THE PROPOSED KHUTSONG EXTENSION 8 HOUSING DEVELOPMENT SITUATED NEAR CARLETONVILLE WITHIN THE MERAFONG CITY LOCAL MUNICIPALITY, WEST RAND DISTRICT MUNICIPALITY, GAUTENG

Draft Scoping Report

Prepared for **On behalf of**

ETL Consulting (Pty) Ltd **Gauteng Department of Human Settlements**

Prepared by

Afzelia Environmental Consultants (Pty) Ltd
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REVISION TRACKING TABLE

Project Title	The Proposed Khutsong Extension 8 Housing Development Situated Near Carletonville within the Merafong City Local Municipality, West Rand District Municipality, Gauteng
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NAME	RESPONSIBILITY	DATE
Mr Andrew Briggs	Report Writer	22nd January 2021
Mr Solomon Fataki	Report Writer	23rd August 2020
Mr Andrew Batho	Project Manager/ Report Review	-
Mr Jon Marshall	Reviewer	-

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REVIEW OF THE DRAFT SCOPING REPORT

This draft Scoping Report is available for commenting for a period of 30 days (excluding public holidays) from **Monday 08th February 2021 to Monday 15th March 2021.**

Copies of the draft Scoping Report are available at the following public venues for consideration:

VENUE	ADDRESS	CONTACT DETAILS	TIMES
Carletonville Library	c/o Celestine and Emerald Street, Carletonville	Tel: 018 788 9541/2 Fax: 018 787 2485	9am to 15pm (Mond to Fri)

In addition, the report will be placed on the Afzelia Environmental Consultants (Pty) Ltd website – www.afzelia.co.za for public viewing.

Please send your comments and queries to the below contact details before the **Monday15th of March 2021**.

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LIST OF ABBREVIATIONS

a.m.s.l.	Above Mean Sea Level
BA	Basic Assessment
BID	Background Information Document
C	Contractor
CBA	Critical Biodiversity Areas
CE	Consulting Engineers
CLO	Community Liaison Officer
DAFF	Department of Agriculture, Forestry and Fisheries
DEFF	Department of Environment, Forestry and Fisheries
DMR	Department of Mineral Resources
DRDLR	Department of Rural Development and Land Reform
DWS	Department of Water and Sanitation
EAP	Environmental Assessment Practitioner
EA	Environmental Authorisation
EAPSA	Environmental Assessment Practitioners Association of South Africa
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
ESO	Environmental Site Officer
EWT	Endangered Wildlife Trust
GDARD	Gauteng Department of Agriculture and Rural Development
GDCS	Gauteng Department of Community Safety
GDED	Gauteng Department of Economic Development
GDRT	Gauteng Department of Roads and Transport
GDHS	Gauteng Department of Human Settlements
GDID	Gauteng Department of Infrastructure Development
GDSD	Gauteng Department of Social Development
GNR	Government Notice Regulations
GIS	Geographic information system
Ha	Hectares
IAIAsa	International Association for Impact Assessments
IAP2	International Association for Public Participation
I&APs	Interested and Affected Parties
IDP	Integrated Development Plan
IECO	Independent Environmental Control Officer
MCLM	Merafong City Local Municipality
NDHS	National Department of Human Settlements
NWA	National Water Act
NEMA	National Environmental Management Act
NFEPA	National Freshwater Ecosystem Priority Area
NGO	Non-Governmental Organisation
PAES	Protected Areas Expansion Strategy
PHRAG	Provincial Heritage Resources Authority Gauteng
PPP	Public Private Partnership
PLC	Project Liaising Committee
Pro	Proponent (Applicant)
SACNASP	South African Council for Natural Scientific Professions
SAHRA	South African Heritage Resources Agency
SANBI	South African National Biodiversity Institute
SAPS	The South African Police Service
SC	Sub-contractors
SDF	Spatial Development Framework
SHE	Safety, Health and Environmental

SDF	Spatial Development Framework
SPLUMA	Spatial Planning and Land Use Management Act
WESSA	Wildlife & Environmental Society of South Africa
WRDM	West Rand District Municipality
WUL	Water Use License
WC/WDM	Water Conservation and Water Demand Management

EXECUTIVE SUMMARY

Summary of Principal Objectives

- The main purpose of this report is to comply with an instruction from DEDTEA Compliance Monitoring & Enforcement component in their email dated 14/09/2017 to undertake an assessment of the current situation (impacts of unlawful commenced construction activity).
- The report is to assist the Department to consider all available information in order to make further decisions regarding this application with respect to the existing impacts and possible further impacts which are likely to occur during the construction activities that will be associated with the completion of the project.
- The report will provide the relevant I&APs with sufficient information to comment on the process and document the public participation process that is being undertaken.

Project Background and Overview

Afzelia Environmental Consultants (Pty) Ltd (Afzelia) have been appointed by ETL Consulting (Pty) Ltd (ETL) on behalf of the Gauteng Department of Human Settlements (GDHS) to undertake a Scoping and Environmental Impact Assessment process for the proposed Khutsong South Extension 8 Housing Development located near Carletonville within the Merafong Local Municipality, West Rand District Municipality, Gauteng.

The project has been initiated by the GDHS together with the Merafong City Local Municipality and West Rand District Municipality in order to relocate residents from the Khutsong Hostel, Khutsong Extensions 1 and 6 as well as the Khutsong informal Area to an area adjacent to the existing Khutsong South settlement. The areas mentioned above, that are currently inhabited, are unsafe due to underlying geological instabilities.

A study undertaken by the Council for Geoscience in 1989 and recommended that development in the existing area of Khutsong should be “frozen” and geologically suitable land is identified where development investment should be channelled. A geotechnical study followed in 1997 undertaken by a firm of consultants “Intraconsult”. This study revealed that 90% of the existing Khutsong’s residential area falls within the extremely high-risk dolomite zones 3 and 4 which are not suitable for human settlement development.

The study resulted in the Municipality supporting a process of relocation of the residents of Khutsong Proper, Extensions 1 & 6 including the informal settlement to Khutsong South which is a land with low to medium risk. The Provincial Housing Department became instrumental in the relocation programme of the Khutsong residents. The relocation will include the construction of approximately 27 000 housing units as well as necessary ancillary infrastructure including roads, piping and electricity. An Environmental Authorisation (EA) was granted for Khutsong South Ext. 5, and another EA for Khutsong South Ext.7 in ward 2 was granted on 7th October 2005. The proposed Khutsong South Ext. 8 has been considered or is such activity applied for in this application or assessment.

The Khutsong resettlement project is aimed at relocating Khutsong Proper, Khutsong Extensions 1and 6 including Khutsong informal Area. The residential household were 15 000 in the informal area and the formal area had a combination of backyard dwellers of 6 500 units and formal units amounting to 3 600 with a total need of 25 100 units. Identified land can accommodate 27 000 stands. Associated bulk infrastructure and services (water supply, electrical supply, access roads, wastewater treatment or removal and solid waste management) will also need to be established.

The site was selected as the favourable site, due to the following reason:

- Proximity to existing hostel,
- All bulk services in close proximity,
- Site in reasonable proximity to CBD, and
- Site included in Spatial Development Framework (SDF).

Nature of Receiving Environment

In terms of the natural receiving environment within the vicinity of the proposed development site, a desktop analysis of the environment and local population yielded the following results regarding the site and surrounds:

- The site comprises primarily secondary grassland, with smaller areas of planted trees and gardens. Historic agricultural activities are evident within the site extent.
- Rain falls from early to mid-summer with highly infrequent winter rainfall. Annual rainfall for the quaternary catchment is 631.4mm.
- The vegetation within the sites has been classified as "Carletonville Dolomite Grassland" at a national resolution.
- In terms of the NFEPA project a wetland was identified approximately 120m downstream of the proposed development site, however, this wetland is not classified as a wetland FEPA. The proposed development site is, however, located within a River FEPA sub-catchment identified as an Upstream Management Area.
- In terms of the Gauteng Conservation Plan (V3.3), an area within the proposed development extent comprises an Ecological Support Area (ESA)
- At a local municipal level:
    - The population composition is primarily Black African
    - The primary language spoken is isiXhosa, closely followed by Setswana
    - The unemployment rate is between 17-20%, which is lower than the national average.
    - Only 26.3% of the population over the age of 20 years have a matric qualification

Applicable Legislation

The proposed Khutsong South Extension 8 Housing Development triggers listed activities in terms of the Environmental Impact Assessment (EIA) Regulations (2014) (as amended), Government Regulations (GNR) 324, 326 and 327 of 07 April 2017 in Government Gazette Number 38282 read in conjunction with GN R. 982 and 983 of 04 December 2014 promulgated under the National Environmental Management Act (NEMA) (Act no 107 of 1998). The following Table below provides a summary of the Listed Activities in terms of the EIA Regulations 2014 that are triggered by the proposed development:

Table: Applicable Listed Activities

GOVERNMENT NOTICE	ACTIVITY NUMBER	ACTIVITY DESCRIPTION	RELEVANCE TO THIS PROJECT
GNR 327 of 07 April 2017 (**Listing Notice 1**) read in conjunction with GNR 983 of 04 December 2014	9	The development of infrastructure exceeding 1 000 metres in length for the bulk transportation of water or stormwater – (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 stormwater drainage inside a road reserve or railway line reserve; or (b) where such development will occur within an urban area.	In regards with the Internal Water Reticulation, it is planned that that the entire development will have potable water mains and full level of service to each erf. Internal water reticulation is therefore classified as all water mains smaller or equal to 160mm in an internal diameter.
	10	The development and related operation of infrastructure exceeding 1 000 metres	Regarding the internal Sewer Reticulation, it is planned that the

		in length for 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, wastewater, 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.	entire development will have gravity sewers and full level of service to each erf and includes 160mm in an internal diameter. It is planned that gravity outfall sewers can be constructed to service the development for Bulk/External Services. Bulk outfall sewer is therefore classified as all sewers greater than 160mm internal diameter.
	12	The development of – (ii) Infrastructure or structures with a physical footprint of 100 square metres or more Where such development occurs – (a) Within a watercourse; (b) In front of a development setback; or (c) Within 32 metres of a watercourse, measured from the edge of the watercourse	The total structure of the housing development and associated infrastructure will have a physical footprint of more than 100 square meter.
	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 (i) a watercourse.	More than 10 cubic metres of soil and other materials will be excavated, removed, or moved during the construction of houses, roads, pipelines, and sewerage within the watercourse.
	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; (b) where the entire road falls within an urban area; or	The proposed housing development will require the development of a new access road network where the road reserve may be wider than 8m.

		(c) which is 1 kilometre or shorter.	
	28	Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such development: (i) will occur inside an urban area, where the total land to be developed is bigger than 5 hectares; or (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare; excluding where such land has already been developed for residential, mixed, retail, commercial, industrial or institutional purposes	The proposed housing development will occur in a land that was used for agriculture purpose.
	31	The decommissioning of existing facilities, structures or infrastructure for— (i) any development and related operation activity or activities listed in this Notice, Listing Notice 2 of 2014 or Listing Notice 3 of 2014;	It is recommended that the scope include demolition of the existing structures as well as ensuring appropriate environmental restitution of the site, including safe disposal of all waste material.
GNR 325 of 07 April 2017 (**Listing Notice 2**) read in conjunction with GNR 984 of 04 December 2014	15	The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for— (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.	The proposed development will result in the clearance of approx. 400Ha of indigenous vegetation. The proposed development is not identified as a linear activity.
	27	The development of a road— (iv) catering for more than one lane of traffic in both directions;	The design of the Roads & Stormwater services will be in accordance with the "Guideline for Human Settlement Planning and Design" (Red book). Construction will be specified to be in accordance with SANS 1200. There will be dual carriageways with two lanes in each direction.
GNR 326 of 07 April 2017 (**Listing Notice 3**) read in conjunction with GNR 984 of 04 December 2014	4	The development of a road wider than 4 metres with a reserve less than 13,5 metres. **c. Gauteng** iv. Sites identified as Critical Biodiversity Areas (CBAs) or Ecological Support Areas (ESAs) in the Gauteng Conservation Plan or in bioregional	The proposed housing development will require the development of a new access road network may be wider than 4m where the road reserve.

		plans;	
	14	The development of— (ii) infrastructure or structures with a physical footprint of 10 square metres or more; where such development occurs— (a) within a watercourse; (b) in front of a development setback; or (c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse; c. **Gauteng** iv. Sites identified as CBAs or ESAs in the Gauteng Conservation Plan or in bioregional plans	The total structure of the housing development and associated infrastructure will have a physical footprint of more than 10 square meter within the CBAs or ESAs in the Gauteng Conservation Plan.

The abovementioned activities contained in Listing Notice 1, 2 and 3 of the Regulations promulgated in terms of NEMA, 1998 (Act 107 of 1998) in GNR No 327 of 07 April 2017 read in conjunction with GN R. 982 and 983, of 04 December 2014; are subject to a Scoping & Environmental Impact Reporting (EIR) within the jurisdiction of the Department of Environment, Forestry and Fisheries (DEFF) – National Office.

Need for the Project

The project proposes the development of a township to accommodate residents of the existing Khutsong Hostel area. Improved access to affordable and RDP housing is a key theme of the IDP for the Merafong City Local Municipality whilst the residents of the Khutsong Hostel area are also in constant danger due to the unstable geology of the area. These statements constitute both a need and desirability for the proposed development. The proposed housing development will also include schools, community centres and open spaces which are desirable for a development of this nature.

Considering the overall need and desirability of the project, certain impacts were specifically addressed during the Scoping phase and will continue to be addressed during the forthcoming EIA process. The Guideline on Need and Desirability in terms of the Environmental Impact Assessment (EIA) Regulations, 2010 – General Notice 891 issued October 2014 in Government Gazette 38108, has been directly addressed for this phase of the development**.**

Feasible and Reasonable Alternatives

The following potential alternative options have been provisionally assessed for the proposed development site;

- Alternatives to the development footprint of the proposed development
- Alternatives in the type of activity to be undertaken
- The design or layout of the activity
- The operational aspects of the activity
- The technology to be used in the activity
- The option of not implementing the activity or 'No-Go' Alternative

The motivation for alternatives to be considered or utilised is provided, below.

Alternatives to the development footprint of the Khutsong South Ext. 8 Housing Development

The current proposed site for the relocation of the Khutsong Hostel provided by the is viewed as the best option given its proximity to the current hostel area. The advantages of the proposed site include the following:

- The size of the site will enable additional housing to be constructed in the area which should also alleviate some of the housing conflict in the area.
- The preferred area is in the process of being donated to the municipality which will negate the technicalities of having to purchase additional land from private/corporate owners.
- The preferred area is in close proximity to key transport routes, the Carletonville Mall and Carletonville town centre.
- Access to existing bulk services in close proximity to the site.

Multiple site alternatives have been provided by the client and although certain alternatives would be able to accommodate the number of required housing units based on their area, these sites are further away from the existing hostel area when compared to the preferred site.

Alternatives in the type of activity to be undertaken

The preferred activity involves the construction of housing and associated infrastructure. Two activity alternatives for the proposed housing development are:

1) the preferred option of the implementation of the housing development, and
2) the no-go development option.

The preferred activity option would infer that the construction of the housing development be undertaken within the preferred development area to address the current housing issue at the Khutsong Hostel site.

The no-go development option is neither advised nor feasible for the proposed development as:

- The geologically related safety issues for residents at the present Khutsong Hostel site will not be sufficiently addressed by government.
- The potential for short to medium term local job creation and skills development opportunities associated with the site establishment and construction of the proposed housing development will not be realised.
- Framework of the municipality as specified in the IDP

The design or layout of the activity

Five potential layout options have been proposed by the project manager. No habitat or areas within the proposed development boundary have been flagged as sensitive according to the preliminary desktop assessments for the scoping report and therefore the layout options are centred around spatial configuration. The preferred alternative has been chosen as a result of several design workshops undertaken with the Merafong Town Planning Department. The latest design (Revision E) has been accepted by the Merafong City Local Municipality.

The operational aspects of the activity

The preferred and only operational aspects of the activity involve the maintenance of housing infrastructure and general service delivery to the area. No alternatives to the operation aspect of the proposed development have been considered

The technology to be used in the activity

Preferred technologies have not yet been investigated for the project, however, best practice construction and implementation is recommended for all infrastructure associated with the project.

Potential alternatives that will be investigated for the proposed development during the EIA phase will include:

- Environmentally friendly technology and designs regarding the construction of housing and associated infrastructure such as:
    - Solar power for geysers and general electricity.
    - Efficient and sanitary rainwater harvesting.
    - Energy efficient lighting (within the houses and streets) and general appliances.
    - Water saving devices such as dual pipe systems for grey water, aerated taps and dual flush toilets.
- Waste minimisation activities during the construction and handover phases including the recycling of generated waste, where possible

The option of not implementing the activity or 'No-Go' Alternative

The no-go alternative must be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed. The no-go alternative, as discussed above, assumes that the proposed project will not go ahead i.e. the proposed housing development will not occur and therefore the safe and adequate housing issue within the Khutsong Hostel area will remain.

Public consultation process

Interested and Affected Parties Register

The compilation of a comprehensive Interested and Affected Party database (I&AP Register) is underway for the project. The latest contact details of the relevant key stakeholders, government departments, NGOs, ward councillors, community leaders and directly affected residences and businesses will be captured in the register. The register will be updated with the contact details of I&APs that respond to newspaper adverts, circulation of the BID, distribution of flyers, the erection of site notices and other documentation made available to the public to view at local public venues (libraries, community halls, municipality offices etc.) during the Scoping and EIA phase.

Key Stakeholders

The following have been provisionally identified as key stakeholders of the project (as stipulated by the EIA Regulations):

- National;
    - Department of Environment, Forestry and Fisheries (DEFF)
    - Department of Water and Sanitation (DWS)
    - Department of Human Settlements (NDHS)
    - Department of Agriculture, Forestry and Fisheries (DAFF)
    - Department of Rural Development and Land Reform (DRDLR)
    - The South African Police Service (SAPS)
- Provincial (Gauteng);
    - Department of Agriculture and Rural Development (GDARD)
    - Department of Infrastructure Development (GDID)
    - Department of Roads and Transport (GDRT)
    - Department of Community Safety (GDCS)
    - Department of Economic Development (GDED)
    - Department of Human Settlements (GDHS)
    - Department of Social Development (GDSD)
- Municipal (District);
    - West Rand District Municipality Public Safety
    - West Rand District Municipality Transport and Roads
    - West Rand District Municipality Integrated Environment
    - West Rand District Municipality Infrastructure and Human Settlement
    - West Rand District Municipality Health and Social Development
    - West Rand District Municipality Development Planning and Environmental Management

    - West Rand District Municipality Economic Development
- Municipal (Local);
    - Merafong City Community Services
    - Merafong City Infrastructure Development
- Organisations and State-Owned Enterprises (SOEs);
    - Wildlife & Environmental Society of South Africa (WESSA)
    - Endangered Wildlife Trust (EWT)
    - South African National Biodiversity Institute (SANBI)
    - Provincial Heritage Resources Authority Gauteng (PHRAG)
    - ESKOM
    - Transnet

Windeed Search

Windeed was utilised to search online for property (deeds office description, LPI code, extent, diagram deed number, local authority details) and ownership information (owner contact details, ID number, title deed number, purchase price, purchase date etc.). The contact details of all affected property owners were captured on the I&AP register.

Background Information Document (BID)

Copies of the BID were circulated by email to key stakeholders, government departments and NGOs to facilitate preliminary comments on the proposed development and to allow the EAP to address any potential issues within the Scoping and EIA phases of the project. The document was circulated by email on the 11th of August 2020, and the registered letters were circulated on the 09th of October 2020.

The BID was circulated to the following stakeholders shown in Table

Table: List of all stakeholders identified.

NAME	ORGANISATION / ENTITIES
Mr Mandla Mona	Department of Environment, Forestry and Fisheries
Ms Masina Litsoane	Department of Environment, Forestry and Fisheries
Mr Lucas Mahlang	Department of Environment, Forestry and Fisheries
Ms Zamashenge Hadebe	Department of Water and Sanitation
Mr B Govender	Department of Water and Sanitation
Ms Florah Mamabolo	Department of Water and Sanitation
Ms Jeanette Nyama	Department of Water and Sanitation
Mr Sibusiso Mthembu	Department of Water and Sanitation
Mr Lawrence Mulangaphuma	Department of Water and Sanitation
Mr Khathutshelo Mudau	Department of Water and Sanitation
Mr Victor Nkuna	Department of Water and Sanitation
Mr Mpho Nevondo	Department of Water and Sanitation
Ms Cindy Benyane	Department of Rural Development and Land Reform
Mr Solomon Maruma	Department of Rural Development and Land Reform
Mr Lebjane Maphutha	Department of Rural Development and Land Reform
Dr Hanneline Smit-Robinson	Bird Life South Africa
Ms Zingisa Smale	Gauteng Department of Agriculture and Rural Development
Mr Motlatjo Moholwa	Gauteng Department of Agriculture and Rural Development
Ms Pumla Ncapayi	Gauteng Department of Agriculture and Rural Development
Mr Albert Marumo	Department of Health
Ms Morakane Mokoena	Merafong City Local Municipality
Mr. I.M. Mavhutha	Merafong City Local Municipality
Mr Elvis Mphithikezi	Merafong City Local Municipality

NAME	ORGANISATION / ENTITIES
Mr Leonard Seabi	West Rand District Municipality
Mr Morongwe Mazibuko	West Rand District Municipality
Boikhutso A. Segopolo	West Rand District Municipality
Mogkotsi Sello	Ward 1 - Councillor
Ms Tshidi Ramodupi	Ward 5 and 27 - Councillor
Councillor Niewenhuys	Ward 28 Councillor

Additional copies of the BID have been circulated to local ward councillors and selected representatives of government departments by email to facilitate comments on the project

Flyers

English and Setswana flyers was distributed to directly affected residences and business located around in the general vicinity of the proposed housing development during the field survey and inspection by the EAP on 01st December 2020.

Pictures of the distribution of the flyers were taken by the EAP, and participants were asked to complete an acknowledgement of receipt register.

Site Notices

Ten (x10) English and Setswana site notices were erected in the vicinity of the proposed development site as part of the preliminary PPP on 01st December 2020. On receipt of the project reference number from DEFF during the EIA phase, an additional ten (x10) English and Setswana site notices will be erected around the site.

Newspaper Advertisements

English and Setswana adverts will be placed in the Local and Regional Newspapers in English and Setswana on 16/02/2021.

Comment and Responses Report

A provisional comment and responses report has been compiled for the Scoping phase of the project whilst a summary of comments and responses is included in this report. The document will be updated as comments on the proposed development are received from key stakeholders, government departments, NGOs, and members of the public during the ongoing PPP through to the EIA phase of the project.

Circulation of the Draft Scoping Report

An email to key stakeholders, Government Departments, NGOs, ward councillors, community leaders and directly affected residences and businesses will be circulated to notify these parties of the application and availability of the report for 30-day commenting period.

Comments received during the 30-day public participation period will be incorporated into the final Scoping report.

Hard copies of the draft report and supporting documentation will be placed at public venues, provided in **Table below**, below, for public viewing from **Monday 08th February 2021 to Monday 15th March 2021**.

Table: Details of public venues

VENUE	ADDRESS	CONTACT DETAILS	TIMES
Carletonville Library	c/o Celestine and Emerald Street, Carletonville	Tel: 018 788 9541/2 Fax: 018 787 2485	9am to 15pm (Mond to Fri)

The draft report will be placed on the Afzelia Environmental Consultants (Pty) Ltd website - http://www.afzelia.co.za for public viewing.

Follow-ups with Key Stakeholders and Government Departments

Two weeks after circulation of hard copies of the draft Scoping Report to key stakeholders and government departments by courier, Afzelia will commence weekly telephonic and email follow-ups to accelerate the submission of official comments.

The follow up process will be presented to officials with the opportunity to present queries and concerns related to the project. Details of all follow-ups with key stakeholders and government departments will be captured in the Follow-Up Register.

Specialist Studies

Several desktop-level specialist studies were conducted as part of the initial Scoping phase of the project, which included the following:

- Desktop Phase 1 Heritage Impact Assessment
- Pedology Scoping Assessment
- Desktop Palaeontological Impact Assessment
- Social Impact Assessment
- Initial Landscape and Visual Impact Assessment
- Desktop Ecological Impact Assessment
- Desktop Watercourse Assessment
- Preliminary Geotechnical Assessment and Geotechnical Review
- Floodline Study
- Market Study & Occupant Survey

The initial assessments did not flag any fatal flaws to the proposed development. It was discovered that a large area of secondary grassland will be transformed, however, a site-based assessment by experienced ecologists is required to determine the sensitivity of the habitat onsite. No direct disturbance of wetland habitat is likely to occur given that the nearest wetland areas are located at least 120m from the site at the nearest point. Infield wetland delineation will, however, be required to ascertain whether any wetland habitat is located onsite. The underlying geology of the area is also of concern given that the site is known to be underlain by Dolomite, which is linked to sinkhole / doline formation.

Although the primary recommendation of most specialist studies received to-date is that infield assessment is required to gather further information at a site-level, the Desktop Palaeontological Impact Assessment should be sufficient at this stage provided a “Chance Find Protocol” is followed onsite during construction.

Provisional Impact Identification and Mitigation Options

In terms of the impacts that the proposed development may have on the proposed site and surrounding areas, a suite of potential impacts was identified for all potential phases of the project, namely: The Planning and Design Phase, the Construction Phase, the Operation Phase, and the Decommissioning Phase.

The potential negative impacts during the planning and design phase were somewhat unique as they are specifically related to planning, adhering to design recommendations, and taking cognisance of the social and environmental setting.

The potential impacts include during the Planning and Design phase include:

- Direct Negative Compliance Impacts

- Direct Negative Erosion Impacts
- Direct Negative Air Quality Impacts
- Direct Negative Water Quality Impacts
- Direct Negative Biodiversity Impacts
- Direct Negative Heritage Impacts
- Indirect Negative Socio-Economic Impacts
- Direct Positive Socio-Economic Impacts

The potential impacts within all other three phases of the project include the following:

- Direct Negative Socio-Economic Impacts
- Direct Positive Socio-Economic Impacts
- Cumulative Social Impacts
- Direct and Cumulative Negative Impacts on Biodiversity
- Direct and Cumulative Negative Impacts on Geology
- Direct and Cumulative Negative Impacts on Surface Water
- Direct and Cumulative Negative Impacts on Ground Water
- Direct and Cumulative Negative Heritage Impacts
- Direct and Cumulative Negative Paleontological Impacts

Mitigation measures identified during the compilation of the Scoping report provisionally addresses all potential negative impacts posed by the proposed development project. It is essential that this proposed mitigation, which will also form part of the EIA report and associated Environmental Management Programme (EMPr), must be followed to ensure compliance, both socially and environmentally.

Plan of Study for the EIA Phase

The Plan of Study for the EIA phase of the project provides an overview of the forthcoming processes and assessments to be undertaken during the EIA phase of the proposed housing development. These steps include, inter alia: additional public participation processes and extensive stakeholder consultation, further analysis of development alternatives as well as the compilation of a full EIA report and EMPr for the proposed development.

The following site-level specialist assessments are also earmarked for completion during the EIA phase, namely:

- Social Impact Assessment;
- Traffic Impact Assessment;
- Ecological Habitat Impact Assessment;
- Geotechnical Assessment;
- Wetland Habitat Impact Assessment;
- Visual Impact Assessment;
- Phase 1 Heritage Impact Assessment;
- Pedology and Agricultural Potential Assessment;

It is the opinion of the EAP that the Scoping report has been undertaken in an objective manner with specific reference to the Scoping Report requirements as per Appendix 2 of GNR 326 of the National Environmental Management Act, 1998. The purpose of this scoping report was to provide the relevant authorities and stakeholders with extensive preliminary information pertaining to the proposed development activities and selected site, incorporate a plan for the upcoming EIA phase of the project as well as to initiate active engagement with all parties to ensure that informed decisions can be made during both the Scoping and EIA phase. Input received from government and stakeholders from the initial Scoping report will be obtained by the EAP and incorporated into the following EIA report.

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SECTION A: THE CORE PROJECT TEAM

1. DETAILS OF THE CORE PROJECT TEAM

1.1. Contact Details of the Applicant and Project Manager

The contact details for the Applicant and the Project Manager are provided in **Table 1**, below.

Table 1-1: Contact details of Applicant and Project Manager

Applicant	**The Gauteng Department of Human Settlements**				
Contact person	Mr Stenjwa Ngcobo				
Physical address	11 Diagonal Street, Marshalltown, 2107				
Postal address	Private Bag X79, Marshalltown, 2107				
Email	Sthenjwa.Ngcobo@gauteng.gov.za	**Fax**	011 838 8973	**Tel**	082 453 6320
Project Manager	**ETL Consulting (Pty) Ltd**				
Contact person	Mr Koos de Wet				
Physical address	1 Ashley Avenue, Bryanston, Johannesburg, 2021				
Postal address	P.O. Box 8129, Halfway House, Midrand, 1685				
Email	koosdw@etlconsulting.co.za	**Fax**	086 540 6795	**Tel**	010 612 0377

1.2. Name and Contact Details of Environmental Assessment Practitioner's Organisation

The contact details of the Environmental Assessment Practitioner (EAP)'s Organisation are provided in **Table 2**, below.

Table 1-2: Contact details of EAP's Organisation

Contact details of the EAP's organisation	
Business Name	Afzelia Environmental Consultants (Pty) Ltd
Physical Address	Office 101A Windermere Centre, 163-177 Lilian Ngoyi Road, Morningside, Durban, 4001
Postal Address	PO Box 37069, Overport, Durban, 4067
Telephone	031 303 2835
Fax	086 692 2547
Email	solomon@afzelia.co.za / andrew.briggs@afzelia.co.za

1.3. Details of the Environmental Assessment Practitioners

Details of the Environmental Assessment Practitioners (EAPs) that prepared this Scoping Report are provided in **Table 3,** below:

Table 1-3: Details of EAP

Name of the EAP	**Education Qualifications**	**Professional Affiliations**	**Years of Experience (yrs)**
Mr Andrew Batho	Master of Social Science – Geography and Environmental Management	EAPASA (Registration No. 2019/1179	10
Mr Solomon Fataki	Bachelor of Science. Honours in Environmental Management:	IAIAsa (Reg. no. 3653), (IAP2), EAPASA (pending)	7
Mr Andrew Briggs	MSc in Conservation Ecology	SACNASP *Pr. Sci. Nat:* 116886	5

Mr. Jon Marshall	Diploma in Landscape Architecture & Environmental Law	SACLAP (Reg. No LI-12303), IAIAsa (Reg. no. 1484)	21

1.4. Summary of EAP Experience

A summary of the project teams experience has been described below in **Table 4**:

Table 1-4: Summary of EAP Experience

NAME OF EAP	DESCRIPTION OF EXPERIENCE
Mr Andrew Batho	Andrew graduated with a BsocSc (Masters) in Geography and Environmental Management from the School of Environmental Sciences, University of KwaZulu-Natal, Durban. His Master's dissertation investigated the use of Wetland Bird Species as Indicators of Land Cover Change within the uMgeni Estuary and Beachwood Mangrove Swamps. His interest lies primarily in wildlife and ecosystem monitoring and management and he has been involved in a variety of research assignments including identification of sites for the purpose of bio fuel production in Western Africa. Andrew has approximately 10 years conservation and environmental consulting expeirence, and is a member of the KwaZulu-Natal Branch of International Association for Impact Assessments (IAIAsa) and Internatonal Association for Public Particpation (IAP2). Andrew is currently completing his application for registation as Professional Environmental Consultant with Environmental Assessment Practioners Association of South Africa (EAPASA), and hopes to lodge the application in April 2019.
Mr Andrew Briggs	Andrew graduated with a MSc in Conservation Ecology from the University of Stellenbosch in March 2016. His thesis focused primarily on the comparisons between the invertebrate and plant assemblages within a selection of degraded and pristine watercourses in KwaZulu-Natal, South Africa. He has since published two chapters of his thesis within internationally recognised scientific journals. Andrew currently specialises in wetland and aquatic ecology, with over 5 years' experience in the respective specialist fields. He is competent with specialist wetland, aquatic and terrestrial assessments as well as full Environmental Impact Assessments (EIA). He is registered with South African Council for Natural Scientific Professions (SACNASP) as a Professional Natural Scientist (*Pr. Sci. Nat.*) in the field of Ecological Science, is also an accredited SASSv5 practitioner as part of the National Aquatic Ecosystem Health Monitoring Programme and is a member of the IAIAsa.
Mr Solomon Fataki	Solomon has 7 years of experience in the environmental field. His specific interest includes water, soil science, terrestrial ecology, environment and occupational health and safety. Solomon is a member of the KwaZulu-Natal branch of IAIAsa and a regional affiliate member of the IAP2SA. His experience inter alia: • Undertaking of EIAs covering the Basic Assessment (BA) process as required by environmental legislation in terms of the National Environmental Management Act (NEMA) (Act 107 of 1998); • Undertaking of Water Use License (WUL) Application in terms of the National Water Act (NWA) (Act No. 36 of 1998); • Compilation of Environmental Management Programmes (EMPr) for a range of developments; • Undertaking Public Participation Process (PPP) to facilitate EIAs and WUL Applications

NAME OF EAP	DESCRIPTION OF EXPERIENCE
Mr Jon Marshall	Jon qualified as a Landscape Architect (Dip LA) at Cheltenham (UK) in 1979. He has been a chartered member of the Landscape Institute UK since 1986 and is a registered Professional Landscape Architect in South Africa. He has wide experience of strategic environmental / landscape planning, landscape design, environmental impact assessment, environmental auditing, environmental management and project management. Jon has worked on and project managed numerous strategic planning projects including ports, major industrial areas and rural areas. He has undertaken a range of environmental impact assessment work including industrial, infrastructure, water supply / treatment, waste, commercial / residential and renewable energy projects. Environmental management and auditing input has also been undertaken for contractors, developers and statutory authorities on a similar range of projects. As a landscape architect, design work in recent years has largely been associated with environmental input and focused on rehabilitation of natural areas. Jon has also provided specialist visual impact assessment input to a range environmental impact assessment projects including proposed mines, renewable energy projects, major infrastructure such as airports, roads through scenic areas and electrical infrastructure. He has also project managed specialists for strategic environmental projects as well as development / historical restoration work. This depth of experience has provided a detailed understanding of issues associated with a broad range of projects and the knowledge to ensure that they are addressed in a practical and appropriate manner. He has more than 21 years of consulting experience.

Note: Please see copies of curriculum vitae, qualifications and professional registrations attached in **Appendix F** of this report.

1.5. Environmental Specialist Studies to be Undertaken

To quantify how and where a project may impact on the environment, specialist studies are required to inform the Scoping and EIA process which includes the provision of site-specific specialist findings and recommendations. The following specialist studies have been identified thus far, and will be conducted during the Scoping and EIA process:

- Soil / Agricultural Potential Assessment
- Level 1 Heritage Impact Assessment
- Level 1 Paleontological Impact Assessment
- Social Impact Assessment
- Visual Impact Assessment
- Ecological risk assessment
- Wetland Assessment
- Geotechnical Assessment
- Floodline Study
- Market Study & Occupant Survey

The public consultation process may necessitate additional studies not envisaged at this juncture, as well as detailed studies of specific sites.

1.6. Names, Details and Expertise of Contributing Specialists

Details of the specialist consultants that prepared the specialist reports are provided in **Table 5,** below:

Table 1-5: Details of Specialists

NAME OF SPECIALIST	QUALIFICATIONS	PROFESSIONAL REGISTRATIONS	YEARS OF EXPERIENCE	TITLE OF SPECIALIST REPORT
Andrew Husted	MSc Aquatic Health (University of Johannesburg)	Professional Natural Scientist – SACNASP (Registration Number: 400213/11)	12	Scoping Report for the Khutsong South Ext. 8 Development: Pedology Scoping Assessment
Ivan Baker	MSc Environmental Science and Hydropedology (North-West University)	Candidate Natural Scientist – SACNASP (Registration Number: 119315)	5	
Andrew Briggs	MSc Conservation Ecology (Stellenbosch University)	Professional Natural Scientist – SACNASP (Registration Number: 116886)	5	Desktop Watercourse Assessment for the Proposed Khutsong Extension 8 Housing Development
Leigh-Ann de Wet	MSc Botany (Rhodes University)	Professional Natural Scientist – SACNASP (Registration Number: 400233/12)	12	Draft Desktop Ecological Habitat Impact Assessment for the Proposed Khutsong Extension 8 Housing Development
Roy Muroyi	Honours Archaeology, Cultural Heritage and Museum Studies (Midlands State University - Zimbabwe)	Association of Southern African Professional Archaeologists (ASAPA) No- 453 Association of Professional Heritage Professionals (APHP) No –C0115 KwaZulu-Natal AMAFA and Research Institute	7	Desktop Phase 1 Heritage Impact Assessment for the Proposed Khutsong South Extension 8 Development
Dr Alan Smith	PhD in Geology (University of KwaZulu-Natal)	International Association of Hydrological Scientists (IAHS Membership No. 5793), SACNASP (Reg. No. 400122/03)	32	Desktop Paleontological Impact Assessment for the Proposed Khutsong South Extension 8 Development
Jan Anton Hough	Master of Art in Sociology	IAIAsa	12	Draft Social Impact Assessment Screening Report for the Proposed Khutsong South Extension 8 Housing Development

NAME OF SPECIALIST	QUALIFICATIONS	PROFESSIONAL REGISTRATIONS	YEARS OF EXPERIENCE	TITLE OF SPECIALIST REPORT
Jonathan Marshall	Diploma in Landscape Architecture (Gloucestershire College of Art and Design)	Chartered Member of the Landscape Institute (UK) Registered Professional Landscape Architect (RSA)	41	Initial Review of Likely Landscape & Visual Impacts and the Necessary Level of Assessment for the Proposed Khutsong South Extension 8 Development
Irshaad Hassen	BEng (Hons) Transport Engineering, (University of Pretoria)	Professional Engineer - Reg No: 20190989 Member of South African Institute of Civil Engineers (MSAICE, No. 205571)	12	Khutsong Extension 10 Floodlines Report
Dr. Hein du Toit	Master's Degree in Real Estate – Cum Laude (University of Pretoria)	Member - SA Property Owners' Association, SA Council of Shopping Centres and SA Planning Institute	19	Khutsong Hostel Redevelopment Market Study & Occupant Survey
Alfred Krebs	BSc Hons (Cum Laude) Engineering Geology	Professional Natural Scientist – SACNASP (Registration Number: 114208)	5	Interim Draft Report To ETL Consulting On The Results of a Preliminary Geotechnical Assessment and Geotechnical Review For The Proposed New Development, Merafong City Council - Khutsong Hostel Development

1.7. Summary of Specialist Consultant Expertise

A summary of the specialist consultant's expertise has been provided in **Table 6,** below:

Table 1-6: Summary of Specialist Consultant Expertise

NAME OF SPECIALIST	DESCRIPTION OF EXPERIENCE
Andrew Husted	Andrew graduated with a MSc in Aquatic Health from the University of Johannesburg. He is an aquatic ecologist, specializing in freshwater systems and wetlands. Andrew is registered as a *Pr. Sci. Nat.* in the following fields of practice: Ecological Science, Environmental Science and Aquatic Science. Andrew is an Aquatic, Wetland and Biodiversity Specialist with 12 years' experience in the environmental consulting field. He has worked all over South Africa and he is familiar with the relevant national and provincial legislative and licensing requirements. His expertise includes providing input for studies conducted as per requirements of the International Finance Corporation (IFC) Performance Standard 6 and World Bank in no less than 12 African countries. Andrew has gained experience across varying sectors; these include mining, agriculture, natural resources and hydro to name a few. He has been involved in numerous

NAME OF SPECIALIST	DESCRIPTION OF EXPERIENCE
	publications, with a keen focus being river systems in South Africa and West Africa.
Ivan Baker	Ivan Baker is Cand. Sci Nat registered (119315) in environmental science and geological science. Ivan is a wetland and ecosystem service specialist, a hydropedologist and pedologist that has completed numerous specialist studies ranging from basic assessments to EIAs. Ivan has carried out various international studies following FC standards. Ivan completed training in Tools for Wetland Assessments with a certificate of competence and completed his MSc in environmental science and hydropedology at the North-West University of Potchefstroom.
Leigh-Ann de Wet	Leigh-Ann is an ecologist with her MSc in Botany from Rhodes University with over 10 years' experience in the field, both within South African and Internationally. She is registered as a Professional Natural Scientist (ecology) with the South African Council for Natural Scientific Professionals (SACNASP). Leigh-Ann has been a full-time ecological consultant since 2009, and part time from 2001 to 2009. She has worked on several Ecological Impact Assessments, Baseline Surveys, Biodiversity Action Plans and Offset Plans, among others both in South Africa and Internationally. She is familiar with International best practice, including IFC and RSPO and has completed Critical Habitat Assessments and High Conservation Value forest assessments throughout Africa. She has published several articles, (both peer reviewed scientific and popular) and presented at 7 international conferences. She has also lectured in methods for specialist assessments for the Rhodes University and CES short course on Environmental Impact Assessment. Leigh-Ann has substantial experience in all 9 provinces of South Africa, as well as in Southern, West and Central Africa. She is also currently pursuing her PhD in forest ecology.
Roy Muroyi	Mr. Roy Muroyi (Archaeologist) is a holder of an Honours Degree, Archaeology, Cultural Heritage and Museum Studies (Midlands State University) an MA Critical Diversity Studies (with specialisation in Archaeology) at the University of Witwatersrand (Awaiting – Examiners), he attended further training as a Laboratory Specialist for Human anatomy and human skeletal analysis through the University of Cape-Town human biology department in-conjunction with Cape Archaeological Surveys. Mr Muroyi has over six years industry experience , after leaving the Department of National Museums and Monuments of Botswana where he worked as an Archaeological Impact Assessment adjudicating officer Mr . Muroyi then moved to South Africa where has been involved in a range of Cultural Resources Management (CRM) projects. He has so far exhumed over 500 historical burials as a professional archaeologist and carried out close to 100 Heritage Impact Assessments.
Jan Anton Hough	Anton is an experienced, freelancing social scientist who, over the last 12 years, has worked in sub-Saharan Africa on more than 17 Resettlement Action Plans (RAPs) and more than 50 social surveying projects - which he project managed and drafted the reports of -, ranging from conducting Health Impact Assessments (HIAs), Social Impact Assessments (SIAs)/Socio-Economic Impact Assessments (SEIAs) to Socio-Economic Baseline Studies (SEBSs). The latest resettlement project he was involved in was for Total East African Midstream (TEAM) BV's East Africa Crude Oil Project (EACOP) in Tanzania, which was being implemented in accordance with the International Finance Corporation's (IFC) Performance Standard (PS) 5 on Involuntary Resettlement. More recently, Anton started to undertake social due diligence studies, such as a RAP due diligence in Kenya (2019). The countries which he has worked in to date include Sierra Leone, Liberia, Ghana, Democratic Republic of Congo (DRC), Cameroon, Kenya, Tanzania, Mozambique, South Africa and Lesotho. He has more than 10 years specifically in conducting his work to the IFC's PSs, most noticeable PS 1 on the Assessment and Management of Environmental and Social Risks and Impacts, PS 5 and PS 8 on Cultural Heritage. He has also drafted several reports and plans for review by the World Bank (WB), European Investment Bank (EIB), Norwegian Investment Fund for Developing Countries (Norfund), African Development Bank (AfDB) and World Bank.
Dr Alan Smith	Dr Alan Smith is a holder of a PhD Degree in Geology (University of KwaZulu-Natal), Pr. Sc. Nat., I.A.H.S. Dr Alan Smith, expert in Vryheid Formation (Ecca Group) in northern KZN (this having been the subject of PhD), .has an Honorary Research Fellow in the following fields of

NAME OF SPECIALIST	DESCRIPTION OF EXPERIENCE
	practice: Geology, School of Agriculture, Earth and Environmental Sciences, at the University of KwaZulu-Natal, Durban. His Scientific Research experience includes: Fluvial geomorphology, palaeoflood hydrology, Cretaceous deposits. His experience includes understanding Earth Surface Processes in both fluvial and coastal environments (modern & ancient). Alan has published in both national and international, peer-reviewed journals. He has published more than 50 journal articles with 360 citations. He has attended and presented scientific papers and posters at numerous international and local conferences (UK, Canada, South Africa) and is actively involved in research.
Irshaad Hassen	Irshaad Hassen is registered as professional Engineer with over 10 years' experience. He is currently employed at Element Consulting Engineers in the Transportation division, in the Gauteng Office. Irshaad Hassen has been with Element Consulting Engineers from April 2020 to the present. He is also an associate member of South African Institution of Civil Engineering. He has obtained experience in both the water and transportation sectors. He also has experience in project and construction management as well as environmental consulting. He has worked in infrastructure projects focussing on the provision of water and transport infrastructure. Irshaad Hassen has experience in Transport Engineering including conducting of Traffic Impact Assessments (TIA's), Routine Road Maintenance (RRM) activities, Traffic Engineering, Transport Modelling etc. Irshaad Hassen also has experience in Stormwater management, hydrology, environmental consulting as well as project and site management. Irshaad holds an honours degree in Transportation Engineering from the University of Pretoria. His focus was on transport planning, traffic engineering and transport modelling. He has also completed a number of post graduate courses at the University of the Witwatersrand including Project Management, Economics, Water Supply, Environmental Engineering Design, Urban Drainage and Water Management. Irshaad has presented and authored a technical paper for the SANCOLD conference, November 2014, on the Christiana raw Water Abstraction Project. He has since completed a number of CPD (Continual Professional Development) courses, including WRSM (Water Resources Management), Risk Assessment, Slope stability, Dam Break Risk Analysis, SWMM (Storm Water Management Module), Advanced Excel, Technical report writing, etc.
Dr. Hein du Toit	Hein du Toit is the Managing Director, sector specialist and founding member of DEMACON Market Studies. Hein is a specialist development economist and expert real estate analyst. He obtained a degree in Town and Regional Planning (Cum Laude) at the University of Pretoria in 1994 and a Master's Degree (MSc) in real estate market studies in 2002 (Cum Laude). He has also completed a specialist course in shopping centre management - the Certificate in Shopping Centre Management (CSCM) in 2005 (Cum Laude). His research has been published in, inter alia, the South African Journal of Economics and Management Sciences. He is a member of the SA Property Owners' Association, SA Council of Shopping Centres and SA Planning Institute. He has been extensively involved in real estate market studies both locally and abroad, including Mozambique, Angola, Zambia, Ethiopia, Burundi, Botswana, Swaziland, Namibia, People's Republic of China, etc. His fields of expertise include, inter alia: real estate market studies, urban and rural economics, as well as economic and fiscal impact assessments. His client base includes, inter alia: listed funds, commercial banks, private funds, investors and development companies, healthcare service providers, retailers, advocates, attorneys, economic development agencies and all tiers of government, including parastatals.

NAME OF SPECIALIST	DESCRIPTION OF EXPERIENCE
Alfred Krebs	Alfred Krebs is the Owner and Managing Director of Davies Lynn and Partners (Pty) Ltd Geotechnical Consultants and Engineering Geologists. Alfred Specializes in Geotechnical Investigations for • Large and Small Scale Housing Developments • Road Alignment and Bridge Investigation and Design • Slope Stability Investigations for tailings or large embankment construction • Hydrogeological Investigations • Financial Management and Business Control Alfred qualified in 2014 with a BSc Honours (Cum Laude) Engineering Geology.

SECTION B: ACTIVITY INFORMATION

2. INTRODUCTION

2.1. Project Background

Afzelia Environmental Consultants (Pty) Ltd (Afzelia) have been appointed by ETL Consulting (Pty) Ltd (ETL) on behalf of the Gauteng Department of Human Settlements (GDHS) to undertake a Scoping and Environmental Impact Assessment (EIA) process for the proposed Khutsong South Extension 8 Housing Development located near Carletonville, Merafong Local Municipality, Gauteng.

The project has been initiated by the GDHS together with the Merafong City Local Municipality and West Rand District Municipality in order to relocate residents from the Khutsong Hostel, Khutsong Extensions 1 and 6 as well as the Khutsong informal Area to an area adjacent to the existing Khutsong South settlement. The areas mentioned above, that are currently inhabited, are unsafe due to underlying geological instabilities (GDHS, 2019).

A study undertaken by the Council for Geoscience in 1989 and recommended that development in the existing area of Khutsong should be "frozen" and geologically suitable land is identified where development investment should be channelled. A geotechnical study followed in 1997 undertaken by a firm of consultants "Intraconsult". This study revealed that 90% of the existing Khutsong's residential area falls within the extremely high-risk dolomite zones 3 and 4 which are not suitable for human settlement development (GDHS: Presentation of Survey Results, 2019).

The study resulted in the Municipality supporting a process of relocation of the residents of Khutsong Proper, Extensions 1 & 6 including the informal settlement to Khutsong South which is land with low to medium risk of geological instability. The Provincial Housing Department became instrumental in the relocation programme of the Khutsong residents (GDHS: Presentation of Survey Results, 2019). (Refer to **Figure** 1 below).

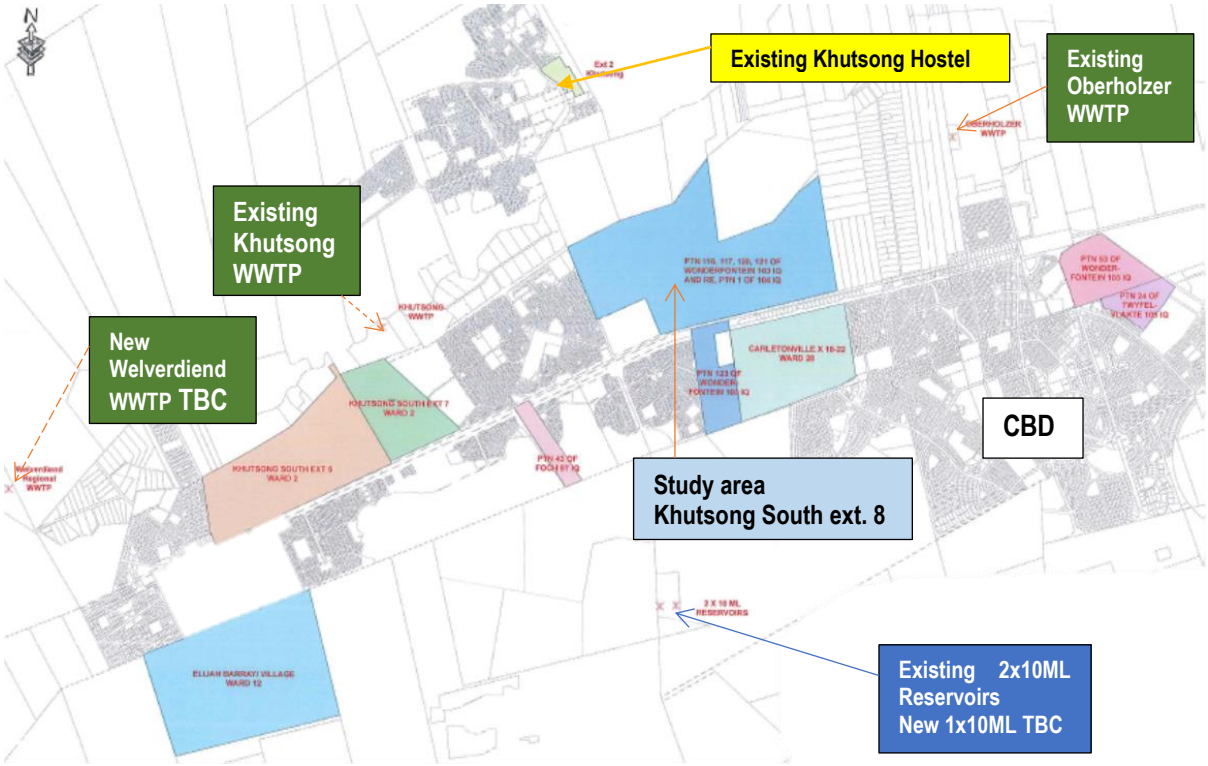

Figure 1: Locality map of the study area in proximity to existing infrastructure

An Environmental Authorisation (EA) was granted for Khutsong South Ext. 5, and another EA for Khutsong South Ext.7 in ward 2 was granted on 7th October 2005. The proposed Khutsong South Ext. 8 is part of this activity applied for and part of this assessment.

The Khutsong resettlement project is aimed at relocating Khutsong Proper, Khutsong Extensions 1and 6 and Khutsong informal Area. The land identified can house up to 27 000 stands / units needed to accommodate all the people from the informal area and the formal area. Associated bulk infrastructure and services (water supply, electrical supply, access roads, wastewater treatment or removal and solid waste management) will also need to be established.

The current site was selected, due to the following key reasons:

- Proximity to existing hostel,
- All bulk services in close proximity,
- Site in reasonable proximity to CBD, and
- Site included in Spatial Development Framework (SDF).

2.2. Contents of the Scoping Report

Appendix 2 of Government Notice Regulations (GNR) 326 of 07 April 2017 read in conjunction with GNR 982 of 04 December 2014 in terms of the National Environmental Management Act (NEMA), 1998 (Act No. 107 of 1998): EIA Regulations, 2014, as amended in 2017, includes the overall objectives of the scoping process as well as the minimum required content of scoping reports. The proposed content for scoping reports, as extracted from Appendix 2 of the regulations, is provided in **Table 7**, below. The corresponding location of information, as set out in this scoping report, is also included.

Table 2-1: Scoping Report requirements as per Appendix 2 of GNR 326 of NEMA, 1998

Minimum required content for Scoping Reports	
Clause	**Section in this report**
2(1)(a) details of— (i) the EAP who prepared the report; and (ii) the expertise of the EAP, including a curriculum vitae;	Section 1.2 to 1.4 and Appendix I
2(1)(b) the location of the activity, including— (i) the 21-digit Surveyor General code of each cadastral land parcel; (ii) where available, the physical address and farm name; (iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;	Section 2.5 to 2.6
2(1)(c) a plan which locates the proposed activity or activities applied for at an appropriate scale, or, if it is— (i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or (ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken;	Section 2.5.
2(1)(d) a description of the scope of the proposed activity, including— (i) all listed and specified activities triggered; (ii) a description of the activities to be undertaken, including associated structures and infrastructure;	Section 3.2. and Section 6.1.
2(1)(e) a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process;	Section 6
2(1)(f) a motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred	Section 4 and Section 5.1.

Minimum required content for Scoping Reports	
Clause	**Section in this report**
location;	
2(1)(g) a full description of the process followed to reach the proposed preferred activity, site and location of the development footprint within the site, including— (i) details of all the alternatives considered; (ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs; (iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them; (iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; (v) the impacts and risks which have informed the identification of each alternative, including the nature, significance, consequence, extent, duration and probability of such identified impacts, including the degree to which these impacts— (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated; (vi) the methodology used in identifying and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives; (vii) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; (viii) the possible mitigation measures that could be applied and level of residual risk; (ix) the outcome of the site selection matrix; (x) if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and (xi) a concluding statement indicating the preferred alternatives, including preferred location of the activity;	(i) Section 5, (ii) and (iii) Section 8, (iv) Section 5 and Section 9 (v) – (vii) Section 11 (viii) Section 12 (ix) Section 5.1. (x) and (xi) Section 5
2(1)(h) a plan of study for undertaking the environmental impact assessment process to be undertaken, including— (i) a description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity; (ii) a description of the aspects to be assessed as part of the environmental impact assessment process; (iii) aspects to be assessed by specialists; (iv) a description of the proposed method of assessing the environmental aspects, including aspects to be assessed by specialists; (v) a description of the proposed method of assessing duration and significance; (vi) an indication of the stages at which the competent authority will be consulted; (vii) particulars of the public participation process that will be conducted during the environmental impact assessment process; and (viii) a description of the tasks that will be undertaken as part of the environmental impact assessment process;	Section 13

Minimum required content for Scoping Reports	
Clause	**Section in this report**
(ix) identify suitable measures to avoid, reverse, mitigate or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored.	
2(1)(i) an undertaking under oath or affirmation by the EAP in relation to— (i) the correctness of the information provided in the report; (ii) the inclusion of comments and inputs from stakeholders and interested and affected parties; and (iii) any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties;	Appendix H
2(1)(j) an undertaking under oath or affirmation by the EAP in relation to the level of agreement between the EAP and interested and affected parties on the plan of study for undertaking the environmental impact assessment;	Appendix H
2(1)(k) where applicable, any specific information required by the competent authority; and	Appendix J
2(1)(l) any other matter required in terms of section 24(4)(a) and (b) of the Act.	Appendix J
2(2) Where a government notice gazetted by the Minister provides for any protocol or minimum information requirement to be applied to a scoping report, the requirements as indicated in such notice will apply.	N/A

2.3. Scoping Report Objective and Structure

The Scoping and EIA process is a comprehensive, independent assessment of all identified and potential environmental impacts to a site of a proposed development.

The aim of the Scoping and EIA process is to ensure that the establishment of the proposed housing development occurs in an environmentally sound manner and to formulate ways for reducing or mitigating any negative impacts of the project, whilst enhancing its potential benefits.

The objective of the initial Scoping Process, as extracted from the NEMA, 1998 (Act No. 107 of 1998) and the amended EIA Regulations, 2014 (amended April 2017): GNR. 326, is to, through a consultative process:

1.
   (a) Determine the policy and legislative context within which the activity is located,
   (b) Motivate the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location,
   (c) Identify and confirm the preferred activity and technology alternative through an identification of impacts and risks and ranking process of such impacts and risks,
   (d) Identify and confirm the preferred site, through a detailed site selection process, which includes an identification of impacts and risks inclusive of identification of cumulative impacts and a ranking process of all the identified alternatives focusing on the geographical, physical, biological, social, economic, and cultural aspects of the environment,
   (e) Identify the key issues to be addressed in the assessment phase,
   (f) Agree on the level of assessment to be undertaken, including the methodology to be applied, the expertise required as well as the extent of further consultation to be undertaken to determine the impacts and risks the activity will impose on the preferred site through the life of the activity, including the significance, duration, and probability of the impacts to inform the technology and micro-siting of the activity on the site; and
   (g) Identify suitable measures to avoid, manage or mitigate identified impacts and to determine the extent of the residual risks that need to be managed and monitored.

The structure of the report, including short descriptions of each heading, is shown in **Table 8**, below:

Table 2-2: Overall structure of the Scoping Report

Chapter	Heading	Description
Chapter 1	Details of the Core Project Team	This chapter provides relevant details of all the key project team members including the Environmental Assessment Practitioners (EAPs), specialist consultants, applicant, landowner and project manager.
Chapter 2	Introduction	This chapter provides a general overview of the project which includes background information of the project, the required checklist for Scoping Reports, assumptions and limitations, regional setting and location of activity, property description and the clearance from the Department of Land Affairs
Chapter 3	Project Description	This chapter includes a comprehensive description of the proposed housing development, including the duration and type of activities to take place onsite.
Chapter 4	Need and Desirability	This chapter explores the motivation for the proposed housing development with reference to national, provincial, and municipal policy, local socio-economic conditions and receiving environment
Chapter 5	Feasible and Reasonable Alternatives	This chapter includes an assessment of potential alternatives for multiple facets of the proposed development
Chapter 6	Relevant Legislation	This chapter includes a broad assessment on how the project aligns with relevant legislation and policies as well as which Listed Activities are triggered by the proposed development.
Chapter 7	Approach and Methodology	This chapter provides and overview of the process that will be followed during both the Scoping and EIA phases of the overall project.
Chapter 8	Public Participation Process	This chapter outlines the processes that will be implemented to allow for comprehensive public input to the project
Chapter 9	Description of the Receiving Environment	This chapter provides an overview of the receiving environment as well as the socio-economic characteristics of the study area. This information is largely obtained through desktop datasets supplemented with acquired, site-level, input.
Chapter 10	Summary of Specialist Studies	This chapter includes a tabulated summary of all specialist studies undertaken during the Scoping phase of the project.
Chapter 11	Potential Impacts That May Result from Planning and Design, Construction, Operational, Decommissioning and Closure of the Activity	This chapter includes an overview of the impact assessment methodology that will be impacted as well as potential impacts based on available data and initial specialist assessments.
Chapter 12	Potential Mitigation Measures	This chapter includes an assessment of potential mitigation measures for each impact identified during the initial Scoping phase.
Chapter 13	EIA Plan of Study	This chapter provides an overview of what will be included in the EIA report that will be compiled during the EIA phase of the project.
Chapter 14	Conclusion	This chapter provides a summary of primary findings and recommendations of the project.
Chapter 15	References	This chapter includes a full reference list of all sources consulted during the compilation of the project
Chapter 16	Appendices	This chapter includes all supporting information for the Scoping Report

2.4. Assumptions and Limitations

Assumptions and limitations as addressed in this scoping report for the Khutsong Extension 8 Housing Development are as follows:

- All information provided by the Project Manager, ETL Consulting (Pty) Ltd, to the EAP was taken to be correct and valid at the time it was provided,
- The Environmental Assessment Practitioners (EAP) does not accept any responsibility in the event that additional information comes to light at a later stage of the process from the Project Manager or Applicant,
- The scope of work is limited to assessing the existing and potential environmental impacts associated with the Khutsong Extension 8 Housing Development, as indicated in the Inception Report, the Engineering Report, the Market Study & Occupant Survey, the Design Layouts and Geotechnical Investigation submitted by, ETL Consulting (Pty) Ltd.
- Descriptions of the natural and social environments are largely based on various desktop studies, complimented by available literature. Site-based information will be provided in the EIA phase.
- With regards to the time frames of construction: these are very rough estimates at this time, subject to a number of external factors beyond our control that may have an impact on time frame changes. The duration for planning and design is estimated from January 2021 going forward.

In addition to the above, assumptions and limitations were noted by the specialist team, who have clearly stated their own concerns, which are considered as assumptions and limitations in their reports attached in **Appendix D**.

2.5. Regional Setting and Location of Activity

The proposed site of the housing development is located adjacent to the settlement of Khutsong South near Carletonville, within the Merafong City Local Municipality, West Rand District Municipality, Gauteng. The proposed development site is located approx. 75km south-west of the Johannesburg CBD and 48km north-east of the Potchefstroom CBD. At a local scale, the proposed development site is situated in between the Khutsong Township, Khutsong South Township, and the Oberholzer Township. A locality map, local area map and topographical map are provided below in **Figures 2, 3 and 4**, respectively. The co-ordinates of the corner points of the proposed development are included in **Table 9**, below.

Table 2-3: Coordinates of the corner points of the proposed development

POINT	LATITUDE (S) (DDMMSS)	LONGITUDE (E) (DDMMSS)
A	26^0 20’ 36”	27^0 19’ 56”
B	26^0 21’ 06”	27^0 20’ 09”
C	26^0 20’ 57”	27^0 20’ 30”
D	26^0 21’ 13”	27^0 20’ 36”
E	26^0 20’ 52”	27^0 21’ 59”
F	26^0 20’ 01”	27^0 21’ 49”
G	26^0 20’ 25”	27^0 21’ 29”
H	26^0 20’ 34”	27^0 21’ 02”
I	26^0 20’ 01”	27^0 20’ 57”
J	26^0 20’ 20”	27^0 20’ 37”
K	26^0 25’ 36”	27^0 20’ 14”

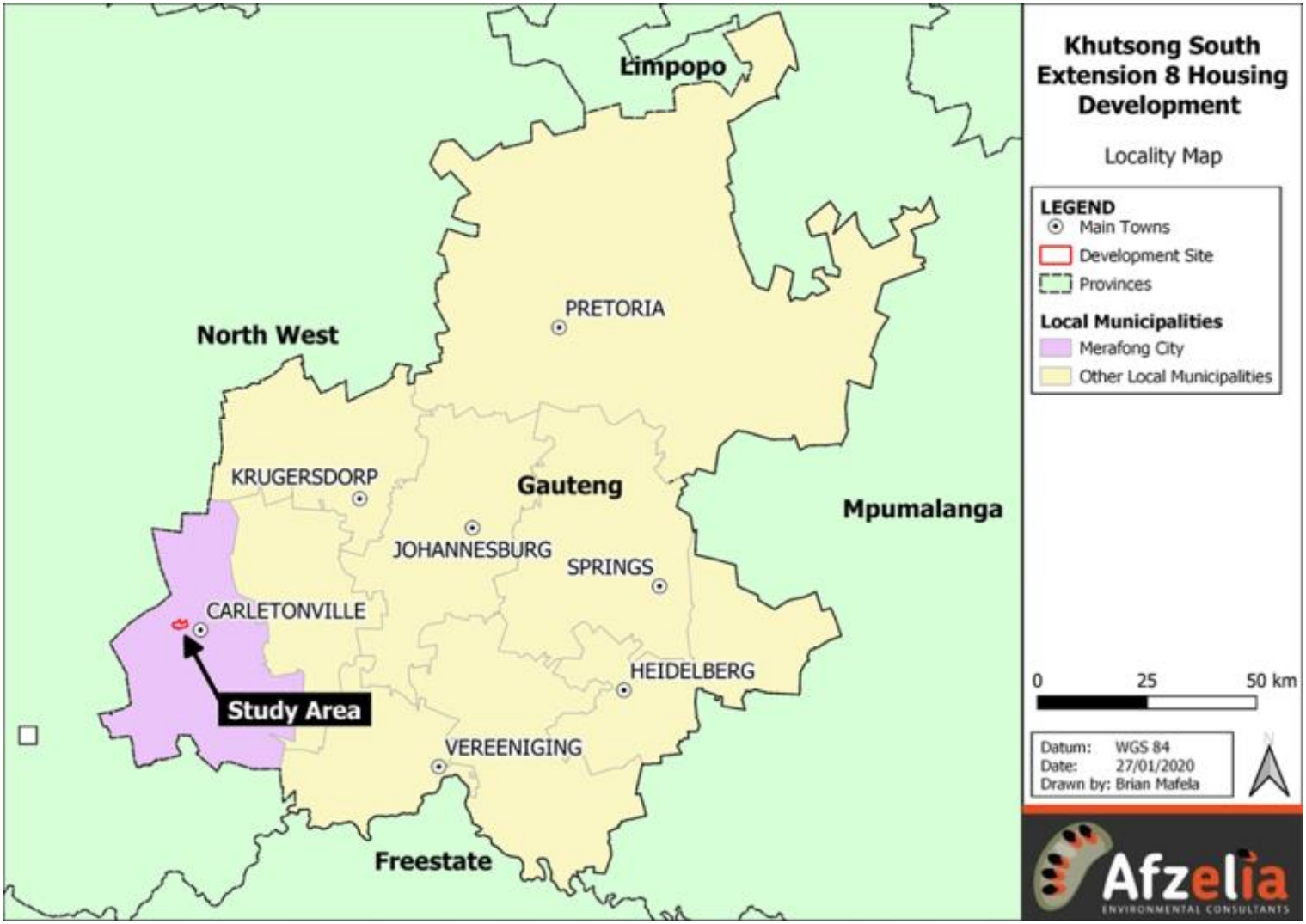

Figure 2: Locality Map for the Proposed Khutsong Housing Development.

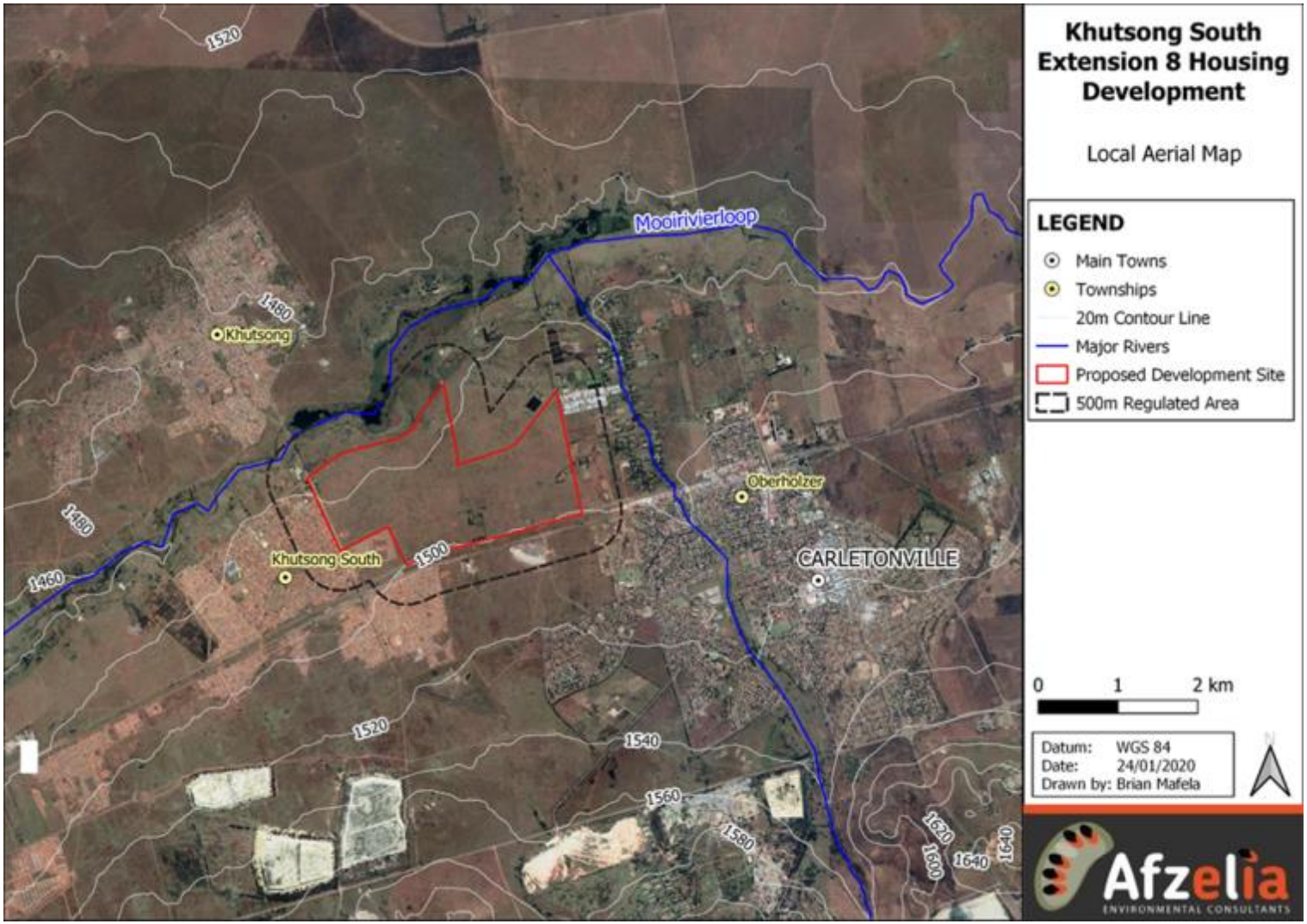

Figure 3: Local Area Map for the Proposed Khutsong Housing Development.

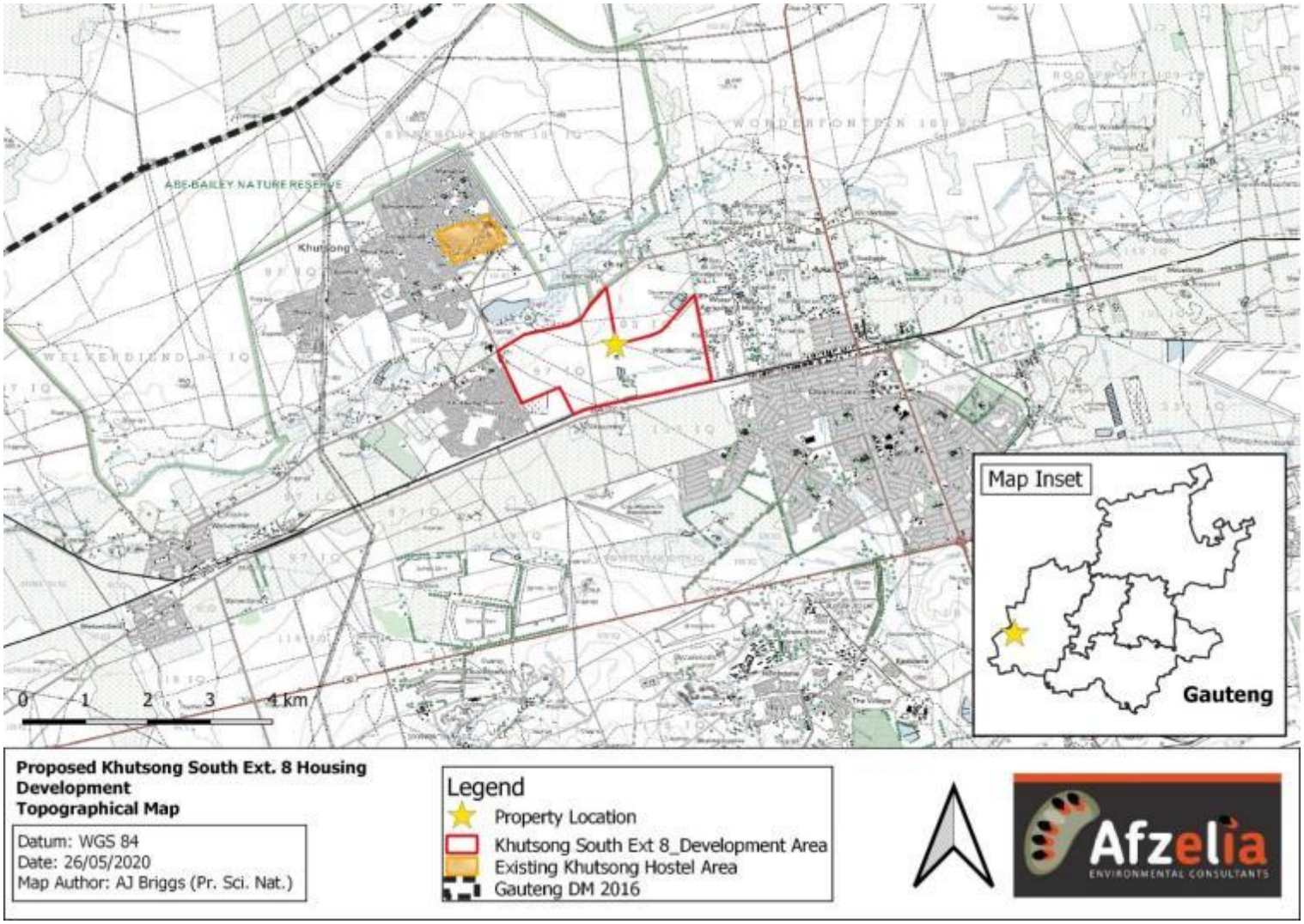

Figure 4: Topographical Map of the Proposed Khutsong Housing Development

2.6. Property Description and Ownership

The properties that include the extent of the proposed development area are shown in **Table 10**, below.

Table 2-4: Property associated with the proposed housing development

Property Name	Surveyor-General Cadastral Code No.	Title Deed Reference No.	Owner
Wonderfontein 103 IQ Portion 20	T0IQ00000000010300020	T27146/1968	FWRDWA (currently transferring to the MCLM)
Wonderfontein 103, IQ, Portion 105	T0IQ00000000010300105	T93666/2003	FWRDWA (currently transferring to the MCLM)
Wonderfontein 103 IQ Portion 117	T0IQ00000000010300117	T49181/1969	FWRDWA (currently transferring to the MCLM)
Wonderfontein 103 IQ Portion 121	T0IQ00000000010300121		FWRDWA (currently transferring to the MCLM)
Wonderfontein 103 IQ Rem Portion 116	T0IQ00000000010300116	T49182/1969	FWRDWA (currently transferring to the MCLM)
Uitspanning aan Wonderfontein 104 IQ Rem Portion 0	T0IQ00000000010400000	T28837/1969	FWRDWA (currently transferring to the MCLM)
Uitspanning aan Wonderfontein 104 IQ Rem Portion 1	T0IQ00000000010400001	T20589/1970	FWRDWA (currently transferring to the MCLM)

2.7. Clearance from Department of Land Affairs

All the properties are owned by Far West Rand Dolomitic Water Association (FWRDWA) However, there are existing land claims on the following properties: Portion 20, 105, 116, 117, 120 & 121 (RE) of the farm Wonderfontein 103 REG DIV IQ, Gauteng. Refer to **Appendix E8**.

3. PROJECT DESCRIPTION

3.1. Project Overview

The Gauteng Department of Human Settlements in conjunction with the Merafong City Municipality and West Rand District Municipality are proposing to expand the existing Khutsong Township by constructing new houses. The new settlement will be known as Khutsong South Extension 8 and involves the construction of a total of 27 000 units over an estimate area of 400ha to accommodate the residents to be relocated from the Khutsong Hostel, Khutsong Extensions 1and 6 including Khutsong informal Area. Therefore, approximately 400ha of indigenous will be cleared during the construction activities.

The proposed development entails development of arterial roads, a sewerage and water reticulation infrastructure to service all parts of the proposed development area. Both the sewer and water reticulation infrastructure will be linked to existing infrastructure. Regarding the internal Sewer Reticulation, it is planned that the entire development will have gravity sewers and full level of service to each erf and includes 160mm in an internal diameter. It is planned that gravity outfall sewers can be constructed to service the development for Bulk/External Services. Bulk outfall sewer is therefore classified as all sewers greater than 160mm internal diameter.

In regards with the Internal Water Reticulation, it is planned that that the entire development will have potable water mains and full level of service to each erf. Internal water reticulation is therefore classified as all water mains smaller or equal to 160mm in an internal diameter. Furthermore, all erven will be provided with a water meter or, in the case of clustered residential units, a communal water meter. This is required both for billing purposes as well as Water Conservation and Water Demand Management (WC/WDM). The design standards will be as per the Guidelines for Human Settlement Planning and Design (Redbook).

The water contribution by the development will be checked against the spare capacity. If the capacity is not adequate, then an upgrade on the existing reservoirs will be required and will be designed during the detailed design stage. Existing Wastewater Treatment Plants (WWTP) in close proximity of the proposed development area will be upgraded to accommodate the increase domestic wastewater (effluent) which will be discharged from the proposed development. The proposed development will potentially require new pipeline and associated infrastructure for the bulk transportation of sewage to connect to the existing WWTP. The existing bulk water system will also be upgraded through the construction of a new reservoir linked to the development.

The design of the Roads & Stormwater services will be in accordance with the “Guideline for Human Settlement Planning and Design” (Red book). Construction will be specified to be in accordance with SANS 1200. There will be dual carriageways with two lanes in each direction. All arterial streets will consist of:

- 25mm thick medium continuously graded asphalt;
- 150mm thick base layer - G1 type imported crushed stone material compacted to 86% of Apparent density;
- 150mm thick sub base layer (stabilized) – G4 type imported natural gravel material (stabilized with 2% OPC cement to achieve “C4” type layer);
- 150mm thick sub base layer – G6 type sourced from site;
- 150mm thick in-situ material ripped, scarified, water and re-compact to a minimum of 90% MOD AASHTO Density and
- Shoulder material will consist of G6 material sourced from site, compacted in 150mm layers to 90% Mod AASHTO.

In addition to the above it is recommended that the scope include demolition of the existing structures as well as ensuring appropriate environmental restitution of the site, including safe disposal of all waste material.

3.2. Description of Development Activities

Please see **Table 11,** below, for a description of the activities associated with the planning and design, site establishment, construction, handover, operation and decommissioning/rehabilitation of the proposed housing development.

Table 3-1: Activities associated with the proposed Khutsong Development

PHASE	ACTIVITIES
Planning and design phase	• Compliance with relevant environmental legislation and policy • Designing the layout of the development taking into consideration the location of potential sites of ecological, archaeological and cultural significance. • Identifying location for the site camp and lay down areas. • Compilation of storm water management plan, dust management plan and a rehabilitation and alien vegetation management plan for the site. • Protected plant and tree relocation permits completed and submitted by appropriately qualified, registered and experienced botanist to Competent Authority.
Construction Phase (Incl. Site Establishment and Handover)	*Site Establishment* • Erection of temporary perimeter fence and installation of signage at the entrance and around the site. • Implementation of access and service roads to the proposed development site; • Erection of a site camp including: a security hut, parking areas, ablution facilities, generators, temporary offices, stormwater management infrastructure and loading areas. • Construction of temporary refuelling and oil storage areas (impervious and bunded areas). • Construction of waste storage areas which will hold excavated material, rubble, vegetation, hazardous waste and general waste. • Clearing of ruderal and pioneer vegetation. • Stripping and stockpiling of topsoil.
	Construction • Construction of housing infrastructure • Construction of permanent road infrastructure • Construction of permanent stormwater infrastructure • Construction of permanent drinking water and wastewater/sewerage infrastructure • Construction of electrical infrastructure
	Handover • Removal of site camp • Removal of temporary refuelling and oil storage areas • Removal of waste storage areas (certificates of satisfactory waste disposal required) • Rehabilitation of all disturbed areas (i.e. the site camp, refuelling and storage areas as well as waste storage areas).

Operation Phase	• Municipal Service delivery related, including:
	  ○ Maintenance of road infrastructure
	  ○ Maintenance of stormwater infrastructure
	  ○ Maintenance of drinking water and wastewater/sewerage infrastructure
	  ○ Maintenance of electrical infrastructure
	• Waste Collection

Decommissioning and Rehabilitation Phase	• Highly unlikely that proposed development will be decommissioned, however, the following would likely be undertaken:
	  ○ Removal of housing and ancillary infrastructure
	  ○ Removal of roads, stormwater, drinking water, wastewater/sewerage and

	electrical infrastructure ○ Recycling or disposal of remaining material once all structures have been disassembled. ○ Re-instatement of natural topography and indigenous vegetation within disturbed areas. • Post rehabilitation monitoring of previously disturbed areas.

Please refer to the construction method statement for further details on planning and design, site establishment, construction and handover of the proposed development sites.

3.3. Duration of Activities

Please see **Table 12**, below, outlining the phase specific timeframes for the project:

Table 3-2 : Duration of activities – Preferred construction programme

PHASE	DURATION OF ACTIVITIES
Planning and Design Phase	10 months
Site Establishment Phase	1 month
Construction Phase	36 months
Handover Phase	2 months
TOTAL DURATION OF ACTIVITIES	49 months

4. NEED AND DESIRABILITY

In considering the Need and Desirability for this project, the Guideline on Need and Desirability in terms of the Environmental Impact Assessment (EIA) Regulations, 2010 – General Notice 891 issued October 2014 in Government Gazette 38108 has been used to inform and provide structure for the Need and Desirability section of this report.

The concept of "need and desirability" relates to, amongst others, the nature, scale and location of the development being proposed, as well as the wise use of land. Need and desirability are inter-related and the two should be considered in an integrated and holistic manner.

The project proposes the development of a township to accommodate residents of the existing Khutsong Hostel area. Improved access to affordable and RDP housing is a key theme of the IDP for the Merafong City Local Municipality whilst the residents of the Khutsong Hostel area are also in constant danger due to the unstable geology of the area. These statements constitute both a need and desirability for the proposed development. The proposed housing development will also include schools, community centres and open spaces which are desirable for a development of this nature.

According the Merafong City Local Municipality the current overall housing backlog after is 10460 after implementation. There are also 11 193 informal settlement households within the 'Northern Urban Area', which includes Khutsong north. These settlements are underlain by dolomite and therefore, according to SANS 1936, are not permitted to remain on dolomitic land. This also negates the option of undertaking the development of a township in the immediate vicinity. The preferred areas for relocation of the informal settlement are the Khutsong South Extensions and areas in the vicinity of Carletonville. A decision is still required as to whether the entire 'Northern Urban Area' is to be relocated (Merafong City, 2020)

The following National, Provincial and Municipal policy documentation were also interrogated for housing related objectives:

- National Development Plan for 2030
- The Integrated Development Plans (IDP) for the West Rand District and Merafong City Local Municipalities;
- The Spatial Development Framework for the West Rand District and Merafong City Local Municipalities; and
- The National Environmental Management Act Principals.

The project has been found to be aligned with the abovementioned policy documentation. Please refer to **Tables 18 and 19** within **Section 6**, below, for further details in this regard.

In consideration of the overall need and desirability of the project, certain impacts must be specifically and directly addressed throughout the Scoping and EIA process. The following questions, adapted from the 'Guideline on Need and Desirability in terms of the Environmental Impact Assessment (EIA) Regulations, 2010 – General Notice 891 issued October 2014 in Government Gazette 38108, relating to the need and desirability of the project are addressed in **Table 13**, below.

Table 4-1: Questions and responses adapted from the gazetted guidelines on Need and Desirability as part of the EIA Regulations.

Section 24 of the Constitution of South Africa refers to "securing ecological sustainable development and use of natural resources". **Questions 1.1. to 1.13**. and associated responses, below, are applicable to this statement.	
Questions	**Responses**
1. How will this development (and its separate elements/aspects) impact on the ecological integrity of the area?	Overarching and introductory question. Is comprehensively discussed below in response to questions **1.1** to **1.13.**
1.1. How were the following ecological integrity considerations taken into account? **1.1.1.** Threatened Ecosystems, **1.1.2.** Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries, wetlands, and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure, **1.1.3.** Critical Biodiversity Areas ("CBAs") and Ecological Support Areas ("ESAs"), **1.1.4.** Conservation targets, **1.1.5.** Ecological drivers of the ecosystem, **1.1.6.** Environmental Management Framework, **1.1.7.** Spatial Development Framework, and **1.1.8.** Global and international responsibilities relating to the environment (e.g. RAMSAR sites, Climate Change, etc.).	The ecological condition of the site will be undertaken at a site-level resolution by suitably qualified specialists during the EIA phase of the proposed development. All potential ecological sensitivities onsite will be addressed during this phase, prior to the commencement of construction onsite. The preliminary screening report for the site compiled by Afzelia (2020a) has identified a provincial ESA within the extent of the proposed development. The ESA will require specific attention and further investigation by specialists to determine the functionality and local importance of the ESA. In addition to the onsite ESA, the proposed development also borders the Abe Bailey Nature Reserve. Onsite development must not encroach or impact on the extent of the reserve. Specific mitigation measures address the border of the reserve will be implemented during all phases of the project. The spatial arrangement of infrastructure within the site boundary will take cognisance of potential environmental sensitive's onsite if/when necessary. No global or international responsibilities were identified for the site.
1.2. How will this development disturb or enhance ecosystems and/or result in the loss or protection of biological diversity? What measures were explored to firstly avoid these negative impacts, and where these negative impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?	The proposed development will disturb a Greenfields site which, according to the screening report, comprises open Carletonville Dolomite Grassland. Carletonville Dolomite Grassland has been identified as Least Concern within the National Biodiversity Assessment (Skowno *et al.* 2019). The proposed development area will be almost completely transformed from grassland to housing and related infrastructure by onsite development. The EIA phase of the project will include potential mitigation for the disturbance of

	intact habitat as part of the ecological assessment, should this be necessary. The screening report has not identified any wetland habitat onsite that will require consideration. This will, however, require confirmation during the site-level wetland and aquatic assessment.
1.3. How will this development pollute and/or degrade the biophysical environment? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?	Refer to **Sections 11 and 12** of the report. There is a potential for downstream watercourses to receive impacts from the proposed development during the construction and operation phases. Potential impacts to downslope watercourses include the following (note that these will be revised during the EIA Phase): • The improper disposal of waste generated during construction • Improper implementation and maintenance of waste management infrastructure such as sewer lines • Channel incision and sedimentation due to increased floodpeaks resulting from catchment hardening from development Best practice construction methods, including the utilisation of Sustainable Drainage Systems (SUDS), are recommended for implementation during construction. The wetland and aquatic assessment, which is to be undertaken during the EIA phase, will provide site-specific mitigation measures to minimise or completely negate impacts to downslope watercourses.
1.4. What waste will be generated by this development? What measures were explored to firstly avoid waste and where waste could not be avoided altogether, what measures were explored to minimise, reuse and/or recycle the waste? What measures have been explored to safely treat and/or dispose of unavoidable waste?	Waste Likely generated by construction related activities onsite include: • Rubble from discarded building material, earth, rock or wood • Solid waste from general waste disposal onsite • Potentially hazardous waste including fuels, oils and concrete. Comprehensive and clear waste disposal practices will be assessed and recommended during the EIA phase for inclusion in the Environmental Management Programme (EMPr) for the construction of the development. Waste management of solid waste during the operation phase of the proposed development will likely be undertaken by the local municipality as an aspect of service delivery.
1.5. How will this development disturb or enhance landscapes and/or sites	The disturbance of landscapes within the proposed development boundary has

that constitute the nation's cultural heritage? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?	been addressed in the response to question **1.2**., above. In terms of the cultural and heritage aspects of the site, a desktop Phase 1 Heritage Impact Assessment (HIA), compiled by Tsimba Archaeological Footprints (2020), reported that the general study area is not known to comprise any archaeological sites, cultural heritage resources or sites of historical significance. Although no recommendations were provided by the heritage specialist during the Scoping assessment, potential heritage sites that that are discovered during construction must be managed effectively, if necessary. Mitigation relating to chance finds of heritage significance will be incorporated into the EMPr during the EIA phase. A site-based Phase 1 HIA and Landscape & Visual Impact Assessment will be undertaken during the EIA phase of the project.
1.6. How will this development use and/or impact on non-renewable natural resources? What measures were explored to ensure responsible and equitable use of the resources? How have the consequences of the depletion of the non-renewable natural resources been considered? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?	Bulk services will be implemented for the development which will include the use of electricity, supplied primarily by ESKOM. ESKOM presently derives approximately 77% of their primary electricity from coal (ESKOM, 2020). The impact on non-renewable natural resources will likely be negligible when compared to the countrywide coal demand. Extraction of non-renewable resources from the site does not fall within the scope of the proposed development and therefore was not considered The use of solar power for geysers and general electricity as well as energy efficient lighting (within the houses and streets) and appliances will be investigated during the EIA phases in an effort to reduce the demand for coal generated electricity.
1.7. How will this development use and/or impact on renewable natural resources and the ecosystem of which they are part? Will the use of the resources and/or impact on the ecosystem jeopardise the integrity of the resource and/or system taking into account carrying capacity restrictions, limits of acceptable change, and thresholds? What	Bulk services will be implemented for the development which will include the supply of water for drinking and general household use. The habitat within the development boundary will also be largely transformed during construction.

measures were explored to firstly avoid the use of resources, or if avoidance is not possible, to minimise the use of resources? What measures were taken to ensure responsible and equitable use of the resources? What measures were explored to enhance positive impacts? **1.7.1.** Does the proposed development exacerbate the increased dependency on increased use of resources to maintain economic growth or does it reduce resource dependency (i.e. de-materialised growth)? (note: sustainability requires that settlements reduce their ecological footprint by using less material and energy demands and reduce the amount of waste they generate, without compromising their quest to improve their quality of life) **1.7.2.** Does the proposed use of natural resources constitute the best use thereof? Is the use justifiable when considering intra- and intergenerational equity, and are there more important priorities for which the resources should be used (i.e. what are the opportunity costs of using these resources of the proposed development alternative?) **1.7.3.** Do the proposed location, type and scale of development promote a reduced dependency on resources?	The use of natural resources, in terms of habitat destruction and water use will be increased by the implementation of the development as basic services become more accessible to residents of Khutsong. The proposed development site is vacant and is close proximity to the current Khutsong Hostel area, which is unsafe for residents due to severe geological constraints. Socially, it is also close to the existing hostel site, nearer to key travel routes as well as the Carletonville town centre. Water saving practices will be investigated during the EIA phase and include: efficient and sanitary rainwater harvesting and the use of water saving devices such as dual pipe systems for grey water, aerated taps and dual flush toilets. As mentioned in the response to question **1.2**., above, The EIA phase of the project will include potential mitigation for the disturbance of intact habitat as part of the ecological assessment, should this be necessary.
1.8. How were a risk-averse and cautious approach applied in terms of ecological impacts? **1.8.1.** What are the limits of current knowledge (note: the gaps, uncertainties and assumptions must be clearly stated)? **1.8.2.** What is the level of risk associated with the limits of current knowledge? **1.8.3.** Based on the limits of knowledge and the level of risk, how and to what extent was a risk-averse and cautious approach applied to the development?	A precautionary approach to construction of the proposed development will be implemented which includes all recommendations and mitigation measures that will be provided by the relevant specialists in both the Scoping and EIA phase of the project. Multiple housing developments of this nature have been undertaken in South Africa in recent times which have resulted in the accumulation of knowledge pertaining to environmental impacts within the EAP and environmental specialist community. Nevertheless, the assumptions and limitations of this study are included in **Section 2.4** of this Report.
1.9. How the ecological impacts resulting from this development impact on people will's environmental right in terms of the following? **1.9.1.** Negative impacts: e.g. access to resources, opportunity costs,	The movement of the residents of the Khutsong Hostel into the new proposed development will have a positive impact for the current hostel residents in terms of improved access to housing, water, electricity, key transport routes and economic

	loss of amenity (e.g. open space), air and water quality impacts, nuisance (noise, odour, etc.), health impacts, visual impacts, etc. What measures were taken to firstly avoid negative impacts, but if avoidance is not possible, to minimise, manage and remedy negative impacts?	nodes. Presently, the site is uninhabited and consists open grassland vegetation. The loss of open space and replacement with housing infrastructure constitutes a visual impact, which has necessitated the compilation of a Visual Impact Assessment (VIA). The VIA found that the proposed development is unlikely to have a significant impact on the existing natural landscape (Environmental Planning and Design, 2020)
1.9.2.	Positive impacts: e.g. improved access to resources, improved amenity, improved air or water quality, etc. What measures were taken to enhance positive impacts?	Air quality impacts are likely to be insignificant given the nature of impacts associated with housing developments and was therefore not assessed during the scoping phase. Potential water quality impacts will be addressed during the EIA phase of the project, however, it is unlikely that water quality impacts will occur if mitigation measures are adhered to, given the proximity of the development to the nearest watercourse. A Socio-Economic Impact Assessment (SIA) has identified four broad issues, namely health and safety, the stimulation of economic growth, the provision of housing and social infrastructure, and landscape alterations. Under each issue, several impacts have been elaborated upon. Impacts have been rated in accordance with their likelihood for the project's construction, operational and decommission phases based on the literature review. The South Africa development agendas and frameworks pertaining to the need for formal housing are very clear and unambiguous. The reviewed provincial, district and municipal development frameworks all require of the local municipality to construct formal houses, whilst Khutsong has been identified as an area where households residing in informal houses need to be urgently relocated to due health and safety considerations related to the soil and environment. Nuisance impacts will be assessed in greater detail during the EIA phase of the project.

	All mitigation measures proposed during the EIA phase of the project will be included in the EMPr which should ensure that best-practice design, construction and operational management of the development is continually implemented.
1.10. Describe the linkages and dependencies between human wellbeing, livelihoods and ecosystem services applicable to the area in question and how the development's ecological impacts will result in socioeconomic impacts (e.g. on livelihoods, loss of heritage site, opportunity costs, etc.)?	Ecosystem services provided by the proposed development site will be investigated thoroughly during the EIA phase of the project. The site likely does not provide any ecosystem services of high significance; however, this will be determined by the relevant environmental specialists during the EIA phase. As mentioned in response to question **1.9**., above, the SIA have identified four broad issues, namely health and safety, the stimulation of economic growth, the provision of housing and social infrastructure, and landscape alterations.
1.11. Based on all of the above, how will this development positively or negatively impact on ecological integrity objectives / targets / considerations of the area?	The development will likely have a low-negative impact on the ecological integrity of the site given the level of transformation that is anticipated onsite, however, this will be determined with greater clarity with specialist input during the EIA phase of the project. All mitigation measures proposed during the EIA phase of the project will be included in the EMPr which should ensure that best-practice design, construction and operational management of the development is continually implemented. This will allow for strict ecological conditions to be adopted as part of the authorisation for the development.
1.12. Considering the need to secure ecological integrity and a healthy biophysical environment, describe how the alternatives identified (in terms of all the different elements of the development and all the different impacts being proposed), resulted in the selection of the "best practicable environmental option" in terms of ecological considerations?	Refer to **Section 5** of the Scoping report for a full analysis of 'Feasible and Reasonable Alternatives' for the proposed housing development. The potential for the 'best practicable environmental option' will be continually assessed during all phases of the project.
1.13. Describe the positive and negative cumulative ecological/biophysical impacts bearing in mind the size, scale, scope and nature of the project in relation to its location and existing and other planned developments in the area?	Refer to **Section 11** of the Scoping report for an analysis of potential impacts relating to the proposed housing development. A more comprehensive assessment of potential impacts and mitigation will be undertaken during the EIA phase.

Section 24 of the Constitution of South Africa refers to "promoting justifiable economic and social development". **Questions 2.1. to 2.22**.and associated responses, below, are applicable to this statement.	
Questions	**Responses**
2.1. What is the socio-economic context of the area based on, amongst other considerations, the following considerations? **2.1.1.** The IDP (and its sector plans' vision, objectives, strategies, indicators and targets) and any other strategic plans, frameworks of policies applicable to the area, **2.1.2.** Spatial priorities and desired spatial patterns (e.g. need for integrated of segregated communities, need to upgrade informal settlements, need for densification, etc.), **2.1.3.** Spatial characteristics (e.g. existing land uses, planned land uses, cultural landscapes, etc.), and **2.1.4.** Municipal Local Economic Development Strategy ("LED Strategy").	The findings of the SIA are summarised as a response to question **1.9**., above. The draft 2020-2021 Integrated Development Plan (IDP) for the West Rand District Municipality (WRDM) has highlighted the increasing housing demand caused by urbanisation and growth of informal settlements, as well as the use of ageing infrastructure, as key service delivery challenges for the district. Addressing the housing backlog within the WRDM and Merafong City Local Municipality (MCLM) remains a '1' priority ranking. Approximately 1599 Ha has been availed for residential development within the MCLM according the draft WRDM 2020-2021 IDP, although, current primary constraints include infrastructure / funding for development and availability of bulk infrastructure. The draft 2020-2021 IDP for the Merafong Local Municipality makes specific reference to the study site as an undeveloped area near Carletonville which 'offers a good opportunity for infill at higher densities which will improve public transport viability, economic potential and social facility viability'. The proposed development location is in closer proximity to key travel routes as well as the Carletonville town centre, compared to the current Khutsong Hostel site. The proposed development of the Khutsong South Extension 8 is earmarked to take place within the short to medium term and is high priority according to the draft Merafong Local Municipality 2020-2021 IDP. The MCLM is steadily achieving their goals of addressing socio-economic challenges regarding housing through the reduction of informal settlements from 32% to 23% and increase in formalised housing from 68% to 73% from 2001-2011, according to the draft MCLM 2020-2021 IDP.
2.2. Considering the socio-economic context, what will the socio-economic impacts be of the development (and its separate elements/aspects), and specifically also on the socio-economic objectives of the area?	The project will likely have a positive socio-economic impact within the local area given the potential for employment and skills development during the construction phase of the development, which will be complimented by improved access to

2.2.1. Will the development complement the local socio-economic initiatives (such as local economic development (LED) initiatives), or skills development programs?	local economic nodes (i.e. Carletonville town centre) and key transport routes. Improved access to basic services such as housing, water and electricity will also support local people and should assist to facilitate self- and economic-growth. Clarity on the social aspects of the project will improve at the conclusion of the public participation exercise during the EIA phase.
2.3. How will this development address the specific physical, psychological, developmental, cultural and social needs and interests of the relevant communities?	The findings of the SIA are summarised as a response to question **1.9**., above. Clarity on the social aspects of the project will improve at the conclusion of the public participation exercise during the EIA phase.
2.4. Will the development result in equitable (intra- and inter-generational) impact distribution, in the short- and long-term? Will the impact be socially and economically sustainable in the short- and long-term?	The findings of the SIA are summarised as a response to question **1.9**., above.
2.5. In terms of location, describe how the placement of the proposed development will: **2.5.1.** result in the creation of residential and employment opportunities in close proximity to or integrated with each other, **2.5.2.** reduce the need for transport of people and goods, **2.5.3.** result in access to public transport or enable non-motorised and pedestrian transport (e.g. will the development result in densification and the achievement of thresholds in terms public transport), **2.5.4.** compliment other uses in the area, **2.5.5.** be in line with the planning for the area, **2.5.6.** for urban related development, make use of underutilised land available with the urban edge, **2.5.7.** optimise the use of existing resources and infrastructure, **2.5.8.** opportunity costs in terms of bulk infrastructure expansions in non-priority areas (e.g. not aligned with the bulk infrastructure planning for the settlement that reflects the spatial reconstruction priorities of the settlement), **2.5.9.** discourage "urban sprawl" and contribute to compaction/densification,	Refer to **Section 5** of the Scoping report for a full analysis of 'Feasible and Reasonable Alternatives' regarding the location of the proposed housing development. The findings of the SIA are summarised as a response to question **1.9**., above. As mentioned above, the project will likely have a positive socio-economic impact within the local area given the potential for employment and skills development during the construction phase of the development, which will be complimented by improved access to local economic nodes (i.e. Carletonville town centre) and key transport routes. At present, the proposed development site is not being used in an official capacity and is therefore preferred for urban development. The proposed housing development will play a key role in the alleviation of some of the housing conflict in the area, which includes the construction of informal settlements on the periphery of existing townships and poor geological conditions for housing. The full description of the proposed Khutsong South Ext. 8 Housing Development project is located in **Section 3** of this Scoping report.

2.5.10. contribute to the correction of the historically distorted spatial patterns of settlements and to the optimum use of existing infrastructure in excess of current needs, **2.5.11.** encourage environmentally sustainable land development practices and processes, **2.5.12.** take into account special locational factors that might favour the specific location (e.g. the location of a strategic mineral resource, access to the port, access to rail, etc.), **2.5.13.** the investment in the settlement or area in question will generate the highest socio-economic returns (i.e. an area with high economic potential), **2.5.14.** impact on the sense of history, sense of place and heritage of the area and the socio-cultural and cultural-historic characteristics and sensitivities of the area, and **2.5.15.** in terms of the nature, scale and location of the development promote or act as a catalyst to create a more integrated settlement?	The preservation of cultural aspects of the site has been discussed in response to Question **1.5**., above.
2.6. How were a risk-averse and cautious approach applied in terms of socio-economic impacts? **2.6.1.** What are the limits of current knowledge (note: the gaps, uncertainties and assumptions must be clearly stated)? **2.6.2.** What is the level of risk (note: related to inequality, social fabric, livelihoods, vulnerable communities, critical resources, economic vulnerability and sustainability) associated with the limits of current knowledge? **2.6.3.** Based on the limits of knowledge and the level of risk, how and to what extent was a risk-averse and cautious approach applied to the development?	The findings of the SIA are summarised as a response to question **1.9**., above. A precautionary approach to construction of the proposed development will be implemented which includes all recommendations and mitigation measures that will be provided by the relevant specialists in both the Scoping and EIA phase of the project
2.7. How will the socio-economic impacts resulting from this development impact on people's environmental right in terms of the following: **2.7.1.** Negative impacts: e.g. health (e.g. HIV-Aids), safety, social ills, etc. What measures were taken to firstly avoid negative impacts, but if avoidance is not possible, to minimise, manage and remedy negative impacts?	The findings of the SIA are summarised as a response to question **1.9**., above. Refer to **Section 11** of the Scoping report for an analysis of potential impacts relating to the proposed housing development. A more comprehensive assessment of potential impacts and mitigation will be

2.7.2. Positive impacts. What measures were taken to enhance positive impacts?	undertaken during the EIA phase.
2.8. Considering the linkages and dependencies between human wellbeing, livelihoods and ecosystem services, describe the linkages and dependencies applicable to the area in question and how the development's socio-economic impacts will result in ecological impacts (e.g. over utilisation of natural resources, etc.)?	The findings of the SIA are summarised as a response to question **1.9**., above. The use of natural resources, in terms of habitat destruction and water use, will be increased by the implementation of the development as basic services become more accessible to residents of Khutsong. Water saving practices will be investigated during the EIA phase and include: efficient and sanitary rainwater harvesting and the use of water saving devices such as dual pipe systems for grey water, aerated taps and dual flush toilets. As mentioned in the response to question **1.2**., above, The EIA phase of the project will include potential mitigation for the disturbance of intact habitat as part of the ecological assessment, should this be necessary
2.9. What measures were taken to pursue the selection of the "best practicable environmental option" in terms of socio-economic considerations?	The findings of the SIA are summarised as a response to question **1.9**., above. Refer to **Section 5** of the Scoping report for a full analysis of 'Feasible and Reasonable Alternatives' for the proposed housing development. The potential for the 'best practicable environmental option' will be continually assessed during all phases of the project.
2.10. What measures were taken to pursue environmental justice so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons (who are the beneficiaries and is the development located appropriately)? Considering the need for social equity and justice, do the alternatives identified, allow the "best practicable environmental option" to be selected, or is there a need for other alternatives to be considered?	The findings of the SIA are summarised as a response to question **1.9**., above. Refer to **Section 5** of the Scoping report for a full analysis of 'Feasible and Reasonable Alternatives' for the proposed housing development. The potential for the 'best practicable environmental option' will be continually assessed during all phases of the project.
2.11. What measures were taken to pursue equitable access to environmental resources, benefits and services to meet basic human needs and ensure human wellbeing, and what special measures were taken to ensure access thereto by categories of persons disadvantaged	The undertaking of a Scoping and Environmental Impact Assessment process ensures that equitable access to all resources is considered. In the case of the proposed Khutsong South Extension 8 Housing Development, housing is being provided by the government of South Africa to previously disadvantaged

by unfair discrimination?	members of society who are presently residing in a geologically unstable area, who likely cannot afford to move on their own accord.
2.12. What measures were taken to ensure that the responsibility for the environmental health and safety consequences of the development has been addressed throughout the development's life cycle?	Refer to **Section 11 and 12** of the Scoping report for an analysis of potential impacts and mitigation relating to the proposed housing development. A more comprehensive assessment of potential impacts and mitigation will be undertaken during the EIA phase.
2.13. What measures were taken to: **2.13.1.** ensure the participation of all interested and affected parties, **2.13.2.** provide all people with an opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation, **2.13.3.** ensure participation by vulnerable and disadvantaged persons, **2.13.4.** promote community wellbeing and empowerment through environmental education, the raising of environmental awareness, the sharing of knowledge and experience and other appropriate means, **2.13.5.** ensure openness and transparency, and access to information in terms of the process, **2.13.6.** ensure that the interests, needs and values of all interested and affected parties were taken into account, and that adequate recognition were given to all forms of knowledge, including traditional and ordinary knowledge, and **2.13.7.** ensure that the vital role of women and youth in environmental management and development were recognised and their full participation therein were promoted?	Refer to **Section 8** of the Scoping report for a full breakdown of the Public Participation Process (PPP). A more comprehensive PPP will be undertaken during the EIA phase.
2.14. Considering the interests, needs and values of all the interested and affected parties, describe how the development will allow for opportunities for all the segments of the community (e.g. a mixture of low-, middle-, and high-income housing opportunities) that is consistent with the priority needs of the local area (or that is proportional to the needs of an area)?	Refer to **Section 8** of the Scoping report for a full breakdown of the Public Participation Process (PPP). A more comprehensive PPP will be undertaken during the EIA phase. The proposed housing development will play a key role in the alleviation of some of the housing conflict, particularly with low income groups in the area. Existing housing pressures include the construction of informal settlements on the

	periphery of existing townships and poor geological conditions for housing.
2.15. What measures have been taken to ensure that current and/or future workers will be informed of work that potentially might be harmful to human health or the environment or of dangers associated with the work, and what measures have been taken to ensure that the right of workers to refuse such work will be respected and protected?	General workers onsite will be provided with required Personal Protective Equipment (PPE) and will also be educated regularly on environmental risks, as well as health and safety risks, pertaining to the projects. In light of the Covid-19 pandemic, additional PPE and hand sanitiser will be provided to each worker as well as any further health and safety requirements, as these become available. The health and safety aspects will be further assessed during the EIA phase of the project.
2.16. Describe how the development will impact on job creation in terms of, amongst other aspects: **2.16.1.** the number of temporary versus permanent jobs that will be created, **2.16.2.** whether the labour available in the area will be able to take up the job opportunities (i.e. do the required skills match the skills available in the area), **2.16.3.** the distance from where labourers will have to travel, **2.16.4.** the location of jobs opportunities versus the location of impacts (i.e. equitable distribution of costs and benefits), and **2.16.5.** the opportunity costs in terms of job creation (e.g. a mine might create 100 jobs, but impact on 1000 agricultural jobs, etc.).	The project will likely have a positive socio-economic impact within the local area given the potential for employment and skills development during the construction phase of the development, which will be complimented by improved access to local economic nodes (i.e. Carletonville town centre) and key transport routes. The potential workers will likely be sourced locally and therefore would travel from adjacent township sites. The findings of the SIA are summarised as a response to question **1.9**., above.
2.17. What measures were taken to ensure: **2.17.1.** the number of temporary versus permanent jobs that will be created, that there were intergovernmental coordination and harmonisation of policies, legislation and actions relating to the environment, and **2.17.2.** that actual or potential conflicts of interest between organs of state were resolved through conflict resolution procedures?	The Scoping and EIA process will initiate inter-governmental department communication. Potential conflict will be managed through active conflict-resolution engagement with all relevant stakeholders, including organs of state. Temporary workers will likely constitute the majority of the labour; however, there should be an opportunity for upskilling of promising individuals. This could lead to permanent employment.
2.18. What measures were taken to ensure that the environment will be held in public trust for the people, that the beneficial use of environmental resources will serve the public interest, and that the environment will be protected as the people's common heritage?	Refer to **Section 8** of the Scoping report for a full breakdown of the PPP. A more comprehensive PPP will be undertaken during the EIA phase.

	Refer to **Section 9** for a description of the receiving environment whilst an analysis of analysis of 'Feasible and Reasonable Alternatives' for the proposed housing development is included in **Section 5**.
2.19. Are the mitigation measures proposed realistic and what long-term environmental legacy and managed burden will be left?	Refer to **Section 12** of the Scoping report for an analysis of potential mitigation measures relating to the proposed housing development. A more comprehensive assessment of potential impacts and mitigation will be undertaken during the EIA phase.
2.20. What measures were taken to ensure that he costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects will be paid for by those responsible for harming the environment?	Refer to **Sections 11 and 12** of the Scoping report for an analysis of potential impacts and mitigation relating to the proposed housing development. A more comprehensive assessment of potential impacts and mitigation will be undertaken during the EIA phase. A declaration of financial provision will be signed by the applicant to ensure that potential remedying of pollution or environmental degradation can be swiftly undertaken.
2.21. Considering the need to secure ecological integrity and a healthy bio-physical environment, describe how the alternatives identified (in terms of all the different elements of the development and all the different impacts being proposed), resulted in the selection of the best practicable environmental option in terms of socio-economic considerations?	Refer to **Section 5** of the Scoping report for a full analysis of 'Feasible and Reasonable Alternatives' for the proposed housing development. The findings of the SIA are summarised as a response to question **1.9**., above.
2.22. Describe the positive and negative cumulative socio-economic impacts bearing in mind the size, scale, scope and nature of the project in relation to its location and other planned developments in the area?	Refer to **Section 11** of the Scoping report for an analysis of potential impacts relating to the proposed housing development. A more comprehensive assessment of potential impacts and mitigation will be undertaken during the EIA phase. The findings of the SIA are summarised as a response to question **1.9**., above.

5. FEASIBLE AND REASONABLE ALTERNATIVES

"alternatives", in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to—

(a) the property on which or location where it is proposed to undertake the activity
(b) the type of activity to be undertaken;
(c) the design or layout of the activity;
(d) the technology to be used in the activity;
(e) the operational aspects of the activity; and
(f) the option of not implementing the activity.

Alternatives must include a consideration of all possible means by which the purpose and need of the proposed activity could be accomplished in the specific instance taking account of the interest of the applicant in the activity. The 'no-go' alternative must in all cases be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed. The determination of whether site or activity (including different processes, etc.) or both is appropriate, needs to be informed by the specific circumstances of the activity and its environment. After receipt of this report the competent authority may also request the applicant to assess additional alternatives that could possibly accomplish the purpose and need of the proposed activity if it is clear that realistic alternatives have not been considered to a reasonable extent.

Please note that the assessment of alternatives should, where possible, be done in a way that feeds back into the planning or design of the activity, thereby optimising the positive aspects and minimizing the negative aspects that are highlighted during the scoping process. The scoping process should also be interactive where necessary to reflect the optimal formulation of alternatives. In instances where it is clear that such an interactive and iterative process has been followed in the development of a preferred alternative, it may be appropriate to terminate the assessment of other alternatives, excluding the 'no-go' alternative. In order to justify the termination of the assessment, or limit the number of possible alternatives, or further assessment of any alternative, it is, however, important to document the interactions and iterations properly.

Please note that only reasonable and feasible alternatives have been considered during this assessment process.

5.1. Development Footprint

The current proposed site for the relocation of the Khutsong Hostel provided by the client (i.e. Khutsong South Extension 8) is viewed as the best option given its proximity to the current hostel area as well as perceived suitable dolomitic conditions (limited within the general area of Khutsong) for development of housing. Additional advantages of the proposed site include the following:

- The size of the site will enable additional housing to be constructed in the area which should also alleviate some of the housing conflict in the area, which includes the construction of informal settlements on the periphery of existing townships and poor geological conditions for housing.
- Access to existing bulk services in close proximity to the site.
- The preferred area is in the process of being donated to the municipality which will negate the technicalities of having to purchase additional land from private/corporate owners.
- The preferred area is in close proximity to key transport routes, the Carletonville Mall, the Carletonville town centre and within the Khutsong South Development Corridor (which is being prioritised by the municipality for future development).

Multiple site alternatives have been provided by the client and are summarised in **Table 14**, below, whilst their location in relation to the proposed site is shown in **Figure 5**, below. Certain alternatives would be able to

accommodate the number of required housing units based on their area, however, these sites are further away from the existing hostel area when compared to the preferred site.

Table 5-1: Table of identified alternative development areas

Land Description	Landowner	Area (Ha)	Bulk Infrastructure Requirements
Preferred Site			
Proposed Khutsong South Ext. 8 (Portion 20 116, 117, 121 Wonderfontein 103 IQ and a portion of the Remaining Extent and Portion 1 of Twyfelvlakte 104 IQ)	Far West Rand Water Association donation to Merafong City in process	391	Bulk Electricity: Eskom feed to be increased to 132 MVA Bulk Water: Currently available without 48 Hr holding capacity. 1x10ML reservoir to be constructed by Elijah Barayi Bulk Sewer: Welverdiend WWTP in process of being upgraded to regional WWTP 22,5 Ml Plant
Alternative Sites			
Proposed Khutsong South Ext. 7 (Portion 97 of the Farm Welverdiend 97 IQ)	Merafong City	97	Bulk Electricity: Eskom feed to be increased to 132 MVA Bulk Water: Currently available without 48 Hr holding capacity. 1x10ML reservoir to be constructed by Elijah Barayi
Khutsong South Ext.5	Merafong City	298	Bulk Services Available
Portion 53 of the Farm Wonderfontein 103 IQ	Merafong City	63	Bulk Services Available
Portion 24 of the Farm Twyfelvlakte 105 IQ	Merafong City	271	Bulk Electricity: Eskom feed to be increased to 132 MVA Bulk Water: Currently available without 48 Hr holding capacity. 1x10ML reservoir to be constructed by Elijah Barayi Bulk Sewer: Welverdiend WWTP in process of being upgraded to regional WWTP 22,5 Ml Plant
Carletonville Extensions 19 to 22	Private Owner	155	Bulk Services Available
Portion 43 of the Farm Welverdiend 97 IQ	Private – Deceased Estate	25	Bulk Services Available
Portion 123 of the Farm	Merafong City	56	Bulk Services Available

Wonderfontein 103 IQ			

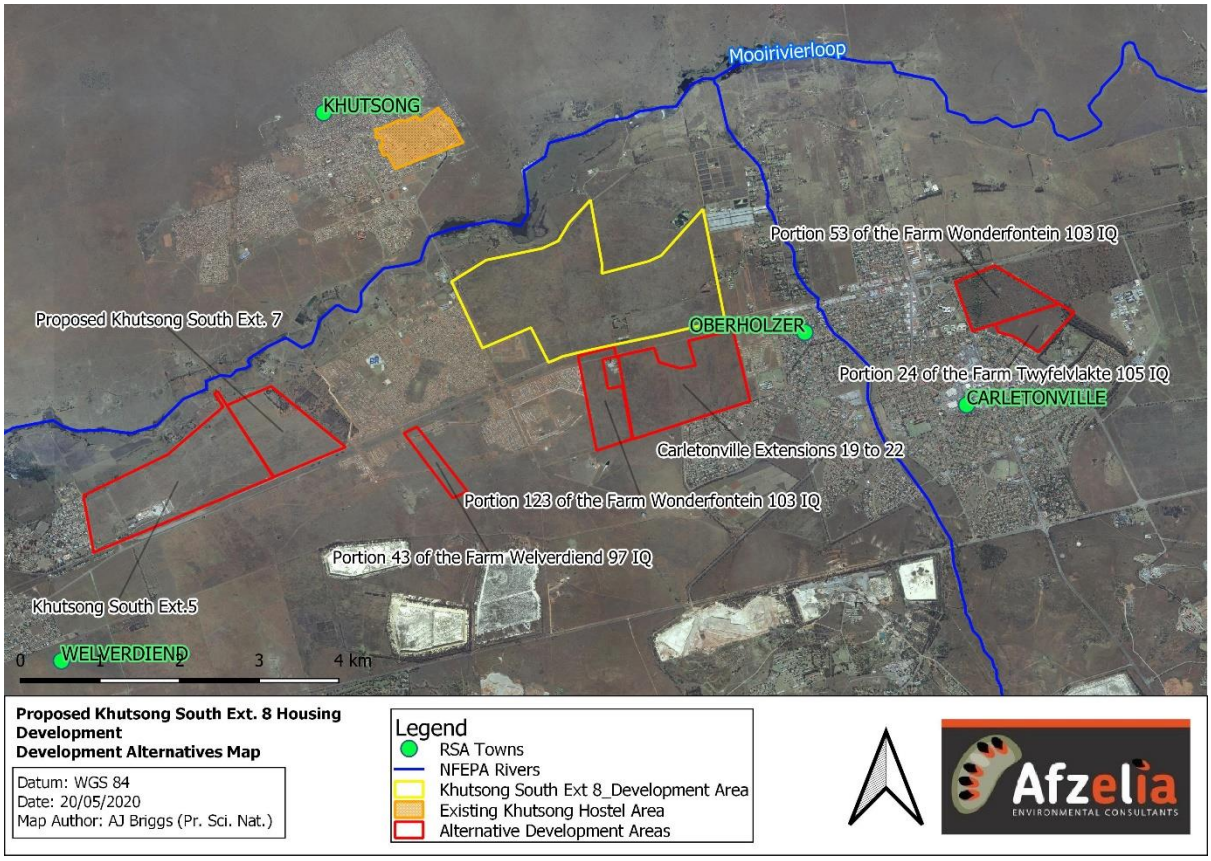

Figure 5: Location of potential alternative development sites in relation to proposed site

5.2. Type of Activity to be Undertaken

The preferred activity involves the construction of affordable housing and associated infrastructure such as roads, stormwater, drinking water, wastewater/sewerage and electrical infrastructure. The preferred site is currently zoned as 'Undetermined' (similar to 'Agricultural') and is largely open and undeveloped. Two activity alternatives for the proposed housing development are:

1) the preferred option of the implementation of the housing development, and
2) the no-go development option.

The preferred activity option would infer that the construction of the housing development be undertaken within the preferred development area to address the current housing issue at the Khutsong Hostel site.

The no-go development option is neither advised nor feasible for the proposed development as:

- The geologically-related safety issues for residents at the present Khutsong Hostel site will not be sufficiently addressed by government.
- The potential for short to medium term local job creation and skills development opportunities associated with the site establishment and construction of the proposed housing development will not be realised. Unemployment within the local municipality stands at 27.7% (see the Socio-Economic Profile in **Section 9.10.** of this report)
- Framework of the municipality as specified in the IDP

In the case that the "no-go" alternative is exercised, the existing greenfield site will remain as open secondary grassland.

5.3. Design and Layout

Five potential layout options have been proposed by the project manager (i.e. ETL Consulting) and are included in **Figures 6 to 10**, below. Habitat within the proposed development boundary has been flagged as sensitive according to the preliminary desktop assessments for the scoping report, which have been considered by ETL Consulting in the determination of the housing development layout. Provided layout options 1-4 were centred around spatial configuration, density of ervens and associated housing units as well as the accessibility of housing and services. Note that in addition to the variable density and layout of housing associated with the proposed development, all provided layout options include clear provisions for the construction of a primary school, secondary school, community facilities and open spaces. Site environmental sensitivity, findings of specialist studies and stakeholder input will assist in the generation of a final layout plan, which will likely be undertaken during the EIA Phase.

Revision E – Option B (shown in Figure 6, below), is the latest preferred option provided by ETL Consulting to Afzelia. This layout incorporates a variety of housing typologies, focal points and general human gathering areas (i.e. places of worship, light industrial, mixed-use, commercial, institutional and green spaces). Revision E is designed around a proposed station, which will serve as the key transport hub for the development in order to connect the development to local economic centres such as Carletonville. Revision E was identified as the preferred layout as a result of several design workshops undertaken with the Merafong Town Planning Department. The latest design (Revision E) has since been accepted by the Merafong City Local Municipality. The proposed development, at this stage, will accommodate a total of 17 960 units which includes:

- 1271 single storey units (freestanding) at a density of 50 units per hectare
- Double storey buildings (row housing) comprising 1 772 units at a density of 80 units per hectare
- Triple storey buildings (HD walkups) comprising 8 090 units at a density of 130 units per hectare
- Four storey buildings (HD walkups) comprising 6 827 units at a density of 180 units per hectare

Other options considered for the housing development included:

- Option 1, which includes 6000 freestanding units on 300-400m^2 ervens. A visual representation of the layout of Option 1 is located in Figure 7, below.
- Option 2, which would accommodate approximately 12000 freestanding Reconstruction and Development Programme (RDP) homes on significantly smaller ervens (between 150-200m^2). A visual representation of the layout of Option 2 is located in Figure 8, below.
- Option 3, which would accommodate approximately 15000 total units which includes freestanding RDP homes and 4 storey walk-ups. A visual representation of the layout of Option 3 is located in Figure 9, below.
- Option 4, which would accommodate more than 20000 units which includes freestanding RDP homes and a 'densification corridor' comprising an elongated section of 4 storey walk-ups along the main road within the development. A visual representation of the layout of Option 4 is located in Figure 10, below.

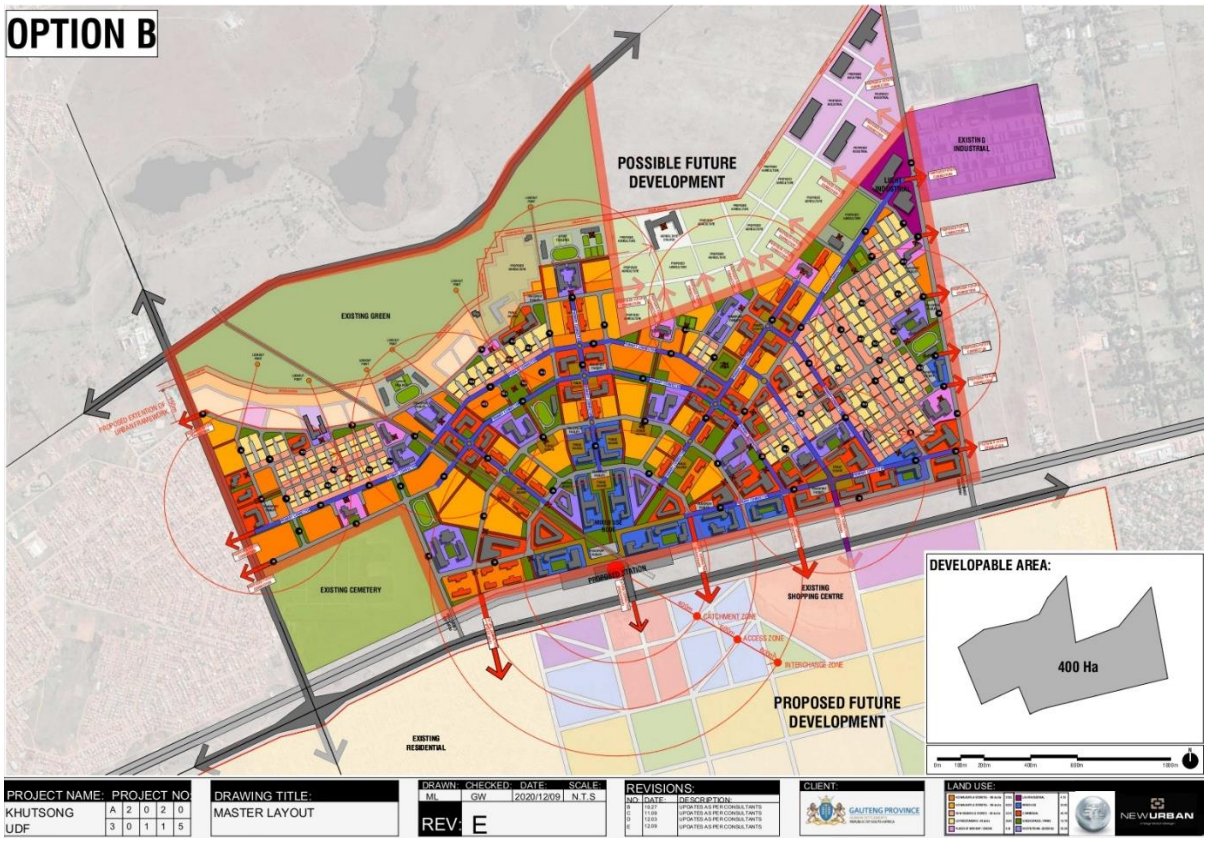

Figure 6: Latest preferred layout option for the development provided by ETL Consulting.

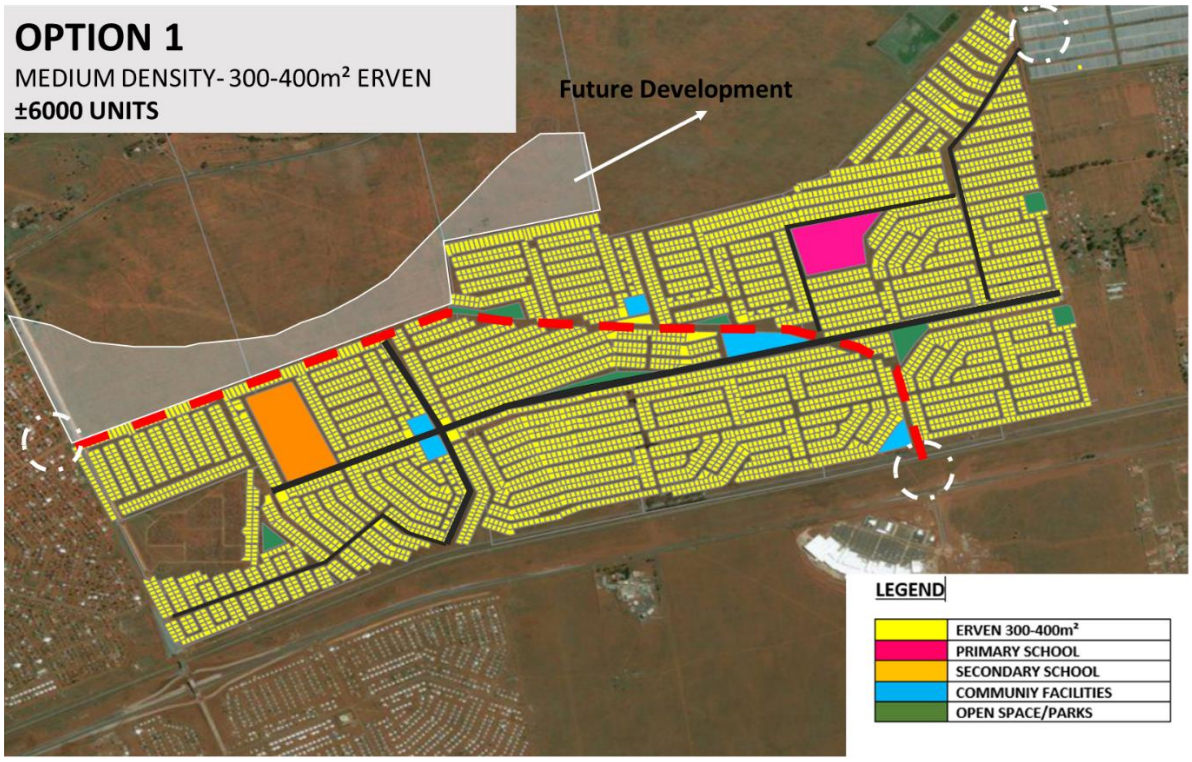

Figure 7: Alternative layout option for the development (Option 1) provided by ETL Consulting.

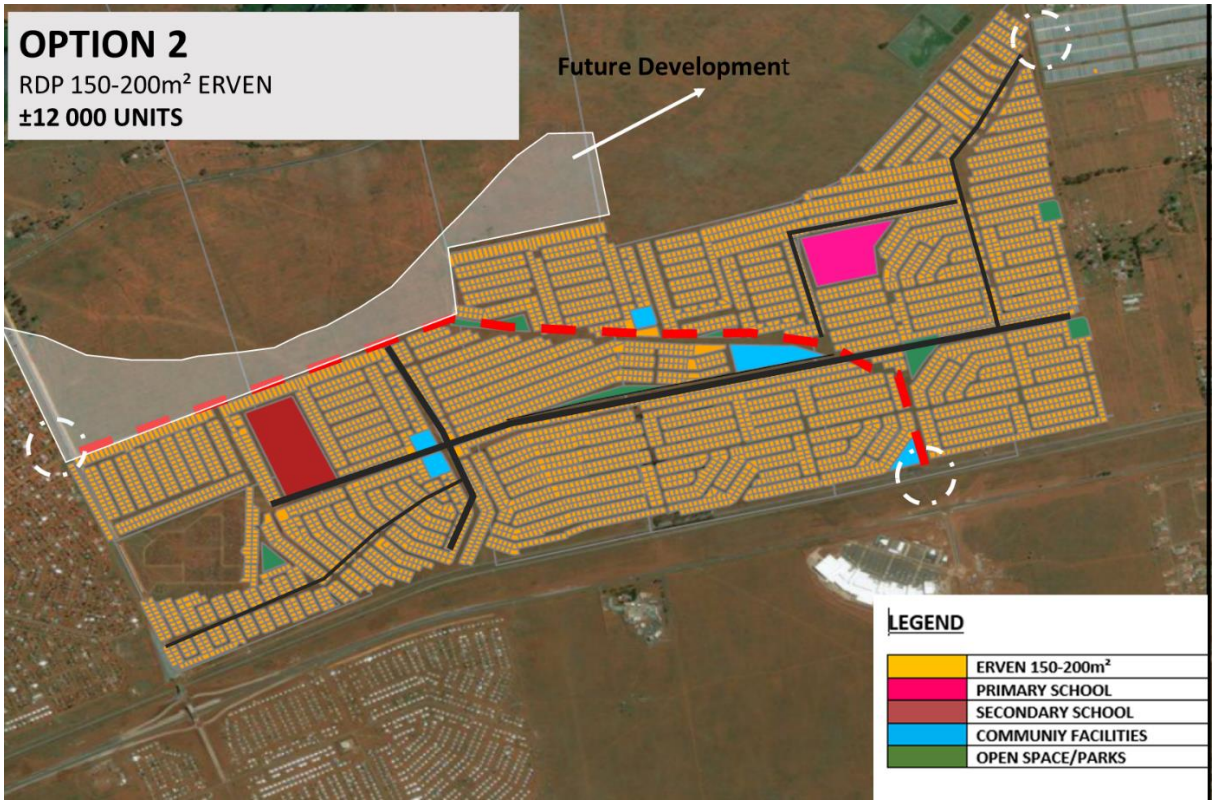

Figure 8: Alternative layout option for the development (Option 2) provided by ETL Consulting.

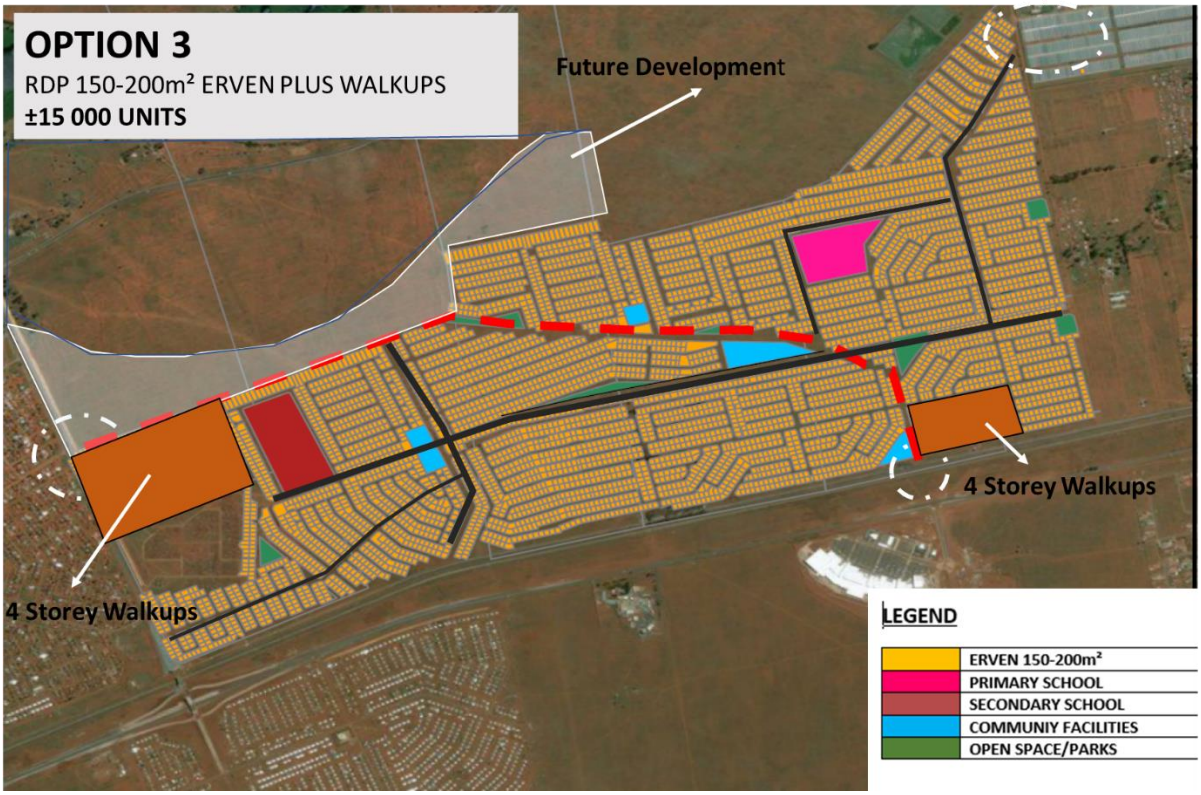

Figure 9: Alternative layout option for the development (Option 3) provided by ETL Consulting.

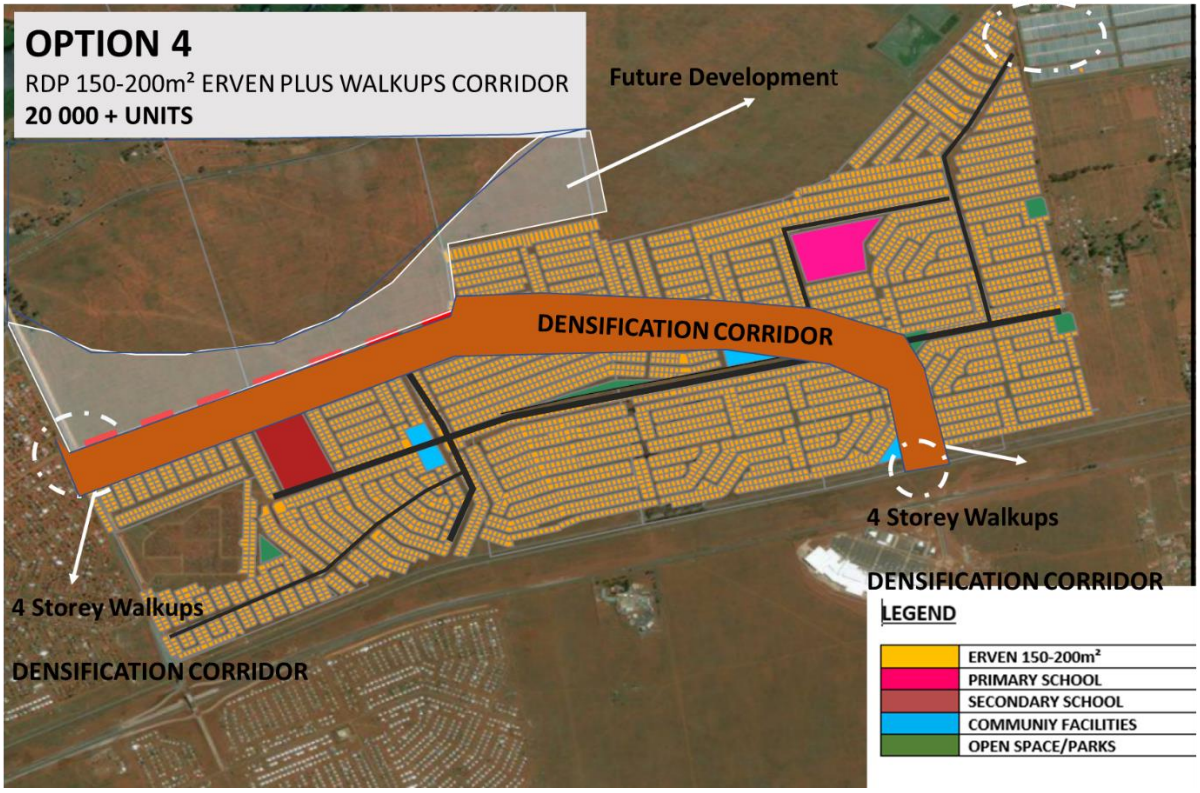

Figure 10: Alternative layout option for the development (Option 4) provided by ETL Consulting.

5.4. Technology

Preferred technologies have not yet been investigated for the project, however, best practice construction and implementation is recommended for all infrastructure associated with the project.

Potential alternatives that must be investigated for the proposed development will include:

- Environmentally friendly technology and designs regarding the construction of housing and associated infrastructure such as:
    - Solar power for geysers and general electricity.
    - Efficient and sanitary rainwater harvesting.
    - Energy efficient lighting (within the houses and streets) and general appliances.
    - Water saving devices such as dual pipe systems for grey water, aerated taps and dual flush toilets.
- Waste minimisation activities during the construction and handover phases including the recycling of generated waste, where possible

Additional feasible technology alternatives will be investigated further and refined during the EIA phase of the proposed development.

5.5. Operational Aspects

The preferred and only operational aspects of the activity involve the maintenance of housing infrastructure and general service delivery to the area. No alternatives to the operation aspect of the proposed development have been considered.

5.6. 'No-Go' Alternative

The no-go alternative must be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed. The no-go alternative assumes that the proposed project will not go ahead i.e. the proposed housing development will not occur and therefore the safe and adequate housing issue within the Khutsong Hostel area will remain. The no-go alternative is discussed further in **Section 5.2**., above.

6. RELEVANT LEGISLATION

6.1. Applicable Listed Activities

The proposed Khutsong South Extension 8 Housing Development triggers listed activities in terms of the Environmental Impact Assessment (EIA) Regulations (2014) (as amended), Government Regulations (GNR) 324, 326 and 327 of 07 April 2017 in Government Gazette Number 38282 read in conjunction with GN R. 982 and 983 of 04 December 2014 promulgated under the National Environmental Management Act (NEMA) (Act no 107 of 1998). The following **Table 15** provides a summary of the Listed Activities in terms of the EIA Regulations 2014 that are triggered by the proposed development:

Table 6-1: Applicable Listed Activities

GOVERNMENT NOTICE	ACTIVITY NUMBER	ACTIVITY DESCRIPTION	RELEVANCE TO THIS PROJECT
GNR 327 of 07 April 2017 (**Listing Notice 1**) read in conjunction with GNR 983 of 04 December 2014	9	The development of infrastructure exceeding 1 000 metres in length for the bulk transportation of water or stormwater – (iii) With an internal diameter of 0.36 metres or more; or (iv) 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 stormwater drainage inside a road reserve or railway line reserve; or (b) where such development will occur within an urban area.	In regards with the Internal Water Reticulation, it is planned that that the entire development will have potable water mains and full level of service to each erf. Internal water reticulation is therefore classified as all water mains smaller or equal to 160mm in an internal diameter.
	10	The development and related operation of infrastructure exceeding 1 000 metres in length for bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes – (iii) With an internal diameter of 0.36 metres or more; or (iv) 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, wastewater, 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.	Regarding the internal Sewer Reticulation, it is planned that the entire development will have gravity sewers and full level of service to each erf and includes 160mm in an internal diameter. It is planned that gravity outfall sewers can be constructed to service the development for Bulk/External Services. Bulk outfall sewer is therefore classified as all sewers greater than 160mm internal diameter.
	12	The development of – (iii) Infrastructure or structures	The total structure of the housing development and associated

		with a physical footprint of 100 square metres or more Where such development occurs – (d) Within a watercourse; (e) In front of a development setback; or (f) Within 32 metres of a watercourse, measured from the edge of the watercourse	infrastructure will have a physical footprint of more than 100 square meter.
	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 (ii) a watercourse.	More than 10 cubic metres of soil and other materials will be excavated, removed, or moved during the construction of houses, roads, pipelines, and sewerage within the watercourse.
	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; (b) where the entire road falls within an urban area; or (c) which is 1 kilometre or shorter.	The proposed housing development will require the development of a new access road network where the road reserve may be wider than 8m.
	28	Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such development: (i) will occur inside an urban area, where the total land to be developed is bigger than 5 hectares; or (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare; excluding where such land has already been developed for residential, mixed, retail, commercial, industrial or institutional purposes	The proposed housing development will occur in a land that was used for agriculture purpose.
	31	The decommissioning of existing facilities, structures or infrastructure for—	It is recommended that the scope include demolition of the existing structures as well as ensuring

		(ii) any development and related operation activity or activities listed in this Notice, Listing Notice 2 of 2014 or Listing Notice 3 of 2014;	appropriate environmental restitution of the site, including safe disposal of all waste material.
GNR 325 of 07 April 2017 (**Listing Notice 2**) read in conjunction with GNR 984 of 04 December 2014	15	The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for— (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.	The proposed development will result in the clearance of approx. 400Ha of indigenous vegetation. The proposed development is not identified as a linear activity.
	27	The development of a road— (iv) catering for more than one lane of traffic in both directions;	The design of the Roads & Stormwater services will be in accordance with the "Guideline for Human Settlement Planning and Design" (Red book). Construction will be specified to be in accordance with SANS 1200. There will be dual carriageways with two lanes in each direction.
GNR 326 of 07 April 2017 (**Listing Notice 3**) read in conjunction with GNR 984 of 04 December 2014	4	The development of a road wider than 4 metres with a reserve less than 13,5 metres. **c. Gauteng** iv. Sites identified as Critical Biodiversity Areas (CBAs) or Ecological Support Areas (ESAs) in the Gauteng Conservation Plan or in bioregional plans;	The proposed housing development will require the development of a new access road network may be wider than 4m where the road reserve.
	14	The development of— (ii) infrastructure or structures with a physical footprint of 10 square metres or more; where such development occurs— (a) within a watercourse; (b) in front of a development setback; or (c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse; c**. Gauteng** iv. Sites identified as CBAs or ESAs in the Gauteng Conservation Plan or in bioregional plans	The total structure of the housing development and associated infrastructure will have a physical footprint of more than 10 square meter within the CBAs or ESAs in the Gauteng Conservation Plan.

The abovementioned activities contained in Listing Notice 1, 2 and 3 of the Regulations promulgated in terms of NEMA, 1998 (Act 107 of 1998) in GNR No 327 of 07 April 2017 read in conjunction with GN R. 982 and 983, of 04 December 2014; are subject to a Scoping & Environmental Impact Reporting (EIR) within the jurisdiction of the Department of Environmental Forestry and Fisheries (DEFF) – National Office.

6.2. National Water Act (NWA) (Act No. 36 of 1998)

Due to the proposed development occurring within 500m radius of wetlands and 1:100 year floodline, a Water Use Authorisation Application (WUA) must be submitted to the Department of Water and Sanitation (DWS) in terms of Section 21 (c) or (i) in accordance with the National Water Act 1998 (Act No. 36 of 1998) (NWA).

The NWA is a legal framework for the effective and sustainable management of water resources in South Africa. A Water Use Licence/Authorisation is a legislative process governed by DWS for the licence/authorisation of all water uses defined in section 21 of the National Water Act, 1998 (Act No 36 of 1998) (NWA). The following table (**Table 16**) provides a summary of water uses that may apply to this proposed housing development:

Table 6-2: Summary of water uses that will require a water use licence

Activity Number	Water Use	Definitions / Activity Description
Section 21 (a) of NWA, 1998	Taking water from a water resource	• Water is to be extracted per day from the neary watercourse.
Section 21 (c) of NWA, 1998	Impeding or diverting the flow of water in a watercourse.	• Impeding flow means the temporary or permanent obstruction or hindrance to the flow of water into watercourse by structures built either fully or partially in or across a watercourse. • Diverting flow means a temporary or permanent structure causing the flow of water to be rerouted in a watercourse for any purpose.
Section 21 (i) of NWA, 1998	Altering the bed and banks of a watercourse or characteristics of a watercourse.	• Altering the bed and banks means any change affecting the resource quality of the watercourse (the area within the riparian habitat or 1:100 year floodline, whichever is the greatest).
Section 21(g) of NWA, 1998	Disposing of waste in a manner which detrimentally impact on a water resource.	• Onsite effluent disposal (sewage) • New sewage pipeline. • Onsite effluent treatment.

6.3. Mineral and Petroleum Resources Development Act, (Act No.28 of 2002)

An application for a Mining Permit and Environmental Authorisation will be submitted to the Department of Mineral and Resources (DMR) for the establishment of a borrow pit for the construction of access roads in line with the requirements of the Mineral and Petroleum Resources and Development Act, 2002 (as amended) and NEMA EIA Regulations Act No 107 of 1998), as amended, and the EIA Regulations (2014). The following **Table 17** provides a summary of the Listed Activity in terms of the EIA Regulations 2014 that are triggered by the establishment of a borrow pit:

Table 6-3: Summary of listed activity for borrow pit

Government Notice Number	Activity number	Description of each listed activity	Component of project
GNR 327 of 07 April 2017 (Listing Notice 1) read in conjunction with GNR 983 of 04 December 2014	21	Any activity including the operation of that activity which requires a mining permit of section 27 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002, including - (a) associated infrastructure, structures and earthworks, directly related to the extractions of a mineral resource, or (b) the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing.	There are borrow pits which are located nearby the proposed site which will be utilised to construct all the access roads within the development for the purpose of procurement of raw materials.

The abovementioned activities contained in Listing Notice 1 of the Regulations promulgated in terms of the National Environmental Management Act, 1998 (Act 107 of 1998) in GNR No 327 of 07 April 2017 read in conjunction with GN R. 982 and 983 of 04 December 2014; are subject to a Basic Assessment within the jurisdiction of the DMR.

6.4. Additional Legislation, Policies and Guidelines

Additional Legislation, policies, and guidelines relevant to the proposed development are summarised in the tables (**Table 18 and 19**) below:

Table 6-4: Environmental legislation considered during the preparation of the draft Scoping Report

TITLE OF ACT	RELEVANCE TO THE DEVELOPMENT PROJECT
The Constitution of the Republic of South Africa (Act No. 108 of 1996)	• The contractor has an obligation to ensure that the construction and operation of the proposed development will not result in pollution and/or ecological degradation at the site; and • To ensure that the proposed development ecologically sustainable as well as improving local economic and social conditions.
The National Environmental Management Act, 1998 (Act No. 107 of 1998) and the amended Environmental Impact Assessment Regulations, 2014 (amended April 2017): GNR. 326	• The client must be aware of the principles and implications associated with the National Environmental Management Act (NEMA) and must avoid or mitigate any potential impacts associated with the construction or operation of the development. • The client must also be aware of the principles and potentially negative implications of causing damage to the environment; and • The client must also comply with the amended Environmental Impact Assessment (EIA) Regulations in the terms of the Act which specifies the requirements of a Scoping and EIA process.
The National Heritage Resources Act, 1999 (Act No. 25 of 1999)	• The Act requires a cultural heritage study for any development of 5000 m^2 or more. It also provides guidelines for impact assessment studies to be undertaken whenever cultural resources may be affected by onsite development activities. • The Provincial Heritage Resources Authority Gauteng (PHRAG) needs to be informed of the proposed development project. • In the case that heritage resources are identified during the construction or the operation of the proposed development, PHRAG must be notified to protect these resources.
The National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)	• The Act promotes the sustainable use of biological resources by protecting natural species and threatened ecosystems that may potentially occur within the development footprint, and the surrounding area.
The National Environmental Management: Biodiversity Act, 2004 (Act No 10. of 2004), Alien and invasive species Lists, 2016	• Any declared weed or invasive species listed in this Act, found onsite, must be removed.
The National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)	• The contractor must ensure that all waste related activities associated with the construction and operation of the proposed development is compliant with the Act.
The National Environmental Management: Air Quality Act (Act No. 39 of 2004)	• Provision of national standards regulating air quality monitoring, management and control that will be applicable during the construction and operation of the proposed development • The contractor must take the necessary measures to ensure compliance with the Act.
Spatial Planning and Land Use Management Act (Act No. 16 of 2013) (SPLUMA)	• SPLUMA is a framework act for all spatial planning and land use management legislation in South Africa. It seeks to promote consistency and uniformity in procedures and

	decision-making in this field. SPLUMA will also assist municipalities to address historical spatial imbalances and the integration of the principles of sustainable development into land use and planning regulatory tools and legislative instruments. • The requirements for rezoning will be confirmed during discussions with the local municipality.

Table 6-5: Policies considered during the preparation of this Scoping Report

TITLE OF POLICY	RELEVANCE TO THE DEVELOPMENT PROJECT
The National Development Plan 2030	• The National Development Plan, finalised in 2011, represents an innovative approach by government to promote sustainable and inclusive development in South Africa. This approach focuses on an array of areas which require improvement and includes increasing access to housing infrastructure and improving the connectivity of townships to economic centres
National Spatial Development Perspective (NSDP)	• Principal 5 of NSDP states that for South Africa to overcome the spatial distortions caused by Apartheid, future settlement and economic development opportunities are to be channelled into activity corridors and nodes that are adjacent to or linked the main growth centres of the country.
The West Rand District Municipality Draft Integrated Development Plan 2016/17 to 2020/21	• The growth of informal settlements and subsequent increased housing demand within the West Rand District Municipality (WRDM) has been identified as a key service delivery challenge. • Specific risks and challenges to the provision of housing within the municipality include: o Mushrooming of Informal Settlements, o Lack of Developable Land, o Unfavourable Dolomitic Conditions, o Cost of Infrastructure, o Budgetary constraints, o Lack of Capacity, and o Lack of Bulk Infrastructure • Approximately 1599 Ha of land has been earmarked for residential development within the Merafong City Local Municipality (MCLM) • Addressing the housing backlog within the WRDM, including the registration of all informal settlements and backyard dwellers on the housing database, registration of title deeds to eligible beneficiaries and improvement of rental/social housing access, has been identified as a level 1 priority for the municipality.
The Merafong City Local Municipality Draft Integrated Development Plan 2020-2021 (Review 2016-2021)	• The MCLM aims to reduce the housing backlog in line with provincial and national standards as well as provide essential services and structures for sustainable communities • Multiple current and future housing projects, as well as the source of funding for each of the projects, are mentioned within the IDP. • Infrastructure development has been identified as an important catalyst for future development and economic

	upliftment for the municipality. • The development of the Khutsong Mixed Precinct Development is identified as a key urban development project, as part of the Integrated Human Settlement Mega Projects, to improve the functioning of urban systems and modernise urban areas.
Merafong City Local Municipality Human Settlement Plan 2019/20	• The housing plan for the MCLM addresses the following: o key principles - housing planning as part of IDP o an overview of the local context; o an information regarding current housing demand; o identification of land suitable for future housing development; o overview of the current housing situation; o information regarding planned projects; o strategic delivery thrust: housing supply options • A priority of the overall housing plan for the MCLM, which is in line with the project, is to provide emergency housing for Khutsong residents in vulnerable areas as well as to initiate hostel upgrading projects to accommodate rental demand.
Merafong Municipal Spatial Development Framework 2016-2021	• The primary goal of the Spatial Development Framework (SDF) is to integrate and restructure the fragmented urban areas within the municipality, resulting from Apartheid spatial planning, in order to promote economic growth and social development. • This aligns with the purpose and preferred location of the development. • Further details of the Merafong City SDF are available within the screening report (Afzelia, 2020a)
Guideline: Public Participation guideline (2017) in terms of NEMA EIA Regulations, Department of Environmental Affairs, Pretoria, South Africa	• Applicable to the conduction of the public consultation process with key stakeholders, government departments, NGOs and directly affected residences and businesses for the duration of the project.
Guideline: Need and Desirability (2017) issued by the Department of Environmental Affairs, Pretoria, South Africa	• Utilised in the assembling of the need and desirability of the project.

The above lists of legislation, policy guidelines and policies should not be regarded as complete or exhaustive, and it is possible that additional legislative requirements will be identified during the environmental impact assessment process.

7. APPROACH AND METHODOLOGY

7.1. Brief Overview of the Scoping and EIR Report Process

The Scoping and EIAR process is a comprehensive, independent assessment of all identified and potential environmental impacts to a site of a proposed development.

The aim of the Scoping and EIR process is to ensure that the establishment of the proposed development occurs in an environmentally sound manner and to formulate ways for reducing or mitigating any negative impacts of the project, whilst enhancing its potential benefits.

The findings and mitigation measures will be recorded in the EMPr which becomes legally binding documentation on approval. The EMPr will be undertaken at a later phase of the project, known as the EIA phase.

Potential impacts of the project will be determined through a PPP, guidance from government authorities, rigorous field assessments by the EAP and specialist consultants and impact modelling, drawing on experience with similar projects.

A flow diagram which details the Scoping and EIR process that will be followed for this development is attached in **Figure 11**, below.

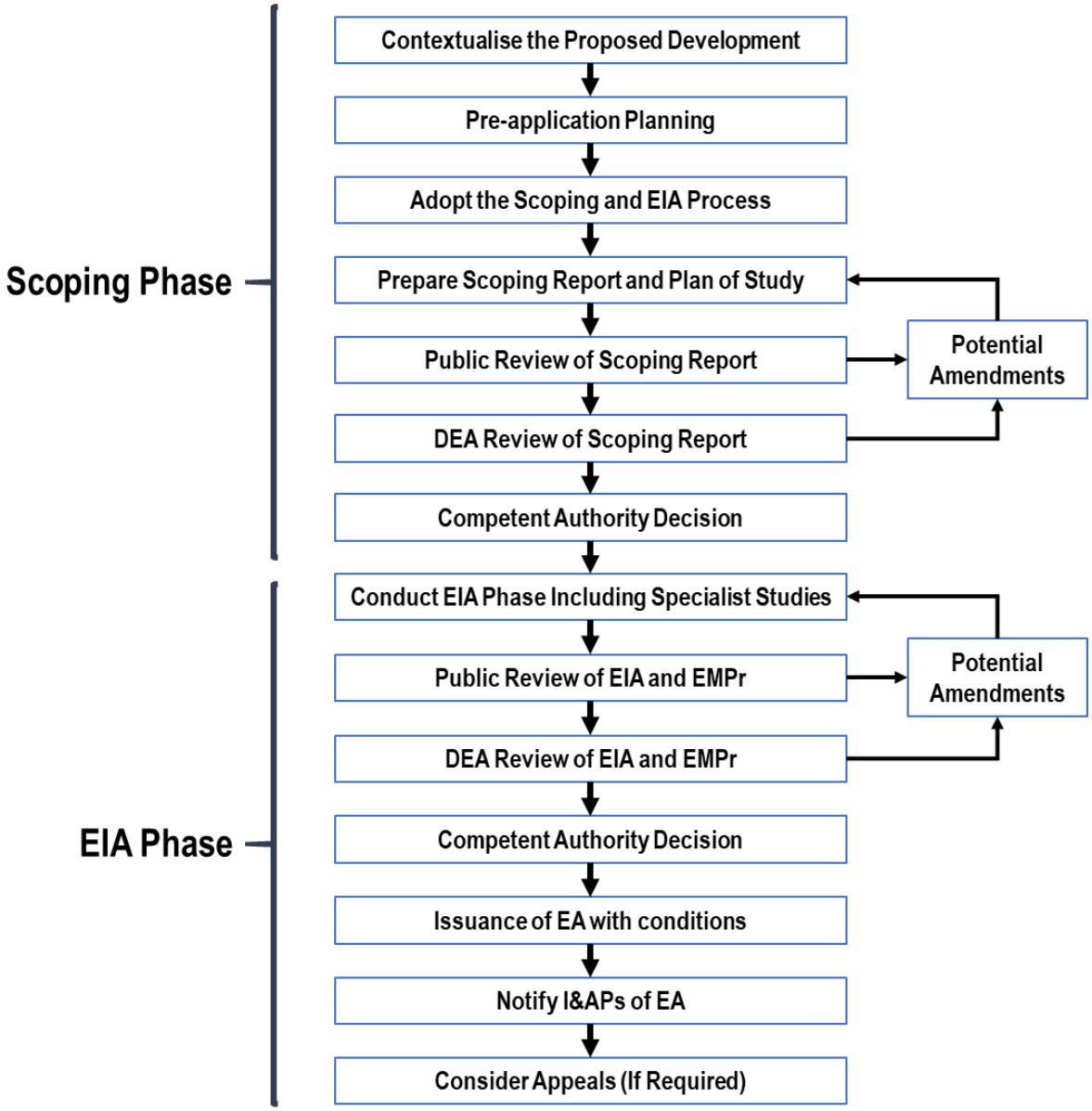

Figure 11: Scoping and EIR Process

7.2. The Scoping Report Process

The general scoping processes applicable to this project (in no particular order), are listed, below:

- Field survey and inspection by the EAP and relevant specialists for the identification of sensitive environmental, cultural and historical features situated within the footprint of the proposed development site, and in the surrounding area.
- The EAP and relevant specialists will complete desktop level GIS mapping for all identified sensitive environmental, cultural and historical features identified within the footprint of the proposed development site, and in the general vicinity.
- Pre-consultation meeting with the Department of Environment, Forestry and Fisheries (DEFF) to ensure that there is consensus between the department and the project team on the following issues, *inter alia*:
  - Environmental impact assessment process to be undertaken for the project;
  - Confirmation of the public participation process to be followed;
  - Confirmation of specialist studies required in support of the EIA Process.
- The following Public Participation Process will be undertaken as part of the Scoping process:

- Compiling and regularly updating an Interested and Affected Party database (I&AP Register);
- Placement of newspaper adverts in a local newspaper to notify the general public of the proposed development and the availability of documentation for review and comment at selected venues. This will be done in English and Setswana.
- Circulation of Background Information Document (BID) to all key stakeholders, Government Departments and directly affected residences and businesses to facilitate preliminary comments on the proposed development, allowing the EAP to address the issues (with the assistance of specialist input), during the EIA phase.
- Site notices placed near the proposed development site where the local community congregates (churches, town halls, taxi ranks and shopping centres). This will be done in English and Setswana.
- Flyers will be distributed to directly affected residences and businesses near the proposed development site.
- Compilation of Comments and Responses Report by EAP. The document will be continuously updated as official comments on the proposed development are received from key stakeholders, Government Departments, NGOs and members of the general public.

- Compilation of **draft** Scoping report, plan of study for the EIA, additional mapping and other supporting documentation and distribution thereof (30-day commenting period) to key stakeholders, government departments, NGOs and registered I&APs.
- Compilation of **final** Scoping report, plan of study for the EIA, additional mapping and other supporting documentation and distribution thereof to key stakeholders, government departments, NGOs and registered I&APs.

7.3. The EIR Report Process

The general EIR processes applicable to this project (in no particular order), are listed, below:

- The EAP will undertake a detailed assessment of the proposed development site and associated activities through the integration of site-based specialist findings and further stakeholder consultation with the findings of the scoping phase report. This additional assessment should address all identified issues related to the proposed development
- The EAP and relevant specialists will complete site-level GIS mapping for all identified sensitive environmental, cultural and historical features identified within the footprint of the proposed development, and in the general vicinity.
- Further consultation and public participation will also be undertaken with the competent authority and all I&APs which will include:
    - Placement of updated newspaper adverts in a local newspaper
    - Placement of the draft EIR report at prescribed public venues
    - Consideration of additional comments from competent authorities and I&APs
    - Updating of the Comments and Responses Report by EAP
- Compilation of **draft** EIR report, Environmental Management Programme (EMPr), additional mapping and other supporting documentation and distribution thereof (30-day commenting period) to key stakeholders, government departments, NGOs and registered I&APs.
- Compilation of **final** EIR report, Environmental Management Programme (EMPr), additional mapping and other supporting documentation and distribution thereof to key stakeholders, government departments, NGOs and registered I&APs.

The final EIR report will be submitted to the DEFF within 106 days of acceptance of the final Scoping report. According to the NEMA EIA Regulations (2014), amended 2017, the DEFF must either grant or refuse the application for Environmental Authorisation within 107 days of receiving the final EIR and EMPr reports.

SECTION D: PUBLIC PARTICIPATION PROCESS

8. PUBLIC PARTICIPATION PROCESS

The purpose of the PPP for the proposed development site is outlined below:

- Provide Interested and Affected Parties (I&APs) with an opportunity to obtain information with regard to the project;
- Allowing I&APs to express their views, issues and concerns with regard to the proposed project;
- Granting I&APs and opportunity to recommend measures to avoid or decrease negative impacts and enhance positive impacts that are associated with the proposed project;
- Granting I&APs and opportunity to contribute any pertinent, locally known, information; and
- Lastly, to enable the project team to incorporate the needs, concerns and recommendation that are made by the I&APs about the proposed project, where feasible.

The PPP that was followed for the proposed project is governed by NEMA and GNR No. 326 of the 2014 EIA Regulations, as amended in April 2017, and the Public Participation guideline (2017) developed and issued by the Department of Environmental Affairs, Pretoria, South Africa. All public participation material can be referred to in **Appendix E.**

8.1. Interested and Affected Parties Register

The compilation of a comprehensive Interested and Affected Party database (I&AP Register) is underway for the project. The latest contact details of the relevant key stakeholders, government departments, NGOs, ward councillors, community leaders and directly affected residences and businesses will be captured in the register. The register will be updated with the contact details of I&APs that respond to newspaper adverts, circulation of the BID, distribution of flyers, the erection of site notices and other documentation made available to the public to view at local public venues (libraries, community halls, municipality offices etc.) during the Scoping and EIA phase. Please see the latest I&AP register attached as **Appendix E1** to this document.

8.2. Key Stakeholders

The following have been provisionally identified as key stakeholders of the project (as stipulated by the EIA Regulations):

- National;
    - Department of Environment, Forestry and Fisheries (DEFF)
    - Department of Water and Sanitation (DWS)
    - Department of Human Settlements (NDHS)
    - Department of Agriculture, Forestry and Fisheries (DAFF)
    - Department of Rural Development and Land Reform (DRDLR)
    - The South African Police Service (SAPS)
- Provincial (Gauteng);
    - Department of Agriculture and Rural Development (GDARD)
    - Department of Infrastructure Development (GDID)
    - Department of Roads and Transport (GDRT)
    - Department of Community Safety (GDCS)
    - Department of Economic Development (GDED)
    - Department of Human Settlements (GDHS)
    - Department of Social Development (GDSD)
- Municipal (District);
    - West Rand District Municipality Public Safety
    - West Rand District Municipality Transport and Roads

    - West Rand District Municipality Integrated Environment
    - West Rand District Municipality Infrastructure and Human Settlement
    - West Rand District Municipality Health and Social Development
    - West Rand District Municipality Development Planning and Environmental Management
    - West Rand District Municipality Economic Development
- Municipal (Local);
    - Merafong City Community Services
    - Merafong City Infrastructure Development
- Organisations and State-Owned Enterprises (SOEs);
    - Wildlife & Environmental Society of South Africa (WESSA)
    - Endangered Wildlife Trust (EWT)
    - South African National Biodiversity Institute (SANBI)
    - Provincial Heritage Resources Authority Gauteng (PHRAG)
    - ESKOM
    - Transnet

8.3. Windeed Search

Windeed was utilised to search online for property (deeds office description, LPI code, extent, diagram deed number, local authority details) and ownership information (owner contact details, ID number, title deed number, purchase price, purchase date etc.). The contact details of all affected property owners were captured on the I&AP register.

8.4. Background Information Document (BID)

Copies of the BID were circulated by email to key stakeholders, government departments and NGOs to facilitate preliminary comments on the proposed development and to allow the EAP to address any potential issues within the Scoping and EIA phases of the project. The document was circulated by email on the 11th of August 2020, and the registered letters were circulated on the 09th of October 2020.

The BID was circulated to the following stakeholders shown in Table

Table 8-1: List of all stakeholders identified.

NAME	ORGANISATION / ENTITIES
Mr Mandla Mona	Department of Environment, Forestry and Fisheries
Ms Masina Litsoane	Department of Environment, Forestry and Fisheries
Mr Lucas Mahlang	Department of Environment, Forestry and Fisheries
Ms Zamashenge Hadebe	Department of Water and Sanitation
Mr B Govender	Department of Water and Sanitation
Ms Florah Mamabolo	Department of Water and Sanitation
Ms Jeanette Nyama	Department of Water and Sanitation
Mr Sibusiso Mthembu	Department of Water and Sanitation
Mr Lawrence Mulangaphuma	Department of Water and Sanitation
Mr Khathutshelo Mudau	Department of Water and Sanitation
Mr Victor Nkuna	Department of Water and Sanitation
Mr Mpho Nevondo	Department of Water and Sanitation
Ms Cindy Benyane	Department of Rural Development and Land Reform
Mr Solomon Maruma	Department of Rural Development and Land Reform
Mr Lebjane Maphutha	Department of Rural Development and Land Reform
Dr Hanneline Smit-Robinson	Bird Life South Africa
Ms Zingisa Smale	Gauteng Department of Agriculture and Rural Development
Mr Motlatjo Moholwa	Gauteng Department of Agriculture and Rural Development

NAME	ORGANISATION / ENTITIES
Ms Pumla Ncapayi	Gauteng Department of Agriculture and Rural Development
Mr Albert Marumo	Department of Health
Ms Morakane Mokoena	Merafong City Local Municipality
Mr. I.M. Mavhutha	Merafong City Local Municipality
Mr Elvis Mphithikezi	Merafong City Local Municipality
Mr Leonard Seabi	West Rand District Municipality
Mr Morongwe Mazibuko	West Rand District Municipality
Boikhutso A. Segopolo	West Rand District Municipality
Mogkotsi Sello	Ward 1 - Councillor
Ms Tshidi Ramodupi	Ward 5 and 27 - Councillor
Councillor Niewenhuys	Ward 28 Councillor

Additional copies of the BID have been circulated to local ward councillors and selected representatives of government departments by email to facilitate comments on the project.

Please see **Appendices E2** to view a copy of the BID, and proof of its circulation to I&APs.

8.5. Flyers

English and Setswana flyers was distributed to directly affected residences and business located around in the general vicinity of the proposed housing development during the field survey and inspection by the EAP on 01st December 2020.

Pictures of the distribution of the flyers were taken by the EAP, and participants were asked to complete an acknowledgement of receipt register. For further information on this process, please see **Appendix E3** for further information.

8.6. Site Notices

Ten (x10) English and Setswana site notices were erected in the vicinity of the proposed development site as part of the preliminary PPP on 01st December 2020. Please see **Appendix E4** of this report for further information on this project.

On receipt of the project reference number from DEFF during the EIA phase, an additional ten (x10) English and Setswana site notices will be erected around the site.

8.7. Newspaper Advertisements

English and Setswana adverts will be placed in the Local and Regional Newspapers in English and Setswana on 16/02/2021. Please see **Appendix E5** to view the newspaper adverts.

8.8. Comment and Responses Report

A provisional comment and responses report has been compiled for the Scoping phase of the project whilst a summary of comments and responses is included in **Table 21**, below. The document will be updated as comments on the proposed development are received from key stakeholders, government departments, NGOs, and members of the public during the ongoing PPP through to the EIA phase of the project.

8.9. Circulation of the Draft Scoping Report

An email to key stakeholders, Government Departments, NGOs, ward councillors, community leaders and directly affected residences and businesses will be circulated to notify these parties of the application and availability of the report for 30-day commenting period.

Comments received during the 30-day public participation period will be incorporated into the final Scoping report.

Hard copies of the draft report and supporting documentation will be placed at public venues, provided in **Table 20**, below, for public viewing from **Monday 08th February 2021 to Monday 15th March 2021**.

Table 8-2: Details of public venues

VENUE	ADDRESS	CONTACT DETAILS	TIMES
Carletonville Library	c/o Celestine and Emerald Street, Carletonville	Tel: 018 788 9541/2 Fax: 018 787 2485	9am to 15pm (Mond to Fri)

The draft report will be placed on the Afzelia Environmental Consultants (Pty) Ltd website - http://www.afzelia.co.za for public viewing.

8.10. Follow-ups with Key Stakeholders and Government Departments

Two weeks after circulation of hard copies of the draft Scoping Report to key stakeholders and government departments by courier, Afzelia will commence weekly telephonic and email follow-ups to accelerate the submission of official comments.

The follow up process will be presented to officials with the opportunity to present queries and concerns related to the project. Details of all follow-ups with key stakeholders and government departments will be captured in the Follow-Up Register.

8.11. Summary of Issues Raised by I&APs

Provisional comments and issues raised, and reaction to those responses by the EAP are summarised in **Tables 21**, below and attached as **Appendix E6** and all copies of comment received attached in **Appendix E7**.

Table 8-3: Summary of issues raised by I&APs during the preliminary public consultation process

NO.	ISSUE	NAME & ENTITY	METHOD & DATE	COMMENT	RESPONSE
COMMENTS RECEIVED DURING THE CIRCULATION OF THE BACKGROUND INFORMATION DOCUMENT					
1	Registration as an I&AP and general comment	**Mr Johannico Vldulerue** *Genroek Group*	01/12/2020	Potential business opportunity and increase in business. No objection for proposed Khutsong Southern & Development	Noted.
2	Registration as an I&AP and general comment	**Mr Lebogany Bathabeng** *KFC*	01/12/2020	Yes. Business will be good as for people will be close to shopping centre and employees will be closed to work	Noted.
3	Registration as an I&AP and general comment	**Thokozane Sibiya**	01/12/2020	In Setswana	
4	Registration as an I&AP and general comment	**Mr Tom Mosiaue** *Private*	01/12/2020	So that the people who stay at the shack can be moved to better place. Will they be RDP or low-cost housing? If it is low-cost housing. How much more or less will be sold?	The subject property is situated on the following farm portions: • A Portion of the Remainder of the Farm Uitspanning Aan Wonderfontein 104 IQ; • Portion 20 of the Farm Wonderfontein 103-IQ; • Remainder of Portion 105 of the Farm Wonderfontein 103 IQ; • Remainder of Portion 116 of the Farm Wonderfontein 103; • Portion 117 of the Farm Wonderfontein 103; • Portion 121 of the Farm Wonderfontein 103; The abovementioned properties are currently owned by Far West Rand Dolomitic Water Association and is in progress of Being transferred to Merafong Local Municpality. The study area and land suitable for development is estimated at ± 393 Hectares. In terms of the Municipal Spatial Development Framework, the subject area is earmarked for Future Human Settlement Areas. The area under application is also classified as a

NO.	ISSUE	NAME & ENTITY	METHOD & DATE	COMMENT	RESPONSE
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					Priority Human Settlements and Housing Development Areas. The proposed development will be focused on the BNG concepti that includes the following principles such as: • integrating subsidised, rental and bonded housing • providing municipal engineering services at a higher level and being applied consistently throughout the township. • providing ancillary facilities such as schools clinics and commercial opportunities • combining different housing densities and types, ranging from single-stand units to doubles Torey units and row houses. At this point in time the potential market cost per living unit cannot be determined or provided. A property and market specialist will be appointed to assist to determine the retail value of units once all statutory approvals have been obtained, bulk services installed and completion of construction. The assessment will take into account the existing retail prices of Khutsong, general market trends and impact of Covid-19 on the residential property market.
5	Registration as an I&AP and general comment	**Mr. Mehrdad Ebrahimi** *Mcdonalds Carletonville*	01/12/2020	I am against this development and objecting this development as it will affect my investment in a negative way. I have just purchased this McDonalds on 1st December 2020 and today is my first day. It cost me a lot of money. I am worried about so many low-cost housing / townships bus built opposite my restaurant and it will affect	The subject property is situated on the following farm portions: • A Portion of the Remainder of the Farm Uitspanning Aan Wonderfontein 104 IQ; • Portion 20 of the Farm Wonderfontein 103-IQ; • Remainder of Portion 105 of the Farm Wonderfontein 103 IQ; • Remainder of Portion 116 of the Farm Wonderfontein 103;

NO.	ISSUE	NAME & ENTITY	METHOD & DATE	COMMENT	RESPONSE
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				security and safety of myself and my customers and employees. There is no shortage of construction land in Carletonville. My question is why you would want to build it in prime business to location and to reduce the value of all business in this area when you can build it at least 10Km away and all will be happy. Much appreciated for your consideration	• Portion 117 of the Farm Wonderfontein 103; • Portion 121 of the Farm Wonderfontein 103; The abovementioned properties are currently owned by Far West Rand Dolomitic Water Association and is in progress of Being transferred to Merafong Local Municpality. The study area and land suitable for development is estimated at ± 393 Hectares. In terms of the Municipal Spatial Development Framework, the subject area is earmarked for Future Human Settlement Areas. The area under application is also classified as a Priority Human Settlements and Housing Development Areas. As per the Gazetted Notice dated 15 May 2020 a number of 136 designated Priority Human Settlements and Housing Development Areas (PHSHDAs), after declaration by human settlement minister Lindiwe Sisulu. The PHSHDAs intends to advance Human Settlement Spatial Transformation by ensuring the delivery of housing is used to restructure and revitalise town and cities, strengthening the livelihoods and to overcome the legacy created by apartheid spatial planning and to foster more integrated and integral urban settlements. The PHSHDAs are correlated as a pillar of the National Development Plan (NDP) with similar objectives on the National Spatial Development Framework (NSDF) and the Integrated Urban Development Framework (IUDF). A Geotechnical analysis indicated that 90% of the Khutsong's residential area falls within the extremely high risk dolomite zones 3 and 4 which are not suitable for human settlement

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					development, the area under application has suitable soil conditions that can allow residential development for future use. Due to the problematic dolomitic conditions, there is a need and backlog to provide quality housing opportunities within the vicinity. The proposed development of Khutsong X8 will not affect surrounding properties negatively. As per the proposed master plan, a variety a land uses are proposed in conjunction with residential land uses to stimulate and uplift the local economy and create a driving force for Merafong Local Municipality to attract key business and institutions. A number of factors influence the valuation of any property. These factors either contribute to the appreciation or depreciation of a real estate investment; the most important factor to consider among them is Location followed by a host of other factors. The following factors contribute to property value: • Location • Geographical Stability • Age and Condition of buildings and Structures • Size of property, Improvement made on property • Population Movement and Need. • Zoning, Legalities and taxes • Surrounding Area and proximity to tertiary services There is a general disposition that an increase in density or any new development will ultimately lead to a negative property value for surrounding property owners. Density contributes to positive property market and investment but

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					also to a sound locality, which is among the main factors that influences the value of the property. The proposed development cannot adversely influence adjacent or surrounding property values. In addition, the proposed development will also be of a high quality, built of robust building materials; aligning itself with the existing residential developments within Khutsong and Merafong Local Muncipality, thereby reinforcing the value and character of the locality and actively contributing to urban regeneration and investment. This will contribute to increase the value of surrounding properties in the vicinity. The provision of additional residential uses will be beneficial towards local business as the development will create an influx within the population. This is a clear indication that the intended development will increase surrounding property values and contribute toward urban regeneration within the area of Khutsong.
6.	Registration as an I&AP and general comment	**Susan Stoffberg** *West Rand District Municipality*	13/10/2020	Good afternoon Mr Briggs With reference to your request for comments in the above regard, the West Rand District Municipality (Environmental Management Section) take note of the proposed application of township establishment and will submit comments when the full Basic Assessment Report is available. Kind regards Susan Stoffberg	Noted, will await final comments on submission on the EIA Phase report.

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7.	Registration as an I&AP and general comment	**Florah Mamabolo and Jeanette Nyama** *Dept. Water and Sanitation*	15/10/2020	Good Day Afzelia Team Kindly note that my colleague Ms Jeanette Nyama copied herein will assist with Scoping Report and EIA. I will assist with Water Use Authorisation. Regards Florah Mamabolo	Noted.
8.	Registration as an I&AP and general comment	**Victor Nkuna** *Dept. Water and Sanitation*	30/10/2020	Reason for Interest: I am an Environmental Officer in the Catchment - Water Resource Management Comments/Questions: • Sewer management of the new development • Water Use Authorisation • Wetland Management • Waste Management	Noted, a water use license process will be undertaken after the recommendation of the wetland specialist has been received. Additional specifics regarding sewer, wetland and waste management will be provided in greater clarity during the EIA Phase of the project, however, the identification of provisional mitigation measures are provided in this report, and include the following: **Preliminary Wetland Management**: • A buffer width of at least 15m must be applied from the edge of the nearest wetland habitat. No incursions are permitted within this buffer. • A watercourse monitoring plan must be compiled, which includes aspects of biomonitoring within the nearby wetland. **General Waste Control**: • The Contractor is responsible for the internal collection of refuse and its transport to a landfill site facility during

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					the construction and handover phase. The facility must be registered in terms of section 20(b) of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008). • Littering on site is forbidden and the site shall be cleared of litter at the end of each working day. • Waste receptacles must be positioned within all working areas and must be emptied daily. • All waste receptacles (bins, barrels, containers etc.) must be securely covered, and lined with a plastic refuse bag. • Separate labelled waste receptacles for different waste types is compulsory. These waste receptacles, which must be clearly labelled, must comprise domestic waste, plastic, paper, rubble and hazardous waste. • Mixing of non-hazardous and hazardous waste is prohibited. • Proof of waste disposal must be maintained onsite.
9.	Oland claims	**Solomon Maruma** *Dept. Agriculture, Land Reform and Rural Development*	10/10/2020	Good day Receipt of your land claim enquiry is hereby acknowledged. Please send a deeds search or a property description as per deeds records of the property/ies affected by this project for this office to confirm to you if there is a land claim against the property or not. Regards Maruma MS	Property records were supplied, there are active land claims against the properties 'Portion of Remainder and Portion 1 of the Farm Uitspanning Aan Wonderfontein 104 IQ' and 'Portion 105, 20, 121 and Portion (116)(RE) of the Farm Wonderfontein 103 IQ', which will need to be addressed.
10	Registration as an I&AP	**Dr Hanneline Smit-**	09/10/2020	Hi Andrew	Noted.

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	and general comment	**Robinson** *Birdlife South Africa*		Many thanks, I confirm receipt and have forwarded it on to our Policy and Advocacy Programme. Kind regards Hanneline	

SECTION D: INFORMATION ON ASSESSMENT FACTORS

9. DESCRIPTION OF THE RECEIVING ENVIRONMENT

9.1. Land Zoning

The proposed development site is located on land zoned as 'Undetermined', which is very similar to 'Agricultural'.

9.2. Current Land-use

The proposed development site comprises approximately 5% anthropogenic structures whilst the remainder is characterised as open areas/veld (TBC, 2020; Figure 12, below).

The proposed development site is surrounded by the following land uses:

- The Abe Bailey Provincial Nature Reserve, which includes conserved open areas, wetland habitat and structures, is located immediately north of the site.
- The Khutsong South Extension 4 settlement is located immediately adjacent to the western extent of the site.
- A small-holding farming area, known as Waters Edge AH, is located immediately east of the proposed site.
- The southern extent of the site comprises multiple land uses, including:
    - Two roads, known as Railway Street and Station Street.
    - Khutsong South Extension 2, which is located immediately south of Station Street.
    - Open grassland
    - The Carletonville Mall Shopping Centre
- The Khutsong South Cemetery is located within the southern extent of the proposed site boundary.

Figure 12*:* Images showing general open grassland observed within the study area.

9.3. Climate

The proposed development site is located within quaternary catchment C23E. The mean annual precipitation (MAP) within the quaternary catchment is ~631.4mm, potential evapotranspiration (PET) is ~2262.6mm with a simulated mean annual run-off of ~58.9mm (Schulze, 1997). Rain falls from early to mid-summer with highly infrequent winter rainfall. Maximum temperatures vary between 24-30°C in February and 14-20°C in July whilst minimum temperatures are between 12-17°C in February and 0-3°C in July (DWAF, 2005).

9.4. Topography

The area within the proposed development is flat in nature with a very gentle slope of 1.4 – 2.0% and drains in a north-westerly direction towards the Mooirivierloop River. The altitude of the site ranges from approximately 1505m a.m.s.l. at the highest point to 1475 a.m.s.l.

9.5. Regional Geology

The underlying regional geology of the study site comprises dolomite of the Malmani Subgroup and chert from the Chuniespoort Group, within the Transvaal Supergroup. At a site level, The proposed development property located within the southern extent of the Hartebeestfontein anticline which is overlain by the Black Reef Formation (Davies Lynn & Partners, 2020). The area supports, primarily, shallow soil forms such as Glenrosa and Mispah from the Fa land type.

9.6. Preliminary Watercourse Assessment

9.6.1. National Freshwater Ecosystem Priority Areas (NFEPA)

In terms of the NFEPA project, the study area is located within a sub-quaternary catchment (ID: 1378) that has been classified as an 'Upstream Management Area'. An Upstream Management Areas is a sub-quaternary catchment in which human activities needs to be managed to prevent degradation of downstream river FEPAs and Fish Support Areas (Nel *et al*. 2011). It indicates that the proposed development will need to be implemented in a manner that prevents any degradation of the aquatic habitat associated with it. In terms of prioritised wetland habitats, the NFEPA GIS dataset did not flag the presence of any wetland FEPA or wetland cluster within a 500m radius of the development area (see **Figure 13**, below).

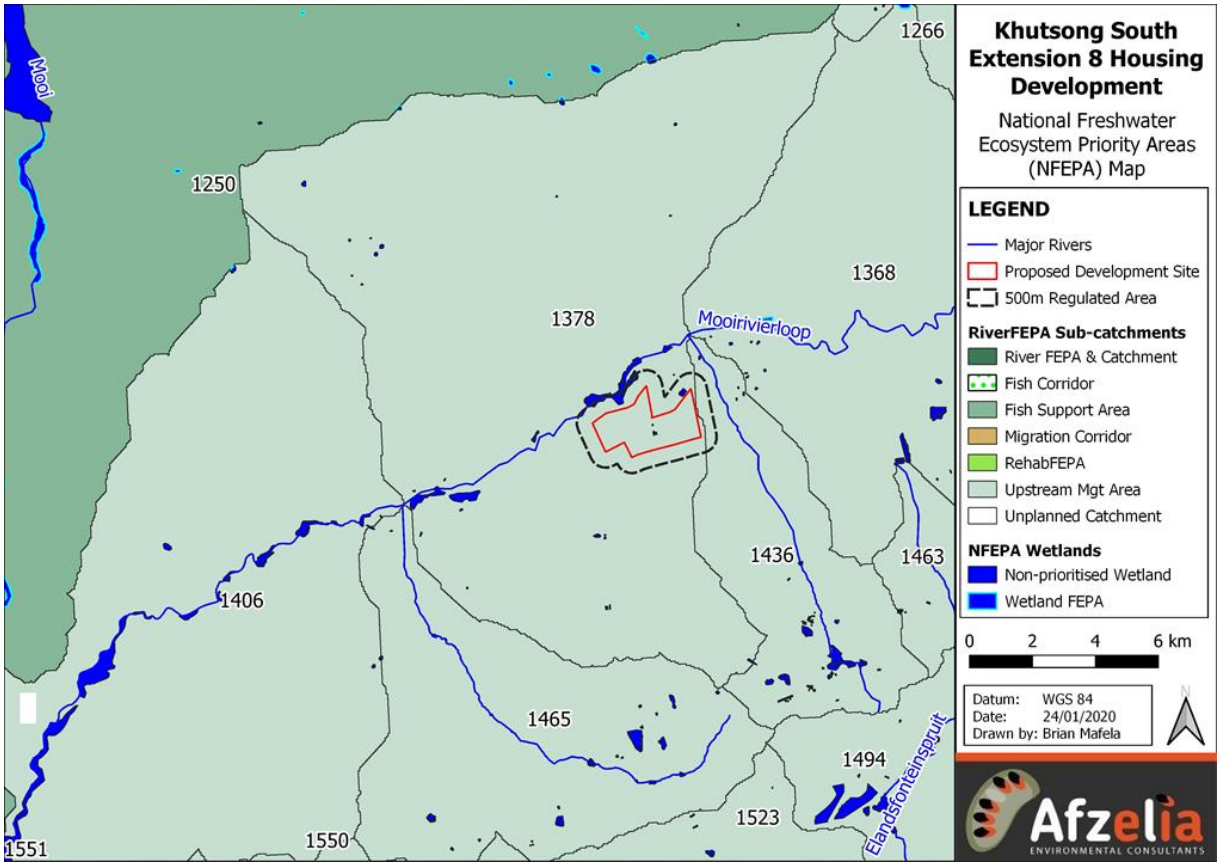

Figure 13: Map showing all river and wetland FEPAs within proximity of the study area.

9.6.2. Desktop Watercourse Delineation and Classification

The desktop delineation of the site undertaken by Afzelia (2020c) revealed the presence of a single unchannelled valley bottom wetland (UCVB1) as well as one channelled valley bottom unit (CVB1) within the 500m DWS regulated area of the site. The stream flowing through the wetland habitat was identified as Mooirivierloop Stream, which is a left-bank tributary of the Mooi River. Wetland unit UCVB1 occurs at least 120m away from the northern boundary of the proposed development whilst unit CVB1 is located approximately 440m downslope of the north eastern boundary of the development area. 2 artificial ponds were also identified within the regulated area of the proposed development. The closest of these artificial ponds is situated 50m away from the northern boundary of the development area and the furthest 390m away

Wetland unit UCVB1 is an inundated unchannelled valley bottom wetland system that is likely fed primarily by diffuse surface and sub-surface flow associated with the Mooirivierloop Stream. The reference wetland vegetation for the area is identified as Dry Highveld Grassland Group 5 which is Least Threatened (Nel and Driver, 2012). It is likely, however, that the wetland vegetation onsite has been modified to some extent as a result of general various anthropogenic pressures in the area.

Note that no wetland habitat has been identified within the proposed development boundary at a desktop-level resolution.

An overview of the delineation and classification of all watercourse units within the proposed development area and associated 500m buffer is shown in **Figure 14**, below.

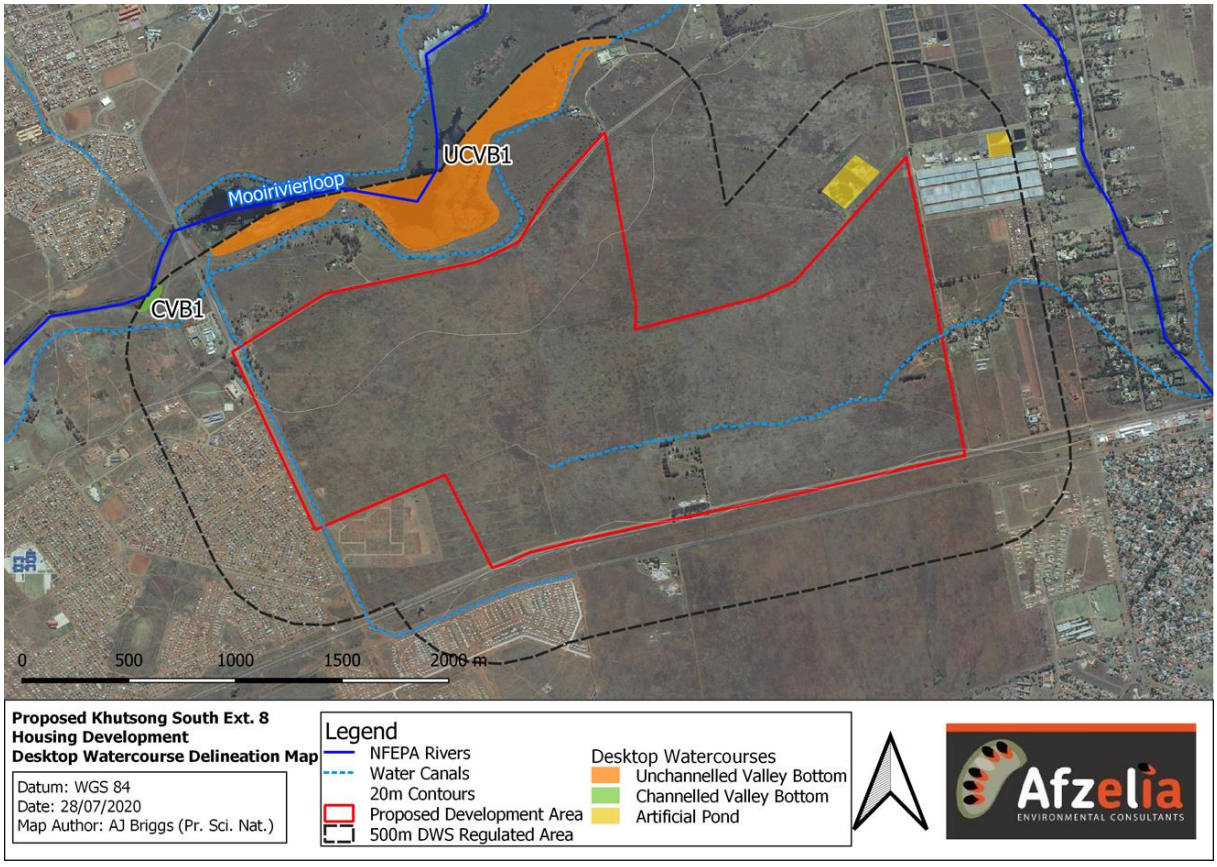

Figure 14: Desktop watercourse delineation and classification map.

9.7. Vegetation Characteristics

9.7.1. National Resolution Vegetation Characteristics

Mucina and Rutherford (2006) have developed the National Vegetation map as part of a South African National Biodiversity Institute (SANBI) funded project: "to provide floristically based vegetation units of South Africa, Lesotho and Swaziland at a greater level of detail than had been available before." The map was developed using data from a variety of sources and has culminated in a comprehensive national vegetation map to date which has been used as a replacement to the Veld Types of South Africa, initially compiled by Acocks (1953).

The vegetation type of the study area for the proposed development site has been defined as Carletonville Dolomite Grassland (Gh15) at a national scale and is shown in **Figure 15**, below (Mucina and Rutherford, 2006).

Carletonville Dolomite Grassland is primarily located within the North West province with lower abundance in Gauteng and the Free State province. The vegetation type occurs on slightly undulating plains dissected by rocky chert ridges, comprising species-rich grassland habitat. Important grasses and herbs include the *Aristida congesta*, *Cynodon dactylon*, *Diherteropogon amplectans*, *Heteropogon contortus*. *Themeda triandra*, *Acalypha angustata*, *Barleria macrostegia*, *Dicoma anomala* and *Helichrysum nudifolium*. Important Shrubs and geoxylix suffrutices include *Anthospermum rigidum*, *Searsia magalismontana*, *Elephatorrhza elephantina* and *Parinari capensis*. The vegetation type comprises a single endemic taxon, namely: *Delosperma davyi*. This vegetation type is vulnerable, with a conservation target of 24%, whilst a small extent statutorily conserved. Approximately 25% has been transformed for cultivation urban sprawl and mining (Mucina & Rutherford, 2006).

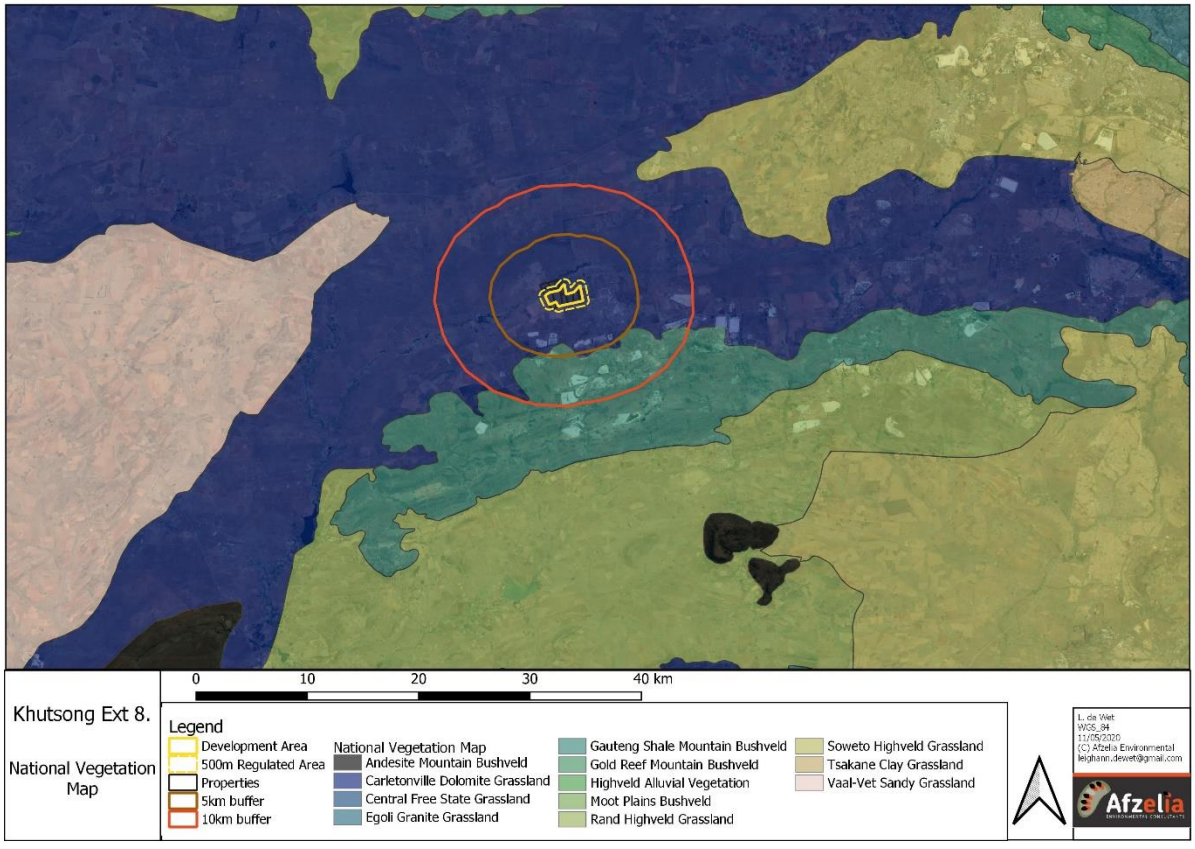

Figure 15: National vegetation map for the proposed study area.

9.7.2. Local Resolution Vegetation Characteristics

A desktop ecological impact assessment was undertaken by Afzelia (2020b) where the site was provisionally assessed as comprising primarily secondary grassland, with smaller areas of planted trees and gardens. Past agricultural activities were evident within the site boundary indicating likely disturbance of the natural habitat.

Note that it is recommended that a terrestrial ecologist be appointed to undertake a formal field assessment of the proposed development area during the EIA phase.

9.8. Protected Areas

9.8.1. National Protected Areas

Protected areas are defined by the Protected Areas Expansion Strategy as: areas of land or sea that are protected by law and managed mainly for biodiversity conservation" (Government of South Africa, 2010). Formal protected areas include those that are recognised in the National Environmental Management: Protected Areas Act (Act 57 of 2003). Several categories of Protected Area exist and include special nature reserves, national parks, nature reserves and protected environments.

The function of protected areas is to ensure ecological sustainability and adaptation to climate change (Government of South Africa, 2010). They ensure the continued provision of ecosystem services such as the provision of clean water, flood attenuation, erosion prevention, carbon sequestration and aesthetic and spiritual value.

Proximity to protected areas is important as close proximity may indicate that the area is important for biodiversity. The Abe Bailey provincial Nature Reserve is located immediately north of the development (See **Figure 16**, below).

9.8.2. National Protected Areas Expansion Strategy

South Africa has insufficient protected areas to ensure the conservation of different vegetation, marine and habitats and, accordingly, the National Protected Areas Expansion Strategy (NPAES) has been developed. Overall, targets were established for protected areas that indicate the extent of an ecosystem should be included in protected area which should help to focus protected area expansion on the least protected ecosystems (Government of South Africa, 2010).

The NPAES utilises biodiversity thresholds that are specific to ecosystems ensuring that the targets and areas earmarked for protected area expansion are based on verifiable scientific research (Government of South Africa, 2010). Two primary factors, importance and urgency, are used to determine which areas should be prioritised as protected areas. There are currently 42 focus areas for land-based protected area expansion. These areas are "large intact and unfragmented areas suitable for the creation or expansion of large protected areas" (Government of South Africa, 2010).

Protected areas are an important consideration for the proposed study area. If there are protected areas within 10km of the study site, or PAES focus areas within 10km of the study site, this indicates that the study area may be important from a biodiversity perspective. Proximity to protected areas and expansion areas are therefore important for assessing the overall biodiversity value of the site. NPAES Focus Areas, comprising Vaal Grasslands, are located within 10km north east of the proposed site (see **Figure 16**, below).

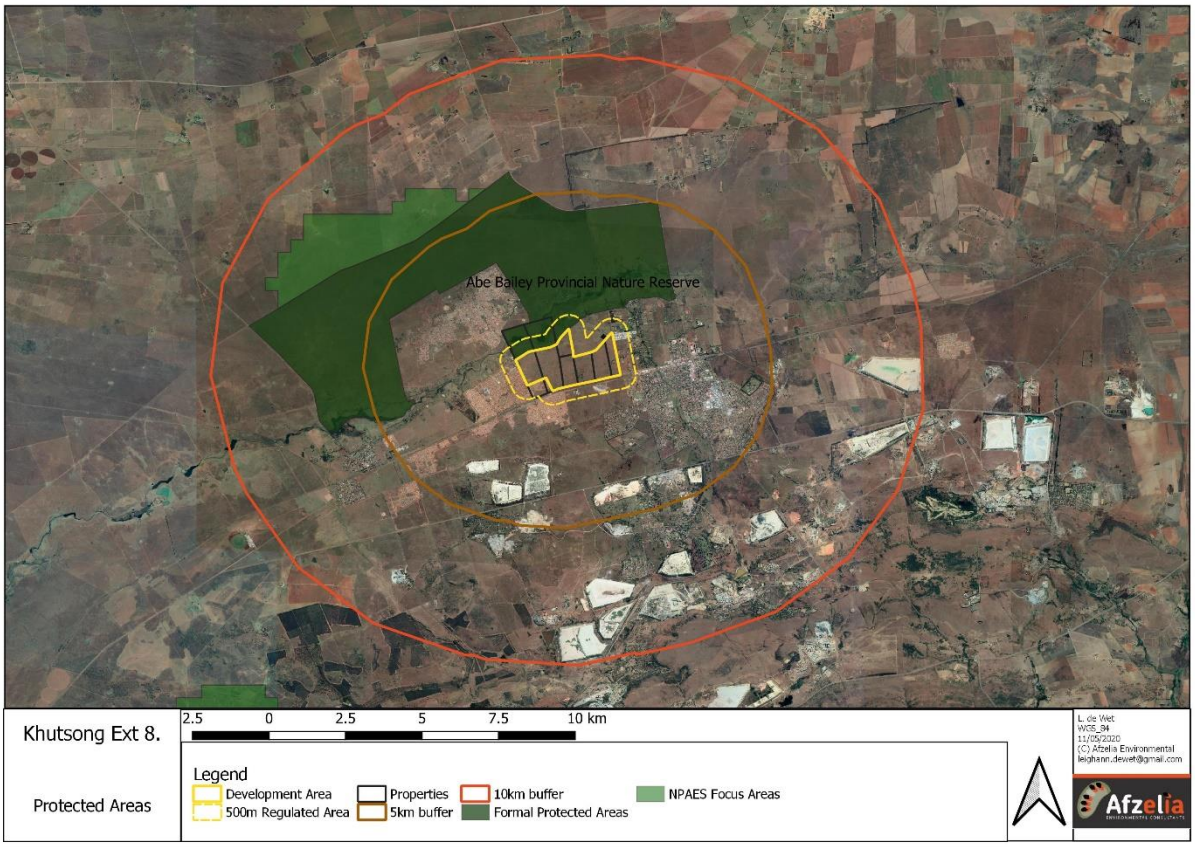

Figure 16: Protected Areas and NPAES focus areas within proximity to the proposed study area.

9.8.3. Important Bird and Biodiversity Areas Programme

The Important Bird and Biodiversity Areas (IBA) Programme is one of the key conservation programmes presently undertaken by BirdLife South Africa (BirdLife South Africa, 2019). The programme is concerned with four focal areas of bird conservation namely; species, sites, habitats and people (BirdLife South Africa, 2019).

There are no IBAs within 10kms of the proposed study site (see **Figure 17**, below).

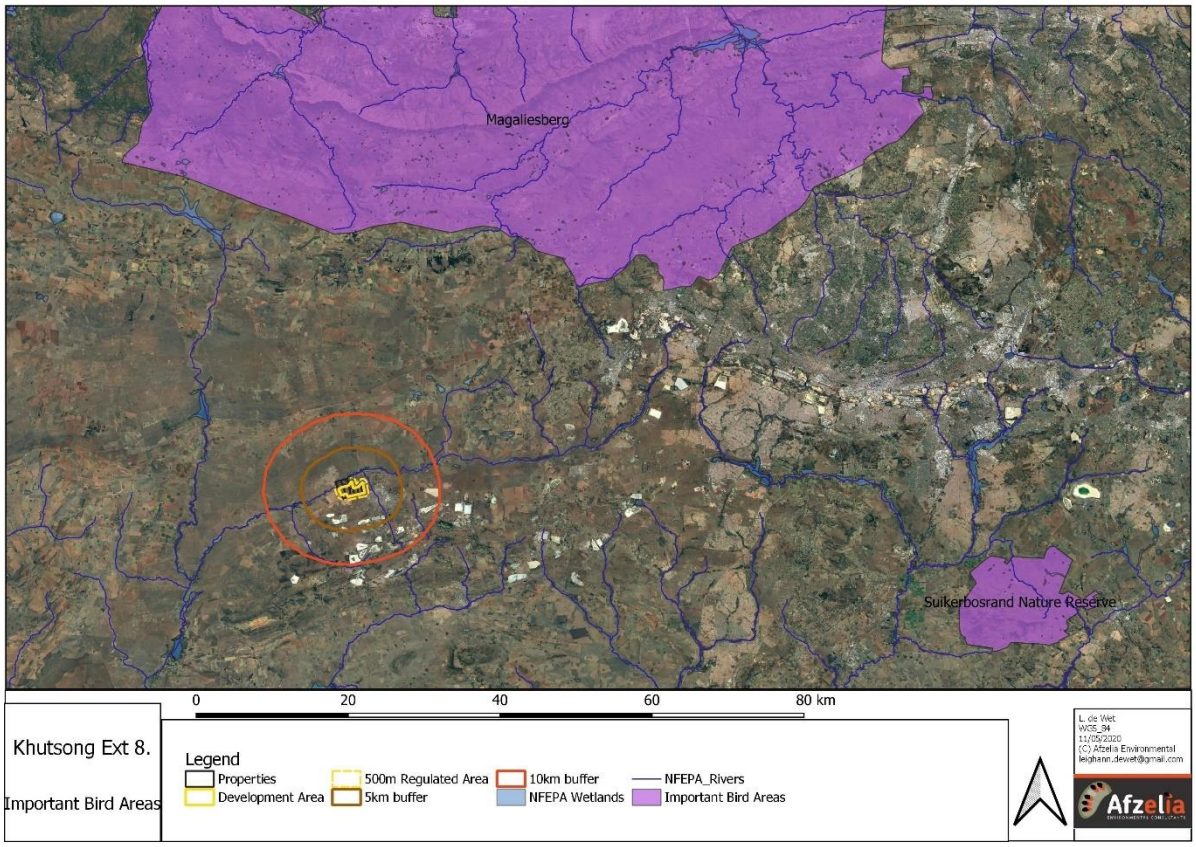

Figure 17: Important Bird and Biodiversity areas within proximity to the proposed study area.

9.9. Conservation Guidelines

9.9.1. Nationally Threatened Ecosystems

The list of Threatened Ecosystems has been gazetted (National Environmental Management: Biodiversity Act: National List of ecosystems that are threatened and in need of protection, (G 34809, GN 1002, 9th December 2011). The Threatened Ecosystems should be conserved as far as possible. The proposed development site does not fall within the extent of any Threatened Ecosystem types, but is surrounded by multiple Threatened Ecosystems, including:

- Eastern Temperate Freshwater Wetlands – Vulnerable
- Egoli Granite Grassland – Endangered
- Klipriver Highveld Grassland – Critically Endangered
- Rand Highveld Grassland – Vulnerable
- Roodepoort Reef Mountain Bushveld – Critically Endangered
- Soweto Highveld Grassland – Vulnerable
- Tsakane Clay Grassland – Endangered
- Vaal-Vet Sandy Grassland – Endangered
- Witwatersberg Skeerpoort Mountain Bushveld – Endangered

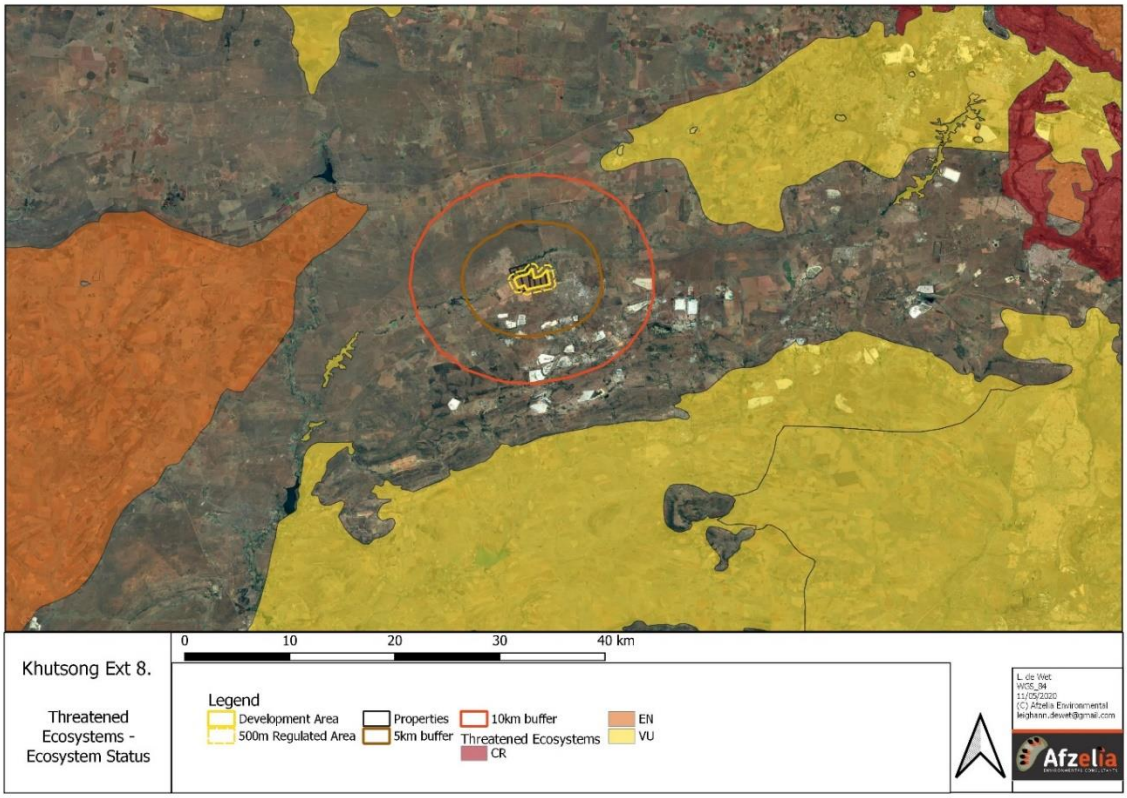

Figure 18: Threatened ecosystems (threat status) in relation to the proposed study area

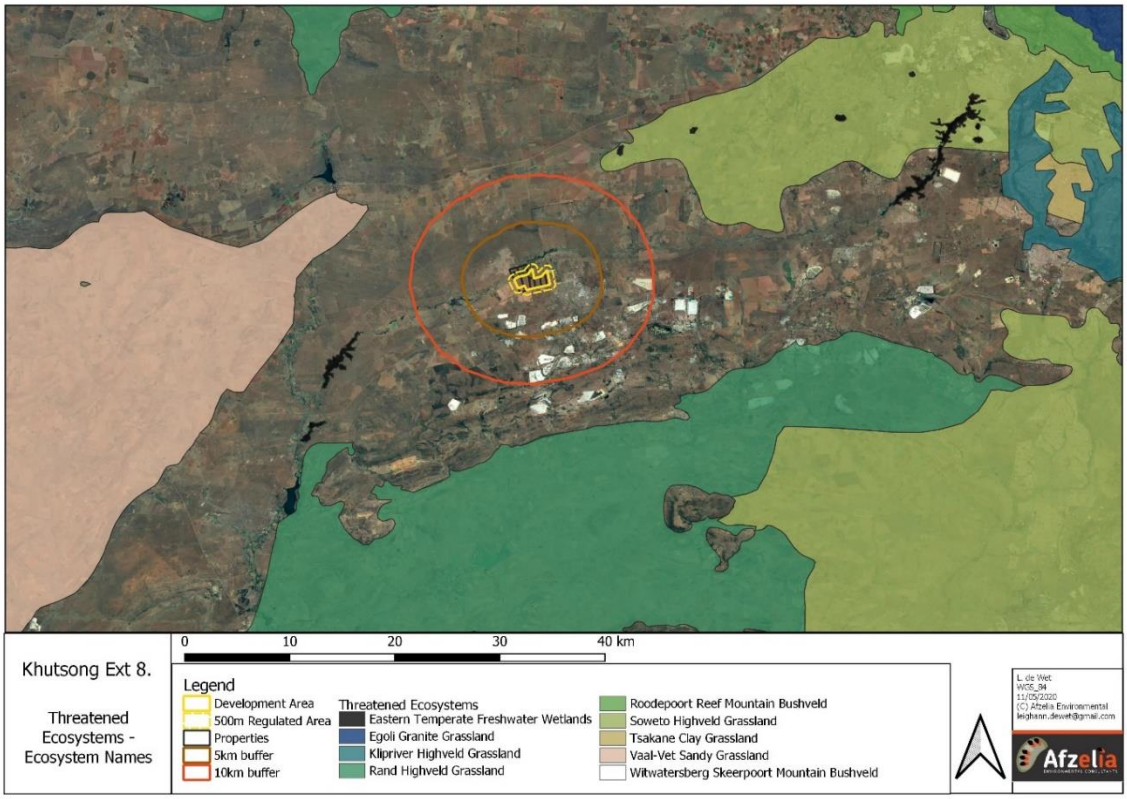

Figure 19: Threatened ecosystems (vegetation type) in relation to the proposed study area

9.9.2. The Gauteng Conservation Plan (Version 3.3)

The Gauteng Conservation Plan Version 3.3 (Gauteng C-Plan) was undertaken by Gauteng Nature Conservation, which is a branch of the Gauteng Department of Agriculture and Rural Development (GDARD). This version of the Gauteng C-Plan is an improved version from the Gauteng C-Plan Version 2.1. The Gauteng C-Plan includes provincially identified Critical Biodiversity Areas and Ecological Support Areas within Gauteng (GDARD, 2014).

Critical Biodiversity Areas (CBAs): CBAs were selected based on biodiversity characteristics, spatial configuration and requirement for meeting biodiversity pattern and process targets. These areas include irreplaceable sites where no other options exist for meeting conservation targets as well as sites that form the best option for meeting prescribed conservation targets. Some CBAs may be degraded but are still required to meet targets. Protected Areas within the province are included as CBAs (GDARD, 2014).

Ecological Support Areas (ESAs): ESAs include natural, near-natural degraded or even heavily modified areas that are required to be maintained in a functioning state to support CBAs and Protected Areas. These areas maintain ecological processes on which Protected Areas and CBAs depend (GDARD, 2014).

The proposed development site includes an Ecological Support Area (ESA) which appears to form a buffer area for the wetland on the northern boundary of the site (See **Figure 20**, below).

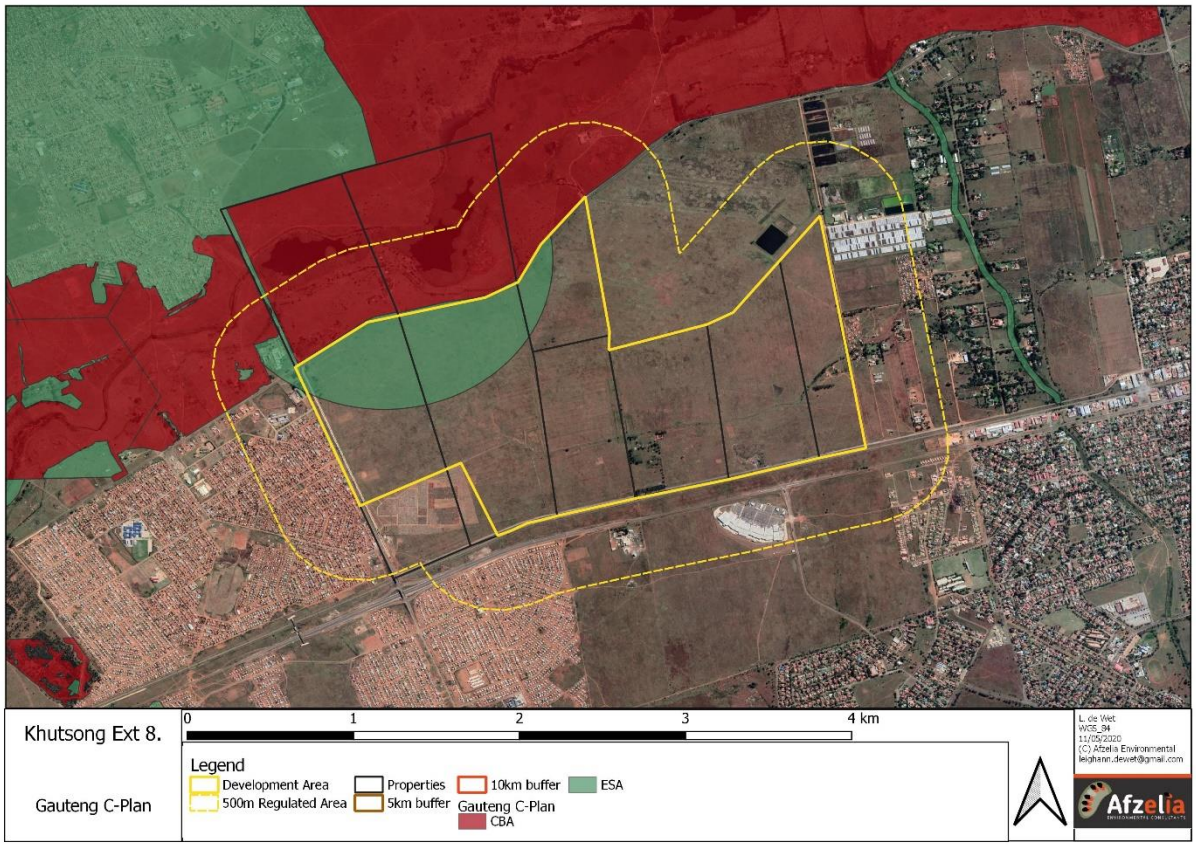

Figure 20: CBAs and ESAs in relation to the proposed study area

9.10. Socio-Economic Profile

The proposed development site is located within the Merafong City Local Municipality (MCLM) which forms part of the greater West Rand District Municipality (WRDM). The MCLM comprises 28 wards which incorporate the following key areas: Carletonville, Khutsong, Fochville, Kokosi, Greenspark, Welverdiend, Wedela, Blybank and

multiple Mining Towns (Merafong City, 2020). The MCLM covers an area of approximately 1631.7 km^2 (Merafong City, 2020)

9.10.1. Population

The 2011 census of the area determined that the total population of the MCLM is 197 520. 86.5% of the population are black African, 11.8% are white whilst the other population groups constitute the remaining 1.7%. The majority of the population listed IsiXhosa as their mother tongue, followed by Setswana and IsiZulu. Data from Khutsong, specifically, has found that the majority of inhabitants list Setswana as their first language (35%), followed by IsiXhosa (25%) (Adrian Firth, 2011).

The average household consists of 2.7 members with 74.9% of dwellings listed as formal, however, only 52.9% have piped water into their dwellings. Females head-up 29.4% of households within the MCLM. 29.9% of the population was listed as married.

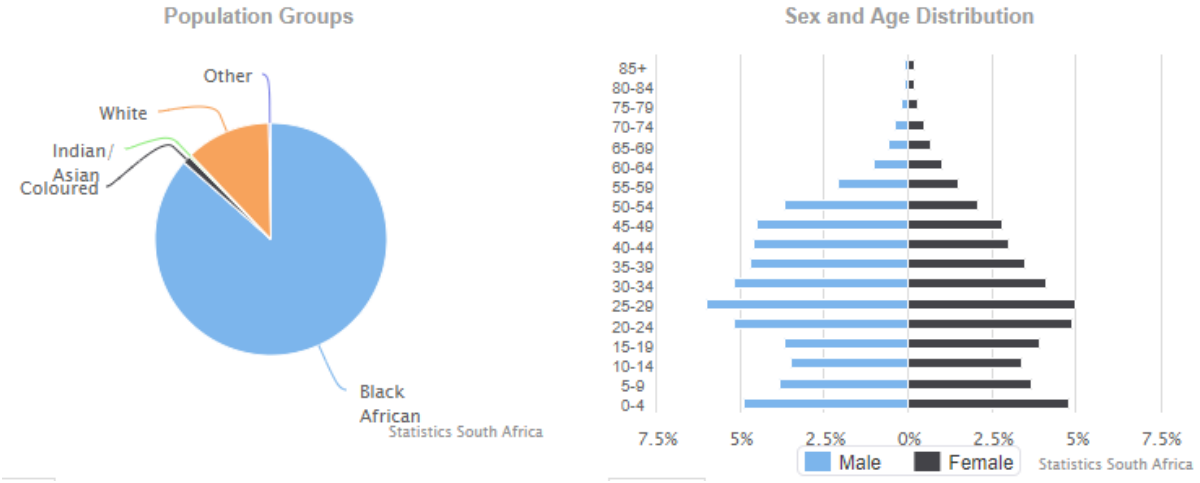

Figure 21: Population data for MCLM - population groups and sex and age distribution

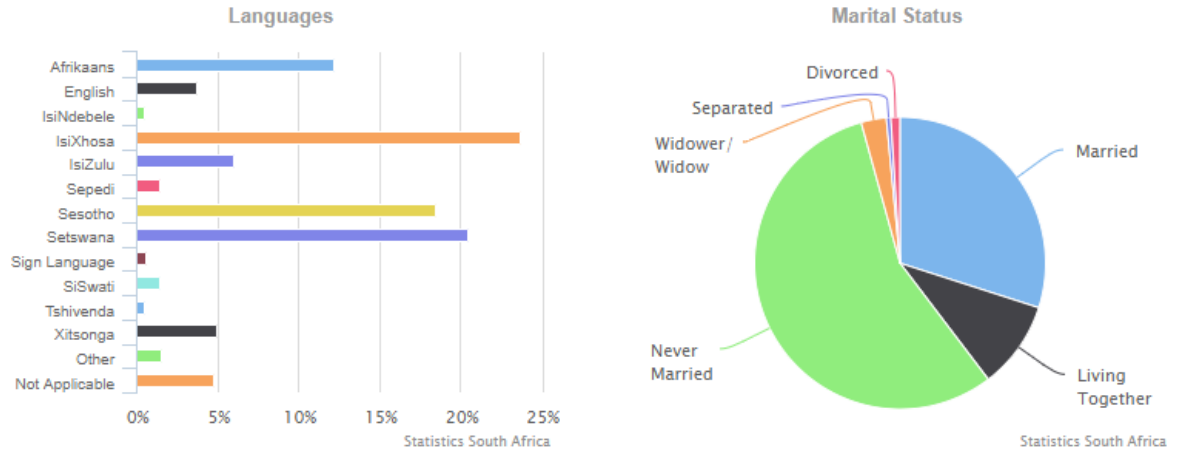

Figure 22: Population data for the MCLM - languages and marital status

9.10.2. Employment

According to Stats SA (2011), 72.5% of the population is within the working Age (15-64 Years) whilst the overall unemployment rate is 27.2%. The IDP for the MCLM for 2020/2021 has indicated that unemployment is currently fluctuating between 17%-20% which is lower than the national average (Merafong City, 2020). The primary

average annual income within the MCLM is between R38 201 – R76 400. Primary employment opportunities within the MCLM lie primarily in the mining sector, which employs 25.4% of the economically active workforce according to the MCLM IDP for 2020/2021 (Merafong City, 2020).

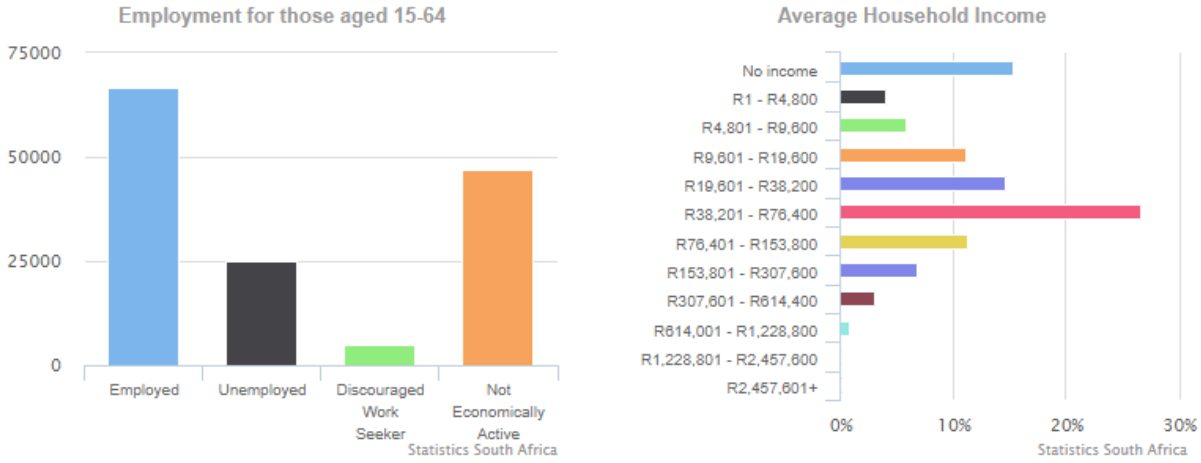

Figure 23: Employment data for the MCLM showing the status of employment between 15-64, as well as average annual household income

However, from the Social specialist's experience in this field, the key components of such a housing development include the detailed designing phase, procurement and then construction. Each of these components should create employment opportunities to the local population. The construction of rural infrastructure should also create a substantial amount of job opportunities, which should be future orientated in terms of maintenance work which will be required. In terms of skilled employees during the designing phases, jobs should be available for town planners, engineers, project managers and surveyors. For establishing the site, contractors will be required to establish the bulk infrastructure, such as roads, water, and sewage. Low-skilled workers will be required during the construction phase as many construction workers will need to be employed by the contractors (JAH Consulting, 2020).

9.10.3. Education

6.5% of the population aged over 20 years have never received any form of schooling, 26.3% have a matric qualification whilst only 7.1% inhabitants over the age of 20 have had some form of higher education. **Figure 22**, below, gives a visual representation of the highest education level achieved by the overall population within the MCLM.

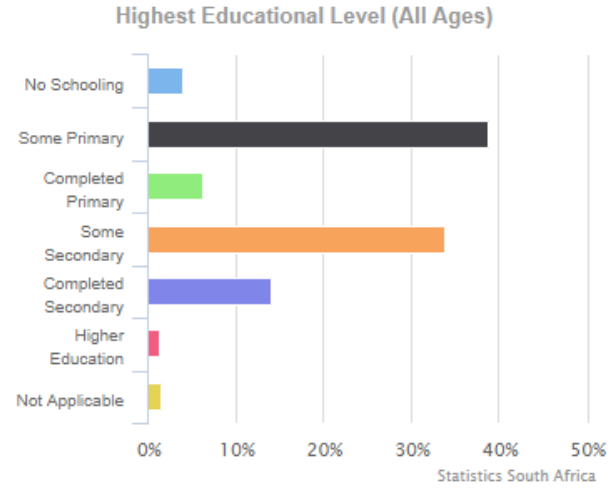

Figure 24: Highest education level achieved by population of MCLM

Please note that the above information and all further information provided within this section was obtained from Stats SA (2011), from information collected during the national census.

10. SUMMARY OF SPECIALIST STUDIES

The table below summarises the key findings and recommendations of the initial specialist studies for the site. Full reports have been attached in **Appendix D** of this report.

Table 10-1: Summary of specialist reports

LIST OF STUDIES UNDERTAKEN	FINDINGS	RECOMMENDATIONS	REFERENCE IN REPORT
Desktop Phase 1 Heritage Impact Assessment	• The general study area is not known to comprise any archaeological sites, cultural heritage resources or sites of historical significance. • The nearest site of know archaeological or palaeontological significance is the Sterkfontein Caves, located approximately 52km away from the site. • Rock engraving sites have been identified north-east of the nearby town of Carletonville. • The Apartheid-style spatial layout of settlements is evident in the area. These layouts are associated with the historic gold industry within the West Rand District Municipality.	• No site-specific recommendations were provided at this point. • Further infield assessment is required to provide comprehensive findings and necessary recommendations	**Section 12 and Appendix D1**
Pedology Scoping Assessment	• The geology of the area includes chert and dolomite of the Malmani Subgroup which supports shallow soil forms such as Glenrosa and Mispah of the Fa land type. Additional soil types that may be present in the region include deep red apedal soil types of the Ab land type. • The elevation of the project area ranges from 1471 metres above sea-level (masl) to 1507 masl. • The gradient of the project area ranges from 0-1.1%, indicating a gentle slope. • The loss of high value farmland and / or food security resulting from the implementation of the proposed development is the primary concern of the	• No site-specific recommendations were provided at this point. • Further infield assessment is required to provide comprehensive findings and necessary recommendations.	**Section 12 and Appendix D2**

LIST OF STUDIES UNDERTAKEN	FINDINGS	RECOMMENDATIONS	REFERENCE IN REPORT
	assessment. • "Moderate" significance ratings are expected for the operational phase with "Medium Low" significance ratings expected for the construction phase. The impact ratings are provisional and will be updated once baseline information is received.		
Desktop Palaeontological Impact Assessment	• The proposed development is underlain by Malmani Dolomite. • The general area within which the site is located, has been zoned as 'red' due to homonid fossils being uncovered within caves in the region. • Trace fossils of stromatolites (i.e. fossil reefs constructed by cyanobacteria) are common within Malmani Dolomite. • Stromatolite occurrences are of general paleontological importance, although individual stromatolites are not.	• As this site includes areas flagged red on the SAHRIS Palaeo-Sensitivity Map, a "Chance Find Protocol" is recommended. • In the case of any unusual finds, a Palaeontologist must be notified immediately by the ECO and/or EAP and a site visit must be arranged at the earliest possible time with the Palaeontologist. Contact The Cradle of Humankind (tel: 014 577 9000) for assistance. • In the case of the ECO or the Site Manager becoming aware of suspicious looking palaeo-material: o The construction must be halted in that specific area and the Palaeontologist must be given enough time to reach the site and remove the material before excavation continues. o Mitigation will involve the attempt to capture all rare fossils and systematic collection of all fossils discovered. This will take place in conjunction with descriptive, diagrammatic and photographic recording of exposures, also involving sediment samples and samples of both representative and unusual sedimentary or biogenic features. • Should caverns or caves be encountered development will be stopped in these areas. These sites can then be demarcated for future investigation.	**Section 12 and Appendix D3**
Initial Landscape and Visual Impact	• The landscape and visual impacts of the proposed development are likely to be limited to a distance of	• No specific recommendations were included within the report, however, the specialist makes specific reference to	**Section 12 and Appendix D5**

LIST OF STUDIES UNDERTAKEN	FINDINGS	RECOMMENDATIONS	REFERENCE IN REPORT
Assessment	approximately 6.2 km. • The topography of the study site comprises a shallow valley which runs in a general west to east direction. The site of the proposed development is located close to the bottom of the southern valley slope. • The affected landscape, within which the development site is located, can be divided into three 'Landscape Character Areas' (LCAs), namely: Urban areas, Natural grassland areas and the valley bottom. • Potential visual receptors that may be sensitive to landscape change include the following: o Area receptors – adjacent urban areas and the Abe Bailey Nature Reserve o Linear receptors – local roads including the R500, R501 and N14. o Point receptors – isolated homes in the vicinity of the Mooirivierloop Stream. • In terms of landscape sensitivity criteria to the visual impacts of the proposed development, people visiting the Abe Bailey Nature Reserve are likely to be highly sensitive to the proposed development. No LCAs are likely to be highly sensitive to the proposed development. The natural grassland areas, the valley bottom and the adjacent residential area are likely to be moderately sensitive to the proposed development. All other LCAs and visual receptors exhibit 'low' sensitivity to the proposed development.	the use of screen planting, tall street trees, gardens and general roadside vegetation, which will assist in reducing the overall visual impact of development	
Desktop Ecological Impact Assessment	• The terrestrial vegetation within the study site has been identified as Carletonville Dolomite Grassland which has been rated as a 'Least Concern' vegetation type.	• A site visit is recommended to ascertain the present state of the site as well as to determine the significance of impacts associated with proposed development activities. • No other recommendations were included at this point.	**Section 9, Section 12 and Appendix D6**

LIST OF STUDIES UNDERTAKEN	FINDINGS	RECOMMENDATIONS	REFERENCE IN REPORT

	• In terms of flora:
	  ○ 511 plant species are expected for the site. Poaceae, i.e. grass species, are dominant with 84 excepted species.
	  ○ 19 invasive and non-indigenous species are expected for the site.
	  ○ A total of 62 plant Species of Conservation Concern (SCC) are expected for the site including endemics, protected species and red listed species.
	• In terms of fauna:
	  ○ A total of 7 mammal SCC, 16 bird SCC and 7 reptile SCC are expected for the site which including endemics, protected species and red listed species.
	• The Abe Bailey Nature Reserve is located immediately to the north of the proposed development.
	• No Important Bird and Biodiversity Areas or focus areas National Protected Areas Expansion Strategy are located within 10km of the site.
	• The site includes a regionally identified Ecological Support Area (ESA).
	• A preliminary vegetation map of the site identified likely secondary grassland habitat with no naturally occurring trees in the area. Buildings and ancillary infrastructure were also identified onsite.
	• The ESA has been identified as an area of high sensitivity, the secondary grassland areas as moderate sensitivity whilst the buildings onsite comprise areas of low sensitivity		

LIST OF STUDIES UNDERTAKEN	FINDINGS	RECOMMENDATIONS	REFERENCE IN REPORT
Desktop Watercourse Assessment	• The site is located within a sub-catchment that has been identified as an Upstream Management Area in the National Freshwater Ecosystem Priority Areas (NFEPA) project. • No wetland FEPAs are located in proximity to the proposed development. • Desktop wetland delineation identified two wetlands located downslope of the proposed development site. Wetland unit UCVB1, an Unchannelled Valley Bottom Wetland, is located approximately 120m downslope of the site whilst CVB1, a Channelled Valley Bottom wetland, is located approximately 440m downslope of the site. • No watercourses were identified within the proposed construction footprint. • Artificial canals are prevalent within proximity to the site which are utilised by mines for dewatering. • Six species of fish are likely to be found within the sub-quaternary reach (SQR) are all of 'Least Concern' and of moderate to very low sensitivity to changes in physico-chemical or no-flow conditions • 38 macroinvertebrate taxa are likely to be found within the SQR. 3 of the anticipated taxa are sensitive to changes in physico-chemical conditions, whilst the remainder exhibit moderate to very low sensitivity to changes in physico-chemical or no-flow conditions. • The reference wetland vegetation for the area is Dry Highveld Grassland Group 5 which is Least Threatened	• A 15m wetland buffer has been provisionally recommended provided best-practice mitigation measures are adhered to by the client. As the development is further than 100m from the nearest watercourse, this should have negligible impact on development plans. • An environmental contingency plan must be compiled; and • A stormwater management plan must be compiled and implemented. • A full wetland habitat impact assessment must be undertaken during the EIA Phase of the project • An infield aquatic ecological assessment may also be necessary, however, this will be determined after an initial site visit. • Stringent mitigation measures will be recommended during the full wetland assessment, although provisional impact identification and mitigation measures have been included within Section 15 and 16 of this report.	**Section 9, Section 12 and Appendix D7**
Preliminary Geotechnical	• 280Ha of the site comprises preliminary and phase 1 detailed investigations completed by VGIconsult in	• The desktop study completed by Davies Lynn and Partners (2020), including a review of the report compiled	**Section 9, Section 12 and Appendix D8**

LIST OF STUDIES UNDERTAKEN	FINDINGS	RECOMMENDATIONS	REFERENCE IN REPORT
Assessment and Geotechnical Review	2008. 120Ha of the site has no geotechnical information. • In terms of the geological characteristics of the site, VGIconsult (2008) found that the property is located within the southern extent of the Hartebeestfontein anticline, which is overlain by the Black Reef Formation. • The Black Reef Formation is overlain by Malmani Subgroup Dolomite and Chuniespoort Group Chert of the Transvaal Supergroup. • In terms of geohydrological characteristics of the site, the property is located within the Boskop-Turffontein Dolomite Groundwater Compartment. • The original groundwater level (OWL) is noted as 1425m AMSL. The surface ground level falls from an elevation of approximately 1500m AMSL at the southern extent of the site to 1485m AMSL at the northern extent, therefore the OWL is between 60-75m below the surface. • Certain boreholes encountered dolomite bedrock between 1435m AMSL and 1472m AMSL. • No Groundwater was found during the Phase 1 investigation undertaken by VGIconsult (2008). • The site comprises two Dolomite Stability Zones, namely, Dolomite Stability Zone 1 and Zone 2. • Dolomite Stability Zone 1: Low inherent risk of all size sinkhole / doline formation. Located within a gravity low area and associated gravity gradient fields. No problematic conditions in this zone. • Dolomite Stability Zone 2: Low to medium inherent risk of all size sinkhole / doline formation. Located within an area of gravity high and gradient fields.	by VGIconsult (2008), indicates that the property is suitable for the housing development pending a detailed feasibility investigation by geotechnical dolomite professional.	

LIST OF STUDIES UNDERTAKEN	FINDINGS	RECOMMENDATIONS	REFERENCE IN REPORT
	Problematic conditions (e.g. sample loss, air loss or cultivation) were recorded at two boreholes at a depth of 48-53m. The problems were linked to 'soft zones' in dolomite residuum directly above dolomite. • Each structure to be built onsite will likely be subjected to specific subsurface conditions and geotechnical constraints given the anticipated variability of onsite sub-surface conditions.		
Khutsong Extension 10 (8) Floodlines Report	• The water level of 50 year and 100 year flood events were found to be largely similar. • The low-level road crossing located downslope of the proposed development site, 700m from the development footprint, would likely be submerged during both 50 and 100 year flood events. • The extent of the proposed development site is located outside of the identified 1:100 year floodline.	• No specific recommendations have been made with regards to the development area.	**Appendix D9**
Market Study & Occupant Survey	• The Merafong City Local Municipality (MCLM) contributes 1,6% to the provincial economy. • The MCLM contributes 25,6% to the district economy. • The tertiary sector (community services, general government, financial and business services, transportation and communication and wholesale and retail trade) is the largest contributor to the economic output of the local community. • The primary sector (mining, agriculture and construction) is the second largest and the secondary sector (construction, utilities and manufacturing) is the smallest contributor. • The average economic growth over the last 10 years within the MCLM is -0.3%.	• No specific recommendations have been made with regards to the development area.	**Appendix D10**

LIST OF STUDIES UNDERTAKEN	FINDINGS	RECOMMENDATIONS	REFERENCE IN REPORT
	• Over the last 10 years, wholesale and retail was the fastest growing sector of the local economy. • Average household expenditure was dominated by food beverages and tobacco (27,7%), followed by Rent (10,6%) and Transport and Communication (9,9%).		
Social Impact Assessment Screening	• Based on the literature review, four broad issues have been identified, namely health and safety, the stimulation of economic growth, the provision of housing and social infrastructure, and landscape alterations.	• The specialist feels inclined to support the development. However, factors which could potentially influence such a decision or, at the very least, contribute to proper mitigation measures, include the current usage of the identified land, and the cultural value and place attachment the surrounding communities have of the land.	**Appendix D4**

Please note that the relevant impacts and mitigation measures from these specialist studies have been included in the provisional Impact and Mitigation sections of this report.

SECTION E: IMPACT ASSESSMENT AND MITIGATION

11. POTENTIAL IMPACTS THAT MAY RESULT FROM PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL, DECOMMISIONING AND CLOSURE OF THE ACTIVITY

11.1. Impact Assessment Methodology

The impact assessment that is carried out for each environmental impact that may arise from the proposed project, forms the basis to determine which management measures that will be required to prevent or minimise these impacts. It is also a means in which the mitigation measures that are determine in the impact assessment which are then translated to action items. These actions items are required to prevent or to keep those impacts that cannot be prevented within acceptable levels.

In order to establish best management practices and prescribe mitigation measures, the following project-related information needs to be adequately understood:

- **Activities** that are associated with the proposed project;
- **Environmental aspects** that are associated with the project activities;
- **Environmental impacts** resulting from the environmental aspects; and
- The nature of the surrounding **receiving environment**.

Information provided by specialists was used to calculate an overall impact score by multiplying the product of the nature, magnitude and the significance of the impact by the sum of the extent, duration and probability based on the following equation. Impact severity qualified with spatial, temporal and probability:

Impact Significance = (NxMxMP) x (E+D+P)

Where: N = Nature;
E = Extent
M = Magnitude
D = Duration
P = Probability
MP = Mitigation Potential

Table 11-1: Impact Methodology Table

Nature			
Negative Impact	Neutral Impact	Positive Impact	
-1	0	+1	
Extent			
Local	Regional	National	International
1	2	3	4
Magnitude			
Low	Medium	High	
1	2	3	
Duration			
Short Term (0-2 years)	Medium Term (2-5years)	Long Term (5-10)	Permanent
1	2	3	3
Probability			
Rare/Remote	Unlikely	Moderate	Likely	Almost Certain
1-20%	20-40%	40-60%	60-90%	90% +
Mitigation Potential			
No Impact / None	No Impact After	Residual Impact After	Impact Cannot be

	Mitigation / Low	Mitigation / Medium	Mitigated / High
0	1	2	3

The following definitions apply:

For the methodology for the impact assessment, the analysis is conducted on a qualitative basis with regards to the **nature, extent, magnitude, duration, probability and mitigation potential** of the impacts.

The following scoring system applies:

Table 11-2: Scoring System

Nature / Status	• **Positive impact** on the environment. • **Negative impact** on the environment. • **Neutral impact** on the environment.
Extent	• **Local** – extends to the site and its immediate surroundings. • **Regional** – impact on the region but within the province. • **National** – impact on an interprovincial scale. • **International** – impact outside of South Africa.
Magnitude[1]	• **Low** – natural and social functions and processes are not affected or minimally affected. • **Medium** – the affected environment is notably altered, the natural and social functions and processed continue albeit in a modified way. • **High** – the natural or social function or processes could be substantially affected or altered to the extent that could temporarily or permanently cease.
Duration	• **Short term** – 0-2 years. • **Medium term** – 2 – 5 years. • **Long term** – 5-10 years • **Permanent** – mitigation is either by natural process or by human intervention, will not occur in such a way or in such a time span that the impact can be considered transient.
Probability	• **Almost certain** – 90% +. • **Likely** – 60-90% • **Moderate** – 40-60% • **Unlikely** – 20-40% • **Rare / Remote** – 1-20%
Mitigation Potential	Provides an overall impression of an impacts importance, and the degree to which the impact can be mitigated. The range for significance ratings are as follows: **0** – Impact will not affect the environment; therefore, no mitigation is necessary. **1** – No impact after mitigation. **2** – Residual impact after mitigation. **3** – Impact cannot be mitigated.

Impact Scores will be ranked in the following way as listed in the table below:

[1] The degree to which an impact may cause irreplaceable loss of resources.

Table 11-3: Ranking of overall impact score

Impact Rating	Low / Acceptable Impact	Medium	High	Very High
Significance	**0 to 30**	**31 to 60**	**61 to 90**	**91 o 117**

The below list of impacts has been assembled following extensive research, field observations, comments and concerns raised during discussions with I&APs, findings of specialist consultants and past project experience on similar projects.

Most impacts are negative, but if appropriate mitigation is undertaken then positive impacts may be possible. However, since there is no guarantee that appropriate mitigation measures will be implemented, or the mitigation measures applied will have the desired effect, the EAP must assume that the mitigation might not happen, and the base impact is negative.

11.2. Planning and Design Phase

Table 11-4: Potential impacts of planning and design phase of the project

IMPACT TYPE	CAUSE OF IMPACTS	POTENTIAL IMPACTS
1. Direct Negative Compliance Impacts	**a) Inadequate planning and design** • Failure to comply with existing policies and legal obligations could result in the project conflicting with local, provincial and national legislation, polices, by-laws, etc. • Not addressing compliance during the planning and design phase.	• Legal non-compliance, fines, overall project failure and delays in construction activity. • Negative physical environmental impacts during the construction and operational phases.
2. Direct Negative Erosion Impacts	**a) Inadequate planning and design** • Inappropriate storm water design during the planning and design phase. • Inappropriate design and layout of the housing development during the planning and design phase.	• Inappropriate storm water design may lead to an increase of surface soil erosion and subsequent sedimentation of adjacent areas, and nearby watercourses. • Off-site erosion caused by inappropriate placement of site camp, or planned disregard for recommended erosion controls.
3. Direct Negative Air Quality Impacts	**a) Inadequate planning and design** • Failure to compile a dust management plan for the project during the planning and design phase of the project. • Inappropriate positioning of topsoil, subsoil and overburden stockpiles close to sensitive receptors (residences, businesses, schools, access points and watercourses).	• Health problems for workers and surround community members; • Soiling of property/clothing; • Contamination of watercourses; • Visual impacts; and • Damage/Death of crops.
4. Direct Negative Water Quality Impacts	**a) Inadequate planning and design** • Inappropriate design and layout of the housing development with particular reference to the storage of hazardous substances near surface water drainage as well as the placement of sewer and wastewater infrastructure.	• Stormwater runoff containing petrochemicals, herbicides, litter, fines and other pollutants that leave the site could result in the contamination of soil, ground and surface water resources in the surrounding areas. • Similarly, the risk of malfunctioning sewer and wastewater infrastructure contaminating surface water resources would be higher and could cause immediate impacts to surface water resources, if implemented in the immediate vicinity of these sensitive areas.

IMPACT TYPE	CAUSE OF IMPACTS	POTENTIAL IMPACTS
5. Direct Negative Biodiversity Impacts	**a) Inadequate planning and design** • Failure to compile an alien vegetation management plan and rehabilitation plan during the planning and design phase.	• The establishment of alien vegetation onsite, and the eventual infestation of the surrounding area.
	b) Appointment of botanist • Not appointing an appropriately qualified, registered and experience botanist to survey the site for protected plants and trees prior to commencement of construction activities.	• Loss of protected plant species and other plants of conservation importance.
6. Direct Negative Heritage Impacts	**a) Inadequate planning and design** • Poor planning and consideration of identified heritage sites. • Failure to undertake social consultation process with community surrounding the proposed development site through a community liaison officer (CLA), to assist in the identification of potential unmarked graves.	• Damage and/or destruction of sites and artefacts of archaeological and/or cultural significance within the proposed development footprints and immediate surrounding areas. • Damage and/or destruction of unmarked graves within the proposed development footprint.
7. Indirect Negative Socio-Economic Impacts	**a) Inadequate planning and design** • Failure to identify material sources for construction from local suppliers, to appoint local sub-contractors to service the site (security guards, waste removal, electricians, etc.) and employ and train members of the local community to work on the sites.	• Failure to identify material sources from local suppliers, to identify local sub-contractors and identify local people for training and employment could lead to discontent of the traditional authority and surrounding communities.
8. Direct Positive Socio-Economic Impacts	**a) Appropriate planning and design** • Planning and agreeing to employment opportunities to benefit the local community and traditional authorities. • Planning and agreeing to the relocation of negatively affected residents to suitable and safe accommodation.	• Community upliftment and improved work opportunities for local people. • General improved access to the local economy by virtue of the proposed development being located closer to key transport routes than where residents of the Khutsong Hostel, Khutsong Extensions 1 and 6 as well as the Khutsong informal Area presently reside.

11.3. Construction Phase

Activities associated with this phase of the project are described below:

- Site Establishment:
    - Erection of temporary perimeter fence and installation of signage at the entrance and around the site.
    - Implementation of access and service roads to the proposed development site;
    - Erection of a site camp including: a security hut, parking areas, ablution facilities, generators, temporary offices, stormwater management infrastructure and loading areas.
    - Construction of temporary refuelling and oil storage areas (impervious and bunded areas).
    - Construction of waste storage areas which will hold excavated material, rubble, vegetation, hazardous waste and general waste.
    - Clearing of ruderal and pioneer vegetation.
    - Stripping and stockpiling of topsoil.
- Construction:
    - Construction of housing infrastructure
    - Construction of permanent road infrastructure
    - Construction of permanent stormwater infrastructure
    - Construction of permanent drinking water and wastewater/sewerage infrastructure
    - Construction of electrical infrastructure
- Handover:
    - Removal of site camp
    - Removal of temporary refuelling and oil storage areas
    - Removal of waste storage areas (certificates of satisfactory waste disposal required)
    - Rehabilitation of all disturbed areas (i.e. the site camp, refuelling and storage areas as well as waste storage areas).

Please see below table describing the potential impacts associated with this phase of the project:

Table 11-5: Potential impacts of the construction phase (including the site establishment and handover phase) of project

IMPACT TYPE	CAUSE OF IMPACTS	POTENTIAL IMPACT
1. Direct Negative Socio - Economic Impacts	**a) Dust** • Clearing of vegetation with plant; • Movement of vehicles and plant over dirt access roads and cleared areas; • Loading of topsoil, subsoil and overburden into load trucks; • Transporting and depositing topsoil in designated stockpile areas; • Failure to consider predominant wind direction on the sites, and orientating stockpiles to maximise wind sheltering; • Positioning stockpiles close to residences, businesses and crops; • Not managing the height and slope of stockpiles; • Not covering, dampening, stabilisation or screening stockpiles. • Not dampening newly cleared areas prior to construction.	• Dust fallout on leaf surfaces may affect the ability of plants to photosynthesise, leading to a loss in recruitment and possible impacts on crops and grazing in the area. • Ill health of local people from dust inhalation which could compromise their ability to work and earn an income, the ability to establish, maintain and harvest crops, and take care of their livestock, etc. Results in food shortages, strain on already limited financial resources due to visits to medical facilities, purchasing of medicine, etc. • Dust could irritate the eyes and mouth of humans, wild and domesticated fauna. • Dust generation could cause nuisance through soiling of property such as windows, cars and also of washed clothes that have been hung out to dry. • Possible loss of visual amenity through deposition of dust. • Dust could cause mechanical or electrical faults to equipment (microwaves, computers, etc.) and will increase wear and tear in onsite plant. • Dust blown onto surrounding veld, could make grass unpalatable to livestock, and force local herders to travel further afield to find suitable grazing.
	b) Local economic opportunities • Sourcing and purchase of materials/supplies for construction purposes i.e. bricks, cement, fence posts, fencing wire, razor wire etc, from outside the area. • Sourcing and securing services of sub-contractors – certified, registered waste removal contractor and security contractor, from outside	• Failure to source and purchase materials from local suppliers, to appoint local sub-contractors and employ and train local people could lead to discontent of the traditional authority and surrounding communities.

IMPACT TYPE	CAUSE OF IMPACTS	POTENTIAL IMPACT
	the area.	
	c) Safety and security • Increased presence of employment seekers around the sites. • Increased in human presence and activity on the sites. • Erection of necessary security lighting • Failure to take necessary and legally prescribed safety measures. (It is the responsibility of the Client's Safety Officer to detail requirements. This issue is therefore raised as a general requirement)	• Increased criminal activity in the surrounding area. • Increased risk of fire which poses a threat to local people and livestock. • Increase in light levels at night due to construction activities and necessary site security. Light pollution can cause a nuisance to neighbouring residences, and interfere with their normal daily activities. If severe enough, it can affect local people's health and wellbeing. • Possible accidental injury or Death from working plant or vehicles, particularly regarding children and livestock.
	d) Noise • Increased noise levels due to construction activities. • Shouting workers, radios and stereos that are turned up to a high-volume level could cause nuisance for local people. • Increased traffic and plant level in the area	• Excessive noise which may cause nuisance or hearing issues for local people. • Habitat disturbance potentially leading to the movement of fauna from the area due to noise related stress.
	e) General Waste • Increased waste generation, particularly material that has the potential to cause contamination of soil, ground and surface water resources. • Uncovered waste receptacles and skips • Not collecting waste at the end of each work day • Not having sufficient number of waste receptacles • Littering by workers and employment seekers	• Build-up of waste on the sites could attract vermin (rodents, flies etc.) which could potentially spread germs and parasites to domestic animals, livestock and humans. Water filled tyres, containers, tins and bottles are breeding grounds for mosquitos which are a nuisance to local people, but they can also spread disease such as malaria. • Workers and local people can get infected sores from cutting themselves on broken bottles, old tins or sharp-edged metal objects which are contaminated.

IMPACT TYPE	CAUSE OF IMPACTS	POTENTIAL IMPACT
	• Not regularly disposing of waste at registered land fill site leading to waste build-up.	• Build-up of waste onsite which can be blown or strewn around the site, nearby residential areas and open habitat. • Ingestion of waste material by livestock potentially leading to fatalities • Livestock can get tangled in waste, leading to physical injury and Death.
	f) Waste Related to Site Camp Removal • Inappropriate storage and disposal of rubble and other waste generated during demolition of the site camp (s) and infrastructure on the sites. • Inappropriate storage and disposal of hazardous waste material (contaminated rubble etc.) during the demolition of the site camp (s) and infrastructure on the sites.	• The impacts outlined in "1. Direct Negative Socio - Economic Impacts – Waste", remain relevant, as well as; • Abandoned structures and materials onsite left after the construction phase could encourage land invaders or general criminals.
	g) Increased traffic • Increased traffic and plant movement around the sites, and the surrounding area.	• Potential to Death or injury to people and livestock due to vehicle accidents.
	h) Water Quality • Surface and ground water contamination due to poor management and spillage of hazardous liquids; • Failure to dispose of chemical toilet waste on a regular basis and in an appropriate manner poses a health risk of spillage of chemicals and sewage which could result in the contamination of water resources.	• Domestic livestock and humans may drink contaminated water which could affect their health, and possibly result in Death.
	i) Visual impacts • Poor site management including lack of dust suppression;	• Excessive visual intrusion experienced by residents and businesses; • Light pollution and nuisance experienced by residents.

IMPACT TYPE	CAUSE OF IMPACTS	POTENTIAL IMPACT
	• Lack of adequate consideration of visual impacts associated site and camp site layout particularly associated with storage areas, stockpiles, etc. relative to adjacent settlement; • Poor lighting design resulting in flood lighting / directional lighting causing increased light in the vicinity of residential buildings.	
2. Cumulative Social Impacts	All listed socio - economic impacts have the potential to combine with each other to increase impact levels. Dust, erosion, safety and security, waste, traffic and water quality impacts in particular are likely to add to existing local impact levels that are resulting from roads, the use of pit latrines and poor waste management.	
3. Direct negative impacts on biodiversity	**a) Erosion and sedimentation** • The newly cleared site could be exposed to increased run-off and sheet erosion during rainfall events in the absence of binding vegetation cover.	• Wind erosion could potentially damage nearby vegetation through sandblasting of young seedlings or transplants, burial of plants or seed, and exposure of seed. • Bank erosion within the nearby watercourse due to increased concentration of flows. • Potential silt and soil that runs into watercourses (wetlands, streams, rivers, dams, etc.) due to lack of vegetation cover cause a decrease in water clarity thus prevents the growth of aquatic plants and algae as denied access to sunlight for photosynthesis, decreased numbers of invertebrate species from smothering of habitat by sediment. • Sediment released through erosion could result in smothering of adjacent vegetated areas leading to plant mortality.
	a) Contamination • Spillage and leakages of hazardous materials. • Inadequate training of workers to clean up spillages and leakages • Failure to handle, store and/or dispose of hazardous material appropriately.	• Health risk / loss of aquatic fauna and flora; • Health risk / loss of terrestrial fauna and flora.
	b) Noise	• Possible habitat disturbance due to increase in noise levels.

IMPACT TYPE	CAUSE OF IMPACTS	POTENTIAL IMPACT
	• Excessive noise from site personnel, job seekers, etc. • Increased traffic and plant causing an increase in noise levels.	• Habitat disturbance potentially leading to loss/migration of fauna.
	c) Destruction of habitat • Clearance of vegetation; • Incursions into wetland habitat by plant, vehicles and workforce. • Poor weed and alien vegetation management; • Poor rehabilitation	• Habitat disturbance / destruction potentially leading to loss / migration of indigenous and flora and fauna.
	d) Soil compaction • Soil compaction caused by vehicle and plant movement and parking on the site, establishment of the site camp (s), establishment of access roads, erection of perimeter fence, etc.	• Loss of rehabilitation potential resulting in long term reduction in habitat area and overall biodiversity. • Loss of rehabilitation potential due to increased run off. Without the organic matter and nutrients of the topsoil, plants struggle to grow. Without plant cover, the erosion will increase, depleting the nutrient bank even further and making plant re-establishment even more difficult.
	e) Waste management • Poor waste management	• Ingestion of waste material by fauna that potentially leads to severe health problems and death; • Fauna can get tangled in waste, leading to physical injury and death. • Fauna may drink contaminated water which could affect their health, and possibly result in death. • Waste washed into watercourse with runoff resulting in aquatic habitat destruction or damage. Waste debris smoothers the bed of the watercourse, or bottom dwelling organisms, and can prevent the growth of aquatic plants and algae by blocking sunlight for photosynthesis.
	f) Traffic • Increased traffic and plant movement around the	• Possible injury and fatalities to fauna.

IMPACT TYPE	CAUSE OF IMPACTS	POTENTIAL IMPACT
	sites, and the surrounding area.	
	g) Water abstraction • Illegal water abstraction from nearby watercourses.	• Possible habitat damage due to reduction in flow and erosion of banks. In itself this is likely to have a local effect however when added to other abstraction it could result in a broader cumulative impact.
4. Cumulative biodiversity Impacts	All listed biodiversity impacts have the potential to combine with each other to increase impact levels they are also likely to add to existing local impacts due to the adjacent settlement, roads, water abstraction/diversion and poor waste management.	
5. Direct negative impacts on geology	**a) Soil compaction** • Soil compaction caused by vehicle and plant movement and parking on the site, establishment of the site camp (s), establishment of access roads, erection of perimeter fence, etc.	• Change / loss of an important environmental and economic resource. Loss of pore space leading to reduction in water-holding capacity, aeration and a decrease in permeability. This is likely to cause waterlogging and surface runoff, which could lead to erosion which will get worse as the topsoil is lost. This is likely to have a local effect limited to site and adjacent areas disturbed by the works.
	b) Soil mixing • The excavation and replacement of surface soils could cause mixing with shallow soil horizons, resulting in a blending of soil characteristics and types.	• Loss of an important environmental and economic resource. This is likely to have a local effect limited the to the site.
	c) Soil erosion • Erosion due to removal of surface vegetation leading to silt-bearing run-off and sedimentation.	• Loss of an important environmental and economic resource. This is likely to have a local effect limited the to the site.
	d) Subsurface Stability • Variable onsite geological conditions indicates that the placement of infrastructure in certain areas of the site may be associated with inherent medium risk of sinkhole formation.	• Sinkhole formation on the construction site, which may cause a risk to construction personnel and future residents.

IMPACT TYPE	CAUSE OF IMPACTS	POTENTIAL IMPACT
6. Cumulative impacts on geology	All listed impacts on geology have the potential to combine with each other to increase impact levels. They also have the potential to add to existing local impacts.	
7. Direct negative impacts on surface water system	**a) Erosion** • The newly cleared site could be exposed to increased run-off and sheet erosion during rainfall events in the absence of binding vegetation cover.	• Change the flow and depth characteristics of watercourse over time due to excessive sediment input. This could have a regional effect. • Increased runoff which could increase the flow in water courses possibly leading to flooding. This could have a regional effect.
	b) Contamination • Accidental spills and leaks during storage, transport or use of petrochemicals, herbicides, paints, lubricants etc; • Failure to dispose of chemical toilet waste appropriately; • Workers utilising nearby veld as toilet facilities; • Workers not provided with the proper training to adequately contain, report, and clean up chemical spills and leaks; • Failure to appropriately dispose of contaminated material including used oils, contaminated soil, packaging, etc. • Failure to keep plant, vehicles and other equipment in good working order to prevent oil, hydraulic fluid and fuel leakage. • Washing of plant and vehicles onsite particularly in close proximity to water courses poses a threat to the environment in terms of contamination; • Servicing plant and vehicles onsite outside of impermeable bunded areas;	• Contamination of nearby rivers and wetlands. This could have a regional effect. Subject to severity and rainfall, it is likely that contamination will be most severe near the site and will be diluted with distance.

IMPACT TYPE	CAUSE OF IMPACTS	POTENTIAL IMPACT
	• Failure to dispose of chemical toilet waste on a regular basis and in an appropriate manner; • Mixing of waste amongst stockpiled soil, leaching of toxic chemicals from containers, tins, bottles, etc. • Accidental spills and leaks during storage, transport or use of chemicals (petrochemicals, herbicides, lubricants, etc.) resulting in contamination of soil; • Using waste oil and chemicals for dust suppression purposes.	
	c) Illegal abstraction • Illegal water abstraction from nearby watercourses.	• Reduction in flow in surface water systems in itself this is likely to have a local effect. When combined with other illegal abstraction events it could however have a cumulative regional effect.
8.Cumulative impacts on surface water	All listed impacts on surface water have the potential to combine with each other to increase impact levels. They also have the potential to add to existing local impacts.	
9. Direct negative impacts on ground water	**a) Contamination** • Accidental spills and leaks during storage, transport or use of petrochemicals, herbicides, paints, lubricants etc; • Failure to dispose of chemical toilet waste appropriately; • Workers utilising nearby veld as toilet facilities; • Workers not provided with the proper training to adequately contain, report, and clean up chemical spills and leaks; • Failure to appropriately dispose of contaminated material including used oils, contaminated soil, packaging, etc.	• Contamination of groundwater. This could have an impact of regional importance. Subject to severity of contamination and rainfall, it is possible that contamination could seep into the soil which could reduce surface water contamination and increase ground water contamination in the vicinity of the site.

IMPACT TYPE	CAUSE OF IMPACTS	POTENTIAL IMPACT
	• Failure to keep plant, vehicles and other equipment in good working order to prevent oil, hydraulic fluid and fuel leakage. • Washing of plant and vehicles onsite particularly in close proximity to water courses poses a threat to the environment in terms of contamination; • Servicing plant and vehicles onsite outside of impermeable bunded areas; • Failure to dispose of chemical toilet waste on a regular basis and in an appropriate manner; • Mixing of waste amongst stockpiled soil, leaching of toxic chemicals from containers, tins, bottles, etc. • Accidental spills and leaks during storage, transport or use of chemicals (petrochemicals, herbicides, lubricants, etc.) resulting in contamination of soil; • Using waste oil and chemicals for dust suppression purposes.	
	a) Illegal abstraction • Illegal water abstraction from nearby watercourses.	• Reduction in ground water recharge. In itself this is likely to have a local effect. When combined with other illegal abstraction events it could however have a cumulative regional impact.
10. Cumulative impacts on ground water	All listed ground water impacts have the potential to combine with each other to increase impact levels They also have the potential to add to existing local impacts.	
11. Direct negative heritage impacts	**a) Disturbance / destruction of heritage sites** • Clearing the sites and establishment of site camp (s) consisting of site offices, change rooms, eating areas, storage areas, laydowns, water tanks, access roads, etc.	• During site establishment and construction, sites of archaeological and cultural significance could be damaged or destroyed by workers, vehicles and plant. • Workers and people attracted to the area seeking employment, could damage or remove heritage artefacts found on the sites,

IMPACT TYPE	CAUSE OF IMPACTS	POTENTIAL IMPACT
	• Increased in human presence and vehicle/plant movement on the site.	or surrounding areas, if they are not secured.
12. Cumulative heritage impacts	All listed heritage impacts have the potential to combine with each other to increase impact levels. They also have the potential to add to existing local impacts, if present.	
13. Direct negative paleontological impacts	**a) Disturbance / destruction of paleontological sites** • Operational activities like drilling, blasting, excavating material with TLBs/excavators and presence of workers on the site will have an impact on sites and fossils of paleontological significance.	• Excavation of material by TLBs and excavators could damage or destroy paleontological resources. • Workers and people attracted to the area seeking employment, could destroy, damage or remove paleontological resources found on the sites, or surrounding areas if they are not secured.
14. Cumulative paleontological impacts	Listed paleontological impacts have the potential to combine with each other to increase impact levels. They also have the potential to add to existing local impacts, if present.	

11.4. Operation Phase

- Municipal Service delivery related, including:
  - Maintenance of road infrastructure
  - Maintenance of stormwater infrastructure
  - Maintenance of drinking water and wastewater/sewerage infrastructure
  - Maintenance of electrical infrastructure
- Waste Collection

Please see below table describing the potential impacts associated with this phase of the project:

Table 11-6: Potential impacts of operational phase of the project

IMPACT TYPE	CAUSE OF IMPACTS	POTENTIAL IMPACT
1. Direct Positive Socio-Economic Impacts	**a) Improved Housing Situation** • Residents of the Khutsong Hostel, Khutsong Extensions 1 and 6 as well as the Khutsong informal Area will be relocated to the new site.	• Improved safety for residents in terms of aversion of sinkhole risks which could lead to significant building damage or even fatalities. • Improved connectivity to important transport routes and important economic nodes which will likely play a significant role in improving work opportunities for residents, • The security of having a stable home will generally improve the quality of life for residents.
2. Cumulative Social Impacts	The cumulative social impacts for the site will be positive for the area provided the project is implemented effectively at all stages.	
3. Direct negative impacts on biodiversity	**a) Erosion and sedimentation** • Increased hardened surfaces due to construction of housing and roads whilst removing natural vegetation cover. • Failure to maintain and implement adequate storm water control measures (e.g. sustainable urban drainage systems) onsite.	• Bank erosion within the nearby watercourse due to increased concentration of flows. • Potential silt and soil that runs, unregulated, into watercourses (wetlands, streams, rivers, dams, etc.) may cause a decrease in water clarity thus prevents the growth of aquatic plants and algae as denied access to sunlight for photosynthesis as well as decreased numbers of invertebrate species from smothering of habitat by sediment. • Sediment released through erosion could result in smothering of

IMPACT TYPE	CAUSE OF IMPACTS	POTENTIAL IMPACT
		adjacent vegetated areas leading to plant mortality.
	b) Contamination • Malfunction of waste water and/or sewer infrastructure	• Health risk / loss of aquatic life; • Health risk / loss of terrestrial fauna and flora.
	c) Waste management • Poor waste management practices within the development.	• Ingestion of waste material by fauna that potentially leads to severe health problems and death; • Fauna can get tangled in waste, leading to physical injury and death. • Fauna may drink contaminated water which could affect their health, and possibly result in death. • Waste washed into watercourse with runoff resulting in aquatic habitat destruction or damage is caused when debris smoothers the bed of the watercourse, or bottom dwelling organisms, waste within watercourse can prevents the growth of aquatic plants and algae by blocking sunlight for photosynthesis.
	d) Traffic • Movement of general vehicles during day-to-day activities.	• Possible injury and fatalities to fauna.
	e) Water abstraction • Illegal water abstraction from nearby watercourses.	• Possible habitat damage due to reduction in flow and erosion of banks. In itself this is likely to have a local effect however when added to other abstraction it could result in a broader cumulative impact.
4. Cumulative biodiversity Impacts	All listed biodiversity impacts have the potential to combine with each other to increase impact levels they are also likely to add to existing local impacts due to the adjacent settlement, roads, water abstraction/diversion and poor waste management.	
5. Direct negative impacts on surface water system	**a) Erosion** • Increased hardened surfaces due to construction of housing and roads whilst	• Change the flow and depth of watercourses over time, excessive sediment can infill watercourses causing alterations in flow regime. This could have a regional effect.

IMPACT TYPE	CAUSE OF IMPACTS	POTENTIAL IMPACT
	removing natural vegetation cover. • Failure to maintain and implement adequate storm water control measures (e.g. sustainable urban drainage systems) onsite.	• Increased runoff which could increase the flow in water courses possibly leading to flooding. This could have a regional effect.
	b) Contamination • Malfunction of waste water and/or sewer infrastructure.	• Contamination of nearby rivers and wetlands. This could have a regional effect. Subject to severity and rainfall, it is likely that contamination will be most severe near the site and will be diluted with distance.
	c) Illegal abstraction • Illegal water abstraction from nearby watercourses.	• Reduction in flow in surface water systems in itself this is likely to have a local effect. When combined with other illegal abstraction events it could however have a cumulative regional effect.
6.Cumulative impacts on surface water	All listed impacts on surface water have the potential to combine with each other to increase impact levels. They also have the potential to add to existing local impacts.	
7. Direct negative impacts on ground water	**a) Contamination** • Malfunction of waste water and/or sewer infrastructure.	• Contamination of groundwater. This could have an impact of regional importance. Subject to severity of contamination and rainfall, it is possible that contamination could seep into the soil which could reduce surface water contamination and increase ground water contamination in the vicinity of the site.
	b) Illegal abstraction • Illegal water abstraction from nearby watercourses.	• Reduction in ground water recharge. In itself this is likely to have a local effect. When combined with other illegal abstraction events it could however have a cumulative regional impact.
8. Cumulative impacts on ground water	All listed ground water impacts have the potential to combine with each other to increase impact levels They also have the potential to add to existing local impacts.	

11.5. Decommissioning and Closure Phase

- Highly unlikely that proposed development will be decommissioned, however, the following would likely be undertaken:
  - Removal of housing and ancillary infrastructure
  - Removal of roads, stormwater, drinking water, wastewater/sewerage and electrical infrastructure
  - Recycling or disposal of remaining material once all structures have been disassembled.
  - Re-instatement of natural topography and indigenous vegetation within disturbed areas.
- Post rehabilitation monitoring of previously disturbed areas.

Please note: Impacts that occur during the decommissioning and closure phase of the project, are similar in nature to the impacts that would occur during the construction phase, but at a reduced magnitude.

Please see below table describing the impacts associated with this phase of the project:

Table 11-7: Potential impacts of decommissioning and closure phase (including rehabilitation and reinstatement)

IMPACT TYPE	CAUSE OF IMPACTS	POTENTIAL IMPACT
1. Direct Negative Socio - Economic Impacts	**a) Removal of residents** • The removal of residents from their places of residence after they have already been moved from the Khutsong Hostel, Khutsong Extensions 1 and 6 as well as the Khutsong informal Area.	• Social unrest which could lead to increased criminal activity in the area
	b) Dust • Demolishing the houses, roads, piping and fencing. • Movement of vehicles and plant over dirt access roads and cleared areas is likely to generate dust which could create nuisance or health risks for local people, flora and fauna. • Loading of topsoil, subsoil, quarried material and overburden into load trucks will generate dust which could create nuisance or health	• The impacts outlined in the relevant subsection under the "Construction Phase", remain relevant

IMPACT TYPE	CAUSE OF IMPACTS	POTENTIAL IMPACT
	risks for local people, flora and fauna. • Transporting and depositing construction rubble and overburden will generate dust.	
	c) Local economic opportunities • Residents contributing to the local area workforce leaving the area.	• Loss of jobs in the area as residents move away.
	d) Safety and security • The decommissioned sites could serve as a refuge for vagrants/criminals if no security measures are in place to discourage would-be intruders, which could lead to increased levels of crime in the surrounding areas. • Removing the fences before rehabilitation is complete.	• Increased criminal activity in the surrounding area. • Possible accidental injury or death from working plant or vehicles, particularly regarding children and livestock. • Destruction of vegetation within areas that are under rehabilitation due to incursions by people or vehicles.
	e) Noise • Demolishing the houses, roads, piping and fencing. • Loading and transporting rubble, overburden, topsoil and subsoil into load trucks and associated noise. • Continued worker presence and activity on the sites, and associated noise. • Continued presence of employment seeks around the sites, and associated noise. • Continued traffic of plant and vehicles on the sites, and in the surrounding area, and associated noise.	• The impacts outlined in the relevant subsection under the "Construction Phase", remain relevant

IMPACT TYPE	CAUSE OF IMPACTS	POTENTIAL IMPACT
	f) Waste • Inappropriate storage and disposal of rubble and other waste generated during demolition of the houses, roads, piping and fencing.	• The impacts outlined in the relevant subsection under the "Construction Phase", remain relevant
	g) Waste Related to Site Camp • Inappropriate storage and disposal of rubble and other waste generated during demolition of the site camp (s) and infrastructure on the sites. • Inappropriate storage and disposal of hazardous waste material (contaminated rubble etc.) during the demolition of the site camp (s) and infrastructure on the sites.	• The impacts outlined in the relevant subsection under the "Construction Phase", remain relevant
	h) Traffic • Increased traffic and plant movement around the sites, and the surrounding area.	• Potential to death or injury to people and livestock due to vehicle accidents
	h) Water Quality • The causes outlined in the relevant subsection, under the "Construction Phase", remain relevant.	• The impacts outlined in the relevant subsection under the "Construction Phase", remain relevant
	i) Visual impacts • Poor site management including lack of dust suppression; • Movement of plant and vehicles onsite, and in the surrounding area. • Stockpiling rubble generated during demolition of the houses, roads, piping and	• The impacts outlined in the relevant subsection under the "Construction Phase", remain relevant

IMPACT TYPE	CAUSE OF IMPACTS	POTENTIAL IMPACT
	fencing. • Poor lighting design resulting in flood lighting / directional lighting causing increased light in the vicinity of residential buildings.	
2. Cumulative Social Impacts	All listed socio - economic impacts have the potential to combine with each other to increase impact levels. Removal of residents, dust, erosion, safety and security, waste, traffic and water quality impacts are likely to add to existing local impact levels that are resulting from existing housing, roads, the use of pit latrines and poor waste management**.**	
3. Direct negative impacts on biodiversity	**a) Erosion** • The causes outlined in the relevant subsection, under the "Construction Phase", remain relevant	• The impacts outlined in the relevant subsection under the "Construction Phase", remain relevant
	b) Contamination • The causes outlined in the relevant subsection, under the "Construction Phase", remain relevant.	• The impacts outlined in the relevant subsection under the "Construction Phase", remain relevant
	c) Noise • Demolishing the houses, roads, piping and fencing. • Loading and transporting rubble, overburden, topsoil and subsoil into load trucks and associated noise. • Continued worker presence and activity on the sites, and associated noise. • Continued presence of employment seeks around the sites, and associated noise. • Continued traffic of plant and vehicles on the sites, and in the surrounding area, and associated noise.	• The impacts outlined in the relevant subsection under the "Construction Phase", remain relevant
	d) Soil compaction • Soil compaction caused by vehicle and plant	• The impacts outlined in the relevant subsection under the "Construction Phase", remain relevant

IMPACT TYPE	CAUSE OF IMPACTS	POTENTIAL IMPACT
	movement and parking on the sites and demolishing the houses, roads, piping and fencing.	
	e) Waste Management • Inappropriate storage and disposal of rubble and other waste generated during demolition of the houses, roads, piping and fencing.	• The impacts outlined in the relevant subsection under the "Construction Phase", remain relevant
	f) Traffic • The causes outlined in the relevant subsection, under the "Construction Phase", remain relevant	• The impacts outlined in the relevant subsection under the "Construction Phase", remain relevant
	g) Water abstraction • The causes outlined in the relevant subsection, under the "Construction Phase", remain relevant	• The impacts outlined in the relevant subsection under the "Construction Phase", remain relevant
4. Direct positive impacts on biodiversity	**a) Rehabilitation of previously disturbed areas**	• Reinstatement of natural vegetation cover within the area which will enhance erosion control, restore visual amenity as well as revive faunal and floral diversity.
5. Cumulative biodiversity Impacts	All listed biodiversity impacts have the potential to combine with each other to increase impact levels they are also likely to add to existing local impacts due to the adjacent settlement, roads, water abstraction/diversion and poor waste management.	
6. Direct negative impacts on geology	**a) Soil compaction** • Soil compaction caused by vehicle and plant movement and parking on the site.	• The impacts outlined in the relevant subsection under the "Construction Phase", remain relevant
	b) Soil mixing • The causes outlined in the relevant subsection, under the "Construction Phase",	• The impacts outlined in the relevant subsection under the "Construction Phase", remain relevant

IMPACT TYPE	CAUSE OF IMPACTS	POTENTIAL IMPACT
	remain relevant	
	c) Soil erosion • The causes outlined in the relevant subsection, under the "Construction Phase", remain relevant.	• The impacts outlined in the relevant subsection under the "Construction Phase", remain relevant
7. Cumulative impacts on geology	All listed impacts on geology have the potential to combine with each other to increase impact levels. They also have the potential to add to existing local impacts, present.	
8. Direct negative impacts on surface water system	**a) Erosion** • The causes outlined in the relevant subsection, under "Construction and Operational Phases", remain relevant	• The causes outlined in the relevant subsections, under "Construction and Operational Phases", remain relevant.
	b) Contamination • The causes outlined in the relevant subsection, under "Construction and Operational Phases", remain relevant	• The causes outlined in the relevant subsection, under "Construction and Operational Phases", remain relevant.
	c) Illegal abstraction • The causes outlined in the relevant subsection, under "Construction and Operational Phases", remain relevant	• The causes outlined in the relevant subsection, under "Construction and Operational Phases", remain relevant.
9.Cumulative impacts on surface water	All listed impacts on surface water have the potential to combine with each other to increase impact levels. They also have the potential to add to existing local impacts.	
10. Direct negative impacts on ground water	**a) Contamination** • The causes outlined in the relevant subsection, under "Construction and Operational Phases", remain relevant	• The causes outlined in the relevant subsection, under "Construction and Operational Phases", remain relevant.
	b) Illegal abstraction • The causes outlined in the relevant	• The causes outlined in the relevant subsection, under "Construction and Operational Phases", remain relevant.

IMPACT TYPE	CAUSE OF IMPACTS	POTENTIAL IMPACT
	subsection, under "Construction and Operational Phases", remain relevant	
11. Cumulative impacts on ground water	All listed ground water impacts have the potential to combine with each other to increase impact levels They also have the potential to add to existing local impacts.	

12. POTENTIAL MITIGATION MEASURES

The purpose of mitigation measures is to avoid, reduce or minimize unwanted impacts and enhance beneficial impacts of the proposed housing development. The following section outlines measures to mitigate environmental risks associated with the housing development, including:

- Mitigation measures for specific issues identified during the site inspection;
- Mitigation measures to address concerns raised by I&APs during the public consultation process;
- General environmental mitigation measures for all phases of the development;
- Past project experience of the professional team.

12.1. Planning and Design Phase

The below mitigation measures have been recommended to manage the impacts associated with the planning and design phase.

Table 12-1: Mitigation measures applicable to planning and design phase of the project

IMPACT TYPE	CAUSE OF IMPACTS	MITIGATION MEASURES
1. Direct Negative Compliance Impacts	Inadequate Planning and Design	• In all instances, the Proponent (Pro), Consulting Engineers (CE), the Contractor (C) and sub-contractors (SC) must be compliant with relevant local, provincial and national legislation, polices, by-laws, etc. The supreme law of the land is "The Constitution of the Republic of South Africa" which states: "Every person shall have the right to an environment which is not detrimental to his or her health or wellbeing". Laws applicable to protection of the environment in terms of environmental management and sustainable development include, but are not restricted to, those directives captured in this documentation. • A copy of the Environmental Authorisation, site specific Environmental Management Programme (EMPr) and other supporting documentation must be kept in the environmental file onsite from the commencement of site establishment. • The environmental file and the documents contained within it, must be made available to any authorised department official, employees or agents who undertakes work on the sites. • The representatives of the Pro, CE, the C and SC must set aside time for familiarisation with the directives and recommendations contained within the Environmental Authorisation, site specific EMPr and other supporting documentation prior to the commencement of construction activities. • The location of all service infrastructures, including sewage, electrical and water infrastructure needs to be identified and proved before construction activities commence on the sites so as to

IMPACT TYPE	CAUSE OF IMPACTS	MITIGATION MEASURES
		reduce the risk of damage to this infrastructure which may result in the temporary disruption of services to surrounding communities. • The Independent Environmental Control Officer (IECO) shall give the Department of Environment, Forestry and Fisheries (DEFF) at least fourteen (14) days (or as specified in the conditions of the Environmental Authorisation) written notice prior to the commencement of site establishment. A general notification letter shall also be sent to all Interested and Affected Parties (I&APs) listed on the project database.
2. Direct Negative Erosion Impacts	Inadequate Planning and Design	• During the planning and design phase appropriate storm water structures must be designed and implemented. • The storm water management plan must be applied and enforced during planning. • Areas that are potentially at risk from erosion or from the pooling of water must be identified prior to site establishment and appropriate measures incorporated into the storm water management plan.
3. Direct Negative Air Quality Impacts	Inadequate Planning and Design	• Compile a dust management plan to avoid significant dust emissions or, if dust emissions occur, mitigate any adverse effects.
4. Direct Negative Water Quality Impacts	Inadequate Planning and Design	• The housing development must be designed by appropriately qualified, professional registered and experienced engineers and town planners. • During the planning and design phase, stockpile areas must be positioned as far as practical away from sensitive receptors (i.e. residents, businesses, school, crops, watercourses, etc.). • Stockpiles must be located at least 5m away from any stormwater flow paths or planned drainage runs. • The site camp (s) must not be constructed within 32 m of watercourses. • Service agreements with appropriate waste disposal companies need to be entered before construction commences including a hazardous waste disposal company.
5. Direct Negative Biodiversity Impacts	Inadequate Planning and Design	• An invasive alien control programme must be compiled and implemented to prevent the introduction and spread of these species as per the legislative requirements specified under the Conservation of Agricultural Resources Act, 1983 amended in 2001 and the National Environmental Management: Biodiversity Act 2004 (Act No, 10 of 2004). • A detailed vegetation survey must be undertaken by an appropriately qualified and experienced botanist. Necessary plant pruning, destruction and relocation permits must be obtained from relevant authorities (GDARD, etc.) and plants relocated as necessary prior to any construction commencing. The botanist shall prepare detailed requirements for the pruning and translocation of plants as necessary.

IMPACT TYPE	CAUSE OF IMPACTS	MITIGATION MEASURES
		• The C must provide workers, equipment and plant to assist in the translocation of the plants as necessary. • The botanist that undertook the detailed vegetation survey must be present onsite for the duration of the necessary plant translocation process to advise the contractor. • The necessary plant translocation process must be undertaken in accordance with all permit requirements and advice. • The care of translocated conservation-important plant species must be undertaken according with the botanist's translocation specification. • No vegetation may be cleared without prior written approval from the Engineer who shall be advised by the IECO.
6. Direct Negative Heritage Impacts	Inadequate Planning and Design	• During the planning and design phase the location of identified heritage sites must be considered in the design of the site camps and layout of infrastructure. • Identified heritage sites must secured by means of the erection of fence. Appropriate warning signage must be erected along the fence line to notified workers and local people not to enter fenced off areas. • An archaeologist (heritage assessment practitioner) must provide workers with a basic awareness training regarding potential heritage and cultural sites within the area prior to site establishment. A Setswana translator may be required during this training.
7. Indirect Negative Socio-Economic Impacts	Inadequate Planning and Design	• Socio-economic impacts will be largely positive to the area. Mitigation to enhance the positive impacts linked to the socio-economic situation of the area includes the following; o Local job-seekers must be identified and preferred for employment and upskilling o Local products, services and business should be utilised as far as practicably possible for various requirements onsite.

12.2. Construction Phase

The below mitigation measures have been recommended to manage the impacts associated with construction activities.

Table 12-2: Mitigation measures applicable to this phase of the project

IMPACT TYPE	CAUSE OF IMPACTS	MITIGATION MEASURES
1. Direct and Cumulative Negative Socio – Economic Impacts	**Dust**	• Workers must be trained in dust management controls. • Monitoring of site conditions (weather/soil conditions) to anticipate and prevent dust effects • Limit operations which have the potential to cause high dust during high wind events. • A water tanker must be present onsite at all times for dust suppression. • Set speed limits to 30km/h within the development footprint and 40km/h on gravel haul roads to minimise the creation of fugitive dust. • Increase dust suppression as necessary on windy and dry days as necessary, or when fugitive dust is dispersed from the sites.
	Erosion	• Drainage measures must promote the dissipation of storm water run-off whilst allowing for surface and subsurface movement of water along drainage lines, so as not to impede natural surface and subsurface flows. • The Contractor must protect all areas onsite that are potentially susceptible to erosion through the installation of temporary and permanent drainage works (earthen berms, cut-off drains, silt fences, etc.) as promptly as possible during site establishment. • All erosion gullies and channels that develop on the site must be backfilled and compacted, so that the affected areas are restored to an acceptable condition, immediately on discovery. • Plant, vehicle and employee movement through/over stabilised areas must be restricted and controlled by the Contractor and/or Environmental Safety Officer (ESO). • The Contractor must implement measures (storm water cut-off drains, earth berms, straw bales, geofabric siltation barriers, etc.) to prevent the movement of material (fines) from the cleared area within the development footprint, into the surrounding areas and nearby watercourses. If these measures cannot be implemented, or fail to achieve the desired outcome, appropriate measures, as agreed with the CE, must be taken to limit the volume of water entering the proposed development footprint, and to improve the water quality before it leaves the site. • Permeable surfaces should be used, where possible, throughout the development in order to assist with rainwater infiltration which will reduce the intensity of and volume of stormwater runoff • Soft or 'green' engineering practices should be employed, where viable, to allow for reduced run-off

IMPACT TYPE	CAUSE OF IMPACTS	MITIGATION MEASURES
		from the hardened surfaces associated with development. Recommended soft engineering practices include the reshaping and revegetation (i.e. landscaping) of disturbed areas as well as the construction of vegetation swales and infiltration trenches as opposed to concrete v-drains. •
	Local Economic Opportunities	• As mentioned in "7. Indirect Negative Socio-Economic Impacts – Inadequate Planning and Design" above.
	Safety and Security	• Security guards must be stationed onsite at all times during construction, conduct daily patrols of the perimeter fence and man the access control points (i.e. vehicle and pedestrian gates). • Appropriate warning signage in English and Setswana must be erected on the fence around the development site. • If the fence is found to be damaged, or a weakness in the fence is discovered, it must be addressed immediately. • Security lighting must be strategically positioned throughout the development area to provide good night-time visibility for security guards. • The C must nominate a Safety Officer who has been sufficiently trained to deal with medical emergencies (such as abrasions, falls, sprained ankles, snake and insect bites). The Safety Officer should have access to a first aid kit, which should be kept on site during all periods that work is occurring on site.
	Noise	• Choosing a suitable time — schedule noisy activities to less sensitive times of the day. There are sensitive times of the day for different people, for example, schools during the day, times of religious services, and residences during evenings and night. Where several noisy pieces of equipment are used, their operation should be scheduled to minimize impacts. • Sound amplification shall only be used in emergency situations. • Work activity scheduling is an administrative means to control noise exposure. Planning how noise sources are sited and organized on the sites can reduce noise nuisance. • Stationary noise sources such as the concrete batching plant, generators and compressors shall be positioned as far as possible from noise sensitive receivers (neighbouring residences, businesses, schools, etc.) or, alternatively, noise screening must be provided • The concrete batching plant can be housed to provide sound insulation. It is important that sound-reduction equipment is also fitted to machinery and maintained properly.
	General Waste	• The Contractor is responsible for the internal collection of refuse and its transport to a landfill site facility during the construction and handover phase. The facility must be registered in terms of

IMPACT TYPE	CAUSE OF IMPACTS	MITIGATION MEASURES
		section 20(b) of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008). • Littering on site is forbidden and the site shall be cleared of litter at the end of each working day. • Waste receptacles must be positioned within all working areas and must be emptied daily. • All waste receptacles (bins, barrels, containers etc.) must be securely covered, and lined with a plastic refuse bag. • Separate labelled waste receptacles for different waste types is compulsory. These waste receptacles, which must be clearly labelled, must comprise domestic waste, plastic, paper, rubble and hazardous waste. • Mixing of non-hazardous and hazardous waste is prohibited. • Proof of waste disposal must be maintained onsite.
	Waste Related to Site Camp Removal	• Structures (site office, change rooms, storage areas, bunded areas) that make up the site camp (s) must be demolished and/or removed from the sites, unless proof can be provided that their presence on the sites is essential for the rehabilitation process or an authorised future use. • The site camp fence, barriers, signage and demarcations must be removed from the sites, sites unless stipulated otherwise by the Consulting Engineer and/or IECO. • The fuel tanks and all associated infrastructure must be removed from the site within 6 months after the cessation of use. Once removed, the area around the tanks must be rehabilitated to the satisfaction of the Proponent and ESO. • All non-contaminated rubble generated during the demolition of the site camps (s) must be collected and disposed of at the nearest registered landfill site. • Left over, undamaged building material such as concrete, bricks and timber should be donated to the local community or reused on other sites. • All non-contaminated waste material must be collected and disposed of at a registered landfill site by a certified, registered waste contractor. • The burying of non-contaminated and contaminated rubble is prohibited. • All solid waste must be collected, stored and appropriately disposed of at the nearest registered landfill site.
	Increased Traffic	• Entry/ exit points onto public roads should take cognisance of traffic safety. The movement of heavy vehicles (excavators, bulldozers, trucks, etc.) should be clearly sign-posted in both directions along the road, and the use of flagmen should be considered where relevant, e.g. for access onto highly trafficked roads or where visibility is impaired. • Drivers must be licensed by law and should be carefully briefed on the appropriate driving practices

IMPACT TYPE	CAUSE OF IMPACTS	MITIGATION MEASURES
		by the ESO. • Transported materials should be appropriately secured on the trucks and vehicles to ensure safe passage between destinations.
	Water Quality	• No washing or servicing of vehicles or equipment should take place in close proximity to a watercourse. Washing of vehicles and equipment should take place at least 50m away from the edge of nearby watercourses. • The Contractor must implement measures (waste water sumps, storm water cut-off drains, earthen berms, etc.) to prevent contaminated water polluting soil, ground and surface water resources. If these measures cannot be implemented, or fail to achieve the desired outcome, appropriate measures, as agreed with the CE, must be taken to limit the volume of water entering the development footprint, and to improve the water quality before it leaves the site. • Plant, vehicles and equipment must be routinely inspected for fuel and oil leakages to minimise the potential for spills. This machinery should also be stored on an impervious bunded area, where possible. • All empty and damaged cement bags must be collected and stored inside a large covered waste receptacle or skip at the end of each working day, to prevent wind-blown cement dust, bags being scattered around the sites and water contamination. Cement bags must be collected and disposed of at a hazardous landfill site.
	Visual impacts	• All construction areas shall be kept neat and tidy at all times. Different materials and equipment shall be kept in designated areas and storing / stockpiling shall be kept orderly. • Temporary chemical toilets, water storage tanks, waste receptacles, skips, storage areas and other facilities must be positioned on the sites in such a manner they have minimal visual impact on neighbouring residences and businesses. • Lighting must help provide maximum security by enabling policing of the sites, without creating a visual nuisance to neighbouring residences and businesses.
2. Direct Positive Socio-Economic Impacts	n/a	n/a
3. Direct and Cumulative Negative Impacts on Biodiversity	**Erosion**	As mentioned in "1. Direct and Cumulative Negative Socio-Economic Impacts – Erosion" above.
	Contamination	• Areas used to store hazardous substances must be suitably signed, fenced and access controlled; residents living adjacent to the construction site must be notified of the existence of the hazardous storage area. • Chemical or hazardous materials storage facilities must be on an impermeable bunded surface that

IMPACT TYPE	CAUSE OF IMPACTS	MITIGATION MEASURES
		is protected from the ingress of storm water from surrounding areas to ensure that accidental spillages do not pollute soil, ground and surface water resources. The cleaning and disposal of spilled material within the bunded area shall be recorded and a safe disposal certificate provided to the IECO. • Hazardous substance containers to be clearly labelled. The labelled side must not be obscured. Damaged labels must be replaced immediately on discovery. • Material Safety Data Sheets (MSDSs) must be readily available on site for all chemicals and hazardous substances to be used on site, this includes diesel. MSDSs must include information on ecological impacts and measures to minimise negative environmental impacts during accidental spills. • Any potentially hazardous containers must be punctured or disabled prior to disposal. All containers from hazardous materials shall be disposed of at a suitably licensed hazardous waste site. • Dispose of old oil, grease, diesel and petrol in the specified containers provided and marked accordingly. Always ensure that the lid of the container used for disposal is closed /tightened. Old oil/grease must be recycled by a suitably licensed and experienced waste contractor.
	Noise	As mentioned in "1. Direct and Cumulative Negative Socio-economic Impacts – Noise" above.
	Destruction of habitat	• The Contractor and/or ESO must inform all employees of the need to be vigilant against any practice that will have a harmful effect on vegetation on areas outside of the proposed development area. This information must form part of the Environmental Education Programme to be actioned by the ESO. • The clearing of indigenous vegetation must be restricted to the development footprint. • Disturbed areas that are earmarked for rehabilitation must be rehabilitated immediately after the completion of construction activities. • All sensitive areas adjacent to the proposed development site, including all potential habitats for threatened species, must be clearly demarcated and no construction activities are permitted to occur across these demarcations. Similarly, no workers, vehicles or plant must be permitted to enter these areas for any reason. • A buffer width of at least 15m must be applied from the edge of the nearest wetland habitat. No incursions are permitted within this buffer.
	Soil compaction	• Access to sites must be planned roads only. They must not be created on an ad-hoc basis. • All access routes must be clearly defined with white stakes/painted rocks and disturbance outside these areas is prohibited.

IMPACT TYPE	CAUSE OF IMPACTS	MITIGATION MEASURES
		• Turning points will be marked out on the sites for easy identification by drivers and workers. No turning manoeuvres other than at designated places shall be permitted. Turning manoeuvres taking place within the development area must be accommodated on access/haulage roads and disturbed areas. • These roads should be maintained in a satisfactory condition for the duration of the construction activities onsite. Drainage areas and low points, specifically, should be regularly monitored and appropriate maintenance undertaken in order to minimise erosion. • Stockpiled topsoil must not be compacted and should be replaced as the final soil layer. • No plant, vehicle, equipment or machinery is permitted to access topsoil stockpile areas.
	Waste Management	As mentioned in "1. Direct and Cumulative Negative Socio-Economic Impacts – General Waste" above.
	Increased Traffic	As mentioned in "1. Direct and Cumulative Negative Socio-Economic Impacts – Increased Traffic" above.
	Water Abstraction	• The Contractor and/or ESO must determine whether a Water Use Licence or a General Authorisation is required for the abstraction of water used during the construction process before the commencement of such abstraction, if necessary. • In all cases, abstraction of water for construction purposes requires a Water Use Licence or a General Authorisation from the Department of Water and Sanitation, unless pre-existing rights are purchased by nearby landowners. • Conditions listed in the Water Use License or General Authorisation must be compiled with at all times, and proof of such compliance must be filed in the environmental file onsite. • Records of water abstraction must be kept in the environmental file. In addition, records of water use for dust suppression must also be kept in the file. • If possible, the water tanker should be parked on an existing hardened surface, such as a road crossing, during the abstraction of water, if required. • Water must not be abstracted from small or sensitive watercourses as these would be most susceptible to critical impacts from abstraction and general habitat disturbance. • The Contractor must monitor the level of water at an abstraction point. If the level of water should decrease, abstraction must cease until the level has recovered.
4. Direct and Cumulative Negative Impacts on Geology	**Soil Compaction**	As mentioned in "3. Direct and Cumulative Negative Impacts on Biodiversity – Soil compaction" above.
	Soil Mixing	• Subsoil stockpiles must be maintained in the same manner as topsoil stockpiles i.e. monitored for

IMPACT TYPE	CAUSE OF IMPACTS	MITIGATION MEASURES
		alien plants, dust, wind and water erosion, etc. • All rock and subsoil overburden must be removed and stockpile separately from the topsoil, if necessary.
	Soil Erosion	As mentioned in "1. Direct and Cumulative Negative Socio-Economic Impacts – Erosion" above.
	Subsurface Stability	• Each structure to be built onsite will likely be subjected to specific subsurface conditions and geotechnical constraints given the anticipated variability of onsite sub-surface conditions.
5. Direct and Cumulative Negative Impacts on Surface Water Systems	**Erosion**	As mentioned in "1. Direct and Cumulative Negative Socio-Economic Impacts – Erosion" above.
	Contamination	As mentioned in "3. Direct and Cumulative Negative Impacts on Biodiversity – Contamination" above.
	Illegal Abstraction	As mentioned in "3. Direct and Cumulative Negative Impacts on Biodiversity – Water abstraction" above.
6. Direct and Cumulative Negative Impacts on Groundwater	**Contamination**	As mentioned in "3. Direct and Cumulative Negative Impacts on Biodiversity – Contamination" above.
	Illegal Abstraction	As mentioned in "3. Direct and Cumulative Negative Impacts on Biodiversity – Water abstraction" above.
7. Direct and Cumulative Negative Heritage Impacts	**Disturbance / Destruction of Heritage Sites**	• Implement a Chance Finds Procedure to ensure that if any heritage resources are uncovered that these are reported and correctly mitigated. • The Contractor and/or ESO must prepare a method statement detailing the protocols for dealing with heritage and cultural resources which must include appointment of the archaeologist, permit application, sampling and collection etc. to the CE and Independent Environmental Control Officer (IECO) for consideration. • A suitably experienced archaeologist must undertake induction and training of the IECO and site management personal in the identification and monitoring/recovery protocols for heritage and cultural resources (including marked and unmarked burial grounds and graves) during the site establishment and construction phase, as appropriate. • If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, marine shell and charcoal/ash concentrations), unmarked human burials or other categories of heritage resources are discovered during the construction and operational phases of the project, Provincial Heritage Resources Authority Gauteng (PHRAG), IECO and CE must be notified immediately, and an accredited professional archaeologist must be contacted as soon as possible to inspect the findings. • If the discovered heritage resources are found to be of archaeological significance, a Phase 2 rescue operation will be necessary.

IMPACT TYPE	CAUSE OF IMPACTS	MITIGATION MEASURES
		• If an artefact is uncovered on the site, all work within a 50m radius of the discovery must stop immediately.

8. Direct and Cumulative Paleontological Impacts	**Disturbance / Destruction of Paleontological Sites**	• All South African fossil heritage is protected by law (South African Heritage Resources Act, 1999), and fossils cannot be collected, damaged or distributed without a permit issued by SAHRA or the Provincial Heritage Resources Authority Gauteng (PHRAG).
		• As this site includes areas flagged red on the SAHRIS Palaeo-Sensitivity Map, a "Chance Find Protocol" is recommended.
		• In the case of any unusual finds, a Palaeontologist must be notified immediately by the ECO and/or EAP and a site visit must be arranged at the earliest possible time with the Palaeontologist. Contact The Cradle of Humankind (tel: 014 577 9000) for assistance.
		• In the case of the ECO or the Site Manager becoming aware of suspicious looking palaeo-material:
		  ○ The construction must be halted in that specific area and the Palaeontologist must be given enough time to reach the site and remove the material before excavation continues.
		  ○ Mitigation will involve the attempt to capture all rare fossils and systematic collection of all fossils discovered. This will take place in conjunction with descriptive, diagrammatic and photographic recording of exposures, also involving sediment samples and samples of both representative and unusual sedimentary or biogenic features.
		• Should caverns or caves be encountered development will be stopped in these areas. These sites can then be demarcated for future investigation.
		• The Contractor and/or ESO must establish a 30-metre buffer around the fossil find, and prevent plant, vehicles or workers accessing the area i.e. erection of danger tape, temporary signage etc.
		• The palaeontologist concerned with any potential mitigation work will need a valid fossil collection permit from SAHRA, and any material collected will have to be curated in an approved depository (e.g. museum or university collection).
		• All paleontological specialist work must confirm to international best practise for paleontological field work and the study (e.g. data recording fossil collection and curation, final report) must be adhered to as far as possible to the minimum standards for Phase 2 paleontological studies developed by HWC (2016) and SAHRA (2013).

12.3. Operation Phase

The below mitigation measures have been recommended to manage the impacts associated with the operational phase of the project:

Table 12-3: Mitigation measures applicable to this phase of the project

IMPACT TYPE	CAUSE OF IMPACTS	MITIGATION MEASURES
1. Direct Positive Socio-Economic Impacts	n/a	n/a
2. Direct and cumulative Negative Impacts on Biodiversity	**Erosion**	• The mitigation measures outlined in the relevant subsection under "Construction Phase ", remain relevant, as well as; • Integrating Sustainable Drainage Systems (SuDS) into the Stormwater Management Plan and final construction of the housing development.
	Contamination	• The compilation of a contingency plan to ensure that potential environmental incidents or emergencies, such as malfunctioning sewerage infrastructure, can be quickly and effectively resolved. • The utilisation of industry best-practice measures when implementing and maintaining the sewerage infrastructure onsite. • The compilation of a watercourse monitoring plan and the undertaken of biomonitoring within the nearby wetland according to the provisions of the plan.
	Waste Management	• The mitigation measures outlined in the relevant subsection under "Construction Phase ", remain relevant, however, the local municipality will assume duties relating to waste management.
	Traffic	• Roads within the new housing development must be furnished with appropriate road signs detailing speed limits, relevant cautions, etc.
	Water Abstraction	n/a (Contractor is off site at this point and therefore cannot be held liable for water abstraction)
3. Direct and cumulative negative impacts on surface water system	**Erosion**	• As mentioned in "2. Direct and Cumulative Negative Impacts on Biodiversity – Erosion" above.
	Contamination	• As mentioned in "2. Direct and Cumulative Negative Impacts on Biodiversity – Contamination" above.
	Water Abstraction	• As mentioned in "2. Direct and Cumulative Negative Impacts on Biodiversity – Water Abstraction" above.

IMPACT TYPE	CAUSE OF IMPACTS	MITIGATION MEASURES
4. Direct and cumulative negative impacts on ground water	**Contamination**	• As mentioned in "2. Direct and Cumulative Negative Impacts on Biodiversity – Contamination" above.
	Water Abstraction	• As mentioned in "2. Direct and Cumulative Negative Impacts on Biodiversity – Water Abstraction" above.

12.4. Decommissioning and Closure Phase

The below mitigation measures have been recommended to manage the impacts associated with the decommissioning and closure phase of the project:

Table 12-4: Mitigation measures applicable to decommissioning and closure phase of the project

IMPACT TYPE	CAUSE OF IMPACTS	MITIGATION MEASURES
1. Direct and Cumulative Negative Socio–Economic Impacts	**Removal of residents**	• Although hypothetical at this stage, decommissioning of the housing development should not occur and residents should not be moved again.
	Dust	• The mitigation measures outlined in the relevant subsection under "Construction Phase", remain relevant.
	Erosion	• The mitigation measures outlined in the relevant subsection under "Construction Phase", remain relevant.
	Local economic opportunities	• The mitigation measures outlined in the relevant subsection under "Construction Phase", remain relevant.
	Safety and security	• The mitigation measures outlined in the relevant subsection under "Construction Phase", remain relevant.
	Noise	• The mitigation measures outlined in the relevant subsection under "Construction Phase", remain relevant.
	General Waste	• The mitigation measures outlined in the relevant subsection under "Construction Phase", remain relevant.
	Waste Related to Site Camp Removal	• The mitigation measures outlined in the relevant subsection under "Construction Phase", remain relevant.
	Increased traffic	• The mitigation measures outlined in the relevant subsection under "Construction Phase", remain relevant.
	Water Quality	• The mitigation measures outlined in the relevant subsection under "Construction Phase", remain relevant.
	Visual impacts	• The mitigation measures outlined in the relevant subsection under "Construction Phase", remain relevant.
2. Direct Positive Socio-Economic Impacts	n/a	n/a
3. Direct and cumulative	**Destruction of housing**	• A 100% indigenous planting plan must be adhered to in terms of all planting carried out on the site.

IMPACT TYPE	CAUSE OF IMPACTS	MITIGATION MEASURES
negative impacts on biodiversity	**leaving bare ground**	The Contractor must provide a rehabilitation plan and specification detailing plant species, timing, planting methods and maintenance for the Engineer's approval under advice from the IECO. The objective of rehabilitation shall be to prevent erosion and to establish an endemic vegetation type that would naturally occur on the site. The rehabilitation plan shall be prepared by a suitably qualified horticulturist. Best practice horticultural methods shall be followed, for guidance the following measures must be considered; ○ Locally harvested material must be free of alien and invader plants/seeds. ○ Trees lost due to construction and operational activities are to be replaced at a 1:3 ratio therefore trees to cut must be counted. Should they not be counted a total of 100 trees must be planted. ○ Shrubs should be planted at one plant every 5 square metres. Plugs of herbs shall be planted at densities of up to 12 per 1 m2. ○ Bulbous plants shall be planted in selected areas and shall be protected from moles using rock linings to the holes and surface soil. ○ Care shall be taken to keep root damage to a minimum when transplanting seedlings. Where plants have a taproot, this shall not be cut. Excess foliage, flowers and side branches shall be pruned. ○ Plants shall be watered immediately after transplanting to ensure that the soil is wet around the plants. If necessary additional soil must be added after initial watering to fill any subsidence back up to ground level. • The soil must be kept damp until young grass tufts are seen then must be watered on a twice a week basis (unless there is substantial/sufficient rainfall) until the soil is 85% covered – thereafter it must be watered as needed
	Erosion	• The mitigation measures outlined in the relevant subsection under "Construction Phase", remain relevant.
	Contamination	• The mitigation measures outlined in the relevant subsection under "Construction Phase", remain relevant.
	Noise	• The mitigation measures outlined in the relevant subsection under "Construction Phase", remain relevant.
	Destruction of habitat	• The mitigation measures outlined in the relevant subsection under "Construction Phase", remain relevant.
	Soil compaction	• The mitigation measures outlined in the relevant subsection under "Construction Phase", remain

IMPACT TYPE	CAUSE OF IMPACTS	MITIGATION MEASURES
		relevant.
	Waste management	• The mitigation measures outlined in the relevant subsection under "Construction Phase", remain relevant.
	Traffic	• The mitigation measures outlined in the relevant subsection under "Construction Phase", remain relevant.
	Water abstraction	• The mitigation measures outlined in the relevant subsection under "Construction Phase", remain relevant.
4. Direct and cumulative negative impacts on geology	**Soil compaction**	• The mitigation measures outlined in the relevant subsection under "Construction Phase", remain relevant.
	Soil mixing	• The mitigation measures outlined in the relevant subsection under "Construction Phase", remain relevant.
	Soil erosion	• The mitigation measures outlined in the relevant subsection under "Construction Phase", remain relevant.
5. Direct and cumulative negative impacts on surface water system	**Erosion**	• The mitigation measures outlined in the relevant subsection under "Construction Phase", remain relevant.
	Contamination	• The mitigation measures outlined in the relevant subsection under "Construction Phase", remain relevant.
	Illegal abstraction	• The mitigation measures outlined in the relevant subsection under "Construction Phase", remain relevant.
6. Direct and cumulative negative impacts on ground water	**Contamination**	• The mitigation measures outlined in the relevant subsection under "Construction Phase", remain relevant.
	Illegal abstraction	• The mitigation measures outlined in the relevant subsection under "Construction Phase", remain relevant.

13. EIA PLAN OF STUDY

13.1. Overview

The EIA Plan of Study explains the approach to be undertaken during the EIA phase of the proposed Khutsong South Extension 8 Housing Development, was prepared in accordance with Appendix 2 of GNR No. 326 of the 2014 EIA Regulations, as amended in April 2017.

13.2. Important Environmental Aspects and Issues Identified during the Scoping phase

The Scoping exercise has been undertaken to identify and qualitatively predict significant environmental issues for further consideration and prioritisation. During the EIA stage a detailed quantitative impact assessment will be conducted via contributions from the project team, necessary specialist studies and through the application of the impact assessment methodology contained in **Section 11.1.** of this report. Suitable mitigation measures will be identified to manage (i.e. prevent, reduce, rehabilitate and/or compensate) the potential environmental impacts associated with the development, and will be incorporated into an EMPr.

Pertinent environmental issues identified during Scoping, which will receive specific attention during the EIA phase are listed in **Sections 11.2. to 11.5.**

13.3. Feasible and Reasonable Alternatives to be Assessed During the EIA Phase

The EIA phase will include a detailed comparative analysis of the project's feasible alternatives that emanate from the Scoping exercise, which will include environmental (with specialist input) and technical evaluations.

The feasible alternative to be assessed in the EIA phase includes the Technological Alternative of the utilisation of solar power and energy efficient lighting as far as possible

13.4. Specialist Studies

13.4.1. Overview

The potential specialist studies that have been triggered by the findings of the Scoping process, aimed at addressing important identified issues and compliance with legal obligations, include:

- Social Impact Assessment;
- Ecological Habitat Impact Assessment;
- Geotechnical Assessment;
- Wetland Habitat Impact Assessment;
- Visual Impact Assessment;
- Phase 1 Heritage Impact Assessment;
- Pedology and Agricultural Potential Assessment;

Key aspects of specialist studies that must be considered by the EAP include:

- Ensuring that the specialists have adequately addressed the potential issues raised by relevant stakeholders, I&APs and local authorities; and
- Ensuring that the specialist input is relevant and clear.

13.4.2. Terms of Reference (ToR) for Additional Specialist Studies

Additional site-based specialist studies have been recommended, in some instances, to support the initial desktop-level findings of the completed specialist reports undertaken during the initial Scoping phase of the project and are listed in **Section 13.4.1**., above. ToR applicable to each specialist study required during the EIA phase are discussed, below.

13.4.2.1. Social Impact Assessment

The ToR for the comprehensive SIA to follow from this screening-level report, are as follows:

- Briefly describe the local socio-economic environment,
- Describe landownership/land-users and property right,
- Examine the impacts of the project, contextualise these impacts and then assess them,
- Provide recommendations for mitigating the assessed impacts; and
- Review the comments made by Interested and Affected Parties (I&APs) to ensure that all issues and concerns raised by them have been addressed and, if some issues cannot be addressed at this stage, indicate these in the report and discuss the implications or when can they be addressed.

13.4.2.2. Ecological Habitat Impact Assessment

The Terms of Reference (ToR) for the Ecological Habitat Impact Assessment are as follows:

- Review existing information on the site,
- Determine and map the main plant communities within the site;
- Where possible identify any flora species of conservation concern (SCC) according to the latest legislation and lists including the Red List;
- Where possible identify any faunal SCC according to the latest legislation and lists, including the Red List;
- Assess the extent of alien plant species over the site, and associated risks of alien invasion as a result of the proposed development in accordance with the latest legislation and lists;
- Assess the condition of the site in terms of current or previous land uses;
- Provide a general overview of the project area in terms of connectivity, corridors, rivers and streams and ecological viability in relation to the surrounding region with relevant recent information;
- Place the project area within the biodiversity context of the wider area (i.e. provide the “bigger picture”);
- Identify (as far as is possible from the data collected) the principal ecological processes evident within the project site and its relative importance in determining the biodiversity characteristics present;
- Assess the potential direct and indirect impacts resulting from the proposed development and associated infrastructure, both on the footprint and the immediate surrounding area during construction and operation; and
- Provide a description of appropriate mitigation measures that can be adopted to reduce negative impacts for each phase of the project, where required.

13.4.2.3. Geotechnical Assessment

The Scope of Work for the Geotechnical Assessment is as follows:

As the site is underlain by dolomite of the Chuniespoort Group, Transvaal Supergroup, a dolomite stability investigation is required, in accordance with SANS 1936 parts 1-4. The stability investigation is aimed at determining the potential for sinkholes and subsidences to develop. The outcome of the stability investigation will determine the type of development that will be allowed as well as the density of development.

Design Level Dolomite Stability Investigation

The dolomite stability investigations will involve exploring the deeper lying strata to depths of up to 60 m if required. This will establish the nature of the overburden above dolomite bedrock allowing the inherent hazard associated with the site with respect to subsidence and sinkhole development to be determined.
A geotechnical investigation allowing the top three meters of the soil profile to be explored enabling the engineering properties thereof to be established.

A phased approach to the investigation will be adopted, by which the dolomite stability investigation will be conducted first and tailor the geotechnical investigation appropriately if possible.

The methodology and principles to be followed in investigating, analyzing and developing dolomitic land are detailed in the following South African Bureau of Standards documents:

- South African Bureau of Standards SANS 633. Soil profiling and rotary percussion borehole logging on dolomite land in Southern Africa for engineering purposes. Pretoria 2012.
- South African Bureau of Standards SANS 634. Geotechnical investigations for township development. Pretoria 2012.
- South African Bureau of Standards SANS 1936-1. Development of dolomite land: Part 1: General principles and requirements. Pretoria 2012.
- South African Bureau of Standards SANS 1936-2. Development of dolomite land: Part 2: Geotechnical investigations and determinations. Pretoria 2012.
- South African Bureau of Standards SANS 1936-3. Development of dolomite land: Part 3: Design and construction of buildings, structures and infrastructure. Pretoria 2012.
- South African Bureau of Standards SANS 1936-4. Development of dolomite land: Part 4: Risk management. Pretoria 2012.

In addition to the above, the investigation will meet the requirements of the National Home Builder's Regulation Council (NHBRC) and meet the specifications set out in the National Department of Housing's Generic Specification GFSH-2, titled "Geotechnical Site Investigations for Housing Developments".

The dolomite stability investigation will include the following aspects:

A gravity survey will be carried out on a 30 m grid over both sites. This geophysical technique uses the density contrast between the low-density soil and high-density rock to construct a plan showing relative depth to bedrock. This is used to position the boreholes and to aid in delineating stability and geotechnical zones.
The geotechnical investigation will be carried out with the following objectives in mind:

- To establish the geological strata underlying the site and the geotechnical properties thereof,
- Zone the site as required by the NHBRC so that areas in which problem soils occur are identified,
- Provide preliminary foundation recommendations, and
- Investigate the soils with a view to establishing the potential for the in-situ materials to be used in the construction of layerworks.

The geotechnical investigation will include the following aspects:

Test pits will be excavated using a tractor loader backhoe (TLB) to depths of up to 3 m. The test pits will be profiled and sampled by an engineering geologist. The number of test pits is to some extent dependent on the complexity of the geology and varies from site to site, but allowance has been made for one hundred and fifty test pits. This will marginally reduce the required number of boreholes to be drilled as well.
Representative soil samples will be collected from the test pits and submitted for laboratory testing at an accredited soil testing laboratory. The following laboratory tests are proposed:

- 50x Foundation Indicators (Grading, Atterberg Limits and clay content)

- 20x Modified AASHTO Compaction and California Bearing Ratio (CBR)
- 20x California Bearing Ratio
- 20x Oedometer
- 10x Bassons Index Tests

Once all the results have been received, a report will be compiled for the geotechnical and dolomite stability investigation that will provide all results, drawings indicating the positions of the test pits, evaluation of results and recommendations for the foundations.

The report will meet the requirements of the National Home Builders Registration Council (NHBRC) for enrolment of the development. Note that the work will be presented to the Council for Geoscience (CGS) in order for their approval to be obtained.

13.4.2.4. Wetland Habitat Impact Assessment

The Terms of Reference (ToR) for the Wetland Habitat Impact Assessment are as follows:

- Undertake a desktop review of the site's biophysical attributes using available literature and GIS information.
- Review conservation planning tools such as NFEPA datasets, the South African Inventory of Inland Aquatic Ecosystems as well as the Gauteng Conservation Plan, and provide a discussion on how they impact the proposed development.
- Undertake infield delineation of wetlands within the study area using techniques detailed in the delineated guideline: A practical Field Procedure for Identification and Delineation of Wetland and Riparian Areas – Edition 1 (DWAF, 2005).
- Undertake an assessment of the present ecological state (PES) of wetlands using a WET-Health Level 1 Assessment (Macfarlane *et al.,* 2007).
- Undertake an assessment of the functions and ecosystem services provided by wetlands using the WET-EcoServices Level 2 Assessment (Kotze *et al.,* 2007).
- Undertake an assessment of the ecological importance and sensitivity (EIS) of wetlands using the EIS Assessment tool (Rountree & Kotze, 2013).
- Identify potential construction and operational phase impacts to delineated watercourses.
- Provide construction-phase and operational-phase mitigation measures.
- Undertake an impact significance assessment.
- Undertake a Department of Water and Sanitation (DWS) Risk Assessment in order to determine the risk level of the proposed development and whether the proposed development requires General Authorisation (GA) or a Water Use Licence (WUL).

13.4.2.5. Visual Impact Assessment

The Visual Impact Assessment will be undertaken in accordance with;

a) The Government of the Western Cape Guideline for Involving Visual and Aesthetic Specialists in EIA Processes, which is the only relevant local guideline, setting various levels of assessment subject to the nature of the proposed development and surrounding landscape; and
b) The Landscape Institute and Institute of Environmental Management and Assessment (UK) Guidelines for Landscape and Visual Impact Assessment which provides detail of international best practice (technical methodology).

It is likely that, in accordance with the Western Cape Guidelines, a Level 4 Assessment will be required.
A Level 4 Assessment requires:

1) Identification of issues raised in scoping phase, and site visit;

2) Description of the receiving environment and the proposed project;
3) Establishment of view catchment area, view corridors, viewpoints and receptors;
4) Indication of potential visual impacts using established criteria;
5) Inclusion of potential lighting impacts at night;
6) Description of alternatives, mitigation measures and monitoring programmes;
7) 3D modelling and simulations with and without mitigation; and
8) Review by independent, experienced visual specialist (if required).

It is possible that should no major concern be raised and if there are no major identified impacts then it may be possible to motivate to the Competent Authority that a Level 3 Assessment is undertaken. A Level 3 Assessment requires the same input as Level 4 with the exception that 3D modelling and simulations are not required.

13.4.2.6. Phase 1 Heritage Impact Assessment

A Phase 1 Heritage Impact Assessment to determine the impacts on heritage resources within the study area requires the following:

- A preliminary desktop investigation of the site;
- A field visit to the proposed development site;
- Identify potential cultural heritage, archaeological and historical sites within the proposed development area;
- Evaluate the potential impacts of construction and operation of the proposed development on cultural heritage, archaeological and historical sites; and
- Recommend mitigation measures to reduce or negate any negative impacts on potential sensitive sites

13.4.2.7. Pedology and Agricultural Potential Assessment

The following tasks were completed in fulfilment of the terms of reference for this assessment:

- To conduct a soil assessment which includes a description of the physical properties which characterise the soil within the proposed area of development of the relevant portions of the property;
- Using the findings from the soil assessment to determine the existing land capability/potential and current land use of the entire surface area of the relevant portions of the project area;
- To delineate soil resources;
- To determine the sensitivity of the baseline findings;
- The soil classification was done according to the Taxonomic Soil Classification System for South Africa, 1991. The following attributes must be included at each observation:
    - Soil form and family (Taxonomic Soil Classification System for South Africa, 1991);
    - Soil depth;
    - Estimated soil texture;
    - Soil structure, coarse fragments, calcareousness;
    - Buffer capacities;
    - Underlying material;
    - Current land use; and
    - Land capability.
- Compile an impact assessment to indicate the significance of the expected impacts;
- Discussing the feasibility of the proposed activities;
- Confirmation that no agricultural segregation will take place and that all options have been considered to avoid segregation; and
- Recommend relevant mitigation measures to limit all associated impacts.

13.5. Public Participation during the EIA Phase

13.5.1. Updating of I&AP Database

The list of concerned I&APs will be continuously updated during the EIA phase.

13.5.2. Public Review of the Draft EIA Report

I&APs will be able to review the draft EIA report at various public venues during the legislated public review period. The locations where the report will be available are listed in **Table 35**, below.

Table 13-1: Locations of the Draft EIA Report

VENUE	ADDRESS	CONTACT DETAILS	TIMES
Carletonville Library	c/o Celestine and Emerald Street, Carletonville	Tel: 018 788 9541/2 Fax: 018 787 2485	9am to 15pm (Mond to Fri)

Copies of the draft EIA report will also be made available to the relevant authorities as listed in **Section 8** of this report**.** The draft EIA Report will also be available for download on Afzelia's website: www.afzelia.co.za

The I&APs will also be notified via email, phone or post of the opportunity to review the draft EIA Report, the period for review and the process of submitting pertinent comments. The general public will also be notified about reviewing the draft EIA report through the following newspapers:

- Newspapers to be confirmed

All comments received from concerned stakeholders will be included in the final EIA Report prior to submission to the competent authority.

13.5.3. Public Meeting

A public meeting will only be held and undertaken if sufficient concern is shown towards the proposed development.

13.5.4. Comments and Response Report

All comments that are received will be added to the Comments and Response Report, which will record the date that issues were raised, a summary of the issue and a response to the issue.

13.5.5. Notification of DEFF Decision

All concerned I&APs will be notified via email, phone call or post after a decision on the development has been reached by the DEFF. Advertisements will also be placed in the relevant newspapers listed above to notify the general public of the decision. The notification will also include the procedure that one would follow to appeal the decision, as legislated.

13.6. Final EIA Report

The EIA Report will contain the necessary information for the DEFF to arrive at a decision on the application. The contents of the EIA Report must comprise all information as contained in Appendix 3 of GNR No. 326 of the 2014 EIA Regulations, as amended in April 2017. These conditions are listed, below:

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

(a) details of -

(i) the EAP who prepared the report; and

(ii) the expertise of the EAP, including a curriculum vitae;

(b) the location of the development footprint of the activity on the approved site as contemplated in the accepted scoping report, including:

(i) the 21-digit Surveyor General code of each cadastral land parcel;

(ii) where available, the physical address and farm name; and

(iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;

(c) a plan which locates the proposed activity or activities applied for as well as the associated structures and infrastructure at an appropriate scale, or, if it is—

(i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken;

(ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken;

(d) a description of the scope of the proposed activity, including—

(i) all listed and specified activities triggered and being applied for; and

(ii) a description of the associated structures and infrastructure related to the development;

(e) a description of the policy and legislative context within which the development is located and an explanation of how the proposed development complies with and responds to the legislation and policy context;

(f) a motivation for the need and desirability for the proposed development, including the need and desirability of the activity in the context of the preferred development footprint within the approved site as contemplated in the accepted scoping report;

(g) a motivation for the preferred development footprint within the approved site as contemplated in the accepted scoping report;

(h) a full description of the process followed to reach the proposed development footprint within the approved site as contemplated in the accepted scoping report, including:

(i) details of the development footprint alternatives considered;

(ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;

(iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them;

(iv) the environmental attributes associated with the development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;

(v) the impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts—

(aa) can be reversed;

(bb) may cause irreplaceable loss of resources; and

(cc) can be avoided, managed or mitigated;

(vi) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks;

(vii) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;

(viii) the possible mitigation measures that could be applied and level of residual risk;

(ix) if no alternative development footprints for the activity were investigated, the motivation for not considering such; and

(x) a concluding statement indicating the location of the preferred alternative development footprint within the approved site as contemplated in the accepted scoping report;

(i) a full description of the process undertaken to identify, assess and rank the impacts the activity and associated structures and infrastructure will impose on the preferred development footprint on the approved site as contemplated in the accepted scoping report through the life of the activity, including—

(i) a description of all environmental issues and risks that were identified during the environmental impact assessment process; and

(ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures;

(j) an assessment of each identified potentially significant impact and risk, including—

(i) cumulative impacts;

(ii) the nature, significance and consequences of the impact and risk;

(iii) the extent and duration of the impact and risk;

(iv) the probability of the impact and risk occurring;

(v) the degree to which the impact and risk can be reversed;

(vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and

(vii) the degree to which the impact and risk can be mitigated;

(k) where applicable, a summary of the findings and recommendations of any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final assessment report;

(l) an environmental impact statement which contains—

(i) a summary of the key findings of the environmental impact assessment:

(ii) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred development footprint on the approved site as contemplated in the accepted scoping report indicating any areas that should be avoided, including buffers; and

(iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;

(m) based on the assessment, and where applicable, recommendations from specialist reports, the recording of proposed impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation;

(n) the final proposed alternatives which respond to the impact management measures, avoidance, and mitigation measures identified through the assessment;

(o) any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation;

(p) a description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed;

(q) a reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;

(r) where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required and the date on which the activity will be concluded and the post construction monitoring requirements finalised;

(s) an undertaking under oath or affirmation by the EAP in relation to—

(i) the correctness of the information provided in the reports;

(ii) the inclusion of comments and inputs from stakeholders and I&APs;

(iii) the inclusion of inputs and recommendations from the specialist reports where relevant; and

(iv) any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties;

(t) where applicable, details of any financial provision for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts;

(u) an indication of any deviation from the approved scoping report, including the plan of study, including—

(i) any deviation from the methodology used in determining the significance of potential environmental impacts and risks; and

(ii) a motivation for the deviation;

(v) any specific information that may be required by the competent authority; and

(w) any other matters required in terms of section 24(4)(a) and (b) of the Act.

(2) Where a government notice by the Minister provides for any protocol or minimum information requirement to be applied to an environmental impact assessment report the requirements as indicated in such notice will apply.

13.7. Competent Authority Consultation

The EIA phase will only be undertaken in the case that the DEFF accepts the Scoping report and proposed EIA Plan of Study. Necessary revisions will be made to the aforementioned documents, if requested.

A meeting with all regulatory authorities will be scheduled during the additional public participation associated with the EIA phase in order to present the latest specialist findings associated with the project.

The final EIA report will be submitted to DEFF once all comments from the local authorities, I&APs and concerned stakeholders have been considered. Final amendments will be assessed and discussed directly with the DEFF to ensure that these are adequately addressed.

13.8. EIA Timeframes

The table below presents the proposed timeframes for the EIA Process. Note that these dates are subject to change.

Table 13-2: EIA Timeframes (dates may change during the course of the EIA)

EIA Milestones	Start	Finish
Submit Application form to DEFF	10/03/2021	19/03/2021
Submit Scoping Report to DEFF	19/03/2021	21/03/2021
DEFF Review including Decision on Scoping Report	19/03/2021	17/05/2021
Review of Draft EIA Report by authorities and I&APs	26/05/2021	10/07/2021
Submit Final EIA and EMPr to DEFF	20/08/2021	23/08/2021
DEFF Review and Decision	23/06/2021	30/11/2021
Notify Stakeholders of Decision	01/12/2021	07/12/2021

14. CONCLUSION

The Scoping report and the EIA Plan of Study was undertaken for the proposed Khutsong South Extension 8 Housing Development in accordance with the NEMA EIA Regulations (2014), amended 2017, in terms of Listing Notice 2 published in Government Notice No. R.325. The site, which likely comprises primarily secondary grassland, is approximately 391 hectares in extent which will likely all be transformed to allow for the construction of approximately 27000 housing units and associated infrastructure such as, inter alia: roads, piping and electricity.

The primary purpose of the scoping process is to provide the relevant authorities and stakeholders with extensive preliminary information pertaining to the proposed development activities and selected site, as well as to initiate active engagement with all parties to ensure that informed decisions can be made during both the Scoping and EIA phase of the project. The EAP, assisted by various desktop-level specialist studies, identified the applicable legislation, policies and guidelines as well as multiple potential impacts and likely mitigation measures that will be relevant to the planning and design phase, the construction phase, the operation phase and the decommissioning and closure phase of the proposed development activities. The impact significance of identified impacts that will likely result from the proposed activities were not assessed for the Scoping phase of the project, however, this will be undertaken during the EIA phase. All identified impacts and mitigation measures will also be further refined during the EIA phase of the project as additional site-based assessments are undertaken by the EAP and relevant specialists. Input from government and stakeholders from the initial Scoping report will also be obtained by the EAP and incorporated into the following EIA report.

The initial public stakeholder consultation is on-going. No fatal flaws to the project have been identified by the EAP or any specialists during the initial Scoping phase of the project. It is likely that a large area of secondary grassland will be transformed, however, a site-based assessment by experienced ecologists are required to determine the sensitivity of the habitat onsite. No direct disturbance of wetland habitat is likely to occur given that the nearest wetland areas are located at least 120m from the site at the nearest point. Infield wetland delineation will, however, be required to ascertain whether any wetland habitat is located onsite. The underlying geology of the area is also of concern given that the site is known to be underlain by Dolomite, which is linked to sinkhole / doline formation.

An EIA Plan of Study was undertaken to indicate what will be included in the next phase of the project, which includes:

- The likely timeframes of the EIA phase;
- Additional, site-based, specialist studies;
- Additional public and relevant authority consultation;
- Further evaluation of all proposed alternatives;
- Evaluation of the impact significance of potential impacts associated with the proposed development with, and without, consideration of proposed mitigation measures and recommendations;
- An environmental impact statement;
- The provision of a reasoned opinion as to whether the proposed development should be approved, or not; and
- The compilation of an Environmental Management Programme (EMPr) to be implemented by the applicant.

The EIA report (including the EMPr) will be developed and submitted within 106 days after the scoping report is accepted by the competent authority.

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16. APPENDIXES

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