PROPOSED NEW TOWNSHIP DEVELOPMENT, LETHABO PARK, ON THE REMAINDER OF THE FARM ROODEPAN NO.70, ERF 17725, AND ERF 15089, ROODEPAN, KIMBERLEY, SOL PLAATJE LOCAL MUNICIPALITY, NORTHERN CAPE

D:E&NC reference number: NC/EIA/01/FB/SOL/KIM1/2019

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SOL PLAATJE LOCAL MUNICIPALITY

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EXECUTIVE SUMMARY

Introduction

Consideration is being given by the Sol Plaatje Local Municipality for the development of a new mixed-use residential housing area, at Lethabo Park (Ivory Park Extension), located in Roodepan in the north western suburb of Kimberley.

The study area are as follows:

- The Remainder of the Farm Roodepan No. 70 (approx. 75ha);
- Erf 17725, Kimberley (approx. 7ha);
- Erf 15089, Kimberley (approx. 8ha).

The proposed project entails the development of approximately 1711 erven (1677 land units for residential purposes, as well as erven for institutional, business, educational, and municipal purposes and for public open space) including associated infrastructure such as roads, and water, stormwater, effluent and electricity reticulation. The total area to be developed measures 90 (ninety) hectares.

The site is located approximately 10km north, north west of the CBD of Kimberley, in the Sol Plaatje Municipality, Northern Cape.

The applicant is Sol Plaatje Local Municipality who will undertake the activity should it be approved. EnviroAfrica CC has been appointed as the independent environmental assessment practitioner (EAP) responsible for undertaking the relevant EIA and the Public Participation Process required in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA).

The Final Scoping Report and Plan of Study for EIA were submitted to the Department of Environment and Nature Conservation (DENC). The Scoping Report and Plan of Study for EIA were approved by DENC on the 25 April 2019 and EnviroAfrica were advised to proceed with the EIA process (**Appendix 1B**).

Environmental Requirements

The National Environmental Management Act (Act 107 of 1998) (NEMA), as amended, makes provision for the identification and assessment of activities that are potentially detrimental to the environment and which require authorisation from the relevant authorities based on the findings of an environmental assessment. NEMA is a national act, which is enforced by the Department of Environmental Affairs (DEA). These powers are delegated in the Northern Cape to the Department of Environment and Nature Conservation (DE&NC).

On the 04 December 2014 the Minister of Water and Environmental Affairs promulgated regulations in terms of Chapter 5 of the NEMA, namely the EIA Regulations 2014. These were amended on 07 April 2017 (GN No. 326, No. 327 (Listing Notice 1), No. 325 (Listing Notice 2), No. 324 (Listing Notice 3) in Government Gazette No. 40772 of 07 April 2017). Listing Notice 1 and 3 are for a Basic Assessment and Listing Notice 2 for a full Environmental Impact Assessment.

According to the regulations of Section 24(5) of NEMA, authorisation is required for the following listed activities for the proposed agricultural development:

Government Notice R327 (Listing Notice 1) listed activities:

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 throughput of 120 litres per second or more;

excluding where;

a) such infrastructure is for bulk transportation of water or storm water or storm water drainage inside a road reserve or railway line reserve; or
b) where such development will occur within an urban area.

10 The development and related operation of infrastructure exceeding 1000 metres in length for the bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes

(i) with an internal diameter of 0,36 metres or more; or
(ii) with a peak throughput of 120 litres per second or more;

excluding where;

a) such infrastructure is for the bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes inside a road reserve or railway line reserve; or
b) where such development will occur within an urban area.

11 The development of facilities or infrastructure for the transmission and distribution of electricity;

(i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts; or
(ii) inside urban areas or industrial complexes with a capacity of 275 kilovolts or more.

Excluding the development of bypass infrastructure for the transmission and distribution of electricity where such bypass infrastructure is:

(a) temporarily required to allow for maintenance of existing infrastructure,
(b) 2 km or shorter in length;
(c) Within an existing transmission line servitude; and
(d) Will be removed within 18 months of the commencement of development

12 The development of;

(i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres;
(ii) infrastructure or structures with a physical footprint of 100 square metres or more;

where such development occurs;

(a) within a watercourse;
(b) in front of a development setback; or
(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse;

13 The development of facilities or infrastructure for the off-stream storage of water, including dams and reservoirs, with a combined capacity of 50000 cubic metres or more, unless such storage falls within the ambit of activity 16 in Listing Notice 2 of 2014.

19 The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse;

(a) will occur behind a development setback;

(b) is for maintenance purposes undertaken in accordance with a maintenance management plan; or

(c) falls within the ambit of activity 21 in this Notice, in which case that activity applies.

24 The development of a road;

(i) for which an environmental authorisation was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Government Notice 545 of 2010; or

(ii) with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres;

but excluding a road;

(a) which is identified and included in activity 27 in Listing Notice 2 of 2014; or

(b) where the entire road falls within an urban area; or

(c) which is 1 kilometre or shorter

27 The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for;

(i) the undertaking of a linear activity; or

(ii) maintenance purposes undertaken in accordance with a maintenance management plan.

56 The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre;

(i) where the existing reserve is wider than 13,5 meters; or

(ii) where no reserve exists, where the existing road is wider than 8 metres;

excluding where widening or lengthening occur inside urban areas.

Government Notice **R325** (Listing notice 2) listed activities:

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.

27 The development of a road;

(i) …

(ii) …

(iii) with a reserve wider than 30 metres; or

(iv) catering for more than one lane of traffic in both directions;

but excluding a road

(a) for which an environmental authorisation was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Government Notice 545 of 2010, in which case activity 24 in Listing Notice 1 of 2014 applies.
(b) Which is 1km or shorter; or
(c) Where the entire road falls within an urban area

Government Notice **R324** (Listing notice 3) listed activities:

2 The development of reservoirs, excluding dams, with a capacity of more than 250 cubic metres.

4 The development of a road wider than 4 metres with a reserve less than 13.5 metres

12 The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.

14 The development of;

(i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 10 square metres;
(ii) infrastructure or structures with a physical footprint of 10 square metres or more;

where such development occurs;

(a) within a watercourse;
(b) in front of a development setback; or
(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse;

Excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour;

Need and Desirability

Housing is a national need, including in the Sol Plaatje Municipality.

According to the Sol Plaatje Municipality, the proposed development represents a significant step towards service delivery and housing objectives within the municipality and broader Kimberley area. As such, this initiative is a positive step towards better governance and service delivery and will benefit the broader Kimberley community. Furthermore, this development will not only meet the pressing needs of adequate housing within the municipality but will also be in line to support of the municipal IDP objectives to provide housing for the poor and decrease the city's housing backlog as well as fulfil the Constitutional mandate to provide adequate housing and basic services to citizens.

According to the Sol Plaatje Municipality Integrated Development Plan (Final IDP 2017 – 2022), *…there are informal settlements north and south of Kimberly. There are also pockets of informal settlements in Roodepan and Richie areas. Some of these informal settlements are already receiving*

attention in terms of current human settlement projects which are at various stages of development. The provincial programme to eradicate the housing backlogs has various stages run in parallel to each other which includes land preparation, service installations and finally the construction of houses. The estimated housing backlog for Sol Plaatje is +/- 11803 houses.

The proposed location is considered to be a viable option. The proposed site is adjacent to the existing residential area of Roodepan, allowing accessibility and linking to the existing services infrastructure.

The involved properties are located within the Kimberley urban edge and are already partially occupied by means of informal settlement. Sections of these land units area also designated locations that is suited to infill planning practices, which is part of the reasons why it was selected by the local authority for the purposes of this project.

The 90ha study area is located on the outer city limits but can be accessed by means of the existing road networks in the area. The aspect of access, traffic flow and road linkages have been properly planned for and addressed in the Traffic Impact Study and layout planning and design.

There are no physical characteristics of these properties or environmental constraints which would exclude the site from development.

The proposed site is directly adjacent to the existing residential area of Roodepan. As stated above, this would provide accessibility and allow the proposed development to link to the existing services infrastructure.

The proposed development is in line with the Sol Plaatje Municipal SDF, the Frances Baard District Municipal Spatial Development Framework (2014)(FBDMSDF), and the Northern Cape Provincial Spatial Development Framework (2019)(NCPSDF).

Site Description

The proposed site is located in Roodepan, adjacent to the existing residential area, in the north-western suburb of Kimberley.

The study area is as follows:

- The Remainder of the Farm Roodepan No. 70 (approx. 75ha);
- Erf 17725, Kimberley (approx. 7ha);
- Erf 15089, Kimberley (approx. 8ha).

The site is mostly vacant, with only an informal church on Erf 15089, a few unregistered agricultural plots and informal structures on Farm 70 Roodepan, and some informal settlements on Erf 17725 (this property is presently zoned as a Public Open Space and as such these structures are in contravention with regard to the existing land use rights of the land that they are located on).

The proposed site of the residential development is undeveloped, fallow and generally near natural and in fairly good condition. The edges of the site, especially adjacent to the existing residential areas, are heavily disturbed by urban creep and illegal dumping. The vegetation has also been impacted on by grazing, especially towards the west and northern sections of the site.

According to the Vegetation map of South Africa, Lesotho and Swaziland, only one broad vegetation type is expected on the majority of the proposed site, namely Kimberley Thornveld (SVk4), and Vaalbos Rocky Shrubland (SVk5) in its immediate vicinity to the south and west.

According to the Botanical Impact Assessment (**Appendix 6A**), The vegetation encountered can be described as an open thornveld or semi-open to closed mixed-acacia woodland.

According to the Northern Cape CBA map, the proposed development footprint is not located within an ESA or CBA, but in an area considered "Other Natural Areas". As such the footprint will not interfere directly with any of the proposed conservation targets for the Northern Cape.

No red-listed species was observed, and no species in terms of the NEM: BA protected species and NFA were observed. One plant in terms of the NCNCA was encountered.

According to the Heritage Impact Assessment (**Appendix 6B**), two occurrences of stone age archaeological material were found within the development footprint. In the northeast section of Erf 15089, four lithics were recorded, which include flakes and upper grindstone. In the north-western section of Reminder of the Farm Roodepan No. 70, a low-density surface scatter of lithics that include MSA/Early LSA scraper and flakes and chips were recorded. The identified archaeological materials are of low significance, as the archaeological sample is small and without context, and therefore of little scientific value.

No historical period artefacts, no significant historical features and no formal or informal graves were identified within the study area. No visible evidence of fossiliferous outcrops was found.

From the SANBI National Freshwater Ecosystem Priority Areas map, there are no natural watercourses on the proposed site.

According to the Freshwater Assessment (**Appendix 6C**), a possible natural drainage line, running south-west from the existing railway line, to a pan to the west of the development, may have historically occurred, but this has been replaced by a dirt road. Although not on the development site, there are four pans to the west and south-west of the site. The four pans to the west are important features of Lethabo Park's drainage landscape.

Alternatives

Various layout alternatives were proposed and have been considered during the Scoping phase.

Alternative 1:
Alternative 1 (**Appendix 2A**) is the first of 2 concept layouts initially proposed. This layout included 1844 erven, which included:

- Residential Zone I - 1830 land units will be established of which 1730 will be higher density and 100 will be lower density.
- Residential III – 1 Unit for Residential III usage
- Institutional I – Seven (7) land units
- Public Open Space - 3 land units
- Educational – One (1) land unit
- Public roads – Two (2) land units will be established. Primary land use right: Street or road

This alternative was considered a viable option as it provided a sufficient number of housing opportunities. It was initially the municipalities preferred layout. However, due to the existing services infrastructure, this layout needed an amendment (see Alternative 3 below).

Alternative 2:
Alternative 2 (**Appendix 2B**) is the second of 2 concept layouts initially proposed. This layout included 1764 erven, which included:

- Residential Zone I - 1751 land units will be established of which 1651 will be higher density and 100 will be lower density.
- Residential III – 1 Unit for Residential III usage
- Institutional I – Six (6) land units
- Public Open Space - 3 land units
- Educational – One (1) land unit
- Government – One (1) land unit
- Public roads – One (1) land units will be established. Primary land use right: Street or road

Although this alternative was still considered a viable option, it was initially not preferred as it allowed for fewer number of residential opportunities compared to Alternative 1.

Alternative 3:
Alternative 3 (**Appendix 2C)** was the final concept layout proposed and is the Applicant's Preferred Layout. This layout includes 1711 erven:

According to the SPLUMA Application Report (**Appendix 4A**), the erven are broken down as follows:

- Residential Zone I - 1677 land units will be established of which 1577 will cover between 250m² (new erven for formalised structures) and 300m² (new erven) and 100 will cover approximately 500m² to 600m². Primary Use: Dwelling House
- Business I - Five (5) land units covering approximately 500m² will be established. Primary Use: Hotels, guest houses, places of refreshment, shops, business premises, dwelling units, residential building, place of amusement, places of worship including funeral parlours with chapels, places of instruction, dry cleaners, public garages, parking, car wash, social halls.
- Institutional I – Six (6) land units will be established in accordance with the requirements of the Guidelines for Human Settlement Planning and Design. Primary land use right: Institutions, dwelling units, places of public worship, places of instruction, canteen.
- Public Open Space - 14 land units will be established of which the primary purpose is to safely and practically enclose municipal infrastructure and associated servitudes. These land units also includes an existing green area and soccer field (dimensions are in accordance with the requirements of the Guidelines for Human Settlement Planning and Design). Primary land use right: Public open spaces
- Educational – One (1) land unit will be established in accordance with the requirements of the Guidelines for Human Settlement Planning and Design and as per the specific request for a primary school site by the Department of Education. Primary land use right: Places of instruction, social hall, places of worship
- Municipal – Two (2) land units will be established – one land unit was specifically requested by the local authority with a required area of approximately 1000m², the second land unit was established in order to set apart municipal electrical infrastructure in the form of an electrical switch house. Primary land use right: Municipal Purposes.

- Government - One (1) land unit will be established, this land unit was specifically requested by the local authority with a required area of approximately 500m². Primary land use right: Government Purposes.
- Public roads – Five (5) land units will be established. Primary land use right: Street or road

Alternative 3 is similar to Alternative 1, and was developed with amendments to Alternative 1 due to new information from the municipal infrastructure departments in relation to existing services infrastructure that had a considerable impact on the layout and requirements for additional land uses/ changes to proposed land uses by the local municipality and specific spacing of these land uses. This alternative is also considered as a viable option, and is also the municipalities preferred layout since it provides sufficient erven and housing opportunities (high and lower density), as well as providing for Municipal and Government land use opportunities, and more Open Space.

Other Alternatives:
Site Alternatives - This is the only site alternative considered. However, an initial site was considered that overlaps part of the proposed site. This site was not considered as a large portion of the site has existing agricultural plots established on the site. These would not have been possible to move or integrate meaningfully in the proposed development. The site also did not lend itself to as much infill development as the proposed site would have.

Activity Alternatives - No Activity Alternatives have been considered. The Municipality wants to develop the properties to provide much needed housing opportunities. Due to the need for housing in the Kimberley area, the housing development and associated infrastructure on the property is therefore the only activity considered.

No-Go Alternative:
This is the option of not developing the proposed residential development. Currently no formal Agricultural activities are taking place on Erf 15089 or Farm 70 Roodepan although they are zoned as Agricultural. However, the site is located adjacent to established residential developments.

Although the no-go development might result in no potential negative environmental impacts, especially on the vegetation on the development site, the direct and indirect socio-economic benefits of not constructing the residential development will not be realised. The need for additional housing opportunities in the area will not be realised.

Tasks to be undertaken during the EIA Phase

The following tasks must still be undertaken during the EIA phase of the process:

- Compile Draft Environmental Impact Report (EIR) for public comment based on specialist information
- Distribute and/or make the Draft EIR available to registered Interested and Affected Parties for viewing and comment
- Receive comments on Draft EIR. All comments received and responses to the comments will be incorporated into the Final Environmental Impact Report (EIR).
- Preparation of a FINAL EIR for submission to DENC for consideration and decision-making.

Specialist Studies

The following specialist studies were undertaken as part of this Environmental Impact Assessment:

- Botanical Impact Assessment
- Heritage Impact Assessment
- Freshwater Assessment
- Geo-technical Assessment
- Traffic Impact Study

Conclusion

The specialist studies and the information provided within the EIA Report, indicates that the proposed Lethabo Park Housing development does not pose any significant impacts and can be implemented with appropriate mitigation.

In terms of the need and desirability of the proposed residential development, housing is a national need, including in the Sol Plaatje Municipality.

The proposed development represents a significant step towards service delivery and housing objectives within the municipality and broader Kimberley area. The development will not only meet the pressing needs of adequate housing within the municipality but will also be in line to support of the municipal IDP objectives to provide housing for the poor and decrease the city's housing backlog as well as fulfil the Constitutional mandate to provide adequate housing and basic services to citizens.

The proposed location is considered to be a viable option. The proposed site is adjacent to the existing residential area of Roodepan, allowing accessibility and linking to the existing services infrastructure. The involved properties are located within the Kimberley urban edge and are already partially occupied by means of informal settlement. Sections of these land units are also designated locations that is suited to infill planning practices, which is part of the reasons why it was selected by the local authority for the purposes of this project.

The site is located on the outer city limits but can be accessed by means of the existing road networks in the area.

There are no physical characteristics of these properties or environmental constraints which would exclude the site from development.

In terms of alternatives, **Alternative 3** is the preferred alternative. This alternative is considered a viable option, and is also the municipalities preferred layout since it provides sufficient erven and housing opportunities (high and lower density), as well as providing for Municipal and Government land use opportunities, and more Open Space. There are no environmental or heritage limitations to this layout.

According to the Botanical Impact Assessment, only one broad vegetation type is expected in the proposed area and its immediate vicinity, namely **Kimberley Thornveld**, which is considered "Least Threatened". The vegetation encountered can be described as an open thornveld or semi-open to closed mixed-acacia woodland, and although most of the site is still in fairly good condition, the remaining natural veld has been significantly compromised, disturbed or transformed in large parts by

illegal housing (urban creep), illegal dumping area, and grazing practices, adding to the degraded status of the area.

The proposed development footprint is not located within an ESA or CBA, but in an area considered "Other Natural Areas". As such the footprint will not interfere directly with any of the proposed conservation targets for the Northern Cape. No red-listed species was observed, and no species in terms of the NEM: BA protected species and NFA were observed. Only one plant, *Aloe grandidentata* (Schedule 2 protected), in terms of the Northern Cape Nature Conservation Act 9 of 2009 (NCNCA) was identified.

The proposed development will result in the permanent transformation of approximately 100ha of natural veld for human settlement. According to the impact assessment, with good environmental control, the development is likely to result in a Low impact on the environment.

With the correct mitigation it is unlikely that the development will contribute significantly to any loss of vegetation type and associated habitat, loss of ecological processes (e.g. migration patterns, pollinators, river function etc.) due to construction and operational activities, loss of local biodiversity and threatened plant species or a loss of ecosystem connectivity.

According to the Freshwater Assessment, the proposed urban development will entirely alter the drainage lines. The lines would be replaced with streets and houses. As the aquatic habitat is insignificant, this does not indicate a loss of aquatic ecosystem functioning.

According to the Heritage Impact Assessment no significant heritage resources were identified on the proposed site. There are no archaeological, historical or cultural sites, or paleontological resources of high significance that will be impacted negatively by the proposed development, in the development footprint.

The Geo-technical Assessment found no significant limiting conditions but provided recommendations for founding and construction, excavations, and soil corrosivity as well as recommendations for further investigations.

The Traffic Impact Study found that with regards to traffic generation and impact, it is estimated that the development will generate in the order of 500 AM and PM peak hour trips (total in and out), although since there are informal Townships I the area this can probably be seen as a worst case for additional external traffic.

Considering all the information, it is not envisaged that this proposed Lethabo Park development will have a significant negative impact on the environment, and the socio-economic benefits are expected to greatly outweigh any negative impacts, especially if the mitigation measures as recommended by the various specialists and detailed in Section 12 and the Environmental Management Programme (Appendix 9) are implemented.

It is therefore recommended that the proposed Lethabo Park Development (**Alternative 3**) be supported and be authorised with the necessary conditions of approval, subject to the implementation of the recommended enhancement and mitigation measures contained in Section 12.

CONTENTS

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APPENDICES

ACRONYMS

BGIS	Biodiversity Geographic Information System
CBA	Critical Biodiversity Area
DEA	Department of Environmental Affairs
DEAT	Department of Environmental Affairs and Tourism
DENC	Department of Environment and Nature Conservation (Northern Cape)
DWS	Department of Water and Sanitation
EAP	Environmental Assessment Practitioner
ECA	Environment Conservation Act (Act No. 73 of 1989)
EIA	Environmental Impact Assessment
EIR	Environmental Impact Assessment Report
EMP	Environmental Management Programme
HIA	Heritage Impact Assessment
I&APs	Interested and Affected Parties
NCNCA	Northern Cape Nature Conservation (Act 9 of 2009)
NEMA	National Environmental Management Act (Act No. 107 of 1998)
NEMBA	National Environmental Management: Biodiversity Act (Act No. 10 of 2004)
NFA	National Forests Act (NFA) of 1998 (Act 84 of 1998)
NHRA	National Heritage Resources Act (Act No. 25 of 1999)
NID	Notice of Intent to Develop
NWA	National Water Act
OESA	Other Ecological Support Area
PIA	Palaeontological Impact Assessment
SAHRA	South African Heritage Resources Agency
SANBI	South African National Biodiversity Institute
SDF	Spatial Development Framework
TIA	Traffic Impact Assessment
WULA	Water Use Licence Application

1. INTRODUCTION

1.1 BACKGROUND

Consideration is being given to the development of a new mixed-use residential housing area, at Lethabo Park (Ivory Park Extension), located in Roodepan in the north western suburb of Kimberley.

The applicant is Sol Plaatje Local Municipality who will undertake the activity should it be approved. EnviroAfrica CC has been appointed as the independent environmental assessment practitioner (EAP) responsible for undertaking the relevant EIA and the Public Participation Process required in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA).

The Final Scoping Report and Plan of Study for EIA were submitted to the Department of Environment and Nature Conservation (DENC). The Scoping Report and Plan of Study for EIA were approved by DENC on the 25 April 2019 and EnviroAfrica were advised to proceed with the EIA process (**Appendix 1B**).

1.2 SCOPE OF WORK

There has been no particular brief given to the consultants to undertake this study. However, the scope of the study has been determined with reference to the requirements of the relevant legislation and undertaken in terms of the Integrated Environmental Management Information Series on Environmental Impact Reporting (2004) issued by DEAT and the Information Document on Requirements with respect to the EIA Process (January 2003), issued by the Department of Environmental Affairs and Development Planning of the Western Cape.

The basic scope of work will include the following:

- Review of all information.
- Participating in the progress of the development proposal.
- Scoping (identification of significant issues).
- Assessment of anticipated impacts.
- Identification of suitable mitigation measures to reduce negative impacts and enhance positive impacts.
- Submission for decision.

One of the crucial aims of an EIA is to ensure that the demands of sustainable development are met on a project level, within the context of the greater area. The most common definition of sustainable development is development that meets the needs of the present while not compromising the needs of future generations.

This EIA is therefore being undertaken with sustainable development as a goal. The assessment will look at the impacts of the proposals on the environment and assess the significance of these, as well as propose mitigation measures, as required, to reduce anticipated impacts to acceptable levels.

1.3 ASSUMPTIONS AND LIMITATIONS

The assumption is made that the information on which the report is based (i.e. specialist studies and project information) is correct.

Future management of the site is essential, and the assumption is made that the mitigation measures recommended by the specialists will be implemented on a long-term basis. This has a major bearing on the reliability of the predictions of significance of impact.

1.4 DESCRIPTION OF THE PROPOSED ACTIVITY

The Sol Plaatje Local Municipality is proposing that a new township development, consisting of low- and middle-income housing, be developed at Lethabo Park (Ivory Park Extension), located in Roodepan in the north western suburb of Kimberley.

The study area are as follows:

- The Remainder of the Farm Roodepan No. 70 (approx. 75ha);
- Erf 17725, Kimberley (approx. 7ha);
- Erf 15089, Kimberley (approx. 8ha).

The proposed project entails the development of approximately 1711 erven (1677 land units for residential purposes as well as erven for institutional, business, educational, and municipal purposes and for public open space) including associated infrastructure such as roads, and water, stormwater, effluent and electricity reticulation. The total area to be developed measures 90 (ninety) hectares.

The site is located approximately 10km north, north west of the CBD of Kimberley, in the Sol Plaatje Municipality, Northern Cape.

Figure 1: Locality Map. Google Earth view of the proposed site (red polygon)

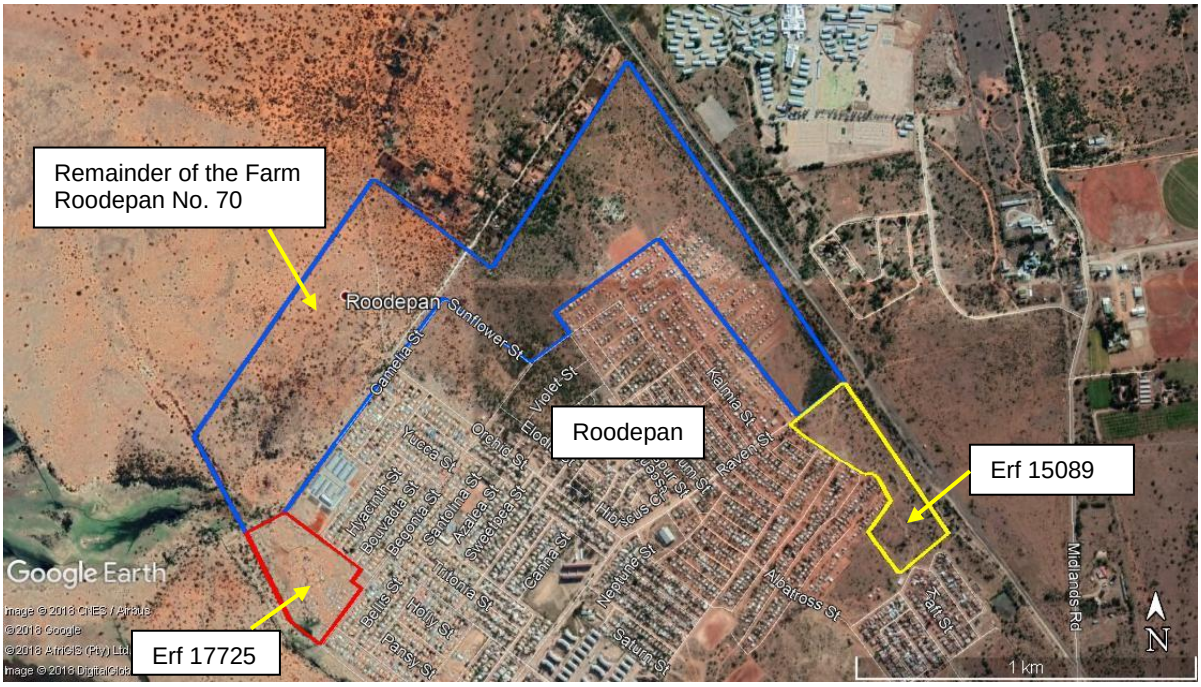

Figure 2: Google Earth image of the site.

2. NEED AND DESIRABILITY

In terms of the National Environmental Management Act, as amended, EIA 2014 regulations the Scoping/EIA report must provide a description of the need and desirability of the proposed activity. The consideration of "need and desirability" in EIA decision-making requires the consideration of the strategic context of the development proposal along with the broader societal needs and the public interest.

The need for and the desirability of a proposed development forms a key component of any EIA application. The consideration of proposed developments in context of the various spatial planning tools and policy applicable to the study area forms an integral part of the present environmental processes. The "need and desirability" will be determined by considering the broader community's needs and interests as reflected in a credible IDP, SDF and EMF for the area.

While the concept of need and desirability relates to the *type* of development being proposed, essentially, the concept of need and desirability can be explained in terms of the general meaning of its two components in which *need* refers to *time* and *desirability* to *place* – i.e. is this the right time and is it the right place for locating the type of land-use/activity being proposed? Need and desirability can be equated to *wise use of land* – i.e. the question of what is the most sustainable use of land. The impact of development on people's health and well-being, as well as its impact on natural and cultural areas, and therefore its desirability, will also be assessed during the Environmental Impact Report phase.

2.1 NEED

Housing is a national need, including in the Sol Plaatje Municipality.

According to the Application Report in terms of the Spatial Planning and Land Use Management Act (Act 16 of 2013) (**Appendix 4A**), the proposed development represents a significant step towards service delivery and housing objectives within the municipality and broader Kimberley area. As such, this initiative is a positive step towards better governance and service delivery and will benefit the broader Kimberley community. Furthermore, this development will not only meet the pressing needs of adequate housing within the municipality but will also be in line to support of the municipal IDP objectives to provide housing for the poor and decrease the city's housing backlog as well as fulfil the Constitutional mandate to provide adequate housing and basic services to citizens.

According to the Sol Plaatje Municipality Integrated Development Plan (Final IDP 2017 – 2022), *…there are informal settlements north and south of Kimberly. There are also pockets of informal settlements in Roodepan and Richie areas. Some of these informal settlements are already receiving attention in terms of current human settlement projects which are at various stages of development. The provincial programme to eradicate the housing backlogs has various stages run in parallel to each other which includes land preparation, service installations and finally the construction of houses. The estimated housing backlog for Sol Plaatje is +/- 11803 houses. The township approvals passed by the municipality for new houses can accommodate 12 607 units. Due to budget constraints the delivery of approximately 5000 new house will be possible within medium term budget framework. In this process parts of Lerato Park, Snake Park, Jacksonville, Freedom Park, Motswedimosa and Diamond Park will be developed.*

2.2 DESIRABILITY

The following factors determine the desirability of the area for the proposed residential development.

2.2.1 LOCATION AND ACCESSIBILITY

The proposed location is considered to be a viable option. The proposed site is adjacent to the existing residential area of Roodepan, allowing accessibility and linking to the existing services infrastructure.

According to the SPLUMA Application Report (**Appendix 4A**), the involved properties are located within the Kimberley urban edge and are already partially occupied by means of informal settlement. Sections of these land units area also designated locations that is suited to infill planning practices, which is part of the reasons why it was selected by the local authority for the purposes of this project.

The 90ha study area is located on the outer city limits but can be accessed by means of the existing road networks in the area. The aspect of access, traffic flow and road linkages have been properly planned for and addressed in the Traffic Impact Assessment and layout planning and design

There are no physical characteristics of these properties or environmental constraints which would exclude the site from development.

2.2.2 COMPATIBILITY WITH THE SURROUNDING AREA

The proposed site is directly adjacent to the existing residential area of Roodepan. As stated above, this would provide accessibility and allow the proposed development to link to the existing services infrastructure.

2.3 INTEGRATED PLANNING

According To the Department of Environmental Affairs: Integrated Environmental Management Guideline: Guideline on Need and Desirability (2017), when considering how the development may affect or promote justifiable economic and social development, the relevant spatial plans must be considered, including Municipal Integrated Development Plans (IDP), Spatial Development Frameworks (SDF) and Environmental Management Frameworks (EMF). No EMF was identified for the area.

According to the Application Report in terms of the Spatial Planning and Land Use Management Act (SPLUMA) (Act 16 of 2013) (**Appendix 4A**), all proposed developments, specifically pertaining to land use change applications within a municipality, must be measured against an approved Spatial Development Framework (SDF) of such a municipality, which may be seen as the spatial translation of the Integrated Development Plan (IDP).

According to the SPLUMA Application Report (**Appendix 4A**), the Sol Plaatje Municipal SDF is currently under review, no draft is however available yet and as such reliance on the available 2009 MSDF for guidance in these matters is made.

The area, in which the study area is situated, is known as Roodepan and it is an expansion project with regard to the already established Ivory Park settlement. Roodepan is located in Sub-Area 33, which includes both Roodepan and Jacksonville, according to the Sol Plaatje SDF area division of Kimberley.

The guidelines listed under Objective 1 of the SDF for Sub-Area 33 indicates the following:
To maintain and enhance residential function of the sub-area -

1. Support strategic residential densification and **infill**.
2. Support guesthouses and tuck-shops which maintain and support the residential character of the neighbourhood.

In the Frances Baard District Municipal Spatial Development Framework (2014)(FBDMSDF), a variety of projects are identified as focus areas in terms of development. These projects stem from the various municipal IDP's and SDF's and one of the outlined areas of focus is that of housing needs in urban and rural areas throughout the district and local municipalities.

The FBDMSDF Housing and Human Settlement identified the following issues:

- *Sol Plaatje is listed as the biggest municipality within the district and is indicated to have a shortage of 3728 households which is said to be contributed to the municipalities' status as an economic hub.*
- *It is indicated that there is an issue in both the district in general, as well as the Sol Plaatje Local Municipality in terms of the provision of formal housing.*
- *In the SWOT analysis of the SDF it is indicated that even though the housing backlog with in the District is being addressed and the average household size is decreasing, there are still very real realities that challenge the provision of housing in the area, such as the ever increasing demand for housing, a lack of funding and also land shortages in some areas.*
- *In this section of the SDF the principles of the district municipal densification policy is set apart and if focusses on various means of the provision of housing in such a manner that it promotes residential densification as well as infill planning practices.*

According to the Northern Cape Provincial Spatial Development Framework (2019)(NCPSDF), as part of the Spatial Development Strategies for Infrastructure Investment and related objectives it is a set objective that, amongst others, the housing backlog within the province must be eradicated. It is furthermore indicated that, as part of policy alignment with the Spatial Planning Categories, adequate, safe and affordable housing (amongst other objectives) must be met by 2030.

3. LEGAL REQUIREMENTS

The current assessment is being undertaken in terms of the National Environmental Management Act (Act 107 of 1998, NEMA), to be read with section 24 (5): NEMA EIA Regulations 2014. However, the provisions of various other Acts must also be considered within this EIA.

The legislation that is relevant to this study is briefly outlined below.

3.1 THE CONSTITUTION OF THE REPUBLIC OF SOUTH AFRICA

The Constitution of the Republic of South Africa (Act 108 of 1996) states that everyone has a right to a non-threatening environment and that reasonable measure are applied to protect the environment. This includes preventing pollution and promoting conservation and environmentally sustainable development, while promoting justifiable social and economic development.

3.2 NATIONAL ENVIRONMENTAL MANAGEMENT ACT (ACT 107 OF 1998)

The National Environmental Management Act (Act 107 of 1998) (NEMA), as amended, makes provision for the identification and assessment of activities that are potentially detrimental to the environment and which require authorisation from the relevant authorities based on the findings of an environmental assessment. NEMA is a national act, which is enforced by the Department of Environmental Affairs (DEA). These powers are delegated in the Northern Cape to the Department of Environment and Nature Conservation (DE&NC).

On the 04 December 2014 the Minister of Water and Environmental Affairs promulgated regulations in terms of Chapter 5 of the NEMA, namely the EIA Regulations 2014. These were amended on 07 April 2017 (GN No. 326, No. 327 (Listing Notice 1), No. 325 (Listing Notice 2), No. 324 (Listing Notice 3) in Government Gazette No. 40772 of 07 April 2017). Listing Notice 1 and 3 are for a Basic Assessment and Listing Notice 2 for a full Environmental Impact Assessment.

According to the regulations of Section 24(5) of NEMA, authorisation is required for the following listed activities for the proposed agricultural development:

<u>Government Notice R327 (Listing Notice 1) listed activities:</u>

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 throughput of 120 litres per second or more;

excluding where;

a) such infrastructure is for bulk transportation of water or storm water or storm water drainage inside a road reserve or railway line reserve; or

b) where such development will occur within an urban area.

10 The development and related operation of infrastructure exceeding 1000 metres in length for the bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes

(i) with an internal diameter of 0,36 metres or more; or

(ii) with a peak throughput of 120 litres per second or more;

excluding where;

(a) such infrastructure is for the bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes inside a road reserve or railway line reserve; or

(b) where such development will occur within an urban area.

11 The development of facilities or infrastructure for the transmission and distribution of electricity;

(i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts; or

(ii) inside urban areas or industrial complexes with a capacity of 275 kilovolts or more.

Excluding the development of bypass infrastructure for the transmission and distribution of electricity where such bypass infrastructure is:

(a) temporarily required to allow for maintenance of existing infrastructure,

(b) 2 km or shorter in length;

(c) Within an existing transmission line servitude; and

(d) Will be removed within 18 months of the commencement of development

12 The development of;

(i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres;

(ii) infrastructure or structures with a physical footprint of 100 square metres or more;

where such development occurs;

(a) within a watercourse;

(b) in front of a development setback; or

(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse;

13 The development of facilities or infrastructure for the off-stream storage of water, including dams and reservoirs, with a combined capacity of 50000 cubic metres or more, unless such storage falls within the ambit of activity 16 in Listing Notice 2 of 2014.

19 The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse;

(a) will occur behind a development setback;

(b) is for maintenance purposes undertaken in accordance with a maintenance management plan; or

(c) falls within the ambit of activity 21 in this Notice, in which case that activity applies.

24 The development of a road;

(i) for which an environmental authorisation was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Government Notice 545 of 2010; or

(ii) with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres;

but excluding a road;

(a) which is identified and included in activity 27 in Listing Notice 2 of 2014; or

(b) where the entire road falls within an urban area; or

(c) which is 1 kilometre or shorter

27 The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for;

(i) the undertaking of a linear activity; or

(ii) maintenance purposes undertaken in accordance with a maintenance management plan.

56 The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre;

(i) where the existing reserve is wider than 13,5 meters; or

(ii) where no reserve exists, where the existing road is wider than 8 metres;

excluding where widening or lengthening occur inside urban areas.

Government Notice **R325** (Listing notice 2) listed activities:

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.

27 The development of a road;

(i) …

(ii) …

(iii) with a reserve wider than 30 metres; or

(iv) catering for more than one lane of traffic in both directions;

but excluding a road

(a) for which an environmental authorisation was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Government Notice 545 of 2010, in which case activity 24 in Listing Notice 1 of 2014 applies.

(b) Which is 1km or shorter; or

(c) Where the entire road falls within an urban area

Government Notice **R324** (Listing notice 3) listed activities:

2 The development of reservoirs, excluding dams, with a capacity of more than 250 cubic metres.

4 The development of a road wider than 4 metres with a reserve less than 13.5 metres

12 The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.

14 The development of;
(i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 10 square metres;
(ii) infrastructure or structures with a physical footprint of 10 square metres or more;

where such development occurs;
(a) within a watercourse;
(b) in front of a development setback; or
(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse;
Excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour;

The environmental process is being undertaken in distinct phases, refer to **Figure 3**. An Application Form has been submitted to Department of Environment and Nature Conservation (DE&NC). On acknowledgment from DE&NC (**Appendix 1A**), the Scoping Process was undertaken to identify potential issues.

The Final Scoping Report and Plan of Study for EIA were submitted to the Department of Environment and Nature Conservation (DE&NC). The Scoping Report and Plan of Study for EIA were approved by DE&NC and EnviroAfrica was advised to proceed with the EIA process (**Appendix 1B**).

The principles of environmental management as set out in section 2 of NEMA have been taken into account. The principles pertinent to this activity include:

- People and their needs will be placed at the forefront while serving their physical, psychological, developmental, cultural and social interests. The activity seeks to provide additional housing, employment and economic development opportunities, which are a local and national need – *the proposed activity is expected to have a beneficial impact on people, especially developmental and social benefits, as well providing additional housing, employment and economic development opportunities.*
- Development will be socially, environmentally and economically sustainable. Where disturbance of ecosystems, loss of biodiversity, pollution and degradation, and landscapes and sites that constitute the nation's cultural heritage cannot be avoided, are minimised and remedied. The impact that the activity will potentially have on these will be considered, and mitigation measures will be put in place - *potential impacts have been identified and considered, and any further potential impacts will be identified during the public participation*

process. Mitigation measures have been recommended by the various specialist assessment, and are included in the EMP.

- Where waste cannot be avoided, it will be minimised and remedied through the implementation and adherence of the Environmental Management Programme (EMP) – *the EMP is included in the EIR as Appendix 9*.
- The use of non-renewable natural resources will be responsible and equitable.
- The negative impacts on the environment and on people's environmental rights will be anticipated, investigated and prevented, and where they cannot be prevented, will be minimised and remedied – *potential negative impacts have been identified and considered, and any further potential impacts will be identified during the public participation process. Mitigation measures have been recommended by the various specialist assessment, and are included in the EMP*.
- The interests, needs and values of all interested and affected parties will be taken into account in any decisions through the Public Participation Process – *refer to Section 7.4 below and Appendix 3*.
- The social, economic and environmental impacts of the activity will be considered, assessed and evaluated, including the disadvantages and benefits - *refer to Section 10 below*
- The effects of decisions on all aspects of the environment and all people in the environment will be taken into account, by pursuing what is considered the best practicable environmental option.

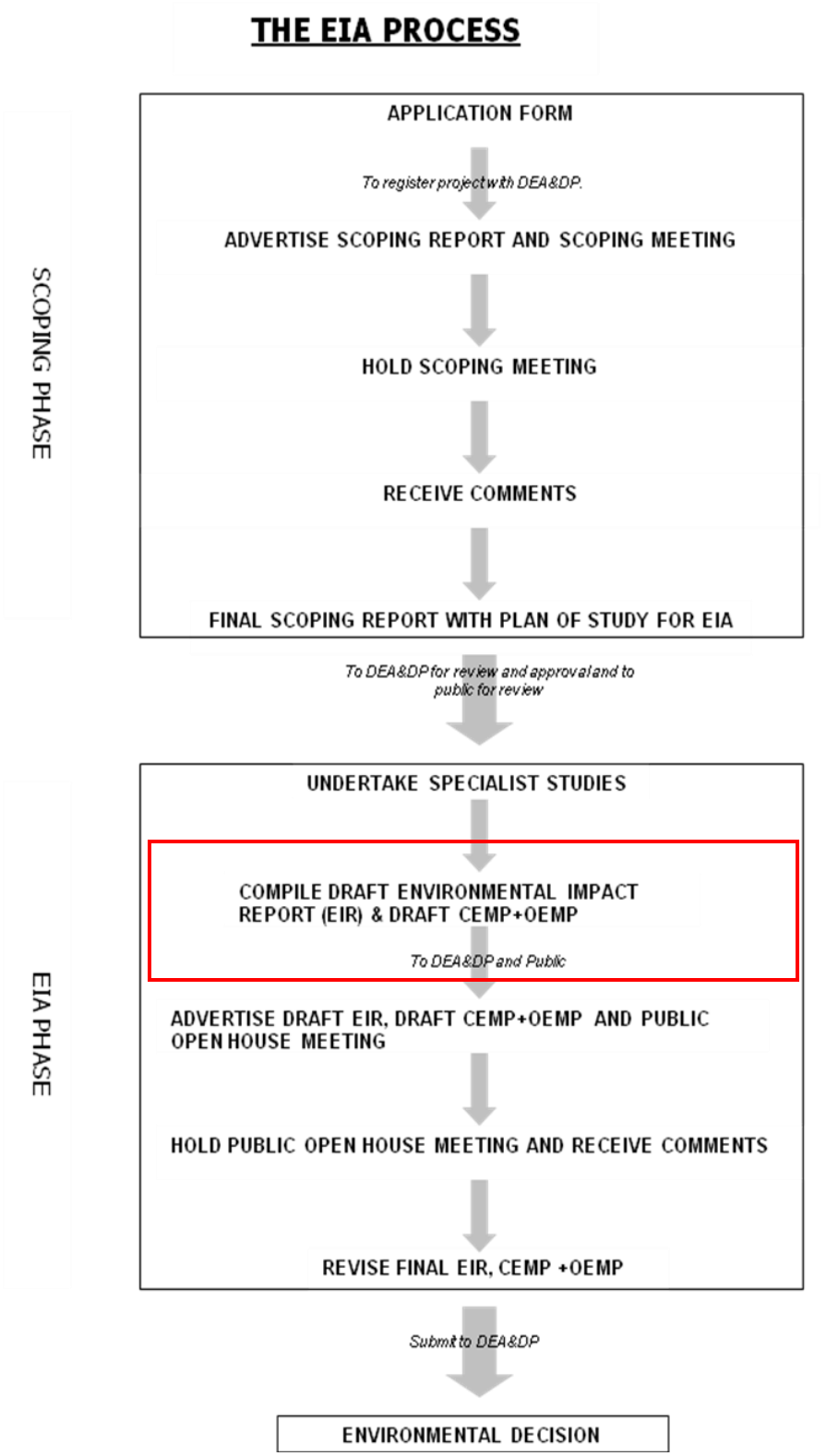

Figure 3: The EIA Process. Currently, this process is in the 'EIA Phase – Compile draft Environmental Impact Report (EIR) and draft CEMP and OEMP', as indicated in red.

3.3 NATIONAL HERITAGE RESOURCES ACT

The protection and management of South Africa's heritage resources are controlled by the National Heritage Resources Act (Act No. 25 of 1999). South African National Heritage Resources Agency (SAHRA) is the enforcing authority.

In terms of Section 38 of the National Heritage Resources Act, SAHRA will require a Heritage Impact Assessment (HIA) where certain categories of development are proposed. Section 38(8) also makes provision for the assessment of heritage impacts as part of an EIA process and indicates that if such an assessment is found to be adequate, a separate HIA is not required.

The National Heritage Resources Act requires relevant authorities to be notified regarding this proposed development, as the following activities are relevant:

- *any development or other activity which will change the character of a site exceeding 5 000 m² in extent;*
- *the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length*

Furthermore, in terms of Section 34(1), no person may alter or demolish any structure or part of a structure, which is older than 60 years without a permit issued by the SAHRA, or the responsible resources authority. Nor may anyone destroy, damage, alter, exhume or remove from its original position, or otherwise disturb, any grave or burial ground older than 60 years, which is situated outside a formal cemetery administered by a local authority, without a permit issued by the SAHRA, or a provincial heritage authority, in terms of Section 36 (3). In terms of Section 35 (4), no person may destroy, damage, excavate, alter or remove from its original position, or collect, any archaeological material or object, without a permit issued by the SAHRA, or the responsible resources authority.

3.4 EIA GUIDELINE AND INFORMATION DOCUMENT SERIES

The following are the latest guidelines and information Documents that have been consulted:

- Department of Environmental Affairs and Development Planning's (DEA&DP) *Environmental Impact Assessment Guideline and Information Document Series (Dated: March 2013)*:
  - ✓ *Guideline on Transitional Arrangements*
  - ✓ *Generic Terms of Reference for EAPs and Project Schedules*
  - ✓ *Guideline on Alternatives*
  - ✓ *Guideline on Public Participation*
  - ✓ *Guideline on Exemption Applications*
  - ✓ *Guideline on Appeals*
  - ✓ *Guideline on Need and Desirability*

- Department of Environmental Affairs and Tourism (DEAT*) Integrated Environmental Management Information Series.*

3.5 NATIONAL WATER ACT

Besides the provisions of NEMA for this EIA process, the proposed development may also require authorizations under the National Water Act (Act N0. 36 of 1998). The Department of Water Affairs, who administer that Act, will be a leading role-player in the EIA.

If, and as required by the Department of Water and Sanitation, a Water Use Licence Application (WULA) may be compiled and submitted.

3.6 NATIONAL ENVIRONMENTAL MANAGEMENT: BIODIVERSITY ACT

The National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA) is part of a suite of legislation falling under NEMA, which includes the Protected Areas Act, the Air Quality Act, the Integrated Coastal Management Act and the Waste Act. Chapter 4 of NEMBA deals with threatened and protected ecosystems and species and related threatened processes and restricted activities. The need to protect listed ecosystems is addressed (*Section 54*).

3.7 NATIONAL FORESTS ACT

The National Forests Act, 1998 (Act 84 of 1998) (NFA) makes provisions for the management and conservation of public forests.

In terms of section 15(1) of the National Forests Act, 1998, no person may -

(a) cut, disturb. damage or destroy any protected tree; or

(b) posses, collect. remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, or any forest product derived from a protected tree, except-

  (i) under a license granted by the Minister; or

  (Ii) in terms of an exemption from the provisions of this subsection published by the Minister in the Gazette.

3.8 NORTHERN CAPE CONSERVATION ACT, ACT 09 OF 2009

On the 12th of December 2011, the new Northern Cape Nature Conservation Act 9 of 2009 (NCNCA) came into effect, which provides for the sustainable utilization of wild animals, aquatic biota and plants. Schedule 1 and 2 of the Act give extensive lists of specially protected and protected fauna and flora species in accordance with this act. The NCNCA is a very important Act in that it put a whole new emphasis on a number of species not previously protected in terms of legislation.

It also put a new emphasis on the importance of species, even within vegetation classified as “Least Threatened” (in accordance with GN 1002 of 9 December 20011, promulgated in terms of the National Environmental Management Biodiversity Act 10 of 2004). Thus, even though a project may be located within a vegetation type or habitat previously not considered under immediate threat, special care must still be taken to ensure that listed species (fauna & flora) are managed correctly.

3.8 SPATIAL PLANNING AND LAND USE MANAGEMENT ACT, ACT 16 OF 2013

The Spatial Planning and Land Use Management Act 16 of 2013 (**SPLUMA**) is a national law that was passed by Parliament in 2013. SPLUMA provides a framework for spatial planning and land use management in South Africa.

The subject area falls under the jurisdiction of the local municipality and the appropriate zoning and subdivision would need to be allocated in order to permit the development of the land for the intended purpose.

Consideration of the Northern Cape Provincial Development Spatial Development Framework and the Northern Cape Provincial Growth and Development Strategy will be taken.

4. ALTERNATIVES

Various layout alternatives were proposed and have been considered during the Scoping phase and these are described below.

4.1 ALTERNATIVE 1

Alternative 1 (**Appendix 2A**) is the first of 2 concept layouts initially proposed. This layout included 1844 erven, which included:

- Residential Zone I - 1830 land units will be established of which 1730 will be higher density and 100 will be lower density.
- Residential III – 1 Unit for Residential III usage
- Institutional I – Seven (7) land units
- Public Open Space - 3 land units
- Educational – One (1) land unit
- Public roads – Two (2) land units will be established. Primary land use right: Street or road

This alternative was considered a viable option as it provided a sufficient number of housing opportunities. It was initially the municipalities preferred layout. However, due to existing services infrastructure, this layout needed an amendment (see Alternative 3 below).

4.2 ALTERNATIVE 2

Alternative 2 (**Appendix 2B**) is the second of 2 concept layouts initially proposed. This layout included 1764 erven, which included:

- Residential Zone I - 1751 land units will be established of which 1651 will be higher density and 100 will be lower density.
- Residential III – 1 Unit for Residential III usage
- Institutional I – Six (6) land units
- Public Open Space - 3 land units
- Educational – One (1) land unit
- Government – One (1) land unit
- Public roads – One (1) land units will be established. Primary land use right: Street or road

Although this alternative was still considered a viable option, it was not preferred as it allowed for the least number of residential opportunities.

4.3 ALTERNATIVE 3

Alternative 3 (**Appendix 2C)** was the final concept layout proposed and is the Applicant's Preferred Layout. This layout includes 1711 erven:

According to the SPLUMA Application Report (**Appendix 4A**), the erven are broken down as follows:

- Residential Zone I - 1677 land units will be established of which 1577 will cover between 250m² (new erven for formalised structures) and 300m² (new erven) and 100 will cover approximately 500m² to 600m². Primary Use: Dwelling House

- Business I - Five (5) land units covering approximately 500m² will be established. Primary Use: Hotels, guest houses, places of refreshment, shops, business premises, dwelling units, residential building, place of amusement, places of worship including funeral parlours with chapels, places of instruction, dry cleaners, public garages, parking, car wash, social halls.
- Institutional I – Six (6) land units will be established in accordance with the requirements of the Guidelines for Human Settlement Planning and Design. Primary land use right: Institutions, dwelling units, places of public worship, places of instruction, canteen.
- Public Open Space - 14 land units will be established of which the primary purpose is to safely and practically enclose municipal infrastructure and associated servitudes. These land units also include an existing green area and soccer field (dimensions are in accordance with the requirements of the Guidelines for Human Settlement Planning and Design). Primary land use right: Public open spaces
- Educational – One (1) land unit will be established in accordance with the requirements of the Guidelines for Human Settlement Planning and Design and as per the specific request for a primary school site by the Department of Education. Primary land use right: Places of instruction, social hall, places of worship
- Municipal – Two (2) land units will be established – one land unit was specifically requested by the local authority with a required area of approximately 1000m², the second land unit was established in order to set apart municipal electrical infrastructure in the form of an electrical switch house. Primary land use right: Municipal Purposes.
- Government - One (1) land unit will be established, this land unit was specifically requested by the local authority with a required area of approximately 500m². Primary land use right: Government Purposes.
- Public roads – Five (5) land units will be established. Primary land use right: Street or road

Alternative 3 is similar to Alternative 1, and was developed with amendments to Alternative 1 due to new information from the municipal infrastructure departments in relation to existing services infrastructure that had a considerable impact on the layout and requirements for additional land uses/ changes to proposed land uses by the local municipality and specific spacing of these land uses. This alternative is also considered as a viable option, and is also the municipalities preferred layout since it provides sufficient erven and housing opportunities (high and lower density), as well as providing for Municipal and Government land use opportunities, and more Open Space.

4.4 OTHER ALTERNATIVES

Site Alternatives

This is the only site alternative considered. However, an initial site was considered that overlaps part of the proposed site (see figure 4below).

This site was not considered as a large portion of the site has existing agricultural plots established on the site. These would not have been possible to move or integrate meaningfully in the proposed development. The site also did not lend itself to as much infill development as the proposed site would have.

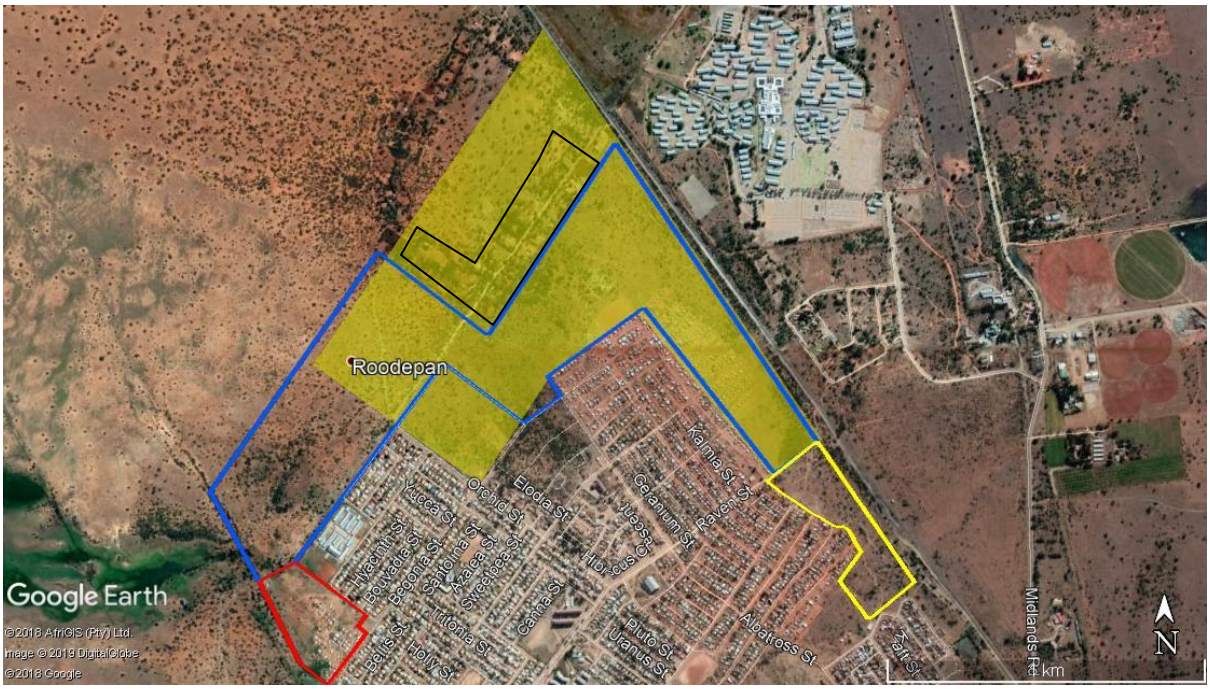

Figure 4: Google Earth image of the proposed site and the initially considered site (solid yellow polygon). The existing agricultural plots are indicated by the black polygon.

Activity Alternatives

No Activity Alternatives have been considered. The Municipality wants to develop the properties to provide much needed housing opportunities. Due to the need for housing in the Kimberley area, the housing development and associated infrastructure on the property is therefore the only activity considered.

4.5 NO-GO ALTERNATIVE

This is the option of not developing the proposed residential development.

Currently no formal Agricultural activities are taking place on Erf 15089 or Farm 70 Roodepan although they are zoned as Agricultural. However, the site is located adjacent to established residential developments.

Although the no-go development might result in no potential negative environmental impacts, especially on the vegetation on the development site, the direct and indirect socio-economic benefits of not constructing the residential development will not be realised. The need for additional housing opportunities in the area will not be realised.

5. SITE DESCRIPTION

5.1 LOCATION

The proposed site is located in Roodepan, adjacent to the existing residential area, in the north western suburb of Kimberley.

The study area is as follows:

- The Remainder of the Farm Roodepan No. 70 (approx. 75ha);
- Erf 17725, Kimberley (approx. 7ha);
- Erf 15089, Kimberley (approx. 8ha).

The site is mostly vacant, with only an informal church on Erf 15089, a few unregistered agricultural plots and informal structures on Farm 70 Roodepan, and some informal settlements on Erf 17725 (this property is presently zoned as a Public Open Space and as such these structures are in contravention with regard to the existing land use rights of the land that they are located on).

Due to the sites being in close proximity to existing formal and informal residential areas, and that the majority of the site is vacant, illegal refuse dumping is very prevalent on the site, especially on the edges adjacent to the existing residential areas. This is evident in Figures 6, 7 and 9 below.

The site coordinates of the site are as follows (refer to map below):

	Point	Latitude (S) (DDMMSS)			Longitude (E) (DDMMSS)		
Coordinates of corner points of study area	1	28°	38'	53.55"	24°	43'	00.79"
	2	28°	39'	38.17"	24°	43'	35.32"
	3	28°	39'	42.19"	24°	43'	30.08"
	4	28°	39'	38.02"	24°	43'	26.86"
	5	28°	39'	35.05"	24°	43'	29.05"
	6	28°	39'	10.35"	24°	43'	04.07"
	7	28°	39'	17.23"	24°	42'	52.88"
	8	28°	39'	21.98"	24°	42'	50.18"
	9	28°	39'	15.99"	24°	42'	40.73"
	10	28°	39'	36.42"	24°	42'	23.49"
	11	28°	39'	43.60"	24°	42'	31.82"
	12	28°	39'	48.83"	24°	42'	27.40"
	13	28°	39'	28.97"	24°	42'	13.55"
	14	28°	39'	04.57"	24°	42'	32.99"
	15	28°	39'	12.88"	24°	42'	46.00"

Figure 5: Google Earth image of the site showing co-ordinate locations.

Figure 6: General view of part of the proposed site (Farm Roodepan No.70), looking west. The existing residential area can be seen to the left of the image.

Figure 7: General view of part of the site, looking east over the boundary to Farm No.70 (to the left of image) and Erf 15089 to the right of the image.

Figure 8: General view of the central part of Farm Roodepan No.70, showing less disturbance the further from the existing residential areas

Figure 9: General view of the site, looking north over Farm No.70 from Camelia Street. The illegal dumping of waste and large volumes of waste (general and building rubble) is evident in this image.

5.2 VEGETATION

The proposed site of the residential development is undeveloped, fallow and generally near natural and in fairly good condition. The edges of the site, especially adjacent to the existing residential areas, are heavily disturbed by urban creep and illegal dumping. This can be seen in figures 6 – 9 above. The vegetation has also been impacted on by grazing, especially towards the west and northern sections of the site.

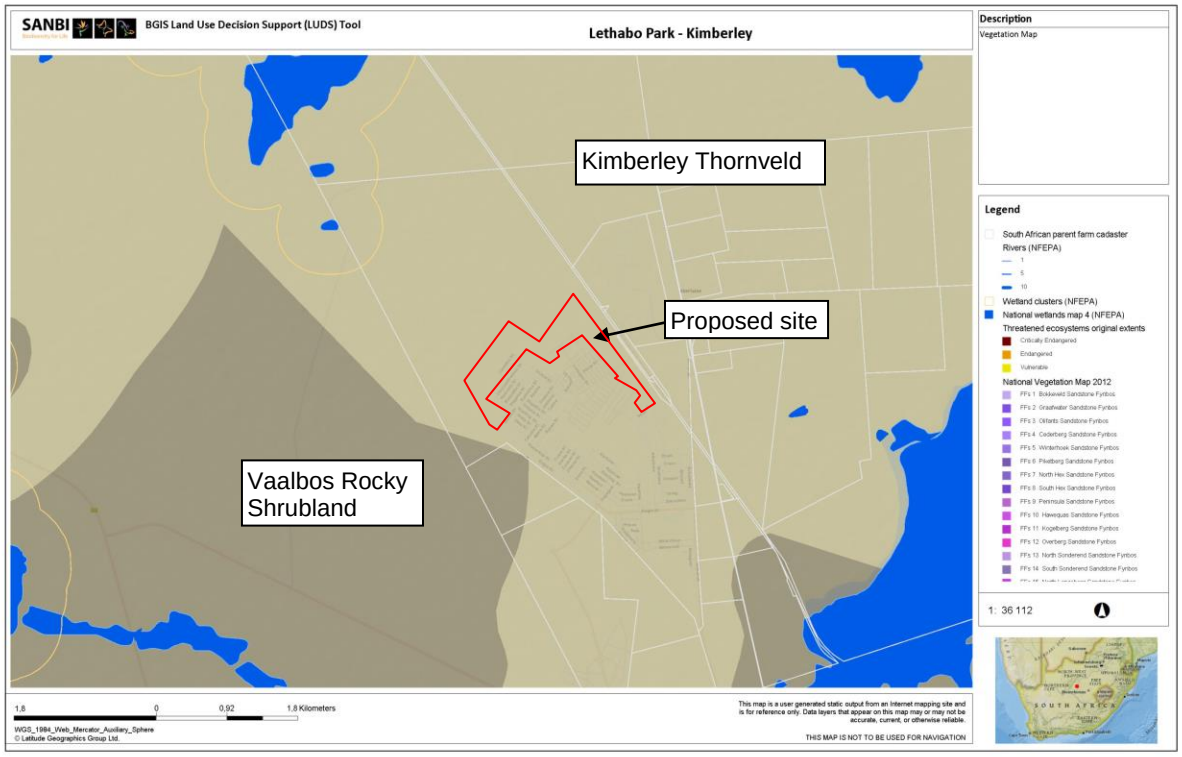

Figure 10: SANBI Vegetation map of the area.

According to the Vegetation map of South Africa, Lesotho and Swaziland, only one broad vegetation type is expected on the majority of the proposed site, namely Kimberley Thornveld (SVk4), and Vaalbos Rocky Shrubland (SVk5) in its immediate vicinity to the south and west (see figure 10 above).

The vegetation encountered can be described as an open thornveld or semi-open to closed mixed-acacia woodland. In general the tree canopy varied in height between 4-8 m and was dominated by *Vachellia tortilis* together with the alien invader tree*, Prosopis glandulosa* and a mixture of *Vachellia karroo* and *Senegalia mellifera* (Black thorn)*,* while *Ziziphus mucronata* was also relatively common.

5.3 FRESHWATER

From the SANBI National Freshwater Ecosystem Priority Areas map (see Figure 11 below), there are no natural watercourses on the proposed site. However, from the site visit and Google earth images, “wet” areas were noted to the east and to the west of the site.

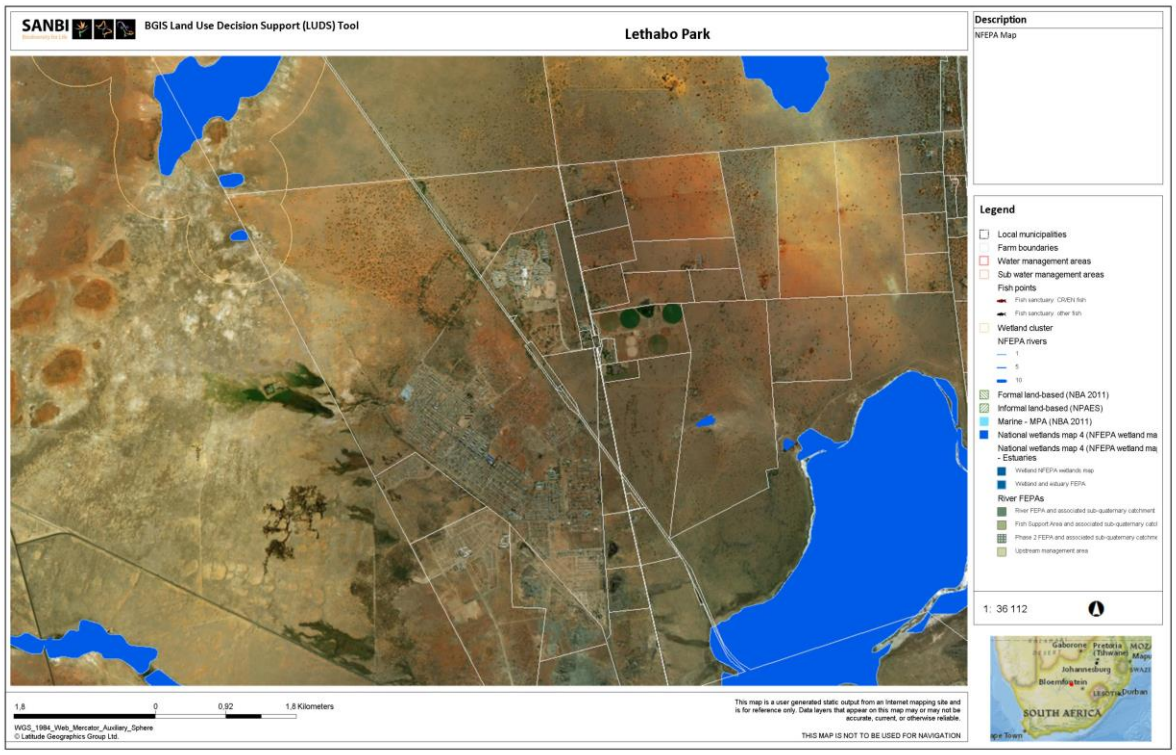

Figure 11: SANBI NFEPA map of the area.

According to the Freshwater Assessment (**Appendix 6C**), a possible natural drainage line, running south-west from the existing railway line, to a pan to the west of the development, may have historically occurred, but this has been replaced by a dirt road. The dirt road is densely overgrown with thorn bushes (*Acacia hebeclada*, but there were others as well), among which the drainage lines are very faint. There are signs that sediments have been eroded from the surface right down to the underlying calcrete, to be deposited lower down the catchment.

Although not on the development site, there are four pans to the west and south-west of the site. According to the Freshwater Assessment (**Appendix 6C**), the four pans to the west are important features of Lethabo Park's drainage landscape. Careful observation reveals that the top end of these pans always is located along diagonal dirt road to the west of Lethabo Park. From here the pans spread towards the west of north west. Water dissipates into the sandy soil and mostly evaporates, leaving the pans dry most of the time. It is surmised that these pans have considerably grown in size because of the storm water runoff from Lethabo Park. The time during which the pans are wet, dubbed the hydroperiod, has increased because of urban storm water runoff.

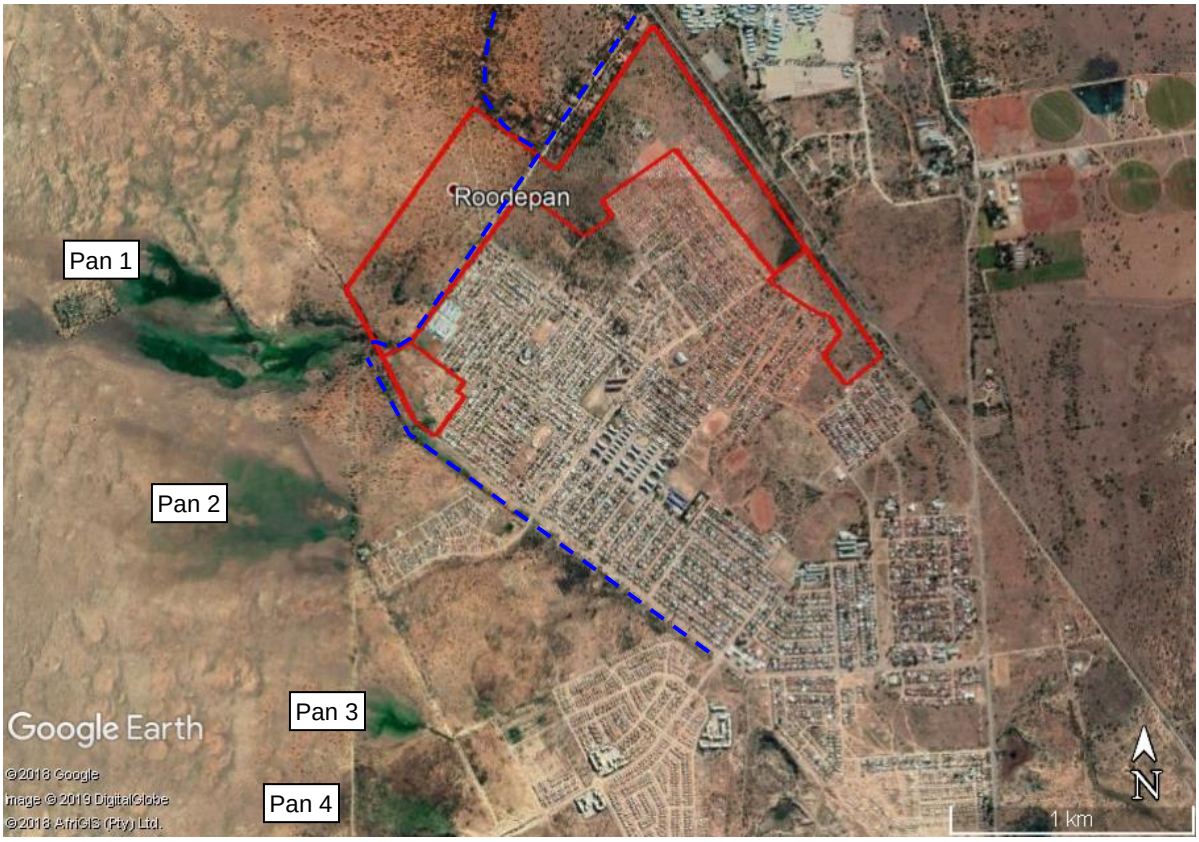

Figure 12: Google Earth image of the area, showing the site (red polygon) in relation to the drainage lines (blue dashed lines) and pans identified in the freshwater assessment.

5.4 GEOLOGY

According to the Geo-technical Assessment (**Appendix 6D**), regional geological information shows that the study area is underlain by the Prince Albert Formation (Ecca Group, Karoo Supergroup) as well as a dolerite intrusion. Quaternary aged deposits also occur.

The Prince Albert Formation (Ppr) consists primarily of shale bedrock. The Formation consists of micaceous shale or silty shale. Arenite and wacke also occur, along with sandstone in the western parts of the Karoo basin. At the same time, dolerite (Jd) of a Jurassic age has intruded the region extensively and erratically, cutting through the older Karoo sedimentary rocks. Lastly, quaternary aged aeolian sands (Qs) are indicated in the north eastern parts of the study and as suggested by the name, the material largely consists of sand deposits.

No fault lines are indicated in the vicinity of the study area.

5.5 GEOHYDROLOGY

According to the Geo-technical Assessment (**Appendix 6D**), no perched water or seepage was encountered in any of the trial holes and no signs or evidence of ferruginisation was noted. As such, it is unlikely that perched or seepage water will occur on this site under normal conditions.

The probability of drilling successfully for water in the area to be less than 40%. In addition, should water be encountered, the chances are between 20% and 30% that the yield of such a borehole will exceed 2l/s. Groundwater in the area is usually encountered at depths exceeding fifteen metres, occurring in compact, dominantly argillaceous strata.

5.6 CLIMATE

The Kimberley area is regarded as an arid area (regions with a rainfall of less than 400 mm per year are regarded as arid). This area normally receives about 283 mm of rain per year, with rainfall largely in summer. It receives the least amount of rain in winter (July), and the most amount during March.

The average midday temperatures range from 18^0C in June, to 32^0C in January.

5.7 SOCIO-ECONOMIC CONTEXT

According to the Sol Plaatje Municipality Integrated Development Plan (Final IDP 2017 – 2022), Sol Plaatje municipality comprises of an estimated 60 297 households housing a population of 248 041. One in five people of the province resides in the Sol Plaatje municipality. The current population density is 79 persons per km^2. The population growth rate over 10 years has been relatively low at 2.04 percent. The average household size is 3.9 persons per household.

According to the Sol Plaatje Municipality IDP, the municipality has experienced negative growth (-0.3%) in the population from 1996 to 2001 and an upswing to 2% from 2001 to 2011. The growth in population has led to sprawl and unplanned settlements which has in turn stressed the infrastructure of the city. It is likely that a number of people from other parts of the province have converged on the city in search of opportunities, access to facilities and government to create the basis of a better life.

Of the economically active people in the municipality, 31.9% are unemployed (narrow definition of unemployment). 41.7% of the economically active youth (15 – 34 years) in the area are unemployed.

The city is home to 60 297 households. From 2001 onwards there has been an increase in informal dwellings in the city. The demand of low-cost housing as well as middle income housing has outstripped supply. The current tenure status reveals a low uptake on the housing bond market, but reveals close to half the households as fully owned by the dweller.

Annual household income reveals about 72% of the households of Sol Plaatje falling in income bracket below R38 400 per year. The 2015 household survey revealed that 32.1% of the households in the Northern Cape indicate that social grants are the source of income. This is one indicator of

poverty, but not the only measure. Food insecurity is another measure of poverty, and food access problems in the Northern Cape were noted to be affecting 31,3% of the households. Given the density of population in the municipality and the in-migration towards perceived opportunities, it is likely that the poverty is acute in the municipality.

The percentage of individuals that benefited from social grants in South Africa consistently increased from 12,7% in 2003 to 30,1% in 2015. This effort on the part of government to care for the vulnerable and households in distress has arrested deep poverty. Social grants are generally dependant on individuals being the ones who have to actively apply for grants instead of the government identifying them as needing such. The percentage of households that received at least one grant increased from 29,9% in 2003 to 45,5% in 2015.

The anticipated socio-economic values associated with the proposed project, as provided by the municipality, can be seen in Table 1 below. The development is expected to create approximately 100 employment opportunities, with approximately 85% of that going to previously disadvantaged individuals.

Table 1: Social and Economic Aspect

Anticipated CAPEX value of the project on completion	R 3 109 225.00 (for planning and surveying i.e. township establishment)
What is the expected annual income to be generated by or as a result of the project?	±R20 000 000.00 estimated from generation of rates and taxes
New skilled employment opportunities created in the construction phase of the project	Construction phase of the project yet to commence. However, it is expected that new skilled employment opportunities will be created for local community during physical construction of infrastructure (i.e. top structure & installation of basic civil services)
New skilled employment opportunities created in the operational phase of the project	None
New un-skilled employment opportunities created in the construction phase of the project	Estimated ±100 employment opportunities
New un-skilled employment opportunities created in the operational phase of the project	None
What is the expected value of the employment opportunities during the operational and construction phase?	± R3 500.00 per employee per month
What percentage of this value that will accrue to previously disadvantaged individuals?	±85%
The expected current value of the employment opportunities during the first 10 years	Unknown at this stage
What percentage of this value that will accrue to previously disadvantaged individuals?	To be confirmed

Although no direct operational job opportunities are expected, indirect job opportunities may be provided with the provision of business zoned properties.

5.8 HERITAGE FEATURES

According to the Heritage Impact Assessment (**Appendix 6B**), two occurrences of stone age archaeological material were found within the development footprint. In the northeast section of Erf 15089, four lithics were recorded, which include flakes and upper grindstone. The large fragmented flakes with sharp edges could be the result of stone crushed for the track ballast of the rail line. Research has shown that some of the debitage produced by heavy-duty earth moving machines can mimic characteristics of lithics produced by knapping activity. The lithics are without archaeological context, and the proximity of this material to the railway line and railway equipment does substantiate this probability.

In the north-western section of Reminder of the Farm Roodepan No. 70, a low-density surface scatter of lithics that include MSA/Early LSA scraper and flakes and chips were recorded.

No historical period artefacts were identified within the boundaries of the study area. No significant historical features were identified within the study area.No formal or informal graves were identified within the development footprint.

According to the Heritage Impact Assessment (**Appendix 6B**), the proposed development footprint is entirely underlain by the Lower Permian sediments of the Ecca Group (Prins Albert Formation) of the Karoo Basin. According to the SAHRIS PalaeoMap, the palaeontological sensitivity of the Prince Albert Formation is rated as high. A site-specific field survey of the development footprint was conducted and no visible evidence of fossiliferous outcrops was found.

6. SERVICES

Due to the nature and size of the proposed development, an investigation into the status and availability of existing bulk services to supply the development was needed.

Reneilwe Consulting and Planners prepared the preliminary Infrastructure Capacity Report (attached as **Appendix 4B**) investigating the status of existing services that were identified to potentially supply the proposed area on the external services for the proposed development.

A brief description of the bulk services is given below.

6.1 WATER

According to the Draft Infrastructure Capacity Report (**Appendix 4B**), the following information was obtained regarding water supply:

- There are two pipes (600 and 965 mm diameter) running on a provincial road adjacent to Roodepan which come from a water purification plant that serves the entire municipality
- A 350mm diameter steel pipe connects to the 600 mm diameter pipe with a pressure reducing valve on the 450 mm diameter steel pipe
- The 350 mm diameter steel pipe was meant to supply water to a 0.75 Mega litre concrete pressure tower that would eventually supply the Roodepan settlement.
- However due to physical structural integrity concerns observed from the 0.75 Mega litre tower the configuration was discontinued, and the settlement is now fed directly from the 350 mm diameter pipe with no back up storage.
- The reticulation system consists of main lines which range from 110 to 450 mm diameter connecting to services lines which are 100mm to 63/50 mm diameter.

In addition to the network configuration explained above, it was discovered that the pressure-reducing valve is currently being used to operate/control the water network in as far as pressure and flow is concerned. Moreover, the municipality personnel confirmed that there is hardly any water interruption issues because the supply is in a way fed by the main pipes from the water purification plant, which also supply the rest of the municipality.

However, it was also observed that the pressure control tower showed signs of deterioration through exposed reinforcement and cracked concrete.

The water demand was calculated, with the following deductions made:

- Roodepan settlement has 9 Megalitre 1-day storage requirement based on design calculations
- After water demand calculations done for both settlement a 12 Megalitre 1-day storage reservoir will be recommended as a 1-day storage reservoir is required according to the Redbook.
- A calculated pipe size of 355mm for Roodepan settlement only which is slightly bigger than the existing pipe main of 350mm, which seems to be adequate.
- After incorporating the water capacity for the two settlements a main pipe size of 400mm will be required. The 350mm existing main pipe will have to be upgraded to a 400mm to handle the water demand capacity.

It should be noted that the 12 Mega litre storage is only for 1-day storage and it depends on the reliability of the water source and maintenance teams, in some cases 2-day storage suffices for most areas but will influence a substantial increase in cost for constructing a 24 Mega litre storage reservoir hence rendering a 1 day storage more feasible.

The Draft Infrastructure Capacity Report (**Appendix 4B**) concluded that from the water demand calculations done for both settlements, a 12 Megalitre - day storage reservoir will be recommended. The Roodepan settlement currently does not have storage which is highly recommended so as to ensure constant supply of water.

After incorporating the water capacity for the two settlements a main pipe size of 400mm will be required. The 350mm existing main pipe will have to be upgraded to a 400mm to handle the water demand capacity.

6.2 SEWER

According to the Draft Infrastructure Capacity Report (**Appendix 4B**), the following information was obtained regarding sanitation services:

- The Roodepan area is serviced by the main wastewater treatment plant which services the entire Kimberly
- The wastewater treatment plant currently has a capacity of 48 Megalitre per day, which was recently upgraded from 33 Megalitre.
- According to municipal technical personnel, it is currently operating at 23 Megalitre at peak demand, which is more than half of its full capacity.
- The main bulk sewer line is connected by five lift stations located along the western part of the settlement, the area's topography is very flat and as such, the lifting stations ensure that sewer lines are not very deep due to minimum slope required for self-cleansing velocity amongst other hydraulic requirements.
- According to the information received from council, there is a 200 mm diameter sewer line which is mainly a rising main connected to most of the lift stations and an outfall gravity line of 450 mm diameter which eventually connects to the wastewater treatment plant.
- Some of the lift stations are not in a good operating condition although they are still functioning, it was observed that there is many overflows as well as lack of maintenance.
- The network is made up of predominantly 160 mm diameter AC pipes, which are more than 15 to 20 years old. Many pipe leakages were observed within the sewer network and this is suspected to be due to high demand as well as aging infrastructure.

The council technical personnel further indicated that there is currently an outfall sewer line, which is being designed by another consulting firm. The design report was not available at the time of this report, as it would clarify what capacity has been designed for and what future demands have been calculated.

The sewer demand was calculated, with the following summary:

- The total capacity for the existing Roodepan settlement was calculated in order to determine the outfall pipe.
- Roodepan has a total of estimated 6463 stands and 93.3 l/s flow is generated. From the design calculation a 315 mm pipe would be sufficient, but the pipe onsite is a 450mm which is sufficient.

- Adding extra flow from the Lethabo settlement with 1838 stands/units which generates a flow of 19.9 l/s the onsite pipe needs to have enough capacity to handle both flows.
- Flow generated from both settlements according to the sewer demand calculations is 113.2 l/s and the outfall sewer 450 mm pipe has a capacity of 310.17 l/s showing that it can handle both capacities.
- The outfall sewer services a wastewater treatment with a capacity of 23 Mega litres at peak factor, therefore the 9.73 Mega litres produced by the two settlements can be accommodated.
- A detailed sewer design for the existing Roodepan sewer system and the proposed Lethabo settlement was then established.

Design calculations show that the pipes are connected to a pump station in the Roodepan areas. The capacities at the pump station were calculated and the capacity to the outfall sewer was also determined.

From the design calculation the pipe sizes for the new Lethabo Park Extension settlement park were determined. The existing sewer design can handle the capacity generated by both settlements.

Due to the fact that the existing sump stations sizes were not available a comparison could not be made. It is important to note that from the physical investigation most of the lift station were overflowing although they were still operational.

The Draft Infrastructure Capacity Report (**Appendix 4B**) concluded that the design calculations showed that the Roodepan sewer pipes had enough capacity to handle the generated capacity. An outfall sewer pipe of 450mm has a capacity of 310 l/s which can handle the generated capacity of 96.5 l/s by both Roodepan and Lethabo settlements.

In sizing the pump stations the existing sizes were not provided therefore a conclusion could not be reached but from the physical investigations done it was observed that there was overflow either due to lack of maintenance or the sizing of the sump stations. The leakages observed could be due to the aging infrastructure or the pipes were not well-connected during construction stages.

6.3 ROADS

According to the Draft Infrastructure Capacity Report (**Appendix 4B**), with regards to the Roodepan area, the internal roads are normal surfaced roads with widths varying from four to six meters and there are sections, which are underdeveloped, and they have informal gravel roads in some cases. The main road connected through a provincial road, which is the MR 909, which will be investigated in a form of a traffic impact study within the project as well.

The Traffic Impact Study (**Appendix 6E**), has been conducted, with the findings and recommendations addressed in Section 10.5 below.

6.4 STORMWATER

According to the Draft Infrastructure Capacity Report (**Appendix 4B**), the area has underground conventional storm water network that collects through street kerbs and channeled through underground storm water pipes. It should however be noted that due to the flat slope of the area the

storm water network is divided into various sub networks which drain at different drainage pans around or adjacent to the area.

The stormwater management demand calculation for Roodepan were calculated and the pipe sizes were determined for the minor and major systems. Stormwater demand calculations depended on the catchment area in Lethabo Park and part of Roodepan settlement showed that a 450mm pipe will be needed for minor systems and a 550mm pipe will be needed for the major systems.

The minor system collects storm water through street kerbs and channels it to the major systems which are channelled through underground storm water pipes.

6.5 SOLID WASTE (REFUSE) REMOVAL

Refuse removal will be via the Municipal waste stream and disposed of at the nearest municipal bulk solid waste disposal site.

6.6 ELECTRICITY

According to the Draft Infrastructure Capacity Report (**Appendix 4B**), for a clear indication of capacity availability, all settlements serviced by the 30MVA substation have been calculated. The results show that a capacity of 6.73 MVA upgrade is required to be able to supply both Lethabo and Roodepan settlement.

7. PROCESS TO DATE

The section below outlines the various tasks undertaken to date, the members of the team involved in the project, as well as the Public Participation Process.

7.1 TASKS UNDERTAKEN TO DATE

Table 2: Tasks undertaken in the EIA to date

DATE	TASK
SCOPING PHASE	
November - December 2018	Initial public participation, including newspaper advertisements, posters, letter drops, BID and notification letters to identified interested and affected parties.
08 February 2019	Submit Application Form to DE&NC
18 February 2019	Received acknowledgement from DE&NC
11 February 2019 – 14 March 2019.	Distribution of notification letters and the Post-Application Draft Scoping Report to Registered Interested and Affected Parties
14 March 2019	30-day comment period ends.
	Compile the Final Scoping Report
27 March 2019	Submit Final Scoping Report to DE&NC.
25 April 2019	Acceptance of Scoping report and Plan of Study for EIA (Appendix 1B)
ENVIRONMENTAL IMPACT ASSESSMENT REPORT PHASE (THIS PHASE)	
May – June 2019	Undertake Specialist Studies where required
July 2019	Draft Environmental Impact Report compiled and made available for viewing and comment to Registered Interested and Affected Parties (this report)

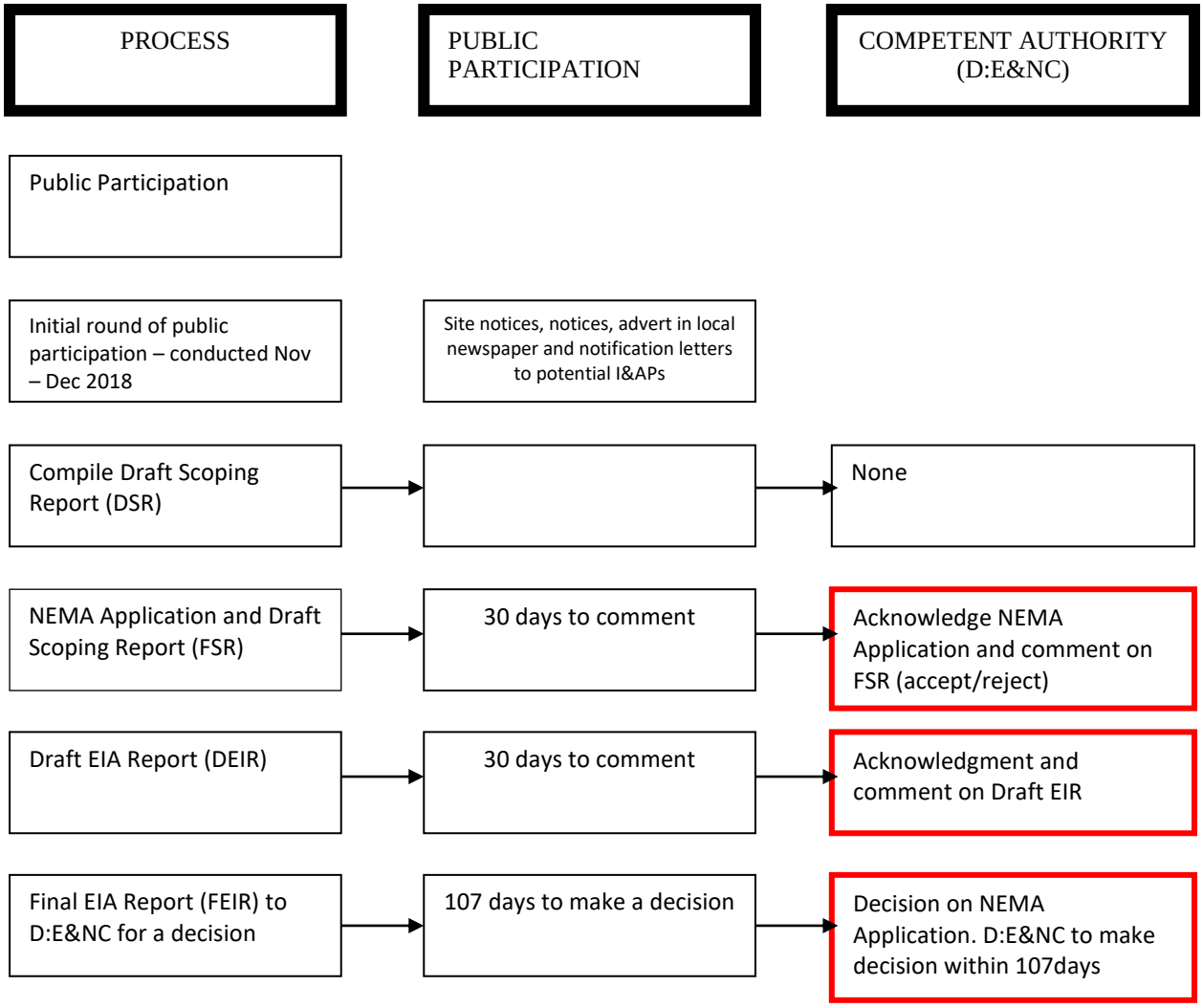

Figure 13. Summary of the EIA process and public participation process. The red indicates the stages where the competent authority will be consulted during the process.

7.2 TASKS TO BE UNDERTAKEN DURING THE EIA PHASE

The following tasks must still be undertaken during the EIA phase of the process:

- Compile Draft Environmental Impact Report (EIR) (THIS DOCUMENT) for public comment based on specialist information.
- Advertise Draft EIR for public comment
- Distribute and/or make the Draft EIR available for viewing and comment
- Receive comments on Draft EIR. All comments received and responses to the comments will be incorporated into the Final Environmental Impact Report (EIR)
- Preparation of a FINAL EIR for submission to DE&NC for consideration and decision-making.

Please refer to Figure 13 to see where the public participation process is present in the environmental impact assessment. The Interested and Affected Parties will have a chance to view and comment on

all the reports that are submitted. The figures also indicated what timeframes are applicable to what stage in the process. If required, meetings with key stakeholders will be held.

At the end of the comment period, the EIR will be revised in response to feedback received from I&APs. All comments received and responses to the comments will be incorporated into the Final Environmental Impact Report (EIR). The Final EIR will then be submitted to DE&NC for consideration and decision-making.

Correspondence with I&APs will be via post, telephone, email and newspaper advertisements.

Should it be required, this process may be adapted depending on input received during the on-going process and as a result of public input. DE&NC will be informed of any changes in the process.

7.3 PROFESSIONAL TEAM

The following professionals are part of the project team.

Table 3: Members of the professional team

DISCIPLINE	SPECIALIST	ORGANISATION
Environmental Consultants	Clinton Geyser / Bernard de Witt	**EnviroAfrica**
Town Planners	Len Fourie / Jani Bruwer / Tinyiko Dwane	**MacroPlan Town and Regional Planners/ Rural and Urban Planners (Pty) Ltd**
Consulting Engineers	Botshelo Jacobs	**Reneilwe Consultants and Planners**
Botanist	Peet Botes	**PB Consult**
Heritage	Jan Englebrecht	**Ubique Heritage Consultants**
Freshwater	Dr Dirk van Driel	**Watsan Africa**
Geo-technical	Dr Izak Breytenbach	**Soilkraft CC**
Traffic		**Route 2 Transport Strategies cc / Reneilwe Consultants and Planners**

7.4 PUBLIC PARTICIPATION

A Public Participation Process was undertaken in accordance with the requirements of the NEMA Environmental Impact Assessment Regulations: Guideline and Information Document Series. *Guidelines on Public Participation 2013* and the NEMA EIA Regulations 2014 (amended). Issues and concerns raised during the Scoping phase are dealt within this report.

7.4.1 PUBLIC PARTICIPATION UNDERTAKEN DURING SCOPING PHASE:

Interested and Affected Parties (I&APs) have been and will be identified throughout the process. Landowners adjacent to the proposed site, relevant organs of state, organizations, ward councillors and the Local and District Municipality were added to this database. A complete list of organisations and individual groups identified to date is shown in **Appendix 3.**

Public Participation will be conducted for the proposed development in accordance with the requirements outlined in Regulation 41 of the NEMA EIA Regulations 2014. The issues and concerns raised during the scoping phase will be dealt with in the EIA phase of this application.

As such each subsection of Regulation 41 contained in Chapter 6 of the NEMA EIA Regulations 2014 will be addressed separately to thereby demonstrate that all potential Interested and Affected Parties (I&AP's) were notified of the proposed development.

R54 (2) (a):

R41 (2) (a) (i): The site notices (A2 and A3 sizes) were placed at different locations around the project site as well as at the municipality office in town. (please refer to **Appendix 3D**)

The posters contained all details as prescribed by R41(3) (a) & (b) and the size of the on-site poster was at least 60cm by 42cm as prescribed by section R41 (4) (a).

R41 (2) (a) (ii): N/A. There is no alternative site.

R41 (2) b):

R41 (2) (b) (i): N/A. The Applicant is the landowner

R41 (2) (b) (ii): The background information document (**Appendix 3A**) was circulated to residents within a 200m radius of the project site **Appendix 3C**

R41 (2) (b) (iii): An initial notification letter was sent to the municipal Ward councillor at the Sol Plaatje Municipality, for the ward in which the site is situated (please refer to **Appendix 3C** for proof of notification letters sent).

R41 (2) (b) (iv): An initial notification letter was sent to the Sol Plaatje Municipality as the municipality is the Applicant

R54 (2) (b) (v): Initial notification letter (please refer to **Appendix 3C** for proof of notification letters sent) will be sent to the following organs of state having jurisdiction in respect of any aspect of the activity:

- Department of Water and Sanitation
- Department of Agriculture and Land Reform
- Department of Roads and Public Works
- Department of Agriculture, Forestry and Fisheries
- Department of Cooperative Governance, Human Settlements and Traditional Affairs
- SANRAL
- Department of Environment and Nature Conservation
- South African Heritage Resources Agency
- Department of Mineral Resources
- Department of Education
- Department of Defence

R41 (2) (c) (i): An advertisement was placed in the local newspaper, Diamond Fields Advertiser, on 21 November 2018 (please refer to **Appendix 3B** for proof of advertisement).

R41 (2) (d): N/A

R41 (6):
R41 (6) (a): All relevant facts in respect of the application were made available to potential I&AP's.

R41 (6) (b): I&AP's were given more than a 30-day registration and comment period on the proposed application during the first round of public participation.

R42 (a), (b), (c) and R43(2): A register of interested and affected parties was opened, maintained and is available to any person requesting access to the register in writing (please refer to **Appendix 3F** for the list of Interested and Affected Parties.

Please find attached in **Appendix 3**:

- Proof of Notice boards, advertisements and notices that were sent out
- List of potential interested and affected parties
- Summary of issues raised by interested and affected parties

7.4.2 PUBLIC PARTICIPATION UNDERAKEN DURING THE EIA PHASE:

A number of groups and individuals were identified as Interested and Affected Parties during the initial Public Participation Process. A complete list of organisations and individual groups identified to date, as well as those I&APs that have registered are shown in **Appendix 3F.**

Full copies of the Environmental Impact Assessment Report (EIR) will be sent to all Registered I&APs, and will be notified of the Environmental Impact Report (EIR) by means of notification letters (via preferred method of communication), informing them of the availability of the Draft EIR and will be invited to comment. The EIR will be made available for a 30-day comment period. The comment period will also include a public

At the end of the comment period, the EIR will be revised in response to feedback received from I&APs. All comments received and responses to the comments will be incorporated into the Final Environmental Impact Report (Final EIR) in the form of a Comments and Response Table. The Final EIR will be made available for a further 30-day comment period. The Final EIR will then be submitted to D:E&NC for decision.

Should it be required, this process may be adapted depending on input received during the ongoing process and as a result of public input. Both DENC and registered I&APs will be informed of any changes in the process.

7.4.3 INTERESTED AND AFFECTED PARTIES

Interested and Affected Parties (I&APs) have been notified by means of advertisements in regional and local newspapers, site notices and letters and/or emails to registered I&APs on the project database.

A list of I&APs is included as **Appendix 3F**.

8. ENVIRONMENTAL ISSUES AND POTENTIAL IMPACTS

Environmental issues were raised through informal discussions with the project team, specialists and authorities, as well as by Interested and Affected Parties during the public participation period of the Scoping Report. All issues raised will be assessed in the specialist reports and will form part of the Environmental Impact Report. Any additional issues raised during the public participation will be listed in the Final Environmental Impact Report.

The following potential issues have been identified:

8.1 BIODIVERSITY

8.1.1 BOTANICAL

A Botanical Impact Assessment (**Appendix 6A**) has been conducted to determine if there is any sensitive or endangered vegetation on the proposed site. Due to the size of the development (approximately 90ha), there will be a significant loss of vegetation during the construction phase of the project.

Botanical Impact Assessment will describe and assess the botanical sensitivity of the area. The terms of reference for this study required a baseline analysis of the flora of the property, including the broad ecological characteristics of the site.

The botanical assessment will include the following:

- The significance of the potential impact of the proposed project, alternatives and related activities – with and without mitigation – on biodiversity pattern and process at the site, landscape and regional scales.
- Recommended actions that should be taken to prevent or, if prevention is not feasible, to mitigate impacts.

8.1.2 FAUNA

Mammal and bird species was not regarded as the proposed activity is not expected to have any significant, permanent impact on these species. As confirmed in the Botanical Impact Assessment (**Appendix 6A**), due to the location of the study area on the urban edge, the current land-use (livestock grazing), the adjacent farming practices (including wild game hunting) and the poor status of the veld in many parts of the proposed footprint will all contribute to a disturbance factor, which is likely to have driven most wild animals away from this area. Because of the long-term impact of human settlement on the larger areas and especially because of the close proximity of the proposed development areas to the urban edge a comprehensive faunal survey is not deemed necessary.

8.2 HERITAGE

The possible impact on heritage resources has been identified as a possible environmental impact as a result of the construction of the residential development and associated infrastructure.

A Heritage Impact Assessment (**Appendix 6B**) has been conducted on the site.

The terms of reference for the heritage and archaeological study are as follows:

- the identification and mapping of all heritage resources in the area affected;
- an assessment of the significance of such resources in terms of heritage assessment criteria set out in regulations;
- an assessment of the impact of the development on heritage resources;
- an evaluation of the impact of the development on heritage resources relative to the sustainable social and economic benefits to be derived from the development;
- if heritage resources will be adversely affected by the proposed development, the consideration of alternatives; and
- plans for mitigation of any adverse effects during and after completion of the proposed development.

Also, the HIA/AIA should comply with the requirements of NEMA, including providing the assumptions and limitations associated with the study; the details, qualifications and expertise of the person who prepared the report; and a statement of competency.

8.3 FRESHWATER ASSESSMENT

Although no freshwater ecosystems were identified on desktop analysis, due to the size and nature of the development and the unknown source of standing water within the development site, a freshwater impact assessment will be conducted.

The terms of reference for the Freshwater assessment are as follows:

- Literature review and assessment of existing information
- Site Assessment of the proposed activities and impact on the associated freshwater systems. This will include an assessment of the freshwater ecological condition, using river health indices such as in-stream and riparian habitat integrity, aquatic macro-invertebrates and riparian vegetation to determine set back lines and geomorphological condition of the streams, which will then determine the overall Ecostatus of the streams and provide data that will inform the Water Use Licence Application of the project.
- Describe ecological characteristics of freshwater systems and compile report based on the data and information collected in the previous two tasks, describe ecological characteristics of the freshwater systems, comment on the conservation value and importance of the freshwater systems and delineate the outer boundary of the riparian zones/riverine corridors.
- Evaluate the freshwater issues on the site and propose mitigation measures and measures for the rehabilitation of the site as well as setback lines for future development.
- Compilation of the documentation for submission of the water use authorisation application (WULA) to the Department of Water and Sanitation (if deemed necessary).

8.4 GEO-TECHNICAL ASSESSMENT

A Geo-technical assessment will be required to provide information related to the soil types, soil potential, soil stability, subsoil structure, suitability of the area to support the proposed structures and recommendation for foundations.

The Geo-technical assessment is included as **Appendix 6D**.

8.5 TRAFFIC IMPACT ASSESSMENT

The potential impact of the new development on the current and projected traffic levels of the surrounding road network will need to be assessed, and recommendations made on external road upgrades and suggested mitigation regarding the proposed access route.

A Traffic Impact Study (**Appendix 6E**) has been conducted.

8.6 VISUAL IMPACT

The potential impact on the sense of place of the proposed residential development has also been considered. However, due to the nature of the activity, the surrounding land-uses and the proximity to other existing residential area, and that the sense of place is not expected to be significantly altered by the proposed residential development, no further studies were suggested.

8.7 OTHER ISSUES AND IMPACTS

The proposed Lethabo Park development has the following additional impacts:

8.7.1 ENERGY REQUIREMENTS

Construction energy requirements:
The proposed development involves the construction of approximately 1700 properties. Subsequently, the initial energy requirements of the project will basically be limited to the use of small power tools, plant such as mixers etc. typically to be powered by portable on-site generators.

Operational phase energy requirements:
According to the Draft Infrastructure Capacity Report (**Appendix 4B**), for a clear indication of capacity availability, all settlements serviced by the 30MVA substation have been calculated. The results show that a capacity of 6.73 MVA upgrade is required to be able to supply both Lethabo and Roodepan settlement. Lethabo Park will have a demand capacity of 11.17MVA.

8.7.2 WATER REQUIREMENTS

Construction water requirements:

Water requirements during the construction phase are unknown at this stage, but it is estimated that a maximum amount in the order of 100 - 150 kiloliter per day will be required for construction purposes, depending on phasing of construction.

Operational phase water requirements:

The operational phase water requirements, the Average Annual Daily Demand is still to be confirmed

8.7.3 NATURE AND QUANTITY OF RAW MATERIALS

This project comprises the construction of approximately 1700 residential and other structures. Subsequently several thousands of cubic meters of crushed stone, sand and cement will be utilized together with reinforcing steel, wood and other material used in the construction of residential units, schools, businesses etc, as input materials during construction.

Exact quantities can only be determined once detailed designs of the structures have been completed.

This development is not expected to utilize any raw materials during the operational phase, besides water usage.

8.7.4 WASTE TYPES, QUANTITIES AND DISPOSAL METHODS

Construction Phase

As this is a “greenfields” project, there are no existing structures to be demolished. It is therefore envisaged that very little building rubble and waste will be generated during construction. Typically, losses of raw materials due to transport, stockpiling on site and conveyance losses amount to approximately 5% of the volumes required. It is not known how much solid waste will be generated during the construction period. This waste will typical be builder’s rubble, concrete debris, timber from used shutters, etc. The waste will be stockpiled on site and periodically disposed of at the nearest licensed landfill site by the contractor.

The large amounts of litter presently on site will also need to be consolidated, removed from site and disposed of at the nearest approved municipal waste disposal site.

Operational Phase

Since the development is generally a residential development, general residential household waste will be generated. Refuse removal should be via the Municipal waste stream and disposed of at the nearest municipal bulk solid waste disposal site.

8.7.5 EMPLOYMENT OPPORTUNITIES

Please refer to Section 5.7 and Table 1 for the anticipated employment opportunities expected from the proposed development.

9. SPECIALIST STUDIES

Based on the issues raised by the I&APs and the project team, specialist studies were undertaken to provide information to address the concerns and assess the impacts of the proposed development alternatives on the environment.

The specialists are provided with set criteria for undertaking their assessments, to allow for comparative assessment of all issues. These criteria are detailed in the Terms of Reference to each specialist and summarised below.

9.1 CRITERIA FOR SPECIALIST ASSESSMENT OF IMPACTS

These criteria are based on the EIA Regulations, published by the Department of Environmental Affairs and Tourism (April 1998) in terms of the Environmental Conservation Act No. 73 of 1989.

These criteria include:

- **Nature of the impact**
  This is an appraisal of the type of effect the construction, operation and maintenance of a development would have on the affected environment. This description should include what is to be affected and how.
- **Extent of the impact**
  Describe whether the impact will be: local extending only as far as the development site area; or limited to the site and its immediate surroundings; or will have an impact on the region, or will have an impact on a national scale or across international borders.
- **Duration of the impact**
  The specialist should indicate whether the lifespan of the impact would be short term (0-5 years), medium term (5-15 years), long terms (16-30 years) or permanent.
- **Intensity**
  The specialist should establish whether the impact is destructive or benign and should be qualified as low, medium or high. The specialist study must attempt to quantify the magnitude of the impacts and outline the rationale used.
- **Probability of occurrence**
  The specialist should describe the probability of the impact actually occurring and should be described as improbable (low likelihood), probable (distinct possibility), highly probable (most likely) or definite (impact will occur regardless of any prevention measures).

The impacts should also be assessed in terms of the following aspects:

- **Status of the impact**
  The specialist should determine whether the impacts are negative, positive or neutral (“cost – benefit” analysis). The impacts are to be assessed in terms of their effect on the project and the environment. For example, an impact that is positive for the proposed development may be negative for the environment. It is important that this distinction is made in the analysis.

- **Accumulative impact**
  Consideration must be given to the extent of any accumulative impact that may occur due to the proposed development. Such impacts must be evaluated with an assessment of similar developments already in the environment. Such impacts will be either positive or negative, and will be graded as being of negligible, low, medium or high impact.
- **Degree of confidence in predictions**
  The specialist should state what degree of confidence (low, medium or high) is there in the predictions based on the available information and level of knowledge and expertise.

Based on a synthesis of the information contained in the above-described procedure, the specialist is required to assess the potential impacts in terms of the following significance criteria:

- **No significance**: the impacts do not influence the proposed development and/or environment in any way.
- **Low significance**: the impacts will have a minor influence on the proposed development and/or environment. These impacts require some attention to modification of the project design where possible, or alternative mitigation.
- **Moderate significance**: the impacts will have a moderate influence on the proposed development and/or environment. The impact can be ameliorated by a modification in the project design or implementation of effective mitigation measures.
- **High significance**: the impacts will have a major influence on the proposed development and/or environment.

The final impact assessment report should at least include the following sections:

- Executive Summary
- Introduction and Description of Study
- Methodology
- Results
- Assessment of Impacts (including mitigation measures to reduce negative impacts and measures to enhance positive impacts and the completion of impact tables)
- Discussion
- Recommendations (Pre-Construction, Construction and Operational Phases)
- Conclusion

9.2 BRIEFS FOR SPECIALIST STUDIES TO BE UNDERTAKEN AS PART OF THE EIA

9.2.1 BOTANICAL ASSESSMENT

Peet Botes (PB Consult) was appointed and undertook the Botanical Assessment on the proposed site – **Appendix 6A**.

The terms of reference for this study include the following:

- Evaluate the proposed site(s) in order to determine whether any significant botanical features will be impacted as a result of the proposed development.
- Determine and record the position of any plant species of special significance (e.g. protected tree species, or rare or endangered plant species) that should be avoided or that may require “search & rescue” intervention.

- Make recommendations on impact minimization should it be required
- Consider short- to long-term implications of impacts on biodiversity and highlight irreversible impacts or irreplaceable loss of species.

9.2.2 HERITAGE IMPACT ASSESSMENT

Jan Engelbrecht of the Ubique Heritage Consultants was appointed to compile the Heritage Impact Assessment (HIA) – **Appendix 6B**.

The terms of reference for the heritage impact study were:

- the identification and mapping of all heritage resources in the area affected;
- an assessment of the significance of such resources in terms of heritage assessment criteria set out in regulations;
- an assessment of the impact of the development on heritage resources;
- an evaluation of the impact of the development on heritage resources relative to the sustainable social and economic benefits to be derived from the development;
- if heritage resources will be adversely affected by the proposed development, the consideration of alternatives; and
- plans for mitigation of any adverse effects during and after completion of the proposed development.

Also, the HIA/AIA should comply with the requirements of NEMA, including providing the assumptions and limitations associated with the study; the details, qualifications and expertise of the person who prepared the report; and a statement of competency.

9.2.3 FRESHWATER ASSESSMENT

Dr Dirk van Driel (Watsan Africa) has been appointed to undertake the Freshwater Assessment for the proposed development – **Appendix 6C**.

The terms of reference for the Freshwater assessment are as follows:

- Literature review and assessment of existing information
- Site Assessment of the proposed activities and impact on the associated freshwater systems. This will include an assessment of the freshwater ecological condition, using river health indices such as in-stream and riparian habitat integrity, aquatic macro-invertebrates and riparian vegetation to determine set back lines and geomorphological condition of the streams, which will then determine the overall Ecostatus of the streams and provide data that will inform the Water Use Licence Application of the project.
- Describe ecological characteristics of freshwater systems and compile report based on the data and information collected in the previous two tasks, describe ecological characteristics of the freshwater systems, comment on the conservation value and importance of the freshwater systems and delineate the outer boundary of the riparian zones/riverine corridors.
- Evaluate the freshwater issues on the site and propose mitigation measures and measures for the rehabilitation of the site as well as setback lines for future development.
- Compilation of the documentation for submission of the water use authorisation application (WULA) to the Department of Water and Sanitation (if deemed necessary).

9.2.4 GEO-TECHNICAL ASSESSMENT

Soilkraft cc was appointed to conduct a Phase One Geo-technical Assessment of the proposed site - **Appendix 6D**.

The primary objective of this study is to provide information related to the soil types, soil potential, soil stability, subsoil structure, suitability of the area to support the proposed structures and recommendation for foundations.

9.2.5 TRAFFIC ASSESSMENT

Route 2 Transport Strategies cc/ Reneilwe Consultants and Planners have been appointed to conduct the Traffic Impact Study for the proposed development. This is included as **Appendix 6E**.

The aim of this study is:

- To determine the impact of the additional traffic generated by the proposed development on the existing road network;
- To propose measures that could be put in place to mitigate the impact that the proposed development will have on the existing traffic and road conditions;
- To determine a suitable access regime for the proposed development; and
- To provide sufficient information for the approval of the proposed development.

10. ASSESSMENT OF ENVIRONMENTAL IMPACTS

The specialist studies detailed in Section 8 were undertaken to determine significance of the impacts that may arise from the proposed development. The findings of the specialist studies are summarised here. Full copies of the studies are included in **Appendices 6A – 6E**.

The following specialist studies were undertaken:

10.1 BOTANICAL ASSESSMENT

Peet Botes (PB Consult) was appointed and undertook the Botanical Assessment on the proposed site – The Botanical Impact Assessment is included as **Appendix 6A**.

10.1.1 KEY FINDINGS

According to the Botanical Impact Assessment (**Appendix 6A**), in accordance with the Vegetation map of South Africa, Lesotho and Swaziland (Mucina & Rutherford, 2006, as updated in the 2012 beta version) only one broad vegetation type is expected in the proposed area and its immediate vicinity, namely **Kimberley Thornveld**. This vegetation type is considered "Least Threatened" (GN 1002, December 2011), but only 2% is currently statutorily conserved in the Vaalbos National Park, the Sandveld Bloemhof Dam and S.A. Lombard Nature Reserves, while some 18% of this vegetation is already transformed, mostly by cultivation.

The vegetation encountered can be described as an open thornveld or semi-open to closed mixed-acacia woodland. In general the tree canopy varied in height between 4-8 m and was dominated by *Vachellia tortilis* together with the alien invader tree*, Prosopis glandulosa* and a mixture of *Vachellia karroo* and *Senegalia mellifera* (Black thorn)*,* while *Ziziphus mucronata* was also relatively common.

Single individuals of the tall trees *Diospyros lycioides* and *Searsia pendulina* were occasionally observed. Towards the north-east the wild camphor bush, *Tarchonanthus camphoratus*, were more prominent, forming patches within an area where the tree canopy were also slightly lower (<4 m). In these areas *Senegalia mellifera* was the dominant small tree together with *Vachellia tortilis.* It was also in this area that *Senna italica* (eland's pea), *Ehretia rigida* (puzzle bush) and *Asparagus retrofractus* was observed for the first time.

The shrub layer showed a low bottom layer (<40 cm) with species like: *Aloe grandidentata* (only observed at one location), *Aptosimum indivisum* (infrequent), *Ferraria variabilis* (observed once)*, Geigeria ornativa* (common)*, Moraea* cf*. tripetala* (common)*, Roepera* species (a low growing variety with sharp thorns) and *Tribulus terrestris*. The shrub layer normally reached a height of approximately 1.5 m and included the following species: *Asparagus capensis* (occasionally), *Calicorema capitata* (infrequent), *Chrysocoma ciliata, Leonotis ocymifolia* (one observation)*, Lycium cinereum, Lycium bosciifolium, Rhigozum trichotomum, Salsola aphylla, Sesamum capense* and *Vachellia hebeclada* (occasionally).

Scattered throughout the footprint, but especially prominent in the more disturbed areas associated with the 7 ha and 8 ha portions a number of alien and invasive plant (AIP) species were observed.

They include: *Alternanthera pungens* (Khakiweed), *Datura stramonium* (Common thorn apple), *Flaveria bidentis, Bidens pilosa* (Blackjack)*, Harrisia martinii* (Moon cactus)*, Ipomoea purpurea* (Morning glory)*, Salsola kali* and *Schinus molle* (Probably planted, and observed in the north-eastern part of the footprint, near the railway line).

Probably because of the recent rains the grasses were quite prominent and included species like: *Cynodon dactylon, Enneapogon cenchroides*, various *Eragrostis*- and *Aristida* species, *Cenchrus ciliaris*, *Chloris virgata, Fingerhuthia africana*, *Schmidtia pappophoroides*, *Stipagrostis ciliata* and *Themeda triandra*.

Erf 17725:

The vegetation were relatively similar for all three sites, but the 7 ha area was by far the most disturbed of the three sites, with about half of the area already transformed by illegal housing and the remaining natural veld dominated by the alien invasive tree, *Prosopis* species. The site had also been used as an illegal dumping area, adding to the degraded status of this area.

The remaining natural veld has been significantly compromised, as a result of urban creep, illegal dumping and grazing practices. In this area the tree canopy are almost totally replaced by the invasive *Prosopis glandulosa*, with only scattered individuals of *Vachellia tortilis* and *Vachellia karroo* remaining.

Farm Roodepan No. 70:

The vegetation encountered in the 75 ha portion of the proposed footprint also shows signs of urban impact, especially the south western corner of the site, which has also been heavily impacted by dumping and other construction related activities. However, the most of the property is still in fairly good condition and is mainly used for grazing by the local community.

Towards the north of Farm 70, just west of the footprint area a number of small holdings had been established. In this area the majority of the canopy was again replaced by the invasive *Prosopis* tree.

The northern portion also shows a vegetation still in fairly good condition. However, the tree canopy is slightly lower (< 4 m) and now dominated by a mixture of *Vachellia tortilis* and *Senegalia mellifera* while stands of *Tarchonanthus camphoratus* were also observed for the first time. The lower canopy cover and the change in vegetation composition might be the result of shallower soils.

The vegetation of north eastern portion is already transformed as a result of (illegal) housing been erected and new stands still going up.

Erf15809:

The vegetation within the 8 ha portion of the footprint was again heavily degraded as a result of urban creep and associated impacts. Apart from physical disturbance, this area had also been used as a dumping site and playground. The natural vegetation had been reduced to a *Prosopis* dominated tree cover with quite a number of other alien and invasive plant species, including a number of *Schinus molle* trees (probably planted as ornamental trees) were observed in this area (a large old quarry was also observed in this area).

According to the Northern Cape CBA map, the proposed development footprint is not located within an ESA or CBA, but in an area considered “Other Natural Areas”. As such the footprint will not interfere directly with any of the proposed conservation targets for the Northern Cape. See also Appendix 5B for the Biodiversity Overlay Map.

No red-listed species was observed, and no species in terms of the NEM: BA protected species and NFA were observed.

Only one plant, *Aloe grandidentata* (Schedule 2 protected), in terms of the Northern Cape Nature Conservation Act 9 of 2009 (NCNCA) was identified.

10.1.2 IMPACT ASSESSMENT

Direct impacts

According to Table 6 of the Botanical Impact Assessment (**Appendix 6A**), the main impacts associated with the proposed development will be on:

- The permanent transformation of approximately 100ha of natural veld for human settlement (in an area used for livestock grazing by the local inhabitants) – Low Impact
- The potential impact on connectivity – Low Impact
- The potential impact on protected plant species – Insignificant Impact after mitigation
- The potential for spreading alien and invasive plant species - Insignificant Impact after mitigation
- The potential veld fire risk - Insignificant Impact after mitigation

Cumulative impacts

Because of the location and the degraded status of the site, the cumulative impact (even without mitigation) is expected to be **Low**, but this can be further reduced by mitigation.

10.1.3 MITIGATION MEASURES

The following mitigation measures are recommended by the Botanical Impact Assessment:

- All construction must be done in accordance with an approved construction and operational phase Environmental Management Plan (EMP), which must include the recommendations made in this report.
- A suitably qualified Environmental Control Officer must be appointed to monitor the construction phase in terms of the EA and the construction phase EMP and any other conditions pertaining to specialist studies.
- The town layout plans should aim to incorporate as many of the larger indigenous trees as possible within its layout (e.g. as shade or ornamental trees within the settlement).
- All protected species discussed in **Error! Reference source not found.** of the Botanical Impact Assessment (**Appendix 6A**) must be Search & Rescued to suitable areas in the surrounding area.
- **Before any work is done** the development footprint and access routes must be clearly demarcated and approved by the ECO. The demarcation must include the total footprint necessary to execute the work, but must aim at minimum disturbance.

- Lay-down areas or construction sites must be located within already disturbed areas or areas of low ecological value and must be pre-approved by the ECO.
- Indiscriminate clearing of any area outside of the construction footprint must be avoided.
- All areas impacted as a result of construction must be rehabilitated on completion of the project.
    - This includes the removal of all excavated material, spoil and rocks, all construction related material and all waste material.
    - It also included replacing the topsoil back on top of the excavation as well as shaping the area to represent the original shape of the environment.
- An integrated waste management approach must be implemented during construction.
    - Construction related general and hazardous waste may only be disposed of at Municipal approved waste disposal sites.
    - All rubble and rubbish should be collected and removed from the site to a suitable registered waste disposal site.
- Special attention must be given to alien and invasive control within the construction footprint. All alien invasive species within the footprint and at least 5 m to the side of the footprint must be removed responsibly.
    - Care must be taken with the eradication method to ensure that the removal does not impact or lead to additional impacts (e.g. spreading of the AIP due to incorrect eradication methods);
    - Care must be taken to dispose of alien plant material responsibly.

10.1.4 CONCLUSION

The proposed development will result in the permanent transformation of approximately 100ha of natural veld for human settlement. According to the impact assessment, with good environmental control, the development is likely to result in a Low impact on the environment.

With the correct mitigation it is unlikely that the development will contribute significantly to any of the following:

- Significant loss of vegetation type and associated habitat.
- Loss of ecological processes (e.g. migration patterns, pollinators, river function etc.) due to construction and operational activities.
- Loss of local biodiversity and threatened plant species.
- Loss of ecosystem connectivity.

10.2 HERITAGE IMPACT ASSESSMENT

Jan Engelbrecht of the Ubique Heritage Consultants was appointed to undertake a Heritage Impact Assessment (HIA) of the proposed site. The HIA is included as **Appendix 6B**.

10.2.1 KEY FINDINGS

According to the Heritage Impact Assessment (**Appendix 6B**), two occurrences of stone age archaeological material were found within the development footprint. In the northeast section of Erf

15089, four lithics were recorded, which include flakes and upper grindstone. The large fragmented flakes with sharp edges could be the result of stone crushed for the track ballast of the rail line. Research has shown that some of the debitage produced by heavy-duty earth moving machines can mimic characteristics of lithics produced by knapping activity. The lithics are without archaeological context, and the proximity of this material to the railway line and railway equipment does substantiate this probability.

In the north-western section of Reminder of the Farm Roodepan No. 70, a low-density surface scatter of lithics that include MSA/Early LSA scraper and flakes and chips were recorded. The identified archaeological materials are of low significance, as the archaeological sample is small and without context, and therefore of little scientific value.

No historical period artefacts were identified within the boundaries of the study area.

No significant historical features were identified within the study area.

No formal or informal graves were identified within the development footprint.

According to the Heritage Impact Assessment (**Appendix 6B**), the proposed development footprint is entirely underlain by the Lower Permian sediments of the Ecca Group (Prins Albert Formation) of the Karoo Basin. According to the SAHRIS PalaeoMap, the palaeontological sensitivity of the Prince Albert Formation is rated as high. A site-specific field survey of the development footprint was conducted and no visible evidence of fossiliferous outcrops was found.

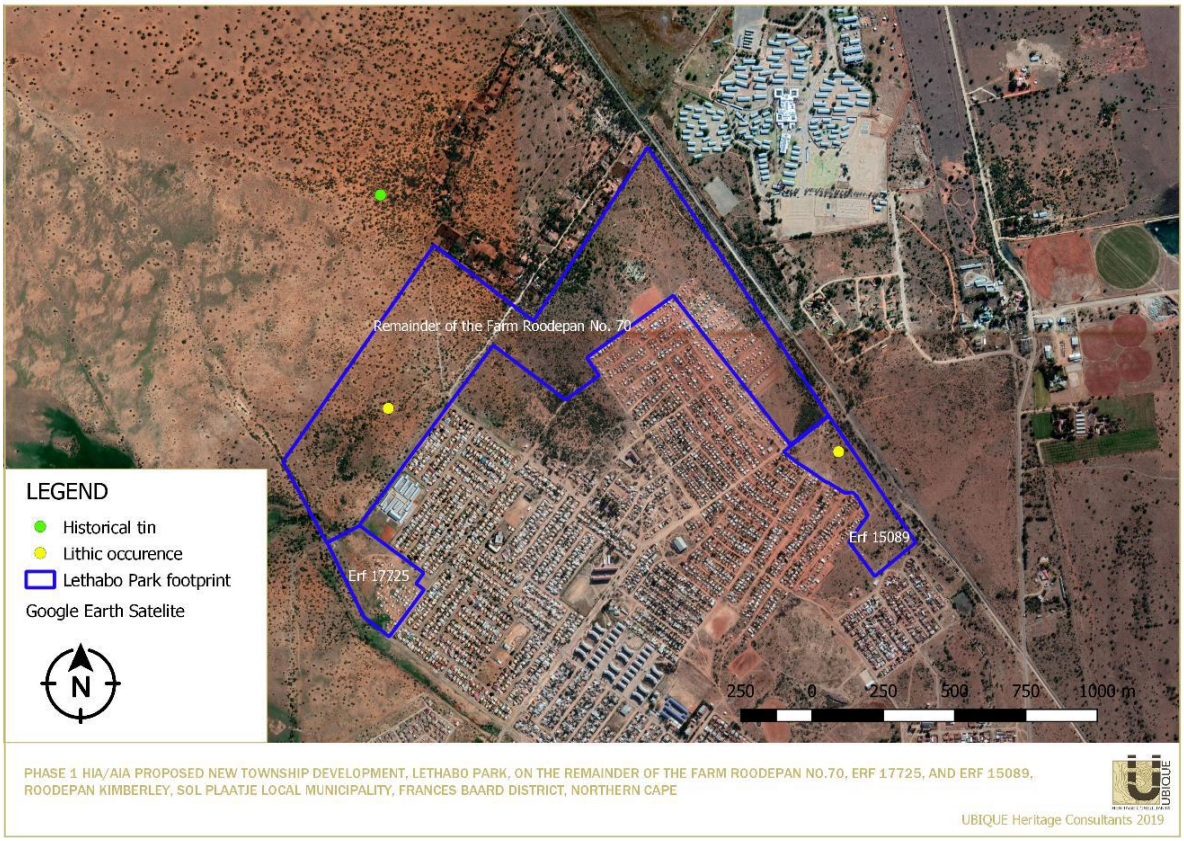

Figure 14: Recorded heritage within, and adjacent study area (Figure 7 of the Heritage Impact Assessment - Appendix 6B)

10.2.2 IMPACT ASSESSMENT

According to the Heritage Impact Assessment (**Appendix 6B**), the impact on Archaeological and Historical resources is considered to be Low

Although the palaeontological sensitivity of the area is rated as high, no visible evidence of fossiliferous outcrops was found. For this reason, an overall low palaeontological sensitivity rating has been allocated to the development footprint, and the impact of the development on the Fossil heritage is considered to be low

10.2.3 MITIGATION MEASURES

According to the Heritage Impact Assessment (**Appendix 6B**), based on the assessment of the potential impact of the development on the identified heritage, the following recommendations are made, taking into consideration any existing or potential sustainable social and economic benefits:

- No significant heritage resources were identified. Therefore, no further mitigation is required, and from a heritage point of view, we recommend that the proposed development can continue.
- Due to the low palaeontological significance of the area, no further palaeontological heritage studies, ground truthing and/or specialist mitigation are required pending the discovery of newly discovered fossils. It is considered that the proposed development is deemed appropriate and feasible and will not lead to detrimental impacts on the palaeontological resources of the area. In the event that fossil remains are discovered during any phase of construction, either on the surface or exposed by fresh excavations the Chance Find Protocol must be implemented by the ECO in charge of these developments.
- Although all possible care has been taken to identify sites of cultural importance during the investigation of study areas, it is always possible that hidden or sub-surface sites could be overlooked during the assessment. If during construction, any possible discovery of finds such as stone tool scatters, artefacts, human remains, or fossils are made, the operations must be stopped, and the ECO in charge of these developments ought to be alerted immediately. These discoveries ought to be protected (preferably in situ), and the ECO must report to SAHRA so that appropriate mitigation (e.g. recording, collection) can be carried out by a professional archaeologist or palaeontologist. SAHRA Contact details: South African Heritage Resources Agency, 111 Harrington Street, PO Box 4637, Cape Town 8000, South Africa. Email: Phone: +27 (0)21 462 4502. Fax: +27 (0)21 462 4509 Web: www.sahra.org.za).

10.2.4 CONCLUSION

The Heritage Impact Assessment identified no significant heritage resources on Remainder of the Farm Roodepan No.70, Erf 17725, and Erf 15089, Roodepan, Kimberley in the Sol Plaatje Local Municipality, Frances Baard District Municipality, Northern Cape, as set out in the report. In the

development footprint are no archaeological, historical or cultural sites, or paleontological resources of high significance that will be impacted negatively by the proposed development.

10.3 FRESHWATER ASSESSMENT

Dr Dirk van Driel (Watsan Africa) has been appointed to undertake the Freshwater Assessment for the proposed development. The Freshwater Impact Assessment is included as **Appendix 6C**.

10.3.1 KEY FINDINGS

According to the Freshwater Assessment (**Appendix 6C**), a possible natural drainage line, running south-west from the existing railway line, to a pan to the west of the development, may have historically occurred, but this has been replaced by a dirt road. The dirt road is densely overgrown with thorn bushes (*Acacia hebeclada*, but there were others as well), among which the drainage lines are very faint. There are signs that sediments have been eroded from the surface right down to the underlying calcrete, to be deposited lower down the catchment.

Although not on the development site, there are four pans to the west and south-west of the site. According to the Freshwater Assessment (**Appendix 6C**), the four pans to the west are important features of Lethabo Park's drainage landscape. Careful observation reveals that the top end of these pans always is located along diagonal dirt road to the west of Lethabo Park. From here the pans spread towards the west of north west. Water dissipates into the sandy soil and mostly evaporates, leaving the pans dry most of the time. It is surmised that these pans have considerably grown in size because of the storm water runoff from Lethabo Park. The time during which the pans are wet, dubbed the hydroperiod, has increased because of urban storm water runoff.

The site is generally flat with an even slope. The streets in the area are oriented in a south westerly direction, as well as perpendicular in north westerly direction. Storm water probably works its way in a zig-zag fashion down the streets towards the pans. Lethabo Park's formalised part is provided with an underground storm water system This system essentially conveys storm water in the same direction and storm water outfalls at the down-hill ends of main roads contribute towards the formation of the pans. However, the storm water system is blocked in places, leaving the streets as the main conduit. Leaky pipes contribute to the situation, some of which have been there for a long time, with wetland indicator plants such as sedges, rushes and reeds growing.

Most of the urban storm water ends up in Pan 1. A section of Pan 1 is located right against the boundary of the proposed development. The bigger section is located against the diagonal road, from which it receives storm water as well. It is expected that Pan 1 will grow as the proposed development takes root. As the informal settlement is replaced with larger, permanent houses and tar roads, the pans will predictably and considerably grow larger in size.

Kamfersdam, probably Kimberley's most prominent aquatic feature and one of only a couple of locations where the lesser flamingo breeds, is located approximately 2.3km south-east of the site. The slope is to the north west, away from Kamfersdam and it is unlikely that Lethabo Park storm water will end up in Kamfersdam.

Litter has been identified as another potential issue. As described in Section 5.1 below, illegal waste disposal is very prevalent on the site. According to the Freshwater Assessment (**Appendix 6C**), this is not only a threat to the aquatic environment, but to the local environment at large. For the DWS to execute their legal mandate, it is probably indicated that this mess is to be cleaned up before permission is granted to carry on the proposed development. On top of this there should be a functional waste management system in Lethabo Park.

With regards to Ecological Importance, there are no fish in either the drainage lines nor the pans, as there is no permanent water. According to this assessment, which is prescribed for WULA's, the drainage lines and the pans are not important.

In terms of Ecological Sensitivity, the drainage lines and the pans will predictably not recover to anything resembling their original, un-impacted state, despite the housing development being removed. Once developed, it is most unlikely that the houses and streets will ever be removed. From this perspective, the aquatic environment and its surrounds can be regarded as ecologically sensitive.

10.3.2 IMPACT ASSESSMENT

According to the Freshwater Assessment (**Appendix 6C**), most of the natural aquatic environment within the demarcated area of the new development has already been impacted upon. The only bit that remains is the very faint drainage lines in the upper part of the site. These would entirely disappear to make way for streets and houses.

The main threat to the aquatic environment, apart from direct habitat destruction, is the movement of sediments down the catchment during large rainfall events. This would have been of major concern if there were any aquatic habitat to conserve, which is hardly the case with Lethabo Park.

Like with most urban developments, the impact on the aquatic environment is definite and severe. In this case mitigation measures are not about to make a difference. Environmental authorities will have to decide if the little and degraded aquatic habitat that was and probably still is available on the site is worth saving, instead of giving the go-ahead for the proposed development.

It is that the aquatic habitat that consists of only very faint and already degraded drainage lines and 4 small mostly dry pans do not have adequate conservation value prevent the proposed urban development. The inefficiency of mitigation should therefore not be a consideration.

10.3.3 MITIGATION MEASURES

There are no mitigating measures available for the new area that is to be developed for housing. Anything that could possibly be defined as aquatic habitat would make way for urban development. The pans will predictably grow in size as urban surfaces harden. For this there are no mitigation measures either. The pans will be mostly dry as evaporation is high.

It would help, though, to upgrade dirt roads to paved streets with an undergrounds drainage system, as money becomes available. This would prevent movement of sediments down the catchment during rainfall events. It would, however, increase the rate of increase of Pan 1 to 4.

The litter remains a cause of concern. Downstream habitat, aquatic or otherwise, will be heavily polluted if the current situation is allowed to continue. Grids and other infrastructure to prevent litter washing down further downstream must be installed. A proper municipal waste management system is necessary.

10.3.4 CONCLUSION

An anthropogenic activity can impact on any of the ecosystem drivers or responses and this can have a knock-on effect on all of the other drivers and responses. This, in turn, will predictably impact on the ecosystem services.

The driver of the mostly dry drainage lines is the occasional flood that follows sudden and intense rainfall events. This is followed by prolonged droughts and intense summer heat that prevents the development of any viable aquatic habitat. This is apart from shallow ground water that explains the growth of vegetation along the drainage lines.

However, the drainage lines on the site of the proposed development are faint. The slope is even and the rainfall low. This is not conducive to the development of geomorphologically distinct drainage lines. Hence the drainage lines can hardly be considered as viable aquatic habitat. The loss of these drainage lines is not considered to be significant.

The four pans are worthy of some level of protection, as they retain poor quality urban runoff to prevent it from running further down the catchment. As viable aquatic habitat, the pans have little value, as they are small and mostly dry.

The proposed urban development will entirely alter the drainage lines. The lines would be replaced with streets and houses. As the aquatic habitat is insignificant, this does not indicate a loss of aquatic ecosystem functioning.

10.4 GEO-TECHNICAL ASSESSMENT

Soilkraft cc was appointed to undertake the Geo-technical Assessment as part of the EIA process, and is included as **Appendix 6D**.

10.4.1 KEY FINDINGS

According to the Geo-technical Assessment, the following are the main conclusions that have been made:

- Geology:

  The study area is underlain by a dolerite intrusion in the east and the Prince Albert Formation in the west. The geology was verified by bedrock materials encountered in trial holes.

- Soil Profile:

  The profiles on site are variable, as is to be expected considering the size of the study area. The profiles hosted aeolian deposits, colluvium, residual shale, residual dolerite and an array of

calcrete deposits. Surficial fill was also found in places and extensive rubble dumping has occurred throughout the study area.

- Hydrology:

No perched water or seepage water was encountered on site, though surface water ponding was found where water services were reportedly leaking.

- Conditions of Excavation:

A minimum proven depth of excavation by backhoe was established at 300mm, though the majority of the trial holes exceeded 1500mm when excavated with the aid of a backhoe. In general, in situ materials make for conditions of intermediate to difficult excavation.

- Geotechnical Classification:

The site is divided into nine separate geotechnical zones. An additional zoning map was supplied indicating other problems encountered on site that are not necessarily of a geotechnical origin.

- Soil Corrossivity:

All soil materials tested proved to be extremely corrosive on account of high soil conductivity.

- Seismicity:

A 10% probability exists that an earthquake with Peak Ground Acceleration of 0.16g to 0.20g may take place once in 50 years. Tremors in this area are likely to be mining-related rather than naturally occurring.

- Chemical Soil Heave:

There are indications that certain materials found on site are similar to those previously investigated due to severe heave associated with chemical expansion. This risk warrants additional work to be undertaken.

10.4.2 RECOMMENDATIONS

According to the Geo-technical Assessment, the following recommendations are given per geotechnical zone (see Figure 5, **Appendix 6D**), as general guidelines to single storey structures of masonry design, in accordance with guidelines proposed by the NHBRC.

- Geotechnical Zone 1: **H3**

Construction in this zone may be done by means of a reinforced raft or soil replacement raft. The exact amount of heave to be accommodated must be determined during the stand-specific phase two geotechnical investigation. The superstructure should also have reinforced masonry and articulation joints, as per the engineering design. Provision should also be made to clear extensive rubble materials deposited on site.

- Geotechnical Zone 2: ***H2 – C1/H2***

Assuming founding is done at a depth of 600mm, the effects of collapsible soil will be limited in this zone. Consequently founding in this zone may therefore be done by means of a reinforced raft or soil replacement raft. The superstructure should also have reinforced masonry and articulation joints, as per the engineering design. As with zone 1, provision should also be made to clear extensive rubble materials deposited on site.

- Geotechnical Zone 3: ***H1-H1/R-H1/C1***

While bedrock does occur in parts of this zone, it is expected that the state of the bedrock will not be considered competent for founding. Unless proven otherwise by a competent person, it is therefore recommended that founding in this zone be done by means of reinforced strip footings, capable of accommodating up to 15mm unrestrained heave. The superstructure must be modified to include articulation joints at all internal and external doors and openings, and masonry must be lightly reinforced.

Alternatively, a soil replacement raft may be considered. As before, founding at a depth of 600mm will limit the effect of collapsible surface soils.

- Geotechnical Zone 4: ***H/R***

As bedrock is relatively shallow in this zone, it is recommended that founding be done directly on suitable bedrock, pointed out by a competent person; however, all expansive materials must be removed from the structure footprint to at least 1.5m beyond the building parameter. Founding may be done by normal strip footings, founded directly on competent bedrock, while the superstructure may be constructed normally.

- Geotechnical Zone 5: ***C1-C1/H***

Movement in this zone is limited to 10mm collapse settlement, possibly with heave of up to 7.5mm. It is therefore recommended that founding be done by means of reinforced strip footings, capable of accommodating the soil movement. Founding pressures should not exceed 50kPa. The superstructure must be modified to include articulation joints at all internal and external doors and openings, and masonry must be lightly reinforced.

As an alternative, a soil replacement raft solution may be considered.

Care must be taken in this zone as the soil profile has in places been disturbed by past diggings, excavations and extensive rubble dumping. Rehabilitation may be required in parts of this zone to render it suitable for development.

- Geotechnical Zone 6: ***C2-C2/H***

Two construction options are available for this zone. Founding and construction by means of either reinforced concrete rafts or stiffened strip footings may be considered. Foundations and fabric pressures should not exceed 50kPa. The building superstructures should contain articulation joints and solid, lightly reinforced masonry.

- Geotechnical Zone 7: ***S1-S1/C***

Founding in this zone may be done with the aid of reinforced strip footings, capable of accommodating up to 20mm settlement. The superstructure must be modified to include articulation joints at all internal and external doors and openings, and masonry must be lightly reinforced. Founding pressures should be limited to 50kPa.

Alternatively, a soil replacement raft may be considered and as before, founding at a depth of 600mm will limit the effect of collapsible aeolian materials, if/when they are present.

- Geotechnical Zone 8: ***S-S/R***

  As bedrock is relatively shallow in this zone, it is recommended that founding be done directly on suitable bedrock, pointed out by a competent person. Remaining areas are expected to be suitable for conventional foundations. Founding may be done by normal strip footings, founded directly on competent bedrock (where available), while the superstructure may be constructed normally.

- Geotechnical Zone 9: ***C/R***

  As with zone 4, bedrock in this zone is relatively shallow, but is not always in a good state, suitable for hosting foundations. As a result, it is recommended that founding may be done by normal strip footings, while the superstructure may be constructed normally. Where suitable bedrock is identified by a competent person, foundations may be hosted directly on bedrock.

In terms of general measures, it is critical that site drainage and storm water be planned carefully to ensure efficient drainage. No storm water or surface runoff should accumulate or pond within 1.5m of the structures. Services and plumbing precautions must be put in place to ensure that underground services are not disrupted by the heaving action of expansive in situ soils.

As far as conditions of excavation are concerned, the following is recommended:

- *Fill:* All fill materials may be considered machine excavatible. Considering the volume of rubbleand waste encountered on site, it is recommended that provision be made to remove these materials prior to development.
- *Colluvium:* The colluvial materials are machine excavatible. While hand excavation is possible, this will be challenging where the colluvium has a cohesive nature and is therefore not advised.
- *Aeolian Deposits:* Aeolian materials may be excavated by hand or by machine. The latter is recommended, though, as loose-lying surface deposits of this material may be susceptible to instability and collapse into excavations, thereby posing a safety risk.
- *Calcrete:* The calcrete materials are generally machine excavatible, but with notable effort. Hand excavation is not recommended and in fact, excavation may be optimised using larger excavation equipment (e.g. excavators). Only the hardpan calcrete induced refusal of excavation and may require the use of a breaker or pecker to facilitate excavation.
- *Residual Dolerite:* The residual dolerite is only partially machine excavatible. Even when using an excavator, it is likely that the material will induce refusal of excavation as it grades into bedrock.
- *Residual Shale 1:* This material will be best excavated using an excavator. When planning deep excavations, provision should also be made for some aids, such as a rock bucket, to help remove the material from the profile.
- *Residual Shale 2:* The second residual shale material should also be excavated using excavation equipment, as opposed to excavation by hand. Provision should also be made for clayey, cohesive excavation in the unlikely event that the material is found in a very moist to wet state.
- *Dolerite Bedrock:* Though no unweathered dolerite was found in trial holes, it is expected that the material will require physical or chemical blasting to be removed from the profile. The unweathered dolerite bedrock will likely constitute very hard rock material.
- *Shale Bedrock:* The shale bedrock consisted of very soft to medium hard rock material. Excavation using an excavator may be partially successful and may be enhanced by using a rock bucket or pneumatic breaking equipment. Blasting may be required to remove medium hard rock shale materials.

- *Depth of Excavation*: Excavatible depths by backhoe varied between 300mm and 2600mm, with the majority of trial holes exceeding 1500mm.
- *Corestones*: Considering site observations and the fact that a backhoe could not effectively manage all corestones encountered, it is recommended that provision be made for small scale blasting or demolition of corestones. The use of an excavator would also be beneficial when removing the corestones from the profile.
- *Sidewall Stabilities*: Excavations proved stable during the investigation, except where highly unstable fill materials or loose lying aeolian sands were encountered.
- *Seepage*: No seepage water was encountered in any of the trial holes.
- *General*: The safety of all persons working in or near open excavations must be ensured.

In terms of soil corrosivity, considering the extremely corrosive nature of prevailing soil materials, it is recommended that precautionary measures be taken to protect steel objects buried and exposed to soil materials (e.g. steel piping, joints, etc.). The use of protectively coated steel piping or cathodic protection may be considered.

10.5 TRAFFIC IMPACT STUDY

Reneilwe Consulting and Planners/Route^2 cc was appointed to undertake the Traffic Impact Study, which is included as **Appendix 6E**.

10.5.1 CONCLUSION AND RECOMMENDATIONS

The Traffic Impact Study investigated the expected transport related impacts of the establishment the Lethabo Park Township with various land uses and Community Facilities.

With regards to traffic generation and impact, it is estimated that the development will generate in the order of 500 AM and PM peak hour trips (total in and out), although since there are informal Townships I the area this can probably be seen as a worst case for additional external traffic.

It is proposed and can be concluded:

- Provision of pedestrian sidewalks along the Class 4 roads and if schools within the Township.
- Minibus-taxi and bus lay-bys along the Class 4 roads.

11. SUMMARY OF IMPACTS

Please refer to Appendix 7 for a summary of the project impact assessment and significance, including a summary of mitigation measures.

Table 4 is a summary of all the impacts assessed in the specialists reports that are associated with the construction and operational phase for the preferred alternative.

Table 4: Summary of all impacts

Study	Impact	Significance No Mitigation	Significance With Mitigation
Botanical	Geology & soils: Potential impact on special habitats	Low (Negative impact)	Low (Negative impact)
	Land-use and cover: Potential impact on socio-economic activities.	Medium (Negative impact)	Medium (Negative impact)
	Vegetation status: Loss of vulnerable or endangered vegetation and associated habitat.	Medium (Negative impact)	Medium-Low (Negative impact)
	Conservation priority: Potential impact on protected areas, CBA's, ESA's or Centre's of Endemism.	Low (Negative impact)	Low (Negative impact)
	Connectivity: Potential loss of ecological migration corridors.	Medium (Negative impact)	Medium-Low (Negative impact)
	Protected & endangered plant species: Potential impact on threatened or protected plant species.	Medium-Low (Negative impact)	Low (Negative impact)
	Invasive alien plant species: Potential invasive plant infestation as a result of the activities.	Low (Negative impact)	Low (Negative impact)
	Veld fire risk: Potential risk of veld fires as a result of the activities.	Low (Negative impact)	Very Low (Negative impact)
	Cumulative impacts: Cumulative impact associated with proposed activity.	Medium (Negative impact)	Medium (Negative impact)
Heritage	Loss of archaeological resources	Low (Negative impact)	Very Low (Negative impact)
Palaeontology	Loss of Palaeontological resources	Very Low (Negative impact)	Very Low (Negative impact)

Freshwater	Impact on Freshwater Resources – Loss of drainage lines	Medium-High (Negative impact)	Medium-High (Negative impact)
Socio-economic	Job Creation – Construction phase	Medium (Positive impact)	
Socio-economic	Job Creation – Operational phase	Low (Positive impact)	
Visual	Potential visual impact on the area	Low (Negative impact)	Low (Negative impact)
Dust	Potential impact of dust from construction activities	Low (Positive impact)	Low (Positive impact)

12. RECOMMENDATIONS

The following mitigation measures must be enforced if the proposed development were approved. These are also included in the Environmental Management Programme (**Appendix 9**).

Construction Phase:

The following mitigation measures are recommended by the Botanical Impact Assessment:

- All construction must be done in accordance with an approved construction and operational phase Environmental Management Plan (EMP), which must include the recommendations made in this report.
- A suitably qualified Environmental Control Officer must be appointed to monitor the construction phase in terms of the EA and the construction phase EMP and any other conditions pertaining to specialist studies.
- The town layout plans should aim to incorporate as many of the larger indigenous trees as possible within its layout (e.g. as shade or ornamental trees within the settlement).
- All protected species discussed in **Error! Reference source not found.** of the Botanical Impact Assessment (**Appendix 6A**) must be Search and Rescued to suitable areas in the surrounding area.
- **Before any work is done** the development footprint and access routes must be clearly demarcated and approved by the ECO. The demarcation must include the total footprint necessary to execute the work, but must aim at minimum disturbance.
- Lay-down areas or construction sites must be located within already disturbed areas or areas of low ecological value and must be pre-approved by the ECO.
- Indiscriminate clearing of any area outside of the construction footprint must be avoided.
- All areas impacted as a result of construction must be rehabilitated on completion of the project.
    - This includes the removal of all excavated material, spoil and rocks, all construction related material and all waste material.
    - It also included replacing the topsoil back on top of the excavation as well as shaping the area to represent the original shape of the environment.
- An integrated waste management approach must be implemented during construction.
    - Construction related general and hazardous waste may only be disposed of at Municipal approved waste disposal sites.
    - All rubble and rubbish should be collected and removed from the site to a suitable registered waste disposal site.
- Special attention must be given to alien and invasive control within the construction footprint. All alien invasive species within the footprint and at least 5 m to the side of the footprint must be removed responsibly.
    - Care must be taken with the eradication method to ensure that the removal does not impact or lead to additional impacts (e.g. spreading of the AIP due to incorrect eradication methods);
    - Care must be taken to dispose of alien plant material responsibly.

According to the Heritage Impact Assessment (**Appendix 6B**), based on the assessment of the potential impact of the development on the identified heritage, the following recommendations are made, taking into consideration any existing or potential sustainable social and economic benefits:

- No significant heritage resources were identified. Therefore, no further mitigation is required, and from a heritage point of view, we recommend that the proposed development can continue.
- Due to the low palaeontological significance of the area, no further palaeontological heritage studies, ground truthing and/or specialist mitigation are required pending the discovery of newly discovered fossils. It is considered that the proposed development is deemed appropriate and feasible and will not lead to detrimental impacts on the palaeontological resources of the area. In the event that fossil remains are discovered during any phase of construction, either on the surface or exposed by fresh excavations the Chance Find Protocol must be implemented by the ECO in charge of these developments.
- Although all possible care has been taken to identify sites of cultural importance during the investigation of study areas, it is always possible that hidden or sub-surface sites could be overlooked during the assessment. If during construction, any possible discovery of finds such as stone tool scatters, artefacts, human remains, or fossils are made, the operations must be stopped, and the ECO in charge of these developments ought to be alerted immediately. These discoveries ought to be protected (preferably in situ), and the ECO must report to SAHRA so that appropriate mitigation (e.g. recording, collection) can be carried out by a professional archaeologist or palaeontologist. SAHRA Contact details: South African Heritage Resources Agency, 111 Harrington Street, PO Box 4637, Cape Town 8000, South Africa. Email: Phone: +27 (0)21 462 4502. Fax: +27 (0)21 462 4509 Web: www.sahra.org.za).

Operational Phase:

According to the Freshwater Assessment, the litter remains a cause of concern. Downstream habitat, aquatic or otherwise, will be heavily polluted if the current situation is allowed to continue. Grids and other infrastructure to prevent litter washing down further downstream must be installed. A proper municipal waste management system is necessary.

13. CONCLUSIONS

The following specialist studies were undertaken as part of this Environmental Impact Assessment:

- Botanical Impact Assessment
- Heritage Impact Assessment
- Freshwater Assessment
- Geo-technical Assessment
- Traffic Impact Study

The specialist studies and the information provided within the EIA Report, indicates that the proposed Lethabo Park Housing development does not pose any significant impacts and can be implemented with appropriate mitigation.

In terms of the need and desirability of the proposed residential development, housing is a national need, including in the Sol Plaatje Municipality.

The proposed development represents a significant step towards service delivery and housing objectives within the municipality and broader Kimberley area. The development will not only meet the pressing needs of adequate housing within the municipality but will also be in line to support of the municipal IDP objectives to provide housing for the poor and decrease the city's housing backlog as well as fulfil the Constitutional mandate to provide adequate housing and basic services to citizens.

The proposed location is considered to be a viable option. The proposed site is adjacent to the existing residential area of Roodepan, allowing accessibility and linking to the existing services infrastructure. The involved properties are located within the Kimberley urban edge and are already partially occupied by means of informal settlement. Sections of these land units are also designated locations that is suited to infill planning practices, which is part of the reasons why it was selected by the local authority for the purposes of this project.

The site is located on the outer city limits but can be accessed by means of the existing road networks in the area.

There are no physical characteristics of these properties or environmental constraints which would exclude the site from development.

In terms of alternatives, **Alternative 3** is the preferred alternative. This alternative is considered a viable option, and is also the municipalities preferred layout since it provides sufficient erven and housing opportunities (high and lower density), as well as providing for Municipal and Government land use opportunities, and more Open Space. There are no environmental or heritage limitations to this layout.

The "no-go" option, which is the option of not developing the proposed housing development. Currently no formal Agricultural activities are taking place on Erf 15089 or Farm 70 Roodepan although they are zoned as Agricultural. However, the site is located adjacent to established residential developments.

Although the no-go development might result in no potential negative environmental impacts, especially on the vegetation on the development site, the direct and indirect socio-economic benefits of not constructing the residential development will not be realised. The need for additional housing opportunities in the area will not be realised.

According to the Botanical Impact Assessment, only one broad vegetation type is expected in the proposed area and its immediate vicinity, namely Kimberley Thornveld, which is considered "Least Threatened". The vegetation encountered can be described as an open thornveld or semi-open to closed mixed-acacia woodland, and although most of the site is still in fairly good condition, the remaining natural veld has been significantly compromised, disturbed or transformed in large parts by illegal housing (urban creep), illegal dumping area, and grazing practices, adding to the degraded status of the area.

The proposed development footprint is not located within an ESA or CBA, but in an area considered "Other Natural Areas". As such the footprint will not interfere directly with any of the proposed conservation targets for the Northern Cape. No red-listed species was observed, and no species in terms of the NEM: BA protected species and NFA were observed. Only one plant, *Aloe grandidentata* (Schedule 2 protected), in terms of the Northern Cape Nature Conservation Act 9 of 2009 (NCNCA) was identified.

The proposed development will result in the permanent transformation of approximately 100ha of natural veld for human settlement. According to the impact assessment, with good environmental control, the development is likely to result in a Low impact on the environment.

With the correct mitigation it is unlikely that the development will contribute significantly to any loss of vegetation type and associated habitat, loss of ecological processes (e.g. migration patterns, pollinators, river function etc.) due to construction and operational activities, loss of local biodiversity and threatened plant species or a loss of ecosystem connectivity.

According to the Freshwater Assessment, the proposed urban development will entirely alter the drainage lines. The lines would be replaced with streets and houses. As the aquatic habitat is insignificant, this does not indicate a loss of aquatic ecosystem functioning.

According to the Heritage Impact Assessment no significant heritage resources were identified on the proposed site. There are no archaeological, historical or cultural sites, or paleontological resources of high significance that will be impacted negatively by the proposed development, in the development footprint.

The Geo-technical Assessment found no significant limiting conditions but provided recommendations for founding and construction, excavations, and soil corrosivity as outlined in Section 10.4.2 above, as well as recommendations for further investigations.

The Traffic Impact Study found that with regards to traffic generation and impact, it is estimated that the development will generate in the order of 500 AM and PM peak hour trips (total in and out), although since there are informal Townships I the area this can probably be seen as a worst case for additional external traffic.

Considering all the information, it is not envisaged that this proposed Lethabo Park development will have a significant negative impact on the environment, and the socio-economic benefits are expected to greatly outweigh any negative impacts, especially if the mitigation measures as recommended by the various specialists and detailed in Section 12 and the Environmental Management Programme (Appendix 9) are implemented.

It is therefore recommended that the proposed Lethabo Park Development (**Alternative 3**) be supported and be authorised with the necessary conditions of approval, subject to the implementation of the recommended enhancement and mitigation measures contained in Section 12.

14. DETAILS AND EXPERTISE OF THE EAP

Details of Environmental Assessment Practitioner, expertise and Curriculum Vitae

This Draft Environmental Impact Report was prepared by Clinton Geyser who has a MSc. Degree in Environmental Management. He has been working as an Environmental Assessment Practitioner since 2009 and is currently employed at EnviroAfrica CC.

Report compiled by Clinton Geyser -
Qualifications:

- BSc. Earth Sciences, Majors in Geology and Geography and Environmental Management (1998 – 2000) and;
- BSc. (hons): Geography and Environmental Management (2001) and;
- MSc. Geography and Environmental Management (2002), all from the University of Johannesburg.

Expertise:
Clinton Geyser has over nine years' experience in the environmental management field as an Environmental Assessment Practitioner and as an Environmental Control Officer, having worked on a variety of projects in the Western, Eastern and Northern Cape. Previous completed applications include, but not limited to:

- Civil engineering infrastructure including pipelines, Waste Water Treatment Works, and roads in the Western and Northern Cape.
- Agricultural developments, including reservoirs and dams, in the Western and Northern Cape.
- Telecommunications masts in the Western and Eastern Cape
- Housing Developments in the Western and Northern Cape.
- Resort developments in the Western and Northern Cape.
- Cemeteries in the Western Cape
- Waste Management Licences in the Western Cape

Employment:
Previous employment as an EAP: Doug Jeffery Environmental Consultants (2009 – 2012)
Current employment: EnviroAfrica cc (2012 – present).

The whole process and report was supervised by Bernard de Witt who has more than 20 years' experience in environmental management and environmental impact assessments.

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