218 4242
E-mail: koot@maxim.co.za

Ref: **8/80/1/K/T**
Enq: **K RAUBENHEIMER**

Municipal Manager
Nama Khoi Local Municipality
PO Box 17
SPRINGBOK
8240



26 November 2020

Sir

PROPOSED SUBDIVISION AND TOWNSHIP ESTABLISHMENT, IN TERMS OF THE NAMA KHOI BY-LAW ON MUNICIPAL LAND USE PLANNING (2016) READ WITH THE SPATIAL PLANNING AND LAND USE MANAGEMENT ACT, 2013 (ACT 16 OF 2013) ON A PORTION OF THE REMAINING EXTENT OF ERF 2048, STEINKOPF, ADMINISTRATIVE DISTRICT NAMAQUALAND, NORTHERN CAPE PROVINCE

(PROPOSED TOWNSHIP STEINKOPF COMPRISING ERVEN 3152 – 4727)

Application is hereby made in terms of the provisions of:

- Sections 3(2)(e), 3(2)(l) and 8(1), read with Section 18 of the Nama Khoi By-law on Municipal Land Use Planning (2016) read with Section 41(2)(b) of the Spatial Planning and Land Use Management Act, 2013 (Act 16 of 2013) for the subdivision of the Remaining Extent of Erf 2048, Steinkopf, Namaqualand Administrative District, Northern Cape Province into one (1) portion (to be known as Erf 3151, Steinkopf) and a remainder.
- Section 3(2)(a) read with Section 18 of the Nama Khoi By-law on Municipal Land Use Planning (2016), read with Section 41(2)(a) of the Spatial Planning and Land Use Management Act, 2013 (Act 16 of 2013) for the establishment of the following township on a portion of the Remaining Extent of Erf 2048, Steinkopf, Namaqualand Administrative District, Northern Cape Province.
 - The proposed township Steinkopf, comprising of Erven 3152 to 4727 and providing for 1500 "Residential Zone I" erven, 3 "Business Zone I" erven, 2 "Business Zone II" erven, 5 "Institutional Zone I" erven, 6 "Institutional Zone II" erven, 1 "Institutional Zone III" erf, 15 "Open Space Zone I erven", 1 "Open Space Zone II" erf, 1 "Authority Zone I" erf, 1 "Special Zone" erf (for the purposes of a

KLERKSDORP - RUSTENBURG

MAXIM PLANNING SOLUTIONS (PROPRIETARY) LIMITED (Reg. No. 2002/017393/07)
Directors: D.J. Bos (Prof.) (CEO), C. Grobbelaar, K. Raubenheimer (CFO / Company Secretary), J.G. Itzold

5. LEGAL AND OTHER REQUIREMENTS

Title of legislation, policy or guideline	Applicability to the project	Administering authority	Date
<p><i>National Environmental Management Act No. 107 of 1998 as amended.</i></p>	<p>NEMA is South Africa's overall environmental legislation and has, as its primary objective to provide for co-operative governance by establishing principles for decision making on matters affecting the environment, institutions that will promote co-operative governance and procedures for co-ordinating environmental functions exercised by organs of state and to provide for matters connected therewith (Government Gazette, 1998).</p> <p>The Act provides for the right to an environment that is not harmful to the health and well-being of South African citizens; the equitable distribution of natural resources, sustainable development, environmental protection and the formulation of environmental management frameworks (Government Gazette, 1998).</p> <p>Section 30 (1, 3 and 4) of NEMA states that:</p> <p>(1)(a) "incident" means an unexpected sudden occurrence, including a major emission, fire or explosion leading to serious danger to the public or potentially serious pollution of or detriment to the environment, whether immediate or delayed. (b) "responsible person" includes any person who; (i) Is responsible for the incident; (ii) Owns any hazardous substance involved in the incident; or (iii) Was in control of any hazardous substance involved in the incident at the time of the incident;</p> <p>(3) The responsible person or, where the incident occurred in the course of that person's employment, his or her employer must forthwith after</p>	<p>National & Provincial</p>	<p>27 November 1998</p>

	<p>knowledge of the incident, report through the most effective means reasonably available (a) the nature of the incident; (b) any risks posed by the incident to public health, safety and property; (c) the toxicity of substances or by-products released by the incident; and (d) any steps that should be taken in order to avoid or minimise the effects of the incident on public health and the environment to; (i) the Director-General; (ii) the South African Police Services and the relevant fire prevention service; (iii) the relevant provincial head of department or municipality; and (iv) all persons whose health may be affected by the incident.</p> <p>(4)The responsible person or, where the incident occurred in the course of that person's employment, his or her employer, must, as soon as reasonably practicable after knowledge of the incident; (a) take all reasonable measures to contain and minimise the effects of the incident, including its effects on the environment and any risks posed by the incident to the health, safety and property of persons; (b) undertake clean-up procedures; (c) remedy the effects of the incident; (d) assess the immediate and long-term effects of the incident on the environment and public health.</p>		
<p><i>The Bill of Rights, Constitution of South Africa, Section 27 (1)(b)</i></p>	<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</p>	<p>National Government</p>	<p>1994</p>

	<p>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>		
<i>New Regulations 2017 in terms of NEMA</i>	<p>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 basic assessment reports and environmental management programmes and the public participation process that should be followed.</p>	National & Provincial	7 April 2017
<i>National Water Act (36 OF 1998)</i>	<p>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 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 	Department of water and sanitation	1998

	<p>•Conserve aquatic and related ecosystems.</p> <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>Chapter 3 of the National Water Act (36 of 1998), deals with pollution of water resources following an emergency incident, such as an accident involving the spilling of a harmful substance that finds or may find its way into a water resource. In terms of Section 30 of NEMA and Section 20 of the National Water Act, the responsibility for remedying the situation rests with the person responsible for the incident or the substance involved. If there is a failure to act, the relevant Catchment Management Agency may take the necessary steps and recover the costs from every responsible person.</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>National & Provincial</p>	<p>2004</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>(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</p>		
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	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.		
National Environmental Management: Protected Areas Act (ACT NO. 57 OF 2003)	<p>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 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</p>	National & Provincial	2003

	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.		
<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 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>	Relevant Provincial Authorities.	2002
<i>National Heritage Resources Act, Act No. 25 of 1999</i>	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
<i>National Environmental Management: Waste Act, Act No.</i>	Legislation consulted to determine whether a waste licence will have to be obtained for the development.	National & Provincial	2008

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	Should the old canal be demolished, Category A: Activity number: 14 might be triggered. However, it is considered unlikely at this stage as it is envisaged that the existing canal will remain operational.		
National Environmental Management: Air Quality Act (Act 39 of 2004)	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 Provincial Authorities.	2004
The Conservation of Agricultural Resources Act (Act 43 of 1983)	This Act regulates the flow pattern of runoff water, control of weeds and invader plants.	Relevant Provincial Authorities.	1983
National Veldt and Forest Fire Act (Act 101 of 1998)	Chapter 4 places a duty on owners to prepare and maintain firebreaks.	Relevant Provincial Authorities.	1998
National Forests Act, Act 84 of 1998 (NFA) read with GN1602 of December 2016.	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
Northern Cape Nature Conservation Act, 2009 (Act. No. 9 of 2009)	This Act contains schedules of protected and specially protected species (fauna and flora) that may not be disturbed without a valid fauna and flora Permit from Nature Conservation.	Northern Cape Provincial Authority.	2009
Occupational Health and Safety Act (Act 85 of 1993)	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 Provincial Authorities.	1993
National Heritage RESOURCES Act (Act 25 of 1999)	Regulation 38. (1) states that any person who intends to undertake a development categorised as—(a) the construction of a canal exceeding 300m in length; must get authorization from SAHRA	Relevant Provincial Authorities.	1999

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 have been 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)
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 EMP 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 NUMBER OF DAYS:	300-350 days

6. NEED AND DESIRIBILITY

As in the rest of South Africa, there is a housing shortage in the area. This is totally 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 fecal 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 new "Human Settlements Plan" promotes the achievement of a non-racial, integrated society through the development of sustainable human settlements and quality housing. Housing is to be utilized for the development of sustainable human settlements in support of spatial restructuring.

The aim is to move beyond the provision of basic shelter towards achieving the broader vision of sustainable human settlements and more efficient towns, cities and regions. The following factors will be taken into consideration in order to achieve this vision:

- Progressive Informal Settlement Eradication: These settlements must be integrated into the broader urban setup so as to overcome spatial, social and economic exclusion. The plan encourages the eradication of informal settlements through in-situ upgrading in desired locations coupled with the relocation of households where development is not possible or desirable.
- Promoting Densification and Integration: The aim is to integrate previously excluded groups into the city so as to enable them to enjoy the benefits it offers and to create more integrated, functional and environmentally sustainable human settlements, towns and cities.
- Enhancing Spatial Planning: Greater co-ordination and alignment of various planning instruments and economic policies lies at the heart of sustainable human settlements. This requires more than mere co-ordination between departments but there needs to be a single overarching planning authority and/or instrument to provide macro-level guidance to support the development of sustainable human settlements.
- Enhancing the location of New Housing Projects: The location of past housing projects was said to reinforce apartheid spatial settlement patterns. Spatial restructuring aims to achieve a more decisive intervention in land markets. The following interventions are envisaged viz. accessing well located state-owned and parastatal land: acquisition of well-located private land for housing development, funding for land acquisition and fiscal incentives.
- Supporting Urban Renewal and Inner-City Regeneration: Urban renewal and inner-city regeneration often result in the current inhabitants being excluded as a result of the construction of dwelling units they cannot afford. Some municipalities are trying to avoid this by promoting affordable inner-city housing. The "Human Settlements Plan" will support this by encouraging social housing.

- Developing Social and Economic Infrastructure: The need to move away from a housing-only approach towards a more holistic development of human settlements which includes the provision of social and economic infrastructure is emphasized.
- Enhancing the Housing Product: The aim is to develop more appropriate settlement layouts and housing products and to ensure appropriate housing quality.

The development of the proposed integrated human settlement represents a definitive move away from providing housing-only township areas and towards the provision of a proper integrated human settlement that offers a magnitude of social, educational and commercial support facilities and infrastructure in close proximity to the inhabitants

Skills development

The members of the Project Steering Committee will during the entire life-cycle of the project be involved with all processes and it anticipated that the capacity of the officials of the Nama Khoi Local Municipality as well as the relevant community structures will be broadened through the transfer of knowledge and skills specifically relating to the integrated human settlement planning process as well as the statutory processes associated with the township establishment process.

During the construction phase of the proposed development, jobs will be created and thus the unemployment rate of the area will be reduced.

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 (See Figure 1 for a copy of the Layout Plan):

Residential	1500 Stands
Business	6 Stands
Churches	6 Stands
Crèche	3 Stands
School	1 Stand
Sports Field	1 Stand
Municipal	1 Stand
Parks	11 Stands

Area of township **123,0452 ha**

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.

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

According to the Geo-Technical Report, the site is underlain by gneiss, granodiorite or adamellite of the Stalhoek Complex, Vioolsdrift Suite, but is locally covered by recent aeolian sand and calcrete gravel. Locally, the site is covered by alluvial gravel and calcrete. No dolomite occurs therefore no stability investigation and evaluation is required.

Some severe problems are foreseen regarding the excavatability to 1,0m depth on site, and shallow rock, core stones and rock outcrop or hard pan calcrete or gneiss were identified across the site.

Zoning of the site revealed zones with minor constraints regarding the **compressibility, collapse potential** and the **expansive potential** of the soil.

The following zones were identified on the site:

Normal Development with risk:

Site Class CR/1A3F: This zone represents the majority of the area and comprises of a relative thin top layer sandy material less than 0,75m in thickness of slightly collapsible and compressible or low expansive soil underlain by a competent pebble marker, calcrete or gneiss, with estimated total movement of less than 7,5mm measured at surface with the risk of shallow rock, core stones and

hard pan calcrete or gneiss rock outcrop adding a R or PR site class designation to the zone with problems relating to restricted excavation to less than 1,0m. Development on solid rock calcrete, calcrete rock outcrop known as hard pan calcrete or gneiss and will have an inflated cost where special pneumatic tools and blasting will be required for the installation of services. Normal foundation techniques will be adequate to enable proper development, with proper compaction within standard strip foundations and drainage provision that will be required. It is classified as CR in terms of the SAIEG & NHBRC guidelines (1995) or the SAICE Code of practice (1995), and 1A3F according to the classification for urban development (Partridge, Wood & Brink)(1993).

Suitable for development with precaution

Site Class PR: Areas with a PR site class designation with problems relating to restricted excavation to less than 0,5m, consisting of solid rock calcrete, calcrete rock outcrop known as hard pan calcrete or gneiss will have an inflated cost where special pneumatic tools and blasting will be required for the installation of services.

Site Class PQ: Areas where small quarries or filling or dumping of spoil (Pq1) were identified must be rehabilitated before any construction can be allowed, and backfilling with an engineer's material may improve the developability of these zones, but these operations will dramatically increase the development cost in this zone.

Undevelopable: Site Class PD: Perennial drainage features with local steeper slopes within the upper channels and towards the river. The development is usually restricted to 32m from the centre of the river, and outside the 1:100 year floodline

No dolomite occurs on site and a stability investigation and evaluation is not required.

Normal and special construction techniques will be required to enable proper development. This includes the use of **compaction techniques** and **site drainage** as described

If the proposed mitigation measures as described in the Geotechnical report are adhered to, it will ensure a sustainable development as far as this variable is concerned.

8.1.2 TOPOGRAPHY

The site is situated on a slightly undulating plain that slopes from 794 to 819 masl towards the centre portion of the site, and then westwards into the Doring River which drains southwards towards the Buffels River. The overall topography of the area can be described as relatively flat and open, with some small rocky ridges, diggings and outcrops present in parts.

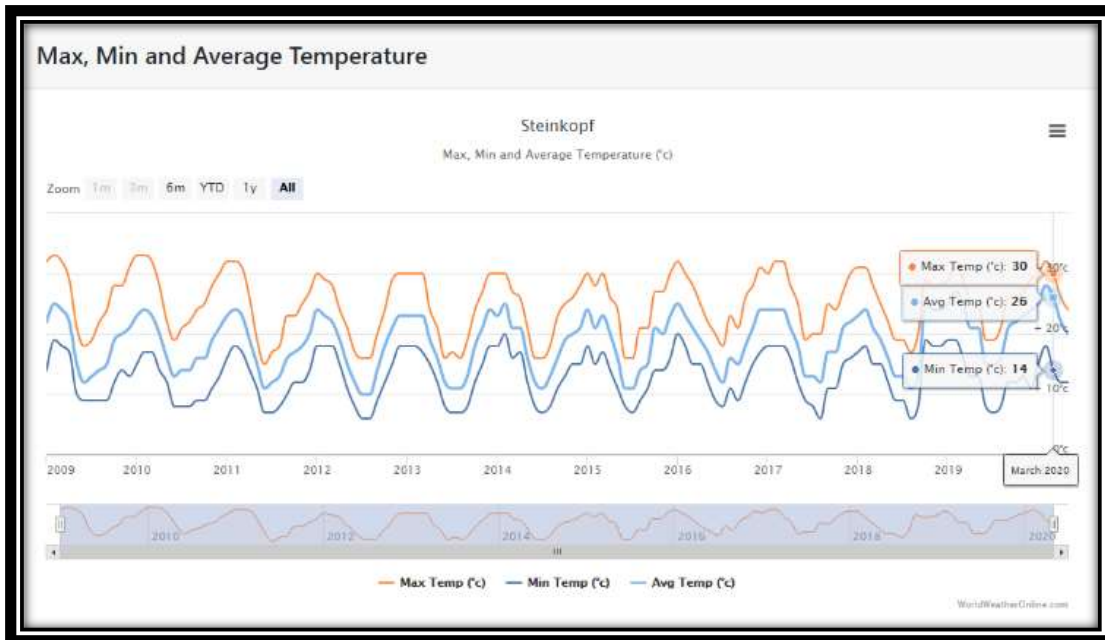
A detailed site survey has been carried out to establish levels. The Engineering report and the Layout plan will address issues regarding storm water. As the proposed development will be in close proximity to residential areas, safety of children and people need to be taken into consideration.

8.1.3 CLIMATE

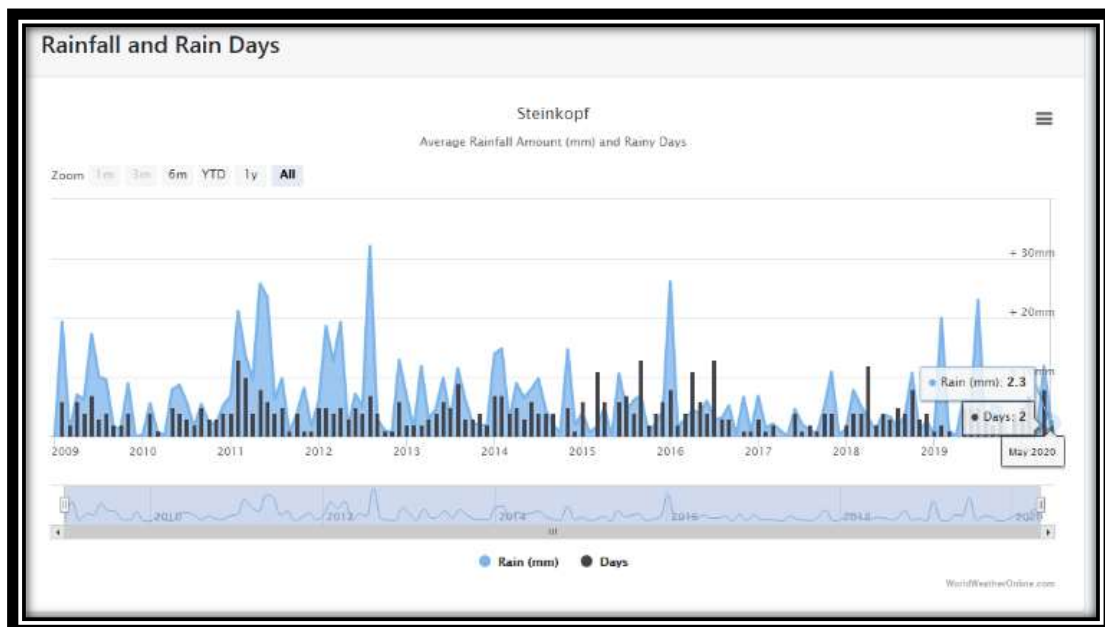
The region is characterized by summer rainfall with thunderstorms, with annual very low rainfall figures of 205 mm for Springbok recorded at the closest weather stations to the site. (According to

the Flood line Report compiled by CWT, rainfall data was derived using software to estimate the rainfall in any catchment where coordinates of a reference point in the catchment is used , the Mean annual precipitation at the reference point is **139 mm**)

Winters are dry with frost common. The warmest months are normally December and January with February the warmest month, and the coldest months are June and July. The Table below provides climatic data for the past 10 years.



Source: <https://www.worldweatheronline.com/steinkopf-weather-averages/northern-cape/za.aspx>



Source: <https://www.worldweatheronline.com/steinkopf-weather-averages/northern-cape/za.aspx>

Extreme climatic events may have an influence on the project during the construction and operational phase and will have to be taken into consideration.

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".

Water availability and demand has been calculated by the consulting Civil Engineers, to enable a sustainable waterborne sewage system as well as potable water supply for both the existing and future developments in the area.

8.1.4 SURFACE DRAINAGE, WETLANDS AND RIPARIAN ZONES

A non-perennial river with associated smaller drainage lines runs through the northwestern and western part of the site. This non-perennial river that crosses the northern and western parts of the site is a tributary of the Doring River which is located further west from Steinkopf. During times of exceptional rainfall the active channel of the non-perennial river at the site is likely to be overflowed which would then result in a much broader floodplain at some areas. The riparian zone of this non-perennial river is and has therefore indicated to be fairly broad at some areas of the site.

Wetlands such as those that could be classified as Floodplain Wetlands, Channelled Valley-bottom Wetlands, Unchannelled Valley-bottom Wetlands, Depressions (Pans), Seeps or Wetland Flats appear to be absent at site.

The site is situated in the Lower Orange Water Management Area (WMA 14). Site falls outside any FEPA (Freshwater Ecosystem Priority Area) (Nel *et al.*, 2011a, 2011b). The site is part of an

Upstream Management Area which are sub-quadernary catchments in which human activities need to be managed to prevent degradation of downstream river FEPAs and Fish Support Areas.

At present the functioning of the active channel (streambed) and riparian zone at the site is extensively compromised by informal dumping, likely severe overgrazing, roads and tracks crossing the streambed and visibly high concentrations of alien invasive plant species - all these factors to the extreme. The riparian area has also been modified in the past by diggings.

Present ecological status (PES) of the Non-perennial River at the site is CATEGORY E which means the watercourse is seriously modified. The losses of natural habitats and basic ecosystem functions are extensive. The present ecological status is outside the general acceptable range. Ecological Importance and Sensitivity (EIS) at the site is CATEGORY C which is moderate and refers to floodplains 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.

While the present ecological status is poor, the active channel with its associated riparian zone is still regarded as sensitive owing to its importance as part of a corridor of particular conservation concern in the larger area. There is an opportunity for the development to alleviate current pressures on the riparian system if accompanied by well-selected and restricted bridge structures, continuous eradication of alien invasive plant species, measures to curb the extensive informal dumping in the area, cultivation of indigenous plant species and proper rehabilitation of impacts that cross the riparian zone.

The non-perennial river, with its riparian zone and buffer zone, at the site is a corridor of particular conservation importance. This non-perennial river, with its riparian zone and buffer zone, is likely to be impacted by the proposed developments, but to a restricted and limited extent. If the development is approved the construction 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 non-perennial river. The geomorphological setting and flow regime should be as similar as possible post development, if the development is approved (in this case there would be some positive impact on flow regime). Loss of any wetland animal or plant species of particular conservation importance is not expected.

Loss of Threatened or Near-Threatened Plants, Mammals, Reptiles, Amphibians and Invertebrates at the proposed footprint appears to be unlikely. The proposed footprint is unlikely to harbour any sensitive species, so that impact risk to any sensitive species is very low.

Rubble or waste could lead to infiltration of unwanted pollutants into the soil. Spilling of petroleum fuels and unwanted chemicals onto the soils that infiltrate these soils could lead to pollution of soils and also impact on water quality when the stream flows. Rubble or waste that could accompany the construction effort, if the development is approved, should be removed during and after construction. Measures should be taken to avoid any spills and infiltration of petroleum fuels or any chemical pollutants into the soil during construction phase.

A rehabilitation plan which include the combatting of alien invasive plant species at the watercourse is essential. Infestation by alien invasive species could replace indigenous vegetation or potential

areas where indigenous vegetation could recover. Once established combatting these alien invasive plant species may become very expensive to combat in the long term, especially if species such as *Prosopis* (Mesquite) is allowed to establish. Continued monitoring and eradication of alien invasive plant species are imperative.

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 site is Low



Figure 6: Indications of active channels, riparian zones and buffer zones at the site.

- Red outline Boundaries of the site
- Orange-brown outline Buffer Zone
- Light green outline and shading Riparian Zone
- Light blue outline and shading Active channel (streambed)

All the streams draining stormwater to **Steinkopf** are shown below in Figure 7.

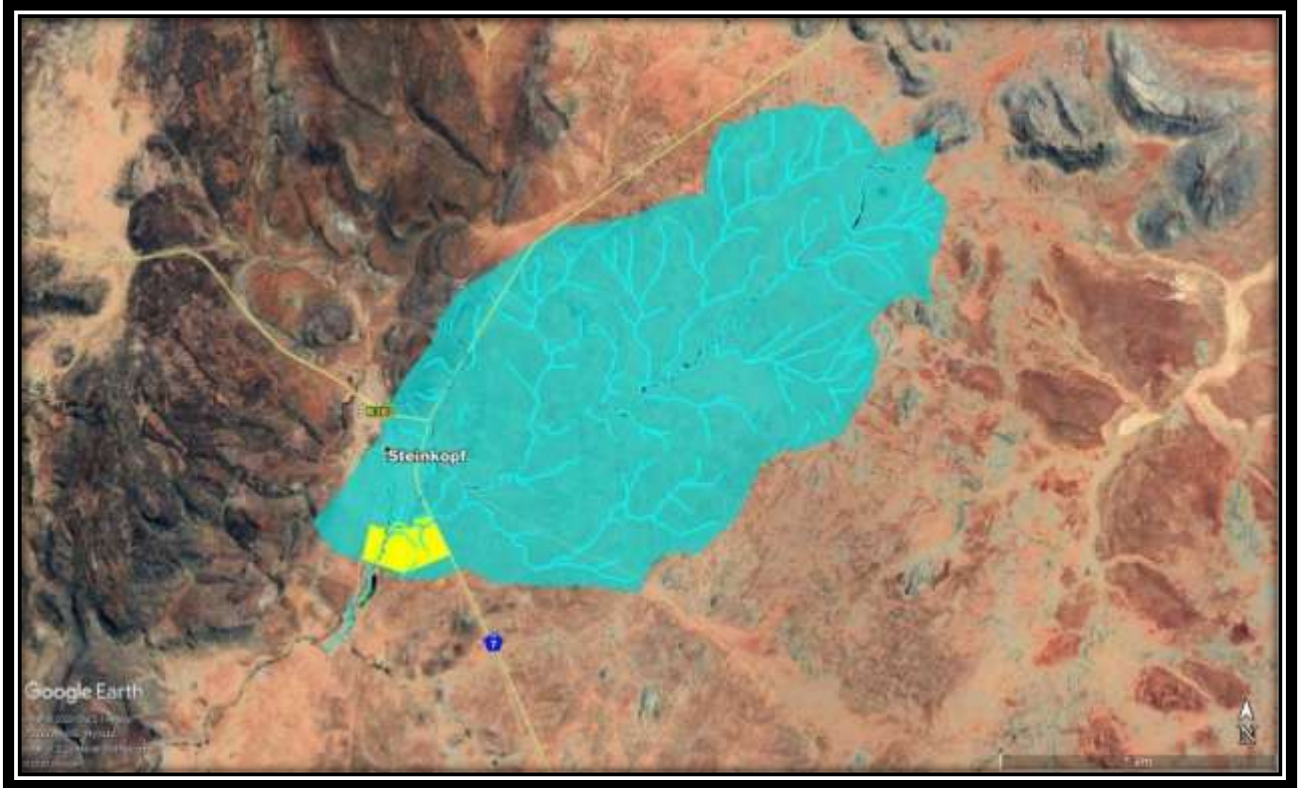


Figure 7: All the streams draining stormwater to Steinkopf

Six of these streams were identified where flood lines will develop that may have an effect on developments on the site. The main stream in this study area is **Stream 1** with a catchment of **57,4 km²** at the study area. **Streams 2 and 3** are Tributaries to **Stream 1**.

Streams 4, 5, and 6 are small streams and the flood peaks for these streams were calculated using the relation of the square roots of the bigger catchment areas and the calculated flood peaks of the relative bigger stream

Figure 8 illustrates the calculated 1:100 year flood lines.



Figure 8: 1:100 year flood lines

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

The study area is at the proposed footprint south of Steinkopf, Northern Cape Province, South Africa (elsewhere referred to as the site). Site is part of the Succulent Karoo Biome is represented by the Namaqualand Blomveld vegetation type (Mucina & Rutherford 2006).

To serve as local context for the landscape and vegetation at the site an outline of the Namaqualand Blomveld from Mucina and Rutherford (2006) follows.

SKn 3 Namaqualand Blomveld

Distribution: Northern Cape Province and to a small extent also Western Cape Province: Valleys and flat areas (piedmonts, vlaktes) between granitic rocky hills of the Namaqualand Escarpment, from Steinkopf southwards to Bitterfontein. Most of the area at altitudes 460 – 1080 m.

Vegetation and landscape features: Level to slightly undulating sedimentary surfaces between rocky granitic hills and mountains, such as wide plains and broad valleys with dry channels of intermittent water courses. Sparse dwarf shrubs with succulent or ericoid leaves dominate these shrublands. Geophytes and ephemeral herbs and in places also low, spreading, leaf-succulents show spectacular flower displays (hence the name of the unit) in wet years.

Geology and soils: Underlain by granite-gneisses and metasediments of Mokolian age, affected by the Namaqualand Metamorphic Event. Supporting relatively deep, yellow-brown, fine to coarse loamy sand derived through weathering of the granite rocks. Ag and Ae land types make up almost 80% of the area, followed by Fc land type accounting for a further 15%.

Climate: Seasonal winter rainfall (May to September) with sporadic drought periods (well below 100 mm per year) of one or two years in succession. Dew is present throughout the winter. MAP (Mean Annual Precipitation) is 145 mm. An average of 13 days of frost per year, but varying greatly from year to year.

Important taxa: Succulent shrubs: *Drosanthemum hispidum*, *Euphorbia mauritanica*, *Galenia sarcophylla*, *Hypertelis salsoloides*, *Leipoldtia schultzei*, *Ruschia robusta*, *Aridaria noctiflora* subsp. *noctiflora*, *Euphorbia decussata*, *Lycium cinereum*, *Ruschia brevibracteata*, *Tetragonia fruticosa*, *Tetragonia robusta* var. *psiloptera*, *Tylecodon wallichii* subsp. *wallichii*. Low Shrubs: *Eriocephalus microphyllus* var. *pubescens*, *Galenia africana*, *Aptosimum indivisum*, *Aptosimum spinescens*, *Asparagus capensis* var. *capensis*, *Berkheya fruticosa*, *Hermannia disermifolia*, *Hermannia trifurca*, *Peliostomum virgatum*, *Pentzia incana*, *Pteronia divaricata*, *Tripteris sinuata*, *Zygophyllum retrofractum*. Semiparasitic shrub: *Thesium lineatum*. Woody climbers: *Astephanus triflorus*, *Microloma sagittatum*. Herbaceous climber: *Cysticapnos grandiflora*. Herbs: *Aizoon canariense*, *Arctotheca calendula*, *Arctotis fastuosa*, *Dimorphotheca sinuata*, *Felicia merxmeulleri*, *Foveolina dichotoma*, *Gazania lichtensteinii*, *Gorteria diffusa* subsp. *diffusa*, *Grielum humifusum*, *Heliophila coronopifolia*, *Heliophila variabilis*, *Leysera gnaphalodes*, *Leysera tenella*, *Oncosiphon grandiflorum*, *Oncosiphon suffruticosum*, *Plantago cafra*, *Senecio arenarius*, *Senecio cardaminifolius*, *Ursinia cakilefolia*, *Ursinia nana*, *Adenogramma glomerata*, *Felicia bergiana*, *Felicia namaquana*, *Felicia tenella* subsp. *cotuloides*, *Gazania leiopoda*, *Heliophila seselifolia* subsp. *nigellifolia*, *Hermannia althaeifolia*, *Jamesbrittenia racemosa*, *Lessertia diffusa*, *Lotononis falcata*, *Nemesia affinis*,

Pelargonium redactum, *Trichogyne paronychioides*, *Zaluzianskya benthamiana*. Geophytic herbs: *Massonia depressa*, *Oxalis obtusa*, *Eriospermum paradoxum*, *Hesperantha pauciflora*, *Lachenalia violacea*, *Moraea serpentina*, *Ornithogalum hispidum*, *Oxalis inconspicua*, *Pelargonium triste*, *Tulbaghia dregeana*. Succulent herbs: *Crassula thunbergiana*, *Conicosia elongata*, *Crassula muscosa*, *Tetragonia microptera*. Graminoids: *Karoochloa schismoides*, *Caetobromus involucratus* subsp. *dregeanus*, *Ehrharta barbinodis*, *Ehrharta calycina*, *Ehrharta longiflora*, *Schismus barbatus*.

Note: Though some plant species of the above listed vegetation type are present at the site, not necessarily all of the plant species listed above are present at the site.

Vegetation at the site can be divided in terrestrial vegetation and along a non-perennial river and its associated smaller drainage lines, riparian vegetation. The site overall appears to be conspicuously extensively degraded.

The site appears trampled and overgrazed in many areas. Numerous tracks, clearings and diggings are found at the site. Various dirt roads cross the active channel (streambed) and riparian zone. Informal homesteads and paddocks are present at the site. Northern boundaries of the site are adjacent to residential areas. Extensive informal dumping occurs at many parts. Various alien invasive weeds are widespread at the site.

Terrestrial vegetation at the site comprises mainly small shrubs and sparse cover of vegetation overall. Extensive ecological disturbances at the site are reflected in what appears to be a poor vegetation cover of mostly dwarf shrubs at the terrestrial zone at the site. *Ruschia*, *Drosanthemum*, *Leipoldtia* species and other succulent shrubs are conspicuous at the terrestrial zone. The shrub *Galenia africana* is conspicuous at hitherto cleared areas. Restricted patches where the succulents such as *Cheiridopsis denticulata* are found in small clumps interrupt the homogenous sparse shrubland. Taller shrubs and trees are mostly absent at the terrestrial zone and are confined to the riparian zone at the site.

Most conspicuous trees at the riparian zone are the alien invasive *Prosopis velutina/ glandulosa* (Mesquite) and *Schinus molle* (Pepper Tree). Only a single *Vachellia karroo* (Sweet Thorn) individual remains at the site. A prominent shrub species at the riparian zone is the alien invasive *Atriplex nummularia* (Old Man Salt Bush). The indigenous shrub *Galenia africana* (Kraalbos), often associated with disturbed areas, is also visible at the obviously disturbed riparian zone at the site. The indigenous herbaceous shrub *Gomphocarpus fruticosus* is also found at the riparian zone often in the non-perennial active channel. Other alien invasive plant species at the riparian zone which are not mentioned above such as *Ricinus communis*, *Caesalpinia gilliesii*, *Datura stramonium*, *Agave americana*, *Salsola kali*, *Argemone ochroleuca*, *Nicotiana glauca* and *Limonium sinuatum* are also present.

Herbaceous plant species at the site overall include *Aptosimum spinescens*, *Melolobium candicans*, and *Radyera urens*. Succulent species include *Tetraena retrofracta*, *Ruschia robusta*, *Cheiridopsis denticulata*, *Pelargonium carnosum* and *Mesembryanthemum guerichianum*.

The vegetation type representing the Succulent Karoo Biome at the site is Namaqualand Blomveld (SKn 3). The Namaqualand Blomveld is not listed as threatened according to the National List of Threatened Ecosystems (2011).

Some plant species that are not threatened but which is listed as protected according to Northern Cape Nature Conservation Act No. 9 of 2009 are present or are likely to be present at the site. All *Pelargonium* species are listed which then includes *Pelargonium carnosum* which is present at the site. Members of the protected plant families Aizoaceae, Amaryllidaceae, Crassulaceae and Iridaceae are also found at the site. A permit for the removal of indigenous vegetation at the site is therefore required.

Ecological sensitivity at the terrestrial zone of the site is medium to low. Ecological sensitivity at the non-perennial active channel (river) and associated smaller drainage lines and its riparian zone, though extremely degraded, are high because these remain a corridor of particular conservation concern in the larger area. Rehabilitation and removal of alien invasive vegetation would be essential to restore some of the functions of this non-perennial river. The following sensitivity map has been created by the Fauna and Flora Habitat Specialist.



Figure 9 Indications of ecological sensitivity at the site. Ecological sensitivity of most of the site is medium, whereas the ecological sensitivity at the active channel, riparian zone and buffer zone is considered to be high even though these are extensively and conspicuously degraded.

- Red outline Boundaries of the site
- Dark orange outline High Sensitivity
and shading

- Light orange-brown Medium Sensitivity
outline and shading
- Light yellow outline and Low Sensitivity
shading

Grid references and altitudes were taken at site with a GPS Garmin E-trex 20 ® instrument. Map information were analysed and depicted on Google images with the aid of Google Earth Pro (US Dept. of State Geographer, MapLink/ Tele Atlas, Google, 2019).

8.1.7 FAUNA

ASSESSMENT OF VERTEBRATE SPECIES OF PARTICULARLY HIGH CONSERVATION PRIORITY

Mammals of particular high conservation priority

Threatened mammal species of the Northern Cape Province. Literature sources: Friedman & Daly, (2004), Skinner & Chimimba (2005), Wilson & Reeder (2005). With mammal species which normally needs a large range their residential status does not implicate that they are exclusively dependent on the site or use the site as important shelter or for reproduction. No = Not recorded at site/ Unlikely to be resident at the site. Yes: Recorded at the site/ Likely to be resident at the site.

Species	Threatened Status	Site is part of range	Recorded at site during survey	Likely to be found based on habitat assessment
<i>Bunolagus monticularis</i> Riverine Rabbit	Critically Endangered	No	No	No
<i>Chrysofalax villosus</i> Rough-haired golden mole	Vulnerable	No	No	No
<i>Chrysochloris visagiei</i> Visagie's Golden Mole	Critically Endangered	No	No	No
<i>Cryptochloris wintoni</i> De Winton's Golden Mole	Vulnerable	No	No	No
<i>Chrysochloris zyli</i> Van Zyl's Golden Mole	Critically Endangered	No	No	No
<i>Cloeotis percivali</i> Short-eared Trident Bat	Vulnerable/ Near-threatened	No	No	No
<i>Cistugo lesueuri</i> Lesueur's Hairy Bat	Vulnerable	No	No	No
<i>Diceros bicornis</i> Black rhinoceros	Critically Endangered	No	No	No

<i>Eremitalpa granti</i> Grant's Golden Mole	Vulnerable	No	No	No
<i>Felis nigripes</i> Black-footed Cat	Vulnerable	No	No	No
<i>Lycaon pictus</i> African wild dog	Endangered	No	No	No
<i>Loxodonta africana</i> African elephant	Vulnerable	No	No	No
<i>Mystromys albicaudatus</i> White-tailed mouse	Endangered	Yes	No	No
<i>Neamblysomus julianae</i> Juliana's Golden Mole	Critically Endangered	No	No	No
<i>Panthera leo</i> Lion	Vulnerable	No	No	No
<i>Rhinolophus blasii</i> Blasi's Horseshoe Bat	Vulnerable	No	No	No
<i>Smutsia temminckii</i> Ground Pangolin	Near threatened	No	No	No

Near threatened mammal species known to occur in the North West Province and Northern Cape Province. Literature sources: Skinner & Chimimba (2005). No = Not recorded at site/ unlikely to be resident at the site. Yes: Recorded at the site/ Likely to be resident at the site.

Species	Threatened Status	Site is part of range	Recorded at site during survey	Likely to be found based on habitat assessment
<i>Ceratotherium simum</i> White Rhinoceros	Near threatened	No	No	No
<i>Cistugo seabrai</i> Angolan Hairy Bat	Near Threatened	No	No	No
<i>Rhinolophus capensis</i> Cape Horseshoe Bat	Near Threatened	No	No	No

Data deficient (or uncertain) mammal species of the North West Province and Northern Cape Province. Literature sources: Skinner & Chimimba (2005). No = Not recorded at site/ unlikely to be resident at the site. Yes: Recorded at the site/ Likely to be resident at the site.

Species	Threatened Status	Recorded at site during survey	Likely be a resident at the site
<i>Myosorex varius</i> Forest shrew	Uncertain	No	No
<i>Rhinolophus denti</i> Dent's Horseshoe Bat	Data Deficient	No	No

Birds of particular high conservation priority

Threatened bird species of the North West Province and Northern Cape Province. Literature sources Barnes (2000), Hockey, Dean & Ryan, P.G. (2005) and Chittenden (2007). No = Not recorded at site/ Unlikely to use site as breeding area or particular habitat on which the species depends. Yes = Recorded at site/ Likely to use site as breeding area or particular habitat on which the species depends.

Species	Common name	Threatened Status	Recorded at site during survey	Likely to use site as breeding area or habitat
<i>Aegypius tracheliotos</i>	Lappet-faced Vulture	Vulnerable	No	No
<i>Anthropoides paradiseus</i>	Blue Crane	Vulnerable	No	No
<i>Aquila rapax</i>	Tawny Eagle	Vulnerable	No	No
<i>Ardeotis kori</i>	Kori Bustard	Vulnerable	No	No
<i>Balearica regulorum</i>	Grey Crowned Crane (Mahem)	Vulnerable	No	No
<i>Botaurus stellaris</i>	Eurasian Bittern	Critically Endangered	No	No
<i>Calendulauda burra</i>	Red Lark	Vulnerable	No	No
<i>Circus ranivorus</i>	African Marsh- Harrier	Vulnerable	No	No
<i>Crex crex</i>	Corn Crake	Vulnerable	No	No
<i>Eupodotis senegalensis</i>	White-bellied Korhaan	Vulnerable	No	No
<i>Falco naumanni</i>	Lesser Kestrel	Vulnerable	No	No
<i>Geronticus calvus</i>	Southern Bald Ibis	Vulnerable	No	No
<i>Gorsachius leuconotus</i>	White-backed Night-heron	Vulnerable	No	No
<i>Gypaetus barbatus</i>	Bearded Vulture	Endangered	No	No

<i>Gyps africanus</i>	White-backed Vulture	Vulnerable	No	No
<i>Gyps coprotheres</i>	Cape Vulture	Vulnerable	No	No
<i>Neophron percnopterus</i>	Egyptian Vulture	Regionally almost extinct	No	No
<i>Neotis ludwigii</i>	Ludwig's Bustard	Vulnerable	No	No
<i>Pelecanus rufescens</i>	Pink-backed Pelican	Vulnerable	No	No
<i>Polemaetus bellicosus</i>	Martial Eagle	Vulnerable	No	No
<i>Rhynchops flavirostris</i>	African Skimmer	Endangered	No	No
<i>Sagittarius serpentarius</i>	Secretarybird	Vulnerable	No	No
<i>Sarothrura ayresi</i>	White-winged Flufftail	Critically Endangered	No	No
<i>Therathopius ecaudatus</i>	Bateleur	Vulnerable (in South Africa)	No	No
<i>Tyto capensis</i>	African Grass-Owl	Vulnerable	No	No

* Though some of the above bird species that roams over large areas may occasionally be found at the site, the site does not appear to be a habitat of particular importance to these birds, and these birds also do not use the site as breeding area.

Near threatened bird species of the North West Province and Northern Cape Province. Literature sources Barnes (2000), Hockey, Dean & Ryan, P.G. (2005) and Chittenden (2007). No = Not recorded at site/ Unlikely to be particularly dependent on the site as breeding area or habitat. Yes = Recorded at site/ Likely to be particularly dependant on the site as breeding area or habitat.

Species	Common name	Threatened Status	Recorded at site during survey	Likely to use site breeding area or habitat
<i>Buphagus erythrorhynchus</i>	Red-Billed Oxpecker	Near threatened	No	No
<i>Certhilauda chuana</i>	Short-clawed Lark	Near threatened	No	No
<i>Calendulauda barlowi</i>	Barlow's Lark	Near Threatened	No	No
<i>Charadrius pallidus</i>	Chestnut-banded Plover	Near threatened	No	No
<i>Ciconia nigra</i>	Black Stork	Near threatened	No	No
<i>Circus macrourus</i>	Pallid Harrier	Near threatened	No	No
<i>Circus maurus</i>	Black Harrier	Near threatened	No	No

<i>Eupodotis caerulescens</i>	Blue Korhaan	Near threatened	No	No
<i>Falco biarmicus</i>	Lanner Falcon	Near threatened	No	No
<i>Falco peregrinus</i>	Peregrine Falcon	Near threatened	No	No
<i>Glareola nordmanni</i>	Black-winged Pratincole	Near threatened	No	No
<i>Leptoptilos crumeniferus</i>	Marabou Stork	Near threatened	No	No
<i>Mirafra cheniana</i>	Melodious lark	Near threatened	No	No
<i>Mycteria ibis</i>	Yellow-billed Stork	Near threatened	No	No
<i>Pelecanus onocrotalus</i>	Great White Pelican	Near threatened	No	No
<i>Phoenicopterus minor</i>	Lesser Flamingo	Near threatened	No	No
<i>Phoenicopterus ruber</i>	Greater Flamingo	Near threatened	No	No
<i>Rostratula benghalensis</i>	Greater Painted-snipe	Near threatened	No	No
<i>Spizocorys sclateri</i>	Sclater's Lark	Near Threatened	No	No
<i>Sterna caspia</i>	Caspian Tern	Near threatened	No	No

** Though some of the above bird species that roams over large areas may occasionally be found at the site, the site does not appear to be a habitat of particular importance to these birds, and these birds also do not use the site as breeding area.

Reptiles of particular high conservation priority

Threatened reptile species in North West Province and Northern Cape Province. Main Source: (Bates, Branch, Bauer, Burger, Marais, Alexander & de Villiers, 2014). No = Reptile species is not a resident on the site; Yes = Reptile species is found to be resident on the site.

Species	Threatened Status	Resident at site	Recorded at site during survey	Likely to be found based on habitat assessment
<i>Crocodylus niloticus</i> Nile Crocodile	Vulnerable	No	No	No
<i>Homopus signatus</i> Speckled Dwarf Tortoise	Vulnerable	No	No	No
<i>Pachydactylus goodi</i> Good's Gecko	Vulnerable	No	No	No
<i>Pachydactylus rangei</i> Namib Web-footed Gecko	Critically Endangered (Regionally)	No	No	No

Near threatened reptile species in North West Province and Northern Cape Province. Main Source: Bates, Branch, Bauer, Burger, Marais, Alexander & de Villiers (2014). Though *Homoroselaps dorsalis* has not yet been recorded from the North West Province, its presence in some areas or the

Province is anticipated. No = Reptile species is not a resident on the site; Yes = Reptile species is found to be resident on the site.

Species	Threatened Status	Resident at site	Recorded at site during survey	Likely to be found based on habitat assessment
<i>Cordylus imkeae</i> Rooiberg Girdled Lizard	Near Threatened	No	No	No
<i>Cordylus macropholis</i> Large-scaled Girdled Lizard	Near Threatened	No	No	No
<i>Goggia gemmula</i> Richtersveld Pygmy Gecko	Near Threatened	No	No	No
<i>Homopus boulengeri</i> Karoo Dwarf Tortoise	Near Threatened	No	No	No
<i>Homoroselaps dorsalis</i> Striped Harlequin Snake	Near threatened	No	No	No
<i>Typhlosaurus lomiae</i> Lomi's Blind Legless Skink	Near Threatened	No	No	No

Amphibian species of particular high conservation priority

Threatened amphibian species in Northern Cape Province. Sources: Du Preez & Carruthers (2009), Carruthers & Du Preez (2011). No = Reptile species is not a resident on the site; Yes = Reptile species is found to be resident on the site.

Species	Red Listed Status	Resident at site	Recorded at site during survey	Likely to be found based on habitat assessment
<i>Breviceps macrops</i> Desert Rain Frog	Vulnerable	No	No	No

Near threatened (currently least concern) amphibian species in North West Province and Northern Cape Province. No = Amphibian species is not a resident on the site; Yes = Amphibian species is found to be resident on the site.

Species	Threatened Status	Resident at site	Recorded at site during survey	Likely to be found based on habitat assessment
<i>Pyxicephalus adspersus</i> Giant Bullfrog	Near threatened (Currently Least Concern)	No	No	No

**ASSESSMENT OF INVERTEBRATE SPECIES OF PARTICULAR HIGH CONSERVATION
PRIORITY**

Butterflies of particular conservation priority

Threatened butterfly species in North West Province, northern Northern Cape Province and Gauteng Province. Sources: Henning, Terblanche & Ball (2009), Mecenero *et al.* (2013). Invertebrates such as threatened butterfly species are often very habitat specific and residential status imply a unique ecosystem that is at stake.

Species	Threatened Status	Recorded at site during survey	Residential status at the site: Yes confirmed, Highly likely, Likely, Medium possibility, Unlikely, Highly unlikely
<i>Aloeides dentatis dentatis</i> Roodepoort Russet	Endangered	No	Highly unlikely
<i>Anthene lindae</i> Kalahari Hairtail	Vulnerable	No	Unlikely
<i>Chrysochrysis aureus</i> Golden Opal	Endangered	No	Highly unlikely
<i>Chrysochrysis trimeni</i> Diamond Opal	Vulnerable	No	Highly unlikely
<i>Lepidochrysis praeterita</i> Highveld Blue	Endangered	No	Highly unlikely
<i>Orachrysis mijburghi</i> Mijburgh's Blue	Endangered	No	Highly unlikely

Butterfly species of the Gauteng Province, North West Province and Northern Cape Province that are not threatened and not near threatened but of which are of particular conservation concern and listed as **Critically Rare/ Rare/ Data Deficient** category (Mecenero *et al.*, 2013). No = Butterfly species is unlikely to be a resident at the study area; Yes = Butterfly species is a resident at the study area.

Species	Threatened Status	Recorded at site during survey	Residential status at the site: Yes confirmed, Highly likely, Likely, Medium possibility, Unlikely, Highly unlikely
<i>Chrysochrysis beaufortia charlesi</i> Roggeveld Opal	Rare (Restricted Range)	No	Highly unlikely
<i>Chrysochrysis beaufortia stepheni</i> Hantam Mountain Opal	Rare (Habitat Specialist)	No	Highly unlikely
<i>Chrysochrysis turneri wykehami</i> Hantam Opal	Rare (Habitat Specialist)	No	Highly unlikely

<i>Chrysothrix violescens</i> Violescent Opal	Rare (Habitat Specialist)	No	Highly unlikely
<i>Colotis celimene amina</i> Lilac Tip	Rare (Low density)	No	Highly unlikely
<i>Lepidochrysops jamesi claussensi</i> Hantamsberg Nimble Blue	Rare (Habitat Specialist)	No	Highly unlikely
<i>Lepidochrysops jamesi jamesi</i> Karoobush Nimble Blue	Rare (Habitat Specialist)	No	Highly unlikely
<i>Lepidochrysops mcgregori</i> Copper-brown Nimble Blue	Rare (Habitat Specialist)	No	Highly unlikely
<i>Lepidochrysops penningtoni</i> Arid Nimble Blue	Data Deficient	No	Highly unlikely
<i>Lepidochrysops procera</i> Savanna Blue	Rare (Habitat specialist)	No	Highly unlikely
<i>Metisella meninx</i> Marsh Sylph	Rare (Habitat specialist)	No	Highly unlikely
<i>Platylesches dolomitica</i> Hilltop Hopper	Rare (low density)	No	Highly unlikely
<i>Pseudonympha southeyi kamiesbergensis</i> Kamiesberg Pepperbrown	Rare (Habitat Specialist)	No	Highly unlikely
<i>Thestor calviniae</i> Calvinia Skolly	Rare (Restricted Range)	No	Highly unlikely
<i>Tuxentius melaena griqua</i> Griqua Black Pie	Data Deficient	No	Highly unlikely

Beetles of particular conservation priority

Fruit chafer species (Coleoptera: Scarabaeidae: Cetoninae) in the Gauteng Province and North-West Province which are of known high conservation priority.

Species	Threatened Status	Recorded at site during survey	Likely to be resident based on habitat assessment
<i>Ichneustoma stobbiai</i>	Uncertain	No	No
<i>Trichocephala brincki</i>	Uncertain	No	No

Scorpion species of particular conservation priority

Rock scorpion species (Scorpiones: Ischnuridae) species that are of known high conservation priority in the Gauteng Province and North-West Province.

Species	Threatened Status	Recorded at	Likely to be resident at site based on
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		site during survey	habitat assessment
<i>Hadogenes gracilis</i>	Uncertain	No	No
<i>Hadogenes gunningi</i>	Uncertain	No	No

8.2 SOCIO ECONOMIC FACTORS

8.2.1 SOCIAL AMENITIES

As in the rest of South Africa, there is a housing shortage in the area. This is totally 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 diarrhea via ingesting pathogens from fecal 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 development guidelines from the Guidelines for human settlement planning and design were taken into account to develop a sustainable area for people to have job opportunities and public facilities close to home. This will encourage a sustainable community and by implementing these guidelines, will help contribute to the upliftment of the community as a whole.

The proposed development also conforms to the following principals and guidelines for development:

- Correction of historically distorted spatial patters
- Discouragement of land invasion and ensuring equitable access to land
- Discouragement of urban sprawl and the promotion of more compact towns
- Promotion of a diverse combination of land use, also at a detailed level
- Optimization of the use of existing resources, including bulk infrastructure
- Sustainable land development patterns and practices
- Promotion of spatial integration

All of the above conclude that there is a need for residential development, and that the proposed township is favorable by the counsel as well as the community.

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

Background research indicates that there are a number of cultural heritage (archaeological & historical) sites and features in the larger geographical area within which the study area falls.

Vegetation cover (trees, shrubs and grass) is very scarce and visibility was therefore very good. Red Aeolian (Kalahari) sands cover sections of the study area. A dry stream bed runs through the area from the north to south in the western section of the footprint, while quarrying activities in the south-western portion has also impacted on the area. Informal dumping of building rubble and household refuse occurs throughout the area, while a few small informal houses are also present. Other impacts include a water pipeline and the south of the study area a water/sewerage treatment plant.

No sites, features or material of cultural heritage (archaeological and/or historical) origin or significance were identified in the study area during the assessment. Erosion dongas, the dry streambed and the quarry areas were scrutinized for the presence of possible Stone Age material (stone tools) and none were identified. It is possible that individual tools might be present in the area and that material could be covered by red sands, but it seems as if there is a total lack of material in the area. It is more than likely that the surrounding hills in the larger area would be more suitable locations for sites.

The remains of a recent informal dwelling were the only site identified in the study area. The site is not old and of no heritage significance. No mitigation measures are therefore required.

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.

From a Cultural Heritage point of view the proposed Township Establishment on the Remaining Extent of Erf 2048 in Steinkopf should be allowed continue taking the above recommendations into consideration.

8.2.5 AESTHETICS

The topography of the area is relatively flat & open, with some small rocky ridges and outcrops present in parts. Vegetation cover (trees, shrubs and grass) is very scarce and visibility was therefore very good. Red Aeolian (Kalahari) sands cover sections of the study area. A dry stream bed runs through the area from the north to south in the western section of the footprint, while quarrying activities in the south-western portion has also impacted on the area. Informal dumping of building rubble and household refuse occurs throughout the area, while a few small informal houses are also present. Other impacts include a water pipeline and the south of the study area a water/sewerage treatment plant. Dirt roads criss-cross the area and was used as the access points to the area and for assessing the total area.

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.

Aesthetics have very little influence as the area is already highly disturbed. The project on the other hand will have a huge impact on the Aesthetics of the area as the informal settlement will be formalized and services will be provided.

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

Nature of the potential impact		Description of the effect, and the affected aspect of the environment
		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
	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	123,0452 ha of indigenous vegetation, located within a critical biodiversity area will be	Duration	Long term	Obtain the necessary environmental authorization for the development	Long term
		Extent	Local		Local
		Magnitude (Intensity)	High		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)
	eradicated in order to establish the development.	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		Medium
	In order to gain access to the proposed development, three 3 750m ² roads will have to be constructed within the water course.	Duration	Long term	Obtain the necessary environmental authorization for the development.	Long term
		Extent	Local		Local
		Magnitude (Intensity)	High	Conduct a Wetland Impact assessment to determine the sensitivity of the area.	High
		Probability	Definite		Definite
		Significance	Medium	The 1:100 flood line and the edge of the wetland/riparian zone will have to be determined and will have to be incorporated into the final layout plan.	High
		Reversibility	Low		Low
		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)
				<p>Install and compact soilcrete stabilised blanket material directly above the syphon in layers of 150mm.</p> <p>Backfill and compact excavated material in layers of 150mm up to natural ground level.</p> <ul style="list-style-type: none"> • Backfill will be done in the same sequence; • Top soil will be backfilled after compaction; • Gabions will be installed for erosion control/management; • Storm water berms will be built to control and manage storm water; • Each site will be landscaped after construction. <p>The necessary erosion prevention mechanism shall be employed to ensure the sustainability of all structures;</p> <p>The construction camp shall not be located within the 1:100 year flood line or within a 100m of any watercourse; whichever the greater.</p> <p>Construct the infrastructure in accordance with the designs and ensure the natural flow of the river is not disturbed in the long term.</p> <p>Obtain the necessary environmental authorization for the development. Obtain the necessary Water Use Licenses.</p> <p>Implement the mitigation measures as described in the Environmental Management plan.</p> <p>Implement the mitigation measures as described by the Wetland specialists incorporated into the Environmental Management Plan.</p>	
	Plan for the provision of services for the development.	Duration Extent Magnitude (Intensity) Probability Significance Reversibility Risk	Long term Local High Definite Medium Low Medium	Appoint a Civil Engineer to assess the availability and design of services to ensure a sustainable development.	Long term Local High Definite Medium Low Medium
		Duration	Short term		Medium term

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 to rehabilitate disturbed surfaces which can lead to erosion and dust pollution. Prepare method statements to this effect.	Extent	Local	Start the rehabilitation of disturbed surfaces as soon as possible. Spray bare surfaces with water to prevent dust pollution.	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 ablation facilities for construction workers to prevent 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		
	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			
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.	Short term	
	Extent	Local		Local	
	Magnitude (Intensity)	Medium		Medium	
	Probability	Definite		Definite	
	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)
		Reversibility	High	Ensure that open trenches are demarcated as required by the Occupational Health and Safety Act.	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	If available, 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. 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.	Local
		Magnitude (Intensity)	Low		Low
		Probability	Probable		Probable
		Significance	Medium		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 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
		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		

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		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		No mitigation measures possible.	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			

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	123,0452 ha of indigenous vegetation, located within a critical biodiversity area will be eradicated in order to establish the development.	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			Medium
		In order to gain access to the proposed development, three	Duration		Long term	Implement the mitigation measures as described in the Environmental Management Plan.
	Extent		Local	Local		

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)
	3 750m ² roads will have to be constructed within the water course.	Magnitude (Intensity)	High	<p>Conduct a Wetland Impact assessment to determine the sensitivity of the area.</p> <p>The 1:100 flood line and the edge of the wetland/riparian zone will have to be determined and will have to be incorporated into the final layout plan.</p> <p>Plan for the following:</p> <p>The construction of the roads and the installation of the pipe is to commence during the dry season to allow for the lowest possible impact on the environment and to simplify the required construction procedures. The local vegetation will be stored and used again during the rehabilitation period.</p> <p>Topsoil will be placed in a demarcated area for re-use during the rehabilitation period.</p> <p>The area to be used for stockpiling of the topsoil will be at an approved location.</p> <p>The area to be excavated needs to be clearly marked with lime.</p> <p>Provide shoring and bracing to the excavations where required.</p> <p>Erect physical barriers around the excavated area according to OHS requirements.</p> <p>Install and compact bedding where the infrastructure is to be installed according to the engineer's specifications (material description, bedding depth and compaction specifications).</p> <p>Install and compact soilcrete stabilised blanket material directly above the syphon in layers of 150mm.</p> <p>Backfill and compact excavated material in layers of 150mm up to natural ground level.</p> <ul style="list-style-type: none"> • Backfill will be done in the same sequence; 	High
		Probability	Definite		Definite
		Significance	Medium		High
		Reversibility	Low		Low
		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)
				<ul style="list-style-type: none"> • Top soil will be backfilled after compaction; • Gabions will be installed for erosion control/management; • Storm water berms will be built to control and manage storm water; • Each site will be landscaped after construction. <p>The necessary erosion prevention mechanism shall be employed to ensure the sustainability of all structures;</p> <p>The construction camp shall not be located within the 1:100 year flood line or within a 100m of any watercourse; whichever the greater.</p> <p>Construct the infrastructure in accordance with the designs and ensure the natural flow of the river is not disturbed in the long term.</p> <p>Obtain the necessary environmental authorization for the development. Obtain the necessary Water Use Licenses.</p> <p>Implement the mitigation measures as described in the Environmental Management plan.</p> <p>Implement the mitigation measures as described by the Wetland specialists incorporated into the Environmental Management Plan.</p>	
	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
	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
		Duration	Short term		Medium term

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 for the eradication of foreign and invader plant species which are likely to invade disturbed areas.	Extent	Local	Start the extermination of any invasive species as soon as possible and maintain the eradication programme.	Local	
		Magnitude (Intensity)	Low		Low	
		Probability	Definite		Definite	
		Significance	Medium		Medium	
		Reversibility	High		High	
		Risk	Low		Medium	
	Plan for the provision and maintenance of ablation facilities for construction workers to prevent pollution of surface and underground water.	Duration	Short term	Provide portable ablation facilities that will not cause pollution during the construction phase.	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.	Long term	
		Extent	Local		Local	
		Magnitude (Intensity)	Low		Medium	
		Probability	Definite		Definite	
		Significance	Medium		Medium	
		Reversibility	High		High	
		Risk	Low	<p>The findings of the Geotechnical Engineer must be incorporated into the design of the project.</p> <p>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.</p> <p>The findings of the Geotechnical Engineer must be incorporated into the design of the project.</p> <p>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.</p>	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.
Extent			Local		Local	
Magnitude (Intensity)			Medium		Medium	
Probability			Definite		Definite	
Significance			Medium		Medium	
Reversibility	High		High			
Risk	Low	Medium				
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		Definite		
	Significance	Medium		Medium		
			Ensure that the trenches stay open for as short a time as possible.			

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	High	Ensure that open trenches are demarcated as required by the Occupational Health and Safety Act.	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	If available, 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. 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.	Local
		Magnitude (Intensity)	Low		Low
		Probability	Probable		Probable
		Significance	Medium		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 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
		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		

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)
		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		
Reversibility		Low	Low		
Risk		Medium	Medium		

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
	No impact on the watercourses in the area.	Duration	Long term	No mitigation measures required.	Long term
		Extent	Local		Local

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)
		Magnitude (Intensity)	Medium		Medium
		Probability	Definite		Definite
		Significance	High		High
		Reversibility	Low		Low
		Risk	Medium		Medium
Indirect impacts:					
Geographical Physical Social Economic Cultural	No new employment opportunities will be created during the planning and design phase. No skills enhancement will take place If this option is implemented, the projected boost to the local and regional economy will not take place.	Extent	Local	Ensure that the development is constructed and operated as planned.	Local
		Magnitude (Intensity)	Medium		Medium
		Probability	Definite		Definite
		Significance	Medium		Medium
		Reversibility	Medium		Medium
		Risk	High		High
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 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	123,0452 ha of indigenous vegetation, located within a critical biodiversity area will be eradicated in order to establish the development.	Duration	Long term	Some plant species that are not threatened but which is listed as protected according to Northern Cape Nature Conservation Act No. 9 of 2009 are present or are likely to be present at the site. All <i>Pelargonium</i> species are listed which then includes <i>Pelargonium carnosum</i> which is present at the site. Members of the	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
				<p>protected plant families Aizoaceae, Amaryllidaceae, Crassulaceae and Iridacea are also found at the site.</p> <p>A permit for the removal of indigenous vegetation at the site is therefore required</p> <p>Implement the mitigation measures as described in the Environmental Management Plan.</p>	
	<p>In order to gain access to the proposed development, three 3 750m² roads will have to be constructed within the water course.</p>	Duration	Long term	<p>The construction of the roads and the installation of the pipe is to commence during the dry season to allow for the lowest possible impact on the environment and to simplify the required construction procedures</p> <p>The local vegetation will be stored and used again during the rehabilitation period.</p> <p>Topsoil will be placed in a demarcated area for re-use during the rehabilitation period.</p> <p>The area to be used for stockpiling of the topsoil will be at an approved location.</p> <p>The area to be excavated needs to be clearly marked with lime.</p> <p>Provide shoring and bracing to the excavations where required.</p> <p>Erect physical barriers around the excavated area according to OHS requirements.</p>	Long term
		Extent	Local		Local
		Magnitude (Intensity)	High		High
		Probability	Definite		Definite
		Significance	Medium		High
		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
				<p>Install and compact bedding where the infrastructure is to be installed according to the engineer's specifications (material description, bedding depth and compaction specifications).</p> <p>Install and compact soilcrete stabilised blanket material directly above the syphon in layers of 150mm.</p> <p>Backfill and compact excavated material in layers of 150mm up to natural ground level.</p> <ul style="list-style-type: none"> • Backfill will be done in the same sequence; • Top soil will be backfilled after compaction; • Gabions will be installed for erosion control/management; • Storm water berms will be built to control and manage storm water; • Each site will be landscaped after construction. <p>The necessary erosion prevention mechanism shall be employed to ensure the sustainability of all structures;</p> <p>The construction camp shall not be located within the 1:100 year flood line or within a 100m of any watercourse; whichever the greater.</p> <p>Construct the infrastructure in accordance with the designs and ensure the natural flow of the river is not disturbed in the long term.</p>	

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. Implement the mitigation measures as described by the Wetland specialists incorporated into the Environmental Management Plan.	
Un-rehabilitated, disturbed surfaces can lead to erosion and dust pollution.	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
Foreign plant species 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.	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.	Short term
	Extent	Local			Local
	Magnitude (Intensity)	Medium			Medium
	Probability	Definite			Definite

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
		Significance	Medium	The rule must be to minimize the disturbance of animal life by keeping the footprint as small as possible.	Medium
		Reversibility	High		High
		Risk	Low		Medium
	Open trenches can be dangerous as they can either collapse on people or on equipment and people- especially small children, can fall into them.			No snares may be set.	
		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	If available, 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	Implement the management plan to ensure that: All construction rubble is disposed of in a safe	Local
		Magnitude (Intensity)	Low		Low
		Probability	Probable		Probable
		Significance	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
		Reversibility	High	and environmentally acceptable manner. NO concrete, gravel or other rubbish will be allowed to remain on site after the construction phase.	High
		Risk	Low		Medium
	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.	Local
		Magnitude (Intensity)	Medium		Medium
		Probability	Probable		Probable
		Significance	Medium		Medium
		Reversibility	High		High
		Risk	Low	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).	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.	Local
		Magnitude (Intensity)	Medium		Medium
		Probability	Definite		Definite
		Significance	Medium		Medium
		Reversibility	Medium		Medium
		Risk	Low		Medium
				The demand for housing will be partially addressed in the area.	Medium
	Solid waste: The proposed development will add additional solid waste into the existing	Extent	Local	Ensure that the development is	Local
		Magnitude (Intensity)	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
	waste stream of the Local Municipality. <u>Sewage:</u> The proposed development will add additional sewage into the existing sewage stream of the Local Municipality. <u>Water supply:</u> The proposed development will add pressure to the water supply of Local Municipality's Water.	Probability	Definite	constructed as planned by the Civil Engineer.	Definite
		Significance	High		High
		Reversibility	High		High
		Risk	Low		Medium
	<u>Traffic:</u> The proposed development will result in an increase in traffic in the immediate surroundings of the proposed development.	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
	Indigenous vegetation will be removed.	Risk	Medium	No mitigation measures possible.	Medium
		Extent	Local		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

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)
		Risk	High		High
Cumulative impacts:					
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	<u>Broadened tax base:</u> The proposed development will generate more income for the 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	Namakwalander	
Date published	11/12/2020	
Site notice position	29°16'14.50"S	17°44'30.58"E
	29°16'20.98"S	17°43'50.48"E
Date placed	12/04/2021	
Site notice position	29°16'14.14"S	17°44'30.10"E
	29°16'21.45"S	17°44'13.79"E
Date placed	07/12/2020	


**PROOF OF PUBLIC PARTICIPATION CONDUCTED IN LINE WITH COVID-19 PROTOCOLS (SANITIZATION, MASK AND GLOVES IN PLACE)
SITE NOTICE PLACED 12/04/2020**





**PROOF OF AFRIKAANS AND ENGLISH SITE NOTICES AS WELL AS LAYOUT PLAN
PLACED 12/04/2020**



10	DIE NAMAKWALANDER 11 DESEMBER 2020	NIUS
<p>ENVIRONMENTAL IMPACT ASSESSMENT PROCESS (EIR AND SCOPING) DENC REF. NO: NC/EIA/18/NAM/NAM/STE1/2020</p>		
<p>Notice is hereby given of an Environmental Impact Assessment Process to be conducted. This process will be undertaken in terms of Section 24(M) and 44 made under section 24(5) of the National Environmental Management Act (Act No. 107 of 1998) (Amended Regulations promulgated on 07 April 2017). The proposed project is classified as, and will be conducted - in terms of Government Notice No. R.326 of 2017 (Government Notice No. R.325 Listing Notice 2; Activity no 15); (Government Notice No. R.327 Listing Notice 1: Activity no's 12 and 19) and (Government Notice No. R.324 Listing Notice 3: Activity no's 12(g)(ii)). This advertisement complies with the instructions regarding such notices, National Environmental Management Act (Act No. 107 of 1998, as amended) (Amended Regulations promulgated on 17 April 2017) (Government Notice No. R.326 of 2017) (Regulation 41(2)(c)(d)). The competent authority is the Northern Cape Province Department: Environment and Nature Conservation and the responsible officer is: Mr. A Nyakaza; Tel: 027 718 8800.</p>		
<p>PROJECT NAME:</p>		
<p>Environmental Impact Assessment for the proposed clearance of 123,0452 ha of indigenous vegetation, located within a critical biodiversity area, the construction of three roads within a watercourse, for the proposed township establishment located on a Portion of the remaining extent of Erf 2048, Steinkopf, Nama Khoi Local Municipality, Northern Cape Province.</p>		
<p>PROJECT DESCRIPTION:</p>		
<p>Clearance of 123,0452 ha of indigenous vegetation, located within a critical biodiversity area, for the proposed township establishment (consisting of a mix of residential, business, municipal, churches, crèches schools and a sport field) which includes the construction of three roads within a watercourse.</p>		
<p>CLIENT:</p>		
<p>Nama Khoi Local Municipality</p>		
<p>CONSULTANT AND CONTACT PERSON:</p>		
<p>Mrs. J.E. (Hannie) Du Plooy of AB Enviro Consult cc. 7 Louis Leipoldt Street, Potchefstroom, 2531 Tel: 071 202 4027 Fax: 018 293 0671 E-mail: hannieduplooy@abenviro.co.za</p>		
<p>Parties wishing to formally object to and / or comment on the proposed development are requested to forward their objections and comments (with reasons) to AB Enviro Consult, no later than 1st February 2021. An electronic copy of the draft Scoping Report is also available from AB Enviro Consult on request.</p>		
	<p style="text-align: center;">FORM 2 NOTICE OF INTENTION TO APPLY IN TERMS OF SECTION 20 OF THE ACT FOR A LICENCE. (Reg. 4(1)) NORTHERN CAPE LIQUOR ACT, 2008</p> <p>Notice is hereby given that it is the intention to lodge the abovementioned application, particulars of which appear hereunder, with the Northern Cape Liquor Board.</p> <p>Municipality: Nama Khoi Municipality Full name, street and postal address of applicant: Abbie Coetzee, Erf 225, Kleinzoem. Kind of license applied for: Bottlestore Kind of liquor to be sold: Any kind of liquor Name under which business is to be conducted and full address of premises: AC Liquors, Erf 225, Kleinzoem Extra items to be sold (section 4(5)(a) and (b): Chips and cigarettes</p>	

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

PROOF OF COVID-19 APPROVED PUBLIC PARTICIPATION PROTOCOLS AS WELL AS PROOF OF LETTER DROP:







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	The Registry: Consultation on EIA applications	Tel: 054 338 5800	(054) 334 0205		Louisvale Road Upington 8800
Northern Cape Department of Agriculture and Land Reform and Rural Development	HOD, Mr. V. Mothibi	(053) 838 9118	(053) 831 3635	cfortune@agri.ncpg.gov	Private Bag X5018, Kimberley 8300
Northern Cape Department of Environment and Nature Conservation	Mr. Dewald Badenhorst Biodiversity Management services	(053) 807 7300	(053) 807 7367		Private Bag X6120 Kimberley 8301
Northern Cape Department of Agriculture, Forestry and Fisheries	Mrs. J Mans	(054) 338 5860	(054) 338 0030		P.O. Box 2782, Upington 8800
Northern Cape Department Roads and Public Works	The director: Roads	053 839 2100			PO Box 3132 Kimberley 8300
Namakwa District Municipality	Mr Christiaan Fortuin	0277128000	0277128040		Private Bag X20, Springbok, 8240
Nama Khoi Local Municipality	Ms Samantha A Titus	0277188100	0277121635		PO Box 17, Springbok, 8240
Nama Khoi Local Municipality	The councilor ward 3	0277188100	0277121635		PO Box 17, Springbok, 8240
SAHRA	SAHRIS				

List of REGISTERED LETTERS
Lys van GEREGISTREERDE BRIEWE
(with an insurance option/met 'n versekeringsopsie)



Post Office

Full tracking and tracing/Volledige volg en spoor

Name and address of sender:
 Naam en adres van afsender:

AB ENVIRO CONSULT
 7 LOUIS LEIPOLDT STREET
 POTCHEFSTROOM
 2531

Enquiries/Navrae
 Sharecall
 number/nommer

0860 111 502
 www.postoffice.co.za

No	Name and address of addressee Naam en adres van geadreseerde	Insured amount Versekerde bedrag	Insurance fee Versekeringsgeld	Postage Posgeld	Service fee Diensgeld	Affix Track and Trace customer copy Plak Volg-en-Spoor-Kliëntafskrif
1	Northern Cape Department of Agriculture and land reform & rural development H.O. Mr V Motibi Private Bag X5015 Kimberley 8300					INSURED PARCEL ShareCall 0860 111 502 www.postoffice.co.za PA542693743ZA CUSTOMER COPY 301012
2	Namatlana District Municipality DMM Mr Christiaan Fortuin Private Bag X20 Springbok 8240					INSURED PARCEL ShareCall 0860 111 502 www.postoffice.co.za PA542693757ZA CUSTOMER COPY 301012
3	Nama Khoi Local Municipality The councillor Ward 3 PO BOX 17 Springbok 8240					INSURED PARCEL ShareCall 0860 111 502 www.postoffice.co.za PA542693765ZA CUSTOMER COPY 301012
4	Northern Cape Department Roads and Public works - Director Roads PO BOX 8132 Kimberley 8300					INSURED PARCEL ShareCall 0860 111 502 www.postoffice.co.za PA542693774ZA CUSTOMER COPY 301012
5	Northern Cape Department of Enviro and nature conservation, Mr. Bolebas Private Bag X6120 Kimberley 8301					INSURED PARCEL ShareCall 0860 111 502 www.postoffice.co.za PA542693791ZA CUSTOMER COPY 301012
6	Northern Cape Department of Agriculture Forestry and Fisheries FAO J. Mans P.O. Box 2782 Upington 8500					INSURED PARCEL ShareCall 0860 111 502 www.postoffice.co.za PA542693805ZA CUSTOMER COPY 301012
7	Nama Khoi local Municipality MM - Ms Samantha A TIEUS PO BOX 11 Springbok 8240					INSURED PARCEL ShareCall 0860 111 502 www.postoffice.co.za PA542693788ZA CUSTOMER COPY 301012
8						
9						
10						

Number of letters posted 7 / SEVEN
 Getal briewe gepos 7 / SEVEN

Total
 Totaal

R	R	R	R
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Signature of client
 Handtekening van klient.....

Signature of accepting officer
 Handtekening van aanneembeampte.....



The value of the contents of these letters is as indicated and compensation is not payable for a letter received unconditionally. Compensation is limited to R100.00. No compensation is payable without documentary proof.
 Optional insurance of up to R200.00 is available and applies to domestic registered letters only.

Die waarde van die inhoud van hierdie briewe is soos aangedui en vergoeding sal nie betaal word vir 'n brief



AB ENVIRO-CONSULT CC

Reg no. 2000/016653/23

7 Louis Leipoldt Street,
Potchefstroom, 2531
Fax: + 27 (18) 293 0671
Cell: + 27 (71) 202 4027
hannieduplooy@abenviro.co.za

11/12/2020

Department of Water and Sanitation
The Registry: Consultation on EIA applications
Louisvale Road
Upington
8800

Tel: 054 338 5800

Dear Sir/Madam

Environmental Impact Assessment for the proposed clearance of 123,0452 ha of indigenous vegetation, located within a critical biodiversity area, the construction of three roads within a watercourse, for the proposed township establishment located on a Portion of the remaining extent of Erf 2048, Steinkopf, Nama Khoi Local Municipality, Northern Cape Province.

AB ENVIRO CONSULT was appointed by Nama Khoi Local Municipality to submit an application to the Northern Cape Province Department: Environment and Nature Conservation for the above mentioned proposed development.

Attached please find a notification of the proposed development as well as an electronic copy of the draft Scoping report for your comments. We must receive your comments no later than the 1st February 2021. 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 do not hesitate to contact us should any further information or clarification be required.

Yours sincerely,

PROF. A.B. DE VILLIERS

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



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hannieduplooy@abenviro.co.za

AB ENVIRO-CONSULT CC

Reg no. 2000/016653/23

11/12/2020

Northern Cape Department of Agriculture and Land Reform and Rural Development
HOD, Mr. V. Mothibi
Private Bag X5018
Kimberley
8300

Dear Sir/Madam

Environmental Impact Assessment for the proposed clearance of 123,0452 ha of indigenous vegetation, located within a critical biodiversity area, the construction of three roads within a watercourse, for the proposed township establishment located on a Portion of the remaining extent of Erf 2048,Steinkopf, Nama Khoi Local Municipality, Northern Cape Province.

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



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Cell: + 27 (71) 202 4027
hannieduplooy@abienviro.co.za

11/12/2020

Northern Cape Department of Environment and Nature conservation
Biodiversity Management services
Mr. Dewald Badenhorst
Private Bag X6120
Kimberley
8301

Dear Sir/Madam

Environmental Impact Assessment for the proposed clearance of 123.0452 ha of indigenous vegetation, located within a critical biodiversity area, the construction of three roads within a watercourse, for the proposed township establishment located on a Portion of the remaining extent of Erf 2048, Steinkopf, Nama Khoi Local Municipality, Northern Cape Province.

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AB ENVIRO-CONSULT CC

Reg no. 2000/016653/23

7 Louis Leipoldt Street,
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Fax: + 27 (18) 293 0671
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hannieduplooy@abenviro.co.za

11/12/2020

Northern Cape Department of Agriculture, Forestry and Fisheries
FAO: J. Mans
P.O. Box 2782
Upington
8800

Dear Sir/Madam

Environmental Impact Assessment for the proposed clearance of 123,0452 ha of indigenous vegetation, located within a critical biodiversity area, the construction of three roads within a watercourse, for the proposed township establishment located on a Portion of the remaining extent of Erf 2048, Steinkopf, Nama Khoi Local Municipality, Northern Cape Province.

AB ENVIRO CONSULT was appointed by Nama Khoi Local Municipality to submit an application to the Northern Cape Province Department: Environment and Nature Conservation for the above mentioned proposed development.

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hannieduplooy@abenviro.co.za

11/12/2020

Northern Cape Department Roads and Public Works
The Director: Roads
PO Box 3132
Kimberley
8300

Dear Sir/Madam

Environmental Impact Assessment for the proposed clearance of 123,0452 ha of indigenous vegetation, located within a critical biodiversity area, the construction of three roads within a watercourse, for the proposed township establishment located on a Portion of the remaining extent of Erf 2048, Steinkopf, Nama Khoi Local Municipality, Northern Cape Province.

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hannieduplooy@abenviro.co.za

11/12/2020

Namakwa District Municipality
District Municipal Manager: Mr Christiaan Fortuin
Private Bag X20
Springbok
8240

Dear Sir/Madam

Environmental Impact Assessment for the proposed clearance of 123,0452 ha of indigenous vegetation, located within a critical biodiversity area, the construction of three roads within a watercourse, for the proposed township establishment located on a Portion of the remaining extent of Erf 2048, Steinkopf, Nama Khoi Local Municipality, Northern Cape Province.

AB ENVIRO CONSULT was appointed by Nama Khoi Local Municipality to submit an application to the Northern Cape Province Department: Environment and Nature Conservation for the above mentioned proposed development.

Attached please find a notification of the proposed development as well as an electronic copy of the draft Scoping report for your comments. We must receive your comments no later than the 1st February 2021. 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.

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Cell: + 27 (71) 202 4027
hannieduplooy@abenviro.co.za

11/12/2020

Nama Khoi Local Municipality
Municipal Manager: Ms Samantha A Titus
PO Box 17
Springbok
8240

Dear Sir/Madam

Environmental Impact Assessment for the proposed clearance of 123,0452 ha of indigenous vegetation, located within a critical biodiversity area, the construction of three roads within a watercourse, for the proposed township establishment located on a Portion of the remaining extent of Erf 2048, Steinkopf, Nama Khoi Local Municipality, Northern Cape Province.

AB ENVIRO CONSULT was appointed by Nama Khoi Local Municipality to submit an application to the Northern Cape Province Department: Environment and Nature Conservation for the above mentioned proposed development.

Attached please find a notification of the proposed development as well as an electronic copy of the draft Scoping report for your comments. We must receive your comments no later than the 1st February 2021. 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.

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AB ENVIRO-CONSULT CC

Reg no. 2000/016653/23

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Patchesfontein, 2531
Fax: + 27 (18) 293 0671
Cell: + 27 (71) 202 4027
hannieduplooy@abenviro.co.za

11/12/2020

**Nama Khoi Local Municipality
The Councillor Ward 3
PO Box 17
Springbok
8240**

Dear Sir/Madam

Environmental Impact Assessment for the proposed clearance of 123,0452 ha of indigenous vegetation, located within a critical biodiversity area, the construction of three roads within a watercourse, for the proposed township establishment located on a Portion of the remaining extent of Erf 2048, Steinkopf, Nama Khoi Local Municipality, Northern Cape Province.

AB ENVIRO CONSULT was appointed by Nama Khoi Local Municipality to submit an application to the Northern Cape Province Department: Environment and Nature Conservation for the above mentioned proposed development.

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

10.4 ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

Summary of main issues raised by I&APs	Summary of response from EAP
SAHRA recommends a chance find procedure, states further comments will be issued upon receipt of the Draft EIR. See letter received from SAHRA below.	Noted
The following comments has been received by DENC on 25 March 2021. See copy of response as received from DENC below.	
DETAILS OF THE ACTIVITIES APPLIED FOR IN TERMS OF THE EIA REGULATIONS (2014).	The EAP will amend the application form and the Draft EIAR to include the Listed Activities.
APPLICABLE LEGISLATION FRAMEWORK, POLICIES AND/OR GUIDELINES.	No action required other that ensuring that this aspect be included into the Draft EIAR.
ZONING AND LAND USE	Proof needs to be obtained from the appointed Town and Regional Planner that an Application has been submitted to Council. This was done. The EAP has received a Zoning Certificate and a stamped cover letter proving that the application has been submitted. These document are included under Paragraph 4 of the Draft EIAR under the heading "Zoning".
PUBLIC PARTICIPATION PROCESS	<p>The EAP will place a new site notice, in both Afrikaans and English as well as a layout plan will be posted on site and the EAP will include proof thereof into the Draft EIAR.</p> <p>Minutes of meetings, comments and response and a list of registered I&APs will be included into the EIAR.</p>
SPECIALIST STUDIES	Ensure that appointed Specialist do comply with Appendix 6 of the 2014 regulations and that their Reports also comply with these Regulations.
BULK SERVICES REPORT (ENG NEERING SERVICES STUDY):	The findings of the Civil Engineer will be included into the Draft EIAR.

Township establishment Steinkopf

Our Ref:



an agency of the
Department of Arts and Culture

T: +27 21 462 4502 | F: +27 21 462 4509 | E: info@sahra.org.za
South African Heritage Resources Agency | 111 Harrington Street | Cape Town
P.O. Box 4637 | Cape Town | 8001
www.sahra.org.za

Enquiries: Natasha Higgitt
Tel: 021 462 4502
Email: nhiggitt@sahra.org.za
CaseID: 15908

Date: Friday January 29, 2021
Page No: 1

Interim Comment

In terms of Section 38(3), 38(8) of the National Heritage Resources Act (Act 25 of 1999)

Attention: Nama Khoi Local Municipality

PO Box 17, Springbok, South Africa, 8240

proposed clearance of 123,0452 ha of indigenous vegetation, located within a critical biodiversity area, the construction of three roads within a watercourse, for the proposed township establishment located on a Portion of the remaining extent of Erf 2048, Steinkopf, Nama Khoi Local Municipality, Northern Cape Province.

AB Enviro-Consult CC has been appointed by the Nama Khoi Local Municipality to conduct an Environmental Authorisation (EA) Application for the proposed construction of three roads and the proposed township establishment on a Portion of the remaining extent of Erf 2048, Steinkopf, Nama Khoi Local Municipality, Northern Cape Province.

A draft Scoping Report has been submitted in terms of the National Environmental Management Act, no 107 of 1998 (NEMA) and the NEMA Environmental Impact Assessment (EIA) Regulations. The proposed development will include approximately 1500 residential stands, and other stands for community services and businesses covering 123.0452 ha.

APelser Archaeological Consulting has been appointed to provide heritage specialist input as part of the EIA process as required by section 24(4)b(iii) of NEMA and section 38(3) and 38(8) of the National Heritage Resources Act, Act 25 of 1999 (NHRA).

Pelser, A. 2020. Phase 1 HIA report for the Proposed Township Establishment on the remaining extent of erf 2048, Steinkopf, Nama Khoi Local Municipality, Northern Cape Province.

No heritage resources were identified within the proposed development. A contemporary structure was identified, however, this site is not defined as a heritage resource. A Chance Finds Procedure is recommended to be followed.

Interim Comment

Township establishment Steinkopf

Our Ref:



an agency of the
Department of Arts and Culture

T: +27 21 462 4000 | F: +27 21 462 4000 | E: info@sahra.org.za
South African Heritage Resources Agency | 1111 Burlington Street | Cape Town
P.O. Box 4037 | Cape Town | 8001
www.sahra.org.za

Enquiries: Natasha Higgitt
Tel: 021 462 4502
Email: nhiggitt@sahra.org.za
CaseID: 15908

Date: Friday January 29, 2021
Page No: 2

The SAHRA Archaeological, Palaeontological and Meteorites (APM) Unit notes the submitted HIA. No further assessment of the impact to Palaeontological resources is required as the development footprint is located in an area of low sensitivity as per the SAHRIS PalaeoSensitivity map.

Further comments will be issued upon receipt of the draft EIA with associated appendices.

Should you have any further queries, please contact the designated official using the case number quoted above in the case header.

Yours faithfully

Natasha Higgitt
Heritage Officer
South African Heritage Resources Agency

Phillip Hine
Manager: Archaeology, Palaeontology and Meteorites Unit
South African Heritage Resources Agency

ADMIN:
Direct URL to case: <https://sahris.sahra.org.za/node/550763>
(DENC, Ref: NC/EIA/18/NAM/NAM/STE1/2020)

RE: COMMENTS ON THE SCOPING REPORT FOR THE PROPOSED TOWNSHIP ESTABLISHMENT LOCATED ON A PORTION OF THE REMAINING EXTENT OF ERF 2048, STEINKOPF, IN NAMA KHOI LOCAL MUNICIPALITY, NAMAKWA DISTRICT MUNICIPALITY, NORTHERN CAPE PROVINCE.

The department hereby provides comments for the consultative Scoping Report for the above mentioned development:

1. DETAILS OF THE ACTIVITIES APPLIED FOR IN TERMS OF THE EIA REGULATIONS (2014).

1.1 The department request for clarity to be provided regarding the current application for environmental authorization:

a) Lack of consistency with regards to the description of listed activities associated with the project:

i) The listed activities cited in the Application form and the Scoping Report are not corresponding. According to the Scoping Report (page 6) there is an inclusion of G.N.R 324 Item 12 whereas in the Application form this is not the case.

1.2 The nature of the development will comprise bulk infrastructure: the relevant or precise Province specific listed activities deemed relevant to the associated project which are promulgated under the following listing notices.

The Department recommends the incorporation/inclusion of the possible listed activities:

Government Notice	Activity No	Listed activity as per the listing notices
GN R. 983 of 4 December 2014	Listing Notice 1 Activity 9	The development of infrastructure exceeding 1000 metres in length for the bulk transportation of water or storm water – i. With an internal diameter of 0.36 metres or more; or ii. With a peak throughout of 120 litres per second or more;
GN R. 985 of 4 December 2014	Listing Notice 3 Activity 12	The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan. (g). Northern Cape ii. Within critical biodiversity areas identified in bioregional plans
GN R. 985 of 4 December 2014	Listing Notice 3 Activity 14	The development of (ii) infrastructure or structures with a physical footprint of 10 square metres or more; where such development occurs- (a) within a watercourse (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse;

		<p>g. Northern Cape</p> <p>ii Outside urban areas:</p> <p>(ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans.</p>
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EIAR to include map of all activities applied for and associated infrastructure, and sensitivities, and buffers.

2. APPLICABLE LEGISLATION FRAMEWORK, POLICIES AND/OR GUIDELINES

2.1) List all legislation, policies and/or guidelines of any sphere of government that are applicable to the application as contemplated in the EIA regulations, if applicable:

2.2) A list of the applicable legislation for this development must be included, also indicate the relevance/applicability of each legislation to the proposed development and associated infrastructure.

3. ZONING AND LAND USE

3.1) The current land use of designated site is zoned as what?. The land use zoning for the proposed site would need to be confirmed with Nam Khoi Local Municipality.

3.2) Zoning of the area: the Zoning of the property to a classification which permits the desired use is required prior the commence with the development and its associated activities.

3.3) Should the area be not zoned as required an Application for change of land use will be required in order to establish the site with all its land uses on the proposed site.

4. PUBLIC PARTICIPATION PROCESS

4.1) Minutes of the pre- application meeting(s) must be provided and copies of any minutes of any meetings held must be included.

4.2) For site notices, In the Namakwa region Afrikaans is the dominant language followed by English , At least two languages must be used, in this case English and Afrikaans to cater for the majority of the population. The site notices must include a locality map and co-ordinates.

4.3) Comments and response table must be done.

4.4) A list of registered I&APs must be included in accordance with regulation 42 of the EIA regulations 2014.

5. SPECIALIST STUDIES

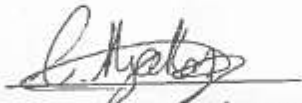
5.1) The specialist studies must comply with Appendix 6 of the 2014 regulations.

5.2 The specialist studies are to be further investigated

6. BULK SERVICES REPORT (ENGINEERING SERVICES STUDY):

This report is an important document to be undertaken and submitted as it provides the bulk assessment, it must state the current status quo of service supply capacity for water, sewage, electricity, road access. Confirmation of the required services or additional capacity to be created for the development. The department requests that detailed information be provided for the services, especially the water provision, due to the current water shortage within the municipal area. **(This is very critical, therefore it must be clearly indicated how this issue will be addressed).**

- ✓ Water sources, Power uses and proposed roads must be further investigated.



Mr A. Nyakaza: Environmental Officer
Aviwenyakaza.denc@gmail.com

10.5 COMMENTS AND RESPONSE REPORT

I&AP registered:	Comment received:		Response by the EAP:
SAHRA <u>Date received:</u> 29 January 2021	recommends a chance find procedure, states further comments will be issued upon receipt of the Draft EIR		Noted
I&AP registered:	Comment received:	Telephone conversation held between Mr JP de Villiers from AB Enviro Consult and Mr A. Nyakaza from DENC on 26 March 2021	Response by the EAP:
<p>Department of Environment and Nature Conservation: Northern Cape Province</p> <p><u>Date received:</u> 25 March 2021</p>	<p>1. DETAILS OF THE ACTIVITIES APPLIED FOR IN TERMS OF THE EIA REGULATIONS (2014).</p> <p>1.1 The department request for clarity to be provided regarding the current application for environmental authorization:</p> <p>a) Lack of consistency with regards to the description of listed activities associated with the project:</p> <p>i)The listed activities cited in the Application form and the Scoping Report are not corresponding- According to the Scoping Report (page 6) there is an inclusion of G.N.R 324 Item 12 whereas in the Application form this is not the case.</p>	<p>This matter was discussed and it was agreed that the application form and the Draft EIAR be amended to include the following Listed Activities:</p> <p>GN.R. 327 Item 9 GN.R. 324 Item 14. g. ii. ff</p> <p>GN.R. 324 Item 12 was in the Scoping report but not in the application form. The application form will be amended to include this Item.</p>	<p>The EAP will amend the application form and the Draft EIAR to include the Listed Activities.</p>

	<p>1.2 The nature of the development will comprise bulk infrastructure: the relevant or precise Province specific listed activities deemed relevant to the associated project which are promulgated under the following listing notices.</p>		
	<p>2 APPLICABLE LEGISLATION FRAMEWORK, POLICIES AND/OR GUIDELINES</p> <p>2.1) List all legislation, policies and/or guidelines of <i>any</i> sphere of government that are applicable to the application as contemplated in the EIA regulations, if applicable:</p> <p>2.2) A list of the applicable legislation for this development must be included, also indicate the relevance/applicability of each legislation to the proposed development and associated infrastructure.</p>	<p>Mr de Villiers has indicated that this aspect has been dealt with in the Scoping report under Paragraph 5. Mr Nyakaza looked this up in the Scoping Report and agreed that this aspect has been sufficiently addressed in the Scoping Report and requested that this also be included in the EIAr.</p>	<p>No action required other than ensuring that this aspect be included into the Draft EIAr.</p>
	<p>3. ZONING AND LAND USE</p> <p>1) The current land use of designated site is zoned as what? The</p>	<p>The EAP indicated that a Town and Regional Planner has been appointed to deal with this aspect.</p>	<p>Proof needs to be obtained from the appointed Town and Regional Planner that an Application has been submitted to Council.</p>

	<p>land use zoning for the proposed site would need to be confirmed with Nam Khoi Local Municipality.</p> <p>.2) Zoning of the area: the Zoning of the property to a classification which permits the desired use is required prior to the commencement with the development and its associated activities.</p> <p>.3) Should the area be not zoned as required an Application for change of land use will be required in order to establish the site with all its land uses on the proposed site.</p>	<p>The issue of "Zoning" will be included into the report and proof of submission of an application to Council will be provided.</p>	<p>This was done. The EAP has received a Zoning Certificate and a stamped cover letter proving that the application has been submitted. These document are included under Paragraph 4 of the Draft EIAR under the heading "Zoning".</p>
	<p>4. PUBLIC PARTICIPATION PROCESS</p> <p>4.1) Minutes of the pre-application meeting(s) must be provided and copies of any minutes of any meetings held must be included.</p> <p>4.2) For site notices in the Namakwa region Afrikaans is the dominant language followed by English ,At least two languages must be used, in this case English and Afrikaans to cater for the majority of the population. The site notices must</p>	<p>It was agreed that a new site notice, in both Afrikaans and English will have to be placed on site and proof will have to be included into the Draft EIAR.</p>	<p>The EAP have placed new site notices, in both Afrikaans and English as well as a layout plan in 2 locations on site and the proof thereof is included into the Draft EIAR.</p> <p>Minutes of meetings, comments and response and a list of registered I&APs will be included into the EIAR.</p>

	<p>include a locality map and co-ordinates.</p> <p>4.3) Comments and response table must be done.</p> <p>4.4) A list of registered &APs must be included in accordance with regulation 42 of the EIA regulations 2014.</p>		
	<p>5. SPECIALIST STUDIES</p> <p>5.1) The specialist studies must comply with Appendix 6 of the 2014 regulations.</p> <p>5.2 The specialist studies are to be further investigated</p>	<p>It was indicated that the appointed Specialist do comply with Appendix 6 of the 2014 regulations and that their Reports will also comply with these Regulations.</p>	<p>Ensure that appointed Specialist do comply with Appendix 6 of the 2014 regulations and that their Reports also comply with these Regulations.</p>
	<p>6. BULK SERVICES REPORT (ENGINEERING SERVICES STUDY):</p> <p>This report is an important document to be undertaken and submitted as it provides the bulk assessment, it must state the current status quo of service supply capacity for water, sewage, electricity, road access. Confirmation of the required services or additional capacity to be created for the development. The department requests that detailed information be</p>	<p>Mr de Villiers has indicated that a Civil Engineer has been appointed to assess this aspect and that his Report will be included into the Draft EIAr.</p>	<p>The findings of the Civil Engineer have been included into the Draft EIAr.</p>

	<p>provided for the services, especially the water provision, due to the current water shortage within the municipal area. {This is very critical, therefore it must be clearly indicated how this issue will be addressed)• ./ Water sources, Power uses and proposed roads must be further investigated</p>		
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11. SUMMARY OF THE FINDINGS AND RECOMMENDATIONS OF SPECIALISTS

11.1 GEO-TECHNICAL REPORT (See Appendix A for a copy of this report)

11.1.1 Terms of Reference

An engineering geological investigation was conducted for the proposed development on the property for the Steinkopf, Nama Khoi Local Municipality, Northern Cape Province.

The aim of this investigation was to identify and evaluate any possible engineering geological problems before commencement of proper township proclamation.

11.1.2 Methodology

The following was consulted during the investigation:

- The geological map 2917BC Steinkopf. Scale 1:250 000. The Geological Survey of South Africa.
- 1.3.2 The topography map 2917BC Steinkopf. Scale 1:50 000. The Chief Directorate: Surveys and Land Information, Mowbray.

SITE INVESTIGATION

All available information was studied before and during the site visit.

The investigation commenced with a desk study, where all relevant information is collected and compiled on a base map. The site was divided into land forms, after which the accuracy of the information was verified by means of a field visit.

Test pits were dug and representative disturbed samples collected and tested. The position of the test pits are represented in Figure 4 (Appendix A) of the Geotechnical Report. The soil profiles were described according to the methods described by Jennings *et al* (Jennings 1973). This method describes each horizon in terms of moisture content, colour, consistency, structure, type of soil and origin of the soil.

Disturbed samples of the soil materials were taken for laboratory analysis. The grading of the soils was determined by sieve and hydrometer analysis, resulting in cumulative grading curves.

The mechanical properties of the soil material are described in terms of the liquid limit and plasticity index (determined by means of the Atterberg Limit tests) and the linear shrinkage. These values can be used to calculate the potential expansiveness of the soils, and to evaluate the materials for use as construction material. The consistency of a soil is described by means of its Atterberg limits, where the effect of a change in the moisture content on the consistency of a cohesive soil is measured. According to Cernica (1982) these tests are useful "mostly for soil identification and classification". It can also be used to determine the mechanical properties of cohesive soil material.

The linear shrinkage test to determine the percentage shrinkage that can be expected, is performed by wetting a soil to approximately its liquid limit and drying the resultant paste in a linear shrinkage mould.

The potential expansiveness of a soil depends upon its clay content, the type of clay mineral, its chemical composition and mechanical character. A material is potentially expansive if it exhibits the following properties (Kantey and Brink, 1952):

- clay content greater than 12 percent,
- plasticity index of more than 12,
- liquid limit of more than 30 percent, and
- linear shrinkage of more than 8 percent.

The potential expansiveness (low, medium, high, very high) is calculated by means of Van der Merwe's method (Van der Merwe, 1964), where the equivalent plasticity index versus the clay content of the material is plotted on a graph divided into heave categories.

If any sample in the study area classifies as potentially expansive, the amount of heave or mobilization in mm measured on the surface will be calculated

LABORATORY TESTS

The minimum requirements for areas 112ha large is 11 samples for foundation indicator tests (GFSH-2 guideline). This may vary and is sometimes limited according to the variability of the geotechnical character such as limited depths of test pits before refusal of the TLB, as well as the uniformity or simplicity of a site. Only 8 samples were tested as the material consisted mainly of calcrete gravel and rock without the possibility of sampling matrix material or soil.

No free swell tests were done as all these areas falls within the drainage features and outside the developable areas.

No consolidometer or potential collapse tests were done as it was impossible to secure any undisturbed soil sample required for these tests.

No soil chemistry samples were tested as all new developments use synthetic pipes not reactive to soil aggressiveness.

The disturbed samples taken during the investigation were tested by the accredited laboratory of Specialised Testing Laboratory in Pretoria to determine their physical properties. Indicator tests include a grading analyses, the determination of Atterberg limits and linear shrinkage. The original laboratory results and a summary of results are represented in Table A, Appendix C (Appendix A) of the Geotechnical Report.

11.1.3 Recommendations and Conclusions

- A site of approximately 112 hectares, Steinkopf, Nama Khoi Local Municipality, was investigated to determine the engineering geological properties that will influence township proclamation.
- The site is underlain by gneiss, granodiorite or adamellite of the Stalhoek Complex, Vioolsdrift Suite, but is locally covered by recent aeolian sand and calcrete gravel.

- Some severe problems are foreseen regarding the excavatability to 1,0m depth on site, and shallow rock, core stones and rock outcrop or hard pan calcrete or gneiss were identified almost across the site.
- Zoning of the site revealed zones with minor constraints regarding the **compressibility, collapse potential** and the **expansive potential** of the soil.

The following zones were identified on the site:

Normal Development with risk:

Site Class CR/1A3F: This zone represents the majority of the area and comprises of a relative thin top layer sandy material less than 0,75m in thickness of slightly collapsible and compressible or low expansive soil underlain by a competent pebble marker, calcrete or gneiss, with estimated total movement of less than 7,5mm measured at surface with the risk of shallow rock, core stones and hard pan calcrete or gneiss rock outcrop adding a R or PR site class designation to the zone with problems relating to restricted excavation to less than 1,0m. Development on solid rock calcrete, calcrete rock outcrop known as hard pan calcrete or gneiss and will have an inflated cost where special pneumatic tools and blasting will be required for the installation of services. Normal foundation techniques will be adequate to enable proper development, with proper compaction within standard strip foundations and drainage provision that will be required. It is classified as CR in terms of the SAIEG & NHBRC guidelines (1995) or the SAICE Code of practice (1995), and 1A3F according to the classification for urban development (Partridge, Wood & Brink)(1993).

Suitable for development with precaution

Site Class PR: Areas with a PR site class designation with problems relating to restricted excavation to less than 0,5m, consisting of solid rock calcrete, calcrete rock outcrop known as hard pan calcrete or gneiss will have an inflated cost where special pneumatic tools and blasting will be required for the installation of services.

Site Class PQ: Areas where small quarries or filling or dumping of spoil (Pq1) were identified must be rehabilitated before any construction can be allowed, and backfilling with an engineer's material may improve the developability of these zones, but these operations will dramatically increase the development cost in this zone.

Undevelopable: Site Class PD: Perennial drainage features with local steeper slopes within the upper channels and towards the river. The development is usually restricted to 32m from the centre of the river, and outside the 1:100 year floodline.

- **Normal and special construction** techniques will be required to enable proper development. This includes the use of compaction techniques and site drainage as described.
- **This investigation was done to reveal the geotechnical properties on site with the techniques as described to form our opinion. Although every possible factor during the investigation was dealt with, it is possible to encounter variable local conditions. This will require the inspection of foundations by a competent person to verify expected problems.**

11.2 CIVIL ENGINEER'S REPORT (SEE APPENDIX B)

11.2.1 Terms of reference

G3T Consult CC was appointed by Maxim Planning Solutions on the 18 February 2020 for the compilation of Technical Service report for the Bulk Civil and Electrical Services for the development of 1500 low cost/ subsidized residential erven towards the Southern side of Steinkopf with in the Nama Khoi Local Municipality.

11.2.2 Methodology

Sewer: Existing municipal infrastructure

Information regarding the existing municipal infrastructure was obtained from the local authorities. Information obtained included the following:

- Horizontal alignments and pipe diameters of the existing municipal sewer network.
- Sizes of existing municipal oxidation ponds (WTW).
- No vertical alignments of the existing municipal sewer network could be obtained.

Water: Existing municipal infrastructure

Information regarding the existing municipal infrastructure was obtained from the local authorities and Department of Water and Sanitation (DWS).

Information obtained included the following:

- Horizontal alignments and pipe diameters of the existing municipal water network.
- Size of existing Trunk Main to reservoir.
- Size of existing municipal reservoir.
- Size of existing bulk water connection from the Sedibeng Bulk Water Main. It must be noted that despite inquiries to Sedibeng Water, no further details regarding this connection (i.e. licenced capacities; available pressures; e.c.t.) are forthcoming

Technical design parameters and standards

The design criteria and specifications as contained in this report are based on the following:

- Guidelines for the Provision of Engineering Services and Amenities in Residential Township Development, 1994 as amended (a.k.a. the "Blue Book").
- Guidelines for Human Settlement Planning and Designs as published by the CSIR and will also refer to the local municipality's guidelines and standards (a.k.a. the "Red Book").
- Water Institute of South Africa; Manual on the Design of Small Sewage Works; First Edition 1988

Furthermore, the design criteria will be in line with design criteria for developing areas, as defined in the "red Book" as follows:

"Developing areas are considered to be those areas where the level of service to be installed may be subject to future upgrade to a higher level."

In addition, it is recommended that the design population per erf for low income group developments be reduced from the specified 7 people/ erf to 5,5 people/ erf, due to the current average size of a household being 3,8 people. A figure of 5,5 represents an average between the existing approximate 4 people per erf and the design standard of 7 people per erf. This figure will provide a relative safety factor for evaluation of the existing infrastructure in the event of slightly higher population densities, while preventing over estimation of the proposed population. The existing capacity of bulk municipal infrastructure will be evaluated in accordance to the population figures as extrapolated from figures obtained from the 2011 senses, as represented in *table 4: Anticipated Population by 2020*, in conjunction with design standards as mentioned above.

Proposed amendments and additions to bulk infrastructure will be designed to accommodate all requirements for developments of this nature, as well as existing developments where applicable. The services will be according to accepted engineering specifications and principles as well as acceptable environmental requirements and standards

11.2.3 Recommendations and Conclusions

WATER

The current bulk services for Steinkopf does not contain sufficient capacity to serve the addition of a further 8250 people (1500 erven at 5.5 people/erf), with a resultant negative deficit when the additional populations is applied to the reserve capacity.

Bulk Infrastructure	Maximum Effective Capacity (people)	Current Capacity Served (people)	Reserve Capacity (people)	Proposed Additional Capacity (people)	Remainder (people)
160 mm Ø Bulk Water Connection and Trunk Main	17280	10081	7199	8250	-1051
Reservoir	5563	10081	-4518	8250	-12768

Table 1: Summary of bulk infrastructure capacity

It must be noted that in the case of the reservoir the capacity available for domestic use, as a result of the reserved volume of water for fire demand, is insufficient to serve the current domestic demand within a single day. However, if the fire demand is ignored, the reservoir capacity increases to an estimated 11781 people for a period of 48 hours. This situation however does not fall in line with the accepted standards for water storage. Furthermore, the reservoir will still not contain sufficient capacity to serve both the existing population and the additional erven, with a resultant negative deficit of 6550 people. *With regards to the bulk water connection to the Sedibeng line, as stated previously little to no information is forthcoming, thus no evaluation can be made at this time. However, in light of telecoms with Ms A Botes of Sedibeng Water Springbok Region, applications for additional capacity and changes to the current connection may be considered. Considering the existing 160 mm trunk main, the resultant negative deficit as seen in Table 1 is indicative of insufficient capacity to serve the total volume of additional water. It must be noted that the negative deficit is relatively small (1051 people). This may be offset by increasing the allowed velocity within the trunk main by approximately 0.1m/s to 1.3m/s. This increase will have an impact on the operational properties in the form of greater friction loss but will allow the accommodation of the 1051 shortfall within the existing*

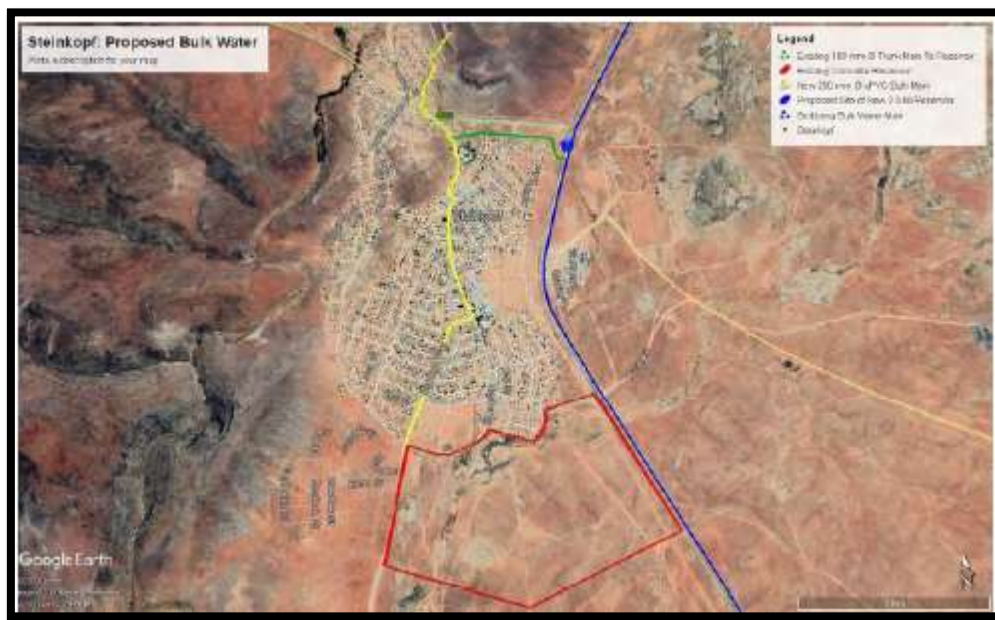
infrastructure. Considering the lack of information in this regard (i.e. available pressure), this may result in too great a head loss within the pipeline, with no water reaching the reservoir as a result.

Recommendations for Bulk infrastructure:

- Upgrade existing connection to Sedibeng water main.
- o Upgrade existing trunk main to site of reservoir.
- o New concrete reservoir to serve the proposed development.
- o New bulk main to proposed development.

The existing reservoir does not contain sufficient capacity to serve the additional proposed erven. Thus, the necessity exists to increase the available storage capacity. Thus, it is recommended that a new reservoir to serve the proposed development be constructed in position at the site of the existing reservoir. The capacity of the new reservoir will be 48 hours of the AADD of the negative population deficit assuming no fire demand in the existing reservoir, thus **6550 people**.

It is proposed that a new trunk main to serve the proposed development be installed from the site of the new and existing reservoir, within the road reserve of the existing municipal road network, to the north-west corner of the proposed development. The new bulk main will be sized to serve the total domestic demand for the town of Steinkopf, including the proposed 1500 erven.



Proposed bulk water

Summary of recommendations:

- Upgrade existing connection to Sedibeng pipeline to 200mmØ.
- Upgrade existing 1.8km trunk main to reservoir site to 200mmØ uPVC Class 16.
- New 2.5 Ml concrete reservoir at site of existing reservoir.
- New 250 mm Ø bulk water main to site of the proposed development approximately 2.990kms in length.

SEWER

The maximum capacity for the bulk infrastructure may be summarised as indicated in Column 1 of Table 8 in the form of the total population that may be served. The population that may be served for the WTW is the least amount across all components of the WTW, thus 19938 people.

Bulk Infrastructure	Maximum Effective Capacity (people)	Current Capacity Served (people)	Reserve Capacity (people)	Proposed Additional Capacity (people)	Remainder (people)
300 mm Ø pipeline	25686	10081	15605	8250	7355
WTW	19938	10081	9857	8250	1607

Table 2: Bulk Sewer Capacity

It can be seen that the 300 mm Ø bulk sewer main and the WTW has sufficient capacity to serve the addition of a further 8250 people (1500 erven at 5.5 people/erv), with a residual capacity of 7355 and 1607 people for the bulk pipeline and WTW respectively.

Recommendation for Bulk Sewer Infrastructure:

It is recommended that all parts of the proposed new development be drained to the existing Wastewater Treatment Works, via the 300 mm Ø bulk sewer main, as there is sufficient capacity to accommodate the new development. Based on the limited information received we anticipate that a small pump station (Lifting Station) with a short section of rising main (300m) will be required to accommodate a portion of the development situated to the north as it is evident that there is a low lying area.

11.3 ECOLOGICAL HABITAT REPORT (SEE APPENDIX C)

11.3.1 Objectives of the habitat study

The objectives of the habitat study are to provide:

- A detailed fauna and flora habitat survey;
- A detailed habitat survey of possible threatened or localised plant species, vertebrates and invertebrates;
- Recording of possible host plants or foodplants of fauna such as butterflies.
- Evaluate the conservation importance and significance of the site with special emphasis on the current status of threatened species;
- Literature investigation of possible species that may occur on site;
- Identification of potential ecological impacts on fauna and flora that could occur as a result of the development; and
- Make recommendations to reduce or minimise impacts, should the development be approved.

11.3.2 Scope of study

- Surveys to investigate key elements of habitats on the site, relevant to the conservation of fauna and flora.

- Recording of any sightings and/or evidence of existing fauna and flora.
- The selective and careful collecting of voucher specimens of invertebrates where deemed necessary.
- An evaluation of the conservation importance and significance of the site with special emphasis on the current status of threatened species.
- Recording of possible host plants or foodplants of fauna such as butterflies.
- Literature investigation of possible species that might occur on site.
- Integration of the literature investigation and field observations to identify potential ecological impacts that could occur as a result of the development.
- Integration of literature investigation and field observations to make recommendations to reduce or minimise impacts, should the development be approved.

11.3.3 Recommendations and Conclusions

- Vegetation at the site can be divided in terrestrial vegetation and along a non-perennial river and its associated smaller drainage lines, riparian vegetation. The site overall appears to be conspicuously extensively degraded.
- The site appears trampled and overgrazed in many areas. Numerous tracks, clearings and diggings are found at the site. Various dirt roads cross the active channel (streambed) and riparian zone. Informal homesteads and paddocks are present at the site. Northern boundaries of the site are adjacent to residential areas. Extensive informal dumping occurs at many parts. Various alien invasive weeds are widespread at the site.
- Terrestrial vegetation at the site comprises mainly small shrubs and sparse cover of vegetation overall. Extensive ecological disturbances at the site are reflected in what appears to be a poor vegetation cover of mostly dwarf shrubs at the terrestrial zone at the site. *Ruschia*, *Drosanthemum*, *Leipoldtia* species and other succulent shrubs are conspicuous at the terrestrial zone. The shrub *Galenia africana* is conspicuous at hitherto cleared areas. Restricted patches where the succulents such as *Cheiridopsis denticulata* are found in small clumps interrupt the homogenous sparse shrubland. Taller shrubs and trees are mostly absent at the terrestrial zone and are confined to the riparian zone at the site.
- Most conspicuous trees at the riparian zone are the alien invasive *Prosopis velutina/ glandulosa* (Mesquite) and *Schinus molle* (Pepper Tree). Only a single *Vachellia karroo* (Sweet Thorn) individual remains at the site. A prominent shrub species at the riparian zone is the alien invasive *Atriplex nummularia* (Old Man Salt Bush). The indigenous shrub *Galenia africana* (Kraalbos), often associated with disturbed areas, is also visible at the obviously disturbed riparian zone at the site. The indigenous herbaceous shrub *Gomphocarpus fruticosus* is also found at the riparian zone often in the non-perennial active channel. Other alien invasive plant species at the riparian zone which are not mentioned above such as *Ricinus communis*, *Caesalpinia gilliesii*, *Datura stramonium*, *Agave americana*, *Salsola kali*, *Argemone ochroleuca*, *Nicotiana glauca* and *Limonium sinuatum* are also present.
- Herbaceous plant species at the site overall include *Aptosimum spinescens*, *Melolobium candicans*, and *Radyera urens*. Succulent species include *Tetraena retrofracta*, *Ruschia robusta*, *Cheiridopsis denticulata*, *Pelargonium carnosum* and *Mesembryanthemum guerichianum*.
- A non-perennial river with associated smaller drainage lines runs through the northwestern and western part of the site. This non-perennial river that crosses the northern and western parts of the site is a tributary of the Doring River which is located further west from Steinkopf. During times of exceptional rainfall the active channel of the non-perennial river at the site is likely to be overflowed.

which would then result in a much broader floodplain at some parts. The riparian zone of this non-perennial river is and has therefore indicated to be fairly broad at some areas of the site.

- The vegetation type representing the Succulent Karoo Biome at the site is Namaqualand Blomveld (SKn 3). The Namaqualand Blomveld is not listed as threatened according to the National List of Threatened Ecosystems (2011).
- No Threatened or Near Threatened plant or animal species appear to be present at site.
- No Nationally Protected tree species appear to be present at the site.
- Some plant species that are not threatened but which is listed as protected according to Northern Cape Nature Conservation Act No. 9 of 2009 are present or are likely to be present at the site. All *Pelargonium* species are listed which then includes *Pelargonium carnosum* which is present at the site. Members of the protected plant families Aizoaceae, Amaryllidaceae, Crassulaceae and Iridaceae are also found at the site. A permit for the removal of indigenous vegetation at the site is therefore required.
- The non-perennial active channel (river), associated smaller drainage lines and its riparian zone are a corridor of particular conservation concern in the larger area. The scope for the remainder of the site (terrestrial zone) to be part of a corridor of particular conservation concern is small.
- Ecological sensitivity at the terrestrial zone of the site is medium to low. Ecological sensitivity at the non-perennial active channel (river) and associated smaller drainage lines and its riparian zone, though extremely degraded, are high because these remain a corridor of particular conservation concern in the larger area. Rehabilitation and removal of alien invasive vegetation would be essential to restore some of the functions of this non-perennial river.
- Following the mitigations which will be upheld and planned footprint for development all the impact risks listed above are moderate or low.
- Establishment of exotic weeds should be monitored and exotic weeds at the site should be eradicated. A declared invader such as the mesquite tree (*Prosopis* species), should not be planted or allowed to spread from adjacent areas to the proposed footprint.
- If the development is approved an opportunity presents itself to rehabilitate and restore some of the function of the currently extensively impacted non-perennial river and its riparian zone at the site.

11.4 WETLAND IMPACT ASSESSMENT REPORT (SEE APPENDIX D)

11.4.1 Aims and objectives of the survey

A survey consisting of three visits to investigate key elements of habitats on the site, relevant to the conservation of wetlands are conducted. The importance and significance of the site with special emphasis on the current status of biodiversity and ecological services of the wetland are evaluated. Literature investigations are integrated with field observations to identify potential ecological impacts that could occur as a result of the development and to make recommendations to reduce or minimise impacts, should the development be approved.

The objectives of the wetland habitat assessment are to provide:

- An indication of the existence of wetlands at the site and if so:
- An identification of major aspects of the hydro-geomorphic setting and terrain unit at which the wetland occur;

- An estimate of the size and roughness of the wetland
- An indication of the hydric soils at the site;
- An indication of erodability;
- An indication of the presence or absence of peat at the site;
- An outline of hydrological drivers that support the existence and character of the wetland;
- An assessment of the possible presence or absence of threatened or localised plant species, vertebrates and invertebrates of the region, at the site;
- A description of the functions provided by the wetland at the site;
- An interpretation of the priority of the wetland for local communities in the area;
- An interpretation of the priority of the wetland to biodiversity at the site;

11.4.2 Methodology

A desktop study comprised not only an initial phase, but also it was used throughout the study to accommodate and integrate all the data that became available during the field observations.

Surveys by R.F. Terblanche were 2 March 2020 to note key elements of habitats on the site, relevant to wetland indicators and the conservation of wetland fauna and flora.

Classification of any inland wetland systems that could be present at the site is according to the Classification System for Wetlands and other Aquatic Ecosystems in South Africa (Ollis *et al.*, 2013). One of the major advantages of the Classification System for South Africa (Ollis *et al.*, 2013) is that the functional aspects of wetlands are the focal point of the classification. Wetlands are very dynamic systems and their functionality weighs high against the rapid changes in their appearance (Terblanche *In prep*). In this document the main guideline for the delineation and identification of wetlands where present is the practical field procedure for identification and delineation of wetlands by DWAF (2005).

11.4.3 Recommendations and Conclusions

- A non-perennial river with associated smaller drainage lines runs through the northwestern and western part of the site. This non-perennial river that crosses the northern and western parts of the site is a tributary of the Doring River which is located further west from Steinkopf. During times of exceptional rainfall the active channel of the non-perennial river at the site is likely to be overflowed which would then result in a much broader floodplain at some areas. The riparian zone of this non-perennial river is and has therefore indicated to be fairly broad at some areas of the site.
- Most conspicuous trees at the riparian zone are the alien invasive *Prosopis velutina/ glandulosa* (Mesquite) and *Schinus molle* (Pepper Tree). Only a single *Vachellia karroo* (Sweet Thorn) individual remains at the site. A prominent shrub species at the riparian zone is the alien invasive *Atriplex nummularia* (Old Man Salt Bush). Other alien invasive plant species at the riparian zone which are not mentioned above such as *Ricinus communis*, *Caesalpinia gilliesii*, *Datura stramonium*, *Agave americana*, *Salsola kali*, *Argemone ochroleuca*, *Nicotiana glauca* and *Limonium sinuatum* are also present. The indigenous shrub *Galenia africana* (Kraalbos), often associated with disturbed areas, is also visible at the extensively disturbed riparian zone at the site. The indigenous herbaceous shrub *Gomphocarpus fruticosus* is also found at the riparian zone often in the non-perennial active channel. Other indigenous plant species at the riparian zone include herbaceous species such as *Melolobium candicans* and *Radyera urens* as well as succulents such as *Mesembryanthemum guerichianum*. The succulent *Tetraena retrofracta* is conspicuous at certain areas at the riparian zone.

- Wetlands such as those that could be classified as Floodplain Wetlands, Channelled Valley-bottom Wetlands, Unchannelled Valley-bottom Wetlands, Depressions (Pans), Seeps or Wetland Flats appear to be absent at site.
- Site is situated in the Lower Orange Water Management Area (WMA 14). Site falls outside any FEPA (Freshwater Ecosystem Priority Area) (Nel *et al.*, 2011a, 2011b). The site is part of an Upstream Management Area which are sub-quaternary catchments in which human activities need to be managed to prevent degradation of downstream river FEPAs and Fish Support Areas.
- At present the functioning of the active channel (streambed) and riparian zone at the site is extensively compromised by informal dumping, likely severe overgrazing, roads and tracks crossing the streambed and visibly high concentrations of alien invasive plant species - all these factors to the extreme. The riparian area has also been modified in the past by diggings.
- Present ecological status (PES) of the Non-perennial River at the site is CATEGORY E which means the watercourse is seriously modified. The losses of natural habitats and basic ecosystem functions are extensive. The present ecological status is outside the general acceptable range (Table 4.2 and Table 4.3). Ecological Importance and Sensitivity (EIS) at the site is CATEGORY C which is moderate and refers to floodplains 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).
- While the present ecological status is poor, the active channel with its associated riparian zone is still regarded as sensitive owing to its importance as part of a corridor of particular conservation concern in the larger area. There is an opportunity for the development to alleviate current pressures on the riparian system if accompanied by well-selected and restricted bridge structures, continuous eradication of alien invasive plant species, measures to curb the extensive informal dumping in the area, cultivation of indigenous plant species and proper rehabilitation of impacts that cross the riparian zone.
- The non-perennial river, with its riparian zone and buffer zone, at the site is a corridor of particular conservation importance. This non-perennial river, with its riparian zone and buffer zone, is likely to be impacted by the proposed developments, but to a restricted and limited extent. If the development is approved the construction 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 non-perennial river. The geomorphological setting and flow regime should be as similar as possible post development, if the development is approved (in this case there would be some positive impact on flow regime). Loss of any wetland animal or plant species of particular conservation importance is not expected.
- Loss of Threatened or Near-Threatened Plants, Mammals, Reptiles, Amphibians and Invertebrates at the proposed footprint appears to be unlikely. The proposed footprint is unlikely to harbour any sensitive species, so that impact risk to any sensitive species is very low.
- Rubble or waste could lead to infiltration of unwanted pollutants into the soil. Spilling of petroleum fuels and unwanted chemicals onto the soils that infiltrate these soils could lead to pollution of soils and also impact on water quality when the stream flows. Rubble or waste that could accompany the construction effort, if the development is approved, should be removed during and after construction. Measures should be taken to avoid any spills and infiltration of petroleum fuels or any chemical pollutants into the soil during construction phase.
- A rehabilitation plan which include the combating of alien invasive plant species at the watercourse is essential. Infestation by alien invasive species could replace indigenous vegetation or potential areas where indigenous vegetation could recover. Once established combatting these alien invasive

plant species may become very expensive to combat in the long term, especially if species such as *Prosopis* (Mesquite) is allowed to establish. Continued monitoring and eradication of alien invasive plant species are imperative.

- 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 site is Low

11.5 HERITAGE IMPACT ASSESSMENT (HIA) (See Appendix E for a copy of this report)

11.5.1 Terms of Reference for Heritage Impact Assessment

The Terms of Reference for the study was to:

1. Identify all objects, sites, occurrences and structures of an archaeological or historical nature (cultural heritage sites) located on the portion of land that will be impacted upon by the proposed development;
2. Assess the significance of the cultural resources in terms of their archaeological, historical, scientific, social, religious, aesthetic and tourism value;
3. Describe the possible impact of the proposed development on these cultural remains, according to a standard set of conventions;
4. Propose suitable mitigation measures to minimize possible negative impacts on the cultural resources;
5. Review applicable legislative requirements;

Legislative requirements of National Heritage Resources Act (NHRA), Act 25 of 1999

Aspects concerning the conservation of cultural resources are dealt with mainly in two acts. These are the National Heritage Resources Act (Act 25 of 1999) and the National Environmental Management Act (Act 107 of 1998).

The National Heritage Resources Act

According to the above-mentioned act the following is protected as cultural heritage resources:

- a. Archaeological artifacts, structures and sites older than 100 years
- b. Ethnographic art objects (e.g. prehistoric rock art) and ethnography
- c. Objects of decorative and visual arts
- d. Military objects, structures and sites older than 75 years
- e. Historical objects, structures and sites older than 60 years
- f. Proclaimed heritage sites

- g. *Grave yards and graves older than 60 years*
- h. Meteorites and fossils
- i. Objects, structures and sites of scientific or technological value.

The National Estate includes the following:

- a. Places, buildings, structures and equipment of cultural significance
- b. Places to which oral traditions are attached or which are associated with living heritage
- c. Historical settlements and townscapes
- d. Landscapes and features of cultural significance
- e. Geological sites of scientific or cultural importance
- f. Sites of Archaeological and palaeontological importance
- g. *Graves and burial grounds*
- h. Sites of significance relating to the history of slavery
- i. Movable objects (e.g. archaeological, palaeontological, meteorites, geological specimens, military, ethnographic, books etc.)

A Heritage Impact Assessment (HIA) is the process to be followed in order to determine whether any heritage resources are located within the area to be developed as well as the possible impact of the proposed development thereon. An Archaeological Impact Assessment (AIA) only looks at archaeological resources. An HIA must be done under the following circumstances:

- a. The construction of a linear development (road, wall, power line, canal etc.) exceeding 300m in length
- b. The construction of a bridge or similar structure exceeding 50m in length
- c. *Any development or other activity that will change the character of a site and exceed 5 000m² or involve three or more existing erven or subdivisions thereof*
- d. Re-zoning of a site exceeding 10 000 m²
- e. Any other category provided for in the regulations of SAHRA or a provincial heritage authority

11.5.2 Methodology

Survey of literature

A survey of available literature was undertaken in order to place the development area in an archaeological and historical context. The sources utilized in this regard are indicated in the bibliography.

Field survey

The field assessment section of the study was conducted according to generally accepted HIA practices and aimed at locating all possible objects, sites and features of heritage significance in the area of the proposed development. The location/position of all sites, features and objects is determined by means of a Global Positioning System (GPS) where possible, while detail photographs are also taken where needed.

Oral histories

People from local communities are sometimes interviewed in order to obtain information relating to the surveyed area. It needs to be stated that this is not applicable under all circumstances. When applicable, the information is included in the text and referred to in the bibliography.

Documentation

All sites, objects, features and structures identified are documented according to a general set of minimum standards. Co-ordinates of individual localities are determined by means of the Global Positioning System (GPS). The information is added to the description in order to facilitate the identification of each locality

11.5.3 Recommendations and Conclusions

In conclusion it is possible to say that the Phase 1 HIA for the proposed Township Establishment on the Remaining Extent of Erf 2048 in Steinkopf was conducted successfully. The development & study area is located in the Nama Khoi Local Municipality of the Northern Cape Province.

The study area is approximately 102 hectares in extent. The project is conducted on instruction from Barzani Town Planning (Pty) Ltd.

Background research indicates that there are a number of cultural heritage (archaeological & historical) sites and features in the larger geographical area within which the study area falls.

Vegetation cover (trees, shrubs and grass) is very scarce and visibility was therefore very good. Red Aeolian (Kalahari) sands cover sections of the study area. A dry stream bed runs through the area from the north to south in the western section of the footprint, while quarrying activities in the south-western portion has also impacted on the area. Informal dumping of building rubble and household refuse occurs throughout the area, while a few small informal houses are also present. Other impacts include a water pipeline and the south of the study area a water/sewerage treatment plant.

No sites, features or material of cultural heritage (archaeological and/or historical) origin or significance were identified in the study area during the assessment. Erosion dongas, the dry streambed and the quarry areas were scrutinized for the presence of possible Stone Age material (stone tools) and none were identified. It is possible that individual tools might be present in the area and that material could be covered by red sands, but it seems as if there is a total lack of material in the area. It is more than likely that the surrounding hills in the larger area would be more suitable locations for sites.

The remains of a recent informal dwelling were the only site identified in the study area. The site is not old and of no heritage significance. No mitigation measures are therefore required.

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.

From a Cultural Heritage point of view the proposed Township Establishment on the Remaining Extent of Erf 2048 in Steinkopf should be allowed continue taking the above recommendations into consideration.

12. CONCLUSIONS AND RECOMMENDATIONS

The Applicant, the **Nama Khoi Local Municipality** has appointed **AB Enviro Consult CC**, an independent environmental consultancy, to undertake an Environmental Impact Assessment for the proposed clearance of 123,0452 ha of indigenous vegetation, located within a critical biodiversity area, the construction of three roads within a watercourse, for the proposed township establishment located on a Portion of the remaining extent of Erf 2048, Steinkopf, Nama Khoi Local Municipality, Northern Cape Province.

This Chapter of the EIR provides a summary of the findings of the EIA process, including the EAP's opinion as to whether the activity should or should not be authorised.

12.1 ENVIRONMENTAL IMPACT STATEMENT

The detailed environmental assessment for the proposed development, has not found any environmental impacts that *cannot* be mitigated to acceptable and manageable levels.

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.

As in the rest of South Africa, there is a housing shortage in the area. This is totally 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 fecal 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 new "Human Settlements Plan" promotes the achievement of a non-racial, integrated society through the development of sustainable human settlements and quality housing. Housing is to be utilized for the development of sustainable human settlements in support of spatial restructuring.

The aim is to move beyond the provision of basic shelter towards achieving the broader vision of sustainable human settlements and more efficient towns, cities and regions.

The proposed integrated human settlement project from the onset aims at providing a proper integrated human settlement that ascribes to the BNG Principles set out above. This will be achieved as follows:

- This project makes provision for a variety of erven that can be utilized for various housing typologies. The largest proportion of the township areas will however be aimed at both the subsidized housing sector through the implementation of one of Government's subsidized housing programmes as well as the need that exists for people that does not qualify for a Government subsidy, due to either already owning other property or earning in excess of the threshold household income prescribed in respect of the various housing subsidy programmes, but who still wishes to acquire an affordable stand where they can construct their own home. This project will also aim at alleviating the plight of people that live in informal settlement areas and in squalid conditions.
- The location of the proposed township area directly adjacent to the existing urban area further enhances integration and will offer inhabitants the opportunity to access the existing social and commercial facilities on offer within the existing village area whilst also providing social and business opportunities within the proposed development area itself that can in turn be utilized by and to the benefit of the inhabitants of the existing village area.

The development represents a definitive move away from providing housing-only township areas and towards the provision of a proper integrated human settlement that offers a magnitude of social, educational and commercial support facilities and infrastructure in close proximity to the inhabitants

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 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.

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.

Specialist studies were conducted and a full Public Participation Process was followed. This information was used to generate a sensitivity map that was used to assess the sustainability of the design and layout plan for the proposed development.

The **Geo-Technical Engineer** has found that the site is underlain by gneiss, granodiorite or adamellite of the Stalhoek Complex, Vioolsdrift Suite, but is locally covered by recent aeolian sand and calcrete gravel. Some severe problems are foreseen regarding the excavatability to 1,0m depth on site, and shallow rock, core stones and rock outcrop or hard pan calcrete or gneiss were identified almost across the site. Zoning of the site revealed zones with minor constraints regarding the compressibility, collapse potential and the expansive potential of the soil.

The Civil Engineer has determined that is the following upgrades are done that sufficient bulk water will be available for the proposed development:

- Upgrade existing connection to Sedibeng pipeline to 200mmØ.
- Upgrade existing 1.8km trunk main to reservoir site to 200mmØ uPVC Class 16.
- New 2.5 Mℓ concrete reservoir at site of existing reservoir.
- New 250 mm Ø bulk water main to site of the proposed development approximately 2.990kms in length.

He also recommended that all parts of the proposed new development be drained to the existing Wastewater Treatment Works, via the 300 mm Ø bulk sewer main, as there is sufficient capacity to accommodate the new development. Based on the limited information received we anticipate that a small pump station (Lifting Station) with a short section of rising main (300m) will be required to accommodate a portion of the development situated to the north as it is evident that there is a low lying area.

The **Heritage Impact Assessment** revealed that no sites, features or material of cultural heritage (archaeological and/or historical) origin or significance were identified in the study area during the assessment. Erosion dongas, the dry streambed and the quarry areas were scrutinized for the presence of possible Stone Age material (stone tools) and none were identified.

The **Fauna and Flora Habitat** study conducted revealed that the vegetation type representing the Succulent Karoo Biome at the site is Namaqualand Blomveld (SKn 3). The Namaqualand Blomveld is not listed as threatened according to the National List of Threatened Ecosystems (2011). No Threatened or Near Threatened plant or animal species appear to be present at site. No Nationally Protected tree species appear to be present at the site. Some plant species that are not threatened but which is listed as protected according to Northern Cape Nature Conservation Act No. 9 of 2009 are present or are likely to be present at the site. All Pelargonium species are listed which then includes *Pelargonium carnosum* which is present at the site. Members of the protected plant families *Aizoaceae*, *Amaryllidaceae*, *Crassulaceae* and *Iridaceae* are also found at the site. A permit for the removal of indigenous vegetation at the site is therefore required.

A **Wetland impact assessment** was also done and the specialist came to the following conclusion: Wetlands such as those that could be classified as Floodplain Wetlands, Channelled Valley-bottom Wetlands, Unchannelled Valley-bottom Wetlands, Depressions (Pans), Seeps or Wetland Flats appear to be absent at site.

Skills development

The members of the Project Steering Committee will during the entire life-cycle of the project be involved with all processes and it anticipated that the capacity of the officials of the Nama Khoi Local Municipality as well as the relevant community structures will be broadened through the transfer of knowledge and skills specifically relating to the integrated human settlement planning process as well as the statutory processes associated with the township establishment process.

During the construction phase of the proposed development, jobs will be created and thus the unemployment rate of the area will be reduced.

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.

12.2 ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPR)

EMPR's aim to identify and minimise the potential impacts that the proposed construction and operational phases of the project may have on the receiving environment. An EMPR has been developed which is contained in Appendix F and includes detailed mitigatory measures for the construction phase.

As a general guideline, the EMPR should be based on a comprehensive set of environmental aspects (elements of the facility that can interact with the environment), and hence, the EMPR compiled for this application includes the following key components:

- Mechanisms for the on-going identification and assessment of environmental aspects and impacts;
- Environmental management programmes; objectives and targets;
- Environmental monitoring and reporting framework;
- Environmental management procedures; and,
- Mechanisms for the recording of environmental incidents and implementing corrective and preventative actions.

12.3 EAP OPINION

The information contained in this DEIAR and Specialist Studies, provides a detailed and comprehensive description of the proposed project, baseline environment and potential environmental impacts associated with the proposed development. As no significant impacts that cannot be mitigated were identified, AB Enviro Consult is of the opinion that the project should proceed, provided that the necessary mitigation and management measures are implemented.

Under South African environmental legislation, the Applicant is accountable for the potential impacts of the activities that are undertaken and is responsible for managing these impacts. The Applicant therefore has overall and total environmental responsibility to ensure that the implementation of the construction phase of the EMPR complies with the relevant legislation and the conditions of the environmental authorisation. The applicant will thus be responsible for the implementation of the EMPR.

The environmental management programme (EMPR) should form part of the contract between the construction company and the applicant. This will help ensure that the EMPR is adhered to. It is suggested that a suitably qualified Environmental Control Officer (ECO) be appointed for the construction phase.

12.4 CONDITIONS RECOMMENDED TO BE INCLUDED IN ANY AUTHORISATION THAT MAY BE GRANTED BY THE COMPETENT AUTHORITY IN RESPECT OF THE APPLICATION

1. A full copy of the signed EA from DENC in terms of NEMA, granting approval for the development must be available on site
2. A copy of the EMPR as well as any amendments thereof must be available on site
3. A suitably qualified ECO must be appointed.
4. Impacts on the environment must be minimised during site establishment and the development footprint must be kept to the approved development area.

5. Vegetation clearing may not commence until such time as the development footprint has been clearly defined.
6. No clearance of vegetation outside of the development footprint may occur.
7. At the end of the construction phase the site and its surrounding area must be free from any pollution that originated as a result of the construction activities.
8. No disturbance of topsoil & subsoil may commence until such time as the development footprint has been clearly defined.
9. No disturbance of topsoil & subsoil outside of the development footprint may occur.
10. At the end of the construction phase the site and its surrounding area must be free from any chemical, fuel, oil and cement spills that originated as a result of the construction activities.
11. At the end of the construction phase the site and its surrounding area must be free from any sewage that originated as a result of the construction activities.
12. At the end of the construction phase the site and its surrounding area must be free from any hazardous or general waste pollution that originated as a result of the construction activities.
13. Dust prevention measures must be applied to minimise the generation of dust.
14. Noise prevention measures must be applied to minimise the generation of unnecessary noise pollution as a result of construction activities on site.
15. Absolutely no burning of waste is permitted.
16. Fires will only be allowed in facilities especially constructed for this purpose.
17. No hunting of animals will be allowed.
18. No intentional destruction of any sites, features or material of cultural heritage (archaeological and/or historical) origin or significance may occur.
19. All Contractors and sub-contractors must abide to the rules and regulations of the Occupational Health and Safety Act, 85 of 1993.

13. AFFIRMATION BY EAP

- I Ms JE du Plooy 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.

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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:
GEOTECHNICAL REPORT**

**APPENDIX B:
CIVIL ENGINEERING REPORT**

**APPENDIX C:
FAUNA AND FLORA HABITAT SPECIALIST REPORT**

**APPENDIX D:
WETLAND IMPACT ASSESSMENT REPORT**

**APPENDIX E:
HERITAGE IMPACT ASSESSMENT REPORT**

**APPENDIX F:
ENVIRONMENTAL MANAGEMENT PLAN**