DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT

PROPOSED ACORN CITY MIXED USE TOWNSHIP DEVELOPMENT

ACORN CITY

MPUMALANGA'S AFRICAN SMART CITY OF THE FUTURE

ON PORTION 27 OF THE FARM ARTHURSSEAT 214-KU, BUSHBUCKRIDGE LOCAL MUNICIPALITY

ENVIRONMENTAL INVESTIGATION IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT 1998

SUBMITTED TO THE DEPARTMENT OF AGRICULTURE, RURAL DEVELOPMENT, LAND AND ENVIRONMENTAL AFFAIRS MPUMALANGA

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MARCH 2022

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COMPILED BY

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EIR REPORT NO: DRAFT DATE: 07 MARCH 2022

ECO8 PROJECT NO: E/393

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D2	*Raven Town Planners*	*Acorn City - Draft Layout Plan*	*February 2022*
D3	*Bushbuck Ridge Local Municipality*	*Confirmation of existing water and wastewater infrastructure for the proposed Acorn City.*	*22 June 2021*
D4.1	*Davel & van Huyssteen Consulting Engineering Geologist*	*Geotechnical Report : Investigation for township rezoning, Acorn City urban mixed-use development.*	*Report Ref: DVH-20-28 Rev.1 July 2020*
D4.2	*Davel & van Huyssteen Consulting Engineering Geologist*	*Addendum to Geotechnical report: Evaluation of founding conditions & excavatibility for proposed fuel station, Acorn City*	*Addendum to Geo-tech Report Ref: DVH-21-108 10 January 2022*
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(i) ACRONYMS & DEFINITIONS

The following Definitions apply to this report in line with the relevant Acts and Regulations.

Phrase	Definition Description	Ref
Activity	An activity identified in any notice published by the Minister or MEC in terms of section 24D(1)(a) of the Act as a listed activity or specified activity.	NEMA
Baseline information/data	Information derived from data which; records the existing elements and trends in a given environment; records the characteristics of a given project proposal.	IEMGS
Biophysical environment	That part of the environment which did not originate with and is not dependent on human activities (e.g. biological, physical and chemical objects and processes).	IEMGS
Buffer area	means, unless specifically defined, an area extending 10 kilometres from the proclaimed boundary of a world heritage site or national park and 5 kilometres from the proclaimed boundary of a nature reserve, respectively, or that defined as such for a biosphere.	NEMA
Channel	An excavated hollow bed for running water.	NEMA
Construction	According to the regulations this term is defined as – "the building, erection or expansion of a facility, structure or infrastructure that is necessary for the undertaking of an activity, but excludes any modification, alteration or upgrading of such facility, structure or infrastructure which does not result in a change to the nature of the activity being undertaken or an increase of the production, storage or transportation capacity of that facility, structure or infrastructure.	NEMA
Cumulative impact	In relation to an activity, means the past, current and reasonably foreseeable future impact of an activity, considered together with the impact of activities associated with that activity, that in itself may not be significant, but may become significant when added to the existing and reasonably foreseeable impacts eventuating from similar or diverse activities.	NEMA
Development	Means the building, erection, construction or establishment of a facility, structure or infrastructure, including associated earthworks or borrow pits, that is necessary for the undertaking of a listed or specified activity but excludes any modification, alteration or expansion of such a facility, structure or infrastructure, including associated earthworks or borrow pits, and excluding the redevelopment of the same facility in the same location, with the same capacity and footprint.	NEMA
Development footprint ("Site")	Means any evidence of physical alteration as a result of the undertaking of any listed activity. For purpose of this assessment, the development footprint comprises th total site-property.	NEMA
Engineering service	A system for the provision of water, sewerage, electricity, municipal roads, storm water drainage, gas and solid waste collection and removal required for the purpose of land development.	SPLUMA
Environment	The external circumstances, conditions and objects that affect the existence and development of an individual, organism or group. These circumstances include biophysical, social, economic, historic, cultural and political aspects.	IEMGS
External engineering service	An engineering service situated outside the boundaries of a land area and which is necessary to serve the use and development of the land area.	SPLUMA
General waste	Is waste that does not pose an immediate threat to man or the environment, i.e. household and garden waste, builders' rubble and some dry industrial and business waste? It may, however, with decomposition and rain infiltration, produce leachate, which is unacceptable.	NEMWA
Hazardous waste	Is waste containing or contaminated by poison, corrosive agents, flammable or explosive substances, chemical or any other substance which may pose detrimental or chronic impacts on human health and the environment.	NEMWA
Health care risk waste (HCRW)	Is waste generated at health care facilities such as hospitals, clinics, laboratories and research institutions, medical, dental and veterinarian practices, and includes infectious, pharmaceutical and diagnostic waste.	NEMWA
Internal engineering service	An engineering service within the boundaries of a land area which is necessary for the use and development of the land area and which is to be owned and operated by the municipality or service provider.	SPLUMA
Land	Any erf, agricultural holding or farm portion, and includes any improvement or building on the land and any real right in land.	SPLUMA
Land development	The erection of buildings or structures on land, or the change of use of land, including township establishment, the subdivision or consolidation of land or any deviation from the land use or uses permitted in terms of an applicable land use scheme.	SPLUMA

Land use	The purpose for which land is or may be used lawfully in terms of a land use scheme, existing scheme or in terms of any other authorisation, permit or consent issued by a competent authority, and includes any conditions related to such land use purposes.	SPLUMA
Land use management system	The system of regulating and managing land use and conferring land use rights through the use of schemes and land development procedures.	SPLUMA
Linear activity	An activity that is arranged in or extending along one or more properties and which affects the environment or any aspect of the environment along the course of the activity, and includes railways, roads, canals, channels, funiculars, pipelines, conveyor belts, cableways, power lines, fences, runways, aircraft landing strips, firebreaks and telecommunication lines.	NEMA
Mitigate	The implementation of practical measures to reduce adverse impacts or enhance beneficial impacts of an action.	IEMGS
Open space	In relation to a land area, means land set aside or to be set aside for the use by a community as a recreation area, irrespective of the ownership of such land.	SPLUMA
Public place	Any open or enclosed place, park, street, road or thoroughfare or other similar area of land shown on a general plan or diagram which is for use by the general public and is owned by or vests in the ownership of a Municipal Council, and includes a public open space and a servitude for any similar purpose in favour of the general public.	SPLUMA
Riparian habitat	The physical structure and associated vegetation of the areas associated with a watercourse which are commonly characterised by alluvial soils, and which are inundated or flooded to an extent and with a frequency sufficient to support vegetation of species with a composition and physical structure distinct from those of adjacent land areas.	NWA
Run-off water	Excess surface water resulting from rain.	CARA
Sanitation	the principles and practices relating to the collection, removal or disposal of human excreta and household, public institution, industrial, agricultural and mining wastewater, grey-water waste as they impact upon people and the environment. Good sanitation includes appropriate health and hygiene education and behaviour, hand hygiene and acceptable, affordable and sustainable sanitation services".	DWS
Sanitation Services	Is "the collection, removal, treatment and or disposal of human excreta, and domestic public institution wastewater, and the collection, treatment and/or disposal of municipal, agricultural, mining and industrial wastewater. This includes all the organisational arrangements necessary to ensure the provision of sanitation services including, amongst others, consideration of natural resources, social acceptance, appropriate health, hygiene and sanitation-related awareness and technologies, the measurement of the quantity and quality of discharges where appropriate, apply the polluter pays principle, the associated billing, collection of revenue and consumer care. Water services authorities have a right but not an obligation to accept industrial, agricultural and mining wastewater within their area of jurisdiction". Sanitation services in this report refer to a wastewater treatment plant.	DWS
Servitude	Means a servitude registered against a title deed of land.	SPLUMA
Sewer waste	Means the system for collection and transportation of effluent, wastewater or sewage, including conduits, pipes and pumping stations. Sewer waste in this report also refers to wastewater.	NEMWA
Significant impact	An impact that may have a notable effect on one or more aspects of the environment or may result in non-compliance with accepted environmental quality standards, thresholds or targets and is determined through rating the positive and negative effects of an impact on the environment based on criteria such as duration, magnitude, intensity and probability of occurrence.	NEMA
Sustainable development	NEMA defines it as "Sustainable development means the integration of social, economic and environmental factors into planning, implementation and decision-making so as to ensure that development serves present and future generations." According to the NEMP "Sustainable development requires the consideration of all relevant factors including the following: (i) That the disturbance of ecosystems and loss of biological diversity are avoided, or where they cannot be altogether avoided, are minimised and remedied; (ii) that pollution and degradation of the environment are avoided, or, where they cannot be altogether avoided, are minimised and remedied; (iii) that the disturbance of landscapes and sites that constitute the nation's cultural heritage is avoided, or where it cannot be altogether avoided, is minimised and remedied; (iv) that waste is avoided, or where it cannot be altogether avoided, minimised and reused or recycled where possible and otherwise disposed of in a responsible manner; (v) that the use and	NEMA

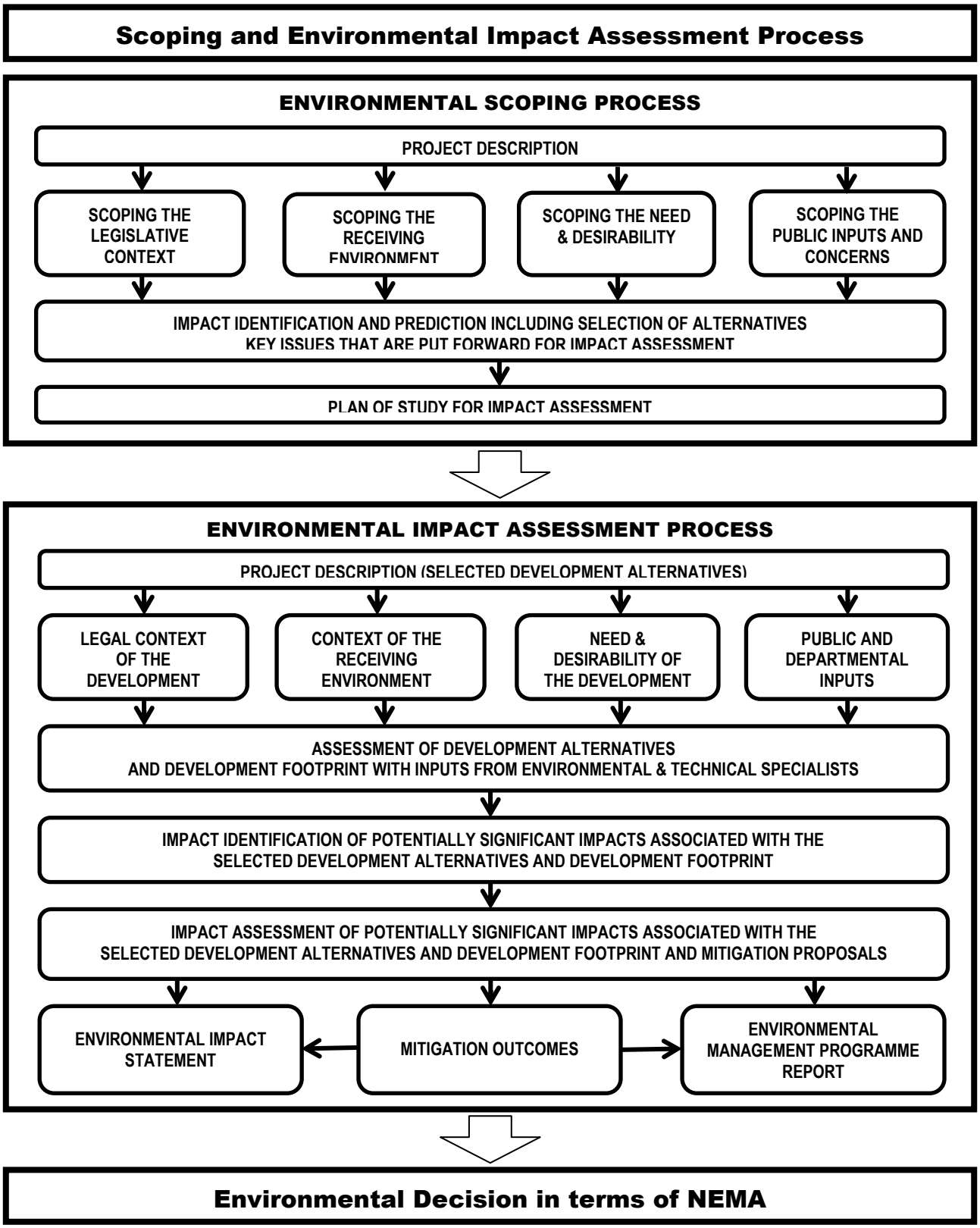
	exploitation of non-renewable natural resources is responsible and equitable, and takes into account the consequences of the depletion of the resource; (vi) that the development, use and exploitation of renewable resources and the ecosystems of which they are part do not exceed the level beyond which their integrity is jeopardised; (vii) that a risk-averse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions; and of current knowledge about the consequences of decisions and actions; and (viii) that negative impacts on the environment and on people's environmental rights be anticipated and prevented, and where they cannot be altogether prevented, are minimised and remedied".	
Township	An area of land is divided into erven, and may include public places and roads indicated as such on a general plan.	SPLUMA
Waste	Any undesirable or superfluous by-product, emission, residue or remainder of any process or activity, any matter, gaseous, liquid or solid, or any combination thereof." The formal classification of waste is made according to the human health or environmental risk that it may pose, and consequently requirements for safe handling and disposal.	NEMWA
Wastewater	Any water whose pristine or potable quality has been altered by domestic, industrial or other use or process.	DWA
Watercourse	Is a) a river or spring; (b) a natural channel in which water flows regularly or intermittently; (c) a wetland, pan, lake or dam into which, or from which, water flows; and any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse as defined in the National Water Act, 1998.	NWA
Waterway	An artificial flow path is constructed on land in order to carry away run-off water without causing excessive soil loss.	CARA
Zone	A defined category of land use which is shown on the zoning map of a land use scheme.	SPLUMA

The following Acronyms apply to this report in line with the relevant Acts and Regulations.

Acronym	Description
App	Appendix
BLM	Bushbuckridge Local Municipality
CARA	Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983)
CBA	Critical Biodiversity Area (a biodiversity classification)
CBR	Critical Biodiversity River
CBW	Critical Biodiversity Wetlands
CSIR	Council for Scientific and Industrial Research
DAFF	Department of Agriculture, Forestry and Fisheries
DARDLEA	Department of Agriculture, Rural Development, Land & Environmental Affairs
DE	Department of Energy
DT	Department of Transport
DWA	Department of Water Affairs
DWS	Department of Water & Sanitation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EDM	Ehlanzeni District Municipality
EIA	Environmental Impact Assessment
EMPr	Environmental Management Program report
ESA	Ecological Support Area (a biodiversity classification)
FAHS	Air Force Base Hoedspruit
FEPA	Freshwater Ecosystem Priority Assessment
GIS	Geographic Information System
GN R	Government Notice Regulation
GVA	Gross Value Added Product
IDP	Integrated Development Plan
IEMGS	Integrated Environmental Management Guideline Series
LUMS	Land Use Management Scheme (municipal)
MBSP	Mpumalanga Biodiversity Sector Plan 2013
MNCA	Mpumalanga Nature Conservation Act, 1998 (Act 10 of 1998)
MTPA	Mpumalanga Tourism & Parks Agency
NCRSA	Not Concidered Require Separate Application
NEMA	National Environmental Management Act, 1998 (Act 107 of 1998)
NEMAQA	National Environment Management: Air Quality Act, 2004 (Act 39 of 2004)
NEMBA	National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004)
NEMPAA	National Environmental Management: Protected Areas Act, 2003 (Act 57 of 2003)
NEMWA	National Environmental Management: Protected Areas Act, 2003 (Act 57 of 2003)
NFA	National Forests Act, 1998 (Act 84 of 1998)
NFEPA	National Freshwater Ecosystem Priority Assessment
NWA	National Water Act, 1998 (Act 36 of 1998)
ONA	Other Natural Areas (a biodiversity classification)
PES	Present Ecological State
Par	Paragraph
SAACA	South African Atlas for Climatology and Agro-hydrology
SAHRA	South African Heritage Resources Agency
SANRAL	South African National Roads Agency
SANS	South African National Standard
SAPS	South African Police Service
SDF	Spatial Development Framework (municipal or provincial or national)
SPLUMA	Spatial Planning Land Use Management Application
SSA	Statistics South Africa
VAC	Visual Absorption Capacity

(ii) EIA PROCESS DIAGRAM

An environmental impact assessment process has been initiated in terms of the EIA Regulations GNR 326 of 7 April 2017 for the proposed mixed-use township development on Portion 27 of the farm Arthursseat 214-KU in the Bushbuck Ridge Municipal Area as indicated in the following diagram:



The Scoping Process was finalised and this draft report constitutes the above Environmental Impact Assessment Process in support of decision-making by the Department of Agriculture, Rural Development, Land and Environmental Affairs with regard to an application for Environmental Authorisation of the proposed development.

APPLICANT & EAP DETAILS

This section complies with GN R326 of 17 April 2017, Appendix 3, Section 3(1)(a).

A.1 APPLICATION REGISTRATION

File Reference No.:	*1/3/1/16/1E-354*
Project Title:	***ACORN CITY – MIXED USE TOWNSHIP DEVELOPMENT***
Responsible Official:	*T. Sithole*

A.2 APPLICANT

Project applicant:	*Dzana Investments (Pty) Ltd*				
ID / Reg No:	*2007/010745/07*				
Contact person:	*Dr. Reuel Khoza*				
Physical address:	*104 Leslie Ave, Fourways*				
Postal address:	*P.O. Box 786684, Sandton*			**Postal code:**	*2146*
Telephone:	*011-465 6666*	**Cell:**	-		
E-mail:	*info@dzanainvestments.co.za*	**Fax:**	-		

A.3 ENVIRONMENTAL ASSESSMENT PRACTITIONER WHO PREPARED THE SCOPING REPORT

Firm name:	*ECO-8 Environmental Planners*				
Contact person:	*Mr. Riaan Visagie*				
Postal address:	*P.O. Box 12898, Nelspruit*			**Postal code:**	*1200*
Telephone:	*013-744 9468*	**Cell:**	*082 5200 461*		
E-mail:	*eco8@vodamail.co.za*	**Fax:**	*086 66 44 070*		
Qualifications:	*B(TRP), M(EM) Environmental Management*				
Professional affiliations:	*EAP: EAPASA* *$IAIA_{SA}$*	**Years experience:**	*22 years experience in environmental management*		

A.4 EAP CONCISE CURRICULUM VITAE

Personal information	*Name:* *Riaan Visagie* *Nationality:* *South African*
Relevant Tertiary Education	***M(EM) 2001 : Master's Degree in Environmental Management (post-graduate)*** *Faculty of Natural and Agricultural Sciences, University Free State - Bloemfontein*
Professional Affiliation	*Registered as Environmental Assessment Practitioner (EAPASA reg. No. 2019/1069)* *Member of the International Association of Impact Assessment (SA)*
Employment Record	*1998 to current: Self-employed as Environmental Assessment Practitioner and practising as Principal of the firm ECO-8 ENVIRONMENTAL PLANNERS in Nelspruit, Mpumalanga.*
Experience	*More than 22 years experience in environmental impact assessment and project management with direct involvement in more than 420 individual development projects that include residential, commercial and industrial township developments, hotels and resorts developments, wildlife and agriculture developments as well as services and infrastructure projects.(A list of projects can be provided on request).*
Specialisation	*Environmental Planning for sustainable developments by way of incorporating ecological design methods into urban design, lodge and resort designs, services infrastructure designs and site rehabilitation designs.*
Experience in the field of this specific project	*Qualified as Town and Regional Planner in land use assessments, site assessment and impact assessment of land uses and regulated activities on the environment. (A list of projects can be provided on request).*

PROJECT LOCALITY

The aim of this Section is to indicate the locality of the land / site as required in terms of GN R326 App.3, Sec.3(1)(b)(i)-(iii)

B.1 SURVEYOR-GENERAL REFERENCE NUMBER

The 21 digit land identification number for all sites (including portions of sites) that are part of the application.

T	0	K	U	0	0	0	0	0	0	0	0	0	2	1	4	0	0	0	2	7

B.2 REGISTERED LAND DESCRIPTION

~~Erf /~~ Portion Number	*PORTION 27*
~~Township /~~ Farm Name	*ARTHURSSEAT 214*
Registration division	*KU*

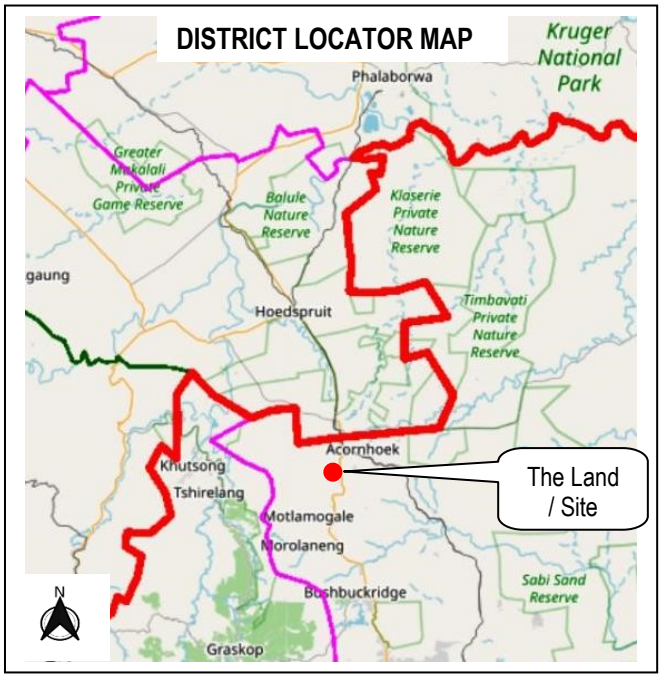
B.3 PHYSICAL ADDRESS OF THE LAND

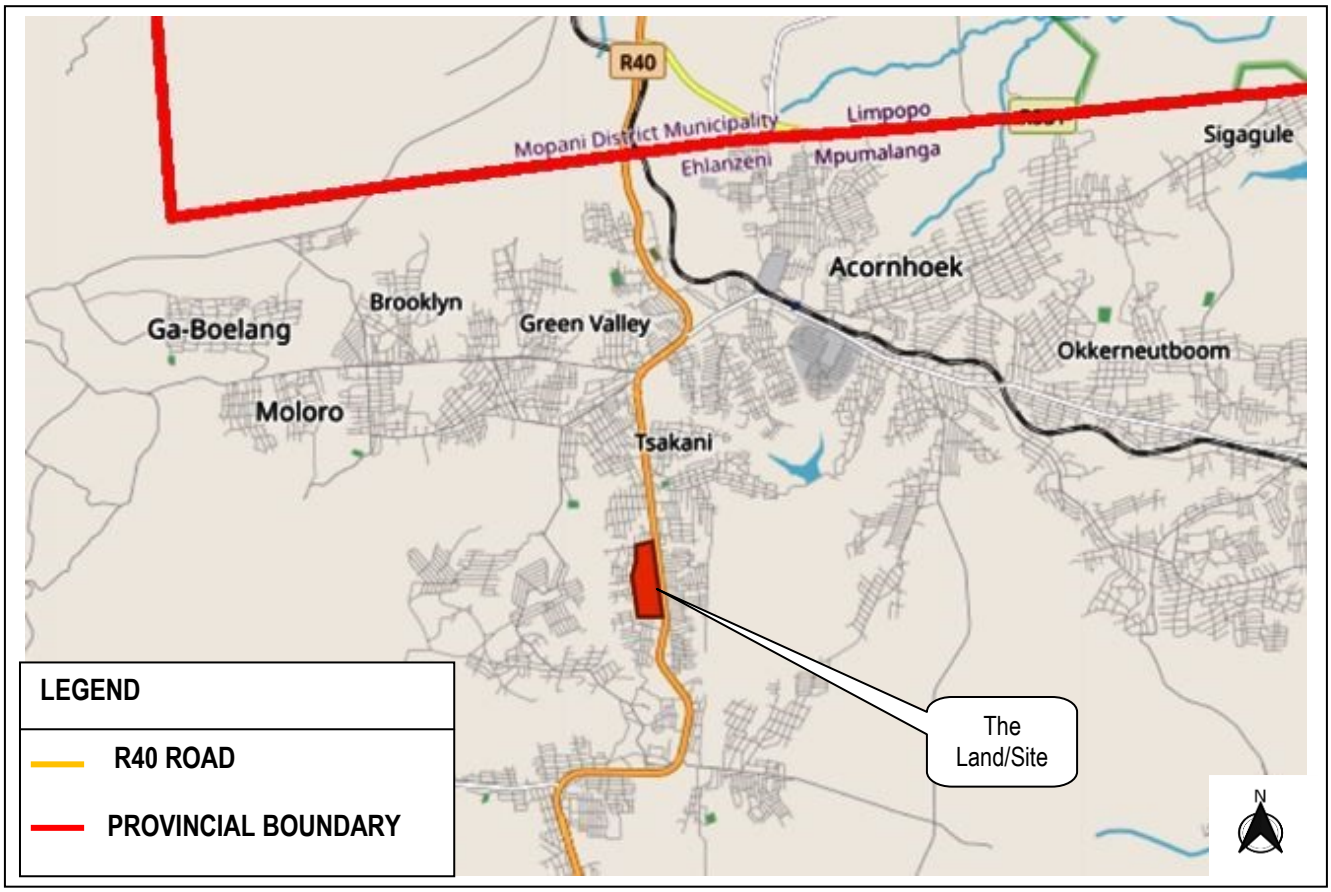
Street name & number	*Next to the R40*
Town / distance from town	*5km from Acornhoek*

B.4 CENTER COORDINATES OF LAND

Projection	*(WGS84)*
Geo Lat/Long (DDMMSS)	*South 31°04'00* *East 24°64'17*

B.5 SITE LOCALITY MAP





PROJECT DESCRIPTION

The aim of this Section is to provide a description of the project to be undertaken including associated structures and infrastructure as required in terms of GN R326 Appendix 3, Section 3(1)(d).

C.1 SCOPE OF THE PROJECT

C1.1 DEVELOPMENT OBJECTIVES

- *The objectives of **spatial justice**, **sustainability, efficiency** and **resilience** as more clearly defined in the Spatial Planning and Land Use Management Act (2013) can be achieved by planning and developing of a new township on the selected land to create a nodal point* where local residents have access to *a wide range of public services and facilities focused in a single area as to allow for a more compact settlement pattern and also improve connectivity and accessibility through the township to the surrounding area.*
- *The proposed land uses and facilities will include retail and business, educational, medical and offices (institutional), a hotel, open spaces and a fuel station. Land uses in support include transportation services as well as utilities and services uses. A small cemetery is proposed for the relocation of historic burial sites (subject to separate authorisation).A substantial area within the township will remain available for urban agriculture, which area forms part of this assessment and which can be utilised for future urban expansion.*
- *The proposed land uses can be made accessible by incorporating a bus and taxi-stop and to provide safe access to and from the R40 road.*
- *The proposed township will be fully serviced by linking proposed new internal engineering services to the existing external road, bulk water and electricity networks and to provide on-site services such as sanitation.*

C1.2 DESCRIPTION OF THE PROPOSED LAND USES AND ALTERNATIVES

A slightly amended township layout plan is proposed (see Appendix A) based on the initial plan that was considered during the scoping process and upon information obtained during the subsequent specialist investigations inclusive of the following land uses / Land use Alternatives (LAs):

LA_1 HOTEL

One (1) erf is planned for purpose of a hotel, conference facility and ancillary uses within the following land use zoning parameters:

- *Zoning -"Residential 4"*
- *Proposed erf size: 3,7240 ha (7.49 % of total township area)*
- *Height - 3 storeys.*
- *Coverage- 50%*

LA_2 URBAN AGRICULTURE

Four (4) erven is planned to maintain their "Agricultural" land use and will not be subject to any development at this moment in time. These erven are reserved for the future extension of the development as the need arises.

- *Zoning - "Agriculture "*
- *Combined erf sizes: 15,2263 ha (30.64 % of total township area)*

LA_3 BUSINESS COMPONENTS

Three (3) business erven is planned to include a retail centres and retail warehouses within the following land use zoning parameters:

- *Zoning - "Business 1"*
- *Combined erf size: 10,6755 ha (21.48 % of total township area)*
- *Height - 3 storeys*
- *Coverage - 50%*

LA_4 EDUCATIONAL COMPONENTS

Three (3) erven is planned for primary and secondary schools with sport facilities, as well as an educational centre and digital learning centre, within the following land use zoning parameters:

- *Zoning - "Educational"*
- *Combined erf size: 6.8472 ha (13.77 % of total area)*
- *Height - 3 storeys*
- *Coverage - 50%*

LA_5 INSTITUTIONAL COMPONENTS

Two (2) erven is planned for a medical facility and for offices within the following land use zoning parameters:

- *Zoning - "Institutional"*
- *Combined erf size: 5,3090 ha (10.68 % of total area)*
- *Height - 3 storeys*
- *Coverage - 50%*

LA_6 FUEL FILLING STATION

One (1) erf is planned for a Fuel Filling Station and ancillary facilities such as convenience store, ATM and car-wash within the following land use zoning parameters:

- *Zoning - "Special "*
- *Proposed erf size: 0.5627 ha (1.13 % of total area)*
- *Coverage - 50%*
- *Height - 3 storeys*

LA_7 TRANSPORTATION SERVICES

One (1) erf is planned for a bus terminal and taxi-rank within the following zoning parameters:

- *Zoning - "Transportation Service"*
- *Proposed erf sizes: 0,3996 ha (0.80 % of total area)*

LA_{10} PRIVATE / PUBLIC OPEN SPACES

Two (2) erven is planned in natural drainage areas that will accommodate urban storm water management structures and as recreation parks.

- *Zoning - "Open Space"*
- *Proposed erf size: 1,9934 ha (4.01 % of total area)*

LA_{11} UTILITIES AND SERVICES FOR CEMETERY AND WASTEWATER TREATMENT PLANT

Two (2) erven to accommodate a cemetery and a wastewater treatment plant respectively.

- *Zoning - "Utilities and Services "*
- *Proposed erf size: 0,1600 ha (0.32 % of total area) for the cemetery*
- *Proposed erf size: : 0,3572 ha (0.72 % of total area) for the wastewater treatment plant*

C1.3 DESCRIPTION OF PROPOSED INFRASTRUCTURE SERVICES AND ALTERNATIVES

EXTERNAL INFRASTRUCTURE SERVICES / TECHNOLOGIES

Bulk services provision from external sources and existing infrastructure are considered to provide in services need of the proposed and other identified land uses based on confirmation of availability and capacity by the respective services providers. The following infrastructure / technology alternatives (TAs) are considered after selection during the scoping process and subsequently after obtaining technical inputs:

TA_1 ACCESS TO EXTERNAL ROAD NETWORK

The site is situated along Road R40, a major provincial road and central point of access to the entire municipal district of Bushbuckridge. Two points of access is planned by way of a Collector Road intersecting the R40 Provincial Road Reserve. The intersection shall be designed according to the National / Provincial Roads Department standards and requirements. Principal decision was obtained from SANRAL who is the Road Authority for the R40, in support of the above and a Traffic Impact Assessment was conducted that determined the proposed road access points to be suitably positioned for this purpose (see Appendix D11).

TA_2 BULK ELECTRICITY SUPPLY

Two main 275kV transmission and 132kV distributor electricity lines are located ±800m east of the proposed township. Eskom supplies electricity to the local urban area from the Acornhoek-Champagne distribution powerline that is located directly east of the site along the R40 and a 150kV link to this powerline is proposed to serve the new township. A Principal decision was obtained from ESKOM who is the local electricity supplier, in support of the above, thus three project phases will occur to address the cumulative demand per phase (see the Electrical Engineering Service report in Appendix D9).

TA_3 BULK WATER PROVISION

The Bushbuck Local Municipality has confirmed that it can provide in the bulk water requirements of the proposed township (±595.18kL/day) by way of connection to an existing bulk water pipeline from a municipal reservoir in the vicinity of the proposed development. It is proposed to install a ±200mm diameter main water pipeline over a length of ±1200m within the R40 road reserve, northwards from the site towards the existing municipal bulk pipeline (see water infrastructure services plans and Outline Services Report (see Appendix D10.1).

TA_0 BULK SANITATION CONNECTION

The site is not located in an area that is serviced with municipal sanitation infrastructure and therefore no sanitation services will be provided to the proposed township externally. However, a wastewater treatment plant (sanitation facility) will be provided on-site to treat and safely dispose of an estimated daily sewer volume of 589.44 kl that can be available for non-consumptive re-use within the proposed township based on the attached Engineering Services Plans and Report (see Appendix D10.1).

TA_4 WASTE REMOVAL SERVICES

Currently general waste is disposed at a municipal waste dumpsite in Acornhoek however, future waste disposal shall take place at a licenced regional landfill site that is currently being commissioned at Thulamahashe. A government provided removal and disposal service for hazardous waste and health care risk waste is currently in place and such service will be utilised at the planned medical and health facilities.

INTERNAL INFRASTRUCTURE SERVICES/TECHNOLOGIES

Selected internal infrastructure services / technologies (TAs) are considered based on the proposed land uses as described in more detail in a Civil and Electrical Engineering Reports (see Appendix D9, D10.1and D10.2).

TA_5 INTERNAL STREETS

The internal road pavement and kerbing will be designed according to the municipal specifications and will include two Collector Roads (Class 4A : 25m road reserves) that will link towards existing residential settlements that are situated directly west of the proposed township. Collector Streets (Class 4B : 20m road reserves) and Local Streets (Class 5A : 16m road reserves) will provide access from the Class 4A roads to the planned internal land uses.

TA_7 INTERNAL ELECTRICITY DISTRIBUTION

Electricity will be transmitted from the surrounding ESKOM network towards an on-site electricity transformer / sub-station. Internal electricity distribution by way of underground cable will be installed to all erven according to the required municipal / ESKOM standard.

TA_8 INTERNAL WATER SUPPLY / RETICULATION

Bulk municipal water (pre-treated) will be provided to the proposed township for potable use to all proposed land use facilities and services. The internal water reticulation will follow the conventional method of underground piping within the internal road reserves towards multiple outlets on the individual erven.

TA_{11} STORM WATER SYSTEMS

The selected project site is not subject to flooding by a 1:100 year flood as certified on the layout plan (see Appendix D10.1 & D10.3).

Surface run-off will be managed on-site by way of a range of measures including:

- *bio-retention measures incorporated in landscaped areas and in the urban agricultural areas,*
- *surface channelling towards inlet drains,*
- *sub-surface storm water pipes towards outlet structures,and*
- *storm water retention ponds with outlets towards natural drainage lines.*

The storm water management plan (see Appendix D10.2).aims at reducing storm water peaks, volumes and velocities to safely discharge into three small tributaries of the Klein-Sandrivier as to prevent down-stream soil erosion and sediment deposition as well as flooding of existing residential properties that are located west of the proposed township.

A Storm Water Management Plan and Report outlines the method that was applied to determine the hydrological properties of the site and the required measures to safely convey and reduce peak volumes and velocity of storm water that may emanate from the proposed township

TA_{12} ON-SITE WASTEWATER TREATMENT, DISPOSAL AND RE-USE

A waterborne sanitation system will be included in the township that will convey wastewater in an piped underground system towards an on-site wastewater treatment plant. The system makes provision for the re-use of treated effluent for non-consumptive use in support of urban agriculture and maintenance of gardens in open spaces within the township. The sewer layout plan and detailed description of the wastewater treatment plant is included in the attached Engineering Services Outline Report and Sewer Layout Plan (see Appendix 10.1).

TA_{13} ON-SITE WASTE MANAGEMENT

The municipality provides waste removal services in the area and it is proposed to make use of that service in the township. Pre-removal waste storage facilities will be planned as part of the architectural design of all buildings within the township to make provision for waste minimisation in line with the Municipal Waste Management Plan.

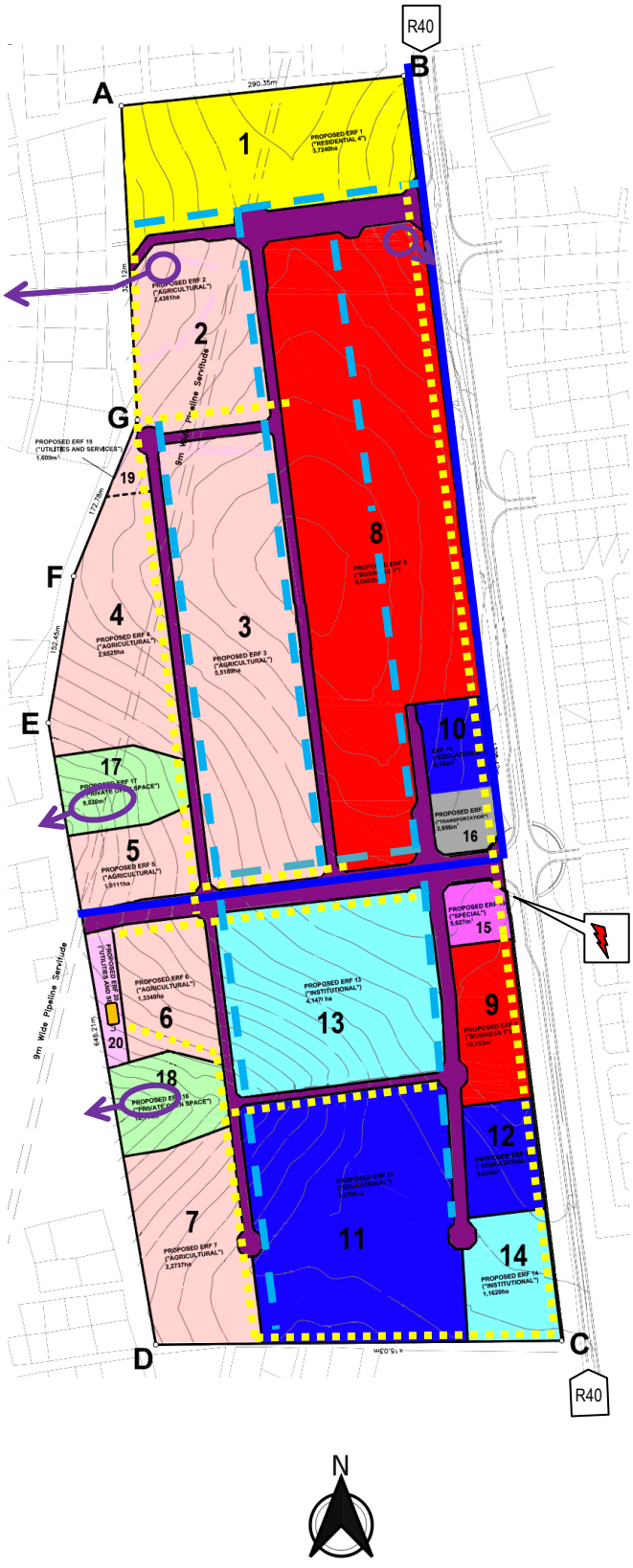
On-site waste management is planned to be part of the architectural facilities design for each of the land uses that includes sufficient and appropriately located waste disposal bins in all public areas. Furthermore, architecturally designed waste management facilities will be incorporated in the back-yard service areas of all buildings within the township. Such facilities will include sufficient space for on-site waste separation and temporary waste storage areas for separated waste (glass, tins, plastic, paper and other).

Waste storage facilities for potentially hazardous waste such as medical / health risk waste from the planned medical facilities within the township will be incorporated within the architectural design of such buildings / facilities and according to the required standards. Such waste will be removed by government appointed contractors for disposal at approved facilities elsewhere.

All waste storage areas will be planned to be secure, enclosed, visually unobtrusive and with impermeable floor surfaces that drains towards sumps that will be connected to the sewer system (with installation of oil-separators where necessary).

Waste removal from these dedicated waste storage areas towards recycling facilities in the area and / or to municipal waste disposal sites will be provided by approved waste removal contractors / waste recycling businesses.

C.2 TOWNSHIP LAYOUT PLAN (2) WITH PROPOSED LAND USES AND ENGINEERING SERVICES



LAYOUT PLAN (Version 2) OF THE PROPOSED
ACORN CITY
ON PORTION 27 OF THE FARM ARTHURSSEAT 214-KU AS DEPICTED BY FIGURE A,B,C,D,E,F,G,A

LAND USE TABLE

Legend	Land Use zone	No of erven	Area (ha)	%
	Business "1"	2	10,6755	21.48
	Agriculture	6	15,2263	30.64
	Educational	3	6.8472	13.77
	Institutional	2	5,3090	10.69
	Residential "4"	1	3,7240	7.49
	Filling Station	1	0.5627	1.14
	Transportation services	1	0.3996	0.80
	Open Space	2	1,9934	4.01
	Utilities and Services	2	0,5172	1.04
	Road purposes	1	4,4360	8.94
Total	**Development footprint**	**20**	**49.6909**	**100**

SCHEMATIC PRESENTATION OF INTERNAL ENGINEERING SERVICES (NOT TO SCALE)

	Public right of way servitudes / streets
	Bulk water line
	Internal water reticulation
	Bulk sewer outflow
	Wastewater treatment plant.
	Storm water management infrastructure
	Electricity Supply Connection Point

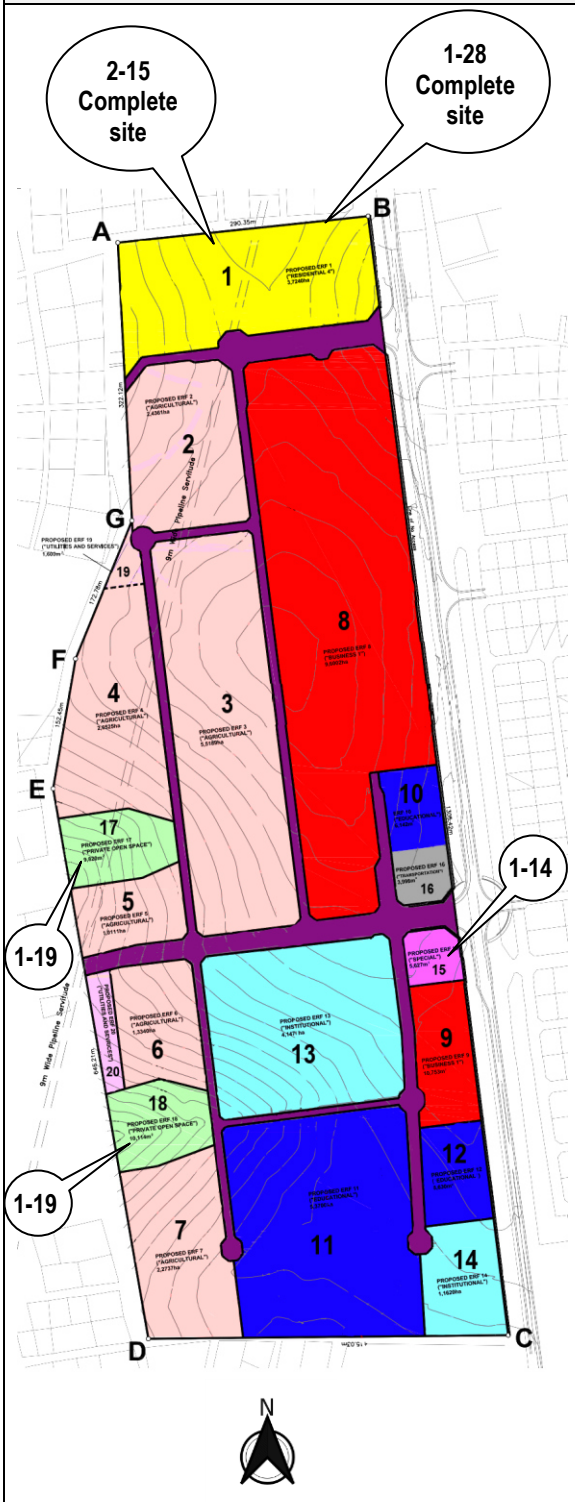
IDENTIFICATION OF REGULATED ACTIVITIES

The aim of this Section is to a provide a description of the scope of the proposed activity/ies, including all listed and specified activities triggered and being applied for; as required in terms of GN R326 Appendix 3, Section 3(1)(c)(i)&(ii).

The following definition apply when considering the relevance of Listed EIA Activities: The land on which the development is planned is located within an "urban area" as defined in GNR 327 of 7 April 2017 even though the land has an "Agricultural" zoning in terms of the Bushbuck Ridge Municipal Land Use Management Scheme (2017).

D1. EIA ACTIVITY IDENTIFICATION CHECKLIST (NEMA EIA GNRs 324, 325 &327 of 7 April 2017)

PROJECT PLAN



LAND USE/ SERVICE	Acty No.	ACTIVITY RELEVANCE	
Residential, hotel, business, educational, institutional & transport service	LN1-27	Vegetation clearance >1ha & <20ha	N/A
	LN2-15	Vegetation clearance >20ha	A
	LN1-28	Urban development >5ha on agricultural land within urban areas.	A
	LN3-6	Hotel>15 beds, inside urban area zoned open space/ conservation use.	N/A
Agriculture	LN1-4	No high density cattle, goat or pig feedlots.	N/A
	LN1-5	No high density poultry farming.	N/A
	LN1-6	No aquaculture.	N/A
	LN1-8	No hatcheries / agri-industrial facility.	N/A
	LN2-15	Vegetation clearance >20ha.	A
"Special" for Fuel Station	LN1-14	Fuel storage of more than 80m^3	A
Access road	LN1-56	Widening and lengthening of an existing road within an urban area is excluded.	N/A
Bulk water provision	LN1-9	Water pipes <360mm dia. inside urban areas are excluded.	N/A
Bulk sanitation		No development/upgrading of bulk services.	N/A
Bulk Electricity	LN1-11	Transmission & distribution inside urban areas less than 275kV are excluded.	N/A
Internal streets	LN1-19	Removal / infilling of more than 10m^3 of material from / into a watercourse.	A
	LN1-24	A road of 8m wide and reserve of 13.5m inside an urban area is excluded.	N/A
Storm water systems & storm water retention ponds	LN1 -9	Storm water pipes >360mm dia. inside urban areas are excluded.	N/A
	LN1-12	Dam/weir >100m² within a watercourse inside urban area is excluded.	N/A
	LN1-19	Removal / infilling of more than 10m^3 of material from / into a watercourse.	A
	LN3-14	Dams / weirs / infrastructure >10m² in geographic sensitive areas but excluded inside urban areas zoned as open space or designated conservation use.	N/A
Internal water reticulation	LN1-9	Water pipes <360mm dia. inside urban areas are excluded.	N/A
Internal sanitation systems	LN1-10	Outfall sewer pipe <360mm dia. and inside urban area is excluded.	N/A
	LN1-26	Wastewater treatment plant with daily capacity of <2000m^3 is excluded.	N/A
Internal electricity	LN1-11	Transmission & distribution inside urban areas less than 275kV are excluded.	N/A
Cemetery site	LN1-23	The development of cemeteries of 2500m² or more in size.	N/A

N/A = Not applicable / A= Applicable

D.2 DESCRIPTION OF THE NEMA-EIA REGULATED PROJECT ACTIVITIES

The following table provides the full description of the identified regulated activities and relevance to the project as identified in the relevant Listing Notices under the EIA Regulations which requires Environmental Authorisation.

Acty. No.	REGULATED ACTIVITIES AS LISTED IN THE EIA REGULATIONS APPLICABLE TO THIS PROJECT	EXTENT OF ACTIVITIES TO BE UNDERTAKEN INCLUDING ASSOCIATED STRUCTURES AND INFRASTRUCTURE
GNR 327 Listing Notice 1		
14	The development and related operation of facilities or infrastructure, for the **storage, or for the storage and handling, of a dangerous good,** where such storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic metres.	*A fuel station is included in the township development plan however, due to the complexity of such facility as well as additional regulatory requirements* ***a separate application and basic environmental impact assessment for the "storage and handling of dangerous goods"*** *will be lodged within the same period as this application for township establishment.* *The proposed fuel station as a land use must still be considered and assessed as part the application for authorising Activity 28 (LN1), but its use for purposes of a fuel station remains conditional and subject to obtaining an additional environmental authorisation for Activity 14 (Listing Notice 1).*
19	The infilling or depositing of any material of more than 10m^3 into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10m^3 from a watercourse.	*It is proposed to construct storm water retention ponds within two watercourses on the property. The soil excavation and infilling volumes associated with these structures is expected to be more than 10m^3.*
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.	*The property of 49.6ha is situated inside an urban area and has an "Agricultural" land use zoning. The proposed development that includes residential, mixed, retail, commercial, and institutional land uses will cover ±49.6ha.*
GNR 325 Listing Notice 2		
15	The clearance of an area of 20 hectares or more of indigenous vegetation.	*The property covers 49.6 ha and more than 20 hectares of indigenous vegetation will be cleared for the development of the township.*

LEGISLATIVE CONTEXT

In compliance with GN R326 Appendix 3, Section 3(1)(e) this section describes the policy and legislative context within which the development is proposed including identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that apply to this development and which are to be considered in the assessment process.

E.1 LEGISLATION

TITLE OF LEGISLATION	RELEVANCE	RESPONSE
The National Environmental Management Act (1998) (NEMA)	*An Application for Authorisation of Listed Activities in terms of Section 24 of the NEMA is applicable.*	*This application is in process.*
Environmental Impact Assessment Regulations, 2014 (as amended in 2017)	*Certain activities as listed in GNR 327 and 325 of the EIA Regulations 2017 are applicable but none that are listed in GNR 324. A Scoping and EIA Process needs to be conducted in support of an Application in terms of Section 24 of NEMA.*	*This application is in process.* *Refer to Section D for the applicable list of Activities.*
National Environmental Management: Biodiversity Act 2004 (NEMBA)	*The NEMBA requires a special authorisation for any activity which may impact on threatened or protected species or ecosystems as specified in terms of Section 52.* *The Alien and Invasive Species Regulations (2014) under the Act specify the legal obligations of landowners in respect of invasive plant and animal species that occur on their properties.*	*The land is not located within a critically endangered or endangered ecosystem listed in terms of Section 52 of the NEMBA as identified by GN-R1002 of 9 December 2011. No endangered species listed in terms of this Act occurs on the site. No alien and invasive species will be introduced. No NEMBA authorisation is required.*
National Environmental Management Waste Act 2008 (NEMWA)	▪ *The activity will <u>not</u> produce general solid waste for temporary storage during the construction and operational phases in excess of the stipulated thresholds.* ▪ *The activity will <u>not</u> produce wastewater effluent during the construction and operational phases in excess of the stipulated thresholds.* ▪ *The Health Care facility <u>may</u> produce hazardous Health Care Waste during the operational phase.*	*The activity would not require a Waste Licence for the temporary general and hazardoues waste storage in a dedicated waste transfer & storage site as the thresholds indicated in NEMWA will not be exceeded. A waste license in termf of NEMWA is not required.*
National Environmental Management Protected Areas Act 2003 (NEMPA)	▪ *The site is not located in a protected area.* ▪ *The site is <u>not</u> located within 10km of a National Park.* ▪ *The site is <u>not</u> located within a 5km protected area buffer of the provincial Nature Reserve.* ▪ *The site is not located within a national or provincial protected area expansion strategy area.*	*No relevance and no action required.*
National Environmental Management Air Quality Act 2004 (NEMAQA)	*The proposed urban and agricultural land uses are not listed/regulated in terms of the Act. However, the National Dust Control Regulation under GN-R827 of 1 November 2013 specifies dust-fall rates for residential areas.*	*Precautionary measures must be employed to minimise dust-fall during residential development/preparation but an Air Emmissions License is not required.*

National Water Act (1998) (NWA)	▪ *Potable water shall be provided by the local municipality.* ▪ *Section 21(b)(c)&(i) of the Act requires a water use authorisation for storing water in a dam and altering the bed & banks and flow of a watercourse.* ▪ *Section 21(f)&(g) requires a water use authorisation for disposing of effluent waste.* ▪ *Section 144 requires that the 1:100 year flood line must be indicated on residential development plans.*	*A water use authorisation must be obtained for the relevant water uses that are required for the proposed township construction of storm water management structures [S21(b)(c)(i)] within two drainage lines and for the wastewater treatment plant and re-use of waste water [S21(f)&(g)]. The site is not subject to flooding by a 1:100 year flood. A water use license application process with DWS is being prepared.*
National Health Act (2003)	*This Act provides for the prevention of nuisance and offensive conditions and provides for municipal health services including water quality monitoring, waste management, and environmental pollution control. Activities that may potentially affect the health of any person, is required to comply with prescribed norms and standards as provided in the Act.*	*Environmental health norms and standards as prescribed by the Act must be integrated into the planning and design of the proposed township., specifically wrt the wastewater treatment plant, on-site general and hazardouse waste storage sites.*
The National Heritage Resources Act (1999) (NHRA)	*Section 38 of the Act provides that any person who intends to undertake a development must at the very earliest stages of initiating such a development, investigate the impact on potential heritage resources. Secondary information indicated that Heritage Resources and graves occur within the development area.*	*A Heritage Impact Assessment Authorisation and a Permit for removal of graves must be obtained before commencement with any construction activity. This process is currently underway in terms of the NHRA requirements.*
The National Forest Act (1998) (NFA)	*Provides for the protection of certain listed tree species.*	*A permit must be obtained before the removal of NFA protected species as part of the township development.*
Conservation of Agricultural Resources Act (1983) (CARA)	*The Act regulates the utilization of land for cultivation purposes, stipulates requirements for cultivation and the responsibility of the land user regarding the prevention of soil erosion, restoration of eroded land, protection of wetlands and watercourses and responsibilities to combat invader listed invader species and bush encroachment.*	*A substantial portion of the land will remain usable for agriculture (cultivation). The required soil conservation & alien and invasive bush encroachment control methods must be applied as required and is included in the EMPR.*
The National Veld and Forest Fire Act (1998)	*The Act requires a landowner to prevent veld fires and maintain fire breaks in conjunction with the Lowveld & Escarpment Fire Prevention Agency. Veld fires can occur on the remaining agricultural land.*	*During the construction and operation of the township the land user shall ensure that veld fires are prevented and shall comply with the Regulations and requirements of the Lowveld & Escarpment Fire Prevention Agency.*
Mpumalanga Nature Conservation Act (1998)	*Provides for the protection of certain plant species and animal species.*	*A permit must be obtained before any removal of protected species.*
Agricultural Pests Act (1983) GNR442 of 6 June 2015 - Control Measures	*The Act prohibits the movement, keeping, planting or cultivation of certain plants and the removal, keeping, planting or cultivating any specified plant originating from any specified area to or in any other specified area.*	*The urban cultivation project must abide by the control measures and shall report pests and obtain a permit for any regulated activity.*
Civil Aviation Act (2009)	*Any activities that potentially could affect civil aviation military aviation or military areas must be assessed by SACAA in terms of the SACARs and South African Civil Aviation Technical Standards (SA-CATS) to ensure aviation safety.*	*The land is not located near to an airfield, aerodrome or military instal-lation and the development would not constitute an aviation obstacle and would not require any authorisation.*

E.2 POLICIES AND PLANS

TITLE OF POLICY OR PLAN	RELEVANCE	RESPONSE
Mpumalanga Biodiversity Sector Plan 2013 (MBSP) **Terrestrial Biodiversity Priority Assessment**	*The **terrestrial biodiversity priority assessment** of the MBSP presents the following classification of the site:* ▪ *A small portion of the site (±0.6%) is situated within a critical biodiversity area (CBA).* ▪ *The site is not situated within an ecological support area (ESA).* ▪ *The majority of the site (±78%) is situated within "other natural areas" (ONA) as defined in terms of the MBSP (2014).* ▪ *The remainder of the site (±21%) is located on heavily or moderately modified old lands.* *It is important to note that the Environmental Screening Tool indicates a completely different terrestrial biodiversity sensitivity rating for the site and indicates the sensitivity to be "HIGH", which is completely inconsistent with the MBSP.*	*It is clear that the MBSP 2013 required updating as significant land cover changes occured over the past 12 years that completely alter the aquatic priority assessment of the site.* *Section 6.1.2 of the MDSP provides guidelines for identifying inconsistencies between CBA maps and ground-truthed land cover.* *The proposed development would therefore not jeopardise the biodiversity priorities outcomes as indicated in the MBSP.* *The comment from MTPA on these findings are being requested.*
Mpumalanga Biodiversity Sector Plan 2013 (MBSP) **Aquatic Biodiversity and Freshwater Ecological Priority Assessment**	*The **aquatic biodiversity** and the **freshwater ecological priority assessment** (FEPA) of the MBSP based on the 2003 Mpumalanga Biobae Assessment and the 2010 Land Cover assessment, presents the following classification of the site:* ▪ *The site is situated within a surface strategic water resource area.* ▪ *A small portion of the site is situated within a critical biodiversity wetlands (±0.2%).* ▪ *The site is situated (±97%) within an aquatic ecological support area for wetlands, and wetland clusters,* ▪ *±78% of the site is located within an important sub-catchment in support if aquatic species.* ▪ *The site is not located in other natural areas as defined in the MBSP.* ▪ *±22% of the site is located in heavily to moderately modified old lands with no aquatic biodiversity value.* *It is important to note that the Environmental Screening Tool indicates a completely different aquatic biodiversity sensitivity rating for the site and indicates the sensitivity to be "LOW", which is completely inconsistent with the MBSP.* *The comment from MTPA on these findings are being requested.*	*ESAs are particularly important as buffers around CBA rivers and wetlands. However, on-site verification confirmed that human settlement within this area have reduced the importance of the watercourses to such an extent that the aquatic biodiversity conservation priorities have been lost altogether.* *It is clear that the MBSP 2013 required updating as significant land cover changes occured over the past 12 years that completely alter the aquatic priority assessment of the site.* *Section 6.1.2 of the MDSP provides guidelines for identifying inconsistencies between CBA maps and ground-truthed land cover.* *Storm water run-off from the proposed township towards the CBA wetlands and river ±400m west of the site may however jeopardise the biodiversity priorities outcomes as indicated in the MBSP. Every effort must therefore be incorporated in the township layout and storm water design to mitigate potential new impacts on these watercourses.*

E.3 PROVINCIAL, MUNICIPAL & OTHER DEVELOPMENT PLANNING FRAMEWORKS AND INSTRUMENTS

MUNICIPAL PLANNING FRAMEWORKS	RELEVANCE	RESPONSE
Mpumalanga Provincial Spatial Development Framework (2019)	*Acornhoek has been identified as a "Secondary Growth Centre" for investment and institutional development in the form of infrastructure development, human capacity building, and provision of financial support to local business. Acornhoek is thus identified as a Strategic Objective for sub-regional/local trade and manufacturing.*	*The proposed township is in line with Acornhoek nodal growth objectives as identified in the MSDF.*
Ehlanzeni District Municipality Local Economic Development Strategy	*Transportation and corridor development along the R40 needs to be formalized, integrated and integrated to streamline development projects and tourism.*	*The proposed township is in line with development strategy objectives as identified in the EDM LED as it will promote development and tourism along the R40 development corridor.*
Ehlanzeni Spatial Development Framework 2010	*The Arthur Seat area has been zoned for the inclusion of higher settlement densities.*	*The proposed township provides opportunity for future residential development.*
The Bushbuckridge Local Municipality Local Economic Development Plan 2010-2014	*The Bushbuckridge spatial prioritisation incorporates the following project scopes complimentary to the proposed development:: education projects, water projects, roads, and stormwater, waste disposal projects, greening, street lighting and paving.*	*The proposed township is in line with the spatial prioritisation of infrastructure projects.*
Bushbuck Ridge Municipal Integrated Development Plan (IDP) 2020-2021	*The IDP (2020-21) aligns with the Spatial Development Framework (2017) in recognition of the Acornhoek area as an important urban development node. The farm Arthursseat has been identified as a Strategic Development Area (SDA No: 5) with certain infrastructure provision priorities in support of socio-economic development programs and goals.*	*The proposed development aligns with the socio-economic development objectives of the IDP and will provide a high standard of urban infrastructure.*
The Bushbuckridge Municipal Spatial Development Framework, 2017	*The R40 is a primary corridor that provides opportunities for economic development The proposed site is identified as a future infill expansion area.*	*The proposed development aligns with all spatial development outcomes of the SDF.*
Bushbuck Ridge Municipal Land Use Management System (LUMS)	*The land is zoned "Agriculture" in terms of the Municipal Land Use Management System.*	*An Application for Township Establish-ment has been submitted in order to proclaim and develop the proposed township.*
Bushbuckridge Local Municipality Integrated Waste Management Plan 2019	*The Plan refers to implementation of the waste management hierarchy that refers to waste prevention, waste reduction, waste separation at source, waste reuse, recycling, recovery throughout the municipal areas.*	*The project allows for the incorporation of the IWMP objectives which can be applied in the site planning and architectural building designs to include temporary waste storage yards for waste separation at source.*
Municipal Environmental Management Framework	*An EMF for this municipality has not been approved.*	*Not applicable.*
World Heritage Convention Act, 1999 and UNESCO Man & Biosphere Prg.	*The site is not located in the core or buffer area of the Kruger-to-Canyons Biosphere Region.*	*Not applicable.*

E.4 REGULATIONS, GUIDELINES, NORMS & STANDARDS

TITLE OF GUIDELINE, NORMS OR STANDARD	RELEVANCE	RESPONSE
DEA (2017), Guideline on Need and Desirability	*The EIA Regulations stipulates that "Need & Desirability" of a project must be considered in the EIA process. The Guideline aims to ensure that all the relevant sustainability considerations have been taken into account.*	*A Need & Desirability assessment according to the Guideline is incorporated into Section G of this report.*
DEA (2010) IEM Guideline 7 Public Participation	*The EIA Regulations stipulates that "Public Participation" must be incorporated in the EIA process. The Guideline aims to ensure that a fair Public Participation Process is followed.*	*A Public Participation Process according to the guideline is incorporated into Appendix F of this report.*
DWAF (2004) Guidelines on Protecting Groundwater from Contamination	*Guidelines on urban agriculture, burial site and waste can pollution groundwater resources and suitable monitoring and mitigation measures must be followed accordingly.*	*Proposed recolation of existing burial sites, urban agriculture and waste water treatment may pose risk to groundwater resources to be managed accordingly.*
The National Building Regulations Part XA. SANS 10400-XA	*The Standard provides the requirements that building designs must adhere to regarding environmental sustainability and the energy use of buildings.*	*Architectural designs as discussed in Section I2 of the Report must comply with the SANS Regulations.*
SANS 10103:2008 The measurement and rating of environmental noise	*The Standard provides a guiding method for environmental noise impact assessments and to predict noise impacts at a certain noise level/distance from noise.*	*A basic noise assessment is incorporated in Section F15 of the Report.*
NEMAQA: Listed activities and minimum emission standards 2007 (as amended).	*Any development must incorporate the minimum emission standard if an activity on the site will produce listed/regulated emissions.*	*No activity as part of the proposed township will produce listed/regulated emissions.*
NEMAQA: Ambient air quality standards 2009.	*The development should not change the characteristics of the ambient air quality above the minimum air quality standards.*	*No activity as part of the proposed township is expected to change the ambient air quality above the listed standards.*
NEMWA: Draft national norms and standards for the treatment of organic waste (2021)	*The proposed development must incorporate facilities and methods in the operational phase that need to comply to the minimum standards if organic waste will be treated on-site.*	*Organic waste can be generated on site and used as organic soil fertiliser; however such facility is not currently foreseen.*
NEMWA: Guidelines on separation of waste at source (2018)	*The guideline provides methods for waste separation on-site before waste removal and disposal to facilitate the waste reduction and waste re-use.*	*The implementation of waste separation on site is a feasible and reasonable waste management activity – refer to Section I1-4.13 of the Report.*
NEMWA: National Norms and Standards for the Remediation of Contaminated Land and Soil Quality (2014).	*The correct remediation procedures must be followed when soil is contaminated to ensure the prevention of further contamination and the correct method of disposal.*	*In the event of soil contamination due to accidental spillage e.g. at the proposed fuel station, these norms and standards shall apply.*
NEMA: Relevant Specialist protocols GN R320 & GN R 1150 (2020)	*EIA Protocol Guidelines for environmental specialist must be incorporated in EIAs.*	*The relevant Environmental Specialist Reports a identified in the Scoping Process have been conducted according to the requirements of these Protocols.*

RECEIVING ENVIRONMENT

In compliance with GN R326 Appendix 3 Section 3(h)(iv), this section provides information on the environmental attributes associated with the development footprint alternatives. Where necessary, the information provided in the scoping report has been verified by specialist / technical professionals and this report is brought in line with the findings of such professionals (see attached reports Appendix D). This section thus highlights any potential impact that the selected development alternatives may pose on the receiving environment. The methods used to assess the environmental attributes of the site were done by way of specialist terrain survey; GIS map overlay analysis, and secondary verifiable data analysis.

F.1 PROPERTY AND LAND-USE ZONING

F1.1 STUDY AREA PROPERTY DESCRIPTION		Site 1	Site (2) Alternative
Property description or physical address of the study area	Province	*Mpumalanga*	*No alternative property/site forms part of this Scoping and EIR assessment.*
	District Municipality	*Ehlanzeni District*	
	Local Municipality	*Bushbuckridge*	
	Ward Number(s)	*16*	
	Farm name and number	*Arthursseat 214-KU*	
	Erf / Portion number	*27*	
	Size of the study area	*496 941.19 m²*	
Other properties included in the study area	Farm name and number	*N/A*	
	Erf / Portion number	*N/A*	
	Size of the study area	*N/A*	

F1.2 PROPERTY LAND-USE ZONING	Selected site
Current zoning as per local municipality LUMS.	*Agricultural*
Earmarked zoning Local Municipality SDF.	*Future development area.*
Change of land-use/consent use required?	*Yes, by way of a SPLUMA Township Establishment Application*
Registered servitudes?	*An unregistered water pipeline servitude cross over the property.*

F1.3 LOCALITY OF THE PROPOSED DEVELOPMENT SITE OF THE PROPERTY

The proposed urban development will cover the entire property as more clearly indicated on the Site Plan (Refer to Section C of this report). The property is also hereafter referred to as the "site" or the "development site".

F1.4 LAND-USE SUITABILITY, IMPACTS, AND RISKS

The property is vacant and has historically been used for informal agriculture following its zoning. Exponential population growth over the past 10 years has changed the rural land use of the property and surrounding area. Medium- to the high-density residential settlement now surrounds the property. The previous rural agricultural character of the area has been lost and aerial photo analysis confirms that no agricultural activity occurred on the property over past years. The proposed mixed-use urban development would therefore not impact any current land use and would also not compromise the earmarked land use of the property as indicated in the Municipal SDF.

F.2 TERRAIN

F2.1 BROAD LANDFORM(S) THAT BEST DESCRIBES THE AREA IN WHICH THE SITE IS LOCATED

Landform Description	Site	Comment
Plateau / Ridgeline	*No*	*Urban development may be subject to uncompromising building restrictions.*
Side slope of mountain/valley	*No*	*Urban development may be subject to cut-and-fill land stability limitations.*
Valley bottom	*No*	*Urban development may be subject to flooding.*
Undulated low hill country	*Yes*	*Urban development may be subject to its position in the local landscape.*
Undulating plains country	*No*	*Urban development may be subject to its position in the local landscape.*

F2.2 POSITION WITHIN THE LOCAL LANDSCAPE THAT BEST DESCRIBES THE SITE

Position of terrain units	Site	Comment
(1) Crest	*Yes*	*The crest area is suitable for urban development (see site attributes below).*
(2) Upper mid-slope	*Yes*	*The upper-mid slope is suitable for urban development (see site attributes below).*
(3) Mid-slope	*No*	*N/A*
(4) Foot-slope	*No*	*N/A*
(5) Valley bottom	*No*	*N/A*
(5) Floodplain	*No*	*N/A*

F2.3 TERRAIN SUITABILITY IMPACTS AND RISKS

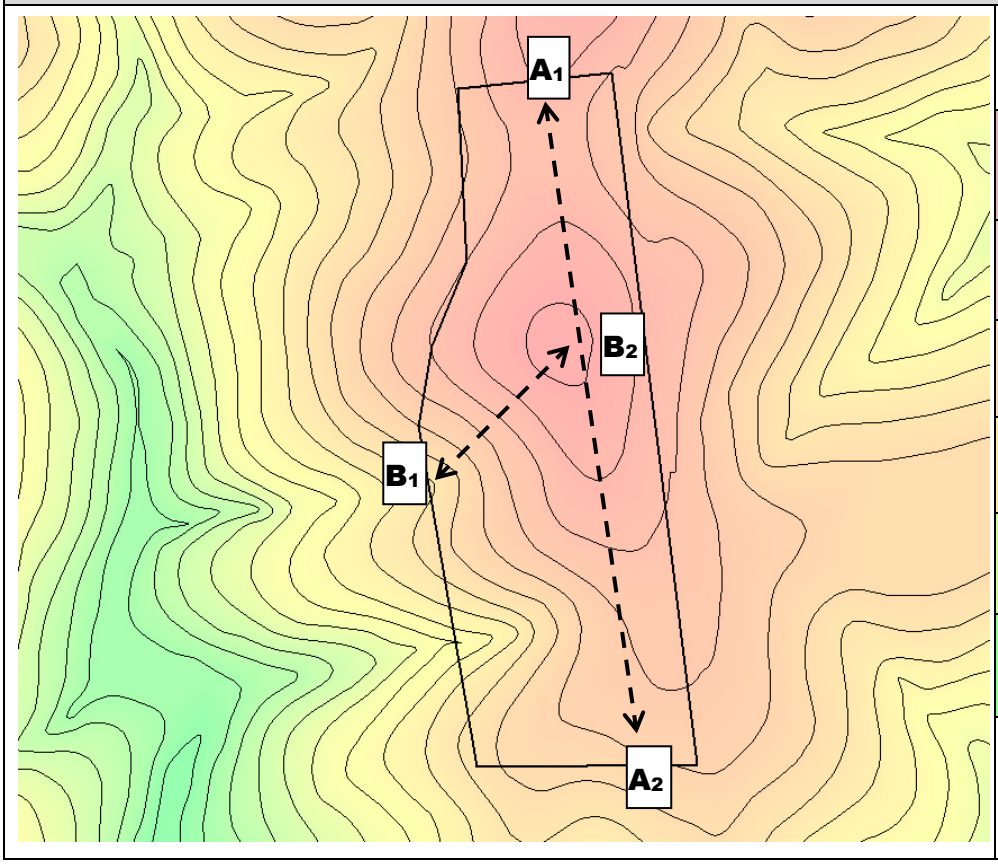
Regionally the development site is located in the undulated Lowveld hill-country between the foothills of the Drakensberg escarpment and the Lowveld plains. The terrain position of the site within an upper-mid-slope to crest terrain unit within the local landscape would pose no impact or risk of land instability and flooding that can sometimes be associated with some of the other landforms and terrain units.

F.3 GRADIENT / SLOPE

F3.1 SITE ALTITUDE		Terrain unit (1)	Terrain unit (2)	Comment
Range – meters (m)		*±660-675m*	*±630 -660m*	*NONE*
Elevation difference	(E)	*±15m*	*±30m*	*NONE*
Elevation distance	(D)	*±1170m (A_1A_2)*	*±210m(B_1B_2)*	*NONE*
Slope %	(E/Dx100)	*±1.3%*	*±14%*	*NONE*

Height : horizontal distance (m)	Slope % of gradient	Terrain unit (1)	Terrain unit (2)	Comment
1:20 – 1:15	1-5%	*X*	-	*Overall highly suitable for urban development*
1:15 – 1:10	5-10%	*X*	*X*	*Overall good suitability for urban development*
1:10 – 1:7,5	10-15%	-	*X*	*Overall suitability for urban development*
1:7,5 – 1:5	15 – 20%	-	-	*Overall limited suitability for urban development*
Steeper than 1:4	>25%	-	-	*Overall poor suitability for urban development*

F3.2 MAP: SLOPE ANALYSIS OF THE SITE AND SURROUNDING AREA

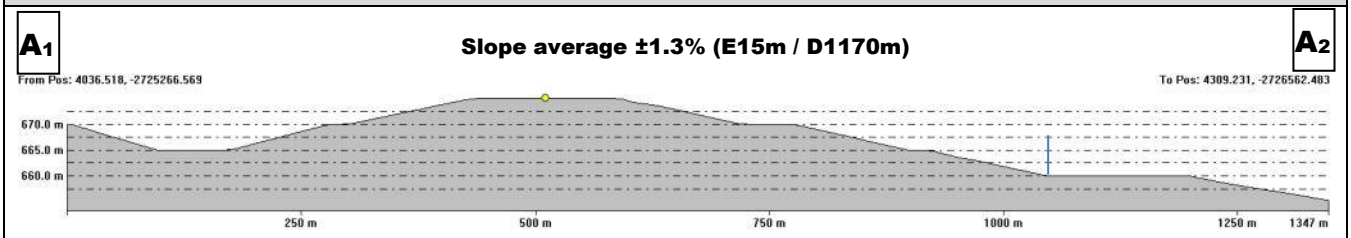


LEGEND OF TERRAIN UNITS

- Crest
- Upper-mid-slopes
- Mid-slopes
- Foot-slopes
- Valley Bottom
- Floodplain

Lines A_1A_2 and B_1B_2 refer to the longitudinal slope cross sections in Figures H3/3/1 & 2.

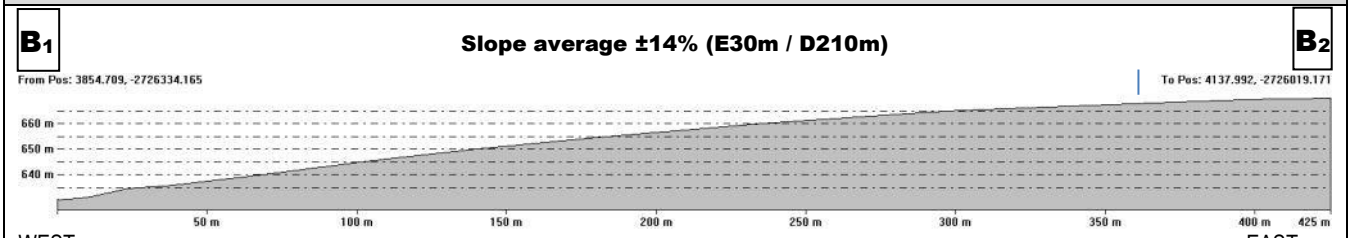
F3.3.1 LONGITUDINAL SITE CROSS-SECTION: CREST TERRAIN UNIT



NORTH-SOUTH

Crest	Upper-mid-slopes

F3.3.2 LONGITUDINAL SITE CROSS-SECTION: UPPER-MID-SLOPE TERRAIN UNIT



WEST EAST

Upper-mid-slopes	Crest

F3.4 GRADIENT SUITABILITY, IMPACTS, AND RISKS

"Slope", concerning a specified portion of land, means the vertical difference in height between the highest and the lowest points of that portion of land, expressed as a percentage of the horizontal distance between those two points. The slope of the site is overall suitable for urban development and drainage of storm water and sewer services as indicated in the Engineering Services Report (Appendix D10).

F4 GEOLOGY AND SOIL CONDITIONS

F4.1 UNDERLYING GEOLOGY

*According to the Geological Map (1:250 000, 2430 Pilgrims Rest), the area of investigation is underlain by **medium to coarse-grained granite-gneiss** of the Swazian Erathem. The granitic-gneiss rock gives rise to sandy-loam soils that are characteristic of the elevated terrain units of the undulated Lowveld hill-country.*

F4.2 BROAD SOIL FORM

The soil information of the site was obtained from the National Land Type survey (Schoeman et al, 1984) map sheet 2430 Pilgrim's Rest (1:250 000) which indicates that the site is located within Land Type Ab41. The sandy-loam Hutton (Hu) soil form is dominant within the crest and upper-mid-slope terrain units consisting of red-yellow appeal freely drained soils, (meaning free from water logging) and does not indicate any limitation for agricultural activities.

F4.3 BROAD SOIL FORM CHARACTERISTICS

Soil form	Colour & Structure	Infiltration rate	Internal drainage	Water supplying capacity		Limiting conditions for root penetration	Depth mm	Erosion hazard (disturbed)	Nutrient status and fertility	Mechanical limitations	Topsoil texture	Average Clay %
				A Hor	B Hor							
Hutton	Red & loamy	Medium to low	Medium to low	Low	Low	None	0-600	Moderate to high	Moderate	None	SA-Lm	15-35%

Soil type; soil depth (mm); soil texture: sand (Sa)/clay (Cl) /loam(L), Clay content (%)

The above table indicates the Hutton soil form to be generally suitable for cultivating a wide range of crops and thus enhances the desirability to include the urban-agricultural land use within the proposed township. The suitability of the soils for urban development was determined by way of an on-site geo-technical investigation, conducted by Davel & van Huyssteen Consulting Engineering Geologists (see App 4.1) who founded the following:

F4.4 GEO-TECHNICAL SOIL PROPERTIES FOR URBAN DEVELOPMENT

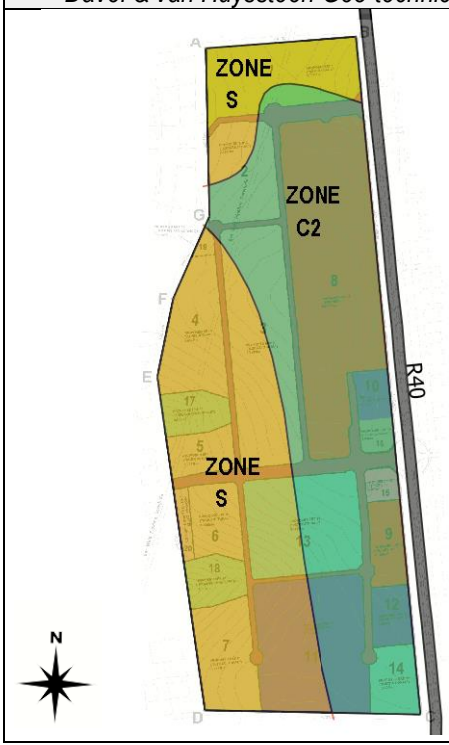
Geo-technical properties	Occurrence on the site	
Shallow water table (less than 1.5m deep)	*No*	*Not expected on crest and upper-mid-slopes.*
Seasonally wet soils (often close to water bodies)	*No*	*No perched water table was detected.*
Dolomite, sinkhole, or doline areas	*No*	*N/A*
Unstable rocky slopes or steep slopes with loose soil	*No*	*N/A*
Dispersive soils (soils that dissolve in water)	*No*	*N/A*
Soils with high clay content (clay fraction more than 40%)	*No*	*N/A*
Compressible / Collapsible soils	*Yes*	*Soil zones S and C2 (ref App. 4.1 – page 8)*
Any other unstable soil or geological feature	*No*	*N/A*
Rocky excavation limitations	*No*	*Suitable excavation 1.3m - >3m.*

F4.5 OVERALL GEO-TECHNICAL SOIL SUITABILITY, IMPACTS, AND RISKS

- *Both Soil Zones "C2" and "S" are overall suitable for urban development, including a fuel station.*
- *The soil indicates adequate infiltration and drainage which is favourable for urban development purposes.*
- *Medium to low internal drainage of the soils will not be problematic for the proposed on-site sanitation.*
- *Sandy-loam soils of these Soil Zones carry the risk of a compressible and collapsible grain structure but can be mitigated by implementing special building foundation measures as indicated in the Geo-technical Report (App D4.1, page 9 & 10)*
- *The soil is moderately to highly susceptible to erosion but this can be mitigated by implementing erosion protection measures as discussed in more detail in the EMPr (App G).*
- *The overall soil excavation properties are suitable for the installation of underground structures and for the relocation of graves to a cemetery on site.*

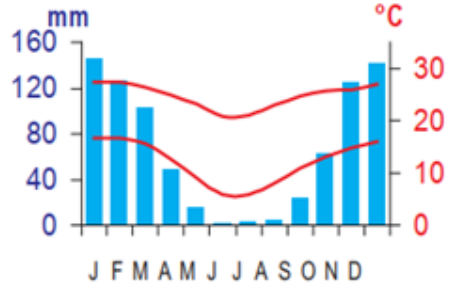
GEO-TECHNICAL SITE MAP

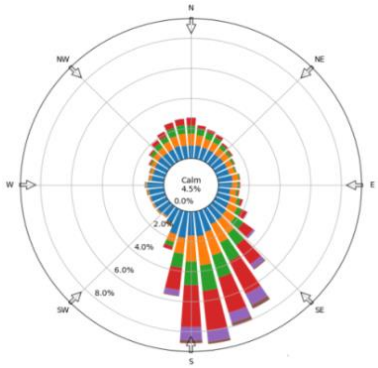
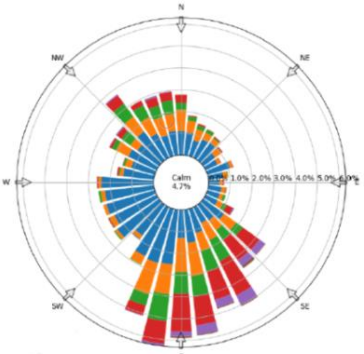
Davel & van Huyssteen Geo-technical Report



F.5 CLIMATE

Long-term climate information for this area was obtained from the South African Atlas for Climatology and Agro-hydrology (SAACA) and FAHS Hoedspruit. The following climate diagrams indicate a range of climate conditions that the area experience. The property is situated in the Lowveld hill-country which occurs along the eastern foot-slopes of the Drakensberg escarpment, where the climate is sub-tropical with summer rainfall and dry winters. The region receives 90% of its total annual rainfall during the period October to April with the highest rainfall in January and February.

F5.1 SUB-REGIONAL TEMPERATURES	SUB-REGION CLIMATE PARAMETERS	
	*800mm*	*MAP: Mean Annual Precipitation*
	25-30%	*APVC: Annual Precipitation Variation Coefficient*
	30-32ºC	*Mean mid-summer temperatures*
	15-17ºC	*Mean mid-winter temperatures*

F5.2 SUB-REGIONAL AIR MOVEMENT		
Prevailing air movement during mid-summer	*Wind speed (km/h)*	*Prevailing air movement during mid-winter*
	*Calm <3* *3 - 8* *8 - 11* *11 - 16* *16 - 25* *25 - 32* *32+*	
The major regional movement of air consists of gentle prevailing winds with occasional strong south to south-easterly winds. The local air movement poses no limitation on the proposed township development.		

F5.3 EMERGING BASELINE CLIMATE VARIANTS FOR THE PROJECT AREA				
Climate	**Baseline**	**2050 Projection**		
		Change	**Percentage**	**Impact*** **
Average Temperature	22°C	▲ ±24°C	▲ ±9%	Low
Very Hot Days* (Per Annum)	45 days	▲ ±50 days	▲ ±9%	Low
Average Rainfall	±800 mm	Neutral	Neutral	Low
Extreme Rainfall**	Not Available	1 event/annum	N/A	Low

Data Source: Le Roux *et al.,* 2019 (CSIR)

*A very hot day is a day when the max temp exceeds 35°C.

**An extreme rainfall event (including severe thunderstorms and lightning) is defined as 20mm of rain occurring within 24h over the 8x 8km grid point.

**Impacts are predicted by low, medium, and extreme

The climate change predictions up to 2050 (CSIR), indicates minor temperature, heat stress and rainfall variances over eastern South Africa which poses a "Low" climate change impact prediction.

F5.4 EMERGING CLIMATE-INDUCED HAZARDS POTENTIAL OF THE PROJECT AREA			
Hazards	**Current Status**	**Projected Status (2050)**	**Trend**
Likelihood of Fire	Low	Low	Neutral
Likelihood of Flooding	Medium	Low	Decrease
Likelihood of Drought	Low	Low	Neutral
Likelihood of Heat Stress	Medium	Low	Decrease

Data Source: Le Roux *et al.,* 2019 (CSIR)

F5.5 BROAD CLIMATE CHANGE VULNERABILITIES OF LOCAL WATER RESOURCES AND SUPPLY			
Environmental Aspect	**Current Status** (Municipal area)	**Projected Vulnerability (2050)** (Municipal area)	**Project Vulnerability**
Local Water Supply	*The water balance is positive due to the local Inyaka Dam. Water supply is 51% (0.51) above the demand for surface water usage.*	*The water use is expected to increase thus water supply is expected to decrease to 33% (0.33) but remains above the demand.*	*None*
Surface Water	*The foothills of the Drakensberg is a high potential water recharge zone.*	*No expected decrease in rainfall, thus unchanged recharge to the Inyaka Dam.*	*None*
Groundwater	*The area is a medium potential water recharge zone with little groundwater dependency.*	*A minor decrease in ground water recharge can be expected with little to no risk of groundwater depletion.*	*None*

Data Source: Le Roux *et al.,* 2019 (CSIR) with data interpretation based on the local municipal area.

F5.6 CLIMATE AND CLIMATE CHANGE IMPACTS, PROJECT ADAPTABILITY AND MITIGATION

- *The global climate change predictions towards 2050 (CSIR) poses a "LOW" impact in the sub-regional area where the proposed township development is proposed. Although the normal climatic conditions also pose a low impact on urban development the central Lowveld naturally experiences a hot sub-tropical climate which may result in increased energy use, water use and greenhouse gas emissions (activities contributing to global climate change). Therefore mitigation measures such as architectural building design, facilities design, landscape design as well as efficient utilisation of resources and reduction of waste should be considered in the planning, construction and operation of the township.*

Temperature effects and regulation

- *The westerly slope orientation of the project site will result in afternoon radiation on buildings, which will require energy usage for indoor cooling. However, building design and outdoor landscaping can mitigate heat radiation to a large extent. Collectively landscapes can absorb heat radiated from buildings and roads in the form of vegetation buffers and tree plantings and by facilitating the flow of prevailing cooling winds to reduce the effects of increased temperatures. The cooling effect of well-landscaped open spaces can contribute to energy and resource efficiency.*
- *Energy use reduction can also be achieved through energy-efficient building design. In this regard, the National Building regulations Part XA1 and XA2, as well as SANS 204, must be applied. As a minimum, aspects such as type of building material, roof overhangs, building and facade orientation, glazing, insulation, and hot water heating should be taken into account. Vertical development makes spaces for green horizontal landscapes which can reduce the urban heat island effect.*
- *Temperature and heat stress management with regard to the proposed urban agriculture land use can be achieved by artificial shading of crops with appropriate "shade netting", which also protects against hail.*
- *The roof of the buildings also holds potential for solar electricity generation and water heating.*

Rainfall effects on water resources and water use

- *Thunderstorm activity with occasional hail may often occur which may lead to flash flooding downstream of the proposed township, however, this can be mitigated by incorporating sustainable storm water drainage systems in the township layout and design (see App D10.2 – Storm Water Management Plan).*
- *Water saving and alleviation of water demand can be achieved by re-use of treated wastewater for urban agriculture and non-consumptive use such as garden irrigation within open spaces in the proposed township.*
- *The project holds potential for rainwater that can provide a substantial volume of water for non-consumptive uses in the township.*
- *Rivers and wetlands that hold a vital resource for human existence are vulnerable to climate change and therefore require special protection. The existing degraded ecosystem functionality of seasonal watercourses that originates on (see F6.3) the project site can be restored by implementing in-stream storm water mitigation measures.*
- *The nature of the proposed urban agriculture land use can contribute to run-off absorption and local groundwater recharge which can benefit the base flow of the nearby watercourses that may be affected by changing climate.*

Overall contribution in reduction of global greenhouse gasses

- *The integrated nature of the proposed land uses creates a compact urban hub that would promote pedestrian movement and reduce the dependency on vehicular movement within the township with the resultant lower contribution of vehicle exhaust emissions (greenhouse gasses).*
- *As the intended urban agriculture would focus predominantly on cultivation, the greening of the local urban landscape may contribute to higher levels of local carbon dioxide absorption as well as provide a cooling effect on surrounding high radiation land uses.*
- *The project holds potential for on-site waste separation for re-use and recycling and compost making by re-using organic wastes from households and urban agriculture during the life of the project.*
- *The on-site separation of waste for re-use and recycling indirectly increase the available capacity of the municipal landfill and reduce the generation of methane (greenhouse gas) that emanated from landfills.*

Summary of climate aspects

- *Overall, local climatic conditions and local climate change predictions would not pose any significant impact with regard to the proposed development and operation of the township and the project's contribution with regard to global climate change is expected to be very low.*

F.6 HYDROLOGY (SURFACE DRAINAGE)

F6.1 REGIONAL HYDROLOGY

The site is located within the Sabie-Sand Rivers catchment area of the greater Inkomati Water Management Area that comprises east-flowing rivers that originates along the foothills of the Drakensberg Escarpment. The development site is located within quaternary catchment X32B of which the Klein-sand River is the main watercourse. The present ecological state "C" of the local catchment area means that it is largely modified and vulnerable.

Table 6.1.1 Local water catchment description

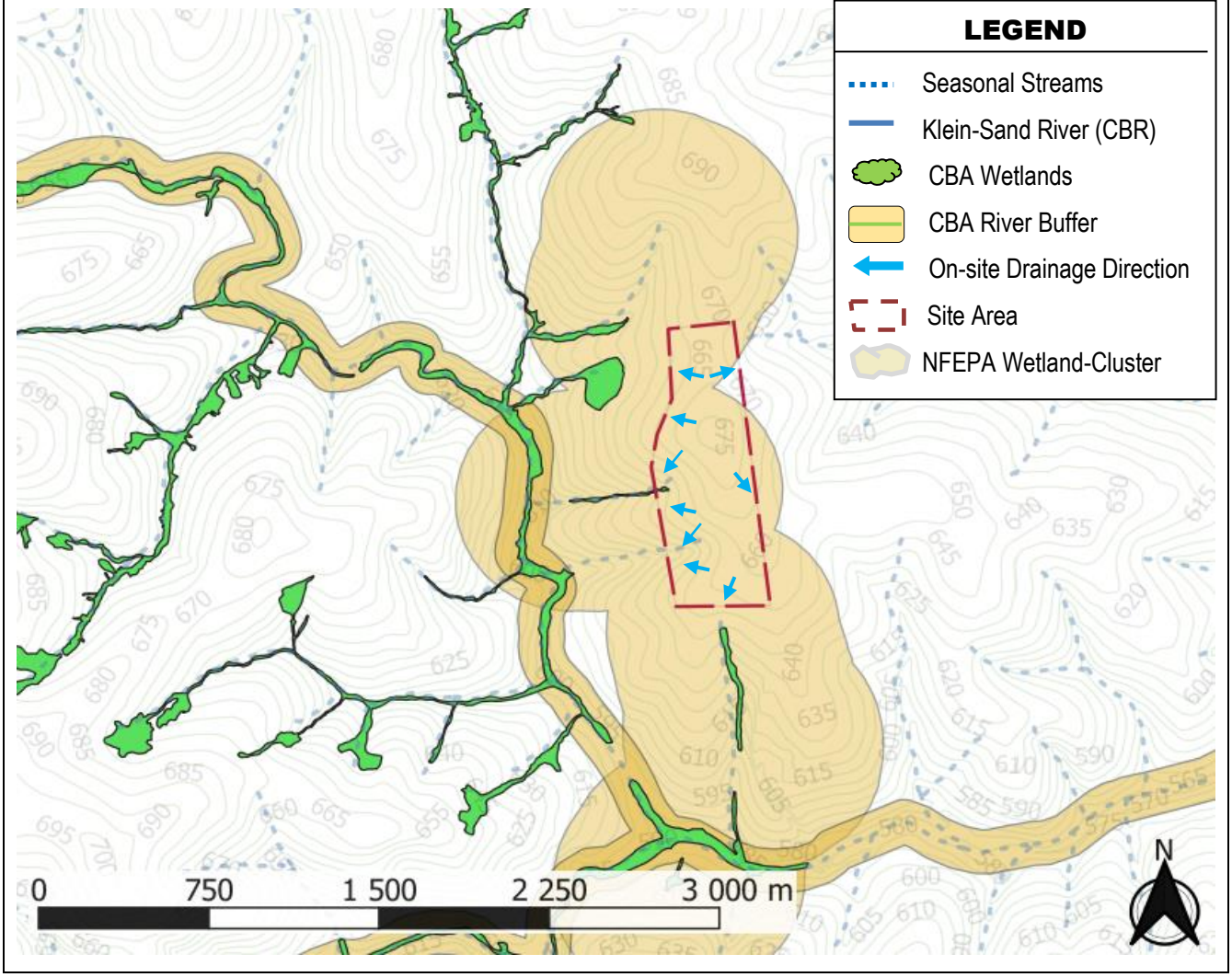
	Catch. Name	Catch. Code	Drainage order	Flow Class	*PES	CBR
Management Area	*Inkomati*	*X*	*N/A*	*Perennial*	*N/A*	*N/A*
Main catchment	*Sabie-Sand*	*X3*	*N/A*	*Perennial*	*D*	*Yes*
Quaternary	*Klein-Sand*	*X32b*	*4*	*Perennial*	*C*	*Yes*

**PES: Present Ecological State / *CBA: Critical Biodiversity River*

F6.2 TERRAIN HYDROLOGY

Three clearly defined seasonal tributaries of the Klein-sand River are located directly west of the development site, of which two originates on the site. Surface drainage from the crest and upper-mid-slope terrain units of the site occurs as sheet-wash towards these small drainage lines. These drainage lines pose clearly defined channel beds and banks and flow occur seasonally directly after a rainfall event. No hillslope seepage wetland is evident on-site, which seems to be confined off-site towards the foot-slopes of the local landscape.

F6.3 NATURAL DRAINAGE AND SENSITIVE WATER RESOURCES (MBSP 2013)



F6.4 SENSITIVE WATER RESOURCES WITHIN OR IMMEDIATELY ADJACENT TO THE SITE

The Mpumalanga Biodiversity Sector Plan (2013) assigned a sensitivity status to vulnerable water resources that require protection as adopted from the National Freshwater Ecological Priority Assessment (2012) as indicated below:

Sensitivity status in terms of the MBSP (2013)					Actual status (2022)
Surface Water Resource Refer to Map H6.5)	Sensitivity	Site Relevance			On-site verification by Aquatic Specialist
		On-site	Off-site	Distance	
Perennial river (Kleinsand River)	*CBR*	*No*	*Yes*	*±470m*	*Highly impacted by urban expansion all-round.*
Seasonal drainage lines	*ESA*	*Yes*	*Yes*	*On-site*	*All ecosystem services lost and drainage lines heavily modified.*
Wetlands	*CBW*	*Yes*	*Yes*	*95m*	*Most hillslope wetlands and wetland functions are irreparably lost .*
Wetland buffer areas	*CBW*	*Yes*	*Yes*	*Total site*	*All buffer areas lost due to human settlement.*

CBR: Critical Biodiversity River / CBW: Critical Biodiversity Wetlands / ESA: Ecological Support Area (Aquatic)

Aerial photo interpretation and on-site verification does however revealed that historic land cover modifications on site and extensive high density urban settlement towards the west and south of the site impacted heavily on the morphology and functioning of the seasonal drainage lines and hillslope wetlands. As a result an overall loss of aquatic biodiversity and freshwater ecosystem services occurred both on- and off-site (see Aquatic Biodiversity Compliance Report – Appendix 7.1). Currently the sensitivity rating of water resources only remains relevant to the Klein-sand River as the seasonal drainage lines and hillslope wetlands and wetland cluster buffer areas have been irreparably lost due to unplanned urban settlement.

F6.5 IMPACTS AND RISKS ON SURFACE WATER RESOURCES AND MITIGATION RECOMMENDATIONS

On-site impacts

- *The present ecological state and environmental sensitivity of the two drainage lines on the site is categorised as "LOW" due to historic and recent land cover modifications and as such aquatic ecological support functionality has been irreparably lost (see Aquatic Biodiversity Compliance Report – Appendix 7.1).*
- *Development across and alongside the two natural drainage lines on the site would thus not pose any direct adverse impact on aquatic biodiversity and ecology.*
- *However, vegetation clearing, cuttings and fillings and infrastructure development in and around these drainage lines can result in soil erosion as the topography of the site naturally drains surface run-off towards these drainage lines.*
- *The development layout will forever alter the natural drainage pattern of run-off towards the drainage lines which will inevitably result in the artificial channelling of run-off and an increase in velocity.*
- *The hardening of the soil surface by buildings and roads will decrease natural infiltration into the sub-soil which will also increase the volume of run-off water that will be concentrated within artificial channels.*
- *Proposed on-site effects of urban development may thus adversely affect off-site watercourses and property.*
- *Furthermore, urban land uses that pose a risk of surface water contamination such as the fuel station and on-site sewer treatment, may impact on water quality and aquatic ecology of the Klein-sand River.*

Off-site impacts

Urban land uses and urban storm water run-off poses a risk to the highly vulnerable Kleinsand River that is situated ±400m west of the site and to the highly modified watercourses and hillslope wetland that conveys surface run-off towards this river. Such risk can be attributed to the following:

- *High velocities and volumes of concentrated storm water will be directed toward the natural drainage lines west of the site which can lead to extensive erosion and potential flooding and loss of property downstream. This in turn can lead to further loss of important downstream aquatic ecological functions on the vulnerable Klein-sand River.*

Recommendations

- *The potential impacts and risks mentioned above can however be mitigated by the implementation of sustainable drainage systems, erosion protection and adequate effluent treatment systems as part of the urban development plan.*
- *The proposed Storm Water Management Plan (App D10.2) proposes efficient ways of achieving the above and can thus address all on-site and off-site impacts associated with surface drainage from the site.*
- *In addition potential surface water contamination from the fuel station and wastewater treatment plant can be prevented*

by way of sufficient design and installation of facilities and stringent management of these sites.

F7. GROUNDWATER RESOURCES

F7.1 REGIONAL GROUNDWATER CLASSIFICATION

According to the Mpumalanga Groundwater Master Plan, the site is located in the Lowveld Hydro-geological Region. The Aquifer Classification Map of South Africa (DWA - August 2012), indicates that the property is located on a minor aquifer region which is a moderately-yielding aquifer system of variable water quality. The hydro-geological map of Vegter (2003) indicates that groundwater is locally located in cracks and intersects of underlying granite bedrock and therefore produces a potentially low-yielding aquifer (2-5 l/s) of potential good water quality.

F7.2 AQUIFER VULNERABILITY

Aquifer vulnerability refers to the tendency or likelihood for contamination to reach a specified position in the groundwater system after introduction at some location above the uppermost aquifer. The Aquifer Vulnerability Map of SA (Directorate Hydrological Services 2013) indicates that the site is located in the least vulnerable region that is only vulnerable to conservative pollutants in the long term when continuously discharged or leached.

F7.3 AQUIFER SUSCEPTIBILITY

Aquifer susceptibility refers to a qualitative measure of the relative ease with which a groundwater body can be potentially contaminated by anthropogenic activities and includes both aquifer vulnerability and the relative importance of the aquifer in terms of its classification (Aquifer Susceptibility Map of SA, Directorate Hydrological Services 2013).

F7.4 AQUIFER SUSCEPTIBILITY MATRIX		AQUIFER CLASSIFICATION		
		Poor	Minor	Major
VULNERABILITY	Least	Low	Low	Medium
	Moderate	Low	Medium	High
	High	Medium	High	High

F7.3 IMPACTS AND RISKS ON GROUNDWATER RESOURCES AND MITIGATION RECOMMENDATION

- *A geo-hydrological risk assessment by Insitu Consulting (see Appendix D51. & D52.) confirms the above "Low" aquifer sensitivity rating and accordingly the risk assessment for the proposed on-site wastewater treatment plant and fuel station indicates a "LOW" risk of groundwater contamination, subject to suitable mitigation measures being applied.*
- *Although the aquifer has a low susceptibility, point-source pollutants from the urban land uses including fuel station, urban agriculture, and on-site wastewater treatment and disposal may pose a "MEDIUM-HIGH" risk of groundwater contamination in the event of inadequate mitigation, management and maintenance of contamination sources.*
- *Therefore stringent design mitigation during the planning period, use of qualified contractors and certifiable construction methods during the construction period as well as the appointment of qualified facility operators, including monitoring and reporting during the lifetime of these facilities are of utmost importance.*
- *It is proposed to relocate multiple graves ±50-60 years of age, located at ±21 existing burial sites on the property to a small cemetery site of ±1600m². No allowance is made for new burials at this site. The proposed cemetery site is evenly sloped, is not subject to a perched water table, the site has deep moderately drained soils and a groundwater table >20m. The proposed cemetery site is also a sufficient distance away from surface water sources (±365m) and off-site boreholes (±571m). According to Żychowski & Bryndal, (2015) pathogenic contamination of soil due to human burial diminishes within a five-year period to insignificant levels, it is thus not expected that on-site re-burial of human remains in excess of 50 years old poses any risk of pathogen contamination on soil and water resources.*

F8. LAND COVER

F8.1 BROAD VEGETATION DESCRIPTION

Acocks (1988) describes the regional vegetation of the area where the property is located as "Lowveld" but a more recent and detailed vegetation classification by Mucina & Rutherford (2006) describes the vegetation of this area as the "Legogote Sour Bushveld" (SVI 9) of the Lowveld bioregion. This vegetation type is reminiscent of the undulated Lowveld hill-country

that occurs along the length of the foot-slopes of the Drakensberg and which can be broadly described as short sparse woodland with scattered short thickets.

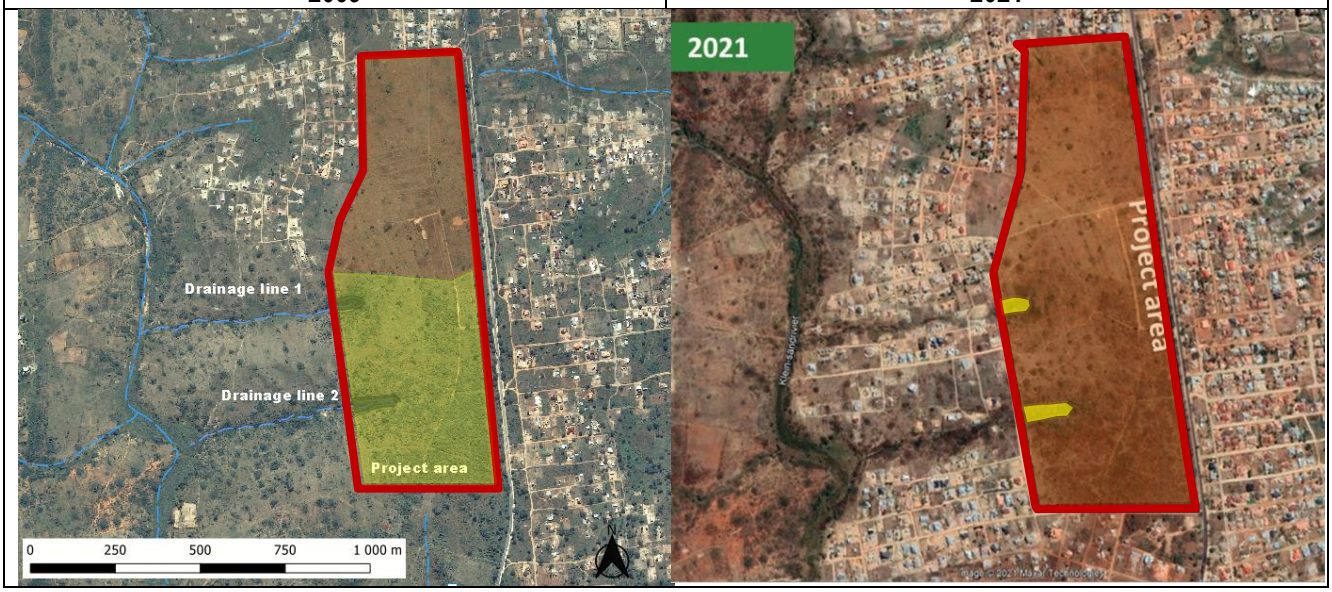
F8.2 VEGETATION / ECOSYSTEM STATUS (IMPORTANCE & SENSITIVITY)

The "Legogote Sour Bushveld" (SVI 9) is listed as an ecosystem that is threatened with a protection status of "Vulnerable" as published in Government Notice R1002 of 9 December 2011 Section 52 of NEMBA. The conservation target as mentioned in the 2006 vegetation classification of Mucina & Rutherford suggests a minimum conservation target of 19%. Currently only ±2% of this vegetation type is statutorily protected and ±2% conserved in private reserves. Regionally ±50% of this vegetation type has been transformed, mainly by plantations, cultivation, and urban development and the remaining 46% is potentially vulnerable.

F8.3 ON-SITE VEGETATION DESCRIPTION

The site was historically used for subsistence cultivation practices, cattle grazing as well as wood harvesting. On-site biodiversity and species verification by Ecologist Koos De Wet (see App. 6.1-6.3) confirms that species composition and structure of the previously occurring natural woodland was severely modified. The remaining naturally occurring woodland species are Sclerocarya birrea spp. caffra (Marula) and Acacia sieberiana (Paper Bark Thorn) which occurs widely spread and at low densities across the site. The natural wood land has extensively been replaced by a dense thicket of the declared invader Dinostachys cinerea (Sickle bush) and alien Lantana camara. Casuarina cumminghamiana that was previously used for agricultural wind-breaks as well as common pine trees also occur on the site. Furthermore, extensive human settlement on the areas surrounding the site occurred over the past ten to fifteen years and the site became completely isolated from the remaining ecological corridors towards the west. As a result the site has lost nearly all of its habitat and ecological functioning to sustain wildlife with possibly only rodent species that remain. The aerial photo analysis below, compares the 2009 land cover condition of the site and the surrounding area with the 2021 land cover condition. The extensive urban settlement around the site occurred and increasing land cover modification on the site is evident which classifies as moderate to heavily modified.

F8.4 VEGETATION / LAND COVER COMPARISON



F8.4 CURRENT ON-SITE VEGETATION / LAND COVER CONDITION

Measure of Modification	Site Position	Description	Size of modification	
			2009	2021
Heavily modified	*Along crest*	*The site show signs of historic cultivation, overgrazing and wood harvesting. Alien and invasive species such as sickle bush and lantana dominates and replaced natural species.*	*±23ha*	*±48*
Moderately modified	*Along crest to mid-slopes*		*±25ha*	*±1ha*
Low modification	*Within and around natural drainage*	*Some minor modifications due to erosion occur in the natural drainage lines.*	*±1ha*	*N/A*

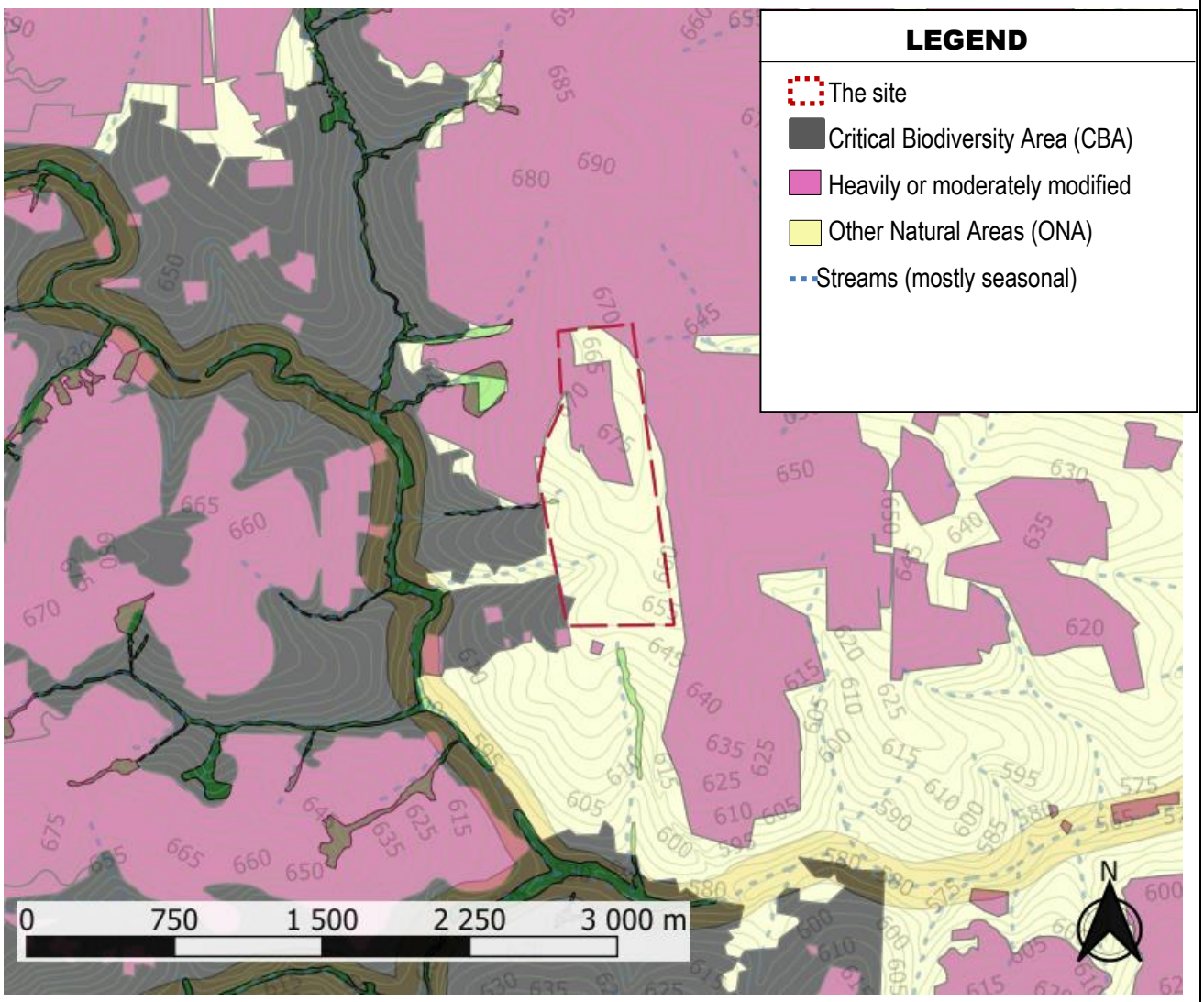
F8.6 LAND COVER SUITABILITY IMPACTS AND MITIGATION RECOMMENDATION

- *The site has mostly lost its vegetation composition and the ecological function and value that are required to maintain a natural ecosystem. The site is also surrounded by urban settlement and thus lost ecological linkages and services.*
- *Accordingly, the site is not a suitable habitat for plant or animal species of conservation concern.*
- *The site has therefore lost its overall importance as a representative ecosystem in need of protection.*
- *Further transformation of the currently degraded land cover should therefore not pose any impact or risk on the potentially vulnerable Legogote-Sour-Bushveld eco-system and would not compromise the conservation targets for the protection thereof.*
- *The overall modified land cover thus poses a "LOW" sensitivity and the proposed township development will not pose an overall adverse impact on natural vegetation.*
- *The remaining and widely distributed Marula trees and Parper Bark Thorns that occur on site can where possible be incorporated within the open space areas of the township and where not possible the species can be replaced and re-introduced along road reserves and garden areas (see App. G – EMPr for more site rehabilitation details).*

F.9 TERRESTRIAL BIODIVERSITY SENSITIVITY

The Mpumalanga Biodiversity Sector Plan (2013) provides an assessment of the terrestrial biodiversity importance and sensitivity on a very detailed scale. According to this biodiversity assessment, previous and existing land transformation on the property (as assessed in 2010), constitutes the majority of the site (±49ha). The map and table below identified and quantifies the areas and classification within the site as it was at that time (2010 – 2013).

F9.1 MAP: TERRESTRIAL BIODIVERSITY ASSESSMENT (MBSP 2013)



F.9.2 SITE QUANTIFICATION : TERRESTRIAL BIODIVERSITY CATEGORISATION Comparison of the 2010 land cover assessment (MBCP 2013) and current on-site situation		Land Cover %	
		2010	2022
Protected area (PAs)	Areas that are already proclaimed under national or provincial legislation.	*0*	*0*
CRITICAL BIODIVERSITY AREA	Areas that are required to meet biodiversity targets for species, ecosystems, or ecological processes.		
CBAs Irreplaceable (Level 1)	Represents the last remaining options for securing critical biodiversity and ecosystems and for achieving biodiversity targets. Any further loss of habitat or ecological function may lead to the decline of the status of species and ecosystems.	*±0.6%*	*0%*
CBAs Optimal (Important and necessary) (Level 2)	Although these areas are not 'irreplaceable' they are the most optimal and efficient land configuration to meet all biodiversity conservation targets and design criteria.	*0%*	*0%*
ECOLOGICAL SUPPORT AREA (Lev 1)	Areas that play an important role in supporting the functioning of PAs or CBAs and for delivering important ecosystem services.		
ESAs Landscape corridor (Level 2)	The best design corridor/pathway option.	*0%*	*0%*
ESAs Local corridor (Level 2)	Pathways that build resilience into corridor network that contributes to connectivity and reduce reliance on single landscape-scale corridors.	*0%*	*0%*
ESAs Species Specific (Level 2)	Areas required for the persistence of particular species.	*0%*	*0%*
ESAs Protected area buffer (Level 2)	Areas surrounding protected areas moderate the impacts of undesirable land-uses that may affect the ecological functioning or tourism potential. Nat. parks 10km; Prov. Parks 5km; Protected Environments 1km buffer.	*0%*	*0%*
OTHER NATURAL AREAS (ONA)	Natural or near-natural areas that are currently not considered essential for meeting biodiversity targets or maintaining ecological functioning; may still retain valuable biodiversity or play an important role as ecological infrastructure or in the delivery of ecosystem services.		
(ONA Level 2)	There are no sub-categories	*±78%*	*0%*
MODERATE & HEAVILY MODIFIED AREAS	Areas in which significant or complete loss of natural habitat and ecological function have taken place due to activities such as cultivation, hardening of surfaces, open-cast mining, etc.		
Heavily Modified (Level 2)	All areas are currently modified to such an extent that any valuable biodiversity and ecological function has been lost.	*0%*	*±90%*
Moderately Modified: Old lands (Level 2)	Old cultivated lands have been allowed to recover (within the past 80 years) and support some natural vegetation. Biodiversity patterns and ecological functioning may have been compromised but areas may still play a role in providing some ecosystem services.	*±21.4%*	*±10%*

F9.3 LAND-USE GUIDELINES FOR THE TERRESTRIAL BIODIVERSITY CATEGORY: HEAVILY MODIFIED	
GUIDELINE	**ASSESSMENT OF THE SITE AND RECOMMENDATIONS**
▪ Areas with no natural habitat remaining are preferred sites for land uses, and new projects are located in these areas before modifying any remaining natural habitat. ▪ Restoration and re-vegetation should be prioritised where heavily modified areas occur close to the land of high biodiversity value or are located such that they could potentially serve useful ecological connectivity functions. ▪ For individual parcels of land identified as having specific actual or potential biodiversity values, develop incentives to restore lost biodiversity and connectivity. ▪ When located land-uses in these modified areas, consider the off-site impacts they may have on neighbouring areas of natural habitat, especially if it is of high biodiversity value.	▪ *Specialist on-site verification confirmed that the site has lost all previous biodiversity conservation priorities in terms of CBAs, ESAs and ONAs as indicated in the MBSP.* ▪ *Specialist investigation confirms that the site has lost all ecological integrity and linkages with the few remaining CBAs, ESAs and ONAs in the area.* ▪ *The total site is heavily to moderately modified.* ▪ *Terrestrial biodiversity sensitivity is thus "LOW".* ▪ *The proposed site is preferred for the proposed urban development as it will pose no impact on biodiversity.* ▪ *Re-vegetation by way of landscaping with endemic tree species within the open space areas of the township is advisable and achievable.*

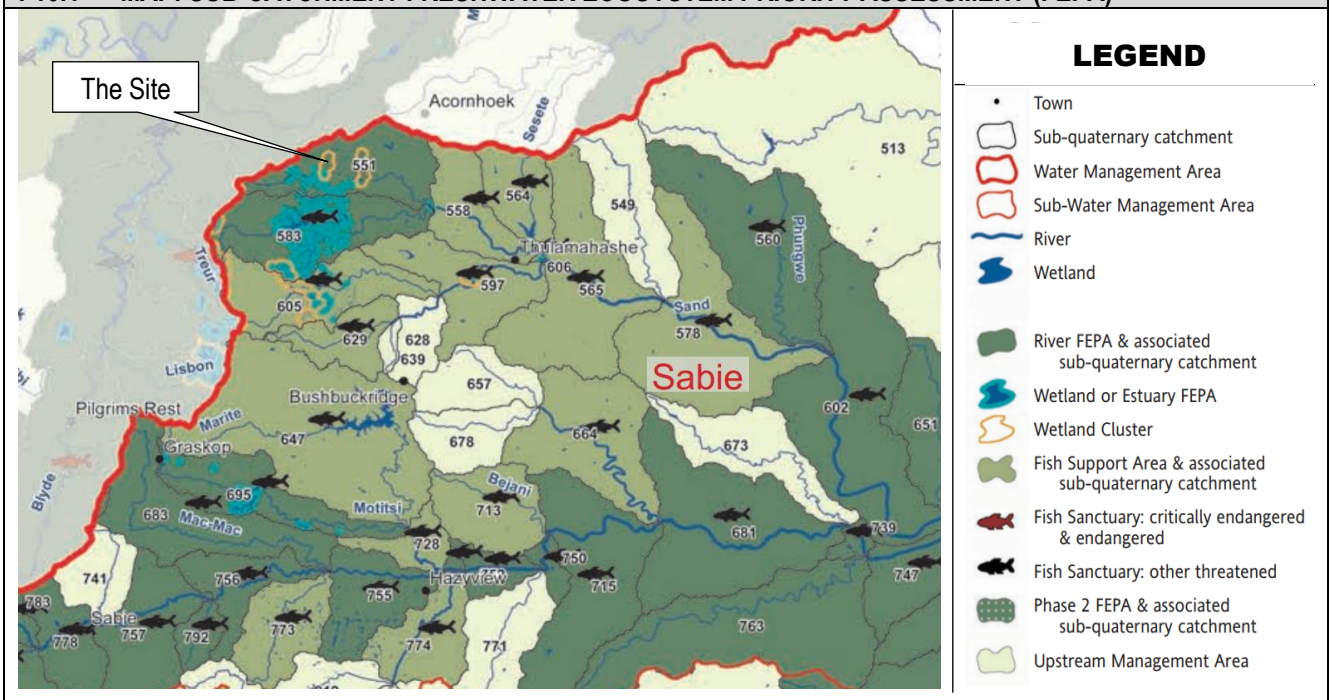
F9.4 TERRESTRIAL BIODIVERSITY IMPACTS AND RISKS

A Terrestrial Biodiversity Compliance Statement (see Appendix 6.1) confirms a "LOW" terrestrial biodiversity and that the proposed development will have negligible impact on the remaining biodiversity on site.

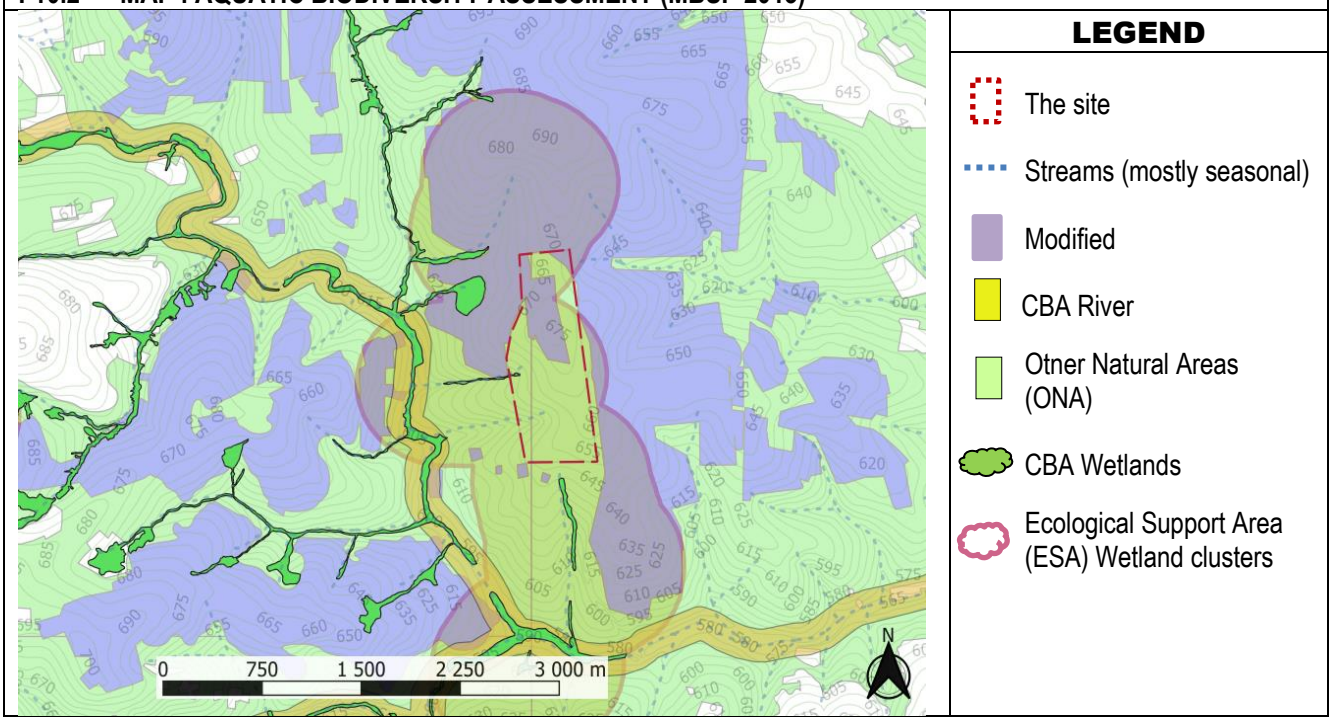
F.10 AQUATIC BIODIVERSITY & FRESHWATER ECOSYSTEM SENSITIVITY

The Mpumalanga Biodiversity Sector Plan (2013) provides an assessment of the aquatic biodiversity and freshwater ecology importance on a very detailed scale. According to the MBSP freshwater assessment, the catchment area within which the site is located is primarily classified as Ecological Support Area (ESA) secondarily as a 'Modified' area and with an overarching ESA Wetland Cluster as presented in the Freshwater Ecological Priority and Aquatic Biodiversity Maps below:

F10.1 MAP: SUB-CATCHMENT FRESHWATER ECOSYSTEM PRIORITY ASSESSMENT (FEPA)



F10.2 MAP : AQUATIC BIODIVERSITY ASSESSMENT (MBSP 2013)



F10.3 SITE QUANTIFICATION : AQUATIC BIODIVERSITY CATEGORIES Comparison of the 2010 land cover assessment (MBCP 2013) and current on-site situation		Land Cover % 2010	 2022
Protected area (PAs)	Areas that are already proclaimed under national or provincial legislation.	*0%*	*0%*
CRITICAL BIODIVERSITY AREA	CBD's are areas that are required to meet biodiversity targets for species, ecosystems, or ecological processes.		
CBA Aquatic species	Areas considered critical for meeting the habitat requirements for selected aquatic invertebrate species. These species are known to occur only at one or a few localities and are at high risk of extinction if their habitat is lost.	*0%*	*0%*
CBR Rivers	Special rivers, with a 100 m buffer, that meet a threshold for riparian sensitivity and/or condition and whose condition should not be allowed to deteriorate. This category includes FEPA rivers and NFEPA free-flowing rivers.	*0%*	*0%*
CBA Wetlands	Important FEPA wetlands that have met a threshold for biodiversity targets and/or condition; the ecological status of these wetlands need to be maintained or improved, and their loss must be avoided.	*±0.2%*	*0%*
ECOLOGICAL SUPPORT AREA	ESA's are areas that play an important role in supporting the functioning of PAs or CBAs and for delivering ecosystem services.		
ESA Wetlands	Although not classed as FEPAs, they support the hydrological functioning of rivers, water tables, and freshwater biodiversity, as well as providing a host of ecosystem services through the ecological infrastructure that they provide.	*0%*	*0%*
ESA Wetland clusters	Clusters of wetlands are embedded within a largely natural landscape allow for the migration of fauna and flora between wetlands.	*±97%*	*0%*
ESA Important sub-catchments	Sub-catchments that either support river FEPAs or fish support areas.	*±78%*	*0%*
ESA Fish support areas	Sub-catchments that harbour fish populations of conservation concern.	*0%*	*0%*
Strategic surface water source areas	High rainfall areas that produce 50% of Mpumalanga's runoff on only 10% surface area, supporting biodiversity and regional water security.	*100%*	*100%*
OTHER NATURAL AREA (ONA)	Not prioritised for immediate conservation action but retain most of their natural character and perform a range of ecosystem services from their ecological infrastructure in varying efficiency and effectiveness. Although these areas are not directly essential for ensuring the persistence of CBAs or ESAs, they may still have an indirect and diffuse impact on these features downstream or in the catchments of ONAs.		
ONA	There are no "ONA" sub-categories	*±78%*	*0%*
HEAVILY MODIFIED AREA	Areas that have been heavily modified by human activity so that they are no longer natural, and do not contribute to biodiversity targets.		
Heavily Modified	Heavily Modified: which includes areas currently transformed where biodiversity and ecological function has been lost to the point that it is not worth considering for conservation at all.	*±22%*	*±100%*
Heavily Modified: In-stream Dams	Artificial water bodies that have impacted wetland or river ecosystems still may have a recharging effect on wetlands, groundwater, and river systems and may support river-or water-dependent fauna and flora.	*0*	*0*

F10.4 SITE QUANTIFICATION: FRESHWATER ECOLOGICAL PRIORITIES		%	Site
Upstream management area	Upstream Management Areas' are sub-quaternary catchments where human activities need to be managed to prevent degradation of downstream river FEPAs and Fish Support Areas.	*±49%*	*±49%*

F10.5 LAND-USE GUIDELINES FOR AQUATIC BIODIVERSITY CATEGORY: HEAVILY MODIFIED AREA	
GUIDELINE	**ASSESSMENT OF THE SITE**
Although heavily modified areas may have residual biodiversity and ecological function, they are generally not considered a priority unless there are unique features that demand it.	▪ *Extensive modification occurred over the past 10 years and previous ESA and ONA services in support of the downstream CBR have been lost completely.* ▪ *The site is heavily modified and mostly void of aquatic biodiversity.*

F10.6 LAND-USE GUIDELINES FOR AQUATIC RIVER FEPA AND ASSOCIATED SUB-QUATERNARY CATCHMENT	
GUIDELINE	**ASSESSMENT OF THE SITE AND RECOMMENDATIONS**
▪ The guiding principle for development is to maintain the good ecological condition of the network of streams and wetlands in the sub-catchment. ▪ Although urban development should be supported in terms of the FEPA, indirect impacts such as point-source and non-point source pollution and suspended solids through eroded soil sediment may occur which may result in poor water quality and pose a detrimental effect on freshwater ecology.	▪ *The seasonal streams on the site have poor ecological conditions and do not provide any ecological services to the nearby CBA river.* ▪ *The incorporation of these drainage lines within the proposed township storm water drainage plan and linking that with the downstream CBA remains of utmost importance to maintain the required ecological condition.* ▪ *This can be achieved by introducing on-site and off-site mitigation as part of the township development in line with the guideline requirements.*

F10.7 AQUATIC BIODIVERSITY AND FRESHWATER ECOLOGY IMPACTS AND MITIGATION

- *On-site verification and assessment by an Aquatic Ecologist confirmed that the site is heavily modified and has negligible remaining aquatic habitat and provides no aquatic ecological services to the few remaining natural watercourses, wetlands and wetland cluster in the surrounding area.*
- *Aquatic biodiversity sensitivity on the site is thus 'LOW" and the proposed development of the township will not pose any adverse impact on aquatic biodiversity and freshwater ecology.*
- *The construction of urban infrastructure over and adjacent to the two drainage lines on the site will not pose any impact on aquatic biodiversity, however indirect impacts off-site on downstream aquatic biodiversity and freshwater ecology is expected to occur as a result of storm water run-off from the proposed township.*
- *Changes can be expected in run-off hydrology such as increased run-off peak flows due to impediment channelling and concentration of normally dispersed run-off within the proposed urban landscape.*
- *This can further lead to erosion and resultant sediment contamination of important and sensitive downstream watercourses.*
- *The downstream Klein-sand River is also at risk of point source pollution from on-site wastewater treatment that poses and indirect impact on aquatic ecology and biodiversity on this vulnerable CBA river.*
- *Upon implementing the necessary on-site mitigation in terms of storm water management and pollution control, potential adverse off-site aquatic ecology impacts can be mitigated effectively and sustainably.*

F.11 SPECIES SENSITIVITY

F11.1 SPECIES OF CONSERVATION CONCERN	National Screening Tool – Preliminary Assessment			
	High	**Medium**	**Low**	**No cat.**
Sensitive Plant Species	-	**X**	-	-
Sensitive Animal Species	-	**X**	-	-
Others	-	-	-	-

F11.2 SPECIES WITH LEGAL PROTECTION

Act	Protected Species	Common Name	Grouping
NFA	*Sclerocarya birrea subsp. caffra*	*Marula*	*Several single-standing trees occur on site.*
MNCA	*Aloe marlothi*	*Aloe*	*Few single standing specimens occur on site.*
NEMBA	*None detected*	-	-

NFA: National Forests Act 1998 / MNCA: Mpumalanga Nature Conservation Act 1998 / NEMBA: National Environmental Management Biodiversity Act 2004

F11.3 IMPORTANT SPECIES IMPACTS AND RISKS

- *On-site Specialist verification confirms that no plant or animal species of conservation concern occur on the site and the site thus pose "NO" sensitivity with regard to species sensitivity.*
- *The protected Marula tree and Aloe marlothi do occur on site and where possible these species must be incorporated in the open space areas of the proposed township. Where not possible a permit must be obtained by the ECO before the commencement of the construction period for marked trees to be removed. All Marula trees and Aloe lost to the development must be replaced along road reserves and gardens in the township (sourced from local nurseries).*

F.12 HERITAGE RESOURCES

"Heritage impact" means the impact or potential impact that activity has, has had or may have on an object or place of cultural or archaeological significance, paleontological remains or a paleontological site, living heritage, public monuments, and memorials, or a place declared to be a national or provincial heritage site by the relevant authority.

F12. 1 POTENTIAL IMPACT ON HERITAGE RESOURCES

- *The National Environmental Screening Tool identifies a potential "medium" sensitivity on the site for the occurrence of archaeological and cultural heritage resources.*
- *A Heritage Impact Assessment was conducted in terms of Sections 35 and 36 of the National Heritage Resources Act (1998) and the report is attached in Appendix D8.*
- *An on-site investigation identified 21 burial sites at different locations all over the project area. The proposed township development will thus impact on such identified grave sites.*
- *The option of retaining the graves at their current positions and establishing conservation buffer areas around such sites is a limiting factor which is not a viable alternative as it would not be possible to plan and to create a functional urban layout considering such limitations.*
- *An alternative and viable option is to include a small cemetery as part of the urban land uses in the proposed township and to relocate the grave to this new position.*
- *A grave relocation process must be followed according to the NHRA Act 25 of 1999 Section 38 (3) which is administered separately by the South African Heritage Resources Agency (SAHRA).*
- *SAHRA indicated that it will provide comment on this DEIR and grave relocation proposal in due course.*
- *In the meantime, a separate consultation with the relevant families is in process of conclusion with the aim of obtaining consent for the relocation of the graves.*
- *Both the comment of SAHRA and the relevant families will be included in the Final EIR as proof of administrative mitigation of this issue.*
- *Apart from the graves, the Heritage Impact Assessment did not identify any other valuable historic structure or cultural heritage site on the property.*

F12. 2 POTENTIAL IMPACT ON PALEONTOLOGICAL RESOURCES

The National Environmental Screening Tool does not identify any potentially important paleontological resources on the proposed site or surrounding area. This is mainly because fossils are normally not found in the underlying granite bedrock. The underlying intrusive grantic and gneiss bedrock formations have no intrinsic palaeontological potential. This is confirmed by the Palao-technical Report of Mpumalanga (2014: SAHRA) which indicates no fossil records in the granite Lowveld of Mpumalanga. Due to the low sensitivity of Palaeontology on the property, SAHRA provided written exemption of the requirement to conduct a palaeontological assessment (see Section H and Appendix .D8).

F13. SENSITIVE GEOGRAPHIC AREAS

Sensitive geographic areas are incorporated in Listing Notice 3 of the EIA Regulations and therefore any development must be considerate to the sensitivity of such areas.

F13.1 IDENTIFICATION OF GEOGRAPHIC SENSITIVE AREAS (AS IDENTIFIED IN LN3 OF EIA REGULATIONS)

Important geographic areas	Description	Locality / occurrence	Potential impact due to the proposed activity
Nearby national protected areas	*Within a 10km buffer surrounding a national protected area.*	*No*	*N/A*
Nearby provincial protected areas	*Within a 5km buffer surrounding a provincial protected area.*	*No*	*N/A*
Nearby private/other protected areas	*Within a 1km buffer surrounding any other protected area.*	*No*	*N/A*

Continue overleaf

Within a national protected area expansion strategy	*Specific guidelines applies*	*No*	*N/A*
Within a provincial protect-ted area expansion area	*Specific guidelines applies*	*No*	*N/A*
Within a World Heritage Site	*Specific guidelines will apply*	*No*	*N/A*
Within a Biosphere Region Core Area	*Core area of the Kruger-to-Canyons Biosphere Region.*	*No*	*N/A*
Within an International Convention Area	*Specific guidelines will apply*	*No*	*N/A*
Within a Nature conservancy	*Specific guidelines will apply*	*No*	*N/A*
Within sensitive areas identified in EMF's	*Specific guidelines will apply*	*No*	*N/A*

F13.2 IMPACTS AND RISKS TO SENSITIVE GEOGRAPHIC AREAS

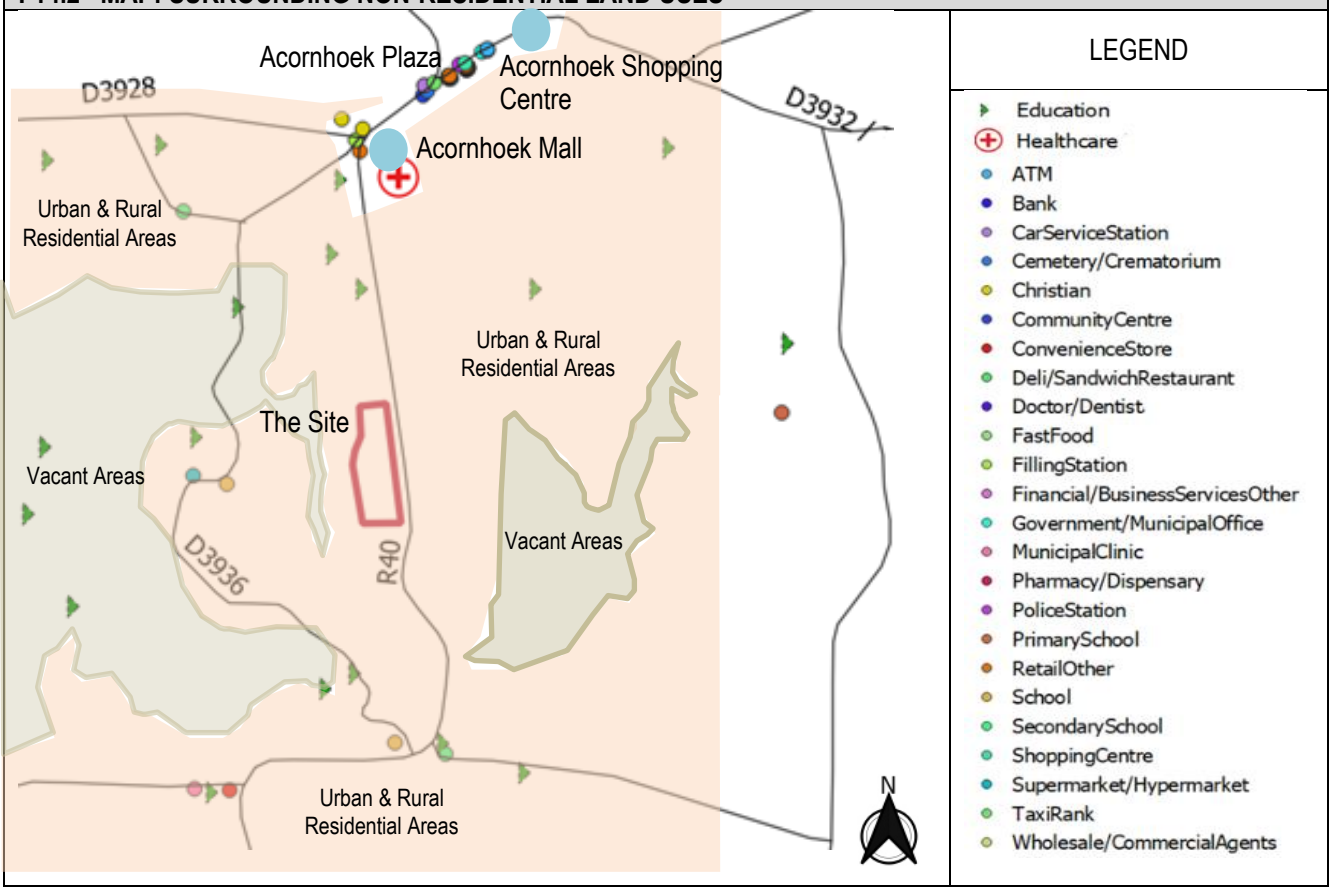
The site is not located within or near to a specified geographic sensitive area.

F14. SURROUNDING LAND USES

F14.1 IDENTIFICATION OF IMPACTS ON SURROUNDING LAND USES (<5KM RADIUS)

Land Use	Occurrence		Potential Impact Due To The Proposed Development
Urban residential areas (formal)	*Yes*	*>0km*	*Proposed new residential infrastructure and spaces are not expected to impact negatively on surrounding formal residential areas and services. The formal nature of the proposed development may enhance the value of surrounding residential areas as these areas may benefit from new infrastructure and community services.*
Urban residential areas (informal)	*Yes*	*>0km*	*Proposed new residential infrastructure and spaces are not expected to impact negatively on surrounding informal residential areas. The formal nature of the proposed development may enhance the value of surrounding residential areas and allowance is made in the township layout to connect informal roads to proposed new access roads.*
Retail & commercial	*Yes*	*>2.5km*	*The proposed development follows the historic trend of "corridor development" along the accessible main traffic route (R40). The Acornhoek mall, a regional commercial centre, is situated 4.5km from the proposed site and a community commercial centre is situated 6 km from the proposed site at Acornhoek. The commercial component of the proposed township will classify as a neighbourhood / community centre, which according to the hierarchy of business centres, can exist within the service retail service sphere of a regional centre without impacting adversely on such centre (see App. D12 – Demacon Report).*
Fuel stations		*>3.5km*	*Two filling stations are located within the 5km radius of the proposed filling station to be included in this township. According to a Fuel Station Feasibility Study (see App. D13 – Petrorex Report) the fuel station will not pose any significant adverse impact on nearby fuel stations.*
Industrial areas	*Yes*	*>3km*	*Although the township can be suitable for light industrial land uses, such uses are not currently considered.*
Offices / Office parks / Consulting rooms	*Yes*	*>1km*	*Proposed new office park infrastructure and spaces are not expected to impact negatively on the surrounding community. It is expected to pose a positive economic opportunity for local businessmen and entrepreneurs.*
Hotel / Guest House / Lodge/Resort	*Yes*	*>0.5km*	*The proposed new Hotel is expected to pose a positive economic opportunity and can provide in needed leisure opportunities which are scarce in this area.*
Health / medical centre	*Yes*	*>0.4km*	*Proposed new medical infrastructure and facilities are expected to provide an important service to the local community and can also provide opportunities for qualified medical professionals locally.*
Educational and sport facilities	*Yes*	*>1km*	*Proposed new educational/learning centres can provide additional education opportunities and employment opportunities for qualified teachers locally.*

F14.2 MAP: SURROUNDING NON-RESIDENTIAL LAND USES



F14.3 INFRASTRUCTURE & SERVICES

Type	Potential infrastructure issues / impacts due to the proposed development
National Road or Provincial Road or District Road	*The property and the adjacent residential area obtain direct access to and from the National Road (R40) that is situated along its eastern boundary. The proposed development will formalise one or more of the existing access roads and junctions with the R40. A Traffic Impact Assessment (see App D11) was conducted and found that safe access from the R40 to the proposed township can be provided. The planning for the necessary upgrading of the R40 and associated intersections will conform to the required road designs standards. SANRAL provided conditional support for the proposed development. The development is thus not expected to impact negatively on the R40.*
Local Roads	*The layout of the proposed township includes access to and from existing informal roads. Construction of roads within the proposed township will not require closure or deviation of existing informal roads that are located in the residential settlement that surrounds the site. Upon completion of the internal roads of the proposed township, surrounding residents will benefit by using these roads which will provide safer access to the R40 and also provide access to the commercial and institutional facilities within the township.*
Storm water system along existing roads	*A storm water canal is located along the length of the property boundary with the R40 Road but due to the topography, this storm water is not received onto the property and therefore does not need to be managed on the property. However, an area that covers ±13ha of the property slopes at an average of 3% towards the R40 and will need to be managed on-site before being discharged into the roadside channel or natural drainage lines. This can be achieved by way of appropriate storm water engineering design and layout planning (see Appendix D10.2 for detail).*
Water supply	*A Municipal Water Scheme that provides domestic water to the Acornhoek area is located to the north of the property. The municipality confirmed a sufficient supply of potable water from this water scheme to the proposed new township development (see App D10.1 for layout details).* *An existing bulk water pipeline for municipal water supply is on the property but its current position limits the township layout and will thus require relocation. A suitable relocation route was determined by the Project Engineer (see App D10.1). The relocation of this pipeline will result only in a temporary disruption of water to the regional reservoir which should not exceed 24 hours.*

	The proposed re-use of treated wastewater within the proposed township will alleviate water demand on the municipal system, specifically for urban agriculture and garden uses. There is currently a sufficient supply of water in the municipality from the Inyaka Dam. The proposed development would thus not pose any adverse impact on water supply infrastructure and sources.
Sewer treatment	*The site and surrounding area are not serviced by sewer connections and it is not foreseen that the municipality will be able to provide such service. On-site sewer treatment and re-use of treated wastewater is a feasible alternative that would not pose any obligation to the local municipality. The proposed wastewater treatment plant is based on the re-activated sludge method, thus eliminating continuing scheduled sludge removal and thus also preventing odours that may emanate from such a plant. The treated water quality of the selected treatment system also conforms to the minimum water quality standards as required by DWS. It is thus not expected that the proposed wastewater treatment plant will pose soil, water or air pollution or any nuisance to residents.*
Electricity	*The area surrounding the site is currently serviced by the Acornhoek-Champagne 22kV ESKOM distribution powerlines. In addition, the Acornhoek-Nwarele 132kV ESKOM distribution powerline and the Acornhoek-Marathon ESKOM 275 kV transmission line are located ±800m east of the property. There is thus sufficient opportunity for connection to the local power supply network. In principal ESKOM supports the proposed development and indicated that a connection to the existing distribution infrastructure is possible (see attached Appendix D9).*
Waste management	*No form of general or hazardous solid waste shall be disposed of on the site. As stated in the Bushbuckridge Local Municipality Integrated Development Plan 2020-2021, the local municipality provides collection services for general waste streams to a local waste site. Collection and disposal of waste from the proposed township can thus be provided by the local municipality or by a private sub-contractor. A newly commissioned municipal landfill site near Thulamahashe can receive solid waste from existing and new waste sources. Hazardous waste from public hospitals is currently managed by a sub-contracted company for the entire Mpumalanga Province. The opportunity, therefore, exists to sub-contract the medical waste disposal of the proposed medical facilities in the township to an approved waste management contractor following the relevant Regulations for the removal and disposal of hazardous medical waste. The generation*
Emergency services	*Local Municipal emergency services (fire brigade and ambulances) are limited and are mainly dependent on District and Provincial services. Currently, any emergency can be reported to the local SAPS at Acornhoek who will dispatch the necessary emergency services. The planning of the township in terms of infrastructure and facilities can incorporate emergency services to supplement emergency services in the area.*

F14.4 IMPACTS TO EXISTING LAND USES AND INFRASTRUCTURE

- *Overall the urban development can be accommodated in terms of existing land uses and infrastructure and the availability, capacity and connection to roads, water and electricity have been confirmed by the relevant authorities.*
- *The proposed connection to existing services will thus not pose any adverse impact on existing services.*
- *The cost of connection to services and its future use will be carried by the Developer, with no cost to the Municipality.*
- *The proposed commercial land uses are aligned with the findings of an urban economical study and such a study also found that the proposed retail component would not pose any significant adverse impact on existing retail centres in the area (see App. 12 – urban-economic Market Research Study by Demacon).*
- *A fuel station feasibility study (see App. 13 by Petrorex) indicates that the proposed fuel station land use within the Acorn City township can be justified in terms of locality, increasing population growth, vehicle ownership and fuel demand and would not pose any significant adverse impact on the on existing fuel stations in the area.*
- *The proposed social facilities (medical and educational land uses) and institutional (office space) would not pose any significant adverse impact on existing fuel stations in the area.*
- *Due to the expected "LOW" significance of impacts on surrounding land uses and infrastructure no specific land use and services mitigation measures are recommended apart from those included in the various feasibility, planning and design reports.*

F15. SENSORY ENVIRONMENT

F15.1 ACOUSTIC ENVIRONMENT

F15.1.1 SOURCES OF POTENTIAL NOISE IMPACTS

Occasional high levels of noise may occur during the construction period of the township. During the operational period of the township normal urban noise levels can be expected (as indicated below).

SANS (10103) TYPICAL RATING LEVELS FOR AMBIENT NOISE dB(A) is the value of sound pressure level in decibels (dB), determined using an expected weighted noise level (A) at typical noise emitting environments.		SANS 10103 Outdoors Rating Level (dBA)	
		Day-time 06:00 – 22:00	**Night-time** 22:00 – 06:00
Type of District			
Residential Districts	Rural districts (N/A)	45	35
	Suburban districts with little road traffic (similar to the site area)	50	40
	Urban districts (new land use)	55	45
Non- Residential Districts	Urban workshops, business premises & main roads (new uses)	60	50
	Central business districts (N/A)	65	55
	Industrial districts (N/A)	70	60

NOISE IMPACT QUALIFIERS (SANS 10103)	
Impact	**The noise difference between residual noise and typical outdoor rating level.**
Negligible	0
Low	Between 0 & 5 dBA
Moderate	Between 5 & 10 dBA
High	Between 10 & 15 dBA
Very high	More than 15 dBA
Noise dissipates by 6dBA as distance doubles	

F15.1.2 ASSESSMENT OF NOISE SOURCES (SANS10103)	Noise dissipates at 6dBA by doubling the distance from source							
Noise type and level at source	**1m**	**2m**	**4m**	**8m**	**16m**	**32m**	**64m**	**128m**
Daytime urban residential district noise (±55 dBA)	*55*	*49*	*43*	*37*	*31*	*25*	*19*	*13*
Night time urban residential district noise (±45 dBA)	*45*	*39*	*33*	*27*	*21*	*15*	*9*	*3*
Daytime urban and central business districts (60 – 65 dBA)	*65*	*59*	*53*	*47*	*41*	*35*	*29*	*23*
Night time urban business and hotel (50 – 55 dBA)	*55*	*49*	*43*	*37*	*31*	*25*	*19*	*13*
Daytime urban workshops / light industrial (±60 – 70 dBA)	*70*	*64*	*58*	*52*	*46*	*40*	*34*	*28*
Daytime construction noise: bulldozer/trucks (±92dBA)	*92*	*86*	*80*	*74*	*68*	*62*	*56*	*50*

F15.1.3 POTENTIAL NOISE IMPACTS

Noise dissipates as the distance from the noise source doubles. Interference between the noise source and the receiver such as soil berms, buildings, trees, walls, bushes, and topographical absorbing landscapes can counter noise impacts. The average daytime outdoor ambient noise rating for the suburban residential area that surrounds the site is ±50dBA.

- *New urban agricultural, educational and hotel land uses that are planned right next to existing residential uses will pose a negligible noise impact on surrounding residents during day and night-time.*
- *The proposed fuel station land use is not located directly next to any residential use, thus day-me-and night time noise will pose a negligible impact to nearby residential uses.*
- *Urban business land uses will be located between 70 – 140m away from the nearest existing residential uses and will pose a negligible noise impact on surrounding residents.*
- *The mechanical components (electrical pumps) of the on-site wastewater treatment plant will be positioned mostly underground or in enclosed buildings and would thus not pose any significant noise impact.*
- *Construction noise during the construction period will occur during the daytime all over the site and in some places very close to existing residential uses. Very high noise impacts may likely occur directly next to the affected development site with moderate to low noise impacts over a distance of 80 -160 m. The noise impacts are expected to be intermittent and at different levels during a short-term period only and can be mitigated to limit noise-generating construction noise to week days and to day-time working hours and to avoid any such work on public holidays.*
- *The overall noise impact emanating from urban land uses is thus expected to be "LOW".*

F15.2 VISUAL ENVIRONMENT

A conceptual architectural impression of the proposed township along the R40 Road (see Appendix C), as well as the town planning layout of the proposed land, uses (see Appendix A), provides the basis on which a basic visual assessment of the development can be based. The assessment below follows the methods and criteria as described by Smardon[19].

F15.2.1 SENSE OF PLACE

"Sense of place" *can be defined as how humans relate to or feel about the environments in which they live".* ***"Sense of place impact"*** *means the impact or potential impact that activity has, has had or may have on the mix of natural and cultural features in the landscape that provides a strong and unique identity and character that is deeply felt by local inhabitants and/or visitors (GN R698:2017).*

F15.2.1.1 "SENSE OF PLACE" IMPORTANCE RATING OF THE SITE

Criteria	High	Moderate	Low
Sense of Place without any development	A particularly definite place with a dominant natural ambience, character, or theme.	A place that projects a loosely defined theme, character, or ambience.	**A place having little or no ambience with which it can be associated.**
The visual quality of the sites	A very attractive setting with great variation and interest.	A setting that has some aesthetic and visual merit.	**A setting that has little aesthetic value.**
Surrounding man-made Structures	Man-made structures as a minor visual element.	Man-made structures as a partial visual element.	**Man-made structures as a dominant visual element.**
Association with surrounding land uses	No similar land uses occur within the local area.	Similar land uses occur further than 5km from the proposed development and are confined to specific areas.	**Similar land uses occur between 2-5km from the proposed development**
Surrounding Landscape Compatibility	The landscape cannot accommodate proposed land use without it appearing totally out of place visually.	The proposed land use can be accommodated in the landscape setting without appearing out of place.	**The proposed land use is ideally suitable within this landscape setting.**

F15.2.1.2 POTENTIAL SENSE OF PLACE IMPACT

- *The mixed-use formal and informal urban developments along the R40 National Road between Bushbuckridge and Acornhoek define the local sense of place.*
- *The above table indicates that the site and surrounding area have a "LOW" sense of place importance.*
- *It is predicted that the proposed mixed-use urban development will pose a high level of compatibility with the surrounding urban landscape.*
- *It is not expected that the mixed use township and any of its land uses and facilities will pose any significant adverse impact the surrounding area's sense of place.*

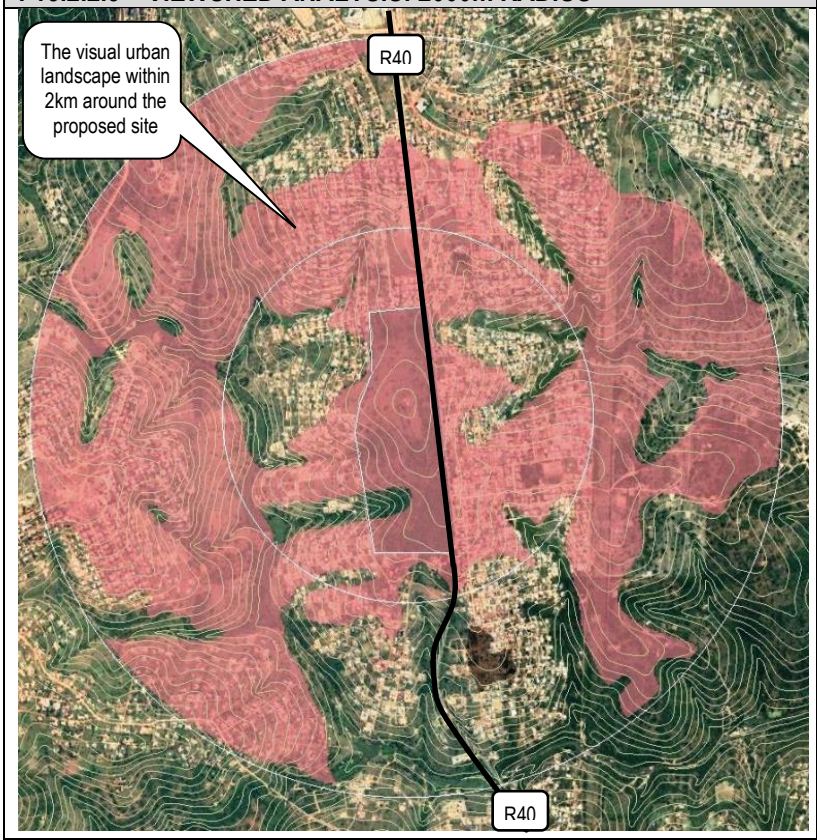
F15.2.2 AESTHETIC ENVIRONMENT

F15.2.2.1 POTENTIAL VISUAL EXPOSURE

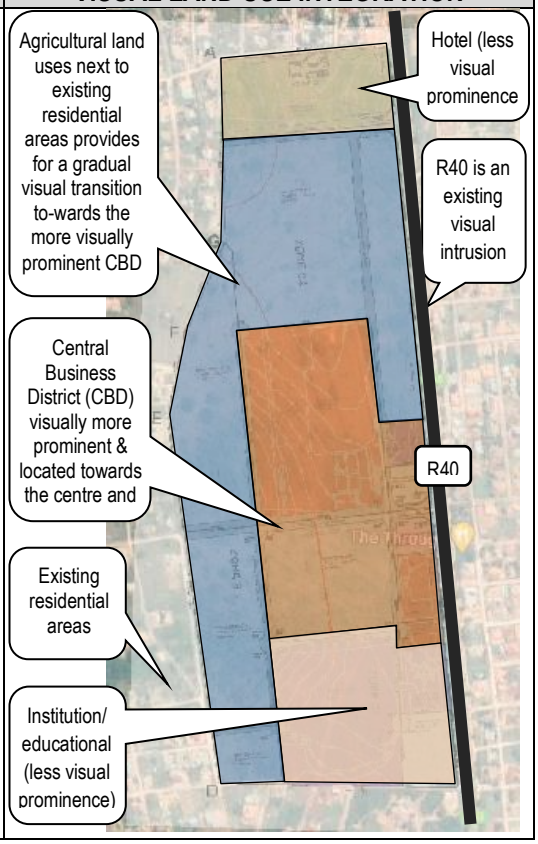
Criteria	Occurrence	Description	Viewer Sensitivity
Views from surrounding urban areas onto the proposed township	*Yes*	*The proposed township will be visible to the surrounding urban community from directions as indicated in the view shed analysis.*	***Low***
Views on the proposed township from national/provincial roads.	*Yes*	*The proposed township will be visible from the National R40-road, similar to other linear activities, e.g. commercial developments, along this road in the surrounding area.*	***Low***
Views from potentially sensitive geographic areas, tourism facilities, and viewpoints.	*No*	*There are no nearby geographic areas, tourism facilities, and scenic viewpoints in the area with views onto the site.*	***N/A***

F15.2.2.2 VISUAL ABSORPTION CAPACITY			
Criteria	**Low**	**Moderate**	**High**
Expected Visual Absorption Capacity (VAC)	*The landscape will not visually accept the development due to incompatible land use within a natural landscape. (N/A)*	*The landscape will partially accept the development visually, due to its urban setting and little surrounding natural landscape elements. (N/A)*	*The landscape will easily accept the development visually because of its urban setting, moderate to dense urban texture and structure as well as compatibility of land use.*
Expected visibility in the local urban landscape	*Very noticeable in the local landscape. (N/A)*	*Low to moderately noticeable in the local landscape.*	*Hardly noticeable in the local landscape. (N/A).*

F15.2.2.3 VIEWSHED ANALYSIS: 2000m RADIUS



VISUAL LAND USE INTEGRATION



F15.2.2.4 VISUAL IMPACTS ANALYSIS

The viewshed analysis indicates that the proposed development is expected to be moderately visible within the receiving urban environment, however, the following visual impact criteria should be considered:

- *The natural landscape on the site has been moderate to heavily transform and therefore mostly lacks any form of significant visual quality. Furthermore, the natural landscape on the site is compromised by a densely developed surrounding urban landscape which sets the scene in terms of visual structure, texture and density.*
- *The proposed urban land uses align with the sense of place of the surrounding urban environment.*
- *The visual exposure analysis indicates a low viewer sensitivity thus negative visual impacts on viewers is not expected.*
- *There are no nearby important geographic areas, tourism facilities, and scenic viewpoints in the area that may be affected by views onto the site.*
- *A building height restriction of 3-storeys is visually acceptable within an area where 2-storey houses already occur.*
- *The visual absorption capacity of the surrounding area is such that the development will be visually acceptable within the existing urban setting and the moderate to dense urban texture and structure.*
- *Following the project description, the proposed development will include mixed land uses that progress gradually inwards from lower density and visually less prominent uses such as urban-agriculture, residential, hotel, and*

educational uses towards the inner business and office district with higher density and visually more prominent buildings. This gradual visual transition between the peripheral and central urban land uses should "soften" the overall visual exposure and visual impact of the development on directly adjacent residents.

- *The proposed higher density business and office district with taller height zones will be grouped nearer towards the R40 National Road to ensure good visibility and visual exposure to road users (the road and existing urban land uses alongside the road already compromise any potential viewer sensitivity along the R40 road section).*
- *The overall visual impact is thus expected to be "LOW" and no additional mitigation is proposed.*

F15.3 AMBIENT AIR QUALITY

F15.3.1 AIR QUALITY CONTROL / PRIORITY AREA		
Is the project located within a declared air quality control /priority area (Section 18 of the NEMAQA 2004).	*No, the project site is located in a low air quality risk area.*	*Regulations / Standards : (N/A)*

F15.3.2 IDENTIFICATION OF EXISTING SOURCES OF ATMOSPHERIC EMISSIONS / ODOURS				
Existing emission sources	**Distance to site**	**Emissions description**	**Frequency / Rating**	**Impact/risk**
Vehicle emissions from the R40	*±15m east*	*CO2, CO, hydrocarbons (HCs), SO2, NOx, particulate matter, and lead.*	*Constant during daytime and frequent during night-time.*	*Human health risk*

F15.3.3 IDENTIFICATION OF POTENTIAL SOURCES OF ATMOSPHERIC EMISSIONS / ODOURS				
New development potential emissions	**Distance from site**	**Emissions description**	**Frequency / Rating**	**Impact/risk**
Construction activities during the construction period.	*On-site*	*Dust*	*Occasional during the construction period.*	*Nuisance to surrounding residents.*
On-site wastewater treatment (point-source) may contribute to potentially offensive emissions.	*On-site*	*CH_4 (methane) and NO_2 Nitrogen oxide during the operational phase.*	*Continuous during the operational period.*	*Human health risk to surrounding residents.*

F15.3.3 POTENTIAL AIR QUALITY IMPACT ANALYSIS AND RECOMMENDATIONS

- *No residential uses are planned along the R40 that may affect the health of residents due to inhalation of vehicle exhaust emissions.*
- *During the construction phase of the township, dust may be a potential nuisance to adjacent residents specifically during the initial site preparation phase when on-site vegetation clearing and earth moving activities will take place.*
- *The extent of dust-fall as a result of vegetation clearing and earth moving activities on the site cannot be anticipated or estimated as several variables such as soil moisture, wind direction, and wind speed as well as the extent of earthworks play a role in the generation of dust. However, precautionary measures can be applied to minimise dust generation during the site preparation phase, this can be monitored by an ECO during the construction period.*
- *It is not anticipated that a regulated air quality activity (emissions, offensive odours or priority air pollutants) will be triggered by any educational, agricultural, business uses and institutional uses in the township.*
- *The proposed on-site WTP is an enclosed system that is installed underground and does not include lagoons / sludge dams / oxidation dams that are open to the atmosphere and potentially and which may emit offensive odours.*
- *The recirculating of wastewater and the re-use of sludge by way of re-activation avoids the need for regular sludge handling and removal that can potentially emit offensive emissions.*
- *The overall air quality impacts due to the proposed development are thus expected to be "LOW".*

F.16 ENVIRONMENTAL POLLUTION AND WASTE

F16.1 EXISTING WASTE MUNICIPAL MANAGEMENT SERVICES

The Bushbuckridge Integrated Waste Management Plan (2019) indicates that the municipality removes solid waste in towns and townships at least once/twice per week in formal residential and urban areas. The nearest municipal waste disposal site is at Acornhoek and the newly constructed regional landfill site at Thulamahashe has sufficient capacity for disposal of solid waste from existing and new urban developments for the foreseeable future.

The removal of hazardous waste within the municipal area is currently being contracted to an approved contractor for disposal at a registered hazardous waste site outside the municipal area. Both general and hazardous waste that may be generated as part of the construction and operation of the township operation can thus be removed and disposed of safely.

The Municipality provides general and hazardous waste removal and disposal services and such waste can thus be safely removed from the proposed township.

The 2020-2021 Bushbuckridge Integrated Development Plan IDP notes that 75% of municipal residents have access to sanitation systems, mostly by way of domestic pit toilets, and in some areas the Enviro-Loo (organic treated, oxygen-infused, and dehydrated decomposition design) as well as waterborne systems in formalised planned neighbourhoods and business centres where the nearest wastewater treatment plant is located at Acornhoek.

The urban settlement where the development is planned is not serviced by a municipal sewer system and connection to the system at Acornhoek is not feasible.

F16.2 SELECTED ON-SITE WASTE MANAGEMENT SERVICES

The temporary storage of General solid waste

- *The relevant solid waste management facilities and services within the township must be installed and provided in line with required norms, standards, policies and plans. No on-site waste disposal site / activities are planned in the township.*
- *Therefore, in line with the Municipal Waste Management Plan it is feasible and reasonable to incorporate, on-site waste storage sites within the architectural design of all buildings in order to promote waste separation at source.*
- *This will promote on-site employment opportunities as well as supplying waste to local waste re-cycling businesses which will ultimately reduce the volume of waste that needs to be disposed of at the municipal waste site.*

The temporary storage of Hazardous waste

- *The temporary storage of hazardous waste on-site at proposed hazardous waste generating facilities such as health and medical facilities (medical waste), the proposed fuel station (hydrocarbon waste) and the urban cultivation project (pesticide and fertiliser wastes) will be architecturally designed in compliance with all relevant regulations, norms, standards, policies and plans.*
- *No on-site disposal of the above-mentioned hazardous wastes is planned in the township.*

Treatment and disposal of Wastewater

- *An on-site wastewater treatment plant (WTP) as part of a water-borne sewer system will be incorporated within the proposed township (see Appendix D10.1 for details), which will contribute to the municipality's objective of achieving DWS's green drop status (2020-2021 Municipal IDP).*
- *The proven Eco-Sat Bio-Catalytic wastewater treatment plant is basically an underground installation with a small surface footprint that is extremely safe, efficient and suitable for small township developments compared to conventional wastewater treatment plants.*
- *The selected WTP is expected to treat wastewater from the township to the required minimum water quality standards as required by DWS after which the wastewater will be disposed of by way of direct discharge to the ephemeral watercourses on the site and / or to be re-used for non-consumptive purposes such as irrigation of the urban cultivation project as well as maintaining parks and gardens within the township.*

F16.3 IDENTIFICATION OF POTENTIAL SOURCES, IMPACTS AND RISKS OF POLLUTION AND WASTE				
Development activities that may cause generate waste and pollution	**Action**	**Waste type**	**Frequency / Rating**	**Impact/risk**
Solid waste will be generated during the construction phase.	*Re-use on-site & disposal off-site*	*Construction waste Inert waste*	*Continuous during the construction period.*	*Inert waste is re-usable for filling but stockpiling on-site can create site hazards.*
Solid waste will be generated during the operation period of the township.	*Collection & off-site disposal*	*General waste: domestic, commercial, dry industrial, and business waste.*	*Continuous during the operational period.*	*Pollution of the local area if not collected and disposed of correctly.*
Wastes are generated by facilities such as hospitals, clinics, laboratories, and pharmacies, medical, dental, and veterinarian practice.	*Collection & off-site disposal*	*General health care waste and High-risk health waste.*	*Continuous during the operational period.*	*Potential health risk if not contained, collected, and disposed of correctly. Risk to surface and groundwater resources*.*
Wastes that contain poisons, corrosive agents, flammable, chemical, or explosive substances.	*N/A*	*Hazardous waste*	*Not expected to be generated on-site during the construction and operational periods.*	*None*
Effluent from the wastewater treatment plant (WTP).	*On-site treatment & re-use*	*Hazardous waste*	*Continuous during the operational period.*	*Potential health risk if not managed correctly. Risk to surface and groundwater resources* if leaked.*
Sludge removal from the wastewater treatment plant (WTP).	*Collection & off-site disposal*	*Hazardous waste*	*WTP re-use of re-activated sludge may require occa-sional removal during the operational period.*	*Potential health risk if not managed correctly. Risk to surface and groundwater resources*.*
Potential hydro-carbon contamination by way of oil and fuel spills as well as leaks from storage tanks.	*Contain, remove & dispose of off-site*	*Hazardous waste*	*Accidental / failure during construction & operational phases*	*Risk to surface and groundwater resources*.*
Leaching of agricultural chemicals & wastes	*Contain & absorb*	*Hazardous waste*	*Occasional during the operational period if not managed correctly*	*Risk to surface and groundwater resources*.*

* Refer to Appendixes 5.1 and 5.2 – Risk Assessment to Groundwater Resources

F16.4 POLLUTION AND WASTE IMPACTS AND RISK MITIGATION RECOMMENDATIONS

- *Several potentially viable measures can be explored to avoid negative impacts of waste generation and to create positive impacts relating to waste minimisation, waste re-use and recycling.*
- *The overall impact of general and hazardous waste generation can be mitigated effectively by implementation of waste hierarchy management principles as recommended in the Municipal Waste Management Strategy as follows:*
  - *Plan for the containment, re-use and correct disposal of construction waste.*
  - *Plan for the safe storage and separation of waste by integrating waste management facilities within the architectural design of buildings and facilities, including general waste and hazardous waste. Plan such facilities include safe enclosure and safe drainage towards integrated sumps and oil separators that are connected to the sewer system.*
  - *Re-use where possible inert solid waste during the construction period.*
  - *Separate solid waste at source during the construction and operational period and contain such waste in a safe manner until removal by appointed services providers for re-use, re-cycling or disposal.*
  - *Appoint reputable service providers to remove wastes for re-use, re-cycling or disposal to approved facilities.*
- *The overall impact of wastewater generation can be mitigated effectively by the implementation of the selected wastewater treatment plant and to ensure its effective and efficient management by an approved service provider to ensure achievement, maintenance and regular auditing of treated wastewater before being discharged or re-used.*
- *A geo-hydrological risk assessment classifies the overall risk of contamination of groundwater resources as "LOW", subject to the implementation of the relevant mitigation measures.*

F.17 SOCIO-ECONOMIC CHARACTER OF THE AREA

The site is located in Ward No.16 of the Bushbuckridge Local Municipality (BLM). The (2011) Census data as provided by Statistics South Africa (SSA)[26], the Municipal Integrated Development Plan[2] and Wazimap[27] (2016) was used to determine the broad socio-economic conditions that occur within the Ward .

F17.1 BROAD SOCIO-ECONOMIC CHARACTER OF THE WARD		
DEMOGRAPHIC INDICATOR	**2011/2016 CENSUS DATA OF WARD 16**	**SOCIO-ECONOMIC INTERPRETATION OF WARD 16**
Age	*The population has a median age of 20 and a 51% male to 49% female ratio.*	*The data indicates a young population that would require employment opportunities.*
Education	*±60.6% completed Grade 9 or higher but only 31.8% completed Matric or higher.*	*The population has a poor educational profile and therefore has little prospect of being included in the formal or skilled workplace. There is thus a need for further education, tertiary education, and skills development.*
Employment	*±82.7% of the adult population is unemployed.*	*The high unemployment rate can be attributed to few employment opportunities.*
Average annual income	*R30000*	*The average annual income of an employed person is low.*
Income opportunities	*The opportunity to earn an income in the formal sector within this Ward is very limited as there are very few formal work opportunities.*	*New employment opportunities in the township development can expand the income opportunities of the local population*

Social infrastructure is critical to the development of sustainable communities. While the provision of housing, potable water, and electricity is vital for meeting basic human needs, other services such as schools, transport, and health care are important for ensuring the long-term satisfaction of residents. In combination, these infrastructure types create the framework within which residents can establish a locality-based community with opportunities for social and economic well-being. This in turn creates the foundation for a sustainable community, (DEA:2015).

F17.2 CURRENT SOCIAL INFRASTRUCTURE LIMITATIONS IN THE SURROUNDING AREA

- *The area in which the site is located is surrounded by mixed urban residential areas.*
- *Open spaces in the local vicinity currently are small to non-existing. Thus the proposed site of interest will impact the surrounding and direct neighbourhood by creating usable open spaces that can be physically accessed and not only visually absorbed. These open spaces will impact the area positive because it will be purposefully designed for community use.*
- *These communities have an overall low-income profile with little to no locally economic opportunities available.*
- *Urban sprawling has fragmented the local landscape and rendered the area unfeasible for cultivation and cattle grazing.*
- *The informal settlement surrounding the site has little to no basic infrastructure services and there was also no provision made for essential community services such as schools, clinics, places of entertainment, and sports facilities.*
- *Un-serviced small businesses, spaza shops, and entrepreneurial enterprises occur in between residential stands and nearby major roadways such as the R40 which results in traffic congestion and safety concerns for motorists and pedestrians alike.*
- *The overall unstructured urban landscape poses several social-economic limitations that cannot be rectified easily within an already built-up area. The proposed mixed-use township development that includes a range of urban social infrastructure, economic services, and urban agriculture is expected to contribute to the enhancement and enjoyment of the local community life and would provide a wide range of opportunities for differently skilled residents.*
- *The draft township layout plan provides a mix of diverse land uses tailored to the identified needs of the local community, as identified in the local municipal IDP. The agglomeration benefits will enhance the overall effectiveness of the proposed mixed land uses. The draft layout of the proposed township complements the specific biophysical conditions of the proposed site.*

"Socio-economic impact" *means the impact or potential impact that activity has, has had or may have on the surrounding community's social and economic wellbeing, including changes in demographics, housing, employment, income opportunities, and demand for public services (GN R698:2017).*

F17.3 SOCIO-ECONOMIC IMPACT ANALYSIS

- *Both an urban-economical Market Research Study (see Appendix D12 by Demacon) and Fuel Station Feasibility Business Plan (see Appendix D13 by Petrorex) provides detailed analyses of the key economic, social and demographic indicators of the area and accordingly make recommendations regarding the feasibility of selected land uses in the proposed township.*
- *The Municipal IDP also clearly indicates the socio-economic objectives that are required in terms of development in order to enhance the socio-economic position of the residents of this municipality.*
- *Based on the above, an overall positive socio-economic impact on the receiving community can be expected by the development and the operation of the proposed township as more clearly summarised below:*

Demographic change

The proposed township development is not expected to pose any immediate change in the demographic characteristics of the local population. However, direct and indirect social and economic opportunities and services in the township may contribute to a positive medium- to long-term change in the demographic composition of the local community in terms of employment and income opportunities and the overall socio-economic wellbeing of the local community.

Employment opportunities

- *The proposed development is not expected to result in the loss of employment opportunities.*
- *The proposed development is also not expected to impact any person's income as the property is currently not being utilised for any income-generating activity.*
- *The proposed development is expected to contribute directly over the short to long-term in new employment opportunities.*
- *Economic benefits of this development are also expected to filter through to the supply-chain service providers and toward secondary and indirect employment opportunities that can lead to widespread income generation within the local community.*

Income-generating opportunities

- *The proposed development has the potential to stimulate local economic growth due to income-generating opportunities that will be created by the proposed township.*
- *It can be expected that local and regional economic role-players may recognize the potential that could be provided by the development, which can encourage investment into the project.*
- *The proposed township is expected to provide various income-generating and private investment opportunities that can complement the Provincial and Local Economic development goals.*
- *The current "agricultural" land value of the property will be increased by the development which would pose a positive impact on Local Government revenues due to increased services contributions as well as increased municipal land-tax and services rate contributions.*

Public goods & services opportunities

- *The proposed township is expected to provide a range of public goods and services to the local area including institutional facilities, educational facilities, health care facilities as well as sport and recreational facilities.*
- *The proposed development is expected to impact positively on improved access to resources such as transportation services, water services, electricity services, emergency services as well as sanitation and waste removal services.*
- *However, the potential increase in the use of public infrastructure as a result of the township development may require increased capacities which may result in negative opportunity costs for existing infrastructure users. However, the necessary services providers have indicated that existing capacities in terms of water provision, electricity and transportation is adequate for safe and sustainable supply to the proposed township. In addition, any required expansion of capacity can be overcome by determining appropriate services contribution charges for the development, thus obtaining the cost for such expansion from the developer with no cost to the Municipality.*

Socio-economic vs environmental dependencies

- *The property is vacant and natural resources thereon are not being used for any social or economic activity.*
- *Potential impacts on the receiving environment as identified in this assessment can be mitigated and it is thus not expected that people's environmental rights will be impacted in terms of loss of amenity, opportunity, water and air quality, nuisance (noise, odour, etc.), visual or health impacts.*
- *The proposed development is not expected to result in the loss of livelihoods and human wellbeing that is dependent on ecosystem services within the area. Although the ecosystem services of the previously impacted ecosystem have completely been lost, considerate landscaping and engineering measures that can be incorporated as part of the township development can restore certain ecological services which can enhance biodiversity and that can benefit downstream river health and down-stream water consumers.*

Public health & safety

- *Some of the proposed services in the township may pose a safety hazard to surrounding residents which will require compliance to required health and safety regulations in terms of traffic safety, fire and explosion prevention, mechanical and electrical systems hazard prevention, noise and odour emitting activities as well as dam safety and flood prevention. This can be mitigated by applying the required norms and standards in the planning and design of the proposed township and associated services.*
- *Architectural and landscape design can accommodate people with disabilities, ensuring an all-inclusive development planning outlook.*
- *Environmental health and safety aspects in terms of township layout, building and facilities design and design of all infrastructure and services shall incorporated the required norms and standards.*
- *The contractors will be accountable in terms of his or her contractual appointment to ensure that the necessary construction norms and standards are being adhered to in the construction phase of the township.*
- *Future land users within the township must individually comply with the occupational health and safety and other relevant laws that regulate public safety during the operational period of the township.*

Economic impact on other retail outlets

- *An important concept in retailing is the fact that different order size shopping centres cater to different consumer needs. In this context, the proposed mixed use township can be sustained in the identified area and should be able to co-exist with other neighbourhood convenience centres, community centres and regional centres that are already established within the Acornhoek, Dwarsloop and Bushbuck Ridge areas.*
- *An estimated combined retail loss of 3.94% on existing regional shopping centres in the Bushbuck Ridge area inclusive of an estimated 1.5% retail loss by the Acornhoek Mall due to the development of an additional retail component as part of the proposed new township can be considered as a very "LOW" impact rating. Furthermore, this estimated impact is likely to be offset over the short to medium term due to growing human settlement (3.4% of annum-compound growth) in the Acornhoek area (see Appendix D12).*
- *Similarly, a feasibility study revealed that the proposed fuel station within the township will be economically viable without impacting adversely on the economic feasibility of existing fuel stations in the area, based on the increased traffic and associated demand for fuel in the market area.*
- *The complement of different shopping centres in the Acornhoek area (within the hierarchy of business centres), from the local spaza shop and the individual convenience shop to the regional centre as well as the proposed neighbourhood centre, will be beneficial to the local community in terms of the range of goods and services that are located conveniently near to each other and accessible from major roads in the Acornhoek area. This concept is evident throughout each and every urban community in a free-market economy which is driven by demand and supply and not by way of economic restrictions and regulated limitations.*

Socio-economic impact conclusion

The above deliberation indicates that the proposed development will pose an overall positive socio-economic impact on local communities and the perceived negative impact on existing businesses is "LOW" and of little significance.

PROJECT NEED & DESIRABILITY

This Section complies with GN R326 Appendix 3, Section 3(1)(f) and motivates the need and desirability for the proposed development, in the context of the preferred development footprint and within the approved site as contemplated in the accepted scoping report.

The need and desirability assessment in EIA deals with the search for the best practicable option that will best ensure the maintenance of ecological integrity while promoting justifiable social and economic development

The Integrated Environmental Management Guideline on Need and Desirability, (DEA:2017) provides the requirements for need and desirability assessment in the EIA process in the form of a list of questions that aims to ensure that all the relevant need and desirability considerations have been taken into account. During the scoping process these questions identified gaps in information and the key issues to be addressed as well as alternatives that may better respond to the development. Specialist studies were (where relevant) commissioned to provide the identified information requirements and assessed the key issues. The findings and recommendations of these studies including any mitigation recommendations in Section F of this report, are included in this assessment.

G1.1 NEED IN TERMS OF THE MUNICIPAL ECONOMIC DEVELOPMENT PRIORITIES

In order to consider how the development may affect or promote justifiable economic and social development, the relevant integrated and spatial development plans must be considered. In this regard the most important are the Municipal Integrated Development Plan (IDP) and Municipal Spatial Development Frameworks (SDF).

G1.1.1 The Bushbuckridge Local Municipality Integrated Development Planning (IDP) 2020 / 2021

The Bushbuck Ridge Municipal Integrated Development Plan (IDP) 2020-2021 as well as the Spatial Development Framework (SDF) 2017, establishes the need for, and the geographic context to physical and infrastructural development concerning the desired spatial form, desirable land use patterns, and the location of future development. It also establishes priorities for public sector involvement and investment and also provides a spatial logic that guides private sector investments.

Development goals according to the Municipal IDP indicates that the Acornhoek area (Ward 16) is in need of road infrastructure, basic water and sewage services as well as local economic growth and job creation. The proposed Acorn City mixed-use township can contribute to achieving these goals by providing important infrastructure on the selected site and by providing local investment and employment opportunities which can result in economic growth locally.

G1.1.2 The Bushbuckridge Local Municipality Spatial Development Framework (SDF) 2017

The Bushbuckridge Local Municipal Spatial Development Framework (SDF) 2017 identifies the R40 (National Road) as a primary development corridor for the development of business, commercial, retail and social land uses and facilities. The Acorn City development proposal is in line with the spatial priorities of the SDF.

G1.2 NEED IN TERMS OF PROVINCIAL AND NATIONAL ECONOMIC GROWTH OBJECTIVES

The municipal economic and planning objectives are supported by the Provisional and National SDF's as well as the National Economic Development Plan and National Growth Plans that make specific reference to the Acornhoek area as indicated in the following sections.

G1.2.1 The Mpumalanga Spatial Development Framework (SDF) 2019

The Mpumalanga SDF identified the Acornhoek area as a secondary growth centre in the Bushbuck Ridge Municipal Area due to its historic nodal development and its locality on the main Nelspruit – Phalaborwa transport corridor (R40).

G1.2.2 National Spatial Development Framework (NSDF) (2019)

The NSDF identifies the Acornhoek area as a Rural Service Centres along a Key National Development Transport Corridor and suggests a diverse mix of land uses in an area, to boost local people-to-people service economies, stimulate co-production of knowledge innovation and jobs creation, reduce the need for travel and travel distances, bring vibrancy

and life to the area, enhance social interaction and cohesion, and make better use of available land. The Acorn City development proposal is perfectly aligned with the NSDF's goals by providing access to and availability of educational, medical, social and business opportunities.

G1.2.3 National Development Plan (NDP) 2030

The NDP identifies vulnerabilities in the South African economic sectors with additional pressure from job insecurity, lack of basic services and climate change and as such proposes long-term development projects that are resilient, diverse and spatially integrated. The proposed Acorn City mix-use township can align with these development goals and can contribute on a small and local scale to address some of the identified economic vulnerabilities such as job creation and provision and maintenance of services.

G2. DESIRABILITY (SUSTAINABILITY)

While the importance of job creation and economic growth for South Africa cannot be denied, the Constitution calls for justifiable economic development. While the specific social and economic needs of the broader community should be achieved the desirability of the economic activity in terms of ecological sustainability must be upheld. It should therefore be assessed whether this development will impact the ecological integrity of the area by considering the conservation priorities identified in Environmental Management Frameworks (EMF). In the absence of a Municipal EMF, the district-level Bioregional Plans or the provincial-level Biodiversity Sector Plan is used instead.

The Mpumalanga Biodiversity Sector Plan (2013) spatially identifies the biodiversity status and conservation priorities of terrestrial and aquatic ecosystems and is accompanied by land use guidelines to direct development planning, thus ensuring maintenance of ecological integrity within spatial planning, spatial form, land use patterns and the location of future developments.

Ecological Sustainability

G2.1.1 The proposed construction and operation of the proposed township within the selected development footprint (site) will not impact the ecological integrity of the broader area in terms of the following:	
a. Threatened Ecosystems	*The site is not located within or near a threatened ecosystem.*
b. Sensitive, vulnerable, highly dynamic or stressed ecosystems.	*The site is not situated within a sensitive, vulnerable, highly dynamic or stressed ecosystem.*
c. Critical Biodiversity Areas ("CBAs") and Ecological Support Areas ("ESAs").	*The site is not located within a Critical Biodiversity Areas ("CBA").* *The site is not located within an Ecological Support Areas ("ESA").*
d. Conservation targets.	*The proposed development and associated vegetation clearing will not impact the conservation target of any important vegetation or plant community.*
e. Ecological drivers of the ecosystem.	*The site has lost its terrestrial and aquatic ecological functions due to historic modification and therefore pose no impact on ecological drivers.*
f. Environmental Management Framework.	*The site is not located in a sensitive area identified in an Environmental Management Framework.*
g. Spatial Development Framework.	*The site is not located in an area that is earmarked for conservation in a Spatial Development Framework.*
h. Global and international environment responsibilities	*The site is not located in an area that has been declared or that is subject to global and international environmental responsibilities.*

G2.1.2 Will this development disturbs or enhance ecosystems and/or result in the loss or protection of biological diversity?	*No*	*F6/8/ 9/10*
a. Were measures explored to avoid negative impacts?	*Yes*	*F9.3-5*
b. Where negative impacts could not be avoided altogether, were measures explored to minimise and remedy (including offsetting) the impacts?	*Yes*	*I1.4.1- I1.4.8*
c. Where possible was ecosystem enhancement explored?	*Yes*	*F6.4*

The scoping process identified the need for additional information regarding these aspects and such issues have been addressed by the studies of a terrestrial and aquatic specialist.		*App D6.1 & D7.1*

G2.1.3 Will this development pollute and/or degrade the biophysical environment?	*No*	*F16.1*
a. Were measures explored to avoid negative impacts and where negative impacts could not be avoided altogether, were measures explored to minimise and remedy (including offsetting) the impacts?	*Yes*	*F16.1*
b. Were measures explored to enhance positive impacts?	*Yes*	*F16.2/3*
Does this issue require further information to be generated during the assessment?	*No*	*N/A*

G2.1.4 What waste will be generated by this development?		*F16.2*
a. Were measures explored to avoid waste?	*No*	*N/A*
b. Where waste could not be avoided altogether, were measures explored to minimise, reuse and/or recycle waste?	*Yes*	*F16.3/4*
c. Were measures explored to safely treat and/or dispose of unavoidable waste?	*Yes*	*F16.5*
Does this issue require further information to be generated during the assessment?	*No*	*N/A*

Cultural / heritage sustainability

G2.1.5 Will this development disturbs or enhance landscapes and/or sites that constitute the nation's cultural heritage?	*Unsure*	*Ref.*
a. Were measures explored to avoid negative impacts?	*No*	*F12.3*
b. Where negative impacts could not be avoided altogether, were measures explored to minimise and remedy (including offsetting) the impacts?	*No*	*F12.1&2 I1.4.1, I1.4.10*
c. Were measures explored to enhance positive impacts?	*No*	*F12.3*
The scoping process identified the need for additional information regarding these aspects and such issues have been addressed by a heritage specialist study.		*App D8*

Sustainable use of renewable resources

G2.1.6 Will this development use and/or impact non-renewable natural resources?	*Yes*	*Ref.*
Electricity supply by ESKOM which is dependent on the use of non-renewable fossil fuels is a given impact of all developments in the country. Some measures of mitigation can be achieved by the efficient design of buildings to reduce energy use.		*F14.4 I1.4.12*
Does this issue require further information to be generated during the assessment?	*No*	*N/A*

G2.1.7 Will this development use and/or impact renewable <u>natural resources</u> and the ecosystem of which they are part? (surface water)	*Yes*	*Ref.*
Surface water quality can be impacted downstream of the development due to on-site wastewater treatment and disposal, storm water discharge and potential accidental contamination.		*F6/F8*
a. Were measures explored to avoid negative impacts?	*Yes*	*Ref.*
▪ *The level of sewer treatment at an on-site wastewater treatment plant must achieve the minimum water quality standard as imposed by DWS Regulation.* ▪ *Special attention must be provided to the design of surface drainage areas that holds potential for pollution by harmful contaminants*		*F6.4/ F15.3.3/ F16.1*
b. Were measures explored to enhance positive impacts?	*Yes*	*Ref.*
The non-consumptive use or re-use of wastewater as well as storage of storm water for on-site use.		*F6.4*
c. Does the proposed development exacerbate the increased dependency on increased use of resources to maintain economic growth?	*No*	*Ref.*

The water supply is from a renewable resource (Inyaka dam) which is recharged naturally by seasonal rainfall and the resource has sufficient capacity to allow for economic development within the municipality.		*F14.4*
d. Does the proposed development reduce resource dependency?	*Yes*	*Ref.*
The non-consumptive use or re-use of wastewater as well as storage of storm water for on-site use can contribute to reduced dependency on potable water supply for non-consumptive uses such as urban agriculture and landscaped garden maintenance.		*F14.4*
e. Does the proposed use of natural resources constitute the best use thereof?	*Yes*	*Ref.*
The resource (Inyaka dam) was constructed to unlock economic development in the municipal area and the proposed development is in line with this purpose.		*F14.4*
f. Is the use justifiable when considering intra- and intergenerational equity?	*Yes*	*Ref.*
The water resource (Inyaka dam) is renewable and its use will benefit future generations.		*F14.4*
g. Are there more important priorities for which the resources should be used (i.e. what are the opportunity costs of using these resources this proposed development alternative?)	*No*	*N/A*
N/A		*N/A*
h. Would the proposed location, type and scale of development promote a reduced dependency on resources?	*Yes*	*Ref.*
Approximately 40% of the development area will be retained for urban agriculture and the re-use of treated wastewater for cultivation purposes will reduce the dependency on the water resource.		*F14.4/ F5.5*
Does this issue require further information to be generated during the assessment?	*No*	*N/A*

Sustainability in terms of environmental health

G2.1.9 Will the ecological impacts resulting from this development impact people environmental rights in terms of the following?		
a. Negative impacts: e.g. access to resources, opportunity costs, loss of amenity, air and water quality impacts, nuisance (noise, odour, etc.), health impacts, visual impacts, etc.	*Yes*	*Ref.*
The ecological impacts resulting from this development has been assessed in terms of the people's environmental rights in terms of the negative impacts such as access to resources, opportunity costs, loss of amenity, air and water quality impacts, nuisance (noise, odour, etc.), health impacts, visual impacts, etc, and the result of such finding has been assessed in Section J of impact identification and also in Section K regarding the assessment of significant impacts.		*J2 K1*
b. Were measures taken to firstly avoid negative impacts, but if avoidance is not possible, to minimise, manage and remedy negative impacts?	*Yes*	*Ref.*
▪ *Implement wastewater treatment on-site as well as on-site storm water attenuation to prevent potential water quality impacts downstream.* ▪ *Position noise emitting land uses an adequate distance away from existing residential areas.* ▪ *Select appropriate wastewater treatment technology to prevent odour emissions.*		*F9.4/F11.4/F12.3/F16.4/F15.2*
c. Positive impacts: e.g. improved access to resources, improved amenity, improved air or water quality, etc. What measures were taken to enhance positive impacts?	*Yes*	*Ref.*
The proposed township will provide access to water (re-use of treated wastewater) for cultivation on available agricultural land.		*F16.4/F17.3/F5.5/F14.4*
Does this issue require further information to be generated during the assessment?	*No*	*N/A*

G2.1.10 Will the development's ecological impacts result in socio-economic impacts (e.g. on livelihoods, loss of heritage site, opportunity costs, etc.) in terms of the linkages and dependencies between human wellbeing, livelihoods and ecosystem services applicable to the area in question?	*Yes*	*Ref.*
Potential wastewater and stormwater may impact downstream water users, due to potential water quality and water quantity impacts.		*F6.4*
The scoping identified the need for additional information regarding these aspects and such issues have been addressed by a Civil Services Specialist Report and Stormwater Management Plan Specialist report.		*App D10.1 & D10.2*

G2.1.11 Based on all of the above, will this development impact on ecological integrity objectives/targets/considerations of the area?	*No*	*Ref.*
The ecological integrity of the site as well as conservation targets has been lost due to previous land use modifications and surrounding environmental degradation. It is not expected that this development will pose a negative impact on objectives/targets/considerations of the area.		*F6/F8.5/F 9.5*
Does this issue require further information to be generated during the assessment?	*No*	*N/A*

G2.1.12 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?	*Yes*	*Ref.*
This was confirmed by way of specialist site verification that both terrestrial and aquatic ecological integrity on the site and surrounding area is lost and provides no eco-system services. The surrounding area has also been permanently modified due to urban expansion and thus no feasible ecological corridors remained. The selected land use and technology alternatives would thus not pose any ecological impact and can thus be regarded as the best practical options.		*Section F8, F9 & F10*

G2.1.13 Describe the positive and negative cumulative ecological/biophysical impacts bearing in mind the size, scale, scope and nature of the project concerning its location and existing and other planned developments in the area?	*Yes*	*Ref.*
▪ *A storm water system and sanitation system without impact mitigation would result in cumulative downstream impacts on water quality, river health and downstream water users.* ▪ *The implementation of impact mitigation measures may result in an enhanced cumulative effect in terms of water quality, river health and no impact on downstream water users.* ▪ *All potential downstream impacts have been investigated by the appointed environmental and technical specialist to ensure that all potentially positive and negative cumulative impacts are identified.*		*Sect F6.4 Sect I5*
This report inclusive of specialist studies, addresses the identified need for additional information which have been included in an Aquatic Biodiversity Report, Civil Services Report and Stormwater Management Plan.		*App D7.1, App 10*

Socio-economic sustainability

G2.2 PROMOTING JUSTIFIABLE ECONOMIC AND SOCIAL DEVELOPMENT
Will this development promote justifiable economic and social development?

G2.2.1 What is the socio-economic context of the area, based on, amongst other considerations, the following considerations?		*Ref*
The socio-economic context of the area is taken into account in terms of the broad socio-economic character of the ward and the socio-infrastructure limitations in the area		*F17.1/2*
a. Will the activity be in line with IDP (and its sector plans vision, objectives, strategies, indicators and targets) and any other strategic plans, frameworks or policies applicable to the area?	*Yes*	*Ref.*

▪ *The Acornhoek business node of which the Arthursseat area forms part has been identified in the Municipal IDP and the Municipal SDF as a Strategic Development Zone with the following objectives:* ▪ *New developments should provide direct access to the R40 road in the Acornhoek area which is a primary transport corridor. The proposed township will provide access to and from the R40 and is therefore in line with the transportation goals of the SDF.*		*E3/F15.2/F16.1/F17.2*
▪ *New developments should increase social amenities and economic activities close to the R40. The proposed township can potentially act as a catalyst for socio-economic growth in the area, in line with the goals and objectives of the Bushbuckridge Local Municipality IDP and SDF.*		*E3/F1.4/F14.1*
b. Will the activity be in line with spatial priorities and desired spatial patterns (e.g. need for integration of segregated communities, need to upgrade informal settlements, need for densification, etc.)	*Yes*	*Ref.*
▪ *The Bushbuckridge SDF outlines the following needs and desires in the future Acornhoek Strategic Development Zone development that can also be satisfied by the proposed township establishment as follows:* ▪ *A spatial priority that can potentially be achieved by the proposed development is the provisioning of medium to high density mixed land uses. This could achieve the goal of providing compact nodes comprising of commercial, social and institutional uses with high accessibility and linkages to major transportation systems and surrounded by fully serviced residential clusters.*		*E3/F11.3/F14/F17.3*
c. Will the activity be in line with spatial characteristics (e.g. existing land uses, planned land uses, cultural landscapes, etc.),	*Yes*	*Ref.*
▪ *The Acornhoek Node is spatially characterised by the corridor-type expansion of informal and formal business uses along the R40 road. Most of these commercial developments are "stand' alone developments" that are not fully integrated with the surrounding urban landscape and do not provide the full range of social and institutional uses that are lacking in this area.* ▪ *The proposed mixed-use is planned to integrate into the spatial character of the surrounding area and the existing community is expected to have access and connect to the much needed social and institutional uses that are proposed.*		*E3/F14.1/F17.2*
d. Will the activity be in line with the Municipal Economic Development Strategy ("LED Strategy")?	*Yes*	*Ref.*
▪ *The proposed township can potentially create short, medium and long term opportunities in terms of socio-economic-, institutional- and agricultural sector investment as well as cross-sectoral integration and partnerships.* ▪ *These investment opportunities are expected to produce the much needed skilled and unskilled employment opportunities over the short to long term that would strengthen the urban fabric of the Acornhoek Node in line with the Municipal Economic Development Strategy.*		*E3/F14/F17.3*
Does this issue require further information to be generated during the assessment?	*No*	*N/A*

G2.2.2 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?		*Ref.*
▪ *Apart from the employment opportunities, it is also expected that each of these sectors can provide the much-needed goods and services to the community which is expected to enhance the overall standard of living in the local area.* ▪ *The proposed development is expected to achieve the major socio-economic objectives of the Acornhoek area.* ▪ *Accordingly, it is expected to provide employment opportunities in the building and services sector as well as opportunities in the commercial, administrative, educational, hospitality, leisure, medical, artisan and agricultural sectors that can create wealth locally.*		*F17.2&3*

a. Will the development complement the local socio-economic initiatives (such as local economic development (LED) initiatives), or skills development programs?	*Yes*	*Ref.*
▪ *All potential identified initiatives have been aligned from the Bushbuckridge Local municipal IDP 2020-2021.* ▪ *Specific services to the proposed township can be provided through the Municipalities Economic Development and Job Creation Programme. This programme provides tax-incentive measures for private investment partnerships with the community programmes through the maintenance of essential services infrastructure.* ▪ *The proposed educational facilities can be aligned with the Municipal Skills Development Plan and Improved Quality of Education and Training Programs.* ▪ *The proposed health facilities planned within the proposed township can extend the reach of existing Health Programs that target the youth, women and disabled people.* ▪ *The Municipality intends to strengthen the existing programs that are aimed at improving local Food Security Programs. The proposed urban agricultural opportunities that the township holds can facilitate the availability of parcels of arable land for cultivation with sustainable water provision for irrigation (recycled wastewater).*		*E3*
Does this issue require further information to be generated during the assessment?	*No*	*N/A*
G2.2.3 Will this development address the specific physical, psychological, developmental, cultural and social needs and interests of the relevant communities?	*Yes*	*Ref.*
▪ *Collectively the proposed development can provide both direct and indirect benefits to the residents of the proposed township and the surrounding community.* ▪ *Physically the proposed development can provide a higher level of fully serviced residential uses that are lacking in this area, as well as a range of goods and services (commercial, business, administrative, institutional, medical and educational uses).* ▪ *The social and cultural needs of the community can be provided by learning centres and sports facilities including open spaces for leisure and cultural activities.*		*F17.2&3*
Does this issue require further information to be generated during the assessment?	*No*	*N/A*
G2.2.4 Will the development result in equitable (intra- and inter-generational) impact distribution, in the short- and long term?	*Yes*	*Ref.*
▪ *Permanent and adaptive opportunities that would complement inter-and intra-generational development over the short and long term can be achieved within the planning of the proposed township.* ▪ *Such opportunities exist on the proposed urban agricultural land that holds opportunity for both, medium to long-term cultivation and future urban land use expansion. Similarly educational, medical and municipal service infrastructure holds positive intra and inter-generational over the short and long term.*		*F17.2&3*
a. Will the impact be socially and economically sustainable in the short- and long term?	*Yes*	*Ref.*
The impact of the development is expected to be overall positive in terms of a well-balanced mix of land uses that can provide for the immediate and future social and economic needs of the local communities.		*F17.2&3*
Does this issue require further information to be generated during the assessment?	*No*	*N/A*
G2.2.5 In terms of location, will the placement of the proposed development:	*Yes*	*Ref*
The SDF identifies the proposed site as a future infill expansion and the R40 (provincial road) as a primary corridor that provides opportunities for economic development.		*E3*
a. Will it result in the creation of residential and employment opportunities near or integrated?	*Yes*	*Ref.*
The proposed township poses mixed employment opportunities and includes a transport depot (bus-stop and taxi-rank) with very good access to the major distributor road (R40 provincial road). Access to transportation would be easy and convenient for all users of the proposed township.		*E3/F14/ F17.3*

b. Will it reduce the need for transport of people and goods?	*Yes*	*Ref.*
The work, commercial, business and educational areas are within walkable distances of internal and external residential areas.		*F5.5 /F14.1*
c. Will it 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 of public transport)?	*Yes*	*Ref.*
The proposed township makes specific provision for transportation of the public towards and from outlying areas; however, the proposed upgrading of intersections on the R40 as well as the provision of vehicle parking areas internally would also provide high accessibility for private transport. Once within the proposed central business district area, its compact design and integration of social facilities should promote non-motorised and pedestrian transport.		*F17.2/ F17.3*
d. Will it compliment other uses in the area?	*Yes*	*Ref.*
It will be complimenting to the needs of the community in terms of social infrastructure commercial needs and economic opportunities.		*F17.2&3*
e. Will it be in line with the planning for the area?	*Yes.*	*Ref.*
The Municipal Spatial Development Plan (SDF) earmarks the application property within the 5 to 20-year development pattern		*E3/ F14/F17.3*
f. Will it (for urban-related development) make use of underutilised land available with the urban edge?	*Yes*	*Ref.*
The application property currently lies vacant within the urban edge.		*F1.4*
g. Will it optimise the use of existing resources and infrastructure?	*Yes*	*Ref.*
The existing bulk municipal water network, electricity network, waste removal service and direct access to the R40 road are infrastructure services that are readily available that can be used for servicing the proposed township. This will also contribute to the increased economic use of such infrastructure which will benefit the municipality financially through services contributions and levies which in turn will contribute to the maintenance and future upgrading of these infrastructure networks.		*F14.1/ F14.4*
h. Will it result in 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)?	*No*	*Ref.*
Bulk services as indicated above, are available within a short distance from the site. The Municipality has confirmed sufficient capacity and availability in the current water network. The proposed township will be self-sufficient in terms of sewer treatment and re-use on site.		*F14.5/E3*
i. Will it discourage "urban sprawl" and contribute to compaction/densification.	*Yes*	*Ref.*
The proposed township is in line with the spatial development pattern as envisaged by the Municipality and is located within the urban edge, which contributes to urban densification of areas.		*F17.2*
j. Will it contribute to the correction of the historically distorted spatial patterns of settlements and the optimum use of existing infrastructure above current needs?	*Yes.*	*Ref.*
The proposed township will provide much needed social infrastructure that is absent locally due to previously poor planning and informal settlement. The proposed development can address the social infrastructure need and can contribute to the correction of the historically spatial distortions.		*F14.4*

k. Will it encourage environmentally sustainable land development practices and processes?	*Yes*	*Ref*
The planning of the proposed township is overall environmentally conscious in terms of the potential impact on natural vegetation, watercourses, sense of place, aesthetics and ambient noise. The efficient use and re-use of renewable resources, the efficient implementation of waste and wastewater reduction, re-cycle and re-use strategies, as well as the implementation of ecological design principles in architectural, landscaping and engineering designs and the supplementing of non-renewable energy sources with renewable energy generation methods, can all be applied to achieve a high level of sustainability.		*F5.5/F15*
l. Will it take into account special locality factors that might favour the specific location (e.g. the location of the strategic mineral resources, access to the port, access to rail, etc.)?	*Yes*	*Ref.*
The proposed township has direct access to an important primary "corridor" road (R40) between main centres and also being a primary local distributor road within the Acornhoek Node that would provide easy access to users of the proposed township and surrounding areas.		*F14.4/F17 .2*
m. Will the investment in the settlement or area in question generate the highest socio-economic returns (i.e. an area with high economic potential)?	*Yes*	*Ref.*
The increasing local population growth provides direction for economic growth and investment in the area and as a result, the proposed development intends to attract a broad mix of investments into the property. Each investor shall determine its specific threshold of investment based on current and future local socio-economic conditions, market demands and supplies.		*F15.2/F17 .3*
n. Will it impact 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?	*No*	*Ref.*
The mixed-use formal and informal urban developments along the R40 National Road between Bushbuckridge and Acornhoek define the local sense of place. *The site and surrounding area has a low "sense of place" importance and the proposed mixed-use urban development is highly compatible with the surrounding urban landscape and it is not expected to impact the area's sense of place.*		*F15.2*
o. Will the development in terms of nature, scale and location promote or act as a catalyst to create a more integrated settlement?	*Yes.*	*Ref*
▪ *The proposed formalisation and upgrading of the current informal access roads and junctions with the R40 and the extension of the proposed township road network towards existing settlements will ensure integration between the existing settlement and the proposed new township.* ▪ *The overall unstructured urban landscape poses several social-economic limitations that cannot be rectified easily within an already built-up area. The proposed mixed-use township development that includes a range of urban social infrastructure, economic services, and urban agriculture is expected to contribute to the enhancement and enjoyment of the local community life and would provide a wide range of opportunities for differently skilled residents.*		*F17.2*
Does this issue require further information to be generated during the assessment?	*No*	*N/A*

G2.2.6 Will a risk-averse and cautious approach is applied in terms of socio-economic impacts?	*Yes*	*Ref.*
a. Are there limits of current knowledge (note: the gaps, uncertainties and assumptions must be clearly stated)?	*No*	*Ref*
A specialist urban-economic study was undertaken to determine the need and desirability of social and economic land uses that are incorporated in the township layout. The socio-economic character of the area was considered to optimise the proposed development in terms of the need and desirability of social and economic land uses. A separate Business Plan specific for the fuel station has been completed and included in this draft EIR.		*I2.2* *App D12* *App D13*
b. 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?	*Low*	*Ref*

The expected level of socio-economic risk associated with the above-mentioned limitation is low to moderate as it is not expected to pose a social or economic level of risk that would impact inequality, social fabric, livelihoods, vulnerable communities or critical resources. The issues mainly relate to economic vulnerability and sustainability and have been dealt with in a urban economic Market Research Study on the township		*F17.3 App D12*
c. Based on the limits of knowledge and the level of risk, was a risk-averse and cautious approach applied to the development (and to what extent)?	*Yes*	*Ref*
A risk-averse and cautious approach forms parts of the Urban Economical Market Research Study on the proposed township.		*F17.3 App D12*
The scoping identified the need for additional information regarding these aspects and such issues have been addressed by a Urban Economic Market Research Study for the proposed township.		*App D12*

G2.2.7 Will the socio-economic impacts resulting from this development impact people's environmental rights in terms of the following:	*No*	*Ref*
a. Negative impacts: e.g. health (e.g. HIV-Aids), safety, social ills, etc.	*No*	*Ref*
It is not expected that the proposed development will pose negative health, safety and social ills. The proposed development will comply with all legal norms and standards that regulate public safety.		*F17.2/3*
b. Were measures taken to firstly avoid negative impacts, but if avoidance is not possible, to minimise, manage and remedy negative impacts?	*Yes*	*Ref*
The scoping assessment identified potential impacts and predicted potential significance and recommends mitigation measures to avoid minimise manage and remedy potential impacts. Potential polluting impacts during the construction period that may pose negative environmental health and social impacts have been identified and can be addressed by way of environmental site monitoring and compliance reporting during the construction period. The position and type of supporting infrastructure that may impact people's environmental rights such as noise emitting, odour emitting and potential polluting activities can be placed at alternative localities on-site and can include technologies to avoid or to minimise any nuisance emitting effect or health impact. These mitigation measures forms part of the draft EIR and the EMPr (see Appendix G).		*F5.5/F15/ F16/F17.2 -3*
c. Positive impacts and were measures taken to enhance positive impacts?	*Yes*	*Ref.*
Section I1.4 applies the method of comparative assessment by considering the advantages, disadvantages and the mitigation potential of selected project alternatives as part of the process to identify potentially significant impacts, and of reaching the proposed development footprint.		*F17.2-3 I1.4*
The scoping identified the need for additional information regarding these aspects and such issues have been addressed in Section I1.4		

G2.2.8 Will the development's socio-economic impacts result in ecological impacts 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 e.g. over utilisation of natural resources, etc.)	*No*	*Ref*
The following two ecosystem linkages have been identified, the first the linkage is with agricultural land and second the natural corridor along with watercourses. The natural habitat on the vacant agricultural zoned property has been modified by previous cultivation and cattle grazing. Furthermore, surrounding informal urban settlements fragmented potential habitats along previous natural corridors to such an extent that the site and remaining drainage line corridors have none to little value for the survival of natural vegetation communities and associated wildlife and the provision of ecosystem services. As a result, most of the site has been invaded by indigenous and alien invader species that further reduce the site's sensitivity and importance. As a result of the above, all ecological –socio-economic linkages has been lost.		*F5.5/F8/F 9/F10/F14 .1/F14.4*
Does this issue require further information to be generated during the assessment?	*No*	*N/A*

G2.2.9 Was the "best practicable environmental option" selected in terms of socio-economic considerations? (What measures were taken to pursue such selection)?	*Yes*	*Ref*
The variety of proposed uses within this township can provide a complementary mix of social and economic activities. Section I1.4 applies the method of comparative assessment by considering the advantages, disadvantages and the mitigation potential of selected project alternatives as part of the process to identify potentially significant impacts, and of reaching the proposed development footprint.		*F14.1/ F15.2 I3-1 I1.4*
Does this issue require further information to be generated during the assessment?	*No*	*N/A*

G2.2.10 Was measures 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)?	*Yes*	*Ref*
All identified impacts can be contained and mitigated on-site and should not impact neighbouring persons or communities. No prejudice to any particular group was identified in the overall layout of the proposed mixed-land uses and services that are proposed for the township.		*F17.3*
a. Considering the need for social equity and justice, do the alternatives identified, allow the "best practicable environmental option" to be selected.	*Yes*	*Ref*
All additional social needs has been identified during the public participation process has been assessed accordingly. The proposed land use aligns with the development goals of the local municipal IDP		*F17 H1.3 I3*
b. Considering the need for social equity and justice is there a need for other alternatives to be considered?	*No*	*Ref*
All additional social needs has been identified during the public participation process.		*H1.3*
Does this issue require further information to be generated during the assessment?	*No*	*N/A*

G2.2.11 Was measures taken to pursue equitable access to environmental resources, benefits and services to meet basic human needs and ensure human wellbeing (what special measures were taken to ensure access thereto by categories of persons disadvantaged by unfair discrimination)?	*Yes*	*Ref.*
The public amenities in the proposed township is not expected to be exclusive to a certain section of the population, Furthermore, architectural and landscape design can accommodate people with disabilities.		*F17.3*
The scoping identified the need for additional information regarding this aspect. However at this stage Architectural plans will opnly be verified in the planning process as indicated in the EMPR.		*N/A*

G2.2.12 Was measures 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?	*Yes*	*Ref*
The life cycle of this project consists of the planning, construction and operational phase of the township. Environmental health and safety aspects that need to be incorporated in the proposed township can be achieved by inputs from each of the relevant professional team members that participate in the planning of this project. The contractors will be accountable in terms of his or her profession to ensure that the necessary standard incorporated in the construction phase of the township. The individual land users in the township must comply with the occupational health and safety and other relevant laws that regulate public safety during the operational period.		*See EMPR App G*
Does this issue require further information to be generated during the assessment?	*No*	*N/A*

G2.2.13 Will measures be taken to:		
a. Ensure the participation of all interested and affected parties.	*Yes*	*Ref.*
Refer to Appemdix F for details on the Public participation process. All comments from registered I&APs was responded to. Additional information applicable on the comments from registered I&APs has been incorporated into this draft EIR assessment.		*H App F*

b. **Provide all people with an opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation**.	*Yes*	*Ref.*
Written and advertised site notices were given where applicable and appropriate. *By a Ward Councillor and Ward Committee Meetings, this issue has been addressed.*		*H* *App F*
c. Ensure participation by vulnerable and disadvantaged persons.	*Yes*	*Ref.*
Written and advertised site notices were given where applicable and appropriate. *By a Ward Councillor and Ward Committee Meetings, this issue has been addressed.*		*H* *App F*
d. Promote community wellbeing and empowerment through environmental education, the raising of environmental awareness, the sharing of knowledge and experience and other appropriate means.	*Yes*	*Ref.*
Written and advertised site notices were given where applicable and appropriate. *By a Ward Councillor and Ward Committee Meetings, this issue has been addressed.*		*H* *App F*
e. Ensure openness and transparency, and access to information in terms of the process,	*Yes*	*Ref.*
Written and advertised site notices were given where applicable and appropriate. *By a Ward Councillor and Ward Committee Meetings, this issue has been addressed.*		*H* *App F*
f. Ensure that the interests, needs and values of all interested and affected parties were taken into account and that adequate recognition was given to all forms of knowledge, including traditional and ordinary knowledge.	*Yes*	*Ref.*
Written and advertised site notices were given where applicable and appropriate. *By a Ward Councillor and Ward Committee Meetings, this issue has been addressed.*		*H* *App F*
g. Ensure that the vital role of women and youth in environmental management and development was recognised and their full participation therein was promoted?	*Yes*	*Ref.*
Written and advertised site notices were given where applicable and appropriate. *By a Ward Councillor and Ward Committee Meetings, this issue has been addressed.*		*H* *App F*
Does this issue require further information to be generated during the assessment?	*No*	*H*

G2.2.14 Considering the interests, needs and values of all the interested and affected parties, will the development 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)?	*Yes*	*Ref.*
The land uses and services that are proposed within this township can provide a complementary mix of economic and social activities that are in need in the local area as identified in the IDP.		*F17.2/F 17.3*
Does this issue require further information to be generated during the assessment?	*No*	*N/A*

G2.2.15 Have 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?	*No*	*Ref*
The life cycle of this project consists of the planning, construction and operational phase of the township. The contractors will be accountable in terms of his or her profession to ensure that the necessary occupational health and safety standards are incorporated in the construction phase of the township. The individual land users in the township must comply with the occupational health and safety and other relevant laws that regulate future workers safety of their specific land use or facility during the operational period.		*K*
Does this issue require further information to be generated during the assessment?	*No*	*N/A*

G2.2.16 Will the development impact job creation in terms of, amongst other aspects:		
a. The number of temporary versus permanent jobs that will be created.	*Yes*	*Ref.*

The detail projection of the potential employment is not available, however, it is expected that more permanent jobs can be created in the operational period compared with temporary jobs in the construction period.		*N/A*
b. 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)0	*Yes*	*Ref.*
The proposed township makes provision for mixed land uses and therefore it can be expected that it will provide different skill-level employment opportunities		*F17.2*
c. The distance from where labourers will have to travel.	*N/A*	
The project area is centrally located along the main distributor road surrounded by medium to high-density residential areas where the potential labour force may originate from. The travel distance is however unknown.		*N/A*
d. The location of jobs opportunities versus the location of impacts (i.e. equitable distribution of costs and benefits).	*N/A*	
The location of the project is not expected to pose negative socio-economic impacts (cost) on the surrounding local community; however, equitable socio-economic opportunities (benefits) for the local community can be provided by the diverse range of land uses that are proposed.		*N/A*
e. The opportunity costs in terms of job creation (e.g. a mine might create 100 jobs, but the impact on 1000 agricultural jobs etc.)	*N/A*	
There are widespread and high levels of unemployment in this area; there is thus an over-supply of labour resources in this area which is not expected to result in opportunity cost (loss of employment opportunities).		*F17.4*
Does this issue require further information to be generated during the assessment?	*No*	*N/A*

G2.2.17 Were measures taken to ensure:		
a. That there were intergovernmental coordination and harmonisation of policies, legislation and actions relating to the environment.	*Yes*	*Ref.*
Relevant State Departments that administers laws and regulations were be invited to participate in the EIA public participation process, all provided comments can be seen in Section H of this draft EIR.		*E1/ H / App F*
b. The development is in line with the IDP, SDF and LED. Relevant organs of state will be included in the Public Participation Process.	*Yes*	*Ref*
Refer to the policy and plan analysis – Section E.		*E*
c. Those actual or potential conflicts of interest between organs of state were resolved through conflict resolution procedures?	*N/A*	*Ref*
No conflict of interest between organs of the state is expected or triggered from the integrated plans and frameworks		*N/A*
Does this issue require further information to be generated during the assessment?	*No*	*H*

G2.2.18 Were measures 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?	*N/A*	*Ref*
▪ *Historic modification of the land destroyed its public environmental value. Thus there are currently no public environmental resource benefits on the land.* ▪ *Therefore, the property in its current state does not represent any environmental value that requires protection or to be held in public trust.*		*F2.3/F1 7.2/F5. 5/F16.2*
Does this issue require further information to be generated during the assessment?	*No*	*N/A*

G2.2.19 Are the mitigation measures proposed realistic (what long-term environmental legacy and the managed burden will be left)?	*No*	*Ref*
There will not be any long-term negative environmental burden or legacy due to this development.		*N/A*
Does this issue require further information to be generated during the assessment?	*No*	*N/A*

G2.2.20 Were measures taken to ensure that the 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?	*No*	*Ref*
In terms of Section 28 of NEMA the Developer remains ultimately responsible for the cost of remedying of environmental damage.		*N/A*
Does this issue require further information to be generated during the assessment?	*No*	*N/A*

G2.2.21 Did the alternatives identified (in terms of all the different elements of the development and all the different impacts being proposed); result in the selection of the best practicable environmental option in terms of socio-economic considerations (Considering the need to secure ecological integrity and a healthy bio-physical environment)?	*Yes*	*Ref*
▪ *Potential reasonable and feasible alternatives are considered as part of this draft EIR assessment.* ▪ *The comparative assessment of identified alternatives will feedback into the planning and design of the township thereby optimising the positive aspects and minimising the negative aspects that are highlighted in this assessment process.*		*I1.4*
Does this issue require further information to be generated during the assessment?	*No*	*N/A*

G2.2.22. Will the development result in positive cumulative socio-economic impacts bearing in mind the size, scale, scope and nature of the project concerns its location and other planned developments in the area?	*Yes*	*Ref*
The proposed development is expected to provide a substantial boost to the local economy and to social facilities that will cumulatively contribute to increased employment, spending and betterment of living conditions.		*I7.4*
Does this issue require further information to be generated during the assessment?	*No*	*N/A*

G.2.2.23 Will the development result in negative cumulative socio-economic impacts bears in mind the size, scale, scope and nature of the project concerning its location and other planned developments in the area?	*No*	*Ref.*
▪ *No, the residual probability (after mitigation has been applied) poses no negative cumulative impacts.*		*I7.4*

G2.3 Specific issues relating to the impacts of the commercial centre

An urban economic Market Research Study by Demacon (see App.D13) investigated the economic and social demands and supplies within the local area and was thus able to determine the composition of commercial and social land uses, facilities and services that would likely be feasible for inclusion in the proposed mixed-use township as described more clearly in Section C of this report. As a result, the issues that were identified in the Scoping process concerning the need and desirability impacts and impacts on other business centres in the area was considered as deliberated hereunder:

G2.3.1 Was the town planning principle of business centre hierarchies applied in the planning of the proposed business component of the township.		**Yes**
▪ *Urban planning allows for a hierarchy of central business centres /commercial centres with different and overlapping service areas as each business centre provides different commercial and social goods and services to a broader or more local service area.* ▪ *The highest hierarchal level is a regional business / commercial centre with a service area that can include in total or a partial municipal area and which can even service a region of adjacent municipal areas.* ▪ *A lower-level business / commercial centre is the community centre of which several can occur within the service sphere of a regional centre. The community centre provides goods and services that are more confined to a community or suburban area.* ▪ *A number of the lower level of business / commercial centres can occur within the service sphere of both the regional and the suburban centres. These are the typical corner-shop in residential areas and also include the informal shops along major roads.* ▪ *The proposed commercial component of the township fits into the community centre of the business centre hierarchy.*		App D12
G2.3.2 Can different order size businesses centres cater to different consumer / social needs.		**Yes**

It is important to note that the proposed new urban centre will also provide social facilities and services to the local communities and the mixed use nature of this development is expected to benefit the local community by providing complementary services that are not necessarily available at other nearby commercial centres.		App D12
G2.3.3 Based on the above, can the proposed mixed use township can be sustained in the identified area and can it co-exist with other neighbourhood convenience centres, community centres and regional centres that are already established within the Acornhoek, Dwarsloop and Bushbuck Ridge areas.		**Yes**
The study of the market demand, supply and viability indicate that the larger Bushbuck Ridge market in general (and also the trade area for the proposed development) is mostly underdeveloped from a retail supply-side perspective. Various components of the retail hierarchy have not yet emerged in the area.		App D12

G2.3.4 Positive and negative impacts that the proposed Acorn City Mixed Use Development will have on Acornhoek Mall Strategic Development Area.		
▪ *In order to determine potential negative impacts on existing commercial centres, it is necessary to determine the estimated retail loss based on the expected retail supply of the proposed new business centre. The proposed new commercial development is expected to add ±3.94% of additional shopping center floor space to the existing offering in the primary trade area. Considering that centers such as Acornhoek Mall, Dwarsloop and Acorn Plaza draw off a larger regional catchment area, the combined impact of the new development on these centers should not exceed 3.94%, and is likely to be in proportion to the size and distance of the center. In this manner, the largest center - Acornhoek Mall sales, is not likely to be impacted by more than ±1.5% over the short term. This can be considered a very small proportion of retail loss and will result in a very low negative impact to Acornhoek Mall.* ▪ *Considering population growth and urban settlement expansion in the Acornhoek area, as can be seen on aerial photo comparison, a positive aspect is that the above impact is likely to be offset over the short to medium term.* ▪ *In addition, Acornhoek Mall may benefit indirectly as more consumers may visit the greater Acornhoek area due to the inclusion of a social services component in the township which is absent at Acornhoek Mall.*		App D12

G2.3.5 How will the proposed neighbourhood/convenience/community centre complement the local and regional centres in the Acornhoek area.		
▪ *An important concept in retailing is the fact that different order size shopping centres cater to different consumer needs. In this context, the proposed mixed use township can be sustained in the identified area and should be able to co-exist with other neighbourhood convenience centres, community centres and regional centres that are already established within the Acornhoek, Dwarsloop and Bushbuck Ridge areas.* ▪ *The complement of different shopping centers in the Acornhoek area (within the hierarchy of business centers) will thus be beneficial to the local community in terms of the range of goods and services that are located conveniently near to each other and accessible from major roads.*		App D12

G2.3.6 The expected significance of the potential socio-economic impact on existing businesses and business centres and social facilities in its market/target area.		
▪ *An estimated combined retail loss of 3.94% on existing regional shopping centres in the Bushbuck Ridge area inclusive of an estimated 1.5% retail loss by the Acornhoek Mall due to the development of an additional retail component as part of the proposed new township can be considered as a very "LOW" impact rating. Furthermore, this estimated impact is likely to be offset over the short to medium term due to growing human settlement in the Acornhoek area. The significance of the impact in terms of extent, duration, consequence and probability is expected to be "LOW".* ▪ *The proposed inclusion of social facilities in the township such as medical and educational and office uses as well as community urban agriculture are essential land uses that are too often overlooked by developers. It is not foreseen that these services will pose any negative impact on existing community facilities in the Acornhoek area.*		App D12

G2.4 SPECIFIC ISSUES RELATING TO THE IMPACTS OF THE FUEL STATION LAND USE		
A Business Plan Study conducted by Petrorex on the feasibility of the proposed fuel station which is a land use being considered as part of this assessment makes the following findings:		App D13

G2.4.1 New filling station developments need to take into account the economic pressure that will be experienced by existing filling stations.		
Section 8 the Market Supply Analysis and specifically Section 8.1.3 and 8.15 complies with the requirement to take existing filling stations and the economic pressure on such filling stations into account.		App D13

G2.4.2 In the case where there are existing filling stations in proximity, an assessment of the cumulative impacts on the socio-economic environment, as a result of combined impacts from all filling stations in the applicable radius must be undertaken.		
▪ *The competitor fuel stations are located between 5 to 25km from the project area.* ▪ *The distance between these fuel stations and the proposed new fuel station are too far apart to consider any combined / cumulative socio-economic impact on the resident community.* ▪ *Furthermore, the proposed new fuel station will not be located directly adjacent to any residences and as such social impacts such as noise, vibration, heavy vehicle impacts and visual impacts that may occur are not applicable to this fuel station site.* ▪ *A geo-hydrological contamination risk assessment (App 5.1) indicates a low probability of impacting of groundwater resources which may impact the scoi-economic environment.*		App D13

G2.4.3 Is there high enough demand to make new filling stations feasible.		
▪ *Given the population growth characteristics of the area and the continued urban expansion in the area, it is expected that the area will experience increased vehicle ownership and traffic volumes which justifies the demand for a new fuel station, conveniently located at the proposed site.* ▪ *The study revealed that the proposed fuel station will be viable and sustainable based on the growing demand for fuel in the market area.*		App D13

G2.4.4 Is existing filling stations experiencing difficulty to maintain feasibility/sustainability?		
▪ *It is unsure as the fuel stations would not provide such classified information. Different minimum fuels sales exist for different fuel companies. For example, Sasol has adopted a minimum fuel sale amount of ±300000 litres per month as an adequate indicator of the potential feasibility of Sasol service stations.* ▪ *However other factors also contribute to this, such as the capital expenditure and other forms of investments as well as the operational requirements that have been made.* ▪ *It can therefore be assumed that all existing fuel stations in the area maintain fuel sales in excess of the above-mentioned volume which makes them feasible.*		App D13

G2.4.5 The specific cumulative impact on other filling stations in the area.		
▪ *An economic multiplier impact analysis as discussed in Section 8.1.2.2 of the Fuel Station Feasibility Study provides the following statement on page 132.* ▪ *Volume Loss indicates a detailed calculation of the potential volume loss of the identified competitor sites. Inclusive an indication of the volume loss recovery in year one to five after the proposed sites have been activated.* ▪ *It is evident from the evidence provided that no competitor site will suffer a severe volume loss and close. Most of the competitor sites will recover the volume loss within 3 (three) years.* ▪ *The significance of the impact in terms of extent, duration, consequence and probability is thus expected to be "LOW".*		App D13

G2.4.6 These include the impact on job losses due to impact on the economic viability of the other filling stations.		
It is not expected that the proposed service station will impact on the viability of other fuel stations to the extent that job losses will occur at other fuel stations. The service station development, once developed, is envisaged to have the feasible potential to generate up to ± 39 permanent employment opportunities, consisting of Cashiers, Forecourt attendants, Chars and Management.		App D13
G2.4.7 The impact on the environment of the proliferation of filling stations as well as the		

impact of the proposed filling station on existing stations, this obligation is 'wider than the requirement to only assess the need and desirability.		
Economic Multiplier Impact Analysis takes several other environmental impacts into consideration namely, direct, indirect and induces impacts such as employment impacts, safety and security and crime impacts, severance impacts, visual impacts, pollution, noise, vibration, and vehicle traffic. Overall the proposed new fuel station is not expected to pose any adverse impact on any of the identified aspects.		App D13

G2.5 SUMMARY OF THE NEED AND DESIRABILITY

The preliminary need of the proposed development in terms of social facilities and commercial land uses as well as its desirability in terms of ecological footprint and locality in terms of accessibility to physical infrastructure and compliance with the local planning and economic objectives can be summarised as follows:

- *The proposed development can be socially and economically justifiable in terms of the needs of the local community as identified in the Municipal Integrated Development Plan and its economic development strategies and objectives of economic growth, investment, employment and wealth creation and social facilitation.*
- *The need for the proposed development can be justified at the selected location without compromising the natural environment within which it will be located subject to the implementation of recommended mitigation measures where necessary.*
- *The proposed site is also desirable due to road network and transport, bulk water and electricity access and accessibility.*
- *The spatial position of the proposed mixed use township is desirable as it is in line with the relevant Spatial Development Framework Plans.*
- *The need for commercial land uses within the proposed township has been investigated and determined to be feasibly based on the demand and supply of such land uses/services within the potential market area of the proposed township.*

The need and desirability assessment did not reveal any fatal flaw in the ecological and socio-economic justification of the project.

KEY ISSUES : I & AP COMMENTS & RESPONSE AND SPECIALIST INPUTS

H1. IDENTIFICATION OF KEY ISSUES BY WAY OF PUBLIC AND DEPARTMENTAL PARTICIPATION

This Section provides a summary of the issues raised during the Scoping Public Participation Process by registered Interested and Affected Parties and State Departments.

H1.1 PURPOSE OF PUBLIC AND DEPARTMENTAL PARTICIPATION

The IEM Guideline Series 7 (2010) indicates the main purpose of public participation is:

- *to provide an opportunity for interested and affected parties (I&Aps), the environmental assessment practitioner and the competent authority to obtain clear, accurate and understandable information about the environmental impacts of the project or implications of a decision,*
- *to provide I&Aps with an opportunity to voice their support, concerns and questions regarding the project, and for suggesting ways for reducing or mitigating any negative impacts of the project,*
- *it enables the applicant to incorporate the need, preferences and values of affected parties into his application, and*
- *it provides the opportunity for clearing up misunderstandings about technical issues, resolving disputes and reconciling conflicting interests.*

H1.2 METHOD OF PUBLIC AND DEPARTMENTAL NOTIFICATION AND PARTICIPATION

The method follows the requirements of GNR 326 of 7 April 2017 and the following public participation process has been concluded as part of the environmental scoping process which commenced on 13 October 2021.

- *A notification of the project to the broad public in the local newspaper.*
- *A notification of the project to the broad public by way of notice boards that were fixed on the boundaries of the site.*
- *A written notice of the application was provided to owners and occupiers of land / property directly adjacent to the site.*
- *A written notice of the application was provided to the municipal Councillor of the relevant Ward.*
- *A written notice of the application was provided to the Local Municipality.*
- *A written notice of the application was provided to relevant State Departments that have interest / jurisdiction.*
- *The above-mentioned notice provided the public and above-mentioned parties with background on the proposed development and invited participation by registering, reviewing and commenting within 30 days on the Draft Scoping Report that was available for public review at the Acornhoek Municipal Offices, the Setlare Traditional Council Offices and on an electronic platform that was publicly accessible.*

Written comments were received from interested and affected parties and state departments and the EAP responded thereon. A Register of Interested and Affected Parties was opened and the comments were incorporated completely into a Final Scoping Report. Where relevant and applicable the comments were included in the plan of study for EIA.

The following method will be followed in the second round of public participation with registered I&APs and State Departments: A written notification will be provided to registered parties and State Departments, inviting them to review and to comment within 30 days on a Draft Environmental Impact Report (EIR) that will be made available for review on a publicly accessible electronic platform.

Comments received during this period will be reviewed, responded to and will be incorporated into a Final EIR that will be submitted to the Competent Authority in support of their decision on the application for Environmental Authorisation of the relevant regulated activities associated with this project.

H.1.3 SUMMARY OF ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

In compliance with Appendix 3, Section 3(h)(iii) of GNR326 (2017), the Section below provides a summary of the issues raised by interested and affected parties and an indication of the manner in which the issues are incorporated or the reasons for not including them (the unabridged comments can be viewed in Appendix F).

.#	Summary of comments/issues received by the commentator	Response and manner in which the comment/issue has been incorporated / or not	Report Reference
12 November 2021 : Mr. M.N. Nelwamando representing Ivan Pauw and Partners consulted with DELRON environmental assessment practitioners to provide comments on the draft Scoping report as follows. (*The numbering format below corresponds to the numbering used by the commentator)*			
2.1	Potential Impact on Acornhoek Mall	*An Urban-economist has assessed the socio-economic impacts on other business centres in the Acornhoek area, see also Par 6.4 and 6.5 below.*	*G2.2.23; G2.3; App 13*
3.1(i)	Was permission obtained from DALR&RD for all the proposed activities?	*The Applicant has a 30 year lease on the land for purposes of a mixed use township as was agreed by the Department of Land Reform and Rural Development.*	*App D1*
3.1(ii)	Was the property purchased from the DALR&RD?	*The property is leased by the Applicant.*	*App D1*
3.1(iii)	A copy of the signed land ownership consent form to be provided in the draft EIA	*Refer to Appendix D1 for the landowner's consent from the Department of Agriculture, Land Reform & Rural Development.*	*App D1*
4.1	No access has been given to the Market study conducted for the proposed development and question arise regarding the need and desirability of the project. This study must be provided in the draft EIA.	*Refer to the urban-economic Market Research Study in Appendix D12.*	*App D12*
4.2(i)	Will Eskom provide the proposed township with electricity? Comments from Eskom must be included in the draft EIA.	*ESKOM will provide electricity to the proposed township establishment, refer to Appendix D9.*	*F14.4 , App D9*
4.2(ii)	Explain whether the necessary services are available and whether the local authority confirmed sufficient, spare, unallocated service capacity. Confirmation of all services must be included in the draft EIA.	*Confirmation on how the township will be serviced is included in the respective engineering services reports, including confirmation of availability and capacity of such services (refer to Appendix D9 , D10.1 and 10.2).*	*F14.4 App D9 App D10.1 & D10.2*
4.2(iii)	Provide detailed descriptions and drawings of the proposed engineering services for all alternatives.	*All detailed descriptions and drawings for the proposed engineering services and all alternatives are seen in the Civil Service Report and the Stormwater Management Plan.*	*App D10.1 App D10.2*
4.3	Access to the Site is from the R40 Provincial Road, has access to the site been approved by the relevant authority?	*The appointed Traffic Engineer received the comments and conditional support from SANRAL. Refer to the Traffic Impact Study and comments from SANRAL in Appendix D 11.*	*App D11*
4.4	A detailed Storm water Management Plan should be complied and included in the draft EIA.	*A stormwater management plan has been finalised.*	*D10.2*
5.1	Confirmation must be provided that listing Notice 1 - Activity 14 is not part of this application for environmental authorisation.	*Reference is made that Listing Notice 1-Activity 14 (the storage and handling of dangerous goods) should not be part of this environmental authorisation application. The fuel station land use forms an integral part of the overall township (refer to Section C),and therefore the activity (land use) and the site assessment for the proposed fuel station will remain part of this application for authorisation of Listing Notice Activity 28, but subject to additional authorisation of Activity 14 of Listing Notice 1. The latter application will focus more intently on the filling station in terms of environmental management issues to be applied by the filling station developer and operator that are not necessarily applicable to the township developer and operator.*	*D1 App A*

#	Summary of comments/issues received	Response and manner in which the comment/issue has been incorporated / or not	Report Reference
6.1(i)	The following information must be provided in the draft EIA for opportunity to comment: Ground verification of baseline environmental conditions	*Refer to Section F regarding the receiving environment that has been updated with specialist report information in the draft EIR. Also, refer to Appendix D regarding all the specialist reports.*	*App D6.1 , App D6.2 App D.3, App D7.1 App D7.2*
6.1(ii)	Confirm and accurately map all terrestrial and aquatic biodiversity features subject to the property	*The Plan of Study for scoping provides the terms of reference for mapping of terrestrial and aquatic features. All specialist reports are included in the draft EIR which included all relevant terrestrial and aquatic biodiversity features.*	*App D6.1 , App D6.2 App D.3, App D7.1 App D7.2*
6.1(iii)	Site specific social-economic profiling and attributes of the study area	*The Plan of Study for scoping provides the terms of reference for socio-economic profiling and attributes of the study area. The socio-economic profiling has been completed by Demacon Urban Economist and Petrorex as part of the Market Research and Feasibility Study see Appendix D11 & D12.*	*F17.3 App D11 App D12*
6.2	Provide the following specialist study in the draft EIA for opportunity to comment:	*The Plan of Study for scoping provided the terms of reference for all of the indicated studies.*	*N/A*
	(i)Terrestrial Biodiversity Compliance Report	*Ground truthing has been conducted by Specialists, see above Par 6.1(i). These specialist studies have been included in the receiving environment of Section F in the draft Environmental Impact Report.*	*App D6.1*
	(ii) Terrestrial Animal Species Compliance Report		*App D6.2*
	(iii)Terrestrial Plant Species Compliance Report		*App D6.3*
	(iv) Watercourse Delineation and Buffer Determination		*App D7.1*
	(v) Wetland Risk Assessment		*App D7.1*
	(vi) Aquatic Biodiversity Specialist Report		*App D7.1*
	(vii) Flood line Report		*App D10.3*
	(viii) Heritage Impact Assessment		*App D8*
6.3	Mention is made that the 1 in 100-year flood line will not be affected but if there is water courses on the property does this not require further assessment that entails a flood line assessment? This uncertainty must be clarified.	*The locality of the property is on a crest to upper-mid-slope position in the local landscape excludes the possibility of flooding, however, the Project Civil Engineer did issue a Flood line Certificate, refer to Appendix D10.3.*	*F2.2; F2.3, F5.4 App D10.3*
6.4	With reference to page 31 of the draft Scoping Report, Section F14.1, explain how the proposed neighbourhood/convenience/community centre will complement the Acornhoek Mall?	*In terms of the hierarchy of business/community centres which is a well-researched and accepted town and regional planning norm for determining the need for such centre, the proposed township will fit more towards a neighbourhood centre while the Acornhoek Mall is a regional commercial centre. Furthermore, the proposed neighbourhood centre will provide a range of social services which are absent at the Acornhoek Mall. In terms of the town planning principles the hierarchy of business centres should be present within communities in order to provide the full spectrum of social and economic services within the larger urban area. This aspect forms part of the urban-economic Market Research Study for the proposed township development.*	*App D12*
6.5	List the positive and negative impacts that the proposed Acorn City Mixed Use Development and alternative will have on Acornhoek Mall Strategic Development Area?		

#	Summary of comments/issues received	Response and manner in which the comment/issue has been incorporated / or not	Report Reference
7.1	Provide a detailed motivation why no property and site alternative were considered.	*A motivation for not assessing an alternative property was presented in the scoping report.*	*I3.4.1 (page 75 of the Scoping report)*
7.2	Provide a full description of the process followed to reach the preferred alternative within the site.	*The process of reaching the preferred alternatives already commenced in the scoping process (see Section I3 of the Scoping Report) and is continued in Section I of the DEIR.*	*I1.4-1.5* *App D2* *App D*
7.3	It is required from the Applicant and the consultant to exclude and remove Land Use Alternative LA_6 Special (Fuel Station) as a land use alternative to be considered and assessed.	*The fuel station as a land use alternative will not be excluded from this assessment and remains subject to authorisation as part of the proposed land use and township layout as indicated in 5.1 above. Also refer to Section D of the DEIR for clarification.*	*Section D*
8.1	Amendment to the plan of study is required to remove all recommended technical and specialist studies relating to the filling station, because the filling station is not part of the application for environmental authorisation	*The fuel station as a land use alternative will not be excluded from this assessment and remains subject to authorisation as part of the proposed land uses and township layout as indicated in 5.1 above.*	*Section D*

21 October 2021 : Ms. T Sithole of Department of Agriculture, Rural Development, Land and Environmental Affairs acknowledged our notification and provided comments (*The numbering format below corresponds to the numbering used by the commentator)*			
1	All buffers must be clearly illustrated on layout plan.	*Refer to the layout plan in Appendix A*	*App A*
2	The layout plan indicates a filling station, but is not part of the application, please clarify?	*The township layout includes a fuel station that required authorisation, on condition that authorisation be obtained for Activity 14 (Notice 1) by way of a separate application for EA which runs simultaneously with this application.*	*D1*
3	Please clarify why the layout plan does not include open spaces as conservation areas.	*The preferred layout and land use alternatives have been finalised, subject to the specialist assessments inputs, and can be seen in Section C2 and Appendix A of this report.*	*C2* *App A*
4	Confirmation of appropriate water supply has to be confirmed.	*The local municipality did confirm sufficient water supply to the township. Refer to Appendix D3 regarding confirmation of existing water provision from the Bushbuckridge Local Municipality. Refer to Section F14.4 of this report for more information regarding infrastructures and services.*	*F14.4* *App D3*
5	The co-ordinates of all preferred watercourse crossings must be available at the draft EIA stage, with the design of such crossings.	*The coordinates of all the watercourse crossings are available in the draft EIA in Appendix A. Design of the crossings is seen on in the Stormwater Management plan.*	*App A* *App D10.2*
6	Relevant roads authority must be added to the list of identified stakeholders.	*SANRAL was notified in terms of this application process. See the comments of SANRAL as part of the Traffic Impact Study in Appendix D11*	*D11*

#	Summary of comments/issues received	Response and manner in which the comment/issue has been incorporated / or not	Report Reference
7	Mpumalanga Tourism and Parks Agency must be a registered I&AP with an opportunity to review and comment on all reports.	*The MTPA was included as an I&AP and was notified. The response was received (see below).*	*N/A*
8	The final scoping report must provide proof that all potential and registered I&AP's, including Organs of State were provided an opportunity to comment on the draft scoping report with access to the report.	*Refer to the final Scoping report Section K*	*Section K of the Scoping report page 95*

11 November 2021 Mr. Khumbelo Malele of the Mpumalanga Tourism and Parks acknowledged receipt of the notice and provided comments. (*The numbering format below corresponds to the numbering used by the commentator)*			
1 & 2	Sensitivities of the terrestrial and freshwater assessment areas on the property needs to be taken into consideration with the layout plan.	*The terrestrial Specialist did not identify any sensitivity on the proposed site, for this reason, there is no sensitivity indicated on the layout plan. The aquatic specialist indicated 20m buffers to be placed around the stormwater retention ponds. These buffer zones are indicated within the "Open space" land uses on the layout plan.*	*App A*
3a-e	Layout plans must include; locality map, proposed mix township development footprint (including area of vegetation clearance), bulk infrastructure and map of sensitive features with buffers.	*The Layout plan is seen in Appendix A. The locality map, proposed mix township development footprint (including area of vegetation clearance), bulk infrastructure and map of sensitive features with buffers is seen on the Layout plan*	*App A*
4	The list of specialist studies for site specific baseline information and potential impact development assessment is in order.	*The list of specialist studies was given in the Scoping report Section J. A site investigation from the Aquatic specialist determined that by ground-truthing only an aquatic compliance report is necessary. The potential impact development assessment is seen in this draft EIR report. Refer to the Impact Statement in Section M for the summary of the potential impact development assessment.*	*App D7.1* *App D7.2* *M*

03 March 2022 Mr. Nokukhanya Khumalo of the South African Heritage Resources Agency provided comments. **(***The numbering format below corresponds to the numbering used by the commentator)*			
	The SAHRA Archaeology, Palaeontology, and Meteorites (APM) Unit notes the submission of the HIA and that the development area is located in a zone with negligible palaeontological sensitivity. According to the SAHRIS palaeo-sensitivity map, there is no requirement for assessments in this zone and the development is granted exemption from undertaking a palaeontological assessment. The SAHRA will provide further comments once the draft EIAr is submitted to the case. The SAHARA acknowledges the presence of graves / burial sites on the property. The SAHRA acknowledges that the only feasible option concerning the locality of the graves will be to relocate the graves to an appropriate site or existing cemetery. The presence of additional graves or burial sites should be confirmed during a social consultation process. The applicant must adhere to all legal requirement and obtain the necessary permits in terms of Section 38 (3 of the NHRA) 1999.	*SAHRA acknowledges that no heritage resources except a low significance grinding stone were identified during an on-site heritage assessment. A "chance find procedure" will however be implemented during the construction phase.* *Appropriate engagement with SAHRA will follow if any heritage resources are identified during the construction period.* *The recommendation in terms of palaeontological requirements is noted.* *With support of the local Tribal Authority a social consultation process is currently underway to identify the next of kin (Nok) of the identified graves on the development site. The aim of the social facilitation will be to obtain consent from the NOK for the grave relocation to a preferred site which may include a cemetery site within the in the proposed township as proposed in Section C and included as a new land use alternative in this assessment. Note that no new burials will be allowed in such cemetery site in the future .*	*F12.2* *App 8*

H2 INVESTIGATION AND INPUTS ON KEY ISSUES BY ENVIRONMENTAL SPECIALISTS AND TECHNICAL PROFESSIONALS

H2.1 PURPOSE OF INVOLVING SPECIALIST

The purpose of involving a wide range of Specialist Input is to specifically address the technical ability of EIA's in determining baseline environmental conditions, field surveys and data collection, identifying and predicting potential impacts and prescribing mitigation measures and implementing monitoring requirements regarding direct, indirect and cumulative impacts (DEAT, 2002c).

H2.2 METHOD OF DETERMINING KEY ISSUES FOR SPECIALIST INVESTIGATION

The priorities of the environmental assessment are determined by applying the scoping process during which the project activities and project site is "scoped" for potential issues, risks and impacts. Stakeholder engagement as a means of identifying key issues forms part of the scoping process. A preliminary scoping assessment of all identified issues, risks and impacts further determines the key aspects that require in-depth investigation by way of specialist verification and/or assessment and which are included in specific terms of reference the Scoping Report's Plan of Study for EIA.

H2.3 SUMMARY OF THE INPUTS / FINDINGS OF SPECIALIST INVESTIGATIONS

The required specialist studies as referred to above have been concluded and are attached in Appendix D to this report. In compliance with Appendix 3, Section 3(k) of GNR326 (2017), the Section below provides a summary of the findings of specialist investigations, based on the previously identified key issues and it also makes reference to the relevant Sections in this report where the findings and recommendations of specialists are included in this report.

#	Key Issues	Specialist Study	Summary of the findings / inputs from environmental specialists	Report Reference
1	***Soil conditions may contribute to development risks***	***Geo-technical investigation***	*The Geo-technical investigation addressed the key issues as follow:* ▪ *Two geotechnical soils zones, Zone S and Zone C2 have been identified across the area of investigation which identified potentially collapsible and compressible soils on site.* ▪ *No perched water table or zones of seepage were identified.* ▪ *The area of investigation (Zone S and Zone C2) classifies as soft excavation material to depths in excess of 3,0m.* ▪ *Conventional and / or deeper than normal strip / spread foundations could be employed for the structures across Zone S.* ▪ *Special foundation procedures such as reinforced concrete raft foundations or suitably designed piled foundations would be required for the structures across Zone C2.* ▪ *To conclude, the investigation determined that the soil conditions are suitable for urban infrastructure development, building construction and installation of underground services, and subject to the implementation of special foundation design measures the impact is rated as "Low".*	*Section F4 App D4.1*
2	***Changes in surface hydrology***	***Storm Water Management Plan***	*The Storm Water Management Plan addressed the key issues as follow:* ▪ *New storm water piped systems will be installed within the proposed development to collect the on surface storm water runoff that will be diverted to the new road reserves, i.e. collector, link and service roads. Collection of the internal storm water runoff will be by means of catch pits, field inlets, grid inlets and kerb inlets constructed as part of the internal roadways.* ▪ *The collected storm water will be discharged into four adequately sized attenuation ponds constructed at every catchment area. Bio-retention areas with retention ponds will form part of the proposed sustainable drainage system and the design and specification of these bio-retention areas and ponds will adhere to the South African Guidelines for Sustainable Drainage Systems (SuDS) as proposed by the Water Research Commission and accepted by Department of Water and Sanitation.* ▪ *The runoff from the above mentioned SuDS will ultimately discharge by way of a controlled spillway into the tributary watercourse to the Klein-sandrivier watercourse, following the same drainage pattern as currently observed. Erosion protection will be provided at all outlets. The hydrological run-off calculations estimate that the total volume of attenuation required is approximately 15433m³ to restrict the 1:5 and 1:20 year developed runoff from the site to that of the 1:5 and 1:20 year pre-developed conditions respectively in accordance with Department of Water Affairs' requirements.* ▪ *Furthermore, the initial construction of the attenuation ponds during the onset of the construction period will ensure all storm water from the construction site will be diverted to the ponds which will thus act as temporary silt trap during construction.* ▪ *To conclude, the proposed storm water system is expected to reduce and buffer peak storm water flows, and velocities, provide effective buffer to avoid the risk of downstream flooding and erosion and ultimately contribute to reduced levels of silt deposition and ultimately preventing degradation of freshwater ecology of the in the nearby Klein-sand River.* ▪ *The proposed storm water plan is a technical mitigation measure that can effectively reduce changes in the surface hydrology to insignificant levels that will constitute to a "Low" impact overall on surface water ecology.*	*Section F6 App 10.2*

#	Key Issues	Specialist Study	Summary of the findings / inputs from environmental specialists	Report Reference
3	***Changes to terrestrial biodiversity***	***Terrestrial Biodiversity Compliance Report***	*The terrestrial biodiversity compliance report addressed the key issues as follow:* ▪ *The site was historically used for subsistence cultivation practices, cattle grazing as well as wood harvesting. An on-site biodiversity verification confirms that species composition and structure of the previously occurring natural woodland was severely modified.* ▪ *Aerial photo analysis compared the 2009 land cover condition of the site and the surrounding area with the 2021 land cover condition.* ▪ *Extensive urban settlement around the site and increasing land cover modification on the site classifies as moderately to heavily modified.* ▪ *Natural terrestrial biodiversity was mostly reduced to the dominant species Sclerocarya birrea spp. caffra (Marula) and Acacia sieberiana (Paper Bark Thorn) which occurs widely spread and at low densities across the site.* ▪ *The natural woodland has been replaced by a dense thicket of the declared invader Sickle bush and alien Lantana. Casuarina that was previously used for agricultural wind-breaks as well as common pine trees also occur widely on the site.* ▪ *The development site thus poses an actual "Low" terrestrial biodiversity rating, which is completely in contrast with the 'High" sensitivity rating as indicated in the Environmental Screening Report. The sensitivity rating is thus adjusted from HIGH to LOW.* ▪ *In conclusion, the heavily modified biodiversity and associated "Low" biodiversity rating poses no limitation to the proposed township development in terms of biodiversity conservation.*	*Section F9* *App D6.1*
4	***Changes to land cover and species***	***Terrestrial Animal Species Verification Report***	*The terrestrial animal verification report addressed the key issues as follow:* ▪ *Extensive human settlement on the areas surrounding the site occurred over the past ten to fifteen years and the site became completely isolated from the remaining ecological corridors towards the west.* ▪ *As a result the site has lost nearly all of its habitat and ecological functioning to sustain wildlife with possibly only rodent species that remain.* ▪ *On-site verification did not identify any sign of important terrestrial animal species.* ▪ *The Environmental Screening Sensitivity Rating for terrestrial animal species is therefore adjusted from MEDIUM to LOW.* ▪ *In conclusion, the heavily modified habitat and associated "Low" animal species sensitivity rating pose no limitation to the proposed township development in terms of species conservation.*	*Section F11* *App D6.2*
		Terrestrial Plant Species Verification report	*The terrestrial plant verification report addressed the key issues as follow:* ▪ *Due to the extensive urban development surrounding the site which indicates historic to recent modification of natural vegetation diversity and structure on the site, no important vegetation communities or plant species of conservation concern were identified on site.* ▪ *Neither site verification nor a review of the authoritative Brahms Database indicated any known presence of red data species.* ▪ *The legally protected Marula Tree (listed in the National Forest Act Regulations) and Aloe species (listed in the Mpumalanga Environmental Management Act) occur widespread across the site. A number of these specimens will be affected by the development footprint but mindful building and landscape design can mitigate their loss to a great extent by incorporating such species within gardens around buildings and along road reserves. Where such mitigation is impossible which will result in the loss of these species mitigation by way of relocation and / or replacing is a viable option, subject to obtaining the required permit by the relevant authorities.* ▪ *The Environmental Screening Sensitivity Rating for terrestrial plant species of conservation concern is thus adjusted from MEDIUM to LOW.* ▪ *In conclusion, the heavily modified natural land cover associated "Low" animal species sensitivity rating poses no limitation to the proposed township development in terms of species conservation, subject to the implementation of mitigation as mentioned above.*	*Section F11* *App D6.3*

#	Key Issues	Specialist Study	Summary of the findings / inputs from environmental specialists	Report Reference
5	***Changes to aquatic biodiversity and freshwater ecology***	***Aquatic Biodiversity Compliance Report***	*The aquatic biodiversity compliance report addressed the key issues as follow:* ▪ *The Klein-sand River which is categorised in the Mpumalanga Freshwater Ecology Priority Assessment (2010) as a Critical Biodiversity River. This assessment also indicates the potential occurrence of important CBA wetlands and accordingly the surrounding areas was classified as wetland buffer ecological support areas in the Mpumalanga Biodiversity Sector Plan (2013).* ▪ *On-site verification confirmed that two ephemeral drainage lines originates on the site which drains in well-defined channels in a westerly direction towards the Klein-sand River, however, there was no indication of the presence of wetlands within or along these drainage lines.* ▪ *The actual situation is that both drainage lines are basically sandy channels, overgrown with invasive Lantana and Sickle Bush and with little to no presence of riparian species and therefore void of any habitat that can sustain aquatic ecology. The aquatic biodiversity rating is therefore "Low" which is in line with the "Low" aquatic sensitivity rating of the Environmental Screening Tool.* ▪ *Comparison of the 2003 to 2021 aerial photos indicates the extensive expansion of human settlement surrounding the site and across watercourses with associated degradation of the natural woodland and subsequent loss of ecological functionality along drainage corridors.* ▪ *The clearance of vegetation along the drainage lines on-site would thus not result in any measurable loss of aquatic biodiversity and poses no limitation to the proposed township development in terms of aquatic ecology on site.* ▪ *However off-site impacts may occur due to clearing of vegetation on the site which lead to soil erosion that can impact on downstream watercourse morphology, flooding of lower-lying dwellings and contributing to silting and poor water quality downstream which will affect aquatic ecology within the Klein-sand River.* ▪ *Cumulative deterioration of water quality by existing and potential new sources of urban storm water and wastewater pollution may contribute to increased impacts on water quality and aquatic biota downstream in the Klein-sand River.* ▪ *It is therefore of critical importance that changes in run-off flow paths, volume and velocity (site hydrology) as well as potential changes in surface water quality be mitigated on-site.* ▪ *In this regard, a storm water management assessment of the site as well as the pollution potential from activities associated with the construction and operation of the township identified several potential impacts. These can, however, be mitigated by implementing sustainable drainage management structures and ensuring that waste generating activities associated with the township that can impact surface water quality, is minimised, managed and prevented.* ▪ *It is expected that the identified off-site aquatic biodiversity impact rating of "Medium to High" can therefore be reduced to acceptable "Low" impact levels, subject to the implementation of the recommended mitigation measures on the site.*	*Section F10* *Sect I1.4.17* *App D7.1*

#	Key Issues	Specialist Study	Summary of the findings / inputs from environmental specialists	Report Reference
6	***Impact on heritage sites***	***Heritage Impact Assessment***	*The Heritage Impact Assessment report addressed the key issues as follow:* ▪ *The heritage did not identify any site of historic or archaeological importance on the proposed development site.* ▪ *An isolated grinding stone that was found on site is of low significance and out of context and this artefact can be removed.* ▪ *Any potential impact on invisible heritage resources not currently known, can be mitigated by implementing a chance find procedure during the construction period.* ▪ *The heritage survey recorded 21 burial sites, consisting of a combination of graves, distributed all over the site. Graves and cemeteries are of high social significance and will be directly impacted by the township development.* ▪ *It is not feasible to amend the township layout to avoid the identified burial sites and therefore the relocation of the graves to an existing cemetery or alternatively accommodating the relocation of the graves in an on-site cemetery is proposed.* ▪ *The legislation allows for the grave sites to be relocated subject to consent from the Next of Kin (NOK) and adhering to all legal requirements.* ▪ *A social facilitation programme, involving the next of kin is currently underway and the outcome is expected in due course after which a final decision can be made with regard to inclusion (or not) of a cemetery in a final township layout.*	*Sect F12* *Sect I1.4.10* *App D8*

#	Key Issues	Specialist Study	Summary of the findings / inputs from environmental specialists	Report Reference
7	***Impact of pollution & waste on groundwater***	***Groundwater Risk Assessment : Fuel station***	*The Groundwater Risk Assessment on the fuel station addressed the key issues as follow:* ▪ *During the operation phase a contamination risk of soil and groundwater may occur from surface wastewater (such as vehicle washing), accidental fuel spillages, overfill of fuel storage tanks and leaking of fuel tanks and underground pipework.* ▪ *The **vulnerability**, or the tendency or likelihood for contamination to reach a specified position in the groundwater system after introduction at some location above the uppermost aquifer, in terms of the above, is classified as **low/least vulnerable**.* ▪ *Aquifer **susceptibility**, a qualitative measure of the relative ease with which a groundwater body can be potentially contaminated by anthropogenic activities, and which includes both aquifer vulnerability and the relative importance of the aquifer in terms of its classification, in terms of the above, is classified as **low.*** ▪ *The Ground Water Quality Management Index of the subject area is "2" which requires a **low-level protection**.* ▪ *A hydro-census of existing groundwater sources within a one-kilometre radius counted 18 boreholes of which only three are in use which indicates **very low** dependency of the local community on groundwater.* ▪ *Soil permeability for completely weathered gneiss (soil and saprolitic soil) and weathered gneiss classify as **medium to low** permeable soils which is regarded to be sufficient in retarding the spread of pollution from an on-site / point source contaminant.* ▪ *In conclusion, potential long-term contamination of hydrocarbons from the proposed Fuel Station on the selected site may pose some impact on the groundwater resources, such effect can be minimised and prevented by applying proper design, installation and operational management procedures.* ▪ *All underground installations must comply with SABS SANS10089-3:2010. Steel tanks shall comply with SABS SANS1535:2018 and all work with that of SABS 0131 Part 3. In addition, storm water drainage infrastructure must be equipped with strategically placed filters and oil traps.* ▪ *To conclude, the groundwater risk investigation determined that risk of groundwater contamination from fuel station activities, accidents and leaks is expected to be "Low" subject to implementation of the above-mentioned mitigation measures.*	*Sect F7* *Sect I1.4.7* *App D5.1*

#	Key Issues	Specialist Study	Summary of the findings / inputs from environmental specialists	Report Reference

8	***Impact of pollution & waste on groundwater***	***Groundwater Risk Assessment : On-site sanitation & Other pollution risks***	*The Groundwater Risk Assessment for the on-site sanitation and other potential pollution sources addressed the key issues as follow:*
			▪ *The **vulnerability**, or the tendency or likelihood for contamination to reach a specified position in the groundwater system after introduction at some location above the uppermost aquifer, in terms of the above, is classified as **low/least vulnerable**.*
			▪ *Aquifer **susceptibility**, a qualitative measure of the relative ease with which a groundwater body can be potentially contaminated by anthropogenic activities, and which includes both aquifer vulnerability and the relative importance of the aquifer in terms of its classification, in terms of the above, is classified as **low.***
			▪ *The Ground Water Quality Management Index of the subject area is "2" which requires a **low-level protection**.*
			▪ *A hydro-census of existing groundwater sources within a one-kilometre radius counted 18 boreholes of which only three are in use which indicates **very low** dependency of the local community on groundwater.*
			▪ *Soil permeability for completely weathered gneiss (soil and saprolitic soil) and weathered gneiss classify as **medium to low** permeable soils which is regarded to be sufficient in retarding the spread of pollution from an on-site / point source contaminant.*
			▪ *The overall risk of contamination based on both risk components (the on-site sanitation system and agriculture irrigation run-off) is assessed as medium to high, due to the high volume of wastewater flow and possible irrigation using treated wastewater.*
			▪ *However, taking into consideration that the development will not make use of groundwater to meet its water demand (still taking in consideration external users) and the proposed treatment system to be implemented the risk is considered as medium to low and recommended that mitigation measures include the following:*
			  ▪ *A dedicated wastewater treatment monitoring program must be put in place throughout the lifecycle of the WTP.*
			  ▪ *The storm water drainage infrastructure must be equipped with strategically placed filters and oil traps.*
			  ▪ *Lining or compaction of the underlying soil (if suitable) of the retention pond into which treated wastewater will be discharged.*
			  ▪ *Management measures must be put in place for possible excess return flow generated from irrigation when using treated wastewater.*
			  ▪ *If at any point excessive sludge build-up occurs, it must be removed and conveyed to an approved treatment or waste disposal facility.*
			▪ *To conclude, the groundwater risk investigation determined that risk of groundwater contamination from on-site sanitation and other land uses that may hold risk of groundwater contamination including poor management, accidental spills and leaks from the system is expected to be "Low" subject to implementation of the above-mentioned mitigation measures.*
				Sect F7
				Sect I1.4.18
				Sect I1.4.10
				App D5.2

#	Key Issues	Specialist Study	Summary of the findings / inputs from technical specialists	Report Reference
9	***Impacts on services provision***	***Civil Services Report***	*The Civil Services Outline Report addressed the key issues as follow:* ▪ *The demand and minimum requirements for the provision of services to the proposed township was calculated.* ▪ *The detail of existing bulk services capacities and connection of these to services the proposed township was confirmed.* ▪ *The advantages and disadvantages of the proposed alternative engineering technologies were considered in consultation with the EAP (see Sections I1.4.11, 13, 15, 16).* ▪ *The layout plans of all services were provided to the EAP for assessment purposes by way of the map overlay method and it was found that the layout of internal infrastructure will not pose any sensorial, health and safety impact on surrounding residents.* ▪ *The 1:100 year flood line was considered and the township layout has been certified not to be affected by such a flood.* ▪ *Integration of solid waste management facilities into the design of buildings falls was wrongly assigned to the civil engineer and such measures with the aim of achieving the goals set out in the Municipal Waste Management Plan is addressed in SectionI1.4.14 of the EIR for inclusion in the Architectural design requirements of the EMPR (see Appendix G to the EIR).* ▪ *The integration of floor drainage systems for medical facilities, food preparation facilities and at the forecourt area of the proposed fuel station with the sewer and / or storm water system are also Architectural design requirements that falls outside the responsibility of the Civil Engineer. Such Architectural design requirements are included in the EMPR (see Appendix G to the EIR).* ▪ *A storm water management report was compiled that includes a hydrological assessment and calculation of the pre-and post-site conditions as well as recommending suitable sustainable storm water systems (see the assessment of the system in Section I1.4.17).* ▪ *It is expected that the attenuation proposals and plans in combination with conventional measures will reduce peak flows, reduce velocity and concentrated volume, and ensure sufficient buffering to release of storm water safely towards the downstream natural watercourses.* ▪ *The capacity of the modular on-site wastewater treatment plant can be increased incrementally to facilitate a phased development approach and future urban land use expansion. The capacity of the storm water services infrastructure and the storm water attenuation ponds already make allowance for future urban expansion, thus preventing creating additional impacts at a later stage.* ▪ *To conclude, the civil services plan indicates that the proposed development will have no adverse impact on the surrounding infrastructure and infrastructure capacities and that the cost for any upgrading of services will not be externalised to the local municipality.*	*Sections I1.4.11 I1.4.13 I1.4.15 I1.4.16 App D10.1*

#	Key Issues	Specialist Study	Summary of the findings / inputs from technical specialists	Report Reference
10	***Impacts on services provision***	***Electrical Engineering Report***	*An Electrical Services Report addressed the key issues as follow:* ▪ *The demand and minimum requirements for the provision of electricity to the proposed township was determined and the calculation of demand included the potential for future inclusion of other land uses. Sufficient resilience is therefore built into the electricity supply system.* ▪ *The Electrical Services Report provides detail of existing bulk services capacities and the required upgrading of infrastructure or capacities and connection of these services to the proposed township.* ▪ *Sufficient allowance is made within the road reserves of the township layout to include underground electricity distribution infrastructure and as such additional assessment such infrastructure at a later stage when the electricity layout plan becomes available, will not be necessary.* ▪ *Written confirmation was obtained from ESCOM in support of electricity supply to the township.* ▪ *To conclude, the proposed provision of electricity to the township will have no adverse impact on the existing electricity supply to the surrounding area.*	*Sect I1.4.12* *App D9*

#	Key Issues	Specialist Study	Summary of the findings / inputs from technical specialists	Report Reference
11	***Impacts on services provision***	***Traffic Impact Study***	*A Traffic Impact Assessment addressed the key issues as follow:* ▪ *The traffic impact assessment considered the design and position of the proposed two new intersections with the R40 road and calculations indicate that the proposed intersections can provide traffic safety and adequate traffic flow.* ▪ *Traffic circulation and integration of the proposed internal road network with the existing residential street network was achieved without posing any risk to existing residential structures.* ▪ *Witten's comment was obtained from SANRAL in support of the proposed access to the township from the R40 road.*	*Sect I1.4.11* *App D11*

#	Key Issues	Specialist Study	Summary of the findings / inputs from environmental specialists	Report Reference

12	***Impacts on surrounding businesses***	***Urban Economic MARKET RESEARCH REPORT by DEMACON***	*The urban economic Market Research Study for the determining of feasible urban land uses in the township, addressed the key issues as follows:*
			▪ *The report makes reference to the planning principle of business centre hierarchies : "The development and overall sustainability of a retail facility relies in its location and should fit in with existing retail hierarchy of the area". Base hereon it can be assumed that the hierarchy makes provision for overlapping service areas as each business centre in a higher or lower hierarchy provides different commercial and social goods and services to a broader or to a more local service area.*
			▪ *Based on the above, the study determines that the proposed retail component within the new township classifies as a "Neighbourhood / Convenience Centre" which should thus be able to co-exist with the larger regional business centre at Acornhoek. Furthermore, the study also identifies social service needs. The mixed-use nature of this development is expected to benefit the local community by providing complementary services that are not necessarily available at other nearby commercial centres*
			▪ *Based on the above the study indicates that the proposed mixed-use township can be sustained in the identified area as the larger Bushbuckridge market in general (and also the trade area for the proposed development) is mostly underdeveloped from a retail supply-side perspective and various components of the retail hierarchy have not yet emerged in the area. A GAP analysis was conducted to determine demand and supply and is elaborated at length in the study.*
			▪ *Based on the information obtained from the study it was possible to list the positive and negative impacts that the proposed Acorn City Mixed Use Development (with selected alternatives) may pose of the greater Acornhoek business area (see Section I4.4.4). It was found that the proposed commercial centre aligns with the spatial planning objectives of the municipal SDF (Spatial Development Framework) and the economic development objectives of the Municipal Integrated Development Plan. A retail demand analysis indicates that there is a market potential for a "local neighbourhood / convenience centre" with a specific tenant composition and as indicated above, all the various components of the retail hierarchy have not yet emerged in the area.*
			▪ *Based on the above, it can be assumed that the proposed neighbourhood/convenience/community centre fill provides the existing demand (gap) for certain goods and services, thus complementing the broader supply of goods and services to the local community in the Acornhoek area as envisaged by the planning principle of business hierarchies.*
			▪ *The study quantified by way of retail floor space ratio the economic impact on existing businesses and business centres in its market/target area. In this regard the study determined the following:*
			  ▪ *The total existing supply of formal shopping centre floor space in the primary trade area amounts to approximately 178 851 m².*
			  ▪ *The population threshold in the primary trade area is ±219 053 people, which translates to ±0.82 m² per capita for the trade area.*
			  ▪ *The larger centres in the trade area cater to a market beyond the trade area for the proposed development.*
				Sect G2.3
				Sect I1.4.4
				App D12

			▪ *The municipal area has approximately 182817 m² of formal shopping centre supply and ±583 716 people. This translates to ±0.31 m² per capita for the municipal area.* ▪ *In more mature markets, the per capita supply is typically around 2 m² up to as high as 4.2 m² shopping centre floor space per capita. These numbers suggest that the Bushbuckridge market is still largely underdeveloped from retail supply-side perspective. Albeit that income levels may be comparatively low, increased investor interest indicates that future supply-side densification can be expected.* ▪ *The proposed new development (±7054 m²) adds ±3.94% of additional shopping centre floor space to the existing offering in the primary trade area. Considering that centres such as Acornhoek Mall, Dwarsloop and Acorn Plaza draw off a larger regional catchment area, the combined impact of the new development on these centres should not exceed 3.94%, and is likely to be in proportion to the size and distance of the centre. In this manner, the largest centre - Acornhoek Mall sales are not likely to be impacted by more than ±1.5% over the short term. Considering area growth, this impact is likely to be offset over the short to medium term due to growing human settlement and urban expansion in the Acornhoek area* *The overall conclusion based on the above is that the retail component of the proposed township is expected to pose a very small economic impact of ±1.5% over the short term. Based thereon the significance of the impact in terms of extent, duration, consequence and probability is expected to be "Low".*	

#	Key Issues	Specialist Study	Summary of the findings / inputs from environmental specialists	Report Reference
13	***Feasibility and impacts on other fuel stations***	***Urban Economic FUEL STATION BUSINESS PLAN by PETROREX***	*The proposed filling feasibility report (Appendix D13) addressed the key issues as follow:* ▪ *Section 8 the Market Supply Analysis and specifically Section 8.1.3 and 8.15 complies with the requirement to take existing filling stations and the economic pressure on such filling stations into account.* ▪ *The study revealed the distance between sixteen competitors these fuel stations in the area. The competitor fuel stations are located between 5 to 25km from the project area. The locality of the existing fuel stations concerning the proposed new fuel station, are too far apart to consider any combined / cumulative socio-economic impact on the resident community.* ▪ *Given the population growth characteristics of the area and the continued urban expansion in the area, it is expected that the area will experience increased vehicle ownership and traffic volumes which justifies the demand for a new fuel station, conveniently located at the proposed site. The study revealed that the proposed fuel station will be viable and sustainable based on the growing demand for fuel in the market area.* ▪ *Based on assumptions made in the study, it can be assumed that all existing fuel stations in the area maintain fuel sales in excess of the minimum volume which makes them feasible.* ▪ *An economic multiplier impact analysis as discussed in Section 8.1.2.2 of the Fuel Station Feasibility Study provides the following statement on page 132. Volume Loss indicates a detailed calculation of the potential volume loss of the identified competitor sites. Inclusive an indication of the volume loss recovery in years one to five after the proposed sites have been activated. It is evident from the evidence provided that no competitor site will suffer a severe volume loss and close. Most of the competitor sites will recover the volume loss within 3 (three) years. The significance of the impact in terms of extent, duration, consequence and probability is thus expected to be "LOW".* ▪ *It is not expected that the proposed service station will impact on the viability of other fuel stations to the extent that job losses will occur at other fuel stations. The service station development, once developed, is envisaged to have the feasible potential to generate up to ± 39 permanent employment opportunities, consisting of Cashiers, Forecourt attendants, Chars and Management.* ▪ *Economic Multiplier Impact Analysis takes several other environmental impacts into consideration namely, direct, indirect and induces impacts such as employment impacts, safety and security and crime impacts, severance impacts, visual impacts, pollution, noise, vibration, and vehicle traffic. Overall the proposed new fuel station is not expected to pose any adverse impact on any of the identified aspects.* *The overall conclusion based on the above, is that the retail component of the proposed township is expected to pose a relatively small economic impact of over the short term. Based thereon the significance of the impact in terms of extent, duration, consequence and probability is expected to be "Low".*	*Sect G2.4* *App D13*

ASSESSMENT OF ALTERNATIVES

This section provides a full description of the process followed to reach the proposed development footprint within the approved site as contemplated in the accepted scoping report as required in GN R326 of 17 April 2017, Appendix 3 Section 3(1)(h).

I1.1 OBJECTIVE OF ALTERNATIVES

Reasonable and feasible alternatives is considered in respect of the proposed development or activities that forms part of it, for it to feedback into the planning and design of the development/activity thereby optimising the positive aspects and minimising the negative aspects that are highlighted during the assessment process with the aim of including the best environmental option / alternatives in the proposed development.

I1.2 DEFINING ALTERNATIVES

*The **"alternatives"** concerning the proposed development or activity, means different means of meeting the general purpose and requirements of the development or activity, which may include alternatives to—*

(a) the land/site on which or location where it is proposed to undertake the activity (SA);
(b) the type of land use activity to be undertaken (LA);
(c) the planning, design or layout of the activity/development (PA);
(d) the technology/process (engineering/architectural) to be used in the activity/development (TA);
(e) the operational aspects of the activity/development (OA); and
(f) the option of not implementing the activity/development, the no-go alternative (NG).

I1.3 THE SELECTION AND ASSESSMENT METHOD

*In the Scoping process alternatives were identified and selected by applying the method proposed by the Integrated Environmental Assessment Guideline Series 11, (DEA in 2004). Only those alternatives that were found to conform to both the requirements of reasonability and feasibility were put forward for further investigation during the EIA process. **Reasonability** refers of considerations of moderation, fairness, cost-effectiveness, sensibility and sound judgement when considering an alternative. **Feasibility** refers to the ease, convenience and capability to achieve/implement an alternative. Only alternatives that were identified in the scoping process and listed as such in the scoping report, and which were found to be **reasonable** and **feasible**, are included in this assessment. The following table indicates the alternatives that were considered during the scoping process and their selection [✓] or not [X] for further assessment(with the addition of LA_{11}).*

ALTERNATIVES SELECTED FOR ASSESSMENT								
	Type of alternative			**Type of alternative**			**Type of alternative**	
SA	*Site / Property*	*X*	*LA_9*	*Light Industrial*	*X*	*TA_7*	*Internal Electricity*	✓
PA	*Planning/design*	✓	*LA_{10}*	*Public Open Space*	✓	*TA_8*	*Internal water supply*	✓
LA_1	*Hotel (Res 4)*	✓	*LA_{11}*	*Cemetery*	✓	*TA_9*	*Conventional septic tank system*	*X*
LA_2	*Agriculture*	✓	*TA_0*	*Municipal Sewer*	*X*	*TA_{10}*	*Conventional waste collection*	*X*
LA_3	*Business 1*	✓	*TA_1*	*R40 Road Upgrading*	✓	*TA_{11}*	*Sustainable storm water*	✓
LA_4	*Educational*	✓	*TA_2*	*ESKOM Electricity*	✓	*TA_{12}*	*Sustainable sanitation*	✓
LA_5	*Office & Medical*	✓	*TA_3*	*Municipal Water*	✓	*TA_{13}*	*Sustainable waste system*	✓
LA_6	Fuel Station	✓	*TA_4*	*Municipal Waste*	✓	*AA_1*	*Conventional buildings*	*X*
LA_7	*Transport Depot*	✓	*TA_5*	*Internal streets*	✓	*AA_2*	*Sustainable buildings*	✓
LA_8	*Other Residential*	*X*	*TA_6*	*Conventional storm water*	*X*	*NG*	*No-Go Alternative*	✓

The purpose of the following Section is to compare the selected project alternatives in terms of their advantages (positive impacts) and disadvantages (negative impacts) as a further method of impact identification (inclusive of the impact identification findings and mitigation recommendations in the previous Sections E, F and G and with inputs from environmental and technical specialists).

I1.4 COMPARATIVE ASSESSMENT : IDENTIFICATION OF IMPACTS OF SELECTED PROJECT ALTERNATIVES

This Section applies the method of comparative assessment by considering the advantages, disadvantages and the mitigation potential of selected project alternatives as part of the process to identify potentially significant impacts, and of reaching the proposed development footprint, in compliance with GNR 326 Appendix 3, Section 3(h)(vii), (viii), (ix), (x).

Symbols used in this assessment have the following meaning : ☑ Positive impact ☒ Negative impact ! Mitigation potential ? Unknown

1.4.1 PLANNING ALTERNATIVE (PA_1) : URBAN DESIGN LAYOUT PLANNING (AMENDED LAYOUT PLAN VERSION 2)

ADVANTAGES *Positive impacts on ecological/social/economic/physical environments*	**CORRECTIONS TO PREVIOUSLY IDENTIFIED DISADVANTAGES / LIMITATIONS** *Mitigation to negative impacts on ecological/social/ physical environments*
☑ *The township layout plan provides for a mix of urban land uses that have been selected by way of in-depth feasibility study that considered the demographic character of the area and the local socio-economic conditions (see Appendix 13).* ☑ *Furthermore, the proposed land uses aligns with the development need analysis of the Municipal Integrated Development Plan (2020-21) and the location of the proposed township along a development corridor aligns with the Municipal Spatial Development Framework (2017).* ☑ *The overall layout provides ease of design as well as connection and installation of infrastructure services.* ☑ *The formalisation of informal roads junctions with the R40, the positioning of an internal services street parallel with the R40 and maintaining of the building restriction lines along the R40 will promote traffic safety along this section of the R40 road.* ☑ *The overall layout design also provides possibility for future rezoning for inclusion of alternative land uses that are not currently part of the layout design, such as residential and light industrial uses.* ☑ *The previous layout (Version 1) that was considered during the scoping process contained some limitations which was corrected after obtaining inputs from interested and affected parties and environmental and heritage specialists.* ☑ *The previous layout limitations as identified in the scoping process were corrected (see table alongside) and therefore an amended Layout Plan (version 2) as attached in Appendix A of this report can be considered for approval.*	☑ *The township layout that previously ignored natural land form and on-site drainage lines now makes provision for these natural features by way of two "open space" erven thus allowing for natural drainage towards these erven and sufficient space on these erven for storm water attenuation by way of detention ponds.* ☑ *The layout makes provision for a properly designed storm water system with the aim of minimising the effect of concentrated storm water on the lower-lying areas.* ☑ *The amended layout includes longer street lengths along the even sloped areas of the site and shorter streets along the steeper sloped areas of the site thus contributing to lower storm water velocities.* ☑ *Proposed new internal roads that run towards the existing residential area to the west of the site were re-aligned to link-up to the existing roads, thus avoiding crossing over existing residential properties.* ☑ *A traffic impact study assessed the proposed junctions on the R40 which indicates that these junctions are viable and safe. The study also assessed existing informal access roads with the R40 with the aim of incorporating such roads within a potential future formal road network and linking such roads with the proposed township layout. The township layout and intersections with the R40 therefore makes provision for future upgrading and therefore the necessary wider class road reserves have been incorporated in the layout plan.* ☑ *Suitable open spaces erven is provided around the two ephemeral water courses and a suitable buffer area was determined by an Aquatic Ecologist (see App D7).* ☑ *The grave sites on the site was located and mapped and it was found that to limit drastically any form of viable development on the site. A small cemetery site was thus incorporated into the layout to make provision for the relocation of the graves to a single site (see more detail in the Heritage Impact report Appendix 8).* ☑ *The amended layout also provides for a services and utility erf for wastewater treatment plant that was previously omitted.*

I1.4.2 LAND USE ALTERNATIVE (LA_1) HOTEL (RESIDENTIAL "4")	
ADVANTAGE *Positive impacts on ecological/social/economic/physical environments*	**INVESTIGATION AND RECOMMENDATIONS ON PREVIOUSLY IDENTIFIED DISADVANTAGES / LIMITATIONS** *Mitigation to negative impacts on ecological/social/ physical environments*
☑ *The assessment in this report indicates that the landform, soils, land cover and terrestrial biodiversity of the site would not be significantly impacted by the proposed hotel land use and selected hotel site.* ☑ *The municipal IDP (Integrated Development Plan) 2021-2021 identifies the Arthursseat area as a Strategic Development Areas to increase the supporting infrastructure for tourism.* ☑ *The proposed hotel land use is compatible with the surrounding residential areas.* ☑ *A hotel can stimulate the local tourism industry positively.* ☑ *The proposed hotel adds value to the overall provision of services.* ☑ *The previous limitation as identified in the scoping process can be mitigated (see table alongside) and therefore the land use as included in the amended Layout Plan (version 2) as attached in Appendix A of this report can be considered for approval.*	☒ *The proposed hotel erf is located next to an informal settlement which may expose negative views from the hotel towards this settlement. This visual impact would rather apply to hotel guests than on surrounding residents and may thus affect the viability of the hotel at the selected location.* ☑ *However, after discussion with the project Architect it became clear that part of the economic viability of the hotel is to provide visual exposure of the hotel to travellers on the R40.* **!** *More detailed planning and design of the hotel can provide more visual focus on appealingly landscaped gardens and inner yard view sheds from the hotel.*

I1.4.3 LAND USE ALTERNATIVE (LA_2) URBAN AGRICULTURE	
ADVANTAGE *Positive impacts on ecological/social/economic/physical environments*	**INVESTIGATION AND RECOMMENDATIONS ON PREVIOUSLY IDENTIFIED DISADVANTAGES / LIMITATIONS** *Mitigation to negative impacts on ecological/social/ physical environments*
☑ *The assessment in this report indicates that the landform, soils, land cover, terrestrial and aquatic biodiversity and hydrology of the site would not be significantly impacted by the proposed urban agricultural land uses and selected sites for this land use.* ☑ *The urban agricultural land use will benefit from a continuously accessible source of treated wastewater for irrigation purposes which will ensure its long-term sustainability.* ☑ *Opportunities for local food production provide additional economic goods and services.* ☑ *The urban agricultural will increase run-off absorption and will thus decrease urban run-off which in turn positively decrease storm water peaks, volumes and velocities.* ☑ *The urban agricultural erven can contribute to reducing the heat island effect of the proposed urban area.* ☑ *Urban agricultural erven can add visual/aesthetic value to the surrounding land uses and act as a "buffer" for the gradual transition between residential and commercial land uses.*	☒ *The indiscriminate use of agricultural pesticides and fertilisers may contribute to toxic contamination of surface and groundwater resources.* ☑ *However, information from the specialist geo-technical, geo-hydrological and aquatic ecological studies attached to this report indicates a low probability of such contamination, when considering the following:* ☑ *The on-site soils are not highly transmissible.* ☑ *The soils are very deep (>3m) and local groundwater is in excess of 30m deep.* ☑ *The site is not underlain by perched water tables.* ☑ *Surface water is not present within the two drainage lines on the site and the nearest river is located ±400m west of the site.* ☑ *The site is not subject to inundation or flooding.* ☑ *The site is not subject to wetland conditions.* **!** *Furthermore, a sufficient vegetated buffer area has been incorporated around the proposed storm water attenuation ponds to act as "sinks" for entrapment of transitive soil contaminants, which is an acceptable and well-researched mitigation measure.*

I1.4.4 LAND USE ALTERNATIVE (LA_3) Business "1"	
ADVANTAGES *Positive impacts on ecological/social/economic/physical environments*	**INVESTIGATION AND RECOMMENDATIONS ON PREVIOUSLY IDENTIFIED DISADVANTAGES / LIMITATIONS** *Mitigation to negative impacts on ecological/social/ physical environments*
☑ *The assessment in this report indicates that the landform, soils, land cover and terrestrial biodiversity of the site would not be significantly impacted by the proposed business land uses as part of the township development.* ☑ *The accessibility to the site from the R40 makes it very suitable for retail development.* ☑ *The proposed commercial node aligns with the spatial planning objectives of the SDF (Spatial Development Framework). This identifies the R40 as a primary transport and development corridor along which urban nodes can develop.* ☑ *A retail demand analysis indicates that there is a market potential for a "local neighbourhood / convenience centre" with a specific tenant composition (see urban economical Market Research Study Appendix D13).* ☑ *The proposed commercial centre thus fits into the hierarchal planning classification of business centres with overlapping consumer trade areas.* ☑ *The business land use creates opportunities for investors which can attract economic development.* ☑ *The greater supply of commercial facilities ultimately provides the competitive supply of goods and services, thus benefitting consumers.*	☒ *A business node will attract more traffic and the R40 can thus be negatively impacted in terms of traffic safety.* **!** *This can however be addressed by upgrading existing and by providing new road junctions from the site towards the R40 road.* ☑ *A Traffic Impact Study (see Appendix D12) confirms the possibility of viable and safe intersection design with little impact on local traffic flow.* ☑ *An urban economical Market Research Study (Appendix D13) indicates that the market demand, supply and viability indicate that the larger Bushbuck Ridge market in general (and also the trade area for the proposed development) is mostly underdeveloped from a retail supply-side perspective. Various components of the retail hierarchy have not yet emerged in the area which poses additional retail opportunities.* ☑ *The study also revealed the expected retail loss of nearby business retail centres due to the proposed new retail land use, to be proportionally very small which may only result in a very low negative economic impact over the short to medium term when considering relatively high population growth and urban expansion in the Acornhoek area.*

I1.4.5 LAND USE ALTERNATIVES (LA_4) Educational (School and Learning Facilities)	
ADVANTAGE *Positive impacts on ecological/social/economic/physical environments*	**DISADVANTAGE** *Negative impacts on ecological/social/economic/physical environments*
☑ *The assessment in this report indicates that the landform, soils, land cover and biodiversity of the sites proposed for the educational land uses would not be significantly impacted by such land uses.* ☑ *In terms of public school supply it is evident that the area is well-supplied in terms of public primary and high schools. However, very little is provided for private schools.* ☑ *Although the area comprises predominantly low to middle-income households there are middle and higher-middle income households that could potentially support a private school.*	☑ *No land use disadvantages have been identified.*

☑ *The municipal IDP 2020-2021 encourage LED (Local Economic Development) projects across the municipal area to have economic pillars, one being SMMEs. Tertiary educational facilities such as colleges or other learning centres would be complimenting to the LED vision for education.* ☑ *The proposed educational land use can increase the overall social infrastructure not only for the pupils but also for the community as a whole in terms of sport facilities and facilities for community meetings, entertainment and conferencing.* ☑ *The inclusion of sport fields and large garden areas can increase storm water infiltration and also reduce the urban heat island effect of a built environment.*	☒ *No land use disadvantages have been identified.*

I1.4.6 LAND USE ALTERNATIVES (LA_5) Institutional (Offices & medical)	
ADVANTAGE *Positive impacts on ecological/social/economic/physical environments*	**INVESTIGATION AND RECOMMENDATIONS ON PREVIOUSLY IDENTIFIED DISADVANTAGES / LIMITATIONS** *Mitigation to negative impacts on ecological/social/ physical environments*
☑ *The assessment in this report indicates that the landform, soils, land cover and biodiversity of the sites proposed for institutional land uses would not be significantly impacted by the proposed development.* ☑ *Institutional land uses will provide access opportunities for administrative and public health services to be established within the township as well employment opportunities for locally skilled persons.* ☑ *The proposed development can provide easily accessible facilities within a convenient distance from local residents.*	☒ *Health care waste poses a contamination risk.* ☒ *However, dedicated and responsible management of such waste according to relevant norms and standards can be instituted by medical facilities.* **!** *Design of medical buildings must include dedicated waste storage and collection sites as well as impermeable drainage systems that connects to the on-site wastewater treatment plant.* **!** *Appointed and approved Contractors must remove hazardous medical waste from medical facilities to approved medical waste disposal / incineration facilities elsewhere.*

I1.4.7 LAND USE ALTERNATIVES (LA_6) Special (Fuel Station)	
ADVANTAGE *Positive impacts on ecological/social/economic/physical environments*	**INVESTIGATION AND RECOMMENDATIONS ON PREVIOUSLY IDENTIFIED DISADVANTAGES / LIMITATIONS** *Mitigation to negative impacts on ecological/social/ physical environments*
☑ *The assessment in this report indicates that the landform, soils, land cover and biodiversity of the proposed fuel station site would not be significantly impacted by the proposed development.*	☒ *A traffic impact study (Appendix D12) indicates that safe access can be provided to the fuel station site from the R40 road after construction of an appropriately designed intersection and upgrading of the road.*

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☑ *A geo-technical study (see Appendix 4) confirms the overall suitability of the site for installation of fuel storage facilities with precautionary proposals for building foundations due to potentially compressible and collapsible soils.* ☑ *Placement of the proposed land use is adjacent to the R40 proving easy access.* ☑ *A specially commissioned urban-economic feasibility study (see Appendix D14) indicates that the proposed land use at the identified locality is feasible.*	☒ *An urban-economic feasibility study indicates that the proposed new fuel station at the selected site will not pose an adverse economic impact on other nearby fuel stations as the Acornhoek area experiences sufficient traffic generation as well as population growth, urban expansion and increased vehicle ownership to economically justify the fuel station.* ☒ *A geo-hydrological risk assessment identifies the potential contamination risk to groundwater in the event of a leak, accidental spill and effluent run-off.* **!** *However, potential contamination risks may be avoided by installation of leak-free double sided fuel tanks, membranes, correctly drained waste storage and collection bins and surface drainage to oil separators linked to the proposed wastewater treatment plant of the township.*

I1.4.8 LAND USE ALTERNATIVES (LA_7) Transport depot	
ADVANTAGE *Positive impacts on ecological/social/economic/physical environments*	**INVESTIGATION AND RECOMMENDATIONS ON PREVIOUSLY IDENTIFIED DISADVANTAGES / LIMITATIONS** *Mitigation to negative impacts on ecological/social/ physical environments*
☑ *The assessment in this report indicates that the landform, soils, land cover and biodiversity of the transport depot site would not be significantly impacted by the proposed development.* ☑ *The accessibility of the site from the R40 makes it very suitable.* ☑ *Bus stop and taxi rank can provide very good accessibility to public transport services in support of the mix land uses.*	☒ *The increased traffic can negatively impact the R40 in terms of traffic safety.* ☑ *A traffic impact study (Appendix D12) indicates that safe access can be provided to the fuel station site from the R40 road.* **!** *An appropriately designed intersection and upgrading of the road is required.*

I1.4.9 LAND USE ALTERNATIVES (LA_{10}) Public Open Spaces	
ADVANTAGE *Positive impacts on ecological/social/economic/physical environments*	**RECOMMENDATIONS ON PREVIOUSLY IDENTIFIED DISADVANTAGES / LIMITATIONS** *Mitigation to negative impacts on ecological/social/ physical environments*
☒ *Increase community wellbeing by providing access to open space for recreation, exercise and enjoyment.* ☒ *Landscaped gardens can provide an aesthetic pleasing environment.* ☒ *Can increase land development feasibility as storm water and treated effluent can be re-used in the landscape irrigation systems.*	☒ *Requires maintenance and cost.* ☑ *Maintenance cost can be recovered from tenants/owners by way of levies.* **!** *A dedicated maintenance plan can be implemented by the Township Management Company.*

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☒ *The proposed land use can decrease the effect of an urban heat island by absorbing sun radiation through plants and trees, and provide shade over roads and buildings that reduce their thermal storing capacity.* ☒ *Can increase the potential space for installation of sustainable storm water mitigation systems by the strategic design of landscapes.* ☑ *Open spaces can reintroduce a measure of ecological infrastructure and habitat restoration.*	

I1.4.10 LAND USE ALTERNATIVES (LA_{11}) Cemetery	
ADVANTAGE *Positive impacts on ecological/social/economic/physical environments*	**INVESTIGATION AND RECOMMENDATIONS ON PREVIOUSLY IDENTIFIED DISADVANTAGES / LIMITATIONS** *Mitigation to negative impacts on ecological/social/ physical environments*
☑ *The cemetery will only be used for the re-location of existing graves on the property to the cemetery site.* ☑ *The assessment in this report indicates that the proposed cemetery site is suitably positioned and the landform, soils, and land cover will not affect the proposed land use.* ☑ *The on-site soils are not highly transmissible.* ☑ *The soils are very deep (>3m) and local groundwater is in excess of 30m deep.* ☑ *The site is not underlain with perched water tables.* ☑ *Surface water is not present within the two drainage lines on the site and the nearest river is located ±400m west of the site.* ☑ *The site is not subject to inundation or flooding.* ☑ *The site is not subject to wetland conditions.* ☑ *The site is also sufficiently distanced from any surface water resources and soil conditions as well as depth to groundwater is sufficient as not to pose any contamination risk.*	☒ *Natural decay of buried human corpses can pollute groundwater through seepage of organic residues and pathogens (bacteria and viruses).* ☑ *However, human remains do not pose any pathogenic contamination potential ±5 years after burial (DWAF, 2004).* ☑ *The identified burial sites on the property are older than 50 years, indicating that the decay process has long since ended.* ☑ *The relocation of human remains in excess of 50 years would thus not pose any risk of contamination.* ! *The proposed cemetery is a relocation of only the burial sites on the property and will not be open to any future private or public individuals / groups to utilize the proposed cemetery for any newly deceased individuals.* ! *The relocation of the burial sites follow a legal public participation and consent process to ensure that all families have given consent for the grave relocation before the physical process of relocation occurs (currently in process in terms of SAHRA requirements).*

I1.4.11 TECHNOLOGY ALTERNATIVES : *TA_1 External Road Networks*	
ADVANTAGE *Ecological/social/economic//efficiency*	**INVESTIGATION AND RECOMMENDATIONS ON PREVIOUSLY IDENTIFIED DISADVANTAGES / LIMITATIONS** *Mitigation to negative impacts on ecological/social/ physical environments*
☑ *The R40 provincial is located directly next to the proposed development site and therefore provides several development opportunities.* ☑ *The class of road and size of roads reserve has sufficient capacity for future upgrading of this road without impacting on the proposed development land or on the social and ecological environments.* ☑ *The proposed construction of two intersections on the R40 can provide access to the proposed township*	☒ *Increase traffic volumes at traffic intersections are expected.* ☑ *However, a traffic engineering conducted a traffic impact assessment (see Appendix D12) which report concludes that traffic safety and sufficiently traffic flow can be achieved at both proposed intersections.* ☑ *SANRAL who has jurisdiction over the R40 Road provided provisional support for such intersection in support of the proposed township.* **!** *The proposed intersections must be professionally designed intersection according to the required standards*

I1.4.12 TECHNOLOGY ALTERNATIVES : (TA_2) Bulk Electricity Supply and (TA_7) Internal Electricity Distribution	
ADVANTAGE *Ecological/social/economic/efficiency*	**INVESTIGATION AND RECOMMENDATIONS ON PREVIOUSLY IDENTIFIED DISADVANTAGES / LIMITATIONS** *Mitigation to negative impacts on ecological/social/ physical environments*
☑ *The area is serviced by ESKOM with existing transmission and distribution infrastructure directly opposite the site along the R40 road.* ☑ *Sufficient capacity exists within the network to provide the required energy demand as indicated in the attached Electrical Services Report (see Appendix D9).* ☑ *The underground electricity network will adhere to the relevant municipal standards.* ☑ *The proposed internal streets provide sufficient reserve to allow the installation of underground electricity distributions networks.*	☒ *The energy supply crisis throughout the country may contribute to local electricity supply outages over the short-to medium term, however, this is currently a nation-wide problem and not confirmed to the local municipal area.* ☒ *ESCOM provided conditional support for connecting the proposed township into its electricity supply network.* **!** *Energy savings can be achieved by way of efficient buildings and facilities design as required in terms of SANS Regulation 10400-XA.*

I1.4.13 TECHNOLOGY ALTERNATIVES : (TA_3) Bulk Water Provision	
ADVANTAGE *Ecological/social/economic/efficiency*	**INVESTIGATION AND RECOMMENDATIONS ON PREVIOUSLY IDENTIFIED DISADVANTAGES / LIMITATIONS** *Mitigation to negative impacts on ecological/social/ physical environments*
☑ *The local area is serviced with bulk municipal water supply and a connection is available for the proposed township.* ☑ *The Inyaka Dam near to Bushbuck Ridge that was constructed as reservoir for water supply in the municipality and is a renewable water resource that received rainfall annually from the eastern slopes of the Drakensberg.* ☑ *The local municipality has confirmed that current availability and capacity within the system is sufficient for the expected demand as included in the Appendix D3.*	**!** *An existing water pipeline servitude that crosses over the site can be re-aligned (see Civil Engineering Layout Plans Appendix D10).*

I1.4.14 TECHNOLOGY ALTERNATIVES : (TA_4) Waste Removal Services and On-site waste management (TA_{13})	
ADVANTAGE *Ecological/social/economic/efficiency*	**INVESTIGATION AND RECOMMENDATIONS ON PREVIOUSLY IDENTIFIED DISADVANTAGES / LIMITATIONS** *Mitigation to negative impacts on ecological/social/ physical environments*
☑ *Sustainable on-site waste management systems can be implemented as part of the township operation by following the waste hierarchy principle as described in NEMWA and as adopted in the IWMP of the Bushbuck Ridge Municipality.* ☑ *General waste removal services are currently provided by the local municipality and the newly commissioned municipal landfill site near to Thulamahashe provides sufficient capacity for solid waste disposal for the foreseeable future.* ☑ *Hazardous waste removal services are currently provided by an approved Contractor as appointed by the District Municipality's Health Department. Medical waste from the proposed medical / health facilities can be safely removed and disposed of.* ☑ *Building waste re-use, reduction and separation is possible during the construction phase.* ☑ *On-site waste management provides an economic and employment opportunity by way of waste separation at source and selling of separated waste for re-use and recycling to local recycling entrepreneurs / companies.* ☑ *Such initiative contributes to overall project sustainability and contributes to increase the capacity of the municipal landfill.* ☑ *Temporary waste storage facilities can be included in architectural building design and can be included as a requirement of the site and building design during the planning phase.*	☒ *On-site waste solid waste that includes construction waste, general waste and hazardous waste is expected to be generated on the site during the construction and operational periods which may cause pollution.* **!** *This can be addressed during the construction period by incorporating dedicated waste storage/collection sites.* **!** *Waste management and pollution prevention can also be addressed during the planning phase by designing buildings with adequate temporary waste storage facilities, appropriately sided to allow for waste separation and inclusive of floor sumps to be connected to the sewer system.*

I1.4.15 TECHNOLOGY ALTERNATIVES : (TA_5) Internal Streets	
ADVANTAGE *Ecological/social/economic/efficiency*	**INVESTIGATION AND RECOMMENDATIONS ON PREVIOUSLY IDENTIFIED DISADVANTAGES / LIMITATIONS** *Mitigation to negative impacts on ecological/social/ physical environments*
☑ *Internal collector and local streets will be designed and constructed according to required municipal standard to include wide enough reserves for services installation.* ☑ *The internal streets will provide the necessary access to the various land uses as well as safe traffic circulation.* ☑ *Internal higher order streets reserves provides opportunity for future expansion.*	☒ *Internal streets are efficient conveyors of surface run-off which results in run-off channelling, run-off concentration and peak flows with potentially significant impacts on lower-lying watercourses.* **!** *Additional storm water management systems must be incorporated as indicated in the attached Storm Water Management Plan (see Appendix D11) and Section 4.17 below.*

1.4.16 TECHNOLOGY ALTERNATIVES : TA_8 Internal Water Supply / Reticulation	
ADVANTAGE *Ecological/social/economic/efficiency*	**INVESTIGATION AND RECOMMENDATIONS ON PREVIOUSLY IDENTIFIED DISADVANTAGES / LIMITATIONS** *Mitigation to negative impacts on ecological/social/ physical environments*
☑ *Bulk water and on-site water reticulation systems will meet the relevant municipal standards.* ☑ *The proposed internal streets provide sufficient reserve to allow the installation of underground water reticulation networks.*	☒ *Water wastage and high water use activities such as urban agriculture may place additional demand on existing bulk water provision and infrastructure.* ! *This can however be mitigated in building and facility design by introducing water saving devices, water harvesting as well as the re-use of treated wastewater.*

I1.4.17 TECHNOLOGY ALTERNATIVES : TA_{11} Alternative Storm Water Systems	
ADVANTAGE *Ecological/social/economic/efficiency*	**INVESTIGATION AND RECOMMENDATIONS ON PREVIOUSLY IDENTIFIED DISADVANTAGES / LIMITATIONS** *Mitigation to negative impacts on ecological/social/ physical environments*
☑ *The aim of an on-site sustainable storm water system is to attenuate storm water run-off from the township affectively on-site to minimise peak flows and concentrated volume and velocity to be similar or better than the pre-development condition.* ☑ *This type of design addresses storm water attenuation from the source, along the run-off paths and at the storm water outlets.* ☑ *Various methods can be incorporated within building and paving designs, within open and landscaped areas as part of the overall architectural site development plan.* ☑ *The urban agricultural stands in the township as well as sport fields can be used as storm water absorption areas.* ☑ *The above measures can be included in the EMPR, to be monitored in terms of compliance during the planning period.* ☑ *Storm water buffering before final discharge by way of detention and/or retention ponds are proposed as indicated in the Storm Water Management Plan (see Appendix D11).* ☑ *The above buffering methods will sufficiently reduce run-off peak flows and will release storm water for downstream discharge at volumes and velocities nearly similar to the pre-development scenario.* ☑ *This will prevent potential downstream flooding, soil erosion and subsequent sediment deposition, poor water quality and impacts on downstream freshwater ecology.*	☒ *The implementation of additionally sustainable storm water methods requires on-site management at higher installation and maintenance cost.* ☑ *The direct and indirect cost of storm water damage to property and ecological deterioration downstream if storm water is not suitably managed will ultimately exceed the initial on-site installation of a costlier storm water system and its ongoing maintenance costs.* ! *The storm water system and all of its components must be suitably designed during the planning period.* ! *The capacity of the storm water services infrastructure and the storm water attenuation ponds must make allowance for future urban expansion, thus preventing creating additional impacts at a later stage.* ! *The storm water attenuation ponds must be installed before the construction of other development components to prevent potential downstream flooding and soil erosion downstream during the construction period.* ! *A Township Management/Services Company must ensure the maintenance of the infrastructure services in the township during the operational period.*

I1.4.18 TECHNOLOGY ALTERNATIVES : TA_{12} *Alternative On-Site Sanitation System*	
ADVANTAGE *Ecological/social/economic/efficiency*	**INVESTIGATION AND RECOMMENDATIONS ON PREVIOUSLY IDENTIFIED DISADVANTAGES / LIMITATIONS** *Mitigation to negative impacts on ecological/social/ physical environments*
☑ *A water-borne sewerage system is proposed for the township as indicated in the engineering Services Outline Report.* ☑ *As part of the system the aim is to provide an on-site wastewater treatment system that will provide treated wastewater outflow at a standard equal or better to the DWS requirement.* ☑ *The proposed alternative mainly consists of an activated sludge process which optimises bacteria effectiveness in the system and thus avoids sludge removal.* ☑ *In addition, treated waste water from this system can be re-used safely for non-consumptive urban agriculture and garden landscaping, thus creating a renewable water resource.* ☑ *The system is constructed completely underground and therefore pose no visual impact and with no emissions of odours.* ☑ *The capacity of the modular on-site wastewater treatment plant can be increased incrementally to facilitate a phased development approach.* ☑ *The proposed site for the sewer treatment plan is suitably positioned along the lower slopes of the property and the soil, slope, land cover and biodiversity, as well as adjacent residential areas, will not be adversely affected by the installation and operation of the WTP at this site..*	☒ *The system will require energy to drive the pumps that are part of the system.* ☑ *Solar power generation may be considered for this purpose with back-up ESKOM and power generators.* ☒ *The waste water treatment plant will require maintenance cost and management input.* ☑ *This can be achieved by instituting services levies to the users of the system.* ☑ *Cost for the alternative on-site sanitation systems is higher than conventional systems, however this cost compares positively with regard to higher efficiency and water saving by re-using wastewater within the urban agriculture land use.* ☒ *A hydro-geological risk assessment identifies a potentially high risk of surface and groundwater contamination by on-site wastewater treatment and disposal (see Appendix D5).* ☑ *However, the high-end type of wastewater treatment plant that is selected pose minimal risk of site contamination.* **!** *An efficient and competent Contractor must be appointed to ensure effective and sufficient daily management of the WTP with sufficient back-up systems in case of an emergency.*

I1.4.19 ARCHITECTURAL ALTERNATIVES – (AA_2) BUILDING AND LANDSCAPING DESIGN ALTERNATIVES	
ADVANTAGE *Ecological/social/economic/efficiency*	**INVESTIGATION AND RECOMMENDATIONS ON PREVIOUSLY IDENTIFIED DISADVANTAGES / LIMITATIONS** *Mitigation to negative impacts on ecological/social/ physical environments*
☑ *Buildings to conform to principles of "green: building design.* ☑ *Buildings to include energy and water saving efficiency design aspects.* ☑ *The overall development will include integrated landscape design and sustainable drainage designs.* ☑ *The developer/owner of these buildings can benefit from energy use reduction and carbon credit tax incentives.* ☑ *Visually and aesthetically appealing building and landscaping designs.*	☒ *Import certain building materials and increased building cost.* ☒ *Initial high building cost can be offset over time by lower costs for energy use, lower maintenance cost and tax incentives.* ☒ *Import certain building skills.* ☒ *However, this is also an opportunity for skills transfer to locally artisans that are skilled in more basic and conventional building methods.*

I1.4.20 NO-GO ALTERNATIVES – (KEEP STATUS QUO)	
ADVANTAGE OF THE DEVELOPMENT NOT OCCURRING	**DISADVANTAGE OF THE DEVELOPMENT NOT OCCURRING**
? *Vacant urban land that creates more visual open space for the human settlements surrounding the proposed property.* **?** *As the property is zoned agriculture, cultivation is an option although without raw water for irrigation only dry land cultivation will be possible that is not economically viable.* **?** *A current walkthrough for people exists to travel on foot between settlements located surrounding the property.*	☒ *Lose the opportunity to utilise vacant urban land that is currently overgrown with alien invasive plans and tree species.* ☒ *Lose the opportunity of short and long term job creation.* ☒ *Lose the opportunity to increase local household income.* ☒ *Lose the opportunity for new education facilities.* ☒ *Lose the business opportunity to diversify goods and services to local communities.* ☒ *Lose the opportunity for new transportation infrastructure and services.* ☒ *Lose the opportunity for new institutional facilities.* ☒ *Lose the opportunity for basic service provision of water, sewage and electricity to the property.* ☒ *Lose the opportunity for urban agriculture to increase food security in the local community.* ☒ *Lose the opportunity to upgrade certain portions of the R40 (national road).* ☒ *Lose the opportunity of a conveniently located filling station.* ☒ *Lose the opportunity to utilise vacant urban land and avoid the current practices on the property that is illegal waste dumping and burning of plastic waste that cause soil and air pollution to surrounding communities and users of the R40 (national road).* ☒ *Lose the opportunity to utilise urban land and discourage urban sprawl of informal settlement on the land.*

I1.5 FINDINGS OF THE COMPARATIVE ASSESSMENT

- *The purpose of the comparative assessment was to analyse the selected project alternatives in terms of their advantages (positive impacts), disadvantages (negative impacts) and mitigation potential as a further method of impact identification and of reaching the proposed development footprint (township layout) within the selected and approved site (property).*
- *The assessment revealed overwhelmingly more advantages ☑ (positive impacts) compared to disadvantages ☒ (negative impacts) of the selected alternatives to be included within or in support of the proposed township. The assessment further identified feasible mitigation potential* [**!**] *with regard to disadvantages (negative impacts) of the selected alternatives.*
- *The assessment of the "no-go" alternative indicates a substantial disadvantage if the proposed development does materialise on the selected site.*

In conclusion, it can be stated that the preferred alternatives as indicated in Section C and their locality as indicated in the amended layout plan V2 (Appendix A) can be considered as the selected alternatives and development footprint as their selection and footprint would not pose any overwhelming disadvantage or negative impacts, also considering the potential of feasible mitigation of identified impacts. In the following Section potential impacts and risks that are associated with the selected alternatives and development footprint are assessed in terms of their significance by applying the impact ranking method.

I2. IMPACT ASSESSMENT RANKING METHOD

The impact ranking assessment method is used to assess the nature, magnitude, extent and duration of potentially significant impacts of the selected project alternatives after which a range of mitigation measures is considered that could be implemented to lessen the impacts of the activity. The ranking results in a significance rating of residual impacts i.e. impacts that remain after taking mitigation measures into account. The ranking method that is used is indicated in the three tables below.

I2.1 IMPACT ASSESSMENT RANKING METHOD				
Nature of Potential Impact	**Rating or Category**	**Ranking**		**Description of Impact on the Environment**
Period	**Planning**	**PI**	**-**	Project planning and decision-making phase.
	Construction	**Co**	**-**	Construction phase
	Operational	**Op**	**-**	Operational phase
Extent	**Site**	**S**	**1**	Limited to the site and its immediate surroundings.
	Local	**L**	**2**	Up to 5km from the project site.
	Regional	**R**	**3**	Beyond 5km of the site. Up to a 20km radius from the project site.
	Province/National	**P**	**4**	Will affect beyond 20km from the site.
Duration	**Short term**	**S**	**1**	Not applicable or construction and early operation 0 - 5 years.
	Medium-term	**M**	**2**	Operational phase up to 25 years.
	Long term	**L**	**3**	Operational phase is longer than 25 years.
	Permanent	**P**	**4**	The impact will continue after the operational phase.
Intensity / Consequence or Severity	**Very low**	**L-**	**0**	None or limited damage to a small area. Natural, cultural or social functions or processes are not affected/negligible.
	Low	**L**	**1**	Marginal damage. Natural, cultural or social functions or processes can / will be only marginally affected.
	Medium	**M**	**2**	Moderate damage. Natural, cultural or social functions or processes can / will be notably altered but can continue although in a modified way /state.
	High	**H**	**3**	Severe damage. Natural, cultural or social functions or processes can / will be altered to the extent that they temporarily cease.
	Very high	**H+**	**4**	Irreparable damage. Natural, cultural or social functions or processes can / will be altered in such a way that they will permanently cease.
Probability	**Unlikely**	**U**	**1**	Less than 5% probability that impact may occur.
	Probable	**P**	**2**	There is a good chance that the impact may occur (6-49%)
	Very likely	**VI**	**3**	Likely that the impact will occur, (50 – 94%)
	Definite	**D**	**4**	More than 95% probability that impact may occur.
Degree of loss of irreplaceable resources	**Low**	**L**	**1**	Not likely that there will be an irreplaceable loss of resources.
	Probable	**P**	**2**	There is a good chance of loss of irreplaceable resources.
	Very likely	**VI**	**3**	More than 50% probability of loss of irreplaceable resources.
	Definite	**D**	**4**	More than 90% probability of loss of irreplaceable resources.
Significance	**See significance ratings in Table I2.2**			Significance rating without applying mitigation measures.
Mitigation potential	**See mitigation measures in Table I1.2.3**		**-1/-5**	Mitigation measures and objectives and ranking in the table below.

(Impact rating: 0 = Lowest / 4 = Highest)

"Significant impact" *means an impact that may have a notable effect on one or more aspects of the environment or may result in non-compliance with accepted environmental quality standards, thresholds or targets and is determined through rating the positive and negative effects of an impact on the environment based on criteria such as duration, magnitude, intensity and probability of occurrence.*

I2.2 CRITERIA FOR DETERMINING IMPACT SIGNIFICANCE				
	Rating or Category	**Ranking**		**Description of Impact on the Environment**
Significance	**Neutral**	**N**	**0**	Zero significance
	Low (Normally acceptable)	**L**	**0-5**	The impact is likely to be very low and mitigation is not required. Impacts have little real effect/ mitigation is easily achieved.
	Medium (Can be acceptable with mitigation).	**M**	**6-10**	Moderate impact and mitigation is both feasible and fairly easily possible but may influence the decision if not mitigated / or modification of the project design or alternative action may be required.
	High (Normally unacceptable).	**H**	**11-15**	Mitigation is essential to reduce to an acceptable level, mitigation is difficult, time-consuming and/expensive and may affect the decision to continue or approve.
	Very high (Unacceptable).	**>H**	**16-20**	No possible mitigation or mitigation is extremely difficult, time-consuming and/or expensive. The decision to approve will be affected
Status of the impact	**Positive or Negative**	**+**	**–**	Status of the impact: positive (benefits) or negative (costs).

I2.3 RANKING MODEL : MITIGATION ACTIONS THAT ARE AIMED AT REDUCING UNACCEPTABLE IMPACTS			
Mitigation objective	**Ranking**		**The degree to which negative impacts can be mitigated**
Avoidance / prevention	**AP**	**-5**	Measures are taken to anticipate and prevent adverse environmental impacts before actions or decisions are taken that could lead to such impacts. This approach is most effective when applied in the earliest stages of project planning. Project alternatives can also form part of avoidance mitigation measures (see Section I3.4) with the aim of identifying the best environmental option and incorporating the selected alternatives in the early planning stages of the proposed development.
Minimise / Reduce	**MI**	**-4**	Measures are taken to reduce the duration, intensity, extent and significance of environmental impacts cannot be completely avoided. This can be achieved by scaling down, relocating, or redesigning elements of a project.
Rehabilitate	**RE**	**-3**	Measures are taken to repair/restore degradation or damage to specific environmental features and ecosystem services of concern following project impacts that cannot be completely avoided and/or minimized.
Compensate / Off-set	**CO**	**-2**	Measurable conservation outcomes resulting from actions designed to remedy the negative impacts of development which remain after measures to avoid, minimize and rehabilitate have been taken into account. Creation, enhancement, or protection of the same type of resource at another suitable and acceptable location, compensating for lost resources.
Preservation	**Ps**	**-1**	Preventing any future actions that might adversely affect an environmental resource. This is typically achieved by extending legal protection to selected resources beyond the immediate needs of the project.

Mitigation rating: -4= Most favourable / -1=Least Favourable

I2.4 IDENTIFICATION OF POTENTIAL SIGNIFICANT IMPACTS BY WAY OF MATRIX RANKING METHOD

The adapted Environmental Impact Identification Matrix method has the following objectives:

- *The matrix method **identifies positive and negative impacts/risks** that selected land use and technology alternatives may pose on the receiving environment and where relevant identify the impacts/risks that the receiving environment may pose on the proposed development.*
- *The matrix method predicts the **significance** (quantitative and quantitative) of negative impacts/risks that may be posed by the selected land use and technology alternatives.*
- *The matrix method provides a **comparative ranking** of the land use and technology alternatives to facilitate the identification of potentially significant impacts / key issues that need to be put forward for additional assessment in Section K where specific mitigation descriptions are required.*

I2.5 – ADAPTED IMPACT MATRIX RANKING METHOD FOR INITIAL SIGNIFICANCE ASSESSMENT

PROJECT DESCRIPTION:
PROPOSED ACORN CITY MIXED USE TOWNSHIP & ASSOCIATED INFRASTRUCTURE

LEGEND

POTENTIALLY SIGNIFICANT IDENTIFIED IMPACTS/RISKS
POTENTIALLY NEGATIVE ○ Indirect ● Direct
POTENTIALLY POSITIVE □ Indirect ■ Direct
(NOT APPLICABLE OR NO ANTICIPATED IMPACT = BLANK)

RECEIVING ENVIRONMENT	POTENTIAL IMPACTS/RISKS OF THE DEVELOPMENT AND ON THE DEVELOPMENT	LAND USE AND TECHNOLOGY ALTERNATIVES																				SIGNIFICANCE ASSESSMENT									
		LA_1 Hotel (Residential 4)	LA_2 Urban Agriculture / future expansion	LA_3 Business "1" for Shopping centers	LA_4 Educational / Schools / Training	LA_5 Institutional / Offices / Medical	LA_6 Special for Fuel Station	LA_7 Transport Depot – Bus & taxi stop	LA_{10} Public Open Spaces	LA_{11} Utilities & Services (cemetery)		TA_1 Access to external road networks	TA_2 External electricity supply	TA_3 External bulk water supply	TA_4 External waste removal services	TA_5 Internal streets	TA_{11} Alternative storm water systems	TA_{12} Alternative on-site sanitation system	TA_{13} On-site waste management				No-go alternative (keep status quo)	Period	Extent	Duration	Consequence / intensity / severity	Probability	Irreplaceable loss of resources	Impact significance without mitigation	Degree of impact mitigation	Predicted residual Impact / risk
I2.5-1. CHANGES TO EXISTING LAND USE & INFRASTRUCTURE AND SERVITUDES	Vacant land																					●									
	Municipal Land use zoning		■																			●									
	Right of way servitude																														
	Water / sewer pipeline servitude													●									Co	1	1	1	3	1	M	-4	3
	Electricity servitude																														
I2.5-2. IMPACTS OF TERRAIN FORM	Land form type	■	■	■	■	■	■	■	■			■	■	■	■	■	■	■	■												
	Land form stability	■	■	■	■	■	■	■	■			■	■	■	■	■	■	■	■												
	Slope face orientation	○	○	○	○	○	○	○															Co	1	1	1	3	1	M	-4	3
I2.5-3. IMPACTS OF TERRAIN GRADIENT / SLOPE	Prominent landscape features																														
	Gradient steeper than (25%)																														
	Gradient between 10 – 15%	■	■	■	■	■	■	■	■			■	■	■	■	■	■	■	■												
	Gradient flatter than 1-10%	■	■	■	■	■	■	■	■			■	■	■	■	■	■	■	■												
	Slope stability	■	■	■	■	■	■	■	■			■	■	■	■	■	■	■	■												
I2.5-4 IMPACT OF LOCAL GEOLOGY	Type and depth to parent material																														
	Fault lines / unstable rock																														
	Seismic activity																														
	Unique geological features																														
	Uses for construction material																														
I2.5-5 IMPACT OF LOCAL SOIL	Compressive strength of soils	●	●	●	●	●	●	●				●	●	●			●	●	●				Co	1	1	2	3	1	M	-4	4
	Binding or bonding of soils																														

I2.5 – ADAPTED IMPACT MATRIX RANKING METHOD FOR INITIAL SIGNIFICANCE ASSESSMENT

PROJECT DESCRIPTION: PROPOSED ACORN CITY MIXED USE TOWNSHIP & ASSOCIATED INFRASTRUCTURE

LEGEND

POTENTIALLY SIGNIFICANT IDENTIFIED IMPACTS/RISKS

POTENTIALLY NEGATIVE ○ Indirect ● Direct

POTENTIALLY POSITIVE □ Indirect ■ Direct

(NOT APPLICABLE OR NO ANTICIPATED IMPACT = BLANK)

LAND USE AND TECHNOLOGY ALTERNATIVES

RECEIVING ENVIRONMENT	POTENTIAL IMPACTS/RISKS OF THE DEVELOPMENT AND ON THE DEVELOPMENT	LA_1 Hotel (Residential 4)	LA_2 Urban Agriculture / future expansion	LA_3 Business "1" for Shopping centers	LA_4 Educational / Schools / Training	LA_5 Institutional / Offices / Medical	LA_6 Special for Fuel Station	LA_7 Transport Depot – Bus & taxi stop	LA_{10} Public Open Spaces	LA_{11} Utilities & Services (cemetery)		TA_1 Access to external road networks	TA_2 External electricity supply	TA_3 External bulk water supply	TA_4 External waste removal services	TA_5 Internal streets	TA_{11} Alternative storm water systems	TA_{12} Alternative on-site sanitation system	TA_{13} On-site waste management				No-go alternative (keep status quo)	**SIGNIFICANCE ASSESSMENT** Period	Extent	Duration	Consequence / intensity / severity	Probability	Irreplaceable loss of resources	Impact significance without mitigation	Degree of impact mitigation	Predicted residual Impact / risk
CONDITIONS	Surface subsidence of soils																														
	Excavation properties of soils	■	■	■	■	■	■	■		■		■	■	■			■	■	■												
	Stability of soils																														
	Permeability of soils	■	■	■	■	■	○	■	■			■	■	■	■		■	■	○					Op	1	4	2	1	1	H	-5	4
	Susceptibility to soil erosion		●															●					●	Co	1	1	3	3	2	M	-4	6
	Disturbance of topsoil	●		●	●	●	●	●				●	●	●	●	●	●	●	●					Co	1	1	3	4	1	H	-3	7
	Perched table/seepage areas																														
I2.5-6 IMPACT OF CLIMATE CHANGE	Change in temperature																														
	Less rainfall - (more drought)		●						●					○									●	Op	1	2	2	1	1	M	-2	5
	Higher evaporation – (more drought)		●						●															Op	1	2	1	1	1	M	-2	4
	Micro-climatic - (higher radiation)	○		○	○	○	○	○	■	■			○			○								Co	1	1	1	3	1	M	-4	3
	Increased fire hazard		●																				●	Op	1	1	2	2	2	M	-5	3
	Increase flooding hazard															○								Op	1	1	2	2	2	M	-5	3
I2.5-7 IMPACT OF CHANGES TO SURFACE DRAINAGE	Varying flows/ flood lines																														
	Flash floods (surface hardening)	○	○	○	○	○	○	○								○	■							Op	1	1	1	2	1	M	-4	2
	Drainage limitations / inundation																														
	Run-off tempo	●	■	●	●	●	●	●	■							●	■							Op	1	3	1	3	2	M	-4	6
I2.5-8 CHANGES TO SURFACE WATER QUALITY	Run-off pollution	○	●	○	○	○	●	○								○	■	●	○				●	Op	2	4	3	2	3	H	-4	10
	Turbidity		○						○								■						●	Op	2	4	1	1	2	H	-5	5
	Salinity																■						●								

I2.5 – ADAPTED IMPACT MATRIX RANKING METHOD FOR INITIAL SIGNIFICANCE ASSESSMENT

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PROPOSED ACORN CITY MIXED USE TOWNSHIP & ASSOCIATED INFRASTRUCTURE

LEGEND

POTENTIALLY SIGNIFICANT IDENTIFIED IMPACTS/RISKS
POTENTIALLY NEGATIVE ○ Indirect ● Direct
POTENTIALLY POSITIVE □ Indirect ■ Direct
(NOT APPLICABLE OR NO ANTICIPATED IMPACT = BLANK)

RECEIVING ENVIRONMENT	POTENTIAL IMPACTS/RISKS OF THE DEVELOPMENT AND ON THE DEVELOPMENT	LAND USE AND TECHNOLOGY ALTERNATIVES																				SIGNIFICANCE ASSESSMENT									
		LA_1 Hotel (Residential 4)	LA_2 Urban Agriculture / future expansion	LA_3 Business "1" for Shopping centers	LA_4 Educational / Schools / Training	LA_5 Institutional / Offices / Medical	LA_6 Special for Fuel Station	LA_7 Transport Depot – Bus & taxi stop	LA_{10} Public Open Spaces	LA_{11} Utilities & Services (cemetery)		TA_1 Access to external road networks	TA_2 External electricity supply	TA_3 External bulk water supply	TA_4 External waste removal services	TA_5 Internal streets	TA_{11} Alternative storm water systems	TA_{12} Alternative on-site sanitation system	TA_{13} On-site waste management				No-go alternative (keep status quo)	Period	Extent	Duration	Consequence / intensity / severity	Probability	Irreplaceable loss of resources	Impact significance without mitigation	Degree of impact mitigation	Predicted residual Impact / risk
	Nutrient balances		○														■	●						Op	2	4	1	3	3	H	-4	9
	Sedimentation/siltation																■						●									
	Wetlands downstream																						●									
I2.5-9. CHANGES TO GROUNDWATER QUANTITY AND QUALITY	Groundwater availability																															
	Groundwater sustainability																															
	Groundwater quality						●											●						Op	2	3	3	1	3	H	-5	7
	Aquifer contamination vulnerability																															
	Aquifer contamination susceptibility						○											○						Op	2	3	2	1	2	H	-5	5
I2.5-10. CHANGES TO LAND COVER / VEGETATION	Threatened ecosystem																															
	Intrinsic vegetation type value																															
	Socio-economic value																															
	Threatened plants	●	●	●	●	●	●	●				●	●	●	●	●	●	●	●				●	Co	1	4	1	0	1	M	-4	3
	Medicinal plants																															
	Ecosystem services																															
	Spread of alien invasive species		●						●	●													●	Op	1	2	1	3	2	H	-5	4
	Fragmentation of habitats																															
I2.5-11. CHANGES TO TERRESTRIAL BIODIVERSITY	CBA Irreplaceable (CBA 1)		●																					Co	1	4	0	0	0	L	-2	3
	CBA Optimal (CBA 2)																															
	ESA Landscape Corridor																															
	ESA Local Corridor																															

I2.5 – ADAPTED IMPACT MATRIX RANKING METHOD FOR INITIAL SIGNIFICANCE ASSESSMENT

PROJECT DESCRIPTION:
PROPOSED ACORN CITY MIXED USE TOWNSHIP & ASSOCIATED INFRASTRUCTURE

LEGEND

POTENTIALLY SIGNIFICANT IDENTIFIED IMPACTS/RISKS
POTENTIALLY NEGATIVE ○ Indirect ● Direct
POTENTIALLY POSITIVE □ Indirect ■ Direct
(NOT APPLICABLE OR NO ANTICIPATED IMPACT = BLANK)

RECEIVING ENVIRONMENT	POTENTIAL IMPACTS/RISKS OF THE DEVELOPMENT AND ON THE DEVELOPMENT	LAND USE AND TECHNOLOGY ALTERNATIVES																					SIGNIFICANCE ASSESSMENT								
		LA_1 Hotel (Residential 4)	LA_2 Urban Agriculture / future expansion	LA_3 Business "1" for Shopping centers	LA_4 Educational / Schools / Training	LA_5 Institutional / Offices / Medical	LA_6 Special for Fuel Station	LA_7 Transport Depot – Bus & taxi stop	LA_{10} Public Open Spaces	LA_{11} Utilities & Services (cemetery)		TA_1 Access to external road networks	TA_2 External electricity supply	TA_3 External bulk water supply	TA_4 External waste removal services	TA_5 Internal streets	TA_{11} Alternative storm water systems	TA_{12} Alternative on-site sanitation system	TA_{13} On-site waste management				No-go alternative (keep status quo)	Period	Extent	Duration	Consequence / intensity / severity	Probability	Irreplaceable loss of resources	Impact significance without mitigation	Degree of impact mitigation	Predicted residual Impact / risk
	ESA Species specific																														
	Other Natural Area ONA	■	■	■	■	■	■	■	■	■		■	■	■	■	■	■	■	■												
	Heavily / moderately modified areas	■	■	■	■	■	■	■	■	■		■	■	■	■	■	■	■	■												
I2.5-12. CHANGES TO AQUATIC BIODIVER-SITY & FRESHWATER ECOLOGY	CBA Species																														
	CBA Rivers																□	□	□				●									
	CBA Wetlands		●															■						Co	2	4	0	0	0	M	-3	3
	ESA Wetlands																															
	ESA Wetland clusters	○	○	○	○	○	○	○	○	○						○	○	○	○				●	Co	1	4	0	0	0	M	-3	2
	ESA Important Sub-catchments	○	○	○	○	○	○	○	○	○						○	○	○	○				●	Co	2	4	0	0	0	M	-4	2
	ESA Fish support areas																															
	ESA Strategic water resource areas																															
	Oher natural Areas (ONA)	■	■	■	■	■	■	■	■	■						■	■	■	■												
	Heavily / moderately modified areas	■	■	■												■															
	Heavily modified instream dams																															
	Upstream management areas	○	○	○	○	○	○	○	○	○							○	○	○				●	Co	2	4	1	1	1	H	-4	5
I2.5-13. IMPACTS ON SENSITIVE SPECIES	SCC Plant species																															
	SCC Animal species																															
	NFA Protected species	●	●	●	●	●	●	●	●	●						●	●	●	●				●	Co	1	4	3	3	1	H	-2	10
	MBCA Protected species																															
	NEMBA Protected species																															

I2.5 – ADAPTED IMPACT MATRIX RANKING METHOD FOR INITIAL SIGNIFICANCE ASSESSMENT

PROJECT DESCRIPTION:
PROPOSED ACORN CITY MIXED USE TOWNSHIP & ASSOCIATED INFRASTRUCTURE

LEGEND

POTENTIALLY SIGNIFICANT IDENTIFIED IMPACTS/RISKS
POTENTIALLY NEGATIVE ○ Indirect ● Direct
POTENTIALLY POSITIVE □ Indirect ■ Direct
(NOT APPLICABLE OR NO ANTICIPATED IMPACT = BLANK)

RECEIVING ENVIRONMENT	POTENTIAL IMPACTS/RISKS OF THE DEVELOPMENT AND ON THE DEVELOPMENT	LAND USE AND TECHNOLOGY ALTERNATIVES																				SIGNIFICANCE ASSESSMENT									
		LA_1 Hotel (Residential 4)	LA_2 Urban Agriculture / future expansion	LA_3 Business "1" for Shopping centers	LA_4 Educational / Schools / Training	LA_5 Institutional / Offices / Medical	LA_6 Special for Fuel Station	LA_7 Transport Depot – Bus & taxi stop	LA_{10} Public Open Spaces	LA_{11} Utilities & Services (cemetery)		TA_1 Access to external road networks	TA_2 External electricity supply	TA_3 External bulk water supply	TA_4 External waste removal services	TA_5 Internal streets	TA_{11} Alternative storm water systems	TA_{12} Alternative on-site sanitation system	TA_{13} On-site waste management				No-go alternative (keep status quo)	Period	Extent	Duration	Consequence / intensity / severity	Probability	Irreplaceable loss of resources	Impact significance without mitigation	Degree of impact mitigation	Predicted residual Impact / risk
I2.5-14. CHANGES TO HERITAGE SITES LANDMARKS	Cultural sites/ landmarks																														
	Historic sites/ landmarks																														
	Sites of religious/spiritual significance																														
	Graves / burial sites	●	●	●	●	●		●	●			●	●	●	●	●	●	●	●					Co	1	4	4	4	1	H	-2	12
	Sites of archaeological importance																														
	Sites of paleontological importance																														
	Accessibility to heritage sites																														
I2.5-15. CHANGES TO SENSITIVE GEO-GRAPHIC AREAS	National protected areas																														
	Provincial protected areas																														
	Private/other protected areas																														
	Protected area expansion areas																														
	World heritage site																														
	Biosphere region core area																														
	International convention area																														
	Sensitive areas identified in EMF's																														
I2.5-16 CHANGES TO THE NEIGHBOURHOOD ENVIRONMENT	Land use compatibility	■	■	■	■	■	■	■	■								■														
	Zoning	■	■	■	■	■	■	■									■														
	The character of the area	■	■	■	■	■	■	■				■					■		○					Op	1	4	2	1	1	M	-4	5
	Security	■	■	■	■	■	■	■									■						●								
	Greenery and Open Space	■	■		■	■			■	■							■	■													

I2.5 – ADAPTED IMPACT MATRIX RANKING METHOD FOR INITIAL SIGNIFICANCE ASSESSMENT

PROJECT DESCRIPTION:
PROPOSED ACORN CITY MIXED USE TOWNSHIP & ASSOCIATED INFRASTRUCTURE

LEGEND

POTENTIALLY SIGNIFICANT IDENTIFIED IMPACTS/RISKS
POTENTIALLY NEGATIVE ○ Indirect ● Direct
POTENTIALLY POSITIVE □ Indirect ■ Direct
(NOT APPLICABLE OR NO ANTICIPATED IMPACT = BLANK)

RECEIVING ENVIRONMENT	POTENTIAL IMPACTS/RISKS OF THE DEVELOPMENT AND ON THE DEVELOPMENT	LAND USE AND TECHNOLOGY ALTERNATIVES																				SIGNIFICANCE ASSESSMENT								
		LA_1 Hotel (Residential 4)	LA_2 Urban Agriculture / future expansion	LA_3 Business "1" for Shopping centers	LA_4 Educational / Schools / Training	LA_5 Institutional / Offices / Medical	LA_6 Special for Fuel Station	LA_7 Transport Depot – Bus & taxi stop	LA_{10} Public Open Spaces	LA_{11} Utilities & Services (cemetery)		TA_1 Access to external road networks	TA_2 External electricity supply	TA_3 External bulk water supply	TA_4 External waste removal services	TA_5 Internal streets	TA_{11} Alternative storm water systems	TA_{12} Alternative on-site sanitation system	TA_{13} On-site waste management				No-go alternative (keep status quo)	Period	Extent	Duration	Consequence / intensity / severity	Probability	Irreplaceable loss of resources	Impact significance without mitigation	Degree of impact mitigation	Predicted residual Impact / risk
I2.5-17 CHANGES TO EXISTING INFRA-STRUCTURE AND PUBLIC SERVICES	Main roads & traffic impacts											●											●	Op	1	2	1	2	1	M	-4	3
	Secondary Roads & traffic levels															○								Op	1	2	2	3	1	M	-4	5
	Local Roads & traffic levels															■																
	Storm water infrastructure																■						●									
	Bulk water reservoirs & pipelines													■				■														
	Bulk sanitation system																															
	Bulk electricity																															
	Waste removal & disposal												■		■				■													
	Emergency services						●																	Op	1	1	2	1	1	M	-5	1
	Availability/accessibility of services											■	■	■	■								●									
	The capacity of existing services											■	■	■	■																	
I2.5-18 CHANGE TO THE ACOUSTIC ENVIRONMENT	Low noise impacts				●																			Op	1	1	2	2	1	M	-4	3
	Moderate noise impact																															
	High noise impact																															
	Very high noise impacts																															
	Ambient noise construction period	●	●	●	●	●	●	●								●	●	●	●					Co	1	1	1	2	1	M	-4	2
I2.5-19 CHANGE TO THE VISUAL ENVIRONMENT	Sense of place																															
	Surrounding landscape compatibility	■	■	■	■	■	■	■	■	■																						
	Visual exposure																															
	Visual absorption capacity	■	■	■	■	■	■	■																								

I2.5 – ADAPTED IMPACT MATRIX RANKING METHOD FOR INITIAL SIGNIFICANCE ASSESSMENT

PROJECT DESCRIPTION:
PROPOSED ACORN CITY MIXED USE TOWNSHIP & ASSOCIATED INFRASTRUCTURE

LEGEND

POTENTIALLY SIGNIFICANT IDENTIFIED IMPACTS/RISKS
POTENTIALLY NEGATIVE ○ Indirect ● Direct
POTENTIALLY POSITIVE □ Indirect ■ Direct
(NOT APPLICABLE OR NO ANTICIPATED IMPACT = BLANK)

RECEIVING ENVIRONMENT	POTENTIAL IMPACTS/RISKS OF THE DEVELOPMENT AND ON THE DEVELOPMENT	LAND USE AND TECHNOLOGY ALTERNATIVES																				SIGNIFICANCE ASSESSMENT									
		LA_1 Hotel (Residential 4)	LA_2 Urban Agriculture / future expansion	LA_3 Business "1" for Shopping centers	LA_4 Educational / Schools / Training	LA_5 Institutional / Offices / Medical	LA_6 Special for Fuel Station	LA_7 Transport Depot – Bus & taxi stop	LA_{10} Public Open Spaces	LA_{11} Utilities & Services (cemetery)		TA_1 Access to external road networks	TA_2 External electricity supply	TA_3 External bulk water supply	TA_4 External waste removal services	TA_5 Internal streets	TA_{11} Alternative storm water systems	TA_{12} Alternative on-site sanitation system	TA_{13} On-site waste management				No-go alternative (keep status quo)	Period	Extent	Duration	Consequence / intensity / severity	Probability	Irreplaceable loss of resources	Impact significance without mitigation	Degree of impact mitigation	Predicted residual Impact / risk
	Expected visibility	●		●	●	●	●	●	■	■									●					Op	2	4	0	1	1	M	-4	4
	Visual integration/transition	■	■	■	■	■	■	■	■	■		■				■																
I2.5-20 IMPACT ON AMBIENT AIR QUALITY	Existing emissions/odours																															
	New sources of emissions/odours																		●					Op	1	2	0	1	1	L	-4	1
	Air quality nuisance (dust)	●	●	●	●	●	●	●	●							●	●	●	●					Co	1	1	1	2	1	M	-4	2
I2.5-21. IMPACT OF POLLUTION AND WASTE	Construction waste	●	●	●	●	●	●	●	●							●	●	●	●					Co	1	1	1	3	3	M	-4	5
	General waste sources	●	●	●	●	●	●	●	●	●					■				■				●	Op	1	1	1	3	0	M	-4	2
	Hazardous waste sources														■																	
	Effluent waste sources																■		●					Op	1	4	3	1	2	H	-5	6
	Point & non-point contamination risk						●	○											○					Op	1	4	3	1	2	H	-5	6
I2.5-22 DEMOGRAPHIC CHANGE	Demographic composition																															
	Socio-economic status		■	■	■	■																										
I2.5-23 CHANGE IN EMPLOYMENT OPPORTUNITIES	Loss of employment opportunities																															
	Direct employment opportunities	■	■	■	■	■	■	■	■	■		■	■	■	■	■	■	■	■				●									
	Indirect employment opportunities	□	□	□	□	□	□	□	□	□		□	□	□	□	□	□	□	□				●									
	Short-term job opportunities	■	■	■	■	■	■	■	■	■		■	■	■	■	■	■	■	■				●									
	Long-term job opportunities	■	■	■	■	■	■	■									■	■	■				●									
I2.5-24 CHANGE OF THE LOCAL ECONOMIC	Change in land value improvements	■	■	■	■	■	■	■	■			■	■	■	■	■	■	■	■				●									
	Local Economic spin-offs	□	□	□	□	□	□	□	□			□			□	□	□	□	□				●									

I2.5 – ADAPTED IMPACT MATRIX RANKING METHOD FOR INITIAL SIGNIFICANCE ASSESSMENT

PROJECT DESCRIPTION:
PROPOSED ACORN CITY MIXED USE TOWNSHIP & ASSOCIATED INFRASTRUCTURE

LEGEND

POTENTIALLY SIGNIFICANT IDENTIFIED IMPACTS/RISKS
POTENTIALLY NEGATIVE ○ Indirect ● Direct
POTENTIALLY POSITIVE □ Indirect ■ Direct
(NOT APPLICABLE OR NO ANTICIPATED IMPACT = BLANK)

RECEIVING ENVIRONMENT	POTENTIAL IMPACTS/RISKS OF THE DEVELOPMENT AND ON THE DEVELOPMENT	LAND USE AND TECHNOLOGY ALTERNATIVES																				SIGNIFICANCE ASSESSMENT									
		LA_1 Hotel (Residential 4)	LA_2 Urban Agriculture / future expansion	LA_3 Business "1" for Shopping centers	LA_4 Educational / Schools / Training	LA_5 Institutional / Offices / Medical	LA_6 Special for Fuel Station	LA_7 Transport Depot – Bus & taxi stop	LA_{10} Public Open Spaces	LA_{11} Utilities & Services (cemetery)		TA_1 Access to external road networks	TA_2 External electricity supply	TA_3 External bulk water supply	TA_4 External waste removal services	TA_5 Internal streets	TA_{11} Alternative storm water systems	TA_{12} Alternative on-site sanitation system	TA_{13} On-site waste management				No-go alternative (keep status quo)	Period	Extent	Duration	Consequence / intensity / severity	Probability	Irreplaceable loss of resources	Impact significance without mitigation	Degree of impact mitigation	Predicted residual Impact / risk
	Investment opportunity	■	■	■	■	■	■	■	■										■				●								
	Contribute to local economic growth	■	■	■	■	■	■	■											■				●								
	Revenues for the Local Municipality	■		■	■	■	■	■						■	■		■	■	■				●								
I2.5-25 CHANGE IN THE PROVISION OF SOCIAL INFRASTRUCTURE	Public & institutional services	■	■		■	■		■								■			■				●								
	Emergency services						●																●	Op	2	4	1	1	1	M	-4	5
	Opportunity costs																		■												
I2.5-26 ENVIRON - MENTAL DEPENDENCY	Impact on environmental rights																		■												
	Loss of livelihood & wellbeing																														
I2.5-27 PUBLIC SAFETY	Increase public hazards						●												■				●	Op	2	4	3	1	1	M	-5	6
I2.5-28 KEY ISSUE IDENTIFIED BY I&AP	Impacts on services provision and Impacts on nearby businesses centres			○								●	○	○					○					Op	2	4	1	1	1	M	-4	5

I2.5-29 RANKING : LAND USE AND TECHNOLOGY ALTERNATIVES (WITHOUT APPLYING MITIGATION MEASURES)	LA1	LA2	LA3	LA4	LA5	LA6	LA7	LA10	LA11		TA1	TA2	TA3	TA4	TA5	TA11	TA12	TA13				No-go
POSITIVE DIRECT and INDIRECT IMPACTS	29	31	28	29	29	25	27	21	23		18	16	17	17	17	32	21	25				0
NEGATIVE DIRECT and INDIRECT IMPACTS	-18	-22	-19	-19	-18	-24	-19	-12	-9		-7	-6	-8	-3	-15	-11	-12	-19				-34
COMPARATIVE ALTERNATIVES RANKING	**11**	**9**	**9**	**10**	**11**	**1**	**8**	**8**	14		**11**	**10**	**9**	**14**	**2**	**25**	**9**	**6**				**-34**

The comparative assessment ranking indicates an overall positive score in favour of all the selected alternatives. The no-go alternative is eliminated.

I3 CUMULATIVE IMPACT ASSESSMENT

This section provides a full description of the process followed to assess each identified potentially significant cumulative impact and risk within the approved site as contemplated in the accepted scoping report as required in GN R 326 of 17 April 2017, Appendix 3 Section 1 (j).

*A **"Cumulative impact",** in relation to an activity, means the past, current and reasonably foreseeable future impact of an activity, considered together with the impact of activities associated with that activity, that in itself may not be significant, but may become significant when added to the existing and reasonably foreseeable impacts eventuating from similar or diverse activities [DEA 2017].*

I3.1 OBJECTIVES OF CUMULATIVE IMPACT ASSESSMENT

The aim is to determine if the combined impacts of the project and activities will result in a condition that may put the sustainability of the valued environmental and social components at risk.

I3.2 RAPID CUMULATIVE IMPACT ASSESSMENT MODEL (RCIA)

The methodology for the Rapid Cumulative Impact Assessment (RCIA) follows the five-step approach as proposed by the IFC Good Practice Handbook.

Step 1: Selection of valued environmental and social components (VESC).

This method considers fifteen selected baseline environmental and social components (refer to Section F) namely: Groundwater, Climate Change, Surface Water (hydrology), Land cover (vegetation), Terrestrial biodiversity, Aquatic Biodiversity and Freshwater Ecology, Heritage Environment, Sensitive Geographic Areas, Land Use & Infrastructure, Acoustic Environment, Visual Environment, Air Quality, Pollution & Waste, Social Environment and the Economic Environment.

Step 2 : Determine the spatial contexts of VESCs

The spatial boundaries selected in this model include (a) the site, (b) the immediate surrounding area up to 500m, (c) the local area and (d) the municipality area.

Step 3 : Determine the temporal boundaries of VESCs

Is to consider the trend of each of the identified VESCs in terms of duration, frequency and reversibility.

Step 4 : Consider the cumulative impacts of VESCs.

Consider the trend of each of the identified VESCs in terms of magnitude and probability (how substantial the predicted residual effect is) and the likelihood of the residual effect.

Step 5 : Assign a cumulative significance prediction ranking of VESCs

The cumulative prediction assigns a low, moderate or high significance ranking on the identified VESCs.

Step 6 : Assigns a positive or negative cumulative prediction

Considering the past, current and predicted mitigated future effects on / to the VESCs, an overall positive or negative cumulative prediction can be assigned to the VESCs.

I3.3 CUMULATIVE IMPACT ASSESSMENT MODEL LIMITATIONS

The limitations of the RCIA during the scoping process has been addressed as follows:

- ***Data** – data used in the cumulative impact assessment was from preliminary primary data collection and largely from secondary sources. The latest primary data as provided by specialist on-site verification and specialist studies is being considered in the assessment.*
- ***Public consultation** –an initial public participation process was conducted and relevant comments are being considered in the assessment.*

I3.4 RAPID CUMULATIVE IMPACT IDENTIFICATION AND PREDICTION MODEL			Step 1 Valued Environmental and Social Components (VESC)													
PROPOSED ACORN CITY MIXED USE TOWNSHIP DEVELOPMENT ON PORTION 217 OF THE FARM ARTHURSSEAT 217-KU BUSHBUCK RIDGE LOCAL MUNICIPALITY			CC=Climate Change SW=Surface water LC=Land cover TB=Terrestrial biodiversity AB=Aquatic Biodiversity					HE=Heritage Environment SG=Sensitive Geographic Areas LU=Land Use & Infrastructure AE=Acoustic Environment VE=Visual Environment				AQ=Air Quality PW=Pollution & waste SE=Social Environment EE=Economic Environment N/A=None/ Not applicable Blank=No cumulative effect					
Cumulative prediction criteria with mitigation included			**CC**	**SW**	**LC**	**TB**	**AB**	**HE**	**SG**	**LU**	**AE**	**VE**	**AQ**	**PW**	**SE**	**EE**
Step 2	**Spatial extent : the spatial occurrence of past, present and future additive / interactive impact components**															
Footprint area	The land/project site (potential cumulative effect remains within the site).		X		X	X		X	N/A	X	X	X	X	X	X	X
Immediate area	The area directly surrounding the project site (500 m).		X	X			X			X		X		X	X	X
Local area	The Acornhoek area and immediate surface water sub-catchment area.		X	X			X			X				X	X	X
Sub-regional area	The municipal area and downstream surface water catchment areas.		X	X			X							X	X	X
Step 3	**Temporal Context**															
Duration **Period of the event causing the effect (without mitigation).**	**Short-term**	Event occurs during the extent of clearing and construction through to project commissioning.														
	Mid-term	Event occurs during the first 10 years of operations.														
	Long-term	Ongoing event that extends greater than 10 years, over the life of the project and beyond.	X	X			X							X	X	X
Frequency **How often would the event that caused the effect occur (without mitigation)?**	**Accidental**	Event occurs rarely over the life of the project.														
	Isolated	Event is confined to a specified project activity. Occasional Event occurs intermittently and sporadically.														
	Occasional	Event occurs intermittently and sporadically over the life of the project.														
	Periodic	Event occurs intermittently however, repeatedly over the life of the project.	X													
	Continuous	Event occurs continually over the life of the project.		X			X							X	X	X
Reversibility **Period of time over which the reversing effect extends (with mitigation).**	**Short-term**	The reversing effect is limited to the project construction through to commissioning.		X			X							X		
	Mid-term	The reversing effect extends during the first 10 years of operations.														
	Long-term	The reversing effect extends beyond the first 10 years of operations.														
	Permanent	The effect is irreversible.	X												X	X

RAPID CUMULATIVE IMPACT PREDICTION MODEL		Valued Environmental and Social Components (VESC)													
Step 4	**Cumulative prediction criteria**	**CC**	**SW**	**LC**	**TB**	**AB**	**HE**	**SG**	**LU**	**AE**	**VE**	**AQ**	**PW**	**SE**	**EE**
Residual Magnitude (after mitigation has been applied)															
Negligible	No detectable change from existing (baseline) conditions.														
Low	Change is detectable and results in a limited effect on the VESC.	**X**	**X**			**X**							**X**		
Medium	Change is detectable and results in a moderate effect on the VESC.													**X**	**X**
High	Change is detectable and results in a severe effect on the VESC.														
Residual Probability (after mitigation has been applied)															
Low	Unlikely	**X**	**X**			**X**							**X**		
High	Likely													**X**	**X**
Step 5	**Cumulative Significance Prediction (after mitigation has been applied)**														
Low Cumulative Impact		**X**	**X**			**X**							**X**		
Moderate Cumulative Impact														**X**	**X**
High Cumulative Impact															
Step 6	**Positive or Negative cumulative significance predictions (after mitigation has been applied)**														
Null	The cumulative effect has no net loss or net benefit.	**X**	**X**			**X**							**X**		
Positive	Predictive significance outcome has a positive cumulative impact													**X**	**X**
Negative	Predictive significance outcome has a negative cumulative impact														

I3.5 FINDINGS CUMULATIVE IMPACT PREDICTION

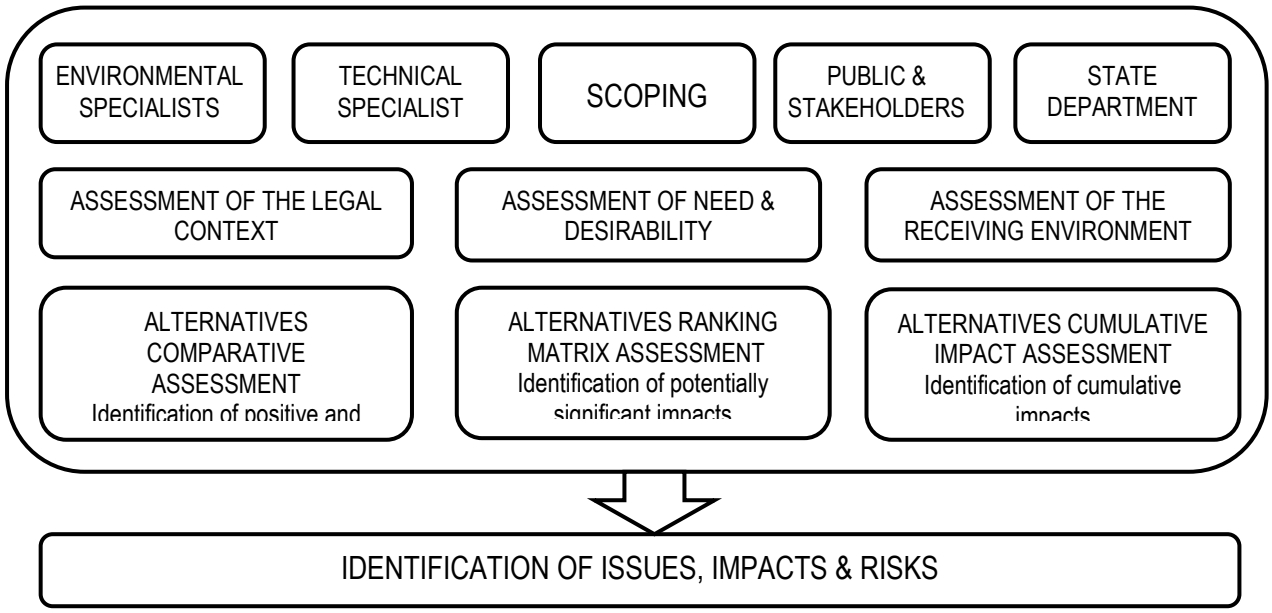
The impacts on/of most VESCs can be contained and or mitigated within the site and immediate surrounding area thus preventing or minimising any off-site cumulative impacts. Six project VESCs were identified that may pose additive or interactive cumulative impacts in the sub-regional area. Climate change may pose a low cumulative impact on the proposed development after mitigation in terms of building and landscape design has been incorporated into the township layout. The installation of appropriate storm water attenuation, soil erosion protection and run-off mitigation measures would pose low cumulative impacts with none or little net loss or benefit. The planning and installation of suitable waste management systems during the construction and operational periods would pose a low cumulative significance. The social and economic advantages would pose an overall positive cumulative effect on the local and surrounding communities.

SUMMARY OF IMPACT IDENTIFICATION

This section provides a description of the process followed to identify the impacts that 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, and a description of all environmental issues and risks that were identified during the scoping and environmental impact assessment process; as required in GN R326 of 17 April 2017, Appendix 3 Section 3(i)(i).

J1 THE IMPACT IDENTIFICATION PROCESS / METHOD

The following schematic diagram indicates the sources and methods utilised to identify impacts



J2 DESCRIPTION OF POTENTIALLY SIGNIFICANT IMPACTS

The potentially negative impacts with a significance prediction ranking of "medium" to "very high" as indicated in the Matrix Ranking Table (Section I2.5), as well as the potential negative cumulative impacts/risk as predicted in the Rapid Cumulative Impact Identification and Prediction model (Section I3) is summarized in the table below.

#	IMPACT TYPE	IMPACT DESCRIPTION
J2.1	*Soil conditions and soil disturbance may contribute to site and development risks.*	*a) Slight compression and settlement of the residual soils can be expected which may affect excavations, surface and underground building / infrastructure installations.* *b) Earth works in watercourse areas for the installation urban infrastructure and storm water management structures may result in collapse of cuttings and fillings and subsequent soil erosion.* *c) Cultivation activities on the urban agricultural erven may result in loss of topsoil and soil erosion.*
J2.2	*Vegetation clearing for urban development may lead to direct and indirect impacts.*	*a) Vegetation clearing will impact on protected Marula Trees.* *b) Bulk removal of vegetation will destroy the topsoil soil profile which may lead to sheet erosion throughout the site.* *c) Disturbed sites may increase the establishment of invasive species.*
J2.3	*Changes in surface hydrology*	*a) Structures and hardened surfaces within the township will alter the run-off infiltration area of the land which will alter the character of natural run-off drainage.* *b) Concentrated run-off with high volume peak and velocity / tempo may result in erosion of the watercourse banks at storm water outlets .* *c) Silting of natural waterways contributes to poor water quality and a loss of aquatic biota which will result in poor river health downstream.* *d) Poor maintenance of storm water systems may result in impacts on the natural watercourse and aquatic ecology.*

J2.4	*Impacts on burial sites and disturbance of graves.*	*a) The development will lead to the destruction or 21 burial sites, encompassing 38 graves.* *b) The bulk of archaeological remains are normally located beneath the soil surface. It is therefore possible that some significant cultural material or remains can be impacted once earth moving commence.*
J2.5	*Changes to surface water and groundwater quality will impact adversely on local water resources.*	*a) The proposed fuel station poses a moderate to high risk of contamination by defective underground storage tanks, pipe work, and surface spillage. Accidental spills and polluted run-off may pose a contamination risk of soil, surface water, and groundwater.* *b) The proposed on-site sewer treatment plant poses a risk of groundwater contamination by defective underground sewer treatment tanks and poor quality of treated water for re-use (irrigation). Accidental spills and polluted run-off may pose a contamination risk of soil, surface water, and groundwater.* *c) Use of pesticides and fertilisers for urban agriculture poses risk of leaching and spilling.* *d) Poor waste management and pollution control during both the construction period and the operational period can result in contamination by general and hazardous waste and impacting on water resources and human health.*

Potential significant generic construction impacts		
J2.6	*Construction staff impacts*	*a) Improper conduct of construction staff may lead to environmental degradation and security risks.* *b) Uncontrolled construction activities may cause environmental damage.* *c) The risk of accidental fires is considered to be high, especially during dry winter months.*
J2.7	*Construction site impacts*	*a) Indiscriminate clearing of vegetation for construction may result in a loss of sensitive species that may require rescue or a permit.* *b) Indiscriminate earth moving activities may result in loss of topsoil and erosion.* *c) Nuisance, noise, and dust from construction activities may impact on adjacent land uses.*
J2.8	*Pollution impacts during the construction period*	*a) Solid waste from construction work may result in pollution of soil and water resources.* *b) Liquid waste from construction work may result in pollution of soil and water resources* *c) Uncontrolled use of cement/concrete mixing may result in pollution.* *d) Re-fuelling and servicing of construction vehicles on site may result in spills and pollution to soil and water resources.*

Potential significant operational impacts		
J2.9	*Maintenance and control*	*a) Disturbed sites may increase the establishment of invasive species.* *b) Poor maintenance of storm water systems during the operational phase may result in water quality, biodiversity, and aquatic ecological impacts.* *c) Poor maintenance of the sewer treatment plant may result in pollution of soil and surface and groundwater resources, further resulting in ecological and health impacts.*
J2.10	*Storage and handling of hazardous substances (petroleum products)*	*All impacts related to the storage and handling of petroleum products as part of the fuel station operation will be dealt with in a separate environmental impact assessment.*

ASSESSMENT OF POTENTIALLY SIGNIFICANT IMPACTS

In Compliance with GN R 326 of 17 April 2017, Appendix 3 Section 3(i)(ii) and (j), this Section applies the impact and mitigation ranking methods (see Sections I1.5.1-3) to provide an assessment of each identified potentially significant impact and risk as identified in the previous Section I .

POTENTIALLY SIGNIFICANT IMPACTS AS IDENTIFIED IN SECTION J

K1.1	**Nature of impact** ***Impact ref. J2.1*** ***Impact Group:*** *GEO-TECHNICAL IMPACTS* ***Impact Description :*** *Soil conditions and soil disturbance may contribute to site and development risks.*	**Period**	**Extent**	**Duration**	**Intensity**	**Probability**	**Degree of loss of resources**	**Degree of mitigation**	**Significance before mitigation**	**Significance after mitigation**
a.	*Slight compression and settlement of the residual soils can be expected which may affect excavations, surface, and underground building / infrastructure installations.*	**Co**	**1**	**1**	**2**	**3**	**1**	**-5**	**8**	**3**
b.	*Earth works in watercourse areas for the installation urban infrastructure and storm water management structures may result in a collapse of cuttings and fillings and subsequent soil erosion.*	**Co**	**1**	**1**	**3**	**2**	**2**	**-4**	**9**	**5**
c.	*Cultivation activities on the urban agricultural erven may result in loss of topsoil and soil erosion.*	**Co/ Op**	**1**	**3**	**1**	**2**	**2**	**-4**	**9**	**5**
K1.2	**Mitigation :**									
a.	▪ *The actual predicted allowable bearing capacities to prevent compression and settlement of foundations of all the material horizons can be mitigated by following the indicated founding depths and foundation recommendations as recommended in the Geotechnical report.*									
b.	▪ *Only commence with site preparation work within or over watercourses when it can immediately be followed by the construction and rehabilitation.* ▪ *All sites within watercourses where earth moving and excavation will take place for construction must be limited to clearly demarcated and marked areas. No earthmoving or excavation may take place outside of demarcated areas.* ▪ *The flow of the watercourse must not be impeded during construction but may be temporarily diverted and channelled.* ▪ *The storm water ponds must be constructed on the site immediately before the bulk of site establishment, vegetation clearing and earth commence during the construction period. This measure is of utmost importance to prevent adverse impacts of erosion and sediment deposition, flooding of downstream properties, and contamination of downstream sensitive watercourses. The storm water retentions pond will act as a buffer to retain and retard run-off peak flows, contaminants and sediment from the construction site. The retention ponds must be maintained throughout the construction period.* ▪ *The dam walls of the storm water ponds must be layered and compacted, taking into account the soil properties as indicated in the Geo-technical report.* ▪ *Steeply sloped excavated cuts and fills sides must either be battered back to a 1:3 slope (vertical : horizontal) or must be stabilised by using suitable retaining material such as rock, retaining walls or similar.* ▪ *The bed of streams at pipe and culvert inlets and outlets must be protected from erosion by making use of rock pitching, rock gabion or "rock mattress" or other structure.*									
c.	▪ *The cultivation lands shall be planned in accordance with such method or be laid out in such a manner that the run-off speed of run-off water is restricted.* ▪ *In this regard planting, ridges shall be employed as soil conservation terraces. Minimum tillage is recommended in-between or planting ridges.* ▪ *The direction of planting ridges must be aligned along the natural terrain contours (at right angle to the slope).*									

	▪ *This method of cultivation land layout will assist to retain run-off for longer periods that will promote soil-water absorption and prevent high velocity run-off over the site that may otherwise result in sheet erosion.* ▪ *Grassed waterways or swales must be planned along the edges of the cultivation lands to safely convey runoff collected from in-field areas to natural water courses.* ▪ *Maintain the natural grass cover in-between tree rows throughout the life of the cultivation project.* ▪ *Check soil conservation structures seasonally for their optimal functioning and maintain and improve such structures throughout the life of the cultivation project.* ▪ *Implement the use of mulch on planting ridges seasonally to prevent crust formation and to promote soil genesis for optimal soil health, suppression of weeds, decreased wind erosion and improved soil fertility.*

	Nature of impact ***Impact ref. J2.2:*** ***Impact Group*** *VEGETATION, BIODIVERSITY AND ECOLOGICAL* ***Impact Description:*** *Vegetation clearing for urban development may lead to direct and indirect impacts.*	**Period**	**Extent**	**Duration**	**Intensity**	**Probability**	**Degree of loss of resources**	**Degree of mitigation**	**Significance before mitigation**	**Significance after mitigation**
a.	*Vegetation clearing will impact on protected Marula Trees.*	**Co**	**1**	**1**	**1**	**3**	**1**	**-3**	**7**	**4**
b.	*Bulk removal of vegetation will destroy the topsoil soil profile which may lead to sheet erosion throughout the site.*	**Co**	**1**	**1**	**1**	**2**	**2**	**-4**	**7**	**3**
c.	*Disturbed sites may increase the establishment of invasive species.*	**Co**	**1**	**2**	**1**	**3**	**2**	**-4**	**9**	**5**
K2.2	**Mitigation :**									
a.	▪ *Protected plant species, prominent clumps of trees, prominent individual tree species must (where possible) be protected and must be incorporated into the landscaping and the natural areas.* ▪ *Where possible important plant species that occur within the development footprint must be relocated to the future "open space" areas within the residential complex before construction commences. An appointed Landscaper shall take care of the actual removal and relocation of rescued plants before the commencement of construction.* ▪ *Obtain the necessary permits for the relocation or destruction of protected plants.* ▪ *Replace all protected tree and plant species that was destructed due to the development according to a ratio of 1:3 (replace three of each species for every one individual specimen that was lost) at suitable areas within the open space areas of the residential complex.* ▪ *Vegetation biodiversity must be complimented only locally occurring or compatible indigenous plants and no alien, invasive or exotic ornamental species may be considered for gardens.* ▪ *Rehabilitate disturbed areas after construction and maintain a suitable natural vegetation community in open areas (non-landscaped areas) during the operation period.*									
b.	▪ *Apply selective stripping of topsoil only in those areas within the actual development footprint.* ▪ *Preserve topsoil during the construction period for later re-use in rehabilitation and landscaping on all areas that becomes disturbed during the construction period.* ▪ *Mitigate the loss of topsoil by erosion by applying landscape contouring and re-vegetation.*									
c.	▪ *Allocate trained staff to control invasive species during the construction period.* ▪ *The Township Management Company must maintain all-natural areas within the township free of alien vegetation throughout the operational period.*									

	Nature of impact ***Impact ref. J2.3:*** ***Impact Group*** *STORM WATER IMPACTS* ***Impact Description*** *: Changes in surface hydrology*	**Period**	**Extent**	**Duration**	**Intensity**	**Probability**	**Degree of loss of resources**	**Degree of mitigation**	**Significance before mitigation**	**Significance after mitigation**
K3.1										

a.	*Structures and hardened surfaces within the township will alter the run-off infiltration area of the land which will alter the character of natural run-off drainage.*	**Op**	**1**	**3**	**1**	**3**	**1**	**-4**	**9**	**5**
b.	*Concentrated run-off with high volume peak and velocity may result in erosion of the watercourse banks at storm water outlets .*	**Op**	**2**	**3**	**1**	**2**	**1**	**-4**	**9**	**5**
c.	*Silting of natural waterways contributes to poor water quality and a loss of aquatic biota which will result in poor river health downstream.*	**Op**	**2**	**3**	**1**	**1**	**1**	**-4**	**8**	**4**
d.	*Poor maintenance of storm water systems may result in impacts on the natural watercourse and aquatic ecology.*	**Op**	**2**	**3**	**1**	**2**	**1**	**-4**	**9**	**5**
K3.2	**Mitigation :**									
a.	▪ *A storm water management plan that was compiled by the project engineer provides for on-site storm water attenuation to reduce the peak discharge from the post-development site more or less equal to the peak discharge from the pre-developed site.* ▪ *A storm water management system that consist of a combination of surface run-off diversion channels, surface run-off detention, natural soak away as well as sub-surface drainage and flow buffering at storm water retention ponds and at storm water outlets, must be incorporated into the planning and design of the township.* ▪ *Five (5) suitable locations for the construction of storm water retention dams within the site have been identified.* ▪ *The design of the dams must be able to accommodate and retain expected peak storm water flows within the natural watercourses. Design measures must ensure that adjacent residential properties are not flooded by the damming of storm water.* ▪ *The design of the dam outlets must ensure the slow release of storm water downstream into the natural watercourse.* ▪ *The outlets of the dams must incorporate erosion prevention structures on the bed and banks of the watercourses.* ▪ *The design must ensure that an adequate water level is retained for re-use of wastewater for agricultural purposes.* ▪ *Erosion prevention measures must be incorporated at the storm water outlets to prevent soil erosion towards the watercourse (such as stone pitched swales).* ▪ *The identified sites were selected for detention areas within the natural drainage line areas and was found to be suitable with low to negligible impact on on-site biodiversity and ecology.* ▪ *The sides and walls of the ponds must be landscaped with natural cover or maintained grass lawns and including the reintroduction of trees around these ponds.* ▪ *The design of the dams must allow access for future maintenance and removal of silt and debris within the dam basins.*									
b.	▪ *All areas where existing erosion of natural watercourses occur must be stabilised by introducing rock structures along the bed and banks of the watercourses.* ▪ *The outlet structures into the basin and into the watercourses must be designed that storm water flows without the risk of erosion of the banks or bed of these watercourses.* ▪ *Such design must include the installation of grassed swales, rock mattresses or stone pitching on the beds and banks of drainage channel to prevent erosion and to further dissipate the energy of water.* ▪ *A series of gabion wall structures must be placed within all existing narrow and deeply channelled gullies within the natural watercourses. The wall structures will trap sediment and as these fill over time, the narrow shape of the watercourse will be broadened and flattened to change the flow of water over a wider area that will create favourable conditions for the establishment of watercourse vegetation and will assist in reducing flow velocity within the watercourses.* ▪ *The incorporation of the above mitigation measures should allow for the slow release of water from the detention structures to the natural watercourses and should prevent scouring of the bed and banks and associated silting and poor water quality downstream.*									

c.	▪ *The Township Management Company must ensure the ongoing maintenance of the storm water system.* ▪ *The detention ponds must be kept clean as part of the routine garden maintenance and piped storm water system including kerb inlets and manholes must be kept clean of dirt, leaves and refuse.*

K4.1	**Nature of impact** ***Impact ref. J2.4:*** ***Impact Group: Heritage aspects*** ***Impact Description:*** *Impacts on burial sites and disturbance of graves.*	**Period**	**Extent**	**Duration**	**Intensity**	**Probability**	**Degree of loss of resources**	**Degree of mitigation**	**Significance before mitigation**	**Significance after mitigation**
a.	*The development will lead to the destruction or 21 burial sites, encompassing 31 graves.*	**Co**	**1**	**1**	**3**	**4**	**0**	**-4**	**9**	**5**
b.	*The bulk of archaeological remains are normally located beneath the soil surface. It is therefore possible that some significant cultural material or remains can be impacted once earth moving commence.*	**Co**	**1**	**1**	**1**	**2**	**1**	**-4**	**6**	**2**
K4.2	**Mitigation :**									
a.	▪ *The relocation of graves is proposed to existing cemetery sites in the nearby area or the relocation is proposed to a small cemetery site that is proposed within the proposed township. The amended Draft Township Layout Plan that is included in Appendix A, indicates the locality of the cemetery site.* ▪ *A social facilitation process in terms of the NHRA (1999), is currently being conducted with the next of kin and will provide clarity on the way forward with regard to dealing with the presence of graves on the development site. It is expected that a decision will be obtained by end of March 2022.*									
b.	▪ *During the construction period, any visible sign of Heritage resources or graves must be reported immediately.* ▪ *All work in such area must stop immediately and a heritage specialist must investigate the find and make recommendations before proceeding with construction work in the affected area.*									

K.5.1	**Nature of impact** ***Impact ref. J2.5:*** ***Impact Group: Surface and Groundwater contamination risk*** ***Impact Description:*** *Changes to surface water and groundwater quality will impact adversely on local water resources.*	**Period**	**Extent**	**Duration**	**Intensity**	**Probability**	**Degree of loss of resources**	**Degree of mitigation**	**Significance before mitigation**	**Significance after mitigation**
a.	*The proposed fuel station poses a moderate to high risk of contamination by defective underground storage tanks, pipe work, and surface spillage. Accidental spills and polluted run-off may pose a contamination risk of soil, surface water, and groundwater.*	**Pl Co Op**	**2**	**3**	**2**	**1**	**1**	**-4**	**9**	**5**
b.	*The proposed on-site sewer treatment plant poses a risk of groundwater contamination by defective underground sewer treatment tanks and poor quality of treated water for re-use (irrigation). Accidental spills and polluted run-off may pose a contamination risk of soil, surface water, and groundwater.*	**Pl Co Op**	**2**	**3**	**2**	**1**	**1**	**-4**	**9**	**5**
c.	*Use of pesticides and fertilisers for urban agriculture poses risk of leaching and spilling.*	**Op**	**2**	**3**	**1**	**1**	**1**	**-4**	**8**	**4**
d.	*Poor waste management and pollution control during both the construction period and the operational period can result in contamination by general and hazardous waste and impacting on water resources and human health.*	**Pl Co Op**	**1**	**3**	**2**	**1**	**2**	**-4**	**9**	**5**

K5.2	Mitigation :
a.	▪ *The soil conditions on the fuel station site was found to be suitable for the intended land use, however, the installation of the underground tanks and pipework, must employ the latest technologies that includes double sided underground fuel tanks, impermeable membranes, and physical, visual and electronic monitoring of fuel levels.* ▪ *The design of the forecourt, pump islands, car wash bays and fuel delivery areas must be as such to ensure an impermeable paved surface, sloped towards catch-pits and linked to an on-site oil separator after which the drainage system can be linked to the storm water management system of the township.* ▪ *Adequate spill retention and spill cleaning tools and material must be available on-site for immediate emergency use and a trained emergency response team must be on site at all times.* ▪ *The fuel station staff must be trained to monitor fuel levels on a daily basis and weekly reporting and reconciliation of fuel levels must be conducted.*
b.	▪ *Although the proposed wastewater treatment plant would be adequate to reduce the risk of site contamination to very low levels, the risk remains high if a spill event occurs due to defective machinery or human error.* ▪ *Therefore, the wastewater treatment plant must be designed, installed and managed by professionally qualified contractors.* ▪ *Fat, oil and grease removal is recommended at all kitchens, restaurants and fuel station with the implementation of oil / water separators.* ▪ *WTP must be able to treat wastewater effectively to the required standard as indicated in the Special Wastewater Limit Values (DWA 2013). The system must also be adaptable to any future changes of these values (to be updated and published by DWA from time to time).* ▪ *Adequate storm water management structures must be designed around and on the WTP site to ensure that run-off is directed away from the site.* ▪ *Emergency power supply for pumping stations and treatment plant should be made by the provision of in-place internal combustion engine equipment or solar power generator that will generate electrical or mechanical energy, or by the provision of portable pumping equipment.* ▪ *The WTP site will be fenced all round with security proof fencing and with a gate for access control and post signs restricting entry to authorised personnel.* ▪ *Water quality monitoring must be conducted on a monthly base by an approved laboratory and the results must be submitted to DWS as required.*
c.	▪ *Research indicates that riparian vegetation is considered extremely efficient in reducing the velocity of water flow entering a stream system and in trapping and utilisation of sediment, nutrients and attached pollutants contained in both surface runoff and sub-surface flow. It is therefore important to conserve the 21m buffer zones around the proposed storm water pond and to re-vegetate these zones with indigenous vegetation.* ▪ *The buffer zone, therefore, becomes an important part of the impact mitigation planning to address erosion control and water purification as part of the cultivation operations.* ▪ *The Township Management Company must also ensure implementation of the best agricultural practices throughout the life of the cultivation project and must ensure supervised handling and application of agricultural chemicals according to manufacturer's data safety requirements and the agricultural Regulations and Standards (SANS 10206) in order to prevent excessive use of agricultural chemicals and poor chemical waste management that may lead to contamination of surface and sub-surface water.*
d.	▪ *Several potentially viable measures can be explored to avoid negative impacts of waste generation and to create positive impacts relating to waste minimisation, waste re-use and recycling.* ▪ *The overall impact of general and hazardous waste generation can be mitigated effectively by the implementation of waste hierarchy management principles as recommended in the Municipal Waste Management Strategy as follows:* ▪ *Plan for the containment, re-use, and correct disposal of construction waste.* ▪ *Plan for the safe storage and separation of waste by integrating waste management facilities within the architectural design of buildings and facilities, including general waste and hazardous waste. Plan such facilities include safe enclosure and safe drainage towards integrated sumps and oil separators that are connected to the*

	sewer system. ▪ *Re-use where possible inert solid waste during the construction period.* ▪ *Separate solid waste at source during the construction and operational period and contain such waste in a safe manner until removal by appointed services providers for re-use, re-cycling, or disposal.* ▪ *Appoint reputable service providers to remove wastes for re-use, re-cycling, or disposal to approved facilities.*

POTENTIALLY SIGNIFICANT GENERIC CONSTRUCTION IMPACTS

K6.1	**Nature of impact** ***Impact ref. J2.6:*** ***Impact Group : Construction staff impacts*** ***Impact Description:*** *Potentially significant staff issues.*	Period	Extent	Duration	Intensity	Probability	Degree of loss of resources	Degree of mitigation	Significance before mitigation	Significance after mitigation
a.	*Improper conduct of construction staff may lead to environmental degradation and security risks.*	**Co**	**1**	**1**	**2**	**1**	**1**	**-4**	**6**	**2**
b.	*Uncontrolled construction activities may cause environmental damage.*	**Co**	**1**	**1**	**2**	**2**	**2**	**-4**	**8**	**4**
c.	*The risk of accidental fires is considered to be high, especially during dry winter months.*	**Co**	**1**	**1**	**2**	**1**	**1**	**-4**	**6**	**2**
K6.2	**Mitigation :**									
a.	▪ *For security purposes, all construction staff must be registered with the contractors / project manager.* ▪ *All construction staff must be informed of environmental issues and specifically with regard to trespassing onto adjacent private property, littering, the use of toilets, the use of hazardous materials, the prevention of pollution, the prohibition of clearing of natural vegetation for firewood or for medicinal purposes and the prohibition of poaching or snaring of wildlife and fishing.*									
b.	▪ *All construction staff must be made aware of the boundaries of the development sites, must understand that trespassing onto adjacent properties is illegal, and may be regarded as a criminal act.* ▪ *A demarcation line must be maintained for all construction work that occur within sensitive sites and no staff or vehicle may move outside of the demarcated work site boundaries.* ▪ *Storage of building materials must be demarcated within the confines of the construction camp.* ▪ *Clearly indicate which activities are to take place in which areas within the site e.g. the mixing of cement, stockpiling of materials etc.* ▪ *Routes for temporary access and haul roads to construction sites are to be identified and vehicle movement is to be confined to these roads. Haul roads will have to be carefully monitored and regularly graded.*									
c.	▪ *Adequate fire-fighting equipment must be on site during construction and construction staff must be instructed how to use the equipment effectively.* ▪ *No open fires for heating or cooking will be permitted on site outside of the demarcated construction camp.*									

K7.1	**Nature of impact** ***Impact ref. J2.7:*** ***Impact Group : Construction site impacts*** ***Impact Description*** *Potentially significant construction site issues.*	Period	Extent	Duration	Intensity	Probability	Degree of loss of resources	Degree of mitigation	Significance before mitigation	Significance after mitigation
a.	*Indiscriminate clearing of vegetation for construction may result in a loss of sensitive species that may require rescue or a permit.*	**Co**	**1**	**1**	**1**	**2**	**1**	**-4**	**6**	**2**
b.	*Indiscriminate earth moving activities may result in loss of topsoil and erosion.*	**Co**	**1**	**1**	**2**	**2**	**2**	**-4**	**8**	**4**
c.	*Nuisance, noise, and dust from construction activities may impact on adjacent land uses.*	**Co**	**2**	**1**	**2**	**1**	**1**	**-4**	**7**	**3**

K7.2	Mitigation :
a.	▪ *All trees and areas within the site where clearing of vegetation may not be done must be clearly marked.* ▪ *Construction areas and linear routes for pipeline trenches that need to be cleared of natural vegetation as well as the degree of clearing required must be determined and must be demarcated.* ▪ *Only clear, the areas that will immediately be developed/where installation of services can occur immediately.* ▪ *Any exotics that are encountered are to be removed immediately, making use of the latest and most effective eradication method. Only mechanical methods are authorised as the use of chemical methods on the residual soils in combination with shallow sub-surface drainage towards the adjacent watercourse may cause indirect impact and death of non-targeted species.*
b.	▪ *All sites where earthmoving, blasting, and excavation will take place must be clearly demarcated and marked. No earthmoving or excavation may take place outside of demarcated areas.* ▪ *Site preparation for earth moving and excavations must not be undertaken until such time that all required materials / services etc. is available on-site, to facilitate the immediate preparation and stabilisation of building platforms and the construction of infrastructure.* ▪ *Strip topsoil together with grass / groundcover from <u>all</u> demarcated areas and stockpile the topsoil separately for later rehabilitation use.* ▪ *Excavated material for backfilling must be stockpiled along the trench within the demarcated working area unless otherwise authorised.* ▪ *Due to the collapsible nature of on-site soils, ensure that excavated trenches are safe to work in or reinforced.* ▪ *Ensure in situ compactions of backfill according to the geo-technical recommendations.* ▪ *Excess spoil material must be stockpiled for later use as filling material wherever necessary.*
c.	▪ *Continuous use of haul roads and earth works on site will result in excessive dust. All construction areas and roads in use on any particular day must be wetted as required to suppress dust.* ▪ *Construction work that may result in a noise nuisance must be confined to normal working hours during week days and up to 13:00 on Saturdays and is prohibited on Sundays and on any public holiday.*

K8.1	Nature of impact ***Impact ref. J2.8:*** ***Impact Group : Construction waste issues*** ***Impact Description*** *Pollution and waste management impacts during the construction period.*	Period	Extent	Duration	Intensity	Probability	Degree of loss of resources	Degree of mitigation	Significance before mitigation	Significance after mitigation
a.	*Solid waste from construction work may result in pollution of soil and water resources.* *Liquid waste from construction work may result in pollution of soil and water resources*	**Co**	**1**	**1**	**1**	**2**	**1**	**-4**	**6**	**2**
b.	*Uncontrolled use of cement/concrete mixing may result in pollution.*	**Co**	**1**	**1**	**2**	**1**	**1**	**-4**	**6**	**2**
c.	*Re-fuelling and servicing of construction vehicles on site may result in spills and pollution to soil and water resources.*	**Co**	**1**	**1**	**2**	**1**	**1**	**-4**	**6**	**2**
K8.2	**Mitigation :**									
a.	▪ *There is a huge problem locally in that contractors and service providers dispose of building waste in unauthorised areas, along roadsides, in the natural veld and in watercourses.* ▪ *No waste shall be disposed of on site or surrounding areas, by burning, or by burying.* ▪ *All refuse and solid waste generated at all work sites shall be deposited in containment vessels at the relevant work site or at the construction camp, where the waste shall be stored for regular removal and disposal.* ▪ *Disposal of all waste shall be to any of the approved Municipal waste transfer sites or directly to the Municipal landfill site.* ▪ *A municipal waste container on site is another option as the waste shall then be removed by the Municipality*									

	when the container is full and the Municipality shall replace empty containers to site on request. ▪ *Apart from the Contractor, and sub-contractors and service providers that shall remove and dispose of waste, shall be pre-approved and registered with the Project Manager with the required approval to dispose of waste at an authorised site.* ▪ *The Main contractor must keep record of the volume and type of waste that was removed off site and must provide proof that such waste was disposed at an approved site by way of recoding waste removal vehicles registration and odometer reading before and after removal of waste from site and by way of a stamp, signature or written receipt from the place of disposal.* ▪ *Inert building waste (a mix of half bricks, concrete aggregate, concrete spills and slurry and spoil material) must be contained separately from glass, plastic, timber and other waste building material as inert waste may be re-used on site for filling and stabilising under road and parking areas as well as under-floor filling.* ▪ *Excess inert waste can be delivered / collected for the same use as indicated above at another approved building site. The Contractor shall provide the details of such site to the Project Manager for record purposes.* ▪ *Any littering and unauthorised waste disposal shall be brought to the attention of the local and provincial authorities who can impose official warnings and fines to the Developer.* ▪ *The adequate number of ablution facilities shall be provided at the construction camp, at least 50m away from the watercourse to avoid localised water pollution from camp sewerage.* ▪ *A service provider shall service these facilities regularly and timeously.*
b.	▪ *Any service providers that shall remove and dispose of sewer waste, shall be pre-approved and registered with the Project Manager with the required approval to dispose of effluent waste at an authorised municipal sewer treatment plant.* ▪ *The service provider shall provide proof of correct and authorised effluent waste disposal by way of a stamp, signature, or written receipt from the place of disposal.* ▪ *A demarcated concrete batching area shall be determined which area shall be bundled by a soil berm to contain concrete mixing at a single area on site. Such site shall not be closer than 50m from the edge of the watercourse. During the installation of road kerbing, concrete mixing may be done within the road surface areas which will be paved over after completion of the kerbing.* ▪ *Similarly, during building construction, concrete mixing other than in the batching yard may be done within the road or building footprint area.* ▪ *All visible remains of excess concrete and building waste must be deposited onto the inert waste heap that may be used later for filling purposes.* ▪ *A dedicated shallow sump must be located at the batching yard where excess concrete slurry and washings of concrete mixing machinery and equipment can be done. The sump must be lined with plastic to catch cement solids and clear effluent can drain into the sub-soil. The plastic lining that holds the cement solids can be cleaned weekly by depositing the cement solids onto the inert waste heap on site.*
c.	▪ *Re-fuelling of construction vehicles on site shall be done by way of a dedicated fuel truck/trailer with the required pumping and piping mechanisms that will ensure effective, safe and leak free transfer of fuel.* ▪ *Any stationary fuel tank that requires re-fuelling on site shall be located at least 50m from the edge of the watercourse and shall have the necessary all-round brick or sandbag bunding wall with impermeable concrete or synthetic floor to retain any form of leak or spill.* ▪ *Any leak or spill of fuel/oil shall be removed from the soil or from any bunded area immediately. Remove spills onto soils by removing the contaminated soil and depositing such soil into a plastic/metal drum for later disposal at the approved Municipal landfill.* ▪ *Liquid fuel and oil spills that forms puddles within a contained area must be cleaned by using the relevant industry absorption material or must be cleaned and removed by approved service providers.* ▪ *All emergency services of construction vehicles on site shall include the necessary drip trays underneath the serviced vehicle in order to retain dripping oil and soiled/replaced parts. Oil shall be drained into containers and shall be discharged at approved oil recycling depots or to be removed by approved service providers.* ▪ *Service providers shall provide the Project Manager with their authorisation to remove oils and fuels.*

POTENTIALLY SIGNIFICANT GENERIC OPERATIONAL IMPACTS

K9	Nature of impact ***Impact ref. J2.9:*** ***Impact Group : Operational Management*** ***Impact Description*** *: Management of important infrastructure and vegetation*	Period	Extent	Duration	Intensity	Probability	Degree of loss of resources	Degree of mitigation	Significance before mitigation	Significance after mitigation
a.	*Disturbed sites may increase the establishment of invasive species.*	**Op**	**1**	**3**	**1**	**2**	**2**	**-4**	**9**	**4**
b.	*Poor maintenance of storm water systems during the operational phase may result in water quality, biodiversity, and aquatic ecological impacts.*	**Op**	**1**	**3**	**1**	**3**	**2**	**-4**	**10**	**5**
c.	*Poor maintenance of the sewer treatment plant may result in pollution of soil and surface and groundwater resources, further resulting in ecological and health impacts.*	**Op**	**1**	**3**	**1**	**3**	**2**	**-4**	**10**	**5**
K9.1	**Mitigation :**									
a.	▪ *A maintenance programme must be implemented at least for the first 6 months after construction to ensure that all vegetation that was introduced to re-vegetate disturbed areas takes root and becomes well established to create habitats that will support a diversity of indigenous plants and animals life.* ▪ *An ongoing alien control programme must be introduced to prevent the colonisation of alien and invasive plants on previously disturbed areas and within the watercourse bed and banks. The removal of invasive alien vegetation has been very effective up to date.* ▪ *A long term maintenance program must be instituted to ensure a good condition of the vegetated buffers around the storm water ponds and to prevent bush encroachment by unwanted species.* ▪ *No exotic plants, amphibian or fish species may be released in the watercourse and dams*									
b.	▪ *The Company Management must maintain storm water structures by regular removal of debris and silt.* ▪ *Pipes or culverts will need to be cleaned regularly of any debris to prevent water impoundment and possible water channelling which may lead to erosion.* ▪ *The dam wall structures must be kept void of tree growth. Tree growth allows large roots to penetrate the dam wall which in future can lead to tunnelling of water and collapse of the wall.* ▪ *A low-level outlet pipe will allow water entering the pond to be discharged at a reduced flow volume. This discharge pipe must be kept clean and open at all times.* ▪ *The emergency overflow structure must be kept open and unobstructed at all times.* ▪ *The dam must be cleaned during the winter times. All sediment deposited during the rainy season must be removed and spoiled at a safe designated location.* ▪ *Gabion structures must regularly be inspected and any damage to the gabion basket structure must be repaired.* ▪ *Any scouring of soils along stream channels must be prevented and repaired on a regular basis.* ▪ *Repairs to the storm water management structures must be initiated as soon as possible after damage to any of the structures has been detected.* ▪ *It is important to maintain stabilised banks of the watercourse. As soon as erosion has been detected along the banks of the watercourse in the area between the introduced storm water management structures, action must be taken to stabilise that section of the bank of the watercourse to prevent further erosion.*									
c.	▪ *Monitoring of the WTP for efficient operation must be a daily routine.* ▪ *Sampling and effluent quality analysis must be done monthly and data must be submitted to DWS.* ▪ *Any indication of inefficient wastewater treatment must be identified and must be corrected immediately by the operator.* ▪ *All gravitational pipes and pump lines that connect to the components to be removed or replaced must be sealed to prevent accidental sewerage spills.* ▪ *All tanks must be emptied of sludge and effluent to be disposed of at a registered site.*									

	▪ *All open pipes or tanks must be closed off before decommissioning or replacement to prevent spills and odours.* ▪ *The operator should be fully conversant with the recommended operating procedures as stipulated in the operation and maintenance manual of the WTP.* ▪ *A program for sludge removal from the WTP must be included in the operation and maintenance plan.* ▪ *All reasonable measures must be taken to provide for the mechanical, electrical, operational, or process failures and malfunctions of the WTP.* ▪ *The Operator shall ensure that the WTP and treated wastewater comply throughout the operational life with all applicable national norms and standards, all existing and new legislation and regulations and the applicable Wastewater Limit Values as published from time to time.*

POTENTIALLY SIGNIFICANT CLOSURE OR DECOMMISSIONING IMPACTS

	Nature of impact	Period	Extent	Duration	Intensity	Probability	Degree of loss of resources	Degree of mitigation	Significance before mitigation	Significance after mitigation
K10.1	***Impact ref. J2.10*** ***Impact Group*** *Storage and handling of hazardous substances (petroleum products)* ***Impact Description*** ***Soil and groundwater contamination***									
NCRSA		**NCRSA**								
All impacts related to the storage and handling of petroleum products as part of the fuel station operation will be dealt with in a separate environmental impact assessment.										

NCSA-Not Considered Require Separate Application

K11 IMPACT ASSESSMENT CONCLUSION

- *The assessment of each identified aspect and impact in the sections above indicates that mitigation measures can be implemented that would effectively minimise or prevent any notable negative effect on the environment.*
- *No fatal flaws were identified where mitigation is not expected to be effective or where mitigation is not achievable.*
- *The proposed impact mitigation will result in an overall low impact significance for each of the identified impacts.*

MITIGATION OUTCOMES

This Section lists impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation, based on the assessment, and where applicable, recommendations from specialist reports as required in terms of GNR 327, Appendix 3, Section 3(m).

L.1 IMPACT MANAGEMENT OBJECTIVE

The objectives are the overall environmental goals for this project which need to be achieved by way of avoiding, preventing, preserving and minimising adverse environmental impacts associated with the project or specific activities thereof and where applicable rehabilitate and restore aspects associated with this project that may result in environmental damage.

L.2 IMPACT MANAGEMENT OUTCOMES

The environmental impact management outcomes indicated below are performance orientated, where possible quantifiable, verifiable and measurable and applicable to the activities and mitigation measures, that arises from the environmental objectives. Performance measurement during the planning and construction periods of the project can be achieved by way of verifying the implementation of plans, guidelines and standards as well as monitoring, reporting and auditing compliance to the EMPR and EA. Performance measurement during the operational period will need to determine the success and the efficiency of the implemented plans and guidelines by way of operational audits and compliance to regulatory norms and standards.

L2.1	IMPACT MANAGEMENT STATEMENT : PLANNING AND DESIGN PHASE	
	The development planning shall be finalised to achieve the objectives of sustainable development.	
	OUTCOMES	**PERFORMANCE MEASURE**
2.1.1	*The administrative requirements for the relocation of graves shall be finalised and the process of relocation shall be initiated together with the necessary specialists and State Departments in consultation with the next of kin.*	*The Applicant shall appoint an independent Environmental Control Officer (ECO) before the commencement of construction or phased construction, who shall verify together with the Project Planner, Project Engineer and Project Architect, Horticulturalist and Landscape Architect an Archaeologists that the relevant planning objectives and outcomes have been met and shall report to the Compliance and Enforcement Section of the competent authority on these matters before the commencement of a construction phase.*
2.1.2	*All above-ground and sub-surface structural and buildings designs shall include the findings and recommendations of the Geotechnical Report with regard to excavations, fills, footings and foundations.*	
2.1.3	*All the planning for township services infrastructure design and construction work shall incorporate site rehabilitation measures to prevent soil erosion. The site rehabilitation planning and construction shall form part of a contractual agreement.*	
2.1.4	*The planning of all the construction phases must ensure that the storm water infrastructure including the proposed ponds are constructed first, before commencement with any other construction work.*	
2.1.5	*The detailed designs of the storm water attenuation pond shall be approval by the relevant authorities.*	
2.1.6	*Architectural building design must include integrated waste storage facilities that allows for different types of waste to allow for waste separation on site.*	

	OUTCOMES	PERFORMANCE MEASURE
2.1.7	*Architectural building design must include the integrated design of wastewater sumps and oil separators at medical facilities, food preparation outlets, fuel station and waste storage facilities to prevent surface and groundwater contamination.*	*The Applicant shall appoint an independent environmental control officer before the commencement of construction or phased construction, who shall verify together with the Project Planner, Project Engineer and Project Architect, Horticulturalist and Landscape Architect that the relevant planning objectives and outcomes have been met and shall report to the Compliance and Enforcement Section of the competent authority on these matters before the commencement of a construction phase.*
2.1.8	*Architectural building design and landscaping design must incorporate additional measures of on-site storm water retention according to the WRC Report (TT558/13)[54].*	
2.1.9	*Soil conservation measures must be planned as part of a cultivation plan for urban agriculture.*	

L2.2	**IMPACT MANAGEMENT STATEMENT : PRE-CONSTRUCTION PHASE**	
	Comply with regulatory requirements pre-construction.	
	OUTCOMES	**PERFORMANCE MEASURE**
2.2.1	*The applicant shall obtain approval in terms of other laws applicable to the proposed development*	*Obtain permits for removal and relocation of protected plants (if applicable).*
2.2.2	*Permanent and temporary employees and contractors shall be made aware of the relevant provisions of the Environmental Authorisation and EMPR, sensitive environmental features and security arrangements.*	*Obtain written confirmation of obligations and compliance to the EMPR by contractors with hand-over of the site or at the first project meeting.*
2.2.3	*The Applicant/Developer shall finalise any administrative requirements as laid down in the Environmental Authorisation. A notice of the intention to commence with construction shall be submitted to relevant organs of state and a complaints register shall be opened for the duration of the construction/establishment period.*	*All complaints are to be acknowledged within five (5) working days and are to be responded to within 10 working days of receipt, unless additional information and / or clarification are required.*

2.3	**IMPACT MANAGEMENT STATEMENT: PRE-CONSTRUCTION PHASE**	
	The construction site shall be prepared to prevent environmental impacts before the commencement of construction or any phase thereof.	
	OUTCOMES	**PERFORMANCE MEASURE**
2.3.1	*Protected plants / trees within the development footprint area shall be rescued / removed (where possible) before clearing of vegetation.*	*A thorough search for resident fauna and protected flora shall be executed and shall remove such species to safe open space areas on- or off-site.*
2.3.2	*The construction areas shall be demarcated and prepared to prevent the potential occurrence of damaging activities before the commencement of construction.*	*The development footprint, sensitive areas, lay-down areas, construction yard and batching areas shall be marked on the ground. The site plan shall be used to verify the correct demarcation.*
2.3.3	*The construction staff shall be informed of the environmental consequences of all construction activities and awareness training shall be conducted before commencement of construction.*	*The Contractors shall conduct awareness training and shall be monitored and report on any incident that may result in environmental degradation, with remedial actions.*

L2.4	IMPACT MANAGEMENT STATEMENT: CONSTRUCTION PHASE	
	The main objective during the construction period or any phase thereof shall be to control waste and prevent pollution.	
	OUTCOMES	**PERFORMANCE MEASURE**
2.4.1	*Activities that may result in a nuisance to adjacent land owners shall be limited and managed during the construction period.*	*Response to noise and dust complaints received during the construction period and if necessary verify against norms and standards.*
2.4.2	*Solid waste emanating from construction activities shall be managed to prevent contamination of natural veld and watercourses.*	*Monitor and report the occurrence of litter and verify the manner of storage and disposal of solid waste during the construction period.*
2.4.3	*Liquid waste emanating from construction activities shall be managed to prevent contamination of soil and water resources.*	*Monitor and report evidence of liquid contamination and verify the manner of storage and disposal of liquid waste during the construction period.*

L2.5	IMPACT MANAGEMENT STATEMENT: THE REHABILITATION PHASE	
	The main objective after completion of construction of the township or any phase thereof is to ensure that rehabilitation has been finalised as part of the construction period.	
	OUTCOMES	**PERFORMANCE MEASURE**
2.5.1	*Ensure clean-up, earth shaping, soil conservation and erosion protection and re-vegetation upon completion of construction.*	*Monitor all areas where construction work occur and report thereon until completion.* *Commission an Enviornmnetal Audit after completion of all construction work and site rehabilitation (per construction phase).*

L2.6	IMPACT MANAGEMENT STATEMENT: OPERATIONAL PHASE	
	The main objective during the operational phase is to maintain the urban infrastructure, prevent solid waste or wastewater pollution and maintain good quality of wastewater .	
	OUTCOMES	**PERFORMANCE MEASURE**
2.6.1	*Maintain open areas free of alien invading plant secies.*	*Institute a seasonal program for eradication of decalred alien and invader plants on the site.*
2.6.2	*Maintain the storm water system as to ensure its effective operation and contribution to river health.*	*Compile a maintenance plan for the scheduled cleaning of the storm water systems, detention ponds and outlets.*
2.6.3	*Maintenance of the sewer treatment plant to ensure good quality wastewater disposal / re-use on-site.*	*Compile a maintenance plan for the scheduled servicing of the wastewater treatment plant and scheduled water quality reporting to DWS.*
L2.7	**IMPACT MANAGEMENT STATEMENT: DECOMMISSIONING PHASE**	
	The main objective during the decommissioning of sewer infrastructure for repair / replacement is to prevent soil and water contamination.	
	OUTCOMES	**PERFORMANCE MEASURE**
2.6.1	*Provide a plan for scheduled maintenance / repair to the sewer system and describe the manner in which pollution shall be avoided.*	*Appoint an ECO to monitor the decommissioning of any sewer infrastructure in order to report thereon to the Competent Authority.*

ENVIRONMENTAL IMPACT STATEMENT

This Section provides an environmental impact statement as required in terms of GNR 326, Appendix 3, Section 3(I)(i)(ii)(iii) as well as motivation for the preferred development footprint and project alternatives [Sect 3(g) & (n)].

M1 KEY FINDINGS AND MOTIVATION OF THE DEVELOPMENT FOOTPRINT AND ALTERNATIVES

Section D of this report identifies the regulated activities as part of the township development that requires authorisation. With reference to the authorisation requirements, the environmental impact assessment process found the following:

Listing Notice 2 Activity 15: Vegetation clearance on an area larger than 20 hectare.

The development site was historically modified and therefore natural land cover was replaced by invader species and as a result terrestrial and aquatic biodiversity including ecological services have been lost. Some protected Marula trees and Aloe species occur on the site but can be rescued, relocated or replaced. No aspect of the selected township layout, land use alternatives or technologies will pose any adverse impact on land cover and biodiversity.

Listing Notice 1 Activity 19: Removal or infilling of material in excess of 10m³ from a watercourse.

Due to the natural land cover modifications referred to above, natural drainage towards the two ephemeral drainage lines have been modified which is evident by the well-defined eroded sand channels that constitute these drainage lines. No evidence of aquatic biota or ecological services within these drainage lines has been detected. The township layout respects the natural drainage areas by incorporating storm water attenuation ponds within the drainage lines, thus allowing for natural drainage towards these ponds and at the same time prevent any further deterioration of these drainage lines downstream. The proposed on-site storm water mitigation will also contribute to enhanced water quality downstream. The proposed structures within these watercourses are not expected to pose any adverse impact on downstream water quality, freshwater ecology and aquatic biodiversity.

Listing Notice 2 Activity 28: Urban mixed use development on land larger than 5 hectares

- *The proposed development site was found feasible and reasonable for mixed use township development purposes in line with the municipal spatial planning and municipal economic development objectives.*
- *The assessment of the proposed township, land uses and infrastructure (technologies) was considered in terms of the legislative environment and it was found that the proposed development can comply with all relevant legislative conditions, plans, policies, standards and guidelines.*
- *The assessment of the receiving environment revealed that the proposed land uses and associated infrastructure can be accommodated on the proposed site. In this regard it was found that the selected development footprint and activity alternatives will not pose any detrimental impact and risk on the following:*
  - *the physical and landscape characteristics of the site and its surroundings;*
  - *essential ecological integrity and the loss of biodiversity of the site and its surroundings;*
  - *the current and potential land-uses of the site and its surrounding;*
  - *heritage and cultural sites and the sense of place of the site and its surroundings;*
  - *the existing infrastructure and/or services in or around the site and holds no future opportunity cost;*
  - *the increase in levels of present and possible pollution or contamination of natural resources;*
  - *the health and safety of the public and different groups or individuals; and*
  - *social /economic welfare of current and future generations / communities located near the site and surroundings.*
- *A need and desirability assessment found the proposed development to be ecologically, economically and socially justifiable in support of minimum sustainability objectives.*
- *A comparative assessment of the identified alternatives and their development footprints indicates overwhelmingly positive impacts and the few negative impacts can be mitigated to acceptable levels.*
- *The initial identification of potential impacts by way of the matrix assessment and rapid cumulative assessment methods identified potentially significant impacts and risks related to the proposed development, however none so much as to discard any of the selected alternatives. The alternative of not to develop the selected site, land uses and services, may pose a negative impact on potential economic and social opportunities locally.*
- *The assessment of identified impacts with potential significance in Section K of this report indicates that negative impacts can be neutralised by the recommended mitigation measures. It was ultimately found that the selected development layout and activities will not give rise to significant adverse impacts when mitigation is applied.*

M2 SELECTED DEVELOPMENT FOOTPRINT AND ALTERNATIVES

- *The draft township layout plan (Raven Town Planners, Plan No: RR2162-5 – Updated February 2022) as depicted in Appendix B to this report has been assessed and found environmentally suitable and is thus proposed as the selected township layout plan subject to approval by the Competent Environmental Authority in terms of NEMA and thereafter by the Local Municipality in terms of SPLUMA as part of the township establishment application process.*

- *The services layout plans (L&S Consulting No's: 7899A-003_RevC; 7899A-004_RevC; 7899A-005_RevC dated 01/03/2022) and Storm Water Management Plan (L&S Consulting No: 7899A-098_RevB) as described and Appendix BD10 to this report are the selected infrastructure plans after having been assessed and found environmentally suitable.*

- *A consolidated layout plan that superimposes the proposed development layout and its associated structures and infrastructure on the environmental sensitivities of the development site is depicted in Appendix A of this report.*

VALIDATION AND RECOMMENDATIONS

This Section complies with GN R326, Appendix 3, Section 3(1)(n)-(r),(t)-(w).

N.1 Conditions of Authorisation

3(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 [3(o)].

- *The recommended mitigation measures as contained in the EMPR (Appendix G) must be implemented during the various project phases and an ECO must conduct compliance monitoring and reporting.*
- *Where proposed mitigation measures are regulated by laws, regulations, norms and standards, the compliance monitoring and enforcement shall be the responsibility of the relevant Department that administers the relevant laws, regulations, norms and standards.*
- *Authorisation of the proposed fuel station land use on Erf 15 as integral part of the proposed mixed use township under Activity 28 of Listing Notice 1, GNR 327 of 7 April 2017, is conditional to a separate environmental authorisation of Activity 14 of Listing Notice 1, GNR 327 of 7 April 2017 on the selected fuel station site, and such condition must be specified in the Environmental Authorisation.*

N.2 Assumptions and uncertainties in the knowledge base

A description of any assumptions, uncertainties, and gaps in knowledge which relate to the assessment and mitigation measures proposed [3(P)]

- *It is assumed that primary and secondary sources of information and data as well as findings of scientific research and models, including information provided by interested and affected parties, the specialist, technical professionals and the Applicant are applicable, accurate, correct and valid.*
- *The separate social facilitation process in terms of the National Heritage Resources Act (1999) with regard to the proposed relocation of graves from the selected site to other cemeteries or to a proposed cemetery site within the proposed township is currently still underway. The grave relocation proposal that is being put forward as a mitigation measure has already been assessed in this report and found acceptable from a biophysical perspective. However, the outcome of a social facilitation process is currently unknown and can only be expected by end of March 2022.*

N.3 Reasoned opinion

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 [3(q)].

The authorisation of the activities applied for can be recommended for the following reasons:

- *The proposed development is considered to be environmentally, economically and socially justifiable.*
- *No aspect of the proposed development is expected to pose any significantly negative impact of the receiving environment.*
- *Mitigation measures and recommendations as well as the environmental management programme are appropriate and practical for implementation and will reduce potentially significant impacts.*

N.4 Authorisation period

Where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required, the date on which the activity will be concluded, and the post construction monitoring requirements finalised [3(r)].

- *The period for which the environmental authorisation is required:*
  -Construction Period : The development shall be phased and as this is a long term development project an authorisation validity period of 10 years should be appropriate.

-Operational Period : The maintenance of the proposed township and facilities will be ongoing according to the approved Environmental Management Program and in this regard the authorisation period is perpetually applicable.

- *The date on which the activity is expected to commence: September 2022*
- *Date on which the construction activity is expected to be concluded : Unknown*
- *The date on which the post construction monitoring requirements is expected to be finalised: A phased construction and construction monitorting approach will be applicable. The first phase of infrastructure development is expected to be completed by September 2023.*

N.5 Financial provisions

Where applicable, details of any financial provisions for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts [3(t)].
Not applicable

N.6 Motivation of Deviations

An indication of any deviation from the approved scoping report, including the plan of study, including— any deviation from the methodology used in determining the significance of potential environmental impacts and risk [3(u)].
Certain environmental aspects to be incoprporated into the architectural building and landscaping designs associated with the selected land uses are proposed in aspiration of integrating sustainability principles within the overall township design. However, such designs are currently premature for inclusion in the township development application which currently mainly focuses on the proposed first phase of the development, being the development of urban infrastructure and services in support of the proposed land uses. The building and landscaping designs and plans will follow at a later stage after approval of the township and thus reference in both the scoping report and in this report to architectural and landscape design as impact mitigation measure, must be forwarded to the specified actions as included in the EMPR. This allows for future verifications and/or approval of such plans or designs as part of the official compliance monitoring process during the construction period. *The Environmental Screening Tool advised that a Compliance Report be adequate for specialist investigation and reporting on terrestrial plant and animal species. Upon on-site verification by the specialist it was found that the site was heavily modified and that both on-site habitat and ecological services have been irrepairibly impacted. The site verification thus revealed that there is no plant or animal species of conservation concern to be reported on asn as such it was proposed to follow the reporting requirements for a Verification Report instead of a Compliance Report.*

N.7 Specific Information

Any specific information that may be required by the competent authority [3(v)]
The findings of a social facilitation programme with regard to the relocation of graves on/ from the site will be available by end of Marche 2022.

N.8 Other matters

Any other matters required in terms of section 24(4)(a) and (b) of the Act [3(w)].
None

AFFIRMATION BY THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

This Section complies with GNR 326, Appendix 3, Section 3(s).

AFFIRMATION BY THE ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)

ON THE DRAFT SCOPING REPORT

I, Riaan Visagie, practicing as Eco-8 Environmental Planners affirm to the best of my knowledge:

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

(ii) written comments and inputs from stakeholders and interested and affected parties are included in this Report;

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

(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.

Riaan Visagie (EAP: EAPASA) 7 March 2022
Eco-8 Environmental Planners

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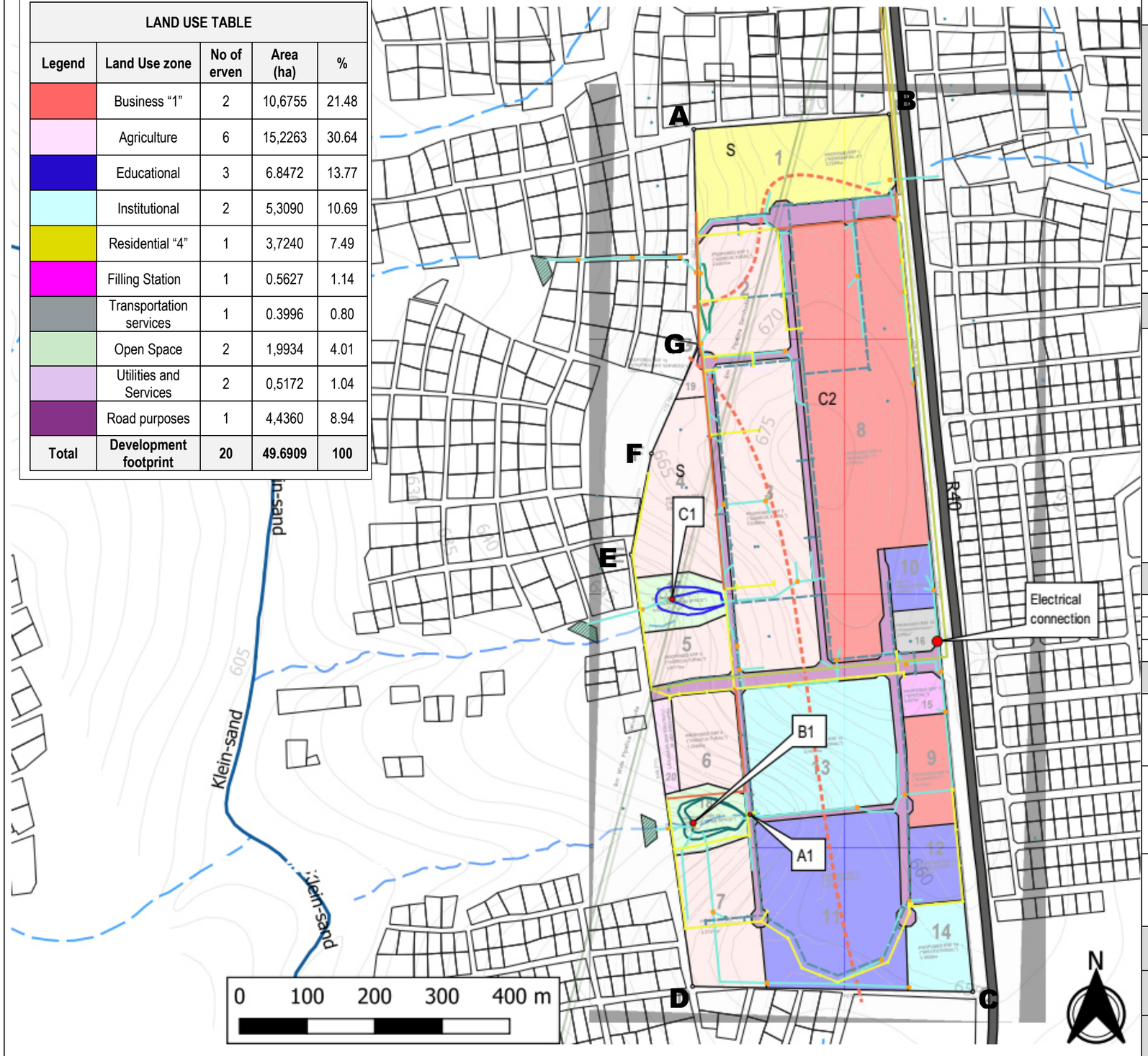
55. Żychowski, J. and Bryndal, T., 2015. Impact of cemeteries on groundwater contamination by bacteria and viruses–a review. Journal of water and health, 13(2), pp.285-301.

APPENDIX A: SITE PLAN

LAND USE TABLE				
Legend	**Land Use zone**	**No of erven**	**Area (ha)**	**%**
	Business “1”	2	10,6755	21.48
	Agriculture	6	15,2263	30.64
	Educational	3	6.8472	13.77
	Institutional	2	5,3090	10.69
	Residential “4”	1	3,7240	7.49
	Filling Station	1	0.5627	1.14
	Transportation services	1	0.3996	0.80
	Open Space	2	1,9934	4.01
	Utilities and Services	2	0,5172	1.04
	Road purposes	1	4,4360	8.94
Total	**Development footprint**	**20**	**49.6909**	**100**



LAYOUT PLAN (Version 2) OF THE PROPOSED ACORN CITY ON PORTION 27 OF THE FARM ARTHURSSEAT 214-KU AS DEPICTED BY FIGURE A,B,C,D,E,F,G,A WITH CO-ORDINATES BELOW

A	**24°37'55.30"S**	**31° 2'17.39"E**
B	**24°37'54.22"S**	**31° 2'27.52"E**
C	**24°38'36.37"S**	**31° 2'33.26"E**
D	**24°38'36.72"S**	**31° 2'18.47"E**
E	**24°38'15.79"S**	**31° 2'14.61"E**
F	**24°38'10.91"S**	**31° 2'15.50"E**
G	**24°38'5.77"S**	**31° 2'17.79"E**

LEGEND

- Servitude for Randwater
- Bulk water supply line
- Reroute of Bulk line
- Main sewer line
- Sewer collecting line
- Stormwater inlets
- Interal water reticulation
- Stormwater pipes
- Stormwater outlet mitigation
- Bio-retention pond A
- Bio-retention pond B
- Bio-retention pond C
- Division of soil zones
- Street layout
- Formal Cadastral
- Contours
- National Roads
- Klein-sand (perennial river)
- Water courses (non-perennial)

Co-ordinates for the watercourse crossing and ponds

A1	**24°38'28.11"S**	**31° 2'21.68"E**
B1	**24°38'28.63"S**	**31° 2'18.85"E**
C1	**24°38'19.25"S**	**31° 2'15.66"E**

Listed project activity

GNR 327 LN 1-19	It is proposed to construct storm water retention ponds within two watercourses on the property. The soil excavation and infilling volumes associated with these structures is expected to be more than 10m3.
GNR 327 LN 1-28	The property of 49.6ha is situated inside an urban area and has an “Agricultural” land use zoning. The proposed development that includes residential, mixed, retail, commercial, industrial or institutional land uses will cover ±49.6ha
GNR 327 LN 2-15	The property covers 49.6 ha and more than 20 hectares of indigenous vegetation will be cleared for the development of the township.

Geological zones S & C2

5m Contours and 2430 Topographical Map Sheet

PLAN NO: PTN27/214KU_V2 04/03/2022

APPENDIX B

PHOTO'S OF THE PROPOSED SITE

APPENDIX C

FACILITY ILLUSTRATION : PLAN

ENVIRONMENTAL AND TECHNICAL SPECIALIST STUDIES

Appendix D1 : Landowners Consent

Appendix D2: Draft Township Layout Plan

Appendix D3: Confirmation of existing water and wastewater infrastructure for the proposed Acorn City.

Appendix D4.1 : Geotechnical Report : Acorn city urban mixed-use development.

Appendix D4.2 : Addendum to Geotechnical Report: Acorn City fuel station.

Appendix D5.1: Geo-hydrological Risk Assessment : Acorn City Filling Station

Appendix D5.2: Groundwater Risk Assessment : Acorn City On-site Sanitation

Appendix D6.1 : Terrestrial biodiversity compliance report

Appendix D6.2 : Terrestrial Animal verification report

Appendix D6.3 : Terrestrial plant verification report

Appendix D7.1: Aquatic biodiversity compliance report

Appendix D8: Heritage Impact Assessment report

Appendix D9: Electrical Engineering Service report

Appendix D10.1: Engineering Services Outline Scheme Report

Appendix D10.2: Storm Water Management Plan & Report

Appendix D10.3: Flood line Certificate

Appendix D11: Traffic Impact Study

Appendix D12: Urban-economic study : Market Research Study Acorn City

Appendix D13: Urban- economic study : Business Plan for the Acorn City filling station

The above-mentioned information and reports can be viewed at the following internet "link".

https://www.dropbox.com/scl/fo/hbtvcwzpynakh0x63m5wf/h?dl=0&rlkey=hzwyy8yvuz2bypf1u3i6sk6nv

By clicking on the link you will be automatically connected to a Dropbox website where the information is available for online review and for downloading to an external device. Please note that you do not need to register on any website to access this information. This information will remain accessible on this website for the same period that is allowed for review and commenting as notified in the public participation process.

Appendix E

COMMENTS & RESPONSE REPORT

SUMMARY OF ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

In compliance with Appendix 3, Section 3(h)(iii) of GNR326 (2017), the Section below provides a summary of the issues raised by interested and affected parties and an indication of the manner in which the issues are incorporated or the reasons for not including them (the unabridged comments can be viewed in Appendix F).

.#	Summary of comments/issues received by the commentator	Response and manner in which the comment/issue has been incorporated / or not	Report Reference
12 November 2021 : Mr. M.N. Nelwamando representing Ivan Pauw and Partners consulted with DELRON environmental assessment practitioners to provide comments on the draft Scoping report as follows. (*The numbering format below corresponds to the numbering used by the commentator)*			
2.1	Potential Impact on Acornhoek Mall	*An Urban-economist has assessed the socio-economic impacts on other business centres in the Acornhoek area, see also Par 6.4 and 6.5 below.*	*G2.2.23; G2.3; App 13*
3.1(i)	Was permission obtained from DALR&RD for all the proposed activities?	*The Applicant has a 30 year lease on the land for purposes of a mixed use township as was agreed by the Department of Land Reform and Rural Development.*	*App D1*
3.1(ii)	Was the property purchased from the DALR&RD?	*The property is leased by the Applicant.*	*App D1*
3.1(iii)	A copy of the signed land ownership consent form to be provided in the draft EIA	*Refer to Appendix D1 for the landowner's consent from the Department of Agriculture, Land Reform & Rural Development.*	*App D1*
4.1	No access has been given to the Market study conducted for the proposed development and question arise regarding the need and desirability of the project. This study must be provided in the draft EIA.	*Refer to the urban-economic Market Research Study in Appendix D12.*	*App D12*
4.2(i)	Will Eskom provide the proposed township with electricity? Comments from Eskom must be included in the draft EIA.	*ESKOM will provide electricity to the proposed township establishment, refer to Appendix D9.*	*F14.4 , App D9*
4.2(ii)	Explain whether the necessary services are available and whether the local authority confirmed sufficient, spare, unallocated service capacity. Confirmation of all services must be included in the draft EIA.	*Confirmation on how the township will be serviced is included in the respective engineering services reports, including confirmation of availability and capacity of such services (refer to Appendix D9 , D10.1 and 10.2).*	*F14.4 App D9 App D10.1 & D10.2*
4.2(iii)	Provide detailed descriptions and drawings of the proposed engineering services for all alternatives.	*All detailed descriptions and drawings for the proposed engineering services and all alternatives are seen in the Civil Service Report and the Stormwater Management Plan.*	*App D10.1 App D10.2*
4.3	Access to the Site is from the R40 Provincial Road, has access to the site been approved by the relevant authority?	*The appointed Traffic Engineer received the comments and conditional support from SANRAL. Refer to the Traffic Impact Study and comments from SANRAL in Appendix D 11.*	*App D11*
4.4	A detailed Storm water Management Plan should be complied and included in the draft EIA.	*A stormwater management plan has been finalised.*	*D10.2*
5.1	Confirmation must be provided that listing Notice 1 - Activity 14 is not part of this application for environmental authorisation.	*Reference is made that Listing Notice 1-Activity 14 (the storage and handling of dangerous goods) should not be part of this environmental authorisation application. The fuel station land use forms an integral part of the overall township (refer to Section C),and therefore the activity (land use) and the site assessment for the proposed fuel station will remain part of this application for authorisation of Listing Notice Activity 28, but subject to additional authorisation of Activity 14 of Listing Notice 1. The latter application will focus more intently on the filling station in terms of environmental management issues to be applied by the filling station developer and operator that are not*	*D1 App A*

		necessarily applicable to the township developer and operator.	

#	Summary of comments/issues received	Response and manner in which the comment/issue has been incorporated / or not	Report Reference
6.1(i)	The following information must be provided in the draft EIA for opportunity to comment: Ground verification of baseline environmental conditions	*Refer to Section F regarding the receiving environment that has been updated with specialist report information in the draft EIR. Also, refer to Appendix D regarding all the specialist reports.*	*App D6.1 , App D6.2 App D.3, App D7.1 App D7.2*
6.1(ii)	Confirm and accurately map all terrestrial and aquatic biodiversity features subject to the property	*The Plan of Study for scoping provides the terms of reference for mapping of terrestrial and aquatic features. All specialist reports are included in the draft EIR which included all relevant terrestrial and aquatic biodiversity features.*	*App D6.1 , App D6.2 App D.3, App D7.1 App D7.2*
6.1(iii)	Site specific social-economic profiling and attributes of the study area	*The Plan of Study for scoping provides the terms of reference for socio-economic profiling and attributes of the study area. The socio-economic profiling has been completed by Demacon Urban Economist and Petrorex as part of the Market Research and Feasibility Study see Appendix D11 & D12.*	*F17.3 App D11 App D12*
6.2	Provide the following specialist study in the draft EIA for opportunity to comment:	*The Plan of Study for scoping provided the terms of reference for all of the indicated studies.* *Ground truthing has been conducted by Specialists, see above Par 6.1(i). These specialist studies have been included in the receiving environment of Section F in the draft Environmental Impact Report.*	*N/A*
	(i)Terrestrial Biodiversity Compliance Report		*App D6.1*
	(ii) Terrestrial Animal Species Compliance Report		*App D6.2*
	(iii)Terrestrial Plant Species Compliance Report		*App D6.3*
	(iv) Watercourse Delineation and Buffer Determination		*App D7.1*
	(v) Wetland Risk Assessment		*App D7.1*
	(vi) Aquatic Biodiversity Specialist Report		*App D7.1*
	(vii) Flood line Report		*App D10.3*
	(viii) Heritage Impact Assessment		*App D8*
6.3	Mention is made that the 1 in 100-year flood line will not be affected but if there is water courses on the property does this not require further assessment that entails a flood line assessment? This uncertainty must be clarified.	*The locality of the property is on a crest to upper-mid-slope position in the local landscape excludes the possibility of flooding, however, the Project Civil Engineer did issue a Flood line Certificate, refer to Appendix D10.3.*	*F2.2; F2.3, F5.4 App D10.3*
6.4	With reference to page 31 of the draft Scoping Report, Section F14.1, explain how the proposed neighbourhood/convenience/community centre will complement the Acornhoek Mall?	*In terms of the hierarchy of business/community centres which is a well-researched and accepted town and regional planning norm for determining the need for such centre, the proposed township will fit more towards a neighbourhood centre while the Acornhoek Mall is a regional commercial centre. Furthermore, the proposed neighbourhood centre will provide a range of social services which are absent at the Acornhoek Mall. In terms of the town planning principles the hierarchy of business centres should be present within communities in order to provide the full spectrum of social and economic services within the larger urban area. This aspect forms part of the*	*App D12*
6.5	List the positive and negative impacts that the proposed Acorn City Mixed Use Development and alternative will have on Acornhoek Mall Strategic Development Area?		

		urban-economic Market Research Study for the proposed township development.	

#	Summary of comments/issues received	Response and manner in which the comment/issue has been incorporated / or not	Report Reference
7.1	Provide a detailed motivation why no property and site alternative were considered.	*A motivation for not assessing an alternative property was presented in the scoping report.*	*I3.4.1 (page 75 of the Scoping report)*
7.2	Provide a full description of the process followed to reach the preferred alternative within the site.	*The process of reaching the preferred alternatives already commenced in the scoping process (see Section I3 of the Scoping Report) and is continued in Section I of the DEIR.*	*I1.4-1.5* *App D2* *App D*
7.3	It is required from the Applicant and the consultant to exclude and remove Land Use Alternative LA_6 Special (Fuel Station) as a land use alternative to be considered and assessed.	*The fuel station as a land use alternative will not be excluded from this assessment and remains subject to authorisation as part of the proposed land use and township layout as indicated in 5.1 above. Also refer to Section D of the DEIR for clarification.*	*Section D*
8.1	Amendment to the plan of study is required to remove all recommended technical and specialist studies relating to the filling station, because the filling station is not part of the application for environmental authorisation	*The fuel station as a land use alternative will not be excluded from this assessment and remains subject to authorisation as part of the proposed land uses and township layout as indicated in 5.1 above.*	*Section D*

21 October 2021 : Ms. T Sithole of Department of Agriculture, Rural Development, Land and Environmental Affairs acknowledged our notification and provided comments (*The numbering format below corresponds to the numbering used by the commentator)*			
1	All buffers must be clearly illustrated on layout plan.	*Refer to the layout plan in Appendix A*	*App A*
2	The layout plan indicates a filling station, but is not part of the application, please clarify?	*The township layout includes a fuel station that required authorisation, on condition that authorisation be obtained for Activity 14 (Notice 1) by way of a separate application for EA which runs simultaneously with this application.*	*D1*
3	Please clarify why the layout plan does not include open spaces as conservation areas.	*The preferred layout and land use alternatives have been finalised, subject to the specialist assessments inputs, and can be seen in Section C2 and Appendix A of this report.*	*C2* *App A*
4	Confirmation of appropriate water supply has to be confirmed.	*The local municipality did confirm sufficient water supply to the township. Refer to Appendix D3 regarding confirmation of existing water provision from the Bushbuckridge Local Municipality. Refer to Section F14.4 of this report for more information regarding infrastructures and services.*	*F14.4* *App D3*
5	The co-ordinates of all preferred watercourse crossings must be available at the draft EIA stage, with the design of such crossings.	*The coordinates of all the watercourse crossings are available in the draft EIA in Appendix A. Design of the crossings is seen on in the Stormwater Management plan.*	*App A* *App D10.2*

6	Relevant roads authority must be added to the list of identified stakeholders.	*SANRAL was notified in terms of this application process. See the comments of SANRAL as part of the Traffic Impact Study in Appendix D11*	*D11*

#	Summary of comments/issues received	Response and manner in which the comment/issue has been incorporated / or not	Report Reference
7	Mpumalanga Tourism and Parks Agency must be a registered I&AP with an opportunity to review and comment on all reports.	*The MTPA was included as an I&AP and was notified. The response was received (see below).*	*N/A*
8	The final scoping report must provide proof that all potential and registered I&AP's, including Organs of State were provided an opportunity to comment on the draft scoping report with access to the report.	*Refer to the final Scoping report Section K*	*Section K of the Scoping report page 95*

11 November 2021 Mr. Khumbelo Malele of the Mpumalanga Tourism and Parks acknowledged receipt of the notice and provided comments. **(***The numbering format below corresponds to the numbering used by the commentator)*			
1 & 2	Sensitivities of the terrestrial and freshwater assessment areas on the property needs to be taken into consideration with the layout plan.	*The terrestrial Specialist did not identify any sensitivity on the proposed site, for this reason, there is no sensitivity indicated on the layout plan. The aquatic specialist indicated 20m buffers to be placed around the stormwater retention ponds. These buffer zones are indicated within the "Open space" land uses on the layout plan.*	*App A*
3a-e	Layout plans must include; locality map, proposed mix township development footprint (including area of vegetation clearance), bulk infrastructure and map of sensitive features with buffers.	*The Layout plan is seen in Appendix A. The locality map, proposed mix township development footprint (including area of vegetation clearance), bulk infrastructure and map of sensitive features with buffers is seen on the Layout plan*	*App A*
4	The list of specialist studies for site specific baseline information and potential impact development assessment is in order.	*The list of specialist studies was given in the Scoping report Section J. A site investigation from the Aquatic specialist determined that by ground-truthing only an aquatic compliance report is necessary. The potential impact development assessment is seen in this draft EIR report. Refer to the Impact Statement in Section M for the summary of the potential impact development assessment.*	*App D7.1* *App D7.2* *M*

03 March 2022 Mr. Nokukhanya Khumalo of the South African Heritage Resources Agency provided comments. **(***The numbering format below corresponds to the numbering used by the commentator)*			
	The SAHRA Archaeology, Palaeontology, and Meteorites (APM) Unit notes the submission of the HIA and that the development area is located in a zone with negligible palaeontological sensitivity. According to the SAHRIS palaeo-sensitivity map, there is no requirement for assessments in this zone and the development is granted exemption from undertaking a palaeontological assessment. The SAHRA will provide further comments once the draft EIAr is submitted to the case. The SAHARA acknowledges the presence of graves / burial sites on the property. The SAHRA acknowledges that the only feasible option concerning the locality of the graves will be to relocate the graves to an appropriate site or existing cemetery. The presence of additional graves or burial sites should be confirmed during a social consultation process. The applicant must adhere to all legal requirement and obtain the necessary permits in terms of Section 38 (3 of the NHRA) 1999.	*SAHRA acknowledges that no heritage resources except a low significance grinding stone were identified during an on-site heritage assessment. A "chance find procedure" will however be implemented during the construction phase.* *Appropriate engagement with SAHRA will follow if any heritage resources are identified during the construction period.* *The recommendation in terms of palaeontological requirements is noted.* *With support of the local Tribal Authority a social consultation process is currently underway to identify the next of kin (Nok) of the identified graves on the development site. The aim of the social facilitation will be to obtain consent from the NOK for the grave relocation to a preferred site which may include a cemetery site within the in the proposed township as proposed in Section C and included as a new land use alternative in this assessment. Note that no new burials will be allowed in such cemetery site in the future .*	*F12.2* *App 8*

PUBLIC PARTICIPATION PROCESS

This Section provides a summary of the issues raised during the Public Participation Process for Environmental Scoping in compliance with, and complies with GN R326 of 17 April 2017, Appendix 2 Section 2(1)(g)(ii) & (iii).

The details of the public participation process for Environmental Scoping commenced on 14 October 2021 during which time directly adjacent land owners, potential stakeholders and State Departments we notified of the availability of a Draft Scoping Report and the opportunity to comment thereon within a period of 30 days.

F1.1 PUBLIC NOTICES : SITE NOTICE AND NEWSPAPER NOTICE : 14 OCTOBER 2021

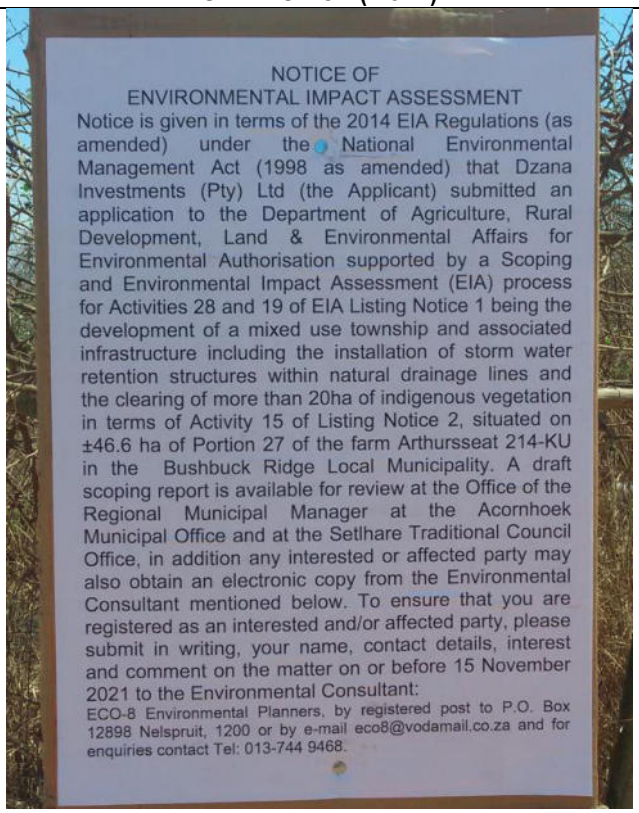
Mpumalanga NEWSPAPER

NOTICE OF ENVIRONMENTAL IMPACT ASSESSMENT

Notice is given in terms of the 2014 EIA Regulations (as amended) under the National Environmental Management Act (1998 as amended) that Dzana Investments (Pty) Ltd (the Applicant) submitted an application to the Department of Agriculture, Rural Development, Land & Environmental Affairs for Environmental Authorisation supported by a Scoping and Environmental Impact Assessment (EIA) process for Activities 28 and 19 of EIA Listing Notice 1 being the development of a mixed use township and associated infrastructure including the installation of storm water retention structures within natural drainage lines and the clearing of more than 20ha of indigenous vegetation in terms of Activity 15 of Listing Notice 2, situated on ±46.6 ha of Portion 27 of the farm Arthursseat 214-KU in the Bushbuck Ridge Local Municipality. A draft Scoping Report is available for review at the Office of the Regional Municipal Manager at the Acornhoek Municipal Office and at the Setlhare Traditional Council Office, in addition any interested or affected party may also obtain an electronic copy from the Environmental Consultant mentioned below. To ensure that you are registered as an interested and/or affected party, please submit in writing, your name, contact details, interest and comment on the matter on or before 15 November 2021 to:
ECO-8 Environmental Planners, by e-mail:
eco8@vodamail.co.za or
by registered post to P.O. Box 12898, Nelspruit, 1200
and for enquiries contact
Tel: 013-744-9468.

TA011222

SITE NOTICE (1 of 2)



F1.2 NOTIFICATION TO ADJACENT LAND OWNERS ON THE 14 OCTOBER 2021

Our ref: e-393

14 October 2021

To : Adjacent land owners

eco 8
environmental planners
P.O. BOX 12898
NELSPRUIT 1200
Tel : 013 - 744 9468
eco8@vodamail.co.za

Dear Sir/Madam

NOTICE IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT 1998 (NEMA): PROPOSED ESTABLISHMENT OF A MIXED USE TOWNSHIP ON PORTION 27 OF THE FARM ARTHURSSEAT 214-KU, BUSHBUCKRIDGE LOCAL MUNICIPALITY

Eco-8 was appointed by the Dzana Investments (Pty) Ltd to facilitate an application processes for authorisation of the proposed development of a mixed use township on the above mentioned property.

Notice is given to you in regards to a registration, review and commenting period on the Draft Environmental Scoping Report that forms part of the above-mentioned application.

Notice is therefore given in terms of the 2014 EIA Regulations (as amended) under the National Environmental Management Act (1998 as amended) that Dzana Investments (Pty) Ltd (the Applicant) submitted an application to the Department of Agriculture, Rural Development, Land & Environmental Affairs for Environmental Authorisation supported by a Scoping and Environmental Impact Assessment (EIA) process for Activities 28 and 19 of EIA Listing Notice 1 being the development of a mixed use township and associated infrastructure including the installation of storm water retention structures within natural drainage lines and the clearing of more than 20ha of indigenous vegetation in terms of Activity 15 of Listing Notice 2, situated on ±46.6 ha of Portion 27 of the farm Arthursseat 214-KU in the Bushbuck Ridge Local Municipality.

A Draft Scoping Report is available for review and comment at the following “on-line” link on the Dropbox website (please note that you do not need to register on this website in order to access the document):

https://www.dropbox.com/s/ad7mekfrmt2qhlf/Draft%20Scoping%20Report%20Acorn%20City.pdf?dl=0

You are requested to provide comment to Eco-8 Environmental Planners by e-mail [eco8@vodamail.co.za] on or before 15 November 2021.

Yours sincerely

Riaan Visagie
Environmental Assessment Practitioner (EAP : EAPASA)

F1.3 NOTIFICATION TO PRE-IDENTIFIED STAKEHOLDERS ON THE 14 OCTOBER 2021

Our ref: e-393

14 October 2021
To pre-identified interested and affected stakeholders

By email: etlharetc@gmail.com;
tsundzum@yahoo.co.uk;
malebereineck@gmail.com

eco 8
environmental planners
P.O. BOX 12898
NELSPRUIT 1200
Tel : 013 - 744 9468
eco8@vodamail.co.za

Dear Sir/Madam

NOTICE IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT 1998 (NEMA): PROPOSED ESTABLISHMENT OF A MIXED USE TOWNSHIP ON PORTION 27 OF THE FARM ARTHURSSEAT 214-KU, BUSHBUCKRIDGE LOCAL MUNICIPALITY

Eco-8 was appointed by the Dzana Investments (Pty) Ltd to facilitate an application processes for authorisation of the proposed development of a mixed use township on the above mentioned property.

Notice is given to you in regards to a registration, review and commenting period on the Draft Environmental Scoping Report that forms part of the above-mentioned application.

Notice is therefore given in terms of the 2014 EIA Regulations (as amended) under the National Environmental Management Act (1998 as amended) that Dzana Investments (Pty) Ltd (the Applicant) submitted an application to the Department of Agriculture, Rural Development, Land & Environmental Affairs for Environmental Authorisation supported by a Scoping and Environmental Impact Assessment (EIA) process for Activities 28 and 19 of EIA Listing Notice 1 being the development of a mixed use township and associated infrastructure including the installation of storm water retention structures within natural drainage lines and the clearing of more than 20ha of indigenous vegetation in terms of Activity 15 of Listing Notice 2, situated on ±46.6 ha of Portion 27 of the farm Arthursseat 214-KU in the Bushbuck Ridge Local Municipality.

A Draft Scoping Report is available for review and comment at the following “on-line” link on the Dropbox website (please note that you do not need to register on this website in order to access the document):

https://www.dropbox.com/s/ad7mekfrmt2qhlf/Draft%20Scoping%20Report%20Acorn%20City.pdf?dl=0

You are requested to provide comment to Eco-8 Environmental Planners by e-mail [eco8@vodamail.co.za] on or before 15 November 2021.

Yours sincerely

Riaan Visagie
Environmental Assessment Practitioner (EAP : EAPASA)

F1.4 NOTIFICATION TO STATE DEPARTMENT ON THE 14 OCTOBER 2021

Our ref: e-393

14 October 2021

To pre-identified interested and affected state departments

By email: khumbelomalele@gmail.com; nkunaS2@dws.gov.za; Louisj02@gmail.com; LoveS@dalrrd.gov.za; charitynxumalo@gmail.com; neveswj@gmail.com ; VDLindel@nra.co.za; kgapholav@nra.co.za; rmtusi@ehlanzeni.gov.za; shabangus@iucma.co.za;

eco 8
environmental planners
P.O. BOX 12898
NELSPRUIT 1200
Tel : 013 - 744 9468
eco8@vodamail.co.za

Dear Sir/Madam

NOTICE IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT 1998 (NEMA): PROPOSED ESTABLISHMENT OF A MIXED USE TOWNSHIP ON PORTION 27 OF THE FARM ARTHURSSEAT 214-KU, BUSHBUCKRIDGE LOCAL MUNICIPALITY

Eco-8 was appointed by the Dzana Investments (Pty) Ltd to facilitate an application processes for authorisation of the proposed development of a mixed use township on the above mentioned property.

Notice is given to you in regards to a registration, review and commenting period on the Draft Environmental Scoping Report that forms part of the above-mentioned application.

Notice is therefore given in terms of the 2014 EIA Regulations (as amended) under the National Environmental Management Act (1998 as amended) that Dzana Investments (Pty) Ltd (the Applicant) submitted an application to the Department of Agriculture, Rural Development, Land & Environmental Affairs for Environmental Authorisation supported by a Scoping and Environmental Impact Assessment (EIA) process for Activities 28 and 19 of EIA Listing Notice 1 being the development of a mixed use township and associated infrastructure including the installation of storm water retention structures within natural drainage lines and the clearing of more than 20ha of indigenous vegetation in terms of Activity 15 of Listing Notice 2, situated on ±46.6 ha of Portion 27 of the farm Arthursseat 214-KU in the Bushbuck Ridge Local Municipality.

A Draft Scoping Report is available for review and comment at the following "on-line" link on the Dropbox website (please note that you do not need to register on this website in order to access the document):

https://www.dropbox.com/s/ad7mekfrmt2qhlf/Draft%20Scoping%20Report%20Acorn%20City.pdf?dl=0

You are requested to provide comment to Eco-8 Environmental Planners by e-mail [eco8@vodamail.co.za] on or before 15 November 2021.

Yours sincerely

Riaan Visagie
Environmental Assessment Practitioner (EAP : EAPASA)

F1.5 NOTIFICATION TO OTHER PRE-IDENTIFIED PARTIES ON THE 14 OCTOBER 2021

Our ref: e-393

14 October 2021

To: Other parties : Ivan Paus & Partners

By email: nhlanhla@ippartners.co.za;

eco 8
environmental planners
P.O. BOX 12898
NELSPRUIT 1200
Tel : 013 - 744 9468
eco8@vodamail.co.za

Dear Sir/Madam

NOTICE IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT 1998 (NEMA): PROPOSED ESTABLISHMENT OF A MIXED USE TOWNSHIP ON PORTION 27 OF THE FARM ARTHURSSEAT 214-KU, BUSHBUCKRIDGE LOCAL MUNICIPALITY

Eco-8 was appointed by the Dzana Investments (Pty) Ltd to facilitate an application processes for authorisation of the proposed development of a mixed use township on the above mentioned property.

Notice is given to you in regards to a registration, review and commenting period on the Draft Environmental Scoping Report that forms part of the above-mentioned application.

Notice is therefore given in terms of the 2014 EIA Regulations (as amended) under the National Environmental Management Act (1998 as amended) that Dzana Investments (Pty) Ltd (the Applicant) submitted an application to the Department of Agriculture, Rural Development, Land & Environmental Affairs for Environmental Authorisation supported by a Scoping and Environmental Impact Assessment (EIA) process for Activities 28 and 19 of EIA Listing Notice 1 being the development of a mixed use township and associated infrastructure including the installation of storm water retention structures within natural drainage lines and the clearing of more than 20ha of indigenous vegetation in terms of Activity 15 of Listing Notice 2, situated on ±46.6 ha of Portion 27 of the farm Arthursseat 214-KU in the Bushbuck Ridge Local Municipality.

A Draft Scoping Report is available for review and comment at the following “on-line” link on the Dropbox website (please note that you do not need to register on this website in order to access the document):

https://www.dropbox.com/s/ad7mekfrmt2qhlf/Draft%20Scoping%20Report%20Acorn%20City.pdf?dl=0

You are requested to provide comment to Eco-8 Environmental Planners by e-mail [eco8@vodamail.co.za] on or before 15 November 2021.

Yours sincerely

Riaan Visagie
Environmental Assessment Practitioner (EAP : EAPASA)

BACKGROUND INFORMATION DOCUMENT

NOTICE OF REVIEW OF A DRAFT SCOPING REPORT FOR THE PROPOSED TOWNSHIP DEVELOPMENT ON PORTION 27 OF THE FARM ARTHURSSEAT 214-KU

Eco-8 was appointed to facilitate an application process for environmental authorisation, scoping and environmental impact assessment for a township establishment on Portion 27 of the farm Arthursseat 214-KU Acornhoek, by Dzana Investments (Pty) Ltd (the Applicant). This document intends to inform identified parties of the application by way of a public participation process and provides opportunity to register as interested and /or affected party and to provide comment on the proposed township establishment.

NOTICE

Notice is given in terms of the 2014 EIA Regulations (as amended) under the National Environmental Management Act (1998 as amended) that Dzana Investments (Pty) Ltd (the Applicant) submitted an application to the Department of Agriculture, Rural Development, Land & Environmental Affairs for Environmental Authorisation supported by a Scoping and Environmental Impact Assessment (EIA) process for Activities 28 and 19 of EIA Listing Notice 1 being the development of a mixed use township and associated infrastructure including the installation of storm water retention structures within natural drainage lines and the clearing of more than 20ha of indigenous vegetation in terms of Activity 15 of Listing Notice 2, situated on ±46.6 ha of Portion 27 of the farm Arthursseat 214-KU in the Bushbuck Ridge Local Municipality.

LOCALITY OF THE DEVELOPMENT PROJECT

The property is situated the Bushbuckridge Municipal Area, west of the R40 Provincial Road, opposite Sefoma Township. The property is situated 4.3 km South of the Acornhoek Mall in Green Valley, also situated adjacent to the R40.

DEVELOPMENT PROPOSAL

A township establishment application has been submitted in terms of Section 29(1) of the of the Bushbuckridge Land Use Management By-law, 2014 in respect of Portion 27 of the farm Arthursseat for the establishment of a mixed use township.

SCOPING AND ENVIRONMENTAL IMPACT REPORT

A scoping and environmental impact report (EIR) is a systematic process of identifying, assessing, and reporting environmental impacts associated with an proposed township development and forms part of an application for environmental authorisation. The scoping assessment is the first phase to be assessed and approved, thereafter the EIR will follow. Thus, this scoping report identifies the impacts of the proposed township establishment development footprint on the receiving environment.

A scoping assessment has been concluded and a draft scoping report is available for review and comment at the Office of the Regional Municipal Manager at the Acornhoek Municipal Office and at the Setlhare Traditional Council Office, Acornhoek.

PUBLIC PARTICIPATION PROCESS

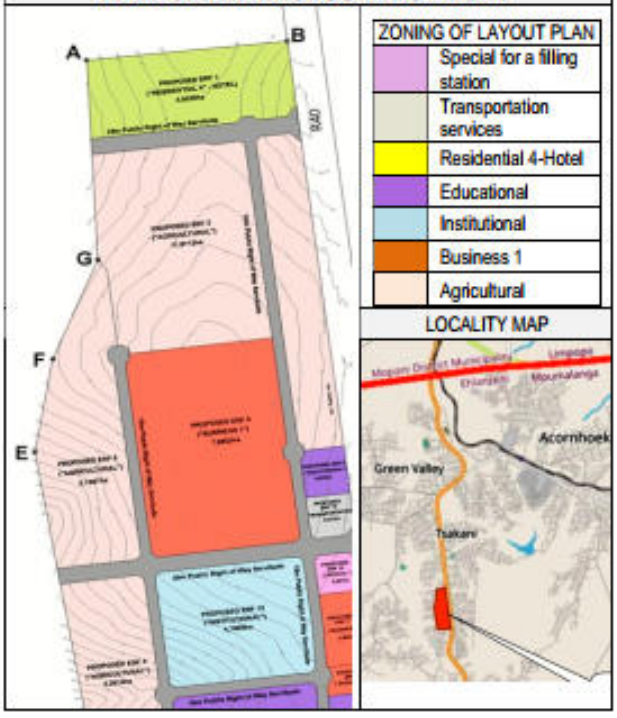
As adjacent landowner / land occupier you have been identified as a potentially interested and affected party and therefore opportunity is provided to register as such and to provide comment on the proposed township establishment

Any person/s that wants to participate in this process must immediately register as Interested and/or Affected Party (I&AP) and must declare his/her interest by completing the attached registration form and sending it to Eco-8 by e-mail or registered post.

All comments must be in writing and must be delivered to Eco-8 Environmental Planners on the provided registration form that is attached to this information document, by way of registered post or by e-mail on or before 15 November 2021.

Consultant: Eco-8 Environmental Planners
Postal address: P.O. BOX 12898, NELSPRUIT, 1200
E-mail address: eco8@vodamail.co.za
Contact Person: Mr. R. Visagie

PLAN OF THE PROPOSED TOWNSHIP



ECO-8 ENVIRONMENTAL PLANNERS P.O. BOX 12898, NELSPRUIT, 1200 or EMAIL: eco8@vodamail.co.za TEL: 013-744 9468

F1.7 REGISTER OF NOTIFIED PARTIES

The register below includes the names of pre-identified adjacent land owners, stakeholders and state departments as well as registered parties that were notified after submitting of the application for environmental authorisation to the competent authority on 12 October 2021. Public notification and participation commenced on 13 October 2021 and all adjacent land owners and pre-identified stakeholders as well as relevant state departments were provided with access to a copy of the Draft Basic Assessment Report for review and comment. Simultaneously a public notice was placed in the local newspaper and a notice board was placed on site.

ADJACENT LAND OWNERS									
NAME / INSTITUTION	PROPERTY DESCRIPTION		CONTACT DETAILS	First Notification	Method*	Registered / Commented	Second Notification	Method	Commented
Name	Valuation roll No.	On-site No.		Date					
Betty Mokoena	220	083	[redacted]	13/10/2021	h				
Kabelo Chiloane	228	New number unknown	[redacted]	13/10/2021	h				
Leah Mepoilo	239	New number unknown	[redacted]	13/10/2021	h				
Caleb Marule	528	249	[redacted]	13/10/2021	h				
Khitso Sebatane	111	250	[redacted]	13/10/2021	h				
Kholofelo Mote	New number unknown	259	[redacted]	13/10/2021	h				
Goodness Mathebula	167	260	[redacted]	13/10/2021	h				
Constance Mokansi	139	261	[redacted]	13/10/2021	h				
Maqau Chiloane	New number unknown	262	[redacted]	13/10/2021	h				
Vision Mokoena	4269	263	[redacted]	13/10/2021	h				
Mathew Sithole	New number unknown	264	[redacted]	13/10/2021	h				
Gelly Mapalle	084	265	[redacted]	13/10/2021	h				
Dipvo Maila	409	New number unknown	[redacted]	13/10/2021	h				
Maria Malepe	410	570	[redacted]	13/10/2021	h				

NOTE: *e*- This symbol refers to the notion that the medium used to notify a person was that of an email
h-This symbol refers to the notion that the medium used to notify a person was that of hand delivery

ADJACENT LAND OWNERS									
NAME / INSTITUTION	PROPERTY DESCRIPTION		CONTACT DETAILS	First Notification	Method*	Registered / Commented	Second Notification	Method	Commented
Name	Valuation roll No.	On-site No.		Date					
Adrecia Segodi	430	New number unknown	[redacted]	13/10/2021	h				
Loraine Mbjwane	431	New number unknown	[redacted]	13/10/2021	h				
Icatiego Samuel Ngobeni	none	2001081	[redacted]	13/10/2021	h				
Dineo Mohlala	455	New number unknown	[redacted]	13/10/2021	h				
Dineo Mohlala	454	New number unknown	[redacted]	13/10/2021	h				
Lokie Maswego	456	03	[redacted]	13/10/2021	h				
Ngobeni Tsepi	489	New number unknown	[redacted]	13/10/2021	h				
Mhkombo Andrean	521	New number unknown	[redacted]	13/10/2021	h				
Excellent Masaka	522	New number unknown	[redacted]	13/10/2021	h				
Thsepo Mahlakwane	557	New number unknown	[redacted]	13/10/2021	h				
Phetow Pebaie	695	New number unknown	[redacted]	13/10/2021	h				
Bethuel Minisi	696	New number unknown	[redacted]	13/10/2021	h				
Bethuel Minisi	713	New number unknown	[redacted]	13/10/2021	h				
Arenda Malele	714	New number unknown	[redacted]	13/10/2021	h				

NOTE: *e*- This symbol refers to the notion that the medium used to notify a person was that of an email
h-This symbol refers to the notion that the medium used to notify a person was that of hand delivery

ADJACENT LAND OWNERS									
NAME / INSTITUTION	PROPERTY DESCRIPTION		CONTACT DETAILS	First Notification	Method*	Registered / Commented	Second Notification	Method	Commented
Name	Valuation roll No.	On-site No.		Date					
Darries Makini	715	New number unknown	[redacted]	13/10/2021	h				
Martha Mokoena	Municipal Stand number unknown	30200	[redacted]	13/10/2021	h				
Mylord Mkhonto	Municipal Stand number unknown	082	[redacted]	13/10/2021	h				
Jane Khoza	Municipal Stand number unknown	30145	[redacted]	13/10/2021	h				
Jane Khoza	Municipal Stand number unknown	30145	[redacted]	13/10/2021	h				
Tinny Mashile	Municipal Stand number unknown	30102	[redacted]	13/10/2021	h				
Mpho Mashego	Municipal Stand number unknown	30241	[redacted]	13/10/2021	h				`
Michael Tisung Gule	Municipal Stand number unknown	New number unknown	[redacted]	13/10/2021	h				
Promise Nbelela	Municipal Stand number unknown	New number unknown	[redacted]	13/10/2021	h				
Marothi Thomas Letsoalo	Municipal Stand number unknown	New number unknown	[redacted]	13/10/2021	h				
Epson Komane	Municipal Stand number unknown	10254	[redacted]	13/10/2021	h				
Mahenuke Goodwill	Municipal Stand number unknown	New number unknown	[redacted]	13/10/2021	h				
Mahenuke Goodwill	Municipal Stand number unknown	New number unknown	[redacted]	13/10/2021	h				
Lindy Mashego	Municipal Stand number unknown	10233	[redacted]	13/10/2021	h				
Richamdso Slbuye	Municipal Stand number unknown	10236	[redacted]	13/10/2021	h				

NOTE: *e*- This symbol refers to the notion that the medium used to notify a person was that of an email
h-This symbol refers to the notion that the medium used to notify a person was that of hand delivery

ADJACENT LAND OWNERS									
NAME / INSTITUTION	PROPERTY DESCRIPTION		CONTACT DETAILS	First Notification	Method *	Registered / Commented	Second Notification	Method	Commented
Name	Valuation roll No.	On-site No.		Date					
Zulu J Nqalunga	Municipal Stand number unknown	2001081	[redacted]	13/10/2021	h				
Mpho Mmola	Municipal Stand number unknown	New number unknown	[redacted]	13/10/2021	h				
Seroto Monareng	Municipal Stand number unknown	10240	[redacted]	13/10/2021	h				
Victor Hlungwane	Municipal Stand number unknown	10163	[redacted]	13/10/2021	h				
Victor Hlungwane	Municipal Stand number unknown	10163	[redacted]	13/10/2021	h				
Lacy Sakane	Municipal Stand number unknown	10143	[redacted]	13/10/2021	h				
Matsi Bawebe	Municipal Stand number unknown	New number unknown	[redacted]	13/10/2021	h				
Lacy Sakane	Municipal Stand number unknown	New number unknown	[redacted]	13/10/2021	h				
Lacy Sakane	Municipal Stand number unknown	New number unknown	[redacted]	13/10/2021	h				
Mabaso Israel	251	New number unknown	[redacted]	13/10/2021	h				

NOTES: *e*- This symbol refers to the notion that the medium used to notify a person was that of an email

h-This symbol refers to the notion that the medium used to notify a person was that of hand delivery

POTENTIAL STAKEHOLDERS								
NAME	INSTITUTION	CONTACT DETAILS	First Notification	Method *	Registered / Commented	Second Notification	Method	Commented
Mr. Kgosi R.N. Chiloane Ms. Machate Myrah	The Setlhare Traditional Council	[redacted]	14/10/2021	**e**	No			
Mr. Remember Makhubela	Acornhoek Regional Office of the Bushbuckridge Local Municipal area	[redacted]	14/10/2021	**e**	No			
Mr. Malebe Reineck	Ward Councillor: Ward 17	[redacted]	14/10/2021	**e**	No			

NOTES: *e*- This symbol refers to the notion that the medium used to notify a person was that of an email
h-This symbol refers to the notion that the medium used to notify a person was that of hand delivery

OTHER PARTIES THAT REQUESTED REGISTRATION								
NAME	INSTITUTION	CONTACT DETAILS	First Notification	Method*	Registered / Commented	Second Notification	Method	Commented
Mr. M N Nelwamando	Ivan Pauw and Partners	[redacted]	14-10-2021	e	Yes Registered & Commented			

NOTES: *e*- This symbol refers to the notion that the medium used to notify a person was that of an email
h-This symbol refers to the notion that the medium used to notify a person was that of hand delivery

STATE DEPARTMENTS THAT HAS JURISDICTION IN THE APPLICATION AREA								
NAME	INSTITUTION	CONTACT DETAILS	First Notification	Method*	Registered / Commented	Second Notification	Method	Commented
Ms. Khumbelo Malele	MTPA	[redacted]	14/10/2021	e	Yes			
Mr. Love Shabangu	DAFF	[redacted]	14/10/2021	e	No			
Ms. Charity Nxumalo	Bushbuckridge Local Municipality, Environmental Department	[redacted]	14/10/2021	e	No			
Ms. Ramse Mtusi	Ehlanzeni District Municipality	[redacted]	14/10/2021	e	No			
Mr. S. Shabangu (IUCMA)	DWS	[redacted]	14/10/2021	e	No			
Mr. S. Nkuna	DWS	[redacted]	14/10/2021	e	No			
Mr. Louis Hlabane Mr. W Neves	Bushbuckridge Local Municipality, Town Planning	[redacted]	14/10/2021	e	No			
Ms V Kgaphola Mr. I van der Linde	SANRAL	[redacted]	22/10/2021	e	Yes			
Nokukhanya Khumalo	SAHRA	[redacted]		e	Yes			

NOTES: *e*- This symbol refers to the notion that the medium used to notify a person was that of an email
h-This symbol refers to the notion that the medium used to notify a person was that of hand delivery

F1.8. DEPARTMENTAL COMMENTS

agriculture, rural development, land & environmental affairs
MPUMALANGA PROVINCE
REPUBLIC OF SOUTH AFRICA

Block 4, Aqua Street, Riverside Park, Mbombela, 1200
Mpumalanga Province
Private Bag X 266, Mbombela 1200
Tel: +27 (13) 759 4000

EHLANZENI DISTRICT

Litiko Letekulima, Kutfutfukiswa Kwetindzawo Tasemakhaya, Temhlaba Netesimondzawo

Departement van Landbou, Landelike Ontwikkeling, Grond en Ongewing Sake

umNyango weZelimo UkuThuthukiswa kweeNdawo zemaKhaya, iNarha neeNdaba zeBhoduluko

Enquiries :T.Sithole
Telephone :082 7373 400
Reference :1/3/1/16/1E-354

Riaan Visagie
Eco8 Environmental Planners
P O Box 12898
Nelspruit
1200

Fax: 086 6644 070
Email: eco8@vodamail.co.za

Dear Sir,

DRAFT SCOPING REPORT: DEVELOPMENT OF A MIXED USE TOWNSHIP ON PORTION 27 OF THE FARM ARTHURSSEAT 217 KU, BUSHBUCKRIDGE LOCAL MUNICIPALITY

The draft scoping report which was submitted by you in respect of the abovementioned application and received by the Department on 12 October 2021 refers. The Department has considered the content of the report, and has the following comments:

1. All proposed buffers, including heritage conservation buffers and watercourse buffers, must be clearly illustrated in the final layout plan.
2. The layout plan on Page 7 of the draft scoping report includes a stand measuring 0.56ha for a filling station, however Activity 14 of GNR 983 has not been applied for. Please clarify.
3. Please clarify why the layout plan does not include open spaces as conservation areas.
4. The provision of water, *at the appropriate capacity*, must be demonstrated to be available before the application for environmental authorisation for the proposed development can be decided. Please note that this Department will only consider authorising phases that have access to water. A water balance must be provided, that illustrates the amount of water required, and the supply capabilities (ie. demand vs supply). Confirmation of water supply must be presented as: written proof from the municipality confirming that they have the capacity to supply; and/or approval from Department of Water and Sanitation for abstraction of water from the relevant water source; and/or proof of sufficient water rights, demonstrating that once converted to primary use, can meet the demand; and/or that any proposed boreholes can reliably and sustainably meet the development's water demand and that such boreholes are supported by Department of Water and Sanitation and the local municipality.
5. The co-ordinates of all preferred watercourse crossings must be available at the draft EIA stage, as well as the preferred design of such crossings.
6. The relevant roads authority must be consulted, and must be added to the list of identified stakeholders.
7. Mpumalanga Tourism and Parks Agency must be registered as an I&AP and must be provided with an opportunity to review and comment on all reports, including the terms of reference for Terrestrial Ecological and Aquatic studies.

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THE PLACE OF THE RISING SUN

1/3/1/16/1E-354

8. The final scoping report must provide proof that all potential and registered I&AP's, including Organs of State were provided with an opportunity to comment on the draft scoping report and that all I&AP's were provided with access to and an opportunity to comment on the draft scoping report following the submission of the application form as per Regulation 40(3).

Please draw the applicant's attention to the fact that the activity may not commence prior to an environmental authorisation being granted by the Department.

Sincerely,

R. LUYT
ACTING DIRECTOR: ENVIRONMENTAL IMPACT MANAGEMENT
DATE: 21/10/2021

Mpumalanga
TOURISM AND PARKS AGENCY

Ref: LUA 21/2868
Unit: LUA /SS
Enquiries: K. Malele
E-mail:khumbelomalele@gmail.com
Tel/Fax: 013- 235 2395 **Ext.** 222

Mr. R. Visagie

ECO8 Environmental Planners
P.O. Box 12898
Nelspruit
1200

Fax: 086 664 4070
E-mail: eco8@vodamail.co.za

Dear Mr. Visagie

SUBJECT: HEREWITH MTPA'S COMMENTS REGARDING THE SCOPING REPORT FOR THE PROPOSED ESTABLISHMENT OF A MIXED USE TOWNSHIP ON PORTION 27 OF THE FARM ARTHURSSEAT 214 KU, SITUATED IN BUSHBUCKRIDGE LOCAL MUNICIPALITY, MPUMALANGA PROVINCE.

Your correspondence, of date 13/10/2021 has reference.

Dzana Investments (Pty) Ltd is proposing to develop a hotel, urban agriculture, business components, educational components, institutional components, fuel filling station, transportation services, other residential, light industrial, private/public open spaces.

The sensitivity of the farm was assessed according to the Mpumalanga Biodiversity Sector Plan (MBSP; MTPA, 2014), This sensitivity is assessed in terms of terrestrial and freshwater assessments. In the MBSP, sensitive areas are identified in terms of *Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs). CBAs and ESAs* are deemed to be necessary to ensure protection of biodiversity, environmental sustainability, and human well-being, and are to remain unaltered.

1. According to the MBSP based terrestrial assessment, (Fig. 1), the proposed development will occur on *Other natural areas* and *heavily or moderately modified areas.*
2. According to the MBSP based freshwater assessment (Fig. 2), there are *CBA Wetlands, ESA Wetland clusters, ESA Important sub-catchments* in the proposed development area. Theses sensitivities will need to be taken into consideration when creating the layout plan.
3. The layout plans should show the following:
    a. General locality map
    b. Demarcation of the proposed mixed use township boundaries including the total area that is proposed for clearance and development in hectares

Private Bag X11338 Nelspruit, 1200, N4 National Road, Hall's Gateway, Matsafin
Tel: +27 (13) 759 5300/01 Fax: +27 (13) 755 3928
www.mpumalanga.com

c. Layouts of any road infrastructure and associated drainage internal to the mixed use township footprint.
d. Any other infrastructure associated with the development (e.g. electrical power lines, pipelines)
e. A map of sensitive features (e.g. CBAs, riparian areas and wetlands), including buffers around these features.

4. The MTPA agree to the list of specialist studies that will be undertaken as part of the EIA process in order for the site specific baseline information to be established and for the assessment of the potential impacts of the development.
5. The MTPA looks forward to receiving the draft EIA report for comment once it is available.

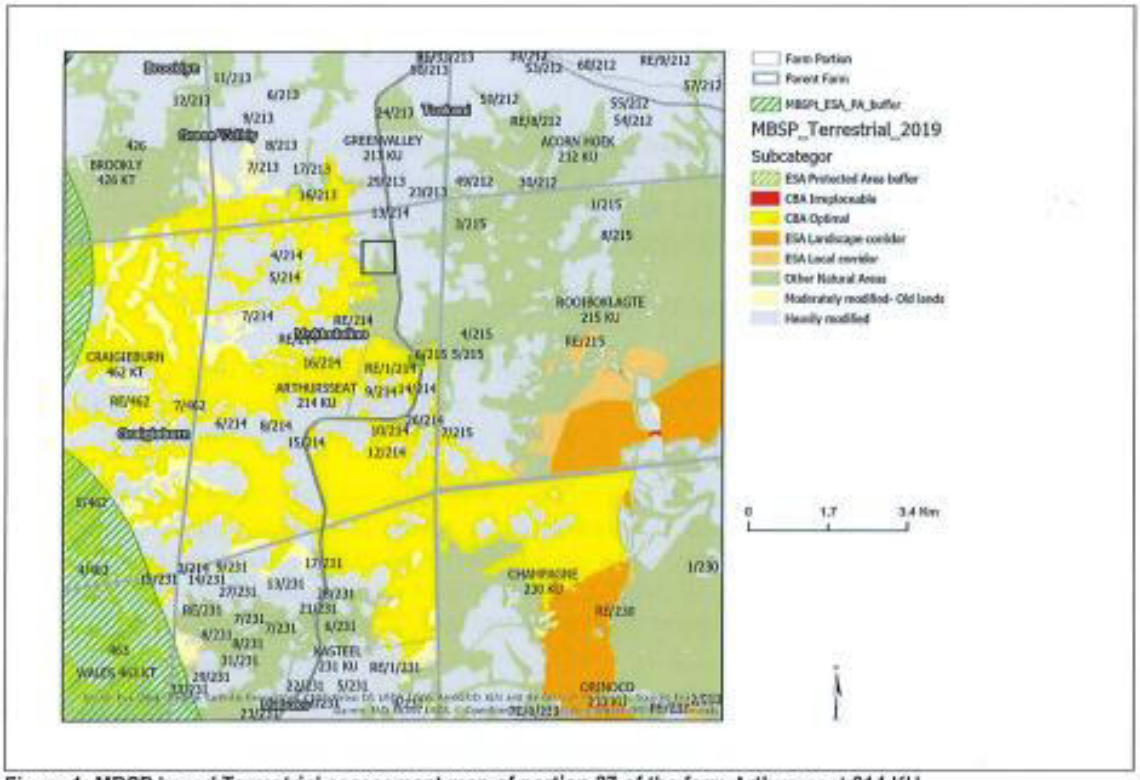

Figure 1: MBSP based Terrestrial assessment map of portion 27 of the farm Arthursseat 214 KU.

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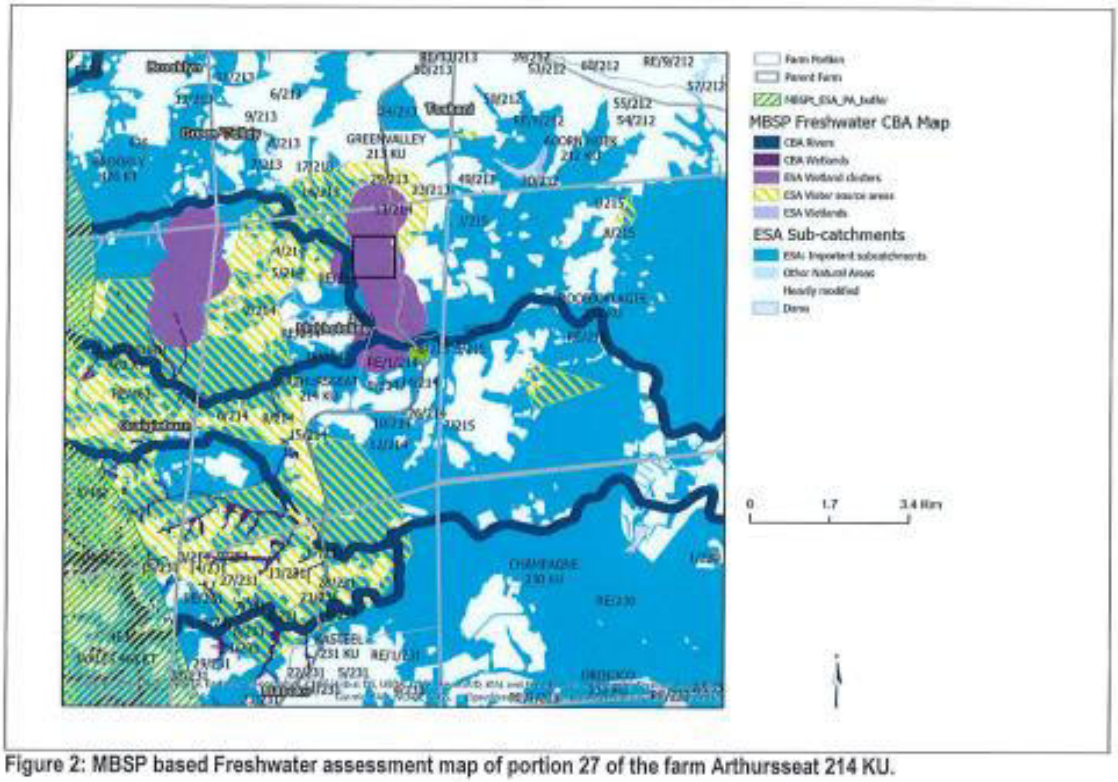

Figure 2: MBSP based Freshwater assessment map of portion 27 of the farm Arthursseat 214 KU.

Kind Regards

.....

MR. J.J EKSTEEN
Manager Scientific Services
DATE: 11 November 2021

Private Bag X11338 Nelspruit, 1200, N4 National Road, Hall's Gateway, Matsulu
Tel: +27 (13) 759 5300/01 Fax: +27 (13) 755 3928
www.mpumalanga.com

3

Proposed Acorn City Mixed Use Township, Limpopo Province

Our Ref: 17544

an agency of the
Department of Arts and Culture

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

Enquiries: Nokukhanya Khumalo
Tel: 021 462 4502
Email: nkhumalo@sahra.org.za
CaseID: 17544

Date: Thursday March 03, 2022

Interim Comment

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

Attention: Beyond Heritage

Heritage Impact Assessment for the proposed Acorn City Mixed Use Township, Limpopo Province

Dzana Investments have appointed Eco 8-Environmental Planners (Pty) Ltd to undertake a Scoping and Environmental Impact Assessment application process in support for an Environmental Authorisation (EA) in terms of the National Environmental Management Act, Act no 107 of 1998 (NEMA) as amended, for activities that trigger the NEMA Environmental Impact Assessment (EIA) 2014 Regulations, as amended.

The proposed new Acorn City smart city development will be 50.61 ha in extent and will be zoned for 1 hotel, 3 business units, 2 institutional units, 4 urban agricultural spaces, and 3 Educational centres, Filling Station, the internal roads and transport services. Additional zoning for light industrial, public open spaces and residential 1 and 2 will be considered in the EA application. The development is located on portion 27 of the farm Arthurseat 214 KU in Acornhoek, Bushbuckridge Local Municipality, Mpumalanga province.

A Heritage Impact Assessment (HIA) by Beyond Heritage Cultural Resources Consultants cc has been submitted to SAHRA for commenting in terms of section 38 of the National Heritage Resources Act, no. 25 of 1999 (NHRA).

Van der Walt, J. November 2021. Heritage Impact Assessment for the proposed Acorn City Mixed Use Township, Limpopo Province.

The author undertook a field assessment of the proposed development area and identified 21 informal burial sites across the entire development area and an isolated lower grinding stone (site AC120 to AC141). The lower grinding stone is of low significance and found outside its context. There will be direct impact on all the identified burials by the proposed development. The author recommends the relocation of the following:

- Implementation of a chance find procedure for the project.
- A pre-construction survey of the area should be conducted after vegetation clearing and prior to construction.
- It is recommended that the presence of additional graves or burial sites should be confirmed during social consultation.

Proposed Acorn City Mixed Use Township, Limpopo Province

Our Ref: 17544

an agency of the
Department of Arts and Culture

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

Enquiries: Nokukhanya Khumalo
Tel: 021 462 4502
Email: nkhumalo@sahra.org.za
CaseID: 17544

Date: Thursday March 03, 2022
Page No: 2

• Graves should preferably be retained in situ with a 30 m buffer, in the case of the Acorn City Development this is not a feasible option as this will render the township layout completely inefficient. Legislation allows for the grave sites to be relocated subject to consent from the Next of Kin (NOK) and adhering to all legal requirements with the necessary permits in place and this seems to be the preferred option from a socio-economic perspective following NHRA 25 of 1999
Section 38 (3).

Interim Comment

The SAHRA Archaeology, Palaeontology, and Meteorites (APM) Unit notes the submission of the HIA and that the development area is located in a zone with negligible palaeontological sensitivity and according to the SAHRIS palaeosensitivity map, there is no requirement for assessments in this zone and the development is granted exemption from undertaking a palaeontological assessment.

The SAHRA will provide further comments once the draft EIAr is submitted to the case.

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

Yours faithfully

Nokukhanya Khumalo
Heritage Officer
South African Heritage Resources Agency

Phillip Hine

F1.8 COMMENT FROM OTHER PARTY

IVAN PAUW AND PARTNERS

448C Sussex Ave, Lynnwood, Pretoria
(Cnr Sussex Ave & Rodericks Rd)

P O Box 3922, Pretoria, 0001, South Africa

Tel: +27 (0)12 369 9180
Fax: +27 (0)12 361 5591

Website: www.ippartners.co.za
Email: khensani@ippartners.co.za

OUR REF / ONS VERW : K C GODI/es/IN0185
YOUR REF / U VERW :
DATE / DATUM : 19 OCTOBER 2021

ECO-8 ENVIRONMENTAL PLANNERS

FOR ATTENTION: MR RIAAN VISAGIE

VIA EMAIL: eco8@vodamail.co.za

Dear Sir

RE: NOTICE IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, ACT 107 OF 1998 ("*NEMA*"): PROPOSED ESTABLISHMENT OF A MIXED USE TOWNSHIP ON PORTION 27 OF THE FARM ARTHURSSEAT 214 KU, BUSHBUCKRIDGE LOCAL MUNICIPALITY

As you are aware, we act in this matter on behalf of NAD Property Income Fund (Pty) Ltd (hereinafter referred to as "*our client*").

We refer to your letter, dated 14 October 2021, informing our client of an application submitted to the Department of Agriculture, Rural Development, Land and Environmental Affairs, Mpumalanga for Environmental Authorisation in respect of the proposed development of a mixed use township and associated infrastructure on Portion 27 of the Farm Arthursseat 214 KU ("*subject property*").

Our client is the registered owner and developer of Erf 930 Greenvalley Extension 1 Township whereon the Acornhoek Mall is established. Our client's property is located approximately 2.5km metres from the subject property.

We have been instructed to place on record our client's above interest to yourselves and to ensure the proper registration of our client as an Interested and Affected Party in the environmental process.

Kindly acknowledge receipt hereof and confirm that our client has been duly registered as an Interested and Affected Party.

Yours faithfully
IVAN PAUW & PARTNERS

K C GODI

delron
ENVIRONMENTAL
assessment practitioners

Your Ref: IN0185
Our Ref: 0691_ACH
Enquiries: Pieter De Lange

12 November 2021

IVAN PAUW & PARTNERS
Per Email: Nhlanhla@ippartners.co.za

Attention: Mr. M. N. Nelwamondo

Dear Sir,

RE: DRAFT SCOPING REPORT: PROPOSED ACORN CITY MIXED USE TOWNSHIP DEVELOPMENT ON PORTION 27 OF THE FARM ARTHURSSEAT 214-KU, BUSHBUCKRIDGE LOCAL MUNICIPALITY

1. Introduction and Background

1.1 These comments on the Draft Scoping Report (Ref. ECO8 Project No: E/393) by ECO8 Environmental Planners is submitted by Delron Consulting (Pty) Ltd. on behalf of NAD Property Income Fund (Pty) Ltd.

NAD Property Income Fund (Pty) Ltd, developed the Acornhoek Mall on Erf 930 Greenvalley Extension 1 Township within the Bushbuckridge Local Municipality. Acornhoek Mall is a Regional Shopping Centre with a Gross Leasable Area in excess of 45 000m² where in excess of 350 people are currently employed on a permanent basis.

1.2 The preparation of these comments is based upon information supplied by Ivan Pauw & Partners as well as a review of the following official application documentation:

- Draft Scoping Report for the Proposed Acorn City Mixed Use Development on Portion 27 of The Farm Arthursseat 214-KU, Bushbuckridge Local Municipality, dated 11 October 2021, compiled by Eco8 Environmental Planners (ECO8).

1.3 The existing legislative framework in South Africa widely defines the environment as encompassing both socio-economic and biophysical elements. It is therefore imperative that any development proposal, such as this application, must pay due respect to the overall socio-economic impact on the affected parties and society in which it would be located as well as the biophysical environment.

It is quite clear therefore that the Applicant and his appointed Environment Assessment Practitioner (ECO8) have a legislated obligation to meaningfully and fully consider the rights and needs of NAD Property Income Fund (Pty) Ltd, an affected party.

ENVIRONMENTAL • ASSESSMENT • PRACTITIONERS

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2. Potential Impact on Acornhoek Mall

2.1 The potential socio-economic impact on the Acornhoek Mall must be determined especially in view of the application site being located approximately 2,5 km south of the Acornhoek Mall and on the same road (Road R40).

The Acornhoek mall opened its doors on the 24th of October 2018 with close to 45 000 m² of retail space (shopping and dining), making it the largest enclosed mall in the surrounding area and fulfilling the role of regional mall to the greater Acornhoek / Bushbuckridge area.

In addition to the above-mentioned, herewith additional comments with regards to the Draft Scoping Report:

3. Section A: Description of Property

3.1 Property Ownership: Section A.4 indicates that the Department of Agriculture, Land Reform & Rural Development (DALR&RD) is the registered landowner.

(i) Was permission obtained from the DALR&RD for all the proposed activities?
(ii) Was the property purchased from the DALR&RD?
(iii) A copy of the signed land ownership consent form to be provided in the Draft EIA.

4. Section C: Project Description

4.1 Not having had the benefit of having been given a copy of the Urban Economic Study (Market Study), NAD Property Income Fund question the need and desirability of the project. The Urban Economic Study (Market Study) as prepared by Demacon Urban Economist must be provided in the Draft EIA.

4.2 Section C1.3 - Description of Proposed Engineering Services and Alternatives

(i) Will Eskom be able to provide the proposed Acorn City mixed use township development with electricity? Written comments regarding the electrical supply and capacity for proposed development site should be sourced from Eskom and included in the Draft EIA.
(ii) Explain whether the necessary services are available and whether the local authority has confirmed sufficient, spare, unallocated service capacity. Confirmation of all services must be included in the Draft EIA.
(iii) Provide a detailed description and drawings of the proposed engineering services (e.g. for roads the length, width and width of the road reserve in the case of pipelines indicate the length and diameter) for all alternatives.

4.3 According to the report, access to the proposed development will sourced from the R40 Provincial Road. Has access to the site been approved by the relevant road authority?

4.4 How will storm water be dealt with? A detailed Stormwater Management Plan should be compiled and included in the Draft EIA.

5. Section D: Identification of Regulated Activities

5.1 With reference to Table D1: EIA Activity Identification Checklist (NEMA EIA GNRs 324, 325 &327 of 7 April 2017), page 8:

Listing Notice 1 - Activity 14 "Fuel storage of more than 80m³" is listed as a relevant and applicable activity. However under D.2 (Description of the NEMA-EIA Regulated Project Activities) the following is stated:

"A fuel station is included in the township application however due to the complexity of such facility as well as additional regulatory requirements a separate application and basic environmental impact assessment for a fuel station will be lodged simultaneously with the application for township establishment."

Confirmation must therefore be provided that Listing Notice 1 - Activity 14 is **NOT** part of this application for environmental authorisation.

6. Section F: Scoping The Receiving Environment

6.1 We request that, to ensure more accurate impact prediction and assessment, the following must be done as a minimum and the information must be provided in the Draft EIA for comment opportunity:

(i) Ground-verification of baseline environmental conditions (i.e. sensitive environments, vegetation types, aquatic habitats, species of conservation concern, etc.);
(ii) Confirm and accurately map all terrestrial and aquatic biodiversity features of the subject property; and
(iii) Site specific social-economic profiling and attributes of the study area.

6.2 The following specialist studies to be provided in the Draft EIA for comment opportunity:

(i) **Terrestrial Biodiversity** Compliance Report as set out in the EIA Protocol for Terrestrial Biodiversity Assessment GN R320 of 20 March 2020;
(ii) **Terrestrial Animal Species** Compliance Report as set out in the EIA Protocol for Terrestrial Animal Species Assessment GN R1150 of 30 October 2020;
(iii) **Terrestrial Plant Species** Compliance Report as set out in the EIA Protocol for Terrestrial Animal Species Assessment GN R1150 of 30 October 2020;
(iv) Watercourse Delineation and Buffer Determination;
(v) Wetland Risk Assessment;
(vi) Aquatic Biodiversity Specialist Report;
(vii) Floodline Report; and
(viii) Heritage Impact Assessment.

6.3 On Page 6 of the Draft Scoping Report we are informed that *"The township is not subject to flooding due to its position in the landscape and is not affected by a 1 in 100-year flood line."*

Anomalous hereto, we read on pages 9 and 21, that:

- Page 9 - *"It is proposed to construct storm water retention ponds within two watercourses on the property. The soil excavation and infilling volumes associated with these structures is expected to be more than 10m³."*
- Page 21 – *"On-site surface drainage from the crest and upper-mid-slope terrain units occurs as sheet-wash towards these small streams. These streams of which two originate on-site, pose clearly defined channel beds and banks but with poorly defined or absent seep-lines."*

The ECO8 Environmental Planners must clarify this uncertainty.

6.4 On page 31 of the Draft Scoping Report the consultant stated under Section F14.1 Surrounding Land Uses – *"The commercial component of the proposed township will classify as a neighbourhood/convenience/community centre and can therefore complement the existing regional and other commercial centres at Acornhoek."*

Please explain how the proposed neighbourhood/convenience/community centre will complement the Acornhoek Mall?

6.5 List the positive and negative impacts that the proposed Acorn City Mixed Use Development and alternatives will have on Acornhoek Mall Strategic Development Area.

7. Section I: Scoping: Identification of Impacts Alternatives & Key Issues

7.1 Provide a detailed motivation why no property and site alternatives were considered.

7.2 Provide a full description of the process followed to reach the preferred alternative within the site.

7.3 Section I3.4 Identification of Alternatives - As previously indicated, we were informed (Page 2 of the Draft Scoping Report) that a filling station is not part of this application *"due to the complexity of such facility as well as additional regulatory requirements ..."*

As such, it is required from the Applicant and the consultant, to exclude and remove Land Use Alternative LA_5 Special (Fuel Station) (page 76) as a land use alternative to be considered and assessed.

8. Section J: Plan of Study For Environmental Impact Assessment

8.1 The Plan of Study For Environmental Impact Assessment must be amended. All recommended technical and specialist studies relating to the filling station are not required as a filling station is not part of the application for environmental authorisation.

Until further notice, my client, NAD Property Income Fund (Pty) Ltd, objects to the proposed Acorn City Mixed Use Township Development on Portion 27 of The Farm Arthursseat 214-KU (i.e. based on the above-mentioned comments). Our client reserve their rights to amplify their objection once the information and documents as requested have been provided and our client had the opportunity to study these.

Yours faithfully

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APPENDIX G

DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME FOR

PROPOSED ACORN CITY MIXED USE TOWNSHIP DEVELOPMENT ON PORTION 27 OF THE FARM ARTHURSSEAT214-KU, BUSHBUCKRIDGE LOCAL MUNICIPALITY

PERSONAL DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

Environmental Assessment Practitioner:	*ECO-8 Environmental Planners*		
Contact person:	*Mr. Riaan Visagie*		
Postal address:	*P.O.Box 12898, Nelspruit*		
Postal code:	*1200*	**Cell:**	*082 5200 461*
Telephone:	*013-744 9468*	**Fax:**	*086 66 44 070*
E-mail:	*eco8@vodamail.co.za*		

PERSONAL DETAILS OF THE DEVELOPER

Developer:	*Dzana Investments (Pty) Ltd*

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FRAMEWORK FOR ENVIRONMENTAL MANAGEMENT

The Environmental Management Programme (EMP) is recognised as the tool that can provide the assurance that the project developer has made suitable provision for mitigation of predicted impacts as specified within the basic environmental impact assessment report and it provides a link to the implementation of such mitigation measures.

The Environmental Management Programme provides a framework for environmental project management during the following project phases:

The planning phase of the project

The EMP identifies planning objectives and outcomes which the project developer needs to achieve to reduce or eliminate negative impacts.

DUTY OF CARE

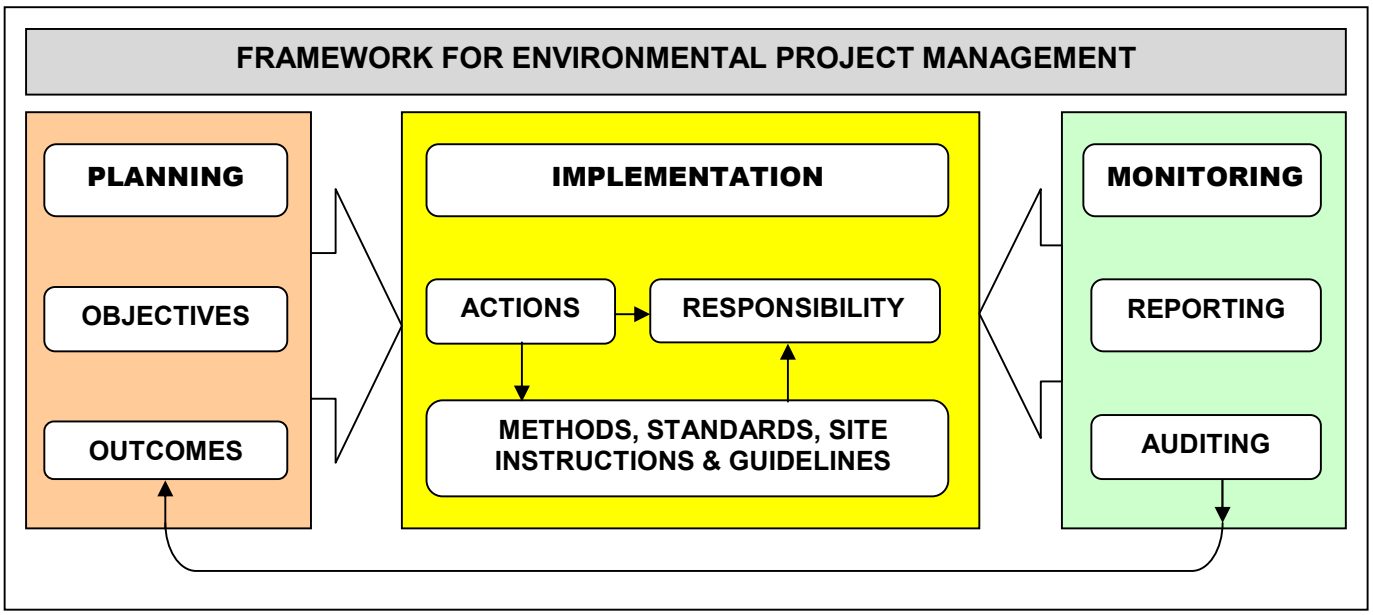
Section 28 of the National Environmental Management Act 1998, requires provision for duty of care and remediation of environmental damage during construction of development projects. The Environmental Management Programme is a tool to accomplish such care and duty.

The implementation phase of the project

The EMP provides for actions and practical measures of achieving management outcomes during the construction and operational phases of the project and allocates responsibilities to the parties involved with implementing the project. Actions are also supplemented by methods, standards and guidelines. The EMP document remains relevant throughout the project lifecycle and can be updated to be aligned with the progress of the project from construction to operation and with regulatory amendments.

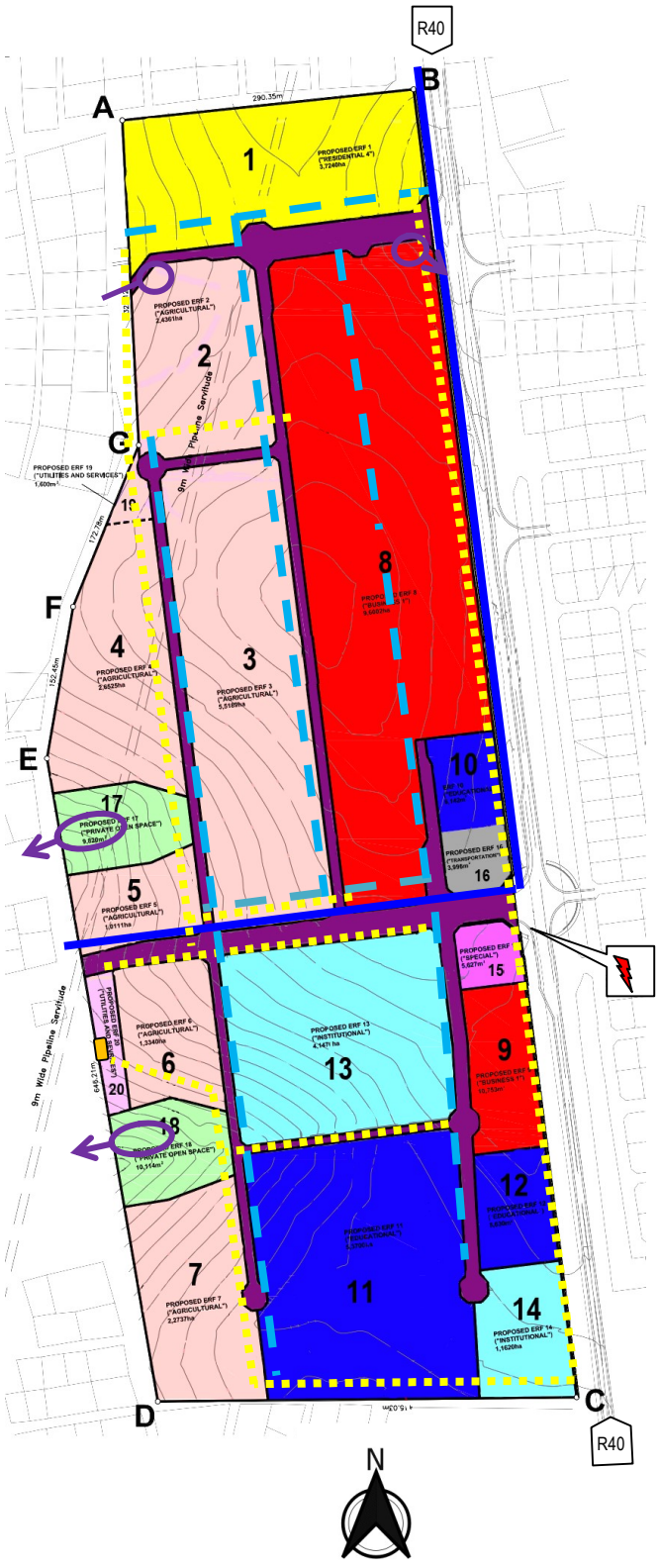
Monitoring of the project during the above phases

The EMP provides for compliance monitoring and reporting on the implementation of mitigation actions during the planning and implementation / construction phases and for post-construction auditing on the achievement of the desired impact mitigation outcomes.



PROJECT DESCRIPTION

The proposed development is as follows:	*Portion 27 of the farm Arthursseat 214-KU*
Land uses	*10 Mixed land uses*
Development footprint	*± 496 909 m² (49.6909 ha)*



LAYOUT PLAN (Version 2) OF THE PROPOSED
ACORN CITY
ON PORTION 27 OF THE FARM ARTHURSSEAT 214-KU AS DEPICTED BY FIGURE A,B,C,D,E,F,G,A

LAND USE TABLE

Legend	Land Use zone	No of erven	Area (ha)	%
	Business "1"	2	10,6755	21.48
	Agriculture	6	15,2263	30.64
	Educational	3	6.8472	13.77
	Institutional	2	5,3090	10.69
	Residential "4"	1	3,7240	7.49
	Filling Station	1	0.5627	1.14
	Transportation services	1	0.3996	0.80
	Open Space	2	1,9934	4.01
	Utilities and Services	2	0,5172	1.04
	Road purposes	1	4,4360	8.94
Total	**Development footprint**	**20**	**49.6909**	**100**

INTERNAL ENGINEERING SERVICES

	Public right of way servitudes / streets
	Bulk water line
	Internal water reticulation
	Bulk sewer outflow
	Wastewater treatment plant.
	Storm water management infrastructure

IMPACT MANAGEMENT OUTCOMES

This Section of the EMP provides a description of the impact management outcomes, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including—
(i) planning and design;
(ii) pre-construction / pre-development activities;
(iii) construction / development activities;
(iv) rehabilitation of the environment after construction / development have been completed; and
(v) where relevant, operational / maintenance activities of the development throughout its lifetime.

3.1	IMPACT MANAGEMENT STATEMENT : PLANNING AND DESIGN PHASE	
	The development planning shall be finalised to achieve the objectives of sustainable development.	
	OUTCOMES	**PERFORMANCE MEASURE**
3.1.1	*The administrative requirements for the relocation of graves shall be finalised and the process of relocation shall be initiated together with the necessary specialists and State Departments in consultation with the next of kin.*	*The Applicant shall appoint an independent Environmental Control Officer (ECO) before the commencement of construction or phased construction, who shall verify together with the Project Planner, Project Engineer and Project Architect, Horticulturalist and Landscape Architect an Archaeologists that the relevant planning objectives and outcomes have been met and shall report to the Compliance and Enforcement Section of the competent authority on these matters before the commencement of a construction phase.*
3.1.2	*All above-ground and sub-surface structural and buildings designs shall include the findings and recommendations of the Geotechnical Report with regard to excavations, fills, footings and foundations.*	
3.1.3	*All the planning for township services infrastructure design and construction work shall incorporate site rehabilitation measures to prevent soil erosion. The site rehabilitation planning and construction shall form part of a contractual agreement with*	
3.1.4	*The planning of all the construction phases must ensure that the storm water infrastructure including the proposed ponds is constructed first, before commencement with any other construction work.*	
3.1.5	*The detailed designs of the storm water attenuation pond shall be approval by the relevant authorities.*	
3.1.6	*Architectural building design must include integrated waste storage facilities that allows for different types of waste to allow for waste separation on site.*	
3.1.7	*Architectural building design must include the integrated design of wastewater sumps and oil separators at medical facilities, food preparation outlets, fuel station and waste storage facilities to prevent surface and groundwater contamination.*	
3.1.8	*Architectural building design and landscaping design must incorporate additional measures of on-site storm water retention according to the WRC Report (TT558/13)[54].*	

	OUTCOMES	PERFORMANCE MEASURE
3.1.9	*Soil conservation measures must be planned as part of a cultivation plan for urban agriculture.*	

3.2	**IMPACT MANAGEMENT STATEMENT : PRE-CONSTRUCTION PHASE**	
	Comply with regulatory requirements pre-construction.	
	OUTCOMES	**PERFORMANCE MEASURE**
3.2.1	*The applicant shall obtain approval in terms of other laws applicable to the proposed development*	*Obtain permits for removal and relocation of protected plants (if applicable).*
3.2.2	*Permanent and temporary employees and contractors shall be made aware of the relevant provisions of the Environmental Authorisation and EMPR, sensitive environmental features and security arrangements.*	*Obtain written confirmation of obligations and compliance to the EMPR by contractors with hand-over of the site or at the first project meeting.*
3.2.3	*The Applicant/Developer shall finalise any administrative requirements as laid down in the Environmental Authorisation. A notice of the intention to commence with construction shall be submitted to relevant organs of state and a complaints register shall be opened for the duration of the construction/establishment period.*	*All complaints are to be acknowledged within five (5) working days and are to be responded to within 10 working days of receipt, unless additional information and / or clarification are required.*

3.3	**IMPACT MANAGEMENT STATEMENT: PRE-CONSTRUCTION PHASE**	
	The construction site shall be prepared to prevent environmental impacts before the commencement of construction or any phase thereof.	
	OUTCOMES	**PERFORMANCE MEASURE**
3.3.1	*Protected plants / trees within the development footprint area shall be rescued / removed (where possible) before clearing of vegetation.*	*A thorough search for resident fauna and protected flora shall be executed and shall remove such species to safe open space areas on- or off-site.*
3.3.2	*The construction areas shall be demarcated and prepared to prevent the potential occurrence of damaging activities before the commencement of construction.*	*The development footprint, sensitive areas, lay-down areas, construction yard and batching areas shall be marked on the ground. The site plan shall be used to verify the correct demarcation.*
3.3.3	*The construction staff shall be informed of the environmental consequences of all construction activities and awareness training shall be conducted before commencement of construction.*	*The Contractors shall conduct awareness training and shall be monitored and report on any incident that may result in environmental degradation, with remedial actions.*

3.4	**IMPACT MANAGEMENT STATEMENT: CONSTRUCTION PHASE**	
	The main objective during the construction period or any phase thereof shall be to control waste and prevent pollution.	
	OUTCOMES	**PERFORMANCE MEASURE**
3.4.1	*Activities that may result in a nuisance to adjacent land owners shall be limited and managed during the construction period.*	*Response to noise and dust complaints received during the construction period and if necessary verify against norms and standards.*
3.4.2	*Solid waste emanating from construction activities shall be managed to prevent contamination of natural veld and watercourses.*	*Monitor and report the occurrence of litter and verify the manner of storage and disposal of solid waste during the construction period.*
3.4.3	*Liquid waste emanating from construction activities shall be managed to prevent contamination of soil and water resources.*	*Monitor and report evidence of liquid contamination and verify the manner of storage and disposal of liquid waste during the construction period.*

3.5	IMPACT MANAGEMENT STATEMENT: THE REHABILITATION PHASE	
	The main objective after completion of construction of the township or any phase thereof is to ensure that rehabilitation has been finalised as part of the construction period.	
	OUTCOMES	**PERFORMANCE MEASURE**
3.5.1	*Ensure clean-up, earth shaping, soil conservation and erosion protection and re-vegetation upon completion of construction.*	*Monitor all areas where construction work occur and report thereon until completion.* *Commission an Environmental Audit after completion of all construction work and site rehabilitation (per construction phase).*

3.6	IMPACT MANAGEMENT STATEMENT: OPERATIONAL PHASE	
	The main objective during the operational phase is to maintain the urban infrastructure, prevent solid waste or wastewater pollution and maintain good quality of wastewater .	
	OUTCOMES	**PERFORMANCE MEASURE**
3.6.1	*Maintain open areas free of alien invading plant species.*	*Institute a seasonal program for eradication of declared alien and invader plants on the site.*
3.6.2	*Maintain the storm water system as to ensure its effective operation and contribution to river health.*	*Compile a maintenance plan for the scheduled cleaning of the storm water systems, detention ponds and outlets.*
3.6.3	*Maintenance of the sewer treatment plant to ensure good quality wastewater disposal / re-use on-site.*	*Compile a maintenance plan for the scheduled servicing of the wastewater treatment plant and scheduled water quality reporting to DWS.*

3.7	IMPACT MANAGEMENT STATEMENT: DECOMMISSIONING PHASE	
	The main objective during the decommissioning of sewer infrastructure for repair / replacement is to prevent soil and water contamination.	
	OUTCOMES	**PERFORMANCE MEASURE**
3.7.1	*Provide a plan for scheduled maintenance / repair to the sewer system and describe the manner in which pollution shall be avoided.*	*Appoint an ECO to monitor the decommissioning of any sewer infrastructure in order to report thereon to the Competent Authority.*

IMPACT MANAGEMENT ACTIONS : PLANNING PHASE

This Section of the EMP provides a description of proposed impact management actions for the planning phase of the project, identifying the manner in which the impact management outcomes contemplated in Section 3 will be achieved, and include where applicable, actions to —
(i) avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation; and
(ii) comply with any prescribed environmental management standards, methods and guidelines.
(iii) comply with any applicable provisions of the Act regarding closure, where applicable; and
(iv) comply with any provisions of the Act regarding financial provision for rehabilitation, where applicable.

RESPONSIBILITY ASSIGNMENT	**PM =** Project Manager	**PE** =Project Engineer	**AR**=Architect
	ECO = Environmental Control Officer	**HS**- Heritage Specialist	**LA=**-Landscape Architect
	CO=Contractor		

4.1	**IMPACT MANAGEMENT STATEMENT** *The development planning shall be finalised to achieve the objectives of sustainable development.*

4.1.1	**IMPACT MANAGEMENT OUTCOME** *The administrative requirements for the relocation of graves shall be finalised and the process of relocation shall be initiated together with the necessary specialists and State Departments in consultation with the next of kin.*	**RESPONSIBILITY**
	IMPACT MANAGEMENT ACTIONS	
a.	*The relocation of graves is proposed to existing cemetery sites in the nearby area or the relocation is proposed to a small cemetery site that is proposed within the proposed township. The amended Draft Township Layout Plan that is included in Appendix A, indicates the locality of the cemetery site.*	***PM / HS***
b.	*A social facilitation process in terms of the NHRA (1999), is currently being conducted with the next of kin and will provide clarity on the way forward with regard to dealing with the presence of graves on the development site. It is expected that a decision will be obtained by end of March 2022.*	***PM / HS***
c.	*During the construction period, any visible sign of Heritage resources or graves must be reported immediately.*	***PM / HS***
d.	*All work in such area must stop immediately and a heritage specialist must investigate the find and make recommendations before proceeding with construction work in the affected area.*	***PM / HS***

4.1.2	**IMPACT MANAGEMENT OUTCOME** *All above-ground and sub-surface structural and buildings designs shall include the findings and recommendations of the Geotechnical Report with regard to excavations, fills, footings and foundations.* *Soil conservation measures must be planned as part of a cultivation plan for urban agriculture.*	**RESPONSIBILITY**
	IMPACT MANAGEMENT ACTIONS	
a.	*The actual predicted allowable bearing capacities to prevent compression and settlement of foundations of all the material horizons can be mitigated by following the indicated founding depths and foundation recommendations as recommended in the Geotechnical report.*	***AR/ PE***
b.	*The cultivation lands shall be planned in accordance with such method or be laid out in such a manner that the run-off speed of run-off water is restricted.*	***AR/ PE***
c	*In this regard planting, ridges shall be employed as soil conservation terraces. Minimum tillage is recommended in-between or planting ridges.*	***AR/ PE***

d	*The direction of planting ridges must be aligned along the natural terrain contours (at right angle to the slope).*	***AR/ PE***
e	*This method of cultivation land layout will assist to retain run-off for longer periods that will promote soil-water absorption and prevent high velocity run-off over the site that may otherwise result in sheet erosion.*	***AR/ PE***
f	*Grassed waterways or swales must be planned along the edges of the cultivation lands to safely convey runoff collected from in-field areas to natural water courses.*	***AR/ PE***

4.1.3	**IMPACT MANAGEMENT OUTCOME** *All the planning for township services infrastructure design and construction work shall incorporate site rehabilitation measures to prevent soil erosion. The site rehabilitation planning and construction shall form part of a contractual agreement .*	**RESPONSIBILITY**
	IMPACT MANAGEMENT ACTIONS	
a.	*Distinction must be made in the planning stage between site rehabilitation during and upon completion of construction work and subsequent landscaping work.*	***AR/LA/CO/PE***
b.	*Both aspects must be planned and budgeted for by way of presenting site rehabilitation plans and landscaping plans to the developer and the ECO for consideration.*	***AR/LA/CO/PE***
c.	*A programme with targets that allows for monitoring and auditing must be submitted by the respective contractors.*	***AR/LA/CO/PE***
d.	*All contractors shall provide a site establishment plan that indicates storage space, ablutions, separate type of waste storage sites as a minimum.*	***AR/LA/CO/PE***

4.1.4	**IMPACT MANAGEMENT OUTCOME** ▪ *Final engineering planning of storm water attenuation structures and the detailed designs of the storm water attenuation pond shall be approval by the relevant authorities.* ▪ *Architectural building design and landscaping design must incorporate additional measures of on-site storm water retention according to the WRC Report (TT558/13)*	**RESPONSIBILITY**
	IMPACT MANAGEMENT ACTIONS	
a.	*The planning of all the construction phases must ensure that the storm water infrastructure including the proposed ponds are constructed first, before commencement with any other construction work.*	***AR/LA//PE***
b.	*The retention ponds must be shaped and designed as planned by the Civil Engineering drawings and layout plan to reach the expected storm water attenuation volume.*	***AR/LA//PE***
c.	*Only commence with site preparation work within or over watercourses when it can immediately be followed by the construction and rehabilitation.*	***AR/LA//PE***
d.	*All sites within watercourses where earth moving and excavation will take place for construction must be limited to clearly demarcated and marked areas. No earthmoving or excavation may take place outside of demarcated areas.*	***AR/LA//PE***
e.	*The flow of the watercourse must not be impeded during construction but may be temporarily diverted and channelled.*	***AR/LA//PE***
f.	*The storm water ponds must be constructed on the site immediately before the bulk of site establishment, vegetation clearing and earth commence during the construction period. This measure is of utmost importance to prevent adverse impacts of erosion and sediment deposition, flooding of downstream properties, and contamination of downstream sensitive watercourses. The storm water retentions pond will act as a buffer to retain and retard run-off peak flows, contaminants and sediment from the construction site. The retention ponds must be maintained throughout the construction period.*	***AR/LA//PE***
g.	*The dam walls of the storm water ponds must be layered and compacted, taking into account the soil properties as indicated in the Geo-technical report.*	***AR/LA//PE***

h.	*Steeply sloped excavated cuts and fills sides must either be battered back to a 1:3 slope (vertical : horizontal) or must be stabilised by using suitable retaining material such as rock, retaining walls or similar.*	***AR/LA//PE***
i.	*The outlet structures into the buffer zone and towards the watercourses must be designed that storm water discharge without the risk of erosion.*	***AR/LA//PE***
j.	*Such design must include one or a combination of the following: the installation of grassed swales, rock mattresses or stone pitching at the point of discharge to prevent soil erosion*	***AR/LA//PE***

4.1.5	**IMPACT MANAGEMENT OUTCOMES** ▪ *Architectural building design must include integrated waste storage facilities that allows for different types of waste to allow for waste separation on site.* ▪ *Architectural building design must include the integrated design of wastewater sumps and oil separators at medical facilities, food preparation outlets, fuel station and waste storage facilities to prevent surface and groundwater contamination.*	**RESPONSIBILITY**
	IMPACT MANAGEMENT ACTIONS	
a.	*Plan for the safe storage and separation of waste by integrating waste management facilities within the architectural design of buildings and facilities, including general waste and hazardous waste. Plan such facilities include safe enclosure and safe drainage towards integrated sumps and oil separators that are connected to the sewer system.*	***AR***
b.	*The temporary storage of hazardous waste on-site at proposed hazardous waste generating facilities such as health and medical facilities (medical waste), the proposed fuel station (hydrocarbon waste) and the urban cultivation project (pesticide and fertiliser wastes) must be architecturally designed in compliance with all relevant regulations, norms, standards, policies and plans.*	***AR***
c.	*Architectural and landscape design can accommodate people with disabilities, ensuring an all-inclusive development planning outlook.*	***AR***

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IMPACT MANAGEMENT ACTIONS : PRE-CONSTRUCTION PHASE

This Section of the EMP provides a description of proposed impact management actions for the pre- phase of the project, identifying the manner in which the impact management outcomes contemplated in Section 3 will be achieved, and include where applicable, actions to —
(i) avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;
(ii) comply with any prescribed environmental management standards or practices.

RESPONSIBILITY ASSIGNMENT	**DE** = Developer	**CO** = Contractors	**PM** = Project Manager
	ECO = Environmental Control Officer	**LA** = Landscape Architect	**EC** = Ecologist

5.1	**IMPACT MANAGEMENT STATEMENT:** *THE DEVELOPMENT SHALL COMPLY WITH REGULATORY AND ADMINISTRATIVE REQUIREMENTS.*

5.1.1	**IMPACT MANAGEMENT OUTCOME :** *Obtain permits and commence with administrative requirements as stipulated in the conditions of authorisation before commencement of construction.*	**RESPONSIBILITY**
	IMPACT MANAGEMENT ACTIONS	
a.	*Obtain a permit for removal and relocation of protected plants.*	***DE / PM / ECO / EC***
b.	*Obtain authorisation from the Municipal Fire Protection Services of the Lowveld & Escarpment Fire Protection Agency (LEFPA) before making use of fire to clear vegetation or to burn removed vegetation matter.*	***DE / PM / CO***
c.	*Provide a notice of the intention to commence with construction to relevant organs of state.*	***DE / PM / ECO***
d.	*Submit the approved proposed township development layout plan and storm water plan to the Environmental Compliance Monitoring Case Officer for record purposes.*	***DE / PM / ECO***
e.	*Obtain written confirmation of obligations and compliance to the EMPr by contractors with hand-over of the site or at the first project meeting.*	***DE / PM / ECO***
f.	*Open and maintain a complaints register for the duration of the construction/ period.*	***ECO***
g.	*For security purposes all construction staff must be registered with the contractors / project manager.*	***DE / PM / CO***

5.1.2	**IMPACT MANAGEMENT OUTCOME :** *Permanent and temporary employees and contractors shall be made aware of the relevant provisions of the Environmental Authorisation and EMPr to prevent environmental degradation.*	**RESPONSIBILITY**
	IMPACT MANAGEMENT ACTIONS	
a.	*All personnel and contracting personnel must be informed of environmental issues and specifically with regard to littering, the use of toilets, the use of hazardous materials, the prevention of pollution, the prohibition of clearing and defacing of natural vegetation and the prohibition of poaching or snaring of wildlife.*	***DE / PM / CO / ECO***
b.	*All construction staff must be made aware of the boundaries of the development site and must understand that trespassing on to adjacent properties is illegal and any incident in this regard can result in criminal charge and dismissal.*	***DE / PM / CO***
c.	*All drivers of the proposed township development project must be informed to confine vehicle movement is to identified and marked routes.*	***DE / PM / CO***
d.	*All personnel and contracting personnel must be sensitised to the requirements of the South African Heritage Resources Act. Should any material of cultural or archaeological significance be encountered during construction, all activities must cease immediately and the South African Heritage Resources Agency (SAHRA) must be informed accordingly.*	***DE / PM / CO***

e.	*All personnel and contracting personnel shall be made aware of the prohibition of the unauthorised use of fire on site. Adequate fire-fighting equipment must be on site during construction and construction staff must be instructed how to use the equipment effectively.*	***DE / PM / CO***

5.2	**IMPACT MANAGEMENT STATEMENT:** *THE CONSTRUCTION SITE SHALL BE PREPARED TO PREVENT UNDUE ENVIRONMENTAL DAMAGE BEFORE COMMENCEMENT OF CONSTRUCTION.*

5.2.1	**IMPACT MANAGEMENT OUTCOME :** *Wildlife, protected plans and other natural resources within the development footprint area shall be removed before bulk clearing of vegetation and earth works.*	**RESPONSIBILITY**
	IMPACT MANAGEMENT ACTIONS	
a.	*A thorough search for any resident fauna shall be executed and where appropriate such species shall be removed to a safe area on- or off-site.*	***ECO / EC***
b.	*After completion of pegging out the development footprint, perform a survey of the site in advance of clearing activities to mark protected plant species and obtain a permit in advance for the removal or re-location of such species. Where possible important plant species that occur within the development footprint must be relocated to the future "open space" areas before construction commences. Obtain the necessary permits for the relocation or destruction of protected plants. It will be necessary that an appointed Landscaper take care of the actual removal and relocation of rescued plants before the commencement of construction.*	***CO/ ECO / EC / LA***
c.	*All trees with a stem diameter of more than 100mm shall be marked for cutting into logs before mass clearing of vegetation commence. Such trees must be cut into suitably sized logs (±3m in length) and must be stacked at the construction yard for later use in site rehabilitation and erosion control actions .*	***ECO / EC / CO***
d.	*Vegetation or other litter emanating from the vegetation clearing may not be disposed of within the drainage lines, riparian zones or other natural areas in or around the development site.*	***CO***
e.	*The necessary procedures, preparations and preventative measures in terms of the relevant regulations must be made if fire is to be used on the site during the site clearing activity.*	***CO***
f.	*Collection of firewood or any other plant resources on the site areas other than those to be cleared for purposes of development is prohibited.*	***CO***

5.2.2	**IMPACT MANAGEMENT OUTCOME :** *The construction areas / activities shall be demarcated to avoid undue damage to the environment.*	**RESPONSIBILITY**
	IMPACT MANAGEMENT ACTIONS	
a.	*The site must be cleared and prepared only when the Developer is ready to commence immediately ,as prolonged periods of inactivity after clearing of vegetation can result in uncontrolled run-off, sheet erosion, loss of topsoil and spread of alien invasive species.*	***DE / PM / CO***
b.	*The contractors' yard, material lay-down areas, site for temporary topsoil and spoil storage, heaps for logs and vegetation waste storage, solid waste storage, inert waste storage and concrete batching areas shall be marked on the ground. These areas may not be located within 50m the edge of a natural watercourse.*	***PM / CO / ECO***
c.	*Identify existing tracks and dirt roads to be used as access and haul roads and where necessary identify and mark new access and haul roads in areas where the impact on natural vegetation shall be minimised.*	***PM / CO / ECO***
d.	*A specific area shall be demarcated for cooking purposes by fire within the Contractor's yard.*	***CO***

IMPACT MANAGEMENT ACTIONS : CONSTRUCTION PHASE

This Section of the EMP provides a description of proposed impact management actions for the construction or project implementation phase, identifying the manner in which the impact management outcomes contemplated in Section 3 will be achieved, and include where applicable, actions to —
(i) avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation; and
(ii) comply with any prescribed environmental management standards or practices.

RESPONSIBILITY ASSIGNMENT	**DE** = Developer	**CO** = Contractors	**PM** = Project Manager
	ECO = Environmental Control Officer		

6.1	**IMPACT MANAGEMENT STATEMENT:** *REDUCE AND CONFINE CONSTRUCTION IMPACTS*

6.1.1	**IMPACT MANAGEMENT OUTCOME** *Vegetation clearing, earth moving activities and construction activities must be confined to within demarcated areas.*	**RESPONSIBILITY**
	IMPACT MANAGEMENT ACTIONS	
a.	*Strip topsoil together with grass / groundcover from all demarcated areas and stockpile the topsoil separately at the predefined stockpile area for later site rehabilitation use. Preserve topsoil during the construction period for later re-use in rehabilitation and landscaping on all areas that becomes disturbed during the construction period.*	***PM / CO***
b.	*Gather cleared vegetation matter in small heaps for removal or for "permitted" burning within the demarcated development footprint or otherwise dispose of at an approved landfill.*	***PM / CO***
c.	*Excavated material from service trenches must be stockpiled along the length of the trench for immediate backfilling directly after service infrastructure has been installed.*	***PM / CO***
d.	*Excess spoil material must be stockpiled at the predefined stockpile area for later reuse.*	***PM / CO***

6.1.2	**IMPACT MANAGEMENT OUTCOME** *Activities that may result in a nuisance to adjacent land owners shall be limited and managed during the construction period.*	**RESPONSIBILITY**
	IMPACT MANAGEMENT ACTIONS	
a.	*Continuous use of haul roads and earth works on site will result in excessive dust. All construction areas and roads in use on any particular day must be wetted as required to suppress dust.*	***PM / CO***
b.	*Construction work that may result in a noise nuisance must be confined to week days and up to 13:00 on Saturdays and is prohibited on Sundays and on any public holiday.*	***PM / CO***

6.1.3	**IMPACT MANAGEMENT OUTCOME** *Site hazards on the construction site shall be clearly marked.*	**RESPONSIBILITY**
	IMPACT MANAGEMENT ACTIONS	
a.	*All potentially hazardous work areas during the construction phase must be demarcated and staff must be made aware of the potential dangers to such site/activity. Specifically deep trench excavations must be visibly marked until such excavations have been backfilled.*	***PM / CO***
b.	*Excavation sides deeper than 1m must either be battered back to 1:1,5 (vertical : horizontal) or shored; allowing safe working conditions for workers in these excavations.*	***PM / CO***
c.	*Allow for escape routes in trench excavations so that animals that may become trapped in a trench can exit easily.*	***PM / CO***

d.	*Hazardous materials such as chemicals for alien vegetation control and fuels for earth moving vehicles and equipment that are required for development, must be stored in a secure facility and shall be handled in a manner to prevent site contamination and ignition according to the relevant Standard and Regulations.*	***PM / CO***
e.	*Handling of hazardous liquids such as changing oil on moving vehicles or filling storage or fuel tanks in vehicles may cause pollution through spillage and requires that a drip tray be used at a specific area of the contractor's yard as indicated by the responsible parties.*	***PM / CO***

6.1.4	**IMPACT MANAGEMENT OUTCOME** *Natural run-off during rain events shall be managed during the construction period to prevent sheet and gully erosion and resultant contamination of water resources due to silting.*	**RESPONSIBILITY**
	IMPACT MANAGEMENT ACTIONS	
a.	*Grass cover and topsoil should remain within the development area up to the stage where construction on that area is eminent. This will retain some measure of soil cohesion that will minimise the potential loss of topsoil due to sheet erosion. In order to achieve this apply light shaving and shallow soil shaping of topsoil within the development site. Only clear those areas of grass cover and topsoil that will immediately be developed such as roads and trenches for service infrastructure.*	***PM / CO***
b.	*Suitable soil conservation works shall be implemented on all areas of the development site that is subject to sheet or gully erosion. Such work shall aim to restrict the concentration, volume and speed of run-off by employing relevant methods as indicated in the relevant guidelines (Section 10).*	***PM / CO***

6.2	**IMPACT MANAGEMENT STATEMENT:** *AVOID AND CONFINE POLLUTION DUE TO CONSTRUCTION ACTIVITIES*

6.2.1	**IMPACT MANAGEMENT OUTCOME** *Solid waste emanating from construction activities shall be managed during the construction period to prevent contamination of natural veld and watercourses.*	**RESPONSIBILITY**
	IMPACT MANAGEMENT ACTIONS	
a.	*All refuse, solid waste and non-inert building waste generated at all work sites, shall be removed from the work sites and shall be deposited in containment vessels at the relevant site or at the construction camp by the end of each work day.*	***PM / CO***
b.	*Solid waste shall be temporarily stored at the construction camp before for regular removal and disposal to the Municipal Landfill site by the Contractor or by approved service providers.*	***PM / CO***
c.	*The Contractor or approved service provider shall upon request by the Project Manager or ECO, provide proof / evidence that solid waste that was removed from site, was disposed at the Municipal Landfill site or Municipal Waste Transfer Site.*	***PM / CO / ECO***
d.	*No solid waste shall be disposed of on-site or surrounding areas or by burning or by burying.*	***PM / CO***

6.2.2	**IMPACT MANAGEMENT OUTCOME** Liquid and waste emanating from construction activities shall be managed during the construction period to prevent contamination of soil and water resources.	**RESPONSIBILITY**
	IMPACT MANAGEMENT ACTIONS	
a.	*A demarcated concrete batching area shall be determined which area shall be bunded by a soil berm to contain concrete mixing at a single area on site. Such site shall not be closer than 50m from the edge of the watercourse.*	***PM / CO***
b.	*During the installation of road kerbing, concrete mixing may be done within the road surface which will be paved over after completion of the kerbing. Similarly, during building construction, concrete mixing other than in the batching yard may be done within the road or building footprint area.*	***PM / CO***

c.	*A dedicated shallow sump must be located at the batching yard where excess concrete slurry and washings of concrete mixing machinery and equipment can be done. The sump must be lined with plastic to catch cement solids and clear effluent can drain into the sub-soil. The plastic lining that holds the cement solids can be cleaned weekly by depositing the cement solids onto the inert waste heap on site.*	***PM / CO***
d.	*All visible remains of excess concrete and building waste must be deposited onto an inert waste heap that may be used later for filling purposes.*	***PM / CO***
e.	*Where concrete mixing cannot be done within the batching plant or within the road footprint, concrete shall not be mixed directly on the ground. Plastic liners or mixing trays are to be used. Waste concrete and cement sludge must be scraped off the site of the batching plant daily and removed to an approved inert waste heap for later re-use.*	***PM / CO***
f.	*Adequate ablution facilities shall be provided at each construction site as well as at the construction camp, conveniently located near to work areas to avoid localised water pollution from camp sewerage. A service provider shall be appointed for the regular maintenance of ablution facilities.*	***PM / CO***
g.	*Re-fuelling of construction vehicles on site shall be done by way of a dedicated fuel truck/trailer with the required pumping and piping mechanisms that will ensure effective, safe and leak free transfer of fuel.*	***PM / CO***
h.	*Upon installation of a static fuel tank on site, such installation shall be bunded by a brick / sandbag wall and shall have an impermeable floor of appropriate synthetic material up to the height of the top edge of the bund wall. The required pumping and piping mechanisms shall ensure the safe and leak free transfer of fuel.*	***PM / CO***
i.	*All emergency services of construction vehicles on site shall include the necessary drip trays underneath the serviced vehicle in order to retain dripping oil and soiled/replaced parts. Oil and fuel shall be drained into containers and shall be discharged at an approved oil recycling depot or to be removed by approved service providers.*	***PM / CO***
j.	*Any soiled area contaminated by a liquid spill that may result in pollution of soil and water resources must be excavated to the depth of contaminant penetration. Such contaminated material must be stored in drums and must be disposed of as solid waste to the Municipal Landfill or remediated on-site by chemical treatment before replacing back on-site.*	***PM / CO***
e.	*The Contractor or approved service provider shall upon request by the Project Manager or ECO, provide proof / evidence that liquid waste that was removed from site and was disposed at an approved oil recycling depot, or Municipal Landfill Site or Municipal Waste Transfer Site or Municipal Sewerage Treatment Plant (where appropriate).*	***PM / CO / ECO***
f.	*No liquid waste shall be disposed of on site or surrounding areas or by burning or by burying.*	***PM / CO***

IMPACT MANAGEMENT ACTIONS : REHABILITATION PHASE

This Section of the EMP provides a description of proposed impact management actions for the construction completion phase of the project, identifying the manner in which the impact management outcomes contemplated in Section 3 will be achieved, and include where applicable, actions to —
(i) avoid, modify, remedy, control or stop any action, activity or process which may cause pollution or environmental degradation; and
(ii) comply with any prescribed environmental management standards or practices.
(iii) comply with any applicable provisions of the Act regarding closure, where applicable; and
(iv) comply with any provisions of the Act regarding financial provision for rehabilitation (where applicable).

RESPONSIBILITY ASSIGNMENT	**PE**=Project Engineer	**CO** = Contractors	**PM** = Project Manager
	ECO = Environmental Control Officer		**LA** = Landscape Architect

7.1.1	**IMPACT MANAGEMENT OUTCOME** *Ensure soil conservation and vegetation rehabilitation upon completion of construction.* **IMPACT MANAGEMENT ACTIONS**	**RESPONSIBILITY**
a.	*Upon completion of any part of the project, ensure that all temporary structures, materials, waste and facilities used for construction activities are removed from the site. It is unacceptable to leave foreign material behind with the knowledge that it will become hidden amongst the rejuvenating vegetation with time.*	***PM / CO / LA***
b.	*All cut and fill surfaces need to be stabilized with appropriate material or measures when major civil works are complete by making use of the methods indicated by the relevant guidelines. Slopes must be designed to prevent soil erosion, and must be re-vegetated to create aesthetically acceptable landscapes.* *Near vertical slopes (1:1 or 1:2) must be stabilised using hard structures following specifications as indicated in the relevant guidelines. Site with a 1:3 – 1:6 slope must be logged or stepped – secured logs must be placed in continuous lines following the contours and spaced appropriately depending on the steepness of the slope as indicated in more detail in the relevant guidelines.*	***PM / CO / LA***
c.	*Soils that become compacted through the activities of the development must be loosened to an appropriate depth to allow seed germination.*	***PM / CO / LA***
d.	*Where shaping of the land resulted in bare areas denuded of natural grass cover, such areas must be re-vegetated (seeding) with natural grass directly after completion of surface shaping and topsoil replacement by employing methods as indicated in the relevant guidelines.*	***PM / CO / LA***
e.	*After completion of shaping of the land erosion protection structures must be constructed such as grassed waterways, stone pitching, miter drains and use of logs and re-vegetation for all areas subject to erosion. (see methods indicated in the relevant guideline in Section 10).*	***PM / PE / CO / LA***
f.	*With regard to rehabilitation after completion of development it is important that re-introduction of indigenous vegetation within and around the edges of the development site conforms to the species composition that currently occur within the area.*	***PM / CO / LA***
g.	*Protected tree species that was removed as a result of the development must be replaced at a ratio of 1 : 3 along road reserves and on open spaces.*	***PM / CO / LA***
h.	*Gardens must be laid out with cognisance of the local landscape and locally occurring plants species. The detentions pond within the buffer zone must be shaped as to form both functional lawns and storm water retention sites.*	***PM / CO / LA / PE***
i.	*Bio-retention ponds must be landscaped within the 21 meter buffer around the ponds and where possible remaining trees and natural vegetation within the pond area must be retained as part of the overall landscaping of the proposed township.*	***PM / CO / LA / PE***

IMPACT MANAGEMENT ACTIONS : OPERATIONAL PHASE

This Section of the EMPr provides a description of proposed impact management actions during the operational phase in order to maintain specified mitigation measures throughout the life cycle of the proposed township development.

RESPONSIBILITY ASSIGNMENT	**MC**= Management Company	**CO** = Contractors	**LA** = Landscape Architect
	ECO = Environmental Control Officer		

8.1.1	**IMPACT MANAGEMENT OUTCOME** *Ensure maintenance of the storm water management system* **IMPACT MANAGEMENT ACTIONS**	**RESPONSIBILITY**
.a	*The Company Management must maintain storm water structures by regular removal of debris and silt.*	***MC / CO***
b	*Pipes or culverts will need to be cleaned regularly of any debris to prevent water impoundment and possible water channeling which may lead to erosion.*	***MC / CO***
c	*The dam wall structures must be kept void of tree growth. Tree growth allows large roots to penetrate the dam wall which in future can lead to tunneling of water and collapse of the wall.*	***MC / CO***
d	*A low-level outlet pipe will allow water entering the pond to be discharged at a reduced flow volume. This discharge pipe must be kept clean and open at all times.*	***MC / CO***
e	*The emergency overflow structure must be kept open and unobstructed at all times.*	***MC / CO***
f	*The dam must be cleaned during the winter times. All sediment deposited during the rainy season must be removed and spoiled at a safe designated location.*	***MC / CO***
g	*Gabion structures must regularly be inspected and any damage to the gabion basket structure must be repaired.*	***MC / CO***
h	*Any scouring of soils along stream channels must be prevented and repaired on a regular basis.*	***MC / CO***
i	*Repairs to the storm water management structures must be initiated as soon as possible after damage to any of the structures has been detected.*	***MC / CO***
j	*It is important to maintain stabilised banks of the watercourse. As soon as erosion has been detected along the banks of the watercourse in the area between the introduced storm water management structures, action must be taken to stabilise that section of the bank of the watercourse to prevent further erosion.*	***MC / CO***
k	*The detention ponds must be kept clean as part of the weekly garden maintenance by mowing of lawns and maintaining a grass-lined detention facility without accumulated silt and debris.* *Specific maintenance must be performed after a major rain event to be removed preferably with hand (and not by heavy moving vehicles) as not to uproot any plant roots in the process of maintenance.*	***MC / CO***

8.1.2	**IMPACT MANAGEMENT OUTCOME** *Ensure maintenance of the gardens, to promote indigenous biodiversity* **IMPACT MANAGEMENT ACTIONS**	**RESPONSIBILITY**
a	*A maintenance programme must be implemented at least for the first 6 months after construction to ensure that all vegetation that was introduced to re-vegetate disturbed areas takes root and becomes well established.*	***MC / LA***
b.	*An ongoing alien control programme must be introduced to prevent the colonisation of alien and invasive plants on previously disturbed areas and within the watercourse bed and banks.*	***MC / LA***

c.	*A long term maintenance program must be instituted to ensure a good condition of the vegetated buffers around the storm water ponds and to prevent bush encroachment by unwanted species.*	***MC / LA***
d.	*No exotic plants, amphibian or fish species may be released in the watercourse and dams. Planting on-site should be complimented with locally occurring or compatible indigenous plants and no alien, invasive or exotic ornamental species should be considered for gardens or any landscaping.*	***MC / LA***

8.1.2	**IMPACT MANAGEMENT OUTCOME** *The wastewater treatment plant must be maintained*	**RESPONSIBILITY**
	IMPACT MANAGEMENT ACTIONS	
a	*Monitoring of the WTP for efficient operation must be a daily routine. Monthly sampling and effluent quality analysis must be submitted to DWS.*	***MC / CO***
b	*Any indication of inefficient wastewater treatment must be identified and must be corrected immediately by the operator.*	***MC / CO***
c	*All gravitational pipes and pump lines that connect to the components to be removed or replaced must be sealed to prevent accidental sewerage spills.*	***MC / CO***
d	*The operator should be fully conversant with the recommended operating procedures as stipulated in the operation and maintenance manual of the WTP.*	***MC / CO***
e	*A program for sludge removal from the WTP must be included in the operation and maintenance plan. All tanks must be emptied of sludge and effluent to be disposed of at a registered site.*	***MC / CO***
f	*All reasonable measures must be taken to provide for the mechanical, electrical, operational, or process failures and malfunctions of the WTP.*	***MC / CO***
g	*The Operator shall ensure that the WTP and treated wastewater comply throughout the operational life with all applicable national norms and standards, all existing and new legislation and regulations and the applicable Wastewater Limit Values as published from time to time.*	***MC / CO***

8.1.2	**IMPACT MANAGEMENT OUTCOME** *Closure of wastewater treatment plant for repairs and replacement*	**RESPONSIBILITY**
	IMPACT MANAGEMENT ACTIONS	
a	*All gravitational pipes and pump lines that connect to the components to be removed or replaced must be sealed to prevent accidental sewerage spills.*	***MC / CO***
b	*All pipes, pumps and tanks must be flushed to ensure that when the system is dissembled there is a lower risk of potential sewage spillage from any elements.*	***MC / CO***
c	*All tanks must be emptied by a suitable sump/pump and the effluent shall be transferred to a suitable tanker truck for removal to the Municipal Sewer Treatment Plant for treatment and disposal.*	***MC / CO***
d	*During decommissioning, a thorough inspection is required for any foundational cracks and defects on tanks and underground pipes.*	***MC / CO***
e	*If any spillages occur on soil such spillage must be dealt with in terms of NEMA Section 30 and contaminated soil must be remediated according to the National Norms and Standards for the Remediation of Contaminated Land and Soil (NEMWA 2014).*	***MC / CO***
f	*All open pipes or tanks must be closed off during decommissioning or replacement to prevent odours.*	***MC / CO***
g	*No fire or sparks may be present at the initial opening or closing of pipes and tanks, as the methane gas that may emanate from the tanks can be explosive.*	***MC / CO***

MONITORING AND REPORTING

This Section complies with Appendix 6, Sections (g) to (m) with regard to monitoring and reporting on compliance to the environmental authorisation and environmental management programme.

9.1 The method of monitoring the implementation of the impact management actions.

- *The method and requirements for environmental monitoring and reporting is contained in the conditions of Environmental Authorisation.*
- *Environmental monitoring and reporting in terms of NEMA during the pre-construction and construction phase will be done by an Environmental Control Officer (ECO) as required in terms of the EIA Regulations and as appointed by the Developer and agreed by the competent Authority.*
- *Monitoring shall also be done by way of a complaints register. All verbal and written complaints received during the construction period shall be entered into the register and shall be investigated for corrective action and shall be reported to the Environmental Authority.*
- *The Provincial Environmental Compliance and Enforcement Inspectorate, constituted under NEMA shall monitor the environment during the operational phase.*
- *Where actions indicated in this programme are regulated by laws, regulations, norms and standards, the compliance monitoring and enforcement of such actions shall be the responsibility of the relevant Government Department that administers the relevant laws, regulations, norms and standards.*

9.2 The frequency of monitoring the implementation of the impact management actions.

- *An unscheduled monitoring programme shall be followed during the planning and pre-construction phases.*
- *During the construction phase, monitoring of the implementation of impact management actions shall be done bi-weekly.*

9.3 The persons who will be responsible for the implementation of the impact management actions.

Pre-construction compliance

- *The Developer must ensure that specified planning outcomes are considered and actions performed during the planning of the development layout and civil services plans*

Construction and rehabilitation phase

- *The Developer and appointed Project Manager shall ensure that all Contractors and Sub-contractors as well as own staff are familiar with, understand and adhere to the EMPr for the duration of all construction operations.*
- *The Contractor/s referred to in this document includes the Sub-contractors involved with earth moving, infrastructure construction and maintenance actions listed in this EMPr.*
- *The contractor must provide a list of any amount of hazardous substances that will be used in the construction. The contractor must provide a description of the storage, handling and control of such substance.*
- *In addition, during construction the Contractors and Sub-contractors must ensure that all personnel under their employment are fully aware of any environmental issues relating to the construction and maintenance activities that are being undertaken on site and of the related environmental precautions that need to be taken.*

Operational phase

- *The obligations for implementing the Environmental Authorisation and approved EMPr must be transferred by way of Application in terms of the EIA regulations, from the Developer to the Management Company of the proposed township development.*
- *The Environmental Authority may from time to time perform random inspections to determine compliance and may act on any complaint received.*

8.4 The time periods within which the construction must be implemented.

A 10-year period is allowed from date of Environmental Authorisation for completion of the development during which construction impact management actions can be phased until full implementation has been achieved.

8.5 The time periods within which the operational management must be implemented.

The implementation of the operational maintenance requirements is permanent and remains applicable in perpetuity.

8.5 The mechanism for monitoring compliance.

- *The appointed ECO shall conduct compliance monitoring as stipulated by the Environmental Authorisation.*
- *Throughout the construction period a systematic and structured approach will be followed to record whether the environmental objectives of the Environmental Authorisation and EMPr are being met.*
- *The following minimum monitoring actions will be implemented:*
  - *A checklist will be used, based on the objectives and outcomes as indicated in the EMPr.*
  - *Monitoring inspections will be performed every second week and photos will be taken when necessary to illustrate certain identified aspects that require rectification.*
  - *Monitoring reports will be distributed to the project manager and contractors after each monitoring inspection. All identified aspects of potential non-compliance will be reported for scheduled rectification.*
  - *Project meetings with the project manager will be held once a month during which environmental aspects will be discussed.*
- *During the operational period, the Environmental Authority may from time to time perform random inspections to determine compliance and may act on any complaint received.*

8.6 A program for reporting on compliance.

- *A compliance report shall be submitted to the Provincial Environmental Compliance and Enforcement Directorate according to an agreed schedule.*
- *A compliance audit shall be performed after completion of the construction phase according to the requirements of the Provincial Environmental Compliance and Enforcement Directorate.*

8.7 Environmental awareness

Information to employees of any environmental risk which may result from their work.

The Developer / Project Manager and Contractors shall ensure that an environmental awareness program is initiated before construction and maintenance commence as follows:

- *All Contractors and employees must be informed formally of any environmental risk which may result from their work specifically with regard to heritages resources, vegetation clearing, liquid and solid wastes, material handling and fire prevention including site hazards such as open trenches and overhead powerlines.*
- *The awareness program must include the risks and how it must be dealt with in order to avoid injury, pollution or the degradation of the environment.*
- *The method of reporting an incident as well as immediate remedial action must also be communicated to all employees.*
- *A copy of the EMPR must be provided to all Contractors and Sub-contractors and a copy must be available at the Site Office for reference purposes.*

Information to employees on how risks must be dealt with in order to avoid pollution or the degradation of the environment.

The process for managing any environmental incident, damage or pollution during the construction period will be as follows:

- *The Contractor/ Employee must immediately report the incident to the Developer.*
- *Identify the cause and extent of the problem and immediately stop the cause of any further environmental damage.*
- *Determine of the incident is reportable in terms of the definition of a NEMA Section 30 incident If "yes" follow the steps as outlined below:*
  - *Initial reporting of the incident to the Relevant Authorities by way of an alarm report.*
  - *Containing and minimising the effects of the incident to the environment, health, safety and property of persons.*
  - *Undertaking clean-up procedures.*
  - *Await a Directive from the Relevant Authorities that will indicate any further action in terms of Section 30 of NEMA or other relevant laws.*
- *If the incident is not reportable in terms of NEMA Section 30, proceed as outlined below:*
  - *Determine a plan of action to provide a remedy to the problem.*
  - *Implement the remedial action as a matter of urgency, monitor the remedial action and maintain the remedial action where applicable.*
  - *Rehabilitate the affected area if required.*

GUIDELINES / METHODS / NORMS / STANDARDS

The following practical guidelines, methods, norms and standards as published by relevant Government Departments and Government Institutions have been found credible and suitable for implementation, where applicable wholly or partially, as supplement to environmental management actions.

	PUBLISHER	YEAR	TITLE	RELEVANCE TO THE PROJECT
a.	*Department of Environmental Affairs*	*2008*	*Best Practice Guideline: Alien vegetation management.*	*Control methods, herbicide use, bark application, ring barking, bark stripping, frilling. Using labour intensive methods: hand pulling, chopping/cutting/slashing. Using mechanical methods: felling, bark stripping. Using chemical control: injection, foliar spray, use and disposal of plant material.*
b.	*Department of Water & Forestry*	*2005*	*Environmental Best Practice Specifications : Planning, Construction*	*Site rehabilitation, shaping, topsoil replacement, ripping and scarifying, planting, grassing, maintenance, erosion control.*
c.	*Water Research Commission*	*2013*	*The South African Guideline for sustainable drainage systems*	*Planning and design of sustainable storm water management systems.*
d.	*University of KwaZuluNata*	*2005*	*Caring for Natural Rangelands.*	*Soil erosion control: planning, design, implementation & monitoring*

The above lists of guidelines / methods / standards are not definitive or exhaustive and current publications may be replaced by newer publications and additional publications may be added in future as supplement to environmental management actions.