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LEAP

Gwen Theron (PhD)

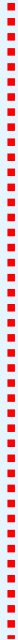
Landscape Architect
Environmental Planner

P.O. Box 13185
Hatfield 0028

012 344 3582
083 302 2116

FAX 086 606 6130

gwen.theron@telkomsa.net



Newcastle: Boschhoek DC25/0006/2011: KZN/EIA/0000168/2011 Draft Environmental Impact Assessment



Submitted on behalf of
St Leger Denny Developments
Reg 2006/029796/07
P.O.Box 2648
Fearie Glen 0043
082 320 5537
wldenny@investec.co.za

Submitted by
LEAP
Dr. Gwen Theron
PrLArch 97082

Submitted to:
KZN Department of Agriculture and Environmental Affairs
P.O.Box 170, Newcastle, 2940
Scott Street, Beares Arcade, Office 9, Newcastle, 2940
Tel: 034 315 3936/3846
Fax 034 312 9986

Executive Summary

INTRODUCTION

LEAP Landscape Architect and Environmental Planner CC, was appointed by St Leger Denny Developments as Independent Environmental Consultants to undertake the appropriate environmental process for the proposed development on a portion of Bosch Hoek 3345 HS in the Newcastle Municipality. The process was registered for an EIA with the KZN Department of Agriculture and Environmental Affairs under Regulation 544, 545, 546 of the National Environmental Management Act (Act 107 of 1998) and was assigned the reference number **DC25/0006/2011: KZN/EIA/0000168/2011**.

GENERAL SITE DESCRIPTION

The subject property is located within the municipal area of jurisdiction of the Newcastle Local Municipality, to the west of the central business district at the far end of Boundary Road on the way to Normandie. See Location map. A large official squatter camp, Siyahlalala, is located immediately to the east of the proposed development. The erf to the north of the township (erf 2588 -70ha in extent) is in the process to be transferred to the Newcastle Municipality and subdivided into residential erven for low-cost or subsidy housing. The subject property is 202 ha but only 130 ha of the whole property is under application here.

RECEIVING ENVIRONMENT

Topography and Hydrology

At an elevation ranging from 1 220m to 1 290m above sea level the natural ground slope of the site is generally steep with a slope between 5% and 13% and in one area up to 15% occurring in the eastern part of the study area. The surface topography of the site is characterized as being gently undulating landscape over the central and western parts of the site and to roughly undulating landscape across the site. The site is bisected by two prominent northerly flowing drainage features and surface drainage takes place via sheetwash towards these features at gradients ranging from 3% to 10% respectively. The 1:50 year flood lines were calculated by SRK Consulting in July 2011, and incorporated in the town planning

General Geology

The entire study area is underlain by transported silty, clayey and gravelly soils that are underlain by residual soils developed over weathered and unweathered dolerite bedrock belonging to a Post Karoo intrusive sill. The site has been apportioned into four prominent material zones, Soil Zones "A" to "D" as shown on the attached "Geotechnical Map" in the detailed Geotechnical Report.

Agriculture

Other than grazing of a few heads of cattle, there are no farming activities on the property since the cultivated areas have reverted back to veld. There are two farm houses on the site and many labourer houses.

The site is not under permanent irrigation nor has it any particular unique value that needs protection. None of the soils forms identified qualify as high potential if the soil depth is taken into consideration. The Hutton soil that normally has a higher potential is rocky, and is 6,6 hectares in extent. It is located in the south western part of the farm. Although it fails to qualify as high potential it can, nevertheless, gainfully be used in producing fodder for the harsh winter months when the temperature can fall below freezing

Ecology

Seven plant communities were identified. The primary vegetation has a Medium sensitivity, while the secondary vegetation and disturbed areas have a Low sensitivity. Most of the area is therefore suitable for development. The wetlands and spruits are protected by law and no development should take place within the 1:100 year flood line or within 32 m from the edge of the spruit or wetland. It is furthermore suggested that the Shrubland of the Hills be at least partly conserved in an open space that remains natural.

Protection of sensitive areas as identified in the vegetation and wetland reports will allow for bio-filtering and allow for connectivity. It will also accommodate the possible occurrence of the “Critically Endangered” rough-haired golden mole, the “Near Threatened” African marsh rat, as well as the confirmed presence of sensitive vleis rats. Should at least part of the rocky ridges are deemed as sensitive and excluded from development, passive conservation will be sufficient. By preserving part of the rocky ridges as well as the two streams (each with its collective 50+50=100 meter-wide conservation buffer), habitat for most Red Data and sensitive small mammals will be preserved and connectivity will be enhanced.

The site does contain important drainage systems on clay-based soils, including springs, streams, dams, riparian vegetation and alluvial flats, that require protection. This protection could be in the form of a green area to service the needs of both ecosystem functioning and recreation for the residents. It must ensure that the drainage habitats are maintained as a natural corridor for those species largely confined to these habitats. In addition, the development site also supports important patches of woodland on the crest and western slopes of two rocky ridges and these deserve protection for the diversity of bird species they support, as both habitat and as transit sites for these species between patches.

Cultural Heritage

There are no important visible cultural heritage resources, including graves, on the proposed development area. There is thus no objection to the proposed development from a cultural heritage resources point of view.

GENERAL PROJECT DESCRIPTION

It is proposed that the site be developed mainly as a residential development. The proposed township will provide 2588 houses /stands in the affordable market – serviced stand. Supportive land uses such as retail, schools, crèche’s, churches, community facilities and open spaces will form part of the proposed township.

The site development plan application will include a table that refers to the gross floor area used on the individual erven to ensure that the maximum gross floor areas allowed in terms of the development controls remain applicable. The above-mentioned land use rights will be incorporated into the Newcastle Town Planning Scheme, 1980 in terms of the provisions of section 125 of the Town Planning and Townships Ordinance, 1986 (Ordinance 15 of 1986). However, these rights will be incorporated in will be prepared in accordance with the phases of the township illustrated on the proposed township layout plan that accompanies the application documents. The proposed land uses are discussed below.

RISKS AND KEY ISSUES

Potential risks and impacts include, but are not limited to, the following:

Physical Impacts

- Geological impacts
- Topographical impacts
- Air quality
- Soil and land capability
- Water quality and availability – surface and ground water

Biophysical

- Impacts on flora and flora habitats
- Impacts on fauna and fauna habitats
- Sensitive landscapes
- Conservation

Socio-economic Impacts

- Noise pollution
- Visual impact
- Sites of cultural significance
- Safety and security
- Impact on rural ambience of the area
- Traffic increase on roads
- Services being inadequate and malfunctioning (including electricity, waste management, water, sewage management systems)
- Run away fires due to poor fire management and lack of capacity to fight fires.
- Improved tax base
- Bulk contributions which result in the improvement of infrastructure in the area

IMPACTS AND MITIGATION MEASURES

Relevant issues were evaluated in terms of the most important parameters applicable to the environmental management. Several mitigation measures have been identified that could manage the impacts, or mitigate them successfully.

CONCLUSION

The development proposal has no fatal flaws in terms of the institutional, bio-physical or socio-economic environments.

RECOMMENDATION

It is recommended that the **residential with ancillary uses (preferred alternative)** option is utilised. Furthermore, it is recommended that this application be approved, subject to all specifications of:

- The Environmental Impact Assessment Report
- The Environmental Management Plan (EMP)
- All specialist studies
- All requirements of the Local municipality
- The requirements of the Record of Decision by KZNDAEA

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1.0 NEMA REQUIREMENTS

In accordance with the Regulations in terms of Chapter 5 of the NEMA, 1998, Chapter 3, Part 3, Section 32 Environmental Impact Assessment Reports require the following:

32. (1) If a competent authority accepts a scoping report and advises the EAP

in terms of regulation 31(1)(a) to proceed with the tasks contemplated in the plan of study for environmental impact assessment, the EAP must proceed with those tasks, including the public participation process for environmental impact assessment referred to in regulation 29(1)(i)(iv) and prepare an environmental impact assessment report in respect of the proposed activity.

An environmental impact assessment report must contain all information that is necessary for the competent authority to consider the application and to reach a decision contemplated in regulation 36, and must include -

- *details of -*
 - *the EAP who compiled the report; and*
 - *the expertise of the EAP to carry an environmental impact assessment;*
- *a detailed description of the proposed activity;*
- *a description of the property on which the activity is to be undertaken and the location of the activity on the property, or if it is -*
- *a linear activity, a description of the route of the activity; or*
- *an ocean-based activity, the coordinates where the activity is to be undertaken;*
- *a description of the environment that may be affected by the activity and the manner in which the physical, biological, social, economic and cultural aspects of the environment may be affected by the proposed activity;*
- *details of the public participation process conducted in terms of sub regulation (1), including -*
 - *steps undertaken in accordance with the plan of study;*
 - *a list of persons, organisations and organs of state that were registered as interested and affected parties;*
 - *a summary of comments received from, and a summary of issues raised by registered interested and affected parties; the date of receipt of these comments and the response of the EAP to those comments; and*
 - *copies of any representations, objections and comments received from registered interested and affected parties;*
- *a description of the need and desirability of the proposed activity and identified potential alternatives to the proposed activity, including advantages and disadvantages that the proposed activity of alternatives may have on the environment and the community that may be affected by the activity;*
- *an indication of the methodology used in determining the significance of potential environmental impacts;*
- *a description and comparative assessment of all alternatives identified during the environmental impact assessment process;*

- *a summary of the findings and recommendations of any specialist report or report on a specialised process;*
- *a description of all environmental issues that were identified during the environmental impact assessment process, an assessment of the significance of each issue and an indication of the extent to which the issue could be addressed by the adoption of mitigation measures;*
- *an assessment of each identified potentially significant impact, including -*
 - *cumulative impacts;*
 - *the nature of the impact;*
 - *the extent and duration of the impact;*
 - *the probability of the impact occurring;*
 - *the degree to which the impact can be reversed;*
 - *the degree to which the impact may cause irreplaceable loss of resources; and*
 - *the degree to which the impact can be mitigated;*
- *a description of any assumptions, uncertainties and gaps in knowledge;*
- *an opinion as to whether the 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;*
- *an environmental impact statement which contains -*
 - *a summary of the key findings of the environmental impact assessment; and*
 - *a comparative assessment of the positive and negative implications of the proposed activity and identified alternatives;*
- *a draft environmental management plan that complies with regulation 34;*
- *copies of any specialist reports and reports on specialised processes complying with regulation 33; and*
- *any specific information that may be required by the competent authority.*

2.0 INTRODUCTION

LEAP Landscape Architect and Environmental Planner CC, was appointed by St Leger Denny Developments as Independent Environmental Consultants to undertake the appropriate environmental process for the proposed development on a portion of Bosch Hoek 3345 HS in the Newcastle Municipality. The process was registered for an EIA with the KZN Department of Agriculture and Environmental Affairs under Regulation 544, 545, 546 of the National Environmental Management Act (Act 107 of 1998) and was assigned the reference number **DC25/0006/2011: KZN/EIA/0000168/2011**.

The Scoping Report was submitted to KZN the middle of May, but NO response had been received. When received the department's comments are received, it will be attached under **Annexure L**.

The property is registered in the name of several individuals, as stated in the title deed T8871/1966. *Meadowood Investments 10 Pty Ltd*, represented by *Willoughby St Leger Denny* was granted a Power of Attorney. The development will be known as **ST LEGER**.

3.0 OBJECTIVES

The following objectives have been set:

- Preparation of the Environmental Impact Assessment Report by describing the context of the proposed development, including the bio-physical, socio-economic and institutional environments;
- Identification of impacts that the proposed development could have on the bio-physical and social environment;
- Assessment of the attitudes of the surrounding landowners and other interested and affected parties (I&APs) to such a proposed development;
- Recommendation of measures that will reduce, mitigate or eliminate identified negative impacts and improve the positive impacts; and therefore
- Determine whether the proposed development site is deemed suitable for the proposed development from an environmental perspective.

4.0 ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)

The Environmental Assessment Practitioner is Dr. Gwen Theron who is a registered professional member of the following associations:

- SACLAP (South African Council for Landscape Architectural Profession)
- ILASA (Institute of Landscape Architects South Africa)
- IAIA (International Association for Impact Assessments)

Please refer to **Annexure A – Prof Gwen Theron’s Curriculum Vitae**

5.0 LOCATION

The subject property is located within the municipal area of jurisdiction of the Newcastle Local Municipality, to the west of the central business district at the far end of Boundary Road on the way to Normandie. See **Figure 1**: Location map. A large official squatter camp, Siyahlalala, is located immediately to the east of the proposed development. The erf to the north of the of the township (erf 2588 -70ha in extent) is in the process to be transferred to the Newcastle Municipality and subdivided into residential erven for low-cost or subsidy housing. The subject property is 202 ha but only 130 ha of the whole property is under application here.



Figure 1: Locality map

6.0 BRIEF DESCRIPTION OF THE PROPOSED DEVELOPMENT

6.1 Proposed land uses

It is proposed that the site be developed mainly as a residential development. The proposed township will provide 2588 houses /stands in the affordable market – serviced stand. Supportive land uses such as retail, schools, crèche's, churches, community facilities and open spaces will form part of the proposed township.

The site development plan application will include a table that refers to the gross floor area used on the individual erven to ensure that the maximum gross floor areas allowed in terms of the development controls remain applicable. The above-mentioned land use rights will be incorporated into the Newcastle Town Planning Scheme, 1980 in terms of the provisions of section 125 of the Town Planning and Townships Ordinance, 1986 (Ordinance 15 of 1986). However, these rights will be incorporated in will be prepared in accordance with the phases of the township illustrated on the proposed township layout plan that accompanies the application documents. The proposed land uses are discussed below.

Table 1: Proposed Land Use Schedule

LAND USE	NO OF STANDS	AREA ± (HA)	STAND NO'S	% OF LAND
Residential 1	2588	67.75	1-2588	33.4
Residential 1 (Municipality)	1	70.00	2589	34.5
Business	3	2.96	2603-2605	1.5
Community facility and Clinic	3	0.70	2600-2602	0.1
Church & Crèche	7	1.46	2589-2595	0.1
Primary & Secondary School	1	6.60	2598	3.2
Primary School	2	4.50	2596-2597	2.2
Community and Sport facilities	1	1.46	2599	0.1
Community facility	3	0.70	2600-2602	0.1
Public open space	6	14.60	2606-2611	7.2
Streets	-	32.16	-	15.8
TOTAL	2611	202.60		100%

6.2 Layout

The layout plan for the proposed township was done taking into consideration the limiting factors such as:

- Gradient or slope of the land
- Wetlands and sensitive area's
- Flood lines
- Existing and future roads
- Existing and future services infrastructure
- Existing and future developments

Due to the principle of maximizing the area for development and to accommodate the maximum number of residential stands on a portion of land, a cul-de-sac layout was done. This maximized the development with more than 40%. The cul-de-sac layout also contributed to the saving in services cost as most of the services such as water, sewer and electricity can be provided in a mid block system, resulting in tremendous savings. Additional contributions from this cul-de-sac layout is to create a "sense of place" to the residents in the cul-de-sac. Safety will also increase with this layout as no "thru" traffic will be created, and people not staying in the cul-de-sac will be identified by the known residents in the cul-de-sac.

The layout of the proposed development is indicated on Figure 2: Proposed layout.

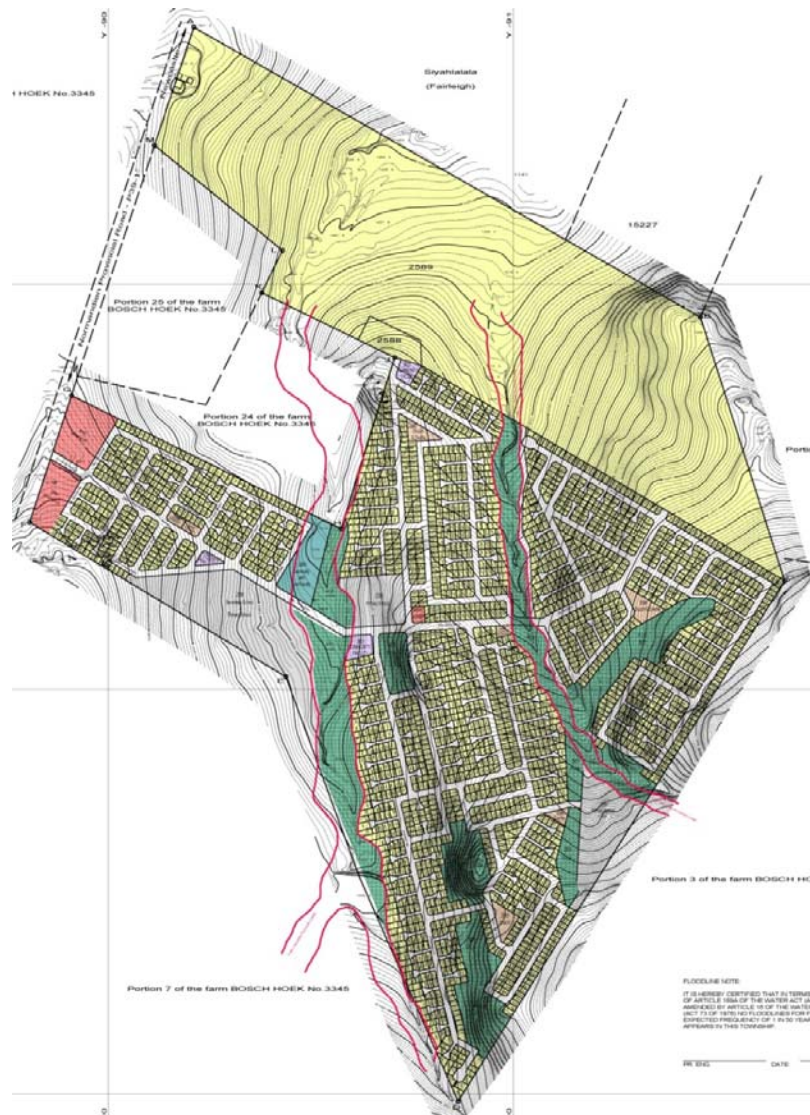


Figure 2: Proposed layout

The design as shown in the figure were optimized as per the dimensions indicated, creating stand sizes between exactly 250m² and 270m² and is well known as a “Super Block”.

Residential neighbourhoods will be defined by the major collector routes that will form a clear boundary. An aspect in defining boundaries is to have relative few access roads (points) to the neighbourhood. Although *ST LEGER* will be one community it would be possible to define the township into smaller neighbourhoods. This will also be useful in the phase construction of services.

The township layout made provision for 3 Primary Schools where two of the primary schools have their own sports facilities. The third primary school forms part of the secondary school where the sports facilities are being shared. The primary school ratio will be for every 860 stands a primary school will be provided. The combined school will thus be highly accessible. The maximum walking distance to the secondary school will be 1200m.

Crèches & Churches can be provided on the same stand. The reason for this is to utilise the property to a maximum, crèche during the week and church on Sunday's when the crèche is not in use. Seven erven were provided throughout the proposed township for crèche and church uses:

In total 3 business sites are provided. These sites will be able to accommodate retail, office and commercial uses. A filling-station would also be proposed on one of these sites. These sites will be highly accessible and visible when entering or exiting the township. Sufficient public transport such as bus and taxi facilities can be provided at these sites.

Community sports facilities will be provided in order to accommodate sport's clubs. The stand is planned on the major collector route (linked to provincial road) for maximum accessibility. The proposed stand is further more adjacent to a public open space and can thus be expanded to this area (east) for sports fields.

Three community facility stands are provided in the proposed township layout. Community facilities on these stands included clinics, municipal offices, halls, places of safety and police stations. These stands can be used for needs as required by the community.

In the proposed layout a total of 12,6 ha public open space was provided along the 1:50 flood lines, wetlands and steeper areas. Recreational facilities can sufficiently be provided in this area such as hiking routes and natural conservation areas. If these public open space areas are well maintained, the upside of improved property values will definitely be of benefit to the community as a whole.

7.0 NEMA LISTED ACTIVITIES TO BE APPLIED FOR

In April 2006 the Minister of Environmental Affairs and Tourism passed Environmental Impact Assessment Regulations in terms of Chapter 5 of the National Environmental Management Act, 1998 (NEMA). The regulations replaced the Environmental Impact Assessment (EIA) regulations which were promulgated in terms of the Environment Conservation Act, 1989 in 1997. The most recent regulations came into place on 18 June 2010 and, therefore, all applications must be made in terms of these NEMA

regulations. The purpose of this process is to determine the possible negative and positive impacts of the proposed development on the surrounding environment and to provide measures for the mitigation of negative impacts and to maximise positive impacts.

Notice No. R 543 to 547, Regulations specifically 544, 545 and 546 list activities that indicate the process to be followed. The Activities listed in Notice No. R 544 and 546 requires that a Basic Assessment process be followed and the Activities listed in Notice No. R545 requires that the Scoping and EIA process be followed. However, the draft guidelines document supplied by DEAT states that if any activity being applied for is made up of more than one listed activity and the scoping and EIA process is required for one or more of these activities, the full EIA process must be followed for the whole application.

The proposed development includes a number of listed activities and therefore it will be necessary to follow a full EIA process (as an independent process) in terms of NEMA. The application is therefore for the following listed activities:

Table 2: Listed Activities to be applied for

Relevant Government Notice:	Activity No (s)	Describe each listed activity as per the wording in the relevant listing notice:
GN Reg 544, 18 June 2010	9	The construction of facilities or infrastructure exceeding 1000 metres in length for the bulk transportation of water, sewage or storm water - (i) with an internal diameter of 0,36 metres or more; or (ii) with a peak throughput of 120 litres per second or more, excluding where: a. such facilities or infrastructure are for bulk transportation of water, sewage or storm water or storm water drainage inside a road reserve; or b. where such construction will occur within urban areas but further than 32 metres from a watercourse, measured from the edge of the watercourse.
GN Reg 544, 18 June 2010	10	The construction of facilities or infrastructure for the transmission and distribution of electricity - (ii) inside urban areas or industrial complexes with a capacity of 275 kilovolts or more.
GN Reg 544, 18 June 2010	11	The construction of: (i) canals; (ii) channels; (iii) bridges; (iv) dams; (v) weirs; (vi) bulk storm water outlet structures; (vii) marinas; (viii) jetties exceeding 50 square metres in size; (ix) slipways exceeding 50 square metres in size; (x) buildings exceeding 50 square metres in size; or (xi) infrastructure or structures covering 50 square metres or more where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line
GN Reg 544, 18 June 2010	18	The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock

		<p>from</p> <ul style="list-style-type: none"> (i) a watercourse; (ii) the sea; (iii) the seashore; (iv) the littoral active zone, an estuary or a distance 18of 100 metres inland of the high-water mark of the sea or an estuary, whichever distance is the greater- <p>but excluding where such infilling, depositing, dredging, excavation, removal or moving</p> <ul style="list-style-type: none"> (i) is for maintenance purposes undertaken in accordance with a management plan agreed to by the relevant environmental authority; or <p>occurs behind the development setback line</p>
GN Reg 544, 18 June 2010	22	<p>The construction of a road, outside urban areas,</p> <ul style="list-style-type: none"> (i) with a reserve wider than 13,5 meters or, (ii) where no reserve exists where the road is wider than 8 metres, or <p>for which an environmental authorisation was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Notice ?? of 2010.</p>
GN Reg 544, 18 June 2010	37	<p>The expansion of facilities or infrastructure for the bulk transportation of water, sewage or storm water where:</p> <ul style="list-style-type: none"> (a) the facility or infrastructure is expanded by more than 1000 metres in length; or (b) where the throughput capacity of the facility or infrastructure will be increased by 10% or more– <p>excluding where such expansion:</p> <ul style="list-style-type: none"> (i) relates to transportation of water, sewage or storm water within a road reserve; or (ii) where such expansion will occur within urban areas but further than 32 metres from a watercourse, measured from the edge of the watercourse.
GN Reg 544, 18 June 2010	39	<p>The expansion of</p> <ul style="list-style-type: none"> (i) canals; (ii) channels; (iii) bridges; (iv) weirs; (v) bulk storm water outlet structures; (vi) marinas; <p>within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, where such expansion will result in an increased development footprint but excluding where such expansion will occur behind the development setback lin</p>
GN Reg 544, 18 June 2010	47	<p>The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre -</p> <ul style="list-style-type: none"> (i) where the existing reserve is wider than 13,5 meters; or (ii) where no reserve exists, where the existing road is wider than 8 metres – <p>excluding widening or lengthening occurring inside urban areas</p>
GN Reg 545, 18 June 2010	15	<p>Physical alteration of undeveloped, vacant or derelict land for residential, retail, commercial, recreational, industrial or institutional use where the total area to be transformed is 20 hectares or more;</p> <p>except where such physical alteration takes place for:</p> <ul style="list-style-type: none"> (i) linear development activities; or (ii) agriculture or afforestation where activity 16 in this Schedule will apply.

8.0 DESCRIPTION OF THE INSTITUTIONAL ENVIRONMENT

The land development proposal of the proposed development site is influenced by the varying scales of institutional environments. The institutional context that is considered and reflected upon ranges from that of international, national, provincial and local / municipal, while each institutional arena as it decreases in scale, requires development planning that is more detailed and responsive to the proposed development site and the surrounding environment.

The following institutional framework documents are relevant to the proposed township and development site.

8.1 INTERNATIONAL CONTEXT

Relevant International Conventions to which South Africa is part of and which should influence the proposed site development:

Table 3: International context

CONVENTION	RESPONSE
<ul style="list-style-type: none"> • Ramsar Convention on Wetlands, 1971 • Framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. 	<p>The Boschhoek development (St Leger) is located on the north western boundary of the site.</p> <ul style="list-style-type: none"> • Development to occur outside of the 1:100 year floodline • Rehabilitation of this drainage line should be implemented as far as possible. <p>Development and particularly storm water management, to be responsive to surrounding wetlands / hydrological systems which drain into the Boschhoek development (St Leger). The implementation of attenuation and dissipation measures to minimise the velocity and quantity of storm water and therefore minimising environmental impacts is essential.</p> <p>Please refer to the Draft Environmental Management Plan (EMP) – Annexure K for further information in this regard.</p>
<ul style="list-style-type: none"> • Agenda 21 adopted at the United Nations Conference on Environment and Development (UNCED) in 1992 as well as • an Action plan and blueprint for sustainable development. 	<p>The proposed development is to be planned, constructed and operated with sustainability as a key prerequisite and baseline standard.</p> <p>Please refer to Annexure K – Draft EMP for practical steps in achieving best practice methodologies.</p>

<ul style="list-style-type: none"> • Convention on Biological Diversity, 1995 • Provided and added stimulus for a re-examining and harmonization of its activities relating to biodiversity conservation. 	<p>An ecological specialist completed an assessment of the proposed development site to determine the biodiversity and habitat value. This assessment is to inform the planning and design phases as far as possible.</p>
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8.2 NATIONAL CONTEXT

The following national legislature is to be considered and applied to the development proposal during the environmental process:

Table 4: National Context

LEGISLATURE	RESPONSE
<p>8.2.1 Development Facilitation Act (DFA), 1995 (Act No 67 of 1995)</p>	
<p>An act which formulates a set of general principles to serve as guidelines for land development that encourage economically sound, socially acceptable and politically correct town planning. The following principles are applicable:</p>	<p>Even though the town planning procedure is not following the KZN PDA process, the DFA principles have great importance with respect to good planning and development and are therefore to be aligned to as far as possible. The KZN PDA is followed. See town planning memorandum for details.</p>
<p>Promote integration of social, economic, institutional and physical aspects of land development</p>	<p>The township establishment process and the environmental impact assessments are transparent and offer the opportunity for interested and affected parties to participate / comment on the proposed development. The processes have been designed to ensure that people's rights in respect of a healthy and economically viable environment are protected. All these aspects are taken into account during the environmental process to ensure a sustainable development.</p>
<p>Promote availability of residential and employment opportunities in close proximity to each other</p>	<p>A number of employment opportunities will be provided for workers during the construction phase of the project which will occur over a number of years. The residential and ancillary uses development principle which is the preferred land use celebrates and promotes a close linkage between living and working environments. In fact, the majority of the land parcels could house retail, business and residential facilities within the same structures. Furthermore, the location of the site next to the</p>

LEGISLATURE	RESPONSE
	current low cost housing areas will enhance the principle of densification.
Promote a diverse combination of land uses	Diverse land use is key to the success of this proposal as a residential with ancillary uses development.
Discourage urban sprawl and promote a compact city	The proposed development site is strategically located along accessible transport corridors and urban amenities.
Development of skills and capacities	Skills development and capacity building will be an essential component of the construction phase while numerous opportunities in the retail, business and management industries will be made available during the operational phase. Adjoining unemployed community members (Siyahlalala /Fairleigh) will be employed and trained as far as possible during the construction phase. For further information please refer to Annexure K – Draft EMP
Furthermore, the DFA encourages environmentally sound land development practices and the promotion of the sustained protection of the environment.	The environmental impact assessment process ensures that sound land development practices are implemented, creating a balance between environmental, social and economic requirements.
8.2.2 National Environmental Management Act (NEMA), 1998 (Act No 107 of 1998) and the Environmental Impact Assessment Regulations	
NEMA aims to provide for co-operative environmental governance by establishing principles for decision-making on matters affecting the environment, institutions that will promote cooperative governance and procedures for coordinating environmental functions exercised by organs of state and to provide for matters connected therewith. The Act recognises that many inhabitants of South Africa live in an environment that is harmful to their health and well being and focuses on the following:	NEMA principles are to be adhered to, with specific reference to development that promotes integrated environmental management, while being socially, environmentally and economically sustainable. The proposed development layout must reflect NEMA principles, such as protection of the environment for present and future generations by preventing pollution and ecological degradation, promoting conservation and securing ecologically sustainable development and utilisation of natural resources.
Everyone has the right to an environment that is not harmful to his or her health or well-being	Please refer to the Draft EMP (Annexure K) which discusses health and safety issues during the construction phase.
The State must respect, protect, promote and fulfil the social, economic and environmental rights of	This development will provide employment opportunities (construction and operational phase

LEGISLATURE	RESPONSE
everyone and strive to meet the basic needs of previously disadvantaged communities	therefore forming an inclusive environment with employment opportunities in close proximity to accommodation.
Inequality in the distribution of wealth and resources, and the resultant poverty, are among the important causes as well as the results of environmentally harmful practices;	Good integration is ensured due to the mixed land use character of the proposed development, as well as its location within the urban realm along public and private transport corridors. A number of communities and individuals will be able to access and invest in the proposed development.
Sustainable development requires the integration of social, economic and environmental factors in the planning, implementation and evaluation of decisions to ensure that development serves present and future generations	Social and environmental aspects are taken into consideration during the environmental impact assessment process, along with appropriate market feasibility research, to ensure that the project is viable and sustainable. The proposed development responds to the Regional Spatial Development Framework of the local municipality.
<p>Everyone has the right to have the environment protected, for the benefit of present and future generations through reasonable legislative and other measures that:</p> <ul style="list-style-type: none"> • prevent pollution and ecological degradation • promote conservation • secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development 	<p>The proposed development plan ensures that areas of cultural and ecological value are maintained.</p> <p>Also, please refer to the Draft EMP (Annexure K) which thoroughly discusses aspects that are related to ecological preservation, conservation and sustainable development.</p>
The environment is a functional area of concurrent national and provincial legislative competence, and all spheres of government and all organs of state must co-operate with, consult and support one another	Applicable national, provincial and municipal legislation is taken into account and aligned to during the environmental impact assessment process
<p>Furthermore, this act develops a framework for integrating good environmental management into all development activities, while establishing principles guiding the exercise of functions affecting the environment.</p> <p>Integrated Environmental Management (IEM) is designed to ensure that the environmental consequences of development proposals are understood and adequately considered in the</p>	<p>A thorough impact assessment process has been undertaken – derived from:</p> <ul style="list-style-type: none"> • Public Participation • Specialist studies • Map assessments • Institutional and legal assessment <p>This process allows for adequate planning and mitigation.</p>

LEGISLATURE	RESPONSE
<p>planning, implementation and management of all developments. It is intended to guide, rather than impede the development process by providing an approach to gathering and analysing information, and ensuring that it can be easily understood by all interested and affected parties in the development. The purpose of IEM is to resolve or lessen any negative environmental impacts and to enhance positive aspects of development proposals.</p>	<p>Please refer to item 15 of this report which provides information on the assessment process.</p>
<p>8.2.3 The National Water Act, 1998 (Act No 36 of 1998)</p>	
<p>The National Water Act:</p> <ul style="list-style-type: none"> • Recognizes that water is a scarce and unevenly distributed national resource which occurs in many different forms which are all part of a unitary, inter-dependent cycle • Recognizes that while water is a natural resource that belongs to all people, the discriminatory laws and practices of the past have prevented equal access to water, and use of water resources • Acknowledges the National Government's overall responsibility for and authority over the nation's water resources and their use, including the equitable allocation of water for beneficial use, the redistribution of water, and international water matters • Recognizes that the ultimate aim of water resource management is to achieve the sustainable use of water for the benefit of all users • Recognizes that the protection of the quality of water resources is necessary to ensure sustainability of the nation's water resources in the interests of all water users • Recognizes the need for the integrated management of all aspects of water resources and, where appropriate, the delegation of management functions to a regional or catchment level so as to 	<p>In essence, the proposed development should align to the purpose of this Act, therefore ensuring that the nation's water resources are protected, utilised, developed, conserved, managed and controlled in ways that take the following into account:</p> <ul style="list-style-type: none"> • Meeting basic human needs of present and future generations • Promoting equitable access to water • Promoting efficient, sustainable and beneficial use of water in the public interest • Reducing and preventing pollution and degradation of water resources • Facilitating social and economic development • Providing for the growing demand for water use • <p>The Act requires that (where applicable) the 1:50 and 1:100 year flood line be indicated on all the development drawings that are being submitted for approval. These flood lines have been indicated, as they directly affect the proposed development site.</p> <p>Please refer to Figure 8 – Environmental Composite.</p>

LEGISLATURE	RESPONSE
enable everyone to participate	
8.2.4 National Environmental Management: Biodiversity Act, (Act No 10 of 2004)	
<p>The National Environmental Management: Biodiversity Act aims to provide for the management and conservation of South Africa's biodiversity within the framework of the National Environmental Management Act1, 1998; including the –</p> <ul style="list-style-type: none"> • Protection of species and ecosystems that warrant national protection • The sustainable use of indigenous biological resources • The fair and equitable sharing of benefits arising from bio-prospecting involving indigenous biological resources • The establishment and functioning of a South African National Biodiversity Institute; and for matters connected therewith 	<p>An ecological specialist was appointed to undertake the flora and fauna biodiversity assessment, with specific attention to Red Data Listed species, habitats and biodiversity</p> <p>The specialist study is aligned to requirements of this act.</p> <p>The proposed development aligns to the purpose of this Act and the above-mentioned specialist report.</p> <p>The sustainable utilisation of indigenous biological resources, i.e. indigenous vegetation species will be reintroduced to the newly created urban open spaces as far as possible, thereby resulting in an ecological urban regeneration strategy.</p> <p>Please refer to Annexure K – Draft EMP for additional information.</p>
8.2.5 The National Heritage Resources Act, 1999 (Act No 25 of 1999) (NHRA)	
<p>The NHRA focuses on the following, that have reference to the development of land:</p> <ul style="list-style-type: none"> • To introduce an integrated and interactive system for the management of the national heritage resources • To promote good government at all levels, and empower civil society to nurture and conserve their heritage resources so that they may be bequeathed to future generations • To lay down general principles for governing heritage resources management throughout the Republic • To introduce an integrated system for the identification, assessment and management of the heritage resources of South Africa • To establish the South African Heritage Resources Agency together with its Council to co-ordinate and promote the management of heritage resources at 	<p>The proposed development should respond to the requirements of the National Heritage Resources Act as well as that of the South African Heritage Resources Agency (SAHRA).</p> <p>Section 38 of the NHRA makes provision for application by developers for permits before any heritage resources may be damaged or destroyed. A specialist in the field was appointed to conduct a Cultural Heritage Resources Impact Assessment. Some heritage features were identified on the site, however no valuable heritage areas, including graves, were found to occur on the proposed development site.</p> <p>In the event that artefacts / graves / areas of cultural significance are discovered during the construction phase, all work should be halted and a cultural heritage practitioner should be appointed to examine the site and make appropriate recommendations.</p>

LEGISLATURE	RESPONSE
<p>national level</p> <ul style="list-style-type: none"> • To set norms and maintain essential national standards for the management of heritage resources in the Republic and to protect heritage resources of national significance • To provide for the protection and management of conservation-worthy places and areas by local authorities; and to provide for matters connected therewith 	
<p>This legislation aims to promote good management of the national estate, and to enable and encourage communities to nurture and conserve their legacy so that it may be bequeathed to future generations. It recognises that our heritage is unique and precious and it cannot be renewed as it –</p> <ul style="list-style-type: none"> • Helps us to define our cultural identity and therefore lies at the heart of our spiritual well-being and has the power to build our nation • Has the potential to affirm our diverse cultures, and in so doing shape our national character • Celebrates our achievements and contributes to redressing past inequities • Educates and deepens our understanding of society and encourages us to empathise with the experience of others • Facilitates healing and material and symbolic restitution and it promotes new and previously neglected research into our rich oral traditions and customs 	<p>The importance of cultural heritage and its related preservation is discussed within the Draft EMP (Annexure K).</p> <p>The EMP places focus on the education of people regarding places of heritage value and artefacts, should they come across them during their work activities.</p>

8.3 PROVINCIAL CONTEXT

Please note that the below section only highlights some of the most prudent issues in this regard.

Table 5: Provincial context

DOCUMENT	RESPONSE
8.3.1 KZN Planning and Development Act (2008) (KZNPDA)	
The KZNPDA states that Policy, administrative	

<p>practice and law in the Province shall promote development and land use which:</p>	
<p>Promotes the more compact development of urban areas and the limitation of urban sprawl and the protection of agricultural resources;</p>	<p>The proposal addresses this requirement via its position within the urban realm adjacent to existing and proposed transport corridors and adjacent to urban amenities. Also, the residential and ancillary uses character caters for high densities which will minimise the necessity for urban development on the outskirts of urban areas.</p>
<p>Supports the correction of historically distorted spatial patterns of settlement in Gauteng;</p>	<p>To be addressed as far as possible with regard to the provision of more affordable high density accommodation therefore catering for a greater socio-economic spectrum.</p>
<p>Promotes integrated land development in rural and urban areas in support of each other;</p>	<p>This proposal forms part of a greater planning framework for the area and integration is ensured via appropriate service and infrastructure provision, the provision of linking transport corridors and the continuity of ecological corridors such as the drainage line to the west of the proposed development site which connects to the St Leger development .</p>
<p>Results in the use and development of land that optimises the use of existing resources such as engineering services and social facilities; and</p>	<p>Existing bulk services are to be utilised as far as possible with appropriate upgrades where necessary.</p>
<p>Owens positive development qualities, particularly with regard to public environments.</p>	<p>The urban design framework and planning methodologies cater for inclusive design at a pedestrian scale, incorporating public open spaces and positive streetscapes.</p>
<p>Policy, administrative practice and law in the Province shall with due regard to the principles of the National Environmental Management Act, 1998 (Act 107 of 1998) promote sustainable development that:</p> <ul style="list-style-type: none"> • Is within the fiscal, institutional and administrative means of the Province • Meets the basic needs of all citizens in an affordable way • Establishes viable communities with convenient access to economic opportunities, infrastructure and social services • Optimises the balanced use of existing resources, including resources relating to 	<p>Sustainable principles are to be incorporated as far as possible within the planning, design, construction and operational phases therefore ensuring an appropriate balance between social, economic and environmental contexts. The environmental impact assessment process ensures that sound land development practices are implemented, creating a balance between environmental, social and economic requirements.</p>

<p>agriculture, land, water, minerals, services infrastructure, transportation and social facilities</p> <ul style="list-style-type: none"> • Balances environmental considerations of preserving natural resources for future generations with economic development practices and processes • Ensures the safe utilisation of land by taking into consideration its biophysical factors such as geology and undermined or hazardous areas 	
<p>8.3.2 Systematic Conservation Plan and Decision-Framework for KwaZulu-Natal</p>	
<p>The aim of the document is:</p> <ul style="list-style-type: none"> • Determine acceptable goals and targets for the conservation of the Province’s biodiversity. • Identify critical areas of the province that require protection in order to achieve these goals. • Incorporate these results into a systematic but flexible decision framework suitable for inclusion into the Integrated Development Plans required by local authorities. 	<p>Sustainable principles are to be incorporated as far as possible within the planning, design, construction and operational phases therefore ensuring an appropriate balance between social, economic and environmental contexts.</p> <p>The environmental impact assessment process ensures that sound land development practices are implemented, creating a balance between environmental, social and economic requirements.</p>
<p>8.3.3 Systematic Conservation Planning Framework (2000)</p>	
<p>The basic steps in this process are:</p> <ul style="list-style-type: none"> • Compile data on biodiversity of the planning region. • Identify conservation goals for the planning region. • Review effectiveness of existing protected areas in achieving the conservation goals. • Identify additional areas that require protection in order to achieve the conservation goals. • Identify the threats to these areas. • Identify and implement conservation actions to secure the biodiversity or processes associated with identified sites. • Manage to maintain the required values of all areas identified as being important for the conservation of biodiversity. • 	<p>Sustainable principles are to be incorporated as far as possible within the planning, design, construction and operational phases therefore ensuring an appropriate balance between social, economic and environmental contexts.</p> <p>The environmental impact assessment process ensures that sound land development practices are implemented, creating a balance between environmental, social and economic requirements.</p>

Figure 3: KZN policies – awaiting KZN DAEA maps

8.4 LOCAL CONTEXT

Please note that the below section only highlights some of the most prudent issues in this regard.

Table 6: Local Context

DOCUMENT	RESPONSE
8.4.1 Newcastle Integrated Development Plan Review 2011/12	
<p>The National Housing Sector Plan was approved by Council in February 2010.</p> <p>One of the more urgent priorities is the relocation of informal settlers from the Fairleigh – Siyahlalala settlement. However the development of approximately 1500 units is pending the upgrading of bulk water and sanitation infrastructure in Newcastle West in line with the WSDP. The Project has accordingly been given top priority on the MIG List.</p>	<p>The St Leger project responds to the need for affordable housing in the Newcastle area. .</p>
8.4.2 Newcastle South Spatial Development Framework (NSSDP)	
<p>The Newcastle Council has instituted a Spatial Development Plan for the area containing the application site, and as a result of that process has identified the site as suitable for residential development.</p> <p>Studies have revealed that the total demand for dwelling units in Newcastle can be calculated at approximately 19000 units. A study of household income reveals that approximately 68% of the households in the Newcastle area are eligible for a housing subsidy.</p>	<p>The St Leger project responds to the need for affordable housing in the Newcastle area. .</p>

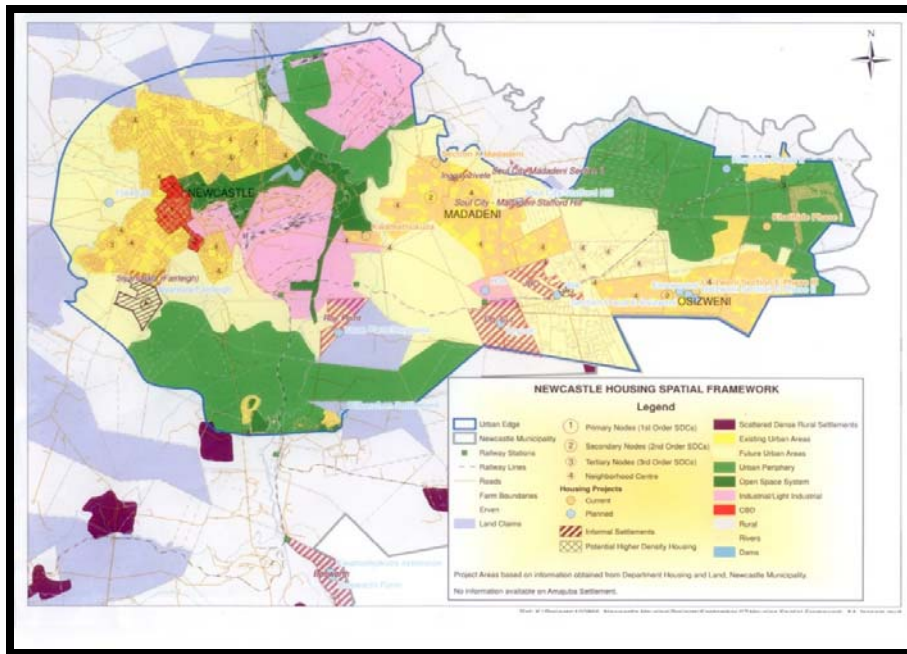


Figure 4: Newcastle Housing Spatial Framework

9.0 DESCRIPTION OF THE BIO-PHYSICAL ENVIRONMENT

9.1 CURRENT LAND USE, ZONING AND SITE CHARACTER

The property and proposed township measured 202,6170 hectare in extend. The northern portion of the farm, measuring 70 hectare will be transferred to the Newcastle Municipality for mainly low cost housing (subsidy). The remainder of the development, 132 hectare will be used for affordable housing with minimum residential stand sizes of 250m².

In terms of the provisions of the Newcastle Town Planning Scheme, 1980, the subject property is currently zoned “Agricultural”. This implies that it may be used for agricultural purposes and the erection of a single dwelling-house with the necessary outbuildings. Buildings and structures associated with farming activities may also be accommodated on the subject property.

Several dwelling-house with outbuildings and structures is situated on a portion of the subject property. Farm dams and other farming structures are also located on the farm. Northwest of the farm, adjacent to the road is a dysfunctional water treatment plant. The existing Provincial Road P39-1 between Newcastle and Normandien borders the subject property on the western boundary of the subject property. The position of existing buildings and structures situated on the subject property is indicated on the proposed township layout plan that accompanies the application documents.

9.2 SURROUNDING LAND USE, ZONING AND CHARACTER

The farm for the proposed township is located directly south of an existing informal settlement “Siyahlalala” or Fairview in Newcastle. The farm is within the existing “Urban Edge” and is earmarked according to the Newcastle Housing Spatial Framework as “Future Urban Area”.

The erf to the north of the of the township (erf 2588 -70ha in extent) is in the process to be transferred to the Newcastle Municipality and subdivided into residential erven for low-cost or subsidy housing. Supportive land uses such as retail, schools, crèche’s, churches, community facilities and open spaces will for part of the proposed township.

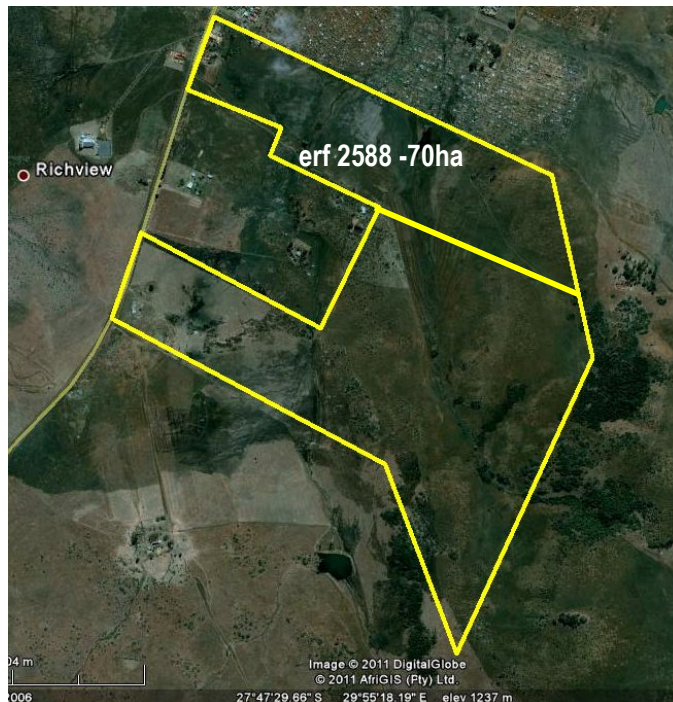


Figure 5: Aerial photo

9.3 TOPOGRAPHY

At an elevation ranging from 1 220m to 1 290m above sea level the natural ground slope of the site is generally steep with a slope between 5% and 13% and in one area up to 15% occurring in the eastern part of the study area. **Figure 6** shows the topography.

A contour survey at a 0.5m intervals were done by “Foto-Graminsura” on the total area for development. These contours were used to establish the flood lines, township designs and services designs.

Implications:

The topographical character of the site will not result in major implications on the proposed development. The steepest slopes will be left as open space.

9.4 HYDROLOGY

The surface topography of the site is characterized as being gently undulating landscape over the central and western parts of the site and to roughly undulating landscape across The site is bisected by two prominent northerly flowing drainage features and surface drainage takes place via sheetwash towards these features at gradients ranging from 3% to 10% respectively. The 1:50 year flood lines were calculated by SRK Consulting in July 2011, and incorporated in the town planning. **Annexure G – Civil Engineering Services Outline Scheme Report and Figure 6 – Environmental Composite**

Implications:

No development is to occur within the 1:100 year floodline delineation. Development and particularly storm water management, to be responsive to surrounding wetlands / hydrological systems which drain into the onsite streams. The implementation of attenuation and dissipation measures to minimise the velocity and quantity of storm water and therefore minimising environmental impacts is essential.

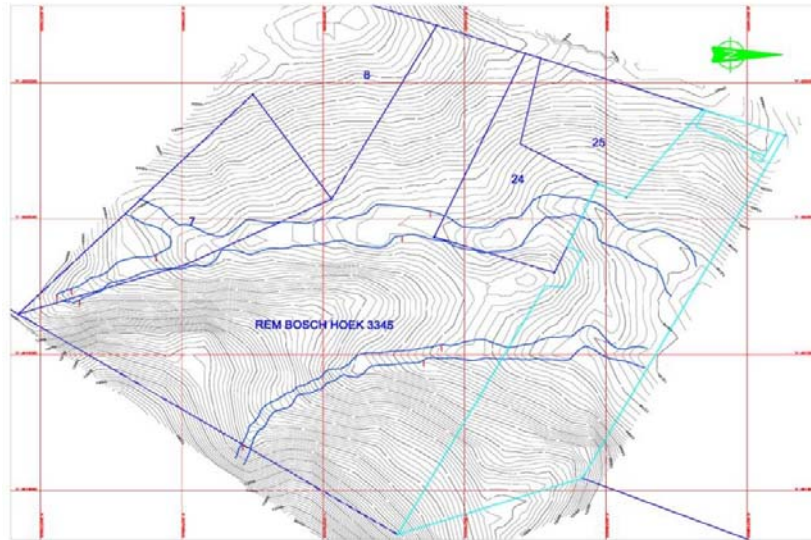


Figure 6: Contour Map

9.5 CLIMATIC CONDITIONS

Climatic conditions of the KwaZulu Natal Province vary significantly. The closest weather station to the site is the Ladysmith weather station and information from that weather station indicates that the average annual rainfall in the area is 800mm, normally between 700mm and 1100mm per annum.

KwaZulu-Natal, on the eastern side of South Africa, is bordered by the warm Indian Ocean to the east and the high escarpment of the Drakensberg Mountains to the west. The province has a warm, sub-tropical climate, with temperatures moderated by the expanse of the Indian Ocean. Summers are hot and humid averaging 28 degrees, and experience the majority of the annual rainfall, while winters, with average temperatures of 23 degrees, are warm, dry and clear. There is occasional frost in the interior and snow often falls in the higher reaches in winter. Winter sunshine averages almost 7 hours a day, some of the highest in the country.

The majority of precipitation takes place between October and April. Hail can be expected periodically, mild damage to fruit can be expected two out of every three years and severe damage two out of five. The mean minimum temperature for the area is 18,6°C, while the mean maximum is 28,8°C.

The area in which the township is being established as a residential area and moderate problems with air pollution are foreseen generated from adjacent land use.

Implications:

No specific development implications have been identified. All houses will be provided with electricity for domestic use to prevent an increase in air pollution.

9.6 GEOTECHNICAL INVESTIGATION

A phase 1 geotechnical investigation was completed by Johan van der Merwe Consulting Applied Earth and Environmental Scientists. **Annexure B: REPORT ON A PHASE 1 GEOTECHNICAL INVESTIGATION.**

The entire study area is underlain by transported silty, clayey and gravelly soils that are underlain by residual soils developed over weathered and unweathered dolerite bedrock belonging to a Post Karoo intrusive sill. The site has been apportioned into four prominent material zones, Soil Zones “A” to “D” as shown on the attached “Geotechnical Map” in the detailed Geotechnical Report.

This investigation serves as a Phase 1 geotechnical investigation in terms of the National Department of Housing’s Generic Specification GFSH-2 that specifies that a Phase 2 investigation should also be carried out. The Phase 2 investigation comprises the appointment of a competent person by the developer during the installation of township services. Such an investigation comprises observations and in some instances, additional investigations after the township has been pegged, to confirm the site class designation of individual erven in accordance with the NHBRC requirements for enrolment of top structures in the Warranty Scheme under the provisions of the Housing Consumer Protection Measures Act, 1998 (Act No 95 of 1998) and the Joint Structural Division of the South African Institution of Civil Engineering and Institution of Structural Engineers’ code of practice for foundations and superstructures for single storey residential buildings of masonry construction.

These soil zones classify as a Site Class “P” according to the guidelines of the NHBRC Standards and Guidelines of 1999 due to the fact that these soil zones occupy areas that may be affected by *seasonal flooding* and disturbed ground conditions and respectively and it is recommended that these areas be excluded from development. It is also recommended that the flood line be determined accurately and that those portions of the site that may be affected by these adverse conditions, be excluded from the development.

Implications:

The design and construction of raft foundations (whether soil or concrete) should be done in accordance with and under supervision of a civil or structural engineer. The NHBRC soil classes on the site are tentative and should be verified during construction by a competent person. The design of heavier structures such as double- and triple-storey structures should take cognisance of the potentially problematic soil conditions. Areas of disturbed ground conditions caused by past agricultural and other activities (old borrow pits, septic tanks, test pits etc.) should be identified and carefully reinstated during the construction of township services.

In view of the above observations and recommendations, it is concluded that the Remainder of the farm Bosch Hoek 3345-HS is suitable for the proposed *Residential Township Development*.

9.7 AGRICULTURAL POTENTIAL

For full details, please refer **Annexure C for the Agricultural Potential Study** completed by *Index Consulting cc.*

Methodology

This agricultural study indicates the following:

- Present and proposed land use;
- Soil description
- Water availability
- Climatic conditions
- Vegetation status and livestock carrying capacity

Following from this, the agricultural potential of the land will be indicated for various farming enterprises.

The elements indicated above will decide the agricultural potential. This potential however is also influenced by the socio-economic environment, which ultimately will determine if agriculture is viable on a specific portion of land. Suitable agricultural enterprises will be subjected to viability analysis from which the development potential for agriculture will be indicated.

Present land use

Other than grazing of a few heads of cattle, there are no farming activities on the property since the cultivated areas have reverted back to veld. There are two farm houses on the site and many labourer houses.

Soil description

There are four soil types:

- Moderately deep, well-drained soil with topsoil of sandy clay loam texture and clay content of around 24% to 35%. The soil was classified as Hutton with surface rock.
- Dark coloured vertic soils containing black expansive clay. It is normally shallower than 500 mm with a greyish brown colour and clayey texture with a clay content of more than 55% and scattered loose rock fragments. Soil types identified were Rensburg and Sepane.
- Structured soils: The soil is a-pedal topsoil that overlies structured subsoil. Sepane and Rensburg are the dominant soil forms.
- Shallow rocky soil that derived from predominantly weathered dolomite, quartzite and shale.

Potential

The site is not under permanent irrigation nor has it any particular unique value that needs protection. None of the soils forms identified qualify as high potential if the soil depth is taken into consideration. The Hutton soil that normally has a higher potential is rocky, and is 6,6 hectares in extent. It is located in the south western part of the farm. Although it fails to qualify as high potential it can, nevertheless, gainfully be used in producing fodder for the harsh winter months when the temperature can fall below freezing.

For the purposes of this study the potential income is calculated from the following land uses:

- 1) 6,6 hectares of crops;
- 2) 210 hectares of livestock grazing.

The projected net farm income is a loss of R54 423.

The land is too small for commercially viable farming. The total farming income is R146 300 hectares, which is too little to cover overheads and part time management. Changing the land use will not pose a significant loss to agriculture.

Implications:

The following conclusions can be made:

According to the criteria of the Department of Agriculture, only 6,6 ha of land can be considered as high potential land for arable agriculture. No land is under permanent irrigation. It can thus be concluded that the farm has a low agricultural potential.

9.8 ECOLOGICAL ASSESSMENT

Please refer to the **Annexure D: An evaluation of the biodiversity and wetlands for the proposed development on the Remainder of the Farm Boschhoek 3345, Newcastle, KwaZulu-Natal**, as co-ordinated and completed by *Dr George Bredenkamp from EcoAgent CC Ecology and Biodiversity Consultants*.

The ecological assessment study was undertaken to determine the overall condition and ecological status of the vegetation type of the proposed development site, as well as the occurrences (and possible potential habitat) of any RDL faunal or floral or protected floral species. The findings of this study should be used to propose recommendations and mitigation actions for the construction and management phases of the proposed development activity pertaining to various ecological processes, as well as to develop an Environmental Management Plan (EMP).

A desktop study to gain background information on the physical habitat and potential faunal and floral biodiversity lists of the proposed development site and surrounding areas was initially undertaken. These lists included the RDL species applicable to the area and a description of the physical habitat and vegetation types represented within the area. This information was then cross-referenced with the data from the habitat assessments done during the field survey. A field survey was conducted on the 5th of March 2011.

9.8.1 Vegetation type status and general area assessment

Seven plant communities were identified. The primary vegetation has a Medium sensitivity, while the secondary vegetation and disturbed areas have a Low sensitivity. Most of the area is therefore suitable for development. The wetlands and spruits are protected by law and no development should take place within the 1:100 year flood line or within 32 m from the edge of the spruit or wetland. It is furthermore suggested that the Shrubland of the Hills be at least partly conserved in an open space that remains natural.

Table 7: Vegetation types

Plant Community	Species Richness	Sensitivity
1 Tall Grassland	High	Medium

2. Shrubby Grassland of rocky areas	High	Medium
3. Shrubveld of the Hills	High	Medium
4. Secondary Grassland on Old Fields or disturbed areas	Low	Low
5. Spruits		High
6. Wetland Drainage and Seepage Systems		High
7. Homesteads	Low	Low

9.8.2 Mammals

Protection of sensitive areas as identified in the vegetation and wetland reports will allow for bio-filtering and allow for connectivity. It will also accommodate the possible occurrence of the “Critically Endangered” rough-haired golden mole, the “Near Threatened” African marsh rat, as well as the confirmed presence of sensitive vleis rats. Should at least part of the rocky ridges be deemed as sensitive and excluded from development, passive conservation will be sufficient. By preserving part of the rocky ridges as well as the two streams (each with its collective 50+50=100 meter-wide conservation buffer), habitat for most Red Data and sensitive small mammals will be preserved and connectivity will be enhanced. The proposed development will in all likelihood be concentrated on the terrestrial habitat (i.e. the grasslands). This will displace terrestrial mammals, which is of little consequence considering the extensive nature of surrounding undeveloped grasslands, especially to the west and south.

9.8.3 Birds

There are not any significant impacts on birds of conservation concern from a residential development on the farm Boschhoek, just south of Newcastle, KwaZulu-Natal. The conclusion is based on an 8-hour site visit integrated with a desktop study of the necessary reference literature. However, the site does contain important drainage systems on clay-based soils, including springs, streams, dams, riparian vegetation and alluvial flats, that require protection. This protection could be in the form of a green area to service the needs of both ecosystem functioning and recreation for the residents. It must ensure that the drainage habitats are maintained as a natural corridor for those species largely confined to these habitats. In addition, the development site also supports important patches of woodland on the crest and western slopes of two rocky ridges and these deserve protection for the diversity of bird species they support, as both habitat and as transit sites for these species between patches.

9.8.4 Herpetofauna

Of the 21 Red Data herpetofauna species of KwaZulu-Natal Province, only one species may occur on the site for the proposed development. The distribution of almost all of the other known Red Data species does not overlap with the study site. The soil composition on site consists mostly of clay, with the result that species that may occur in the area have no suitable habitat. There is almost no chance that the Striped Harlequin Snake may occur on the study site, because of the total absence of the moribund termitaria where this species is most likely to be found. The temporary manmade dams on the southern section of the study site are potential breeding habitats for Giant Bullfrogs. However, the clay soil of the surrounding areas and the lack of sand or loam soil, which giant bullfrogs need to migrate to for aestivation, resulted in their absence. The Sungazer Girdled Lizards also need mostly sand or loam soil for self-excavated burrows. This, and the almost total lack of termite mounds, at which they feed during the summer rainfall period, resulted in their absence on the study site. Only Spotted Shovel-

nosed Frogs have been recorded in a nearby quarter degree. The study site provides the pans and marshy ground in grassland that this species requires

9.8.5 Wetlands

The wetland areas are typical wetlands with wetland vegetation and wetland soil types. Two hydrogeomorphic types of wetland were identified, namely channelled valley bottom wetland as spruits and Hillslope seepage as wetlands. The Present Ecological Status (PES) score is B, indicating that the wetlands are in a good condition, largely natural with few modifications. A slight change in ecosystem processes is discernable and a small loss of natural habitats and biota may have taken place. The Ecological Importance and Sensitivity (EIS) score is C, indicating moderate importance and sensitivity. These are wetlands that are considered to be ecologically important and sensitive on a provincial or local scale.

Although most of the (terrestrial) area is suitable for development, the wetlands and spruits are protected by law and no development should take place within the 1:100 year flood line or within 32 m from the edge of the spruit or wetland. This is in line with the legal requirements for wetlands inside the urban edge. Although it is not realistic to exclude all activities from the buffer zone, it should still be considered as a sensitive feature of the landscape in which mitigation measures should be implemented.

Implications

- The proposed development site is traversed by two riverine and associated riparian habitats that could potentially be impacted negatively through ecologically insensitive construction methods.
- Construction should be limited to the dry seasons as far as possible, with silt fencing and sediment traps being implemented to negate the impact of soil erosion and sub-sequential siltation of the associated aquatic habitats
- The proposed development activities, if undertaken in an environmentally responsible manner and the proposed ecological sensitivity map is adhered to, is perceived to have an insignificant effect on the overall conservation of RDL species within the region

Planning the new residential development as an immediate extension to existing suburbs is laudable and accepted as a best-case scenario for the inevitable consequence of a burgeoning population. The rocky ridges and the streams with their wetlands should be regarded as sensitive areas. Wetland systems are ranked as very sensitive and will thus require special intervention. The proposed mitigation measures address ways to deal with stormwater runoff that, if left unattended, could cause damage to the wetland systems. Wetlands should primarily be protected by means of 50 meter wide buffer zones measured from either edge of the streams.

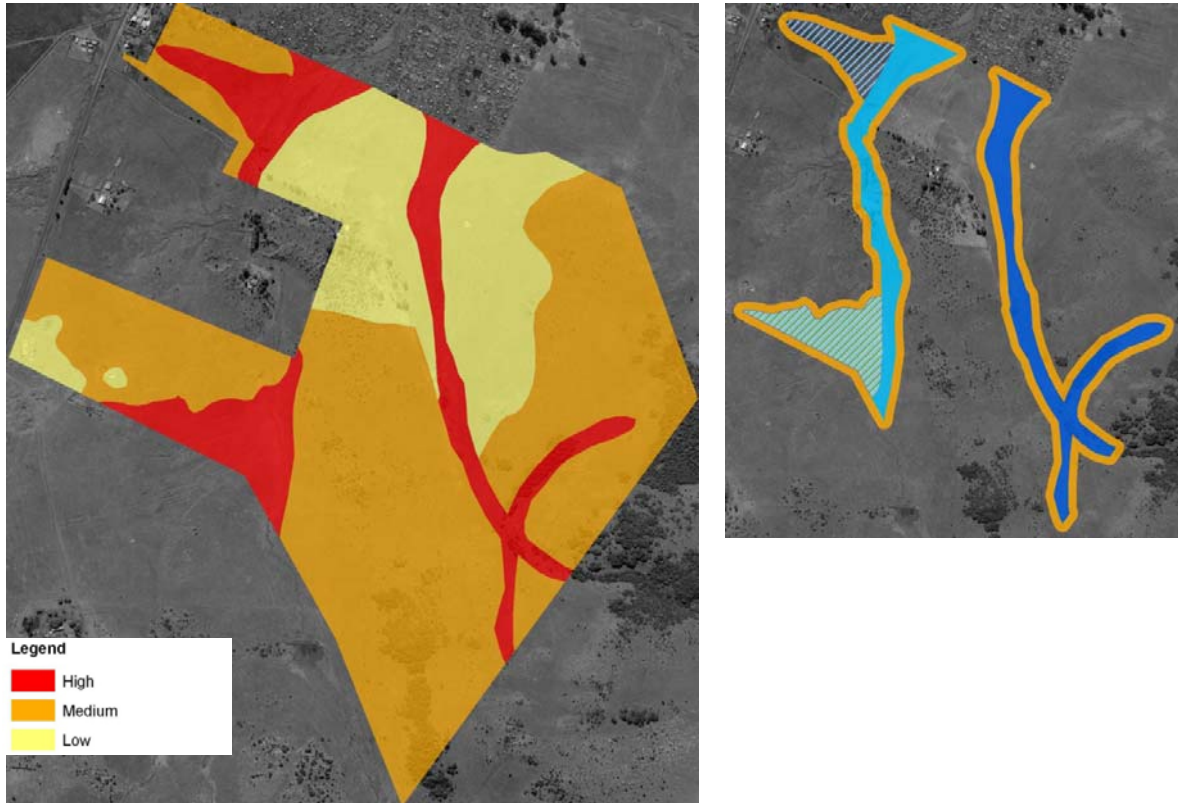


Figure 7: Ecological Sensitivity – Vegetation and Wetland Maps

10.0 DESCRIPTION OF SOCIO-ECONOMIC ENVIRONMENT

10.1 CULTURAL HERITAGE ASSESSMENT

For further information, please refer to **Annexure E: Cultural Heritage Resources Impact Assessment** as completed by *African Heritage Consultants cc.*

Scope of the Study

An independent heritage consultant was appointed to conduct a survey to locate, identify, evaluate and document sites, objects and structures of cultural importance found within the boundaries of the proposed development site. The following are the most important sites and objects protected by the National Heritage Act:

- Structures or parts of structures older than 60 years
- Archaeological sites and objects
- Palaeontological sites
- Meteorites
- Ship wrecks
- Burial grounds

- Graves of victims of conflict
- Public monuments and memorials
- Structures, places and objects protected through the publication of notices in the Gazette and Provincial Gazette
- Any other places or object which are considered to be of interest or of historical or cultural significance
- Geological sites of scientific or cultural importance
- Sites of significance relating to the history of slavery in South Africa
- Objects to which oral traditions are attached
- Sites of cultural significance or other value to a community or pattern of South African history

Methodology

All relevant maps and documents on the site were studied. The site was visited and evaluated.

Findings

The proposed development area is typical Kwa- Zulu Natal mountain grassland with indigenous and exotic trees, with a stream running through the farm. The following cultural heritage resources were recorded.

- Farm settlement (S27° 47' 13.4" & E 29° 55' 14.4")
- Cattle dip (S27° 47' 8.2" & E29° 55' 5.6")
- Farm workers cemetery (S27° 47' 2.69" & E29° 54' 56.2")
- Informal settlement cemetery (S27° 46' 54.1" & E29° 55' 02.3")
- Old Waterworks

Implications

- Farm settlement – Most of the structures are older than sixty years and representative of a typical farm settlement of the 1940/50's. Very few of these settlements have survived. The settlement is of regional importance.
- Cattle dip – The cattle dip is typical of the dips of the 1940's where farmers had to dip their cattle on a regular basis under supervision of government dip inspectors. Today the dips are not in use any more. The dip represents an interesting part of farm practice. The dip is at least of local interest.
- The cemeteries are important and have to be dealt with according to legislation.
- Old waterworks – The old waterworks are an interesting site from a construction and engineering point of view. The site is at least of local interest.

10.2 VISUAL INTEGRITY OF THE AREA

Due to the topography and location of the project area, the proposed development will have some visual impact. However, it could have a positive impact if the development is planned well and integrated into the surroundings.

The following visual criteria were used to determine what possible visual impact the proposed development could have on the surrounding environment:

Table 8: Visual Impact Analysis

PREDICTED IMPACT			
Visual criteria	Low	Medium	High
Quality of the area	The site or surrounding environment has little or no natural quality	The site or surrounding environment has some natural quality	The site or surrounding environment has a definite natural quality
Compatibility with surrounding environment	The development will blend in / compliment the surrounding environment completely	The environment will be able to accommodate the development without looking out of context	The environment will not be able to accommodate the development. Development will look abnormal in setting
Viewing distance	Continuous viewing distance to site is less than 500m	Continuous viewing distance to site is between 500 m and 1 km	Continuous viewing distance to site is more than 1 km
Visual acceptance capability	The environment can visually accept the type of development, due to its location adjacent to the existing housing developments	The environment can moderately accept the type of development, due to its varied vegetation and land-uses	The environment cannot visually accept the type of development, due to its unvarying vegetation and land-uses

Implications

It can be deduced that the proposed development will not blend with the surrounding environment, but will be a pleasant new housing township, that is much needed in the town and which will be seen and accepted as growth and prosperity for the people in Newcastle, the visual impact is mitigated in a psychological manner rather than a physical manner.

The architectural and landscape architectural guidelines for the proposed development will be developed to allow for a positive aesthetic influence on the surrounding environment. The guidelines will include aspects of finishes, lights pollution, colours to blend into the surrounding colours, heights of buildings, and roof finishes. Aesthetics and contextual appropriateness is to be a major aspect of these guidelines.

The design of the proposal will in fact enhance visibility via a striking architectural design of a small commercial complex, therefore emphasising the recommended nodal character and ensuring adequate place-making.

10.3 INFRASTRUCTURE AND SERVICES

10.3.1 Traffic and Access Routes

Please refer to **Annexure F – Transportation Assessment** as completed by *WSP Engineering*.

WSP Engineering was appointed as part of the project team to complete a Traffic Impact assessment according to *Manual for Traffic Impact Studies (1995)*. It was confirmed that provincial road planning affects the proposed township. This study investigates the impact of the additional traffic generated by the proposed township on the immediate surrounding road network and determines whether it is necessary to implement any road and/or intersection improvements to mitigate the anticipated traffic impact. Comments are also made in respect of site access and nonmotorised & public transport. Given the extent of the proposed township on a currently vacant site, it was necessary to consider the existing and future road network in the area. In this respect the internal road network of the proposed township had been designed as such to tie in with the future road planning.

Given the existing spare capacity on Boundary Road to the west of the site and the anticipated traffic generations of the proposed township, it is submitted that the proposed township is not dependent on the implementation of the abovementioned future roads. However, once implemented, the future roads would significantly improve the accessibility to/from the proposed township.

The proposed main east-west spine road through the proposed township will form a new T-intersection with Boundary Road, which will serve as the only access to the township in the short to medium term. The location of the proposed intersection has taken account of the limited access restriction along Boundary Road and it is line with the access principles of a Class 2 road. Boundary Road / Access Road Intersection:

As part of the implementing the short-medium access to the township, a new third leg is proposed off Boundary Road which will serve as the primary access road. Also, As part of implementing the proposed township, a new network of local roads is proposed as shown in the township layout. Key characteristics of these streets, such as road reserve widths, intersection spacing, roadway widths, types of kerbs, surfacing, etc will be dealt with and negotiated with the municipality as part of the services agreement.

The proposed township will cater for the lower income market. These households typical have a low socio economic profile and it is expected that the majority of the residents will commute to/from work by means of public transport such as minibus taxis. Although there are currently no public transport services in the vicinity of the subject site, it is expected that taxi operators will respond to the demand created by the new township. It is anticipated that the minibus taxis will at least run along the main internal spine roads from where residents will have less than 1km to walk.

Implications

Improvements to traffic and transportation conditions in the proposed township will be accommodated with external road improvements, internal roads and the provision for public transportation and sidewalks for pedestrians. It is believes that the proposals will be adequate to accommodate the new residents.

From a traffic engineering perspective, the proposed township is supported provided that the proposed internal roads, intersection upgrade and suggested non-motorised and public transport facilities be implemented to the relevant design standards of the local and/or provincial roads authority.

10.3.2 Civil Services

Please refer to **Annexure G: Services Report** as completed by KBK Engineers (Pty) Ltd as Consulting Civil Engineers

Water

It is the responsibility of the Municipality to bring the bulk services to the boundary of the site.

Water for the town of Newcastle is supplied from the Ngagane water purification plant. This plant is at present running at 110% of the design capacity with the consequence that no water is available for any new development within Newcastle. The supply line for raw water, from the Ntshingwayo dam, is also at capacity.

A new pumpline was designed to pump water from the purification plant to a new proposed reservoir positioned close to the northeast corner of Bosch Hoek 3345. This pumpline can also provide water for the proposed Bosh Hoek townships. The pumpline and reservoir still have to be put out on tender for construction. The size of the reservoir (5 MI at present) has to be re-evaluated in the light of this new proposed township and other areas that may benefit from such a reservoir. Water demand is estimated as follows:

Affordable houses	:	2 700 erven x 600 ℓ/erf	=	1 620 kℓ/day
General Business (9 sites)	:	5,575 ha/100 m ² x 0,5 x 400 ℓ	=	112 kℓ/day
Sport (1 site)	:	1,288 ha x 12,5 kℓ/ha	=	16 kℓ/day
School (3 sites)	:	10,616 ha x 15,0 kℓ/ha	=	159 kℓ/day
Crèche (4sites)	:	0,919 ha x 12,5 kℓ/ha	=	12 kℓ/day
Church (3 sites)	:	3 x 2 000 ℓ/erf	=	6 kℓ/day
Clinic (1 site)	:	0,623 / 100 m ² x 0,5 x 500 ℓ	=	16 kℓ/day
Total water demand per day			=	1 941 kℓ/day
			→	2 000 kℓ/day

The site will be supplied with water via an uPVC main distribution network, which will also provide water to the fire hydrants. Isolation valves will be positioned along the water pipes to facilitate easy maintenance.

Sewer

It is the responsibility of the Municipality to bring the bulk services to the boundary of the site.

The sewer network within the proposed township will be a full waterborne sanitation system and will drain in a northwest direction to connect to the network of the proposed Siyhlalala Project.

The existing outfall sewer to service these developments is at present a concrete pipe sewer and no spare capacity is available to accommodate the additional sewage flow. The pipe is also in a poor condition and has to be upgraded or replaced with a new pipeline.

This outfall sewage line drains to the Voortrekker pump station. The sewage is then pumped from Voortrekker pump station to pump station no. 1 and from there to the treatment works. To accommodate the additional sewage generated by the proposed developments the following needs to be done as indicated by Mr R Gillmer:

- The pump station at Voortrekker is too small and has to be upgraded.
- The capacity and condition of the rising main to pump station No. 1 needs to be evaluated.
- The pumps at pump station No. 1 are in good condition and will have capacity but the temporary storage facility needs upgrading.
- The pumpline and outfall pipelines to the treatment works also need maintenance and/or upgrading.

Roads

The proposed township layout makes provision for Collector roads, Bus routes and Access streets of varying road reserve and road widths.

Road reserve widths will vary between 20 m, 16 m, 13 m and 8 m with road widths between 10,5 m and 4,0 m. Collector and bus routes will be paved and standards of all other roads to be agreed upon in cooperation with the Local Authority.

The construction cost of all internal roads will be at the cost of the Developer.

Storm water

Stormwater from rainfall would mainly be generated on the site itself. The development is traversed by two well defined natural waterways running in a south-north direction through the site. Stormwater from the site will be released, on a regular, into these water waterways.

Stormwater will be collected via catchpits within paved roads and then piped and discharged into the waterways. If alternative roads, for instance gravel roads, be considered stormwater will be managed via open canals at the elevated side of the road reserve with concrete or gabion drifts where these canals crosses any road intersection. These canals will also discharge into the waterways.

Pipes will be concrete pipes with ogee joints and pipes to be installed to the appropriate trenching and bedding requirements as per SANS1200.

The rainfall average for this area is 820 mm/year with average rainy days of 120 days/year.

In terms of Section 144 of the National Water Act (Act 36) of 1998 the proposed township is affected by two 1 : 50 and 1 : 100 flood lines. The floodlines as indicated on the drawing were calculated by SRK Engineers and their report is available separately to this report.

Solid Waste

Removal of solid waste will be the responsibility of the local municipality

Electrical Supply

Please refer to **Annexure H: Electrical Services Report** as completed by *RPC Consulting*.

New Castle Council will supply electrical services to the development, The electrical reticulation must conform to Council standards and requirements and will be handed over to New Castle Council after commissioning.

In a meeting with Council officials it was stated that there is adequate capacity on the existing Lennoxton substation transformers for the private development of appr. 2,800 stands. The neighbouring Siyahlala development to be developed by the Council will have a separate electrical supply. The private and Council developments can thus run independently. A unit demand of 2kVA was used to calculate a total demand for the private development of 5.6 MVA. It is required to install 2 x 5.5km 240mm² aluminium 11kV cables from Lennoxton substation up to a central distribution point in the private development.

11.0 PUBLIC PARTICIPATION

Please refer to **Annexure I: Public Participation Report**.

The Public Participation Process is to be conducted as an essential component of the Environmental Impact Assessment Process in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended, and the Environmental Impact Assessment Regulations, 2010

11.1 Notification of Interested and Affected Parties

LEAP notified Interested and Affected Parties of the public participation process for the proposed development in the following ways:

- A newspaper advertisement was placed in the The Mercury newspaper on 4 March 2011
- Detailed site notices were prepared in accordance with the requirements of the Regulations and were erected at the main entrance to the property, as well as other visible points, on 5 March 2008.
- A Background Information Document (BID) was posted, faxed, emailed or hand delivered to all adjacent landowners. Written acknowledgement has been gathered from each of these landowners. The BID document provides information concerning the proposed development. Interested and affected parties were invited to submit written comments concerning the proposed development and become part of the environmental process

- Ward Councillor Jean Damon of Ward 25 will be kept informed of the proposed development at all times at jean.damon@telkomsa.net contact tel: 034 328 7600
- Local authority officials were contacted by the relevant consultants. Direct communication with Mr Erick Nyathikazi (Newcastle Municipal Acting SED DP & HS) is ongoing

11.2 Public Meeting

Once the awareness raising initiative of the proposed development was achieved, a public meeting was arranged for the 31th of March 2011 at The Cannon Restaurant, New Castle, KZN. Despite the fact that the meeting was advertised, attendance was limited to the professional team and only few attendees

The purpose of the meeting was to:

- Provide an opportunity for interested and affected parties (I&AP's) to obtain clear and accurate information about the proposed activity
- Provide I&AP's with an opportunity to indicate their viewpoints, issues and concerns regarding the planned activity
- Discuss the way forward

The presentation that was prepared for the meeting is included under the Public Participation Report in **Annexure I**.

11.3 Issues and Concerns

Written correspondence received from I&APs by GAA has been collected and a list of all issues and concerns compiled. These are referred to the appropriate specialists for addressing. A list of issues and concerns was drawn up from the following sources:

- Written correspondence received from I&APs

The Environmental Impact Assessment aims to address these issues & concerns from the public, and those identified during all the other methods of impact identification. All issues and concerns received throughout the entire environmental assessment process will be addressed in the Final Environmental Impact Assessment. Issues and concerns are addressed in this report.

11.4 Public Insight

The Scoping Report was made available for public insight from 18 May 2011 to 18 June 2011 in hard copy at the Local Library in Newcastle. The expected impacts, as issued by the I&APs are included in the issues and response register as attached to this report, also **Table 10** below.

This Draft Environmental Impact Assessment (EIA) Report will also be made available for public review for a period of 30 days from the 20th of August 2011 till the 21st September 2011. Comments received on the Draft EIA will be included within the Comments and Response Report (Appendix 6) of the Public Participation Report (**Annexure I**)

11.5 Issues and response register

Table 9: Comments and response register

	NAME	DATE RECEIVED	COMMENT	RESPONSE
1.	Mr Mckenzie	31/03/2011 (Public Meeting)	Mr Mckenzie wants to know how they will be influence by the development? GvdM asked where his property is and then explained that there will not be any direct influence on his property.	GvdM asked where his property is and then explained that there will not be any direct influence on his property.

Implications:

The issues and responses as per the public participation report are to be reviewed and addressed as far as possible. I&APs are to be contacted and informed regarding the environmental process

12.0 ENVIRONMENTAL COMPOSITE MAP

An Environmental Composite Map was configured to clearly understand the various environmental characteristics and areas of significance that could be taken into consideration. This map indicates the following in relation to the proposed development site:

- 1:100 year floodline delineation (does not affect the proposed development site)
- Contours
- High, medium and low ecological sensitivity
- The following areas, according to the environmental composite map, are no-go zones for development and therefore considered significant and environmentally sensitive:
- The 1:100 year floodline and wetland areas on the proposed development site are to be maintained as conservation zone open space areas and green corridors

Please refer to **Figure 8: Environmental Composite**

13.0 ALTERNATIVES IDENTIFIED & MOTIVATION FOR PROPOSED DEVELOPMENT

The concept of Integrated Environmental Management suggests that an Environmental Impact Assessment process, to determine the possible impact of the proposed activity, should incorporate the consideration of feasible alternatives. A reasonable number of possible proposals or alternatives, to achieve the same objective should be assessed. The identification, description, evaluation and comparison of alternatives are important for ensuring a sound environmental scoping process.

Alternatives should be considered as a norm within the Environmental Process. These should include, as applicable, the demand alternative, scheduling alternative, land use alternative (including the NO-go option), location alternatives and service alternatives.

13.1 Demand Alternatives

Having regard to the size of the proposed development site (approximately 135 hectares) and the location adjacent to the local informal community, Siyahlalala, and bordering on Boundary Road to develop the land as a residential and ancillary uses/nodal development, aligns to the area's needs and demands for residential and supporting uses, therefore providing accessible employment opportunities.

In a general sense, the demand alternative only presents two logical alternatives namely:

- To retain the site as open land (the status quo); or
- To develop the land as an infill component to the established urban environment, linking the site to surrounding activities and accessible infrastructure

To a large extent, events have overrun the option of retaining the land within its current status. The financial requirement that is necessary to revive the land's agricultural use is rising every year and it is becoming more and more difficult to make a living by farming the lands, therefore making this option

unfeasible. It appears that, from a demand perspective, the alternative of developing the land as an infill portion in the area concerned would be appropriate.

13.2 Process Alternatives

It would appear that the process relevant to the establishment of a development area can only be achieved by way of one of two alternatives, namely:

- An application in terms of the Kwazulu-Natal Planning and Development Act 2008 or alternatively (preferred alternative)
- An application in terms of the Town Planning and Townships Ordinance, 1986 (Ordinance 15 of 1986)

The end result in respect of either of the above-mentioned processes would be similar in that the development area will result in the transformation of a portion of land into a residential development with ancillary uses. The development process per se (in a physical sense) does not offer viable alternatives to consider other than making reference to typical construction methods relevant to the building of roads, the laying of subterranean infrastructure and the like. Clearly, methods applied may involve more or less manual labour in certain circumstances. In the development proposal under consideration, manual labour will indeed be feasible having regard to the scale and extent of the development which, in turn, will enhance employment creation and should be preferred as the alternative construction method where practically possible.

13.3 Scheduling Alternatives

The creation of a residential development with ancillary uses of the scale and nature proposed by the land development applicant is not specifically sensitive to weather patterns or cycles. There does not appear to be a more or less preferred time to undertake the physical development associated with a new urban complex in the form of road construction and the laying of infrastructure. Typically, the rainy season (spring and summer) may impact negatively on the construction related activities and may result in "down time". It follows that, if possible, the construction periods during the seven phases should accord with the winter months to avoid down time related to rain. Following this alternative it may also result in less of an impact on the possibility of top soil erosion during flash thunderstorms and increased runoff where new trenches lie exposed to the elements for a restrictive period of time. However, suitable mitigation methods can be employed to curb washing of storm water into sensitive wetland areas.

13.4 Location Alternatives

Location alternatives for the proposed development, which constitutes a residential development with ancillary uses, such as the preferred activity alternative, include the following:

13.4.1 Inner-city location

An inner-city location would be environmentally and socially feasible, however economically unviable, provided that the same area extent of land be found available for development as inner-city resources are very scarce. However, the proposed location of the site is close to the CBD of Newcastle and directly adjacent to the existing low cost housing areas of the town.

13.4.2 Suburban location

Not socially, environmentally or economically feasible due to the following:

- Not situated adjacent to primary movement corridors
- Not accessible to a range of socio-economic population groups
- Isolated nature of development and therefore not inclusive
- Contrasting densities and heights with regard to the residential development with ancillary uses proposal
- Availability of land at an affordable cost minimal

13.4.3 Urban edge / rural location (preferred)

Although land is available in this location at a lower economic cost, this location is socially and environmentally less feasible due to the following:

- The land is available at an affordable cost
- Aligns to the prerequisites of the Newcastle SDF
- Situated within the urban realm adjacent to existing and proposed urban infrastructure, service and amenities
- Socially inclusive due to its location to numerous communities and along public transport routes

13.5 Land Use Alternatives

The following Land Use alternatives have been investigated:

13.5.1 Alternative 1: No-go Option

This implies that the site be left as is and that no development or alteration be done. If this alternative is pursued the sites existing habitat will be retained. This option has the following drawbacks:

- A high demand for residential development with ancillary uses and employment provision exists in this area, especially with respect to the proposed developments characteristics as urban edge development. Should the site not be developed a very viable opportunity to exploit the residential development with ancillary uses market in the immediate area will be negated.
- If not developed, the owner will derive no income from the property and will subsequently not be able to maintain it. This will lead to the site falling into disrepair and the protection and appropriate management of potential conservation areas will be negated
- Illegal squatters or vagrants may potentially settle on the site, as severe pressure for housing in the lower income brackets also exist. Due to the presence of extensive development

throughout the greater area it is possible that undeveloped, un-managed land may be illegally settled.

- Agriculture is not an economically viable option according to the agriculture potential study

Due to the pressure and demand for the provision of residential development with ancillary uses in the area and the very limited space available for this purpose; given the fact that the site will eventually degenerate if left unmanaged, and the fact that it is most likely unsuitable to be utilised for grazing or agricultural purposes due to its location, it is reasonable to state that the no-go option is less favourable than some of the other options presented. Furthermore, should this property not be developed it would be left as an isolated and disconnected land due to all the surrounding areas that have already received environmental authorisation and on which development will proceed.

13.5.2 Alternative 2: Low Density Residential

The provision of a low density residential development does not cater for numerous socio-economic requirements and is therefore less favourable than the preferred alternative (residential development with ancillary uses). Furthermore, other sections of Newcastle are composed of low density residential estates which already cater for this housing requirement.

Additionally the following drawbacks with respect to this alternative are applicable:

- This option will exclude a very large number of potential buyers from purchasing property in the area, especially with respect to the current economic environment that we find ourselves in
- Lack of diversity and vibrancy associated with a residential development with ancillary uses
- Lack of response to the Newcastle SDF with regard to densification and the creation of a regional urban node

13.5.3 Alternative 3: Light Industrial

The introduction of a light industrial development, although suited to the general functioning and land uses of the surrounding urban environment and other light industrial areas, is considered unsuitable due to the following reasons:

- Over-saturation of a single-use activity
- Inappropriateness to the adjacent low-residential and medical activities and therefore does not respond to the immediate context and surrounding land-uses
- Lack of diversity and vibrancy associated with a Light Industrial development
- Higher risk of pollution to the surrounding drainage lines and the drainage systems

13.5.4 Preferred alternative: Mixed Use Residential development with ancillary uses

This is the preferred alternative by the developer. As mentioned before, this development proposal will enhance the requirement of the Newcastle SDF to develop the town as node of regional importance. This development will furthermore also meet the requirements of the surrounding area in terms of retail, and residential activities. The flood line area of the two streams will be accommodated by the development in terms of an open space. Furthermore, the configuration of this layout makes provision for the proposed link road.

Please refer to **Figure 9: Proposed Layout** and **Figure 10: Proposed Layout over Aerial**.

This development is viewed as desirable, and as the preferred alternative, due to the following:

- The strategic position of the proposed development on the Newcastle Normandie Road, and the proposed location of the servitude for the future link road which will improve access to this development.
- The development aligns to the requirements of the Newcastle SDF and definitely meets the requirements of the area
- The proposed development will compliment the surrounding urban activities, including business and residential activities
- The socio-economic value of the proposed development is considered high, as a residential development with ancillary uses caters for a variety of social and economic factors
- Creation of a safe and sustainable environment via appropriate management
- Creation of employment opportunities (short to medium term during the construction period over the next three years, and the spin-off permanent employment)
- Enhance property value, as well as safety and security of surrounding areas

For further information please refer to **Annexure J – Town Planning Motivation**.

13.6 ALTERNATIVES FOR SERVICES AND OTHER LISTED ACTIVITIES

Table 10: Alternatives for services and other activities

INDICATE THE NUMBER AND DATE OF THE RELEVANT NOTICE:	ACTIVITY NO (S) (IN TERMS OF THE RELEVANT OR NOTICE) :	DESCRIPTION AND COMMENTS ON ALTERNATIVES
<p>GN Reg 544, 18 June 2010</p> <p>Item 9</p>	<p>The construction of facilities or infrastructure exceeding 1000 metres in length for the bulk transportation of water, sewage or storm water -</p> <p>(iii) with an internal diameter of 0,36 metres or more; or</p> <p>(iv) with a peak throughput of 120 litres per second or more,</p> <p>excluding where:</p> <p>a. such facilities or infrastructure are for bulk transportation of water, sewage or storm water or storm water drainage inside a road reserve; or</p> <p>b. where such construction will occur within urban areas but further than 32 metres from a watercourse, measured from the edge of the watercourse. measured from the edge of the watercourse.</p>	<p>No alternative for this activity exists.</p> <p>The sewer reticulation system will be designed to take the capacity of sewer generated by the development and adequately transfer it to the existing municipal sewer treatment plant. The pipe sizes will be selected to ensure adequate capacity to effectively transport all effluent.</p> <p>Applicable alternative: Selection of materials to be utilised and the location of the pipes.</p> <p>Where stream crossings are required, they will be implemented according to the DWAF requirements.</p>
<p>GN Reg 544, 18 June 2010</p> <p>Item 10</p>	<p>The construction of facilities or infrastructure for the transmission and distribution of electricity -</p> <p>(ii) inside urban areas or industrial complexes with a capacity of 275 kilovolts or more.</p>	<p>No alternative for this activity exists.</p> <p>The electricity consumption will be kept to a minimum with the use of solar geysers, and other alternative energy sources, such as gas.</p>

INDICATE THE NUMBER AND DATE OF THE RELEVANT NOTICE:	ACTIVITY NO (S) (IN TERMS OF THE RELEVANT OR NOTICE) :	DESCRIPTION AND COMMENTS ON ALTERNATIVES
<p>GN Reg 544, 18 June 2010 Item 11</p>	<p>The construction of:</p> <ul style="list-style-type: none"> (i) canals; (ii) channels; (iii) bridges; (iv) dams; (v) weirs; (vi) bulk storm water outlet structures; (vii) marinas; (viii) jetties exceeding 50 square metres in size; (ix) slipways exceeding 50 square metres in size; (x) buildings exceeding 50 square metres in size; or (xi) infrastructure or structures covering 50 square metres or more <p>where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line</p>	<p>No alternative for this activity exists. Stream crossings are kept to a minimum.</p> <p>The development is planned to accommodate a 32 m buffer from any wetland and stream area.</p> <p>Where stream crossings are required, they will be implemented according to the DWAF requirements.</p>
<p>GN Reg 544, 18 June 2010 Item 18</p>	<p>The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock from</p> <ul style="list-style-type: none"> (v) a watercourse; (vi) the sea; (vii) the seashore; (viii) the littoral active zone, an estuary or a distance 18of 100 metres inland of the high-water mark of the sea or an estuary, whichever distance is the greater- <p>but excluding where such infilling, depositing, dredging, excavation, removal or moving</p> <ul style="list-style-type: none"> (ii) is for maintenance purposes undertaken in accordance with a management plan agreed to by the relevant environmental authority; or occurs behind the development setback line 	<p>No alternative for this activity exists.</p> <p>The development is planned to accommodate a 32 m buffer from any wetland and stream area.</p> <p>Where stream crossings are required, they will be implemented according to the DWAF requirements.</p>
<p>GN Reg 544, 18 June 2010 Item 22</p>	<p>The construction of a road, outside urban areas,</p> <ul style="list-style-type: none"> (iii) with a reserve wider than 13,5 meters or, (iv) where no reserve exists where the road is wider than 8 metres, or <p>for which an environmental authorisation was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Notice ?? of 2010.</p>	<p>No alternative for this activity exists.</p> <p>The local municipality requires the upgrading of roads and services in and around the proposed development. Where these upgrading are required are not currently known, but it is anticipated that it will be adjacent to the site.</p> <p>Internal roads will be constructed and existing roads will be upgraded where necessary.</p> <p>Access roads and entrance roads must be located along the contours as far as possible,</p>

INDICATE THE NUMBER AND DATE OF THE RELEVANT NOTICE:	ACTIVITY NO (S) (IN TERMS OF THE RELEVANT OR NOTICE) :	DESCRIPTION AND COMMENTS ON ALTERNATIVES
		<p>and at appropriate distances from each other along the provincial roads.</p> <p>The roads in the development as well as the access road to the development will be constructed according to the standards of the provincial and local governments and according to the recommendations of the traffic engineer.</p>
<p>GN Reg 544, 18 June 2010</p> <p>Item 37</p>	<p>The expansion of facilities or infrastructure for the bulk transportation of water, sewage or storm water where:</p> <p>(c) the facility or infrastructure is expanded by more than 1000 metres in length; or</p> <p>(d) where the throughput capacity of the facility or infrastructure will be increased by 10% or more—</p> <p>excluding where such expansion:</p> <p>(iii) relates to transportation of water, sewage or storm water within a road reserve; or</p> <p>(iv) where such expansion will occur within urban areas but further than 32 metres from a watercourse, measured from the edge of the watercourse.</p>	<p>No alternative for this activity exists.</p> <p>The sewer reticulation system will be designed to take the capacity of sewer generated by the development and adequately transfer it to the existing municipal sewer treatment plant. The pipe sizes will be selected to ensure adequate capacity to effectively transport all effluent. Applicable alternative: Selection of materials to be utilised and the location of the pipes. Where stream crossings are required, they will be implemented according to the DWAF requirements.</p>
<p>GN Reg 544, 18 June 2010</p> <p>Item 39</p>	<p>The expansion of</p> <p>(vii) canals;</p> <p>(viii) channels;</p> <p>(ix) bridges;</p> <p>(x) weirs;</p> <p>(xi) bulk storm water outlet structures;</p> <p>(xii) marinas;</p> <p>within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, where such expansion will result in an increased development footprint but excluding where such expansion will occur behind the development setback line</p>	<p>No alternative for this activity exists. Stream crossings are kept to a minimum.</p> <p>The development is planned to accommodate a 32 m buffer from any wetland and stream area.</p> <p>Where stream crossings are required, they will be implemented according to the DWAF requirements.</p>
<p>GN Reg 544, 18 June 2010</p> <p>Item 47</p>	<p>The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre -</p> <p>(iii) where the existing reserve is wider than 13,5 meters; or</p> <p>(iv) where no reserve exists, where the existing road is wider than 8 metres –</p> <p>excluding widening or lengthening occurring inside urban areas</p>	<p>No alternative for this activity exists.</p> <p>The local municipality requires the upgrading of roads and services in and around the proposed development. Where these upgrading are required are not currently known, but it is anticipated that it will be adjacent to the site.</p> <p>Internal roads will be constructed and existing roads will be upgraded where necessary.</p> <p>Access roads and entrance roads must be located along the contours as far as possible, and at appropriate distances from each other along the provincial roads.</p> <p>The roads in the development as well as the</p>

INDICATE THE NUMBER AND DATE OF THE RELEVANT NOTICE:	ACTIVITY NO (S) (IN TERMS OF THE RELEVANT OR NOTICE) :	DESCRIPTION AND COMMENTS ON ALTERNATIVES
		access road to the development will be constructed according to the standards of the provincial and local governments and according to the recommendations of the traffic engineer.
GN Reg 545, 18 June 2010 Item 15	Physical alteration of undeveloped, vacant or derelict land for residential, retail, commercial, recreational, industrial or institutional use where the total area to be transformed is 20 hectares or more; except where such physical alteration takes place for: (iii) linear development activities; or (iv) agriculture or afforestation where activity 16 in this Schedule will apply.	The total area of the proposed development site is approximately 132 ha hectares. Please refer to item 13.5 of this report for varying land use and layout options, as well as Table 12.

14.0 COMPARISON OF ALTERNATIVE LAND USES

Please refer to the Table 11: Comparison of alternatives below, a comparison of the five alternative activities for the proposed development site with regards to layout and densities, engineering and design alternatives, road access, storm water management, waste collection, sewer disposal, impact on the surrounding environment and visual impact. Within this comparison it may be assumed that mitigation measures have been adequately implemented. The impact rating is as follows:

High	-	5
Medium	-	3
Low	-	1
Lowest score	-	8
Highest score	-	40

Table 11: Comparison of alternatives

	Alternative 1: No-go	Impact Rating	Alternative 2: Low Density Residential	Impact Rating	Alternative 3: Light Industrial	Impact Rating	Preferred Alternative: Residential development with ancillary uses	Impact Rating
Layout and densities	The site will remain as it currently exists. The potential for the site to fall into disrepair is high, along with inappropriate management / control and the potential for informal settlement invasion. The No-go option is not considered desirable.	Medium – 3 No improvements will be implemented.	A low density layout is monotonous and unresponsive to the SDF and will not create a balance between social, economic and environmental requirements for the growing urban environment.	High – 5 Due to lack of diversity and vibrancy and responsiveness to city requirements	Monotonous and mono-functional. Unresponsive to the RSDF and will not create a balance between social, economic and environmental requirements for the growing urban environment.	High – 5 Due to lack of diversity and vibrancy and responsiveness to city requirements	Residential development with ancillary uses with a layout that is responsive to the city requirements creating a balance between environmental, social and economic requirements. Optimal utilisation of land to promote an accessible development.	Low – 1 Urban design framework that responds to city requirements
Engineering and design	This alternative will not currently require upgrading of engineering services; however no upgrades will be implemented to the benefit of the surrounding area.	Med-low – 2 No improvements will be implemented	Structural and design aspects can be accommodated within this proposal. Positioning of services will be strategically planned according to the proposed layout to prevent further impacts on the environment.	Med-low – 2 The systems will be designed to function optimally and measures can be implemented to ensure effective monitoring	Structural and design aspects can be accommodated within this proposal. Positioning of services will be strategically planned according to the proposed layout to prevent further impacts on the environment.	Med-low – 2 The systems will be designed to function optimally and measures can be implemented to ensure effective monitoring	Structural and design aspects can be accommodated within this proposal. Positioning of services will be strategically planned according to the proposed layout to prevent further impacts on the environment.	Med-low – 2 The systems will be designed to function optimally and measures can be implemented to ensure effective monitoring

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	Alternative 1: No-go	Impact Rating	Alternative 2: Low Density Residential	Impact Rating	Alternative 3: Light Industrial	Impact Rating	Preferred Alternative: Residential development with ancillary uses	Impact Rating
				and maintenanc e		and maintenanc e		and maintenanc e
Road access	To remain as existing. No upgrades will be required and implemented.	High – 5 No improvements will be implemented in an area that desperately requires road upgrades	Entrances and accesses as well as road upgrades according to the traffic engineering report. Limited public transport improvement and accessibility due to gated community.	High – 5 Due to gated community structure in an area that should be accessible	Entrances and accesses as well as road upgrades according to the traffic engineering report.	Med-low – 2 Increase in traffic to be accommodated due to surrounding road upgrades	Re-alignment of the K22 servitude to form an intersection with the R25 and to reduce instances where the alignment conflicts with existing buildings and infrastructure. Entrances and accesses as well as road upgrades according to the traffic engineering report.	Med-low – 2 Increase in traffic to be accommodated due to surrounding road upgrades
Stormwater management	The storm water is currently managed as sheet flow. The site drains naturally towards the streams which borders the flows through of the site. Better management options could be implemented to prevent erosion.	Medium – 3 No storm water management	Storm water management via a storm water drainage system composed of stormwater inlets and pipes along internal roads which connecting to attenuation structures. No water will be released into natural systems without retention and slowing down of the water. Accumulated storm water can be utilised for irrigation of open spaces.	Medium – 3 Effective storm water management can be implemented	Storm water management via a storm water drainage system composed of stormwater inlets and pipes along internal roads which connecting to attenuation structures. No water will be released into natural systems without retention and slowing down of the water. Accumulated storm water can be utilised for irrigation of open spaces.	Medium – 3 Effective storm water management can be implemented	Storm water management via a storm water drainage system composed of stormwater inlets and pipes along internal roads which connecting to attenuation structures. However, stormwater will be released into the streams and no provision has been made for stormwater retention. Accumulated storm water can be utilised for irrigation of open spaces	Medium-High – 4 Effective storm water management can be implemented

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	Alternative 1: No-go	Impact Rating	Alternative 2: Low Density Residential	Impact Rating	Alternative 3: Light Industrial	Impact Rating	Preferred Alternative: Residential development with ancillary uses	Impact Rating
Waste collection	No waste management strategies are currently being implemented.	Med-low – 2 No improvements will be implemented	Refuse removal to be provided by the Newcastle Local Municipality, however waste is to be minimised by the provision of waste transfer stations	Med-low – 2 Effective waste management due to structure and management by Body Corporate.	Refuse removal to be provided by the Newcastle Local Municipality, however waste is to be minimised by the provision of waste transfer stations	Med-high – 4 Due to hazardous waste risk	Refuse removal to be provided by the Newcastle Local Municipality, however waste is to be minimised by the provision of waste transfer stations	Med-low – 2 Effective waste management due to structure and management by individual land parcels
Sewer disposal	No additional requirement.	Medium – 3 No improvement to system in the area	Improvement of municipal sewage reticulation system. Increase on load.	Medium – 3 Less time for expansion due to probably once-off roll out	Improvement of municipal sewage reticulation system. Increase on load.	Medium – 3 Phased nature of development will ensure the correct and timeous planning associated with the upgrading of sewer system	Improvement of municipal sewage reticulation system. Increase on load.	Medium – 3 Phased nature of development will ensure the correct and timeous planning associated with the upgrading of sewer system
Impact on surrounding environment	No change expected other than the potential degradation that could be resultant of poor site	Med-low – 2 No change, however possibility of	Impact on the ecological environment is mitigated due to the provision of adequate open space for ecological connectivity and	High – 5 A definite change in land use,	Impact on the ecological environment is mitigated due to the provision of adequate open space for ecological connectivity and	Med-high – 4 A definite change in	Impact on the ecological environment is mitigated due to the provision of adequate open space for ecological connectivity and	Med-low – 2 A definite change in land use,

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	Alternative 1: No-go	Impact Rating	Alternative 2: Low Density Residential	Impact Rating	Alternative 3: Light Industrial	Impact Rating	Preferred Alternative: Residential development with ancillary uses	Impact Rating
	management and illegal informal occupation.	illegal squatters	preservation. No surrounding community benefit as the development will most likely be gated and inaccessible with no economic and social facilities that are available for surrounding neighbourhoods.	although strict access control with no surrounding community access	preservation. Great pollution hazard of surrounding environment.	land use No accessible social or economic facilities for surrounding community	preservation. The community will benefit due to the provision of various residential development with ancillary uses, the improvement of bulk infrastructure as well as various job opportunities.	along with a mix of economic and social land uses that will benefit surrounding community
Visual impact	Visual impact will not change.	Low – 1	Unilateral and monotonous mass of development. Lack of diversity and vibrancy	High – 5 Can potentially be mitigated with greening	Visual impact of monotonous industrial activities. Haphazard building forms, materials and colours. Due to the land use type not much aesthetic design detail is considered. High lighting pollution.	High – 5 Can be mitigated via strict design guidelines	Vibrancy and diversity associated with residential development with ancillary uses character under an umbrella of guidelines (materials, lighting, greening, forms, etc)	Med-low – 2 Architectural guidelines and aesthetic requirements
IMPACT SCORE		21		30		28		18

15.0 ENVIRONMENTAL ISSUES AND POTENTIAL IMPACTS

15.1 Methods used to identify potential impacts

A combination of the following methods was used to identify impacts during the Scoping and EIA Processes:

15.2 Specialist Study Findings

A minimum of legally responsible specialist studies is conducted (as required by KZN DAEA and as per DEAT guidelines). The findings of such specialist studies highlighted potential impacts on protected or endangered species and/or environments. Methods used to determine the potential impacts are:

Site Inspection

The environmental consultant and specialists conduct several site visits and identified potential sensitive environments. These areas are then red-flagged to be investigated further and excluded from development.

Desktop Studies

Specialist reports such as the geotechnical and agricultural assessments are used to identify those areas and aspects that may be impacted on, but that will not be identified through the other specialists' studies.

Public Participation

Conducting public participation produces an issues list. Such a list needs to be screened for relevant impacts which then need to be addressed by specialist studies or identified for further investigation. A very comprehensive public participation process was followed, including a public meeting.

KZNDAEA Review / Terms of Reference

KZNDAEA reviews the application and the different sub-directorates within the department give comments to the relevant environmental officer. The issues identified are forwarded to the environmental consultant and these issues are addressed or translated as impacts.

15.3 Impact Identification

Environmental impacts can be classified according to physical impacts, bio-physical impacts and socio-economic impacts and can occur during the construction and / or operational phases.

15.3.1 Physical Impacts

- Geological impacts
- Topographical impacts
- Air quality
- Soil and land capability
- Water quality and availability – surface and ground water

15.3.2 Biophysical

- Impacts on flora and flora habitats
- Impacts on fauna and fauna habitats
- Sensitive landscapes
- Conservation

15.3.3 Socio-economic Impacts

- Noise pollution
- Visual impact
- Sites of cultural significance
- Safety and security
- Impact on rural ambience of the area
- Traffic increase on roads
- Services being inadequate and malfunctioning (including electricity, waste management, water, sewage management systems)
- Run away fires due to poor fire management and lack of capacity to fight fires.
- Improved tax base
- Bulk contributions which result in the improvement of infrastructure in the area

15.4 Assessment of Impacts

15.4.1 Definition of terms

Construction Phase: All construction or related activities, from occupation by the contractor, until the contractor leaves the site.

Operational Phase: All activities related to and including the operation and maintenance of the proposed development.

Nature: The type of effect the specific activity will have on the environment

Probability: Degree of certainty of impacts

Duration: Lifetime of the impact

Scale: Spatial scale of the impact

Magnitude: Degree/severity of impact

15.4.2 Methodology

The significance of the identified impacts will be determined using the approach outlined below. This incorporates two aspects for assessing the potential significance of impacts (terminology from the

Department of Environmental Affairs and Tourism Guideline document on EIA Regulations, 2010), namely occurrence and severity, which are further sub-divided as follows:

Tables 12: Methodology to determine impact

Occurrence		Severity	
Probability of occurrence	Duration of occurrence	Magnitude (severity) of impact	Scale / extent of impact

To assess each of these factors for each impact, the following four ranking scales are used:

PROBABILITY	DURATION
5 – Definite/don't know	5 – Permanent
4 – Highly probable	4 – Long-term
3 – Medium probability	3 –Medium-term (8-15 years)
2 – Low probability	2 – Short-term (0-7 years) (impact ceases after the operational life of the activity)
1 – Improbable	1 – Immediate
0 – None	
SCALE	MAGNITUDE
5 – International	10 – Very high/don't know
4 – National	8 – High
3 – Regional	6 – Moderate
2 – Local	4 – Low
1 – Site only	2 – Minor
0 – None	

Once these factors are ranked for each impact, the significance of the two aspects, occurrence and severity, is assessed using the following formula:

$$SP \text{ (significance points)} = (\text{probability} + \text{duration} + \text{scale}) \times \text{magnitude}$$

The maximum value is 150 significance points (SP). The impact significance will then be rated as follows:

SP >75	Indicates high environmental significance	An impact which could influence the decision about whether or not to proceed with the project regardless of any possible mitigation.
SP 30 – 75	Indicates moderate environmental significance	An impact or benefit which is sufficiently important to require management and which could have an influence on the decision unless it is mitigated.
SP <30	Indicates low	Impacts with little real effect and which should not have an influence on or

	environmental significance	require modification of the project design.
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15.5 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Please refer to **Table 13** which indicates the quantification of impacts related to construction activities and **Table 14** which indicates the quantification of impacts related to the operational activities, as per the methodology identified above.

Also please refer to **Annexure K: Draft Environmental Management Plan (EMP)**.

Legend:	M:	Magnitude of impact	High	>70	SBM: Significance Before Mitigation
	D:	Duration of impact	Mod.	30 -70	SAM: Significance After Mitigation
	S:	Scale of impact	Low	0 - 30	Positive impacts are shaded in green
	P:	Probability of unmitigated occurrence occurring			

15.5.1 Construction Phase

Table 13: Quantification of impacts related to construction activities

Environmental Component	Activity	Potential Impact	Environmental Significance Score							Mitigation Measures	
			P	D	S	M	Total	When	Rating		
Physical Impacts											
Geology	There are no expected construction related impacts on the geology of the proposed development site and surrounding areas										None, although geological monitoring should commence during the Construction Phase by the Geotechnical engineer
Topography	Construction activities including levelling of road and building surfaces	Erosion	4 3	2 2	2 1	6 4	48 24	SBM SAM	M L	Demolition and construction activities should preferably take place during the dry months All surface run-offs shall be managed in such a way so as to ensure erosion of soil does not occur All surfaces that are susceptible to erosion shall be covered with a suitable vegetative cover as soon as construction is completed Where erosion may potentially occur, dissipaters such as gravel beds or straw bales must be installed to prevent erosion. For further information please refer to the Draft EMP (Annexure K)	
Air quality	Construction activities and vehicles on site.	Dust pollution that affects adjacent developments.	3 2	2 2	2 1	6 4	42 20	SBM SAM	M L	Dust to be minimised by spraying down (water truck) of construction site daily	
Soils and land capability	Site clearance for road construction and construction of units and other structures	Compaction of topsoil	4 2	2 2	1 1	6 4	42 20	SBM SAM	M L	The top (200-300mm) layer (as applicable) of all areas to be excavated for the purposes of construction shall be stripped and stockpiled in areas where this material will not be damaged, removed or compacted. This stockpiled material shall be used for the rehabilitation of the site. Weeds appearing on the stockpiled topsoil shall be removed by hand before seeding. For further information please refer to the Draft EMP (Annexure K)	
	Site vehicles and storage of fuel on site	Contamination by fuel and lubricant spillages from vehicles	3 2	2 2	1 1	5 4	30 20	SBM SAM	M L	Provision of proper re-fuelling and maintenance facilities and procedures will reduce the likelihood of soil contamination For further information please refer to the Draft EMP (Annexure K)	
Water quality and	Storage of fuel and	Fuel or chemical	3	2	2	6	42	SBM	M	Good housekeeping by contractor	

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Environmental Component	Activity	Potential Impact	Environmental Significance Score							Mitigation Measures
			P	D	S	M	Total	When	Rating	
availability	re-fuelling of construction vehicles	spillage and pollution of surface and/or ground water	1	2	2	4	20	SAM	L	Store new and used oils in bunded areas No co-handling of reactive liquids or solids should be allowed Create and monitor an inventory of chemicals held on site For further information please refer to the Draft EMP (Annexure K)
	There will be no construction related impact on the quantity of groundwater available to surrounding borehole users									None, although groundwater monitoring should commence during the Construction Phase
Biophysical Impacts										
Flora	Site clearing for construction activities	Loss of species diversity and habitat characteristics	5 4	2 2	1 1	10 8	80 56	SBM SAM	H M	Most of the site will be transformed due to the requirement to develop this site as a regional node The Environmental Control Officer (ECO) is to be trained to be able to identify any possible red data species Set up a planting list together with the ecologist from which all rehabilitation in the development must be done – only indigenous and non-invasive species For further information please refer to the Draft EMP (Annexure K)
Fauna	Site clearing for construction activities	Loss of species diversity and habitat characteristics	5 4	2 2	1 1	10 8	80 56	SBM SAM	H M	Most of the site will be transformed due to the requirement to develop this site as a regional node The riparian zones with associated floodlines to be retained The Environmental Control Officer (ECO) is to be trained to be able to identify any possible red data species For further information please refer to the Draft EMP (Annexure K)
Sensitive landscapes	Construction activities – wetland and associated buffer areas	Loss of valuable landscape and habitat	4 2	3 3	1 1	8 4	64 24	SBM SAM	M L	The sensitive drainage line areas adjacent and off the proposed development site are to be fenced off from all construction activities For further information please refer to the Draft EMP (Annexure K)
Conservation	Delineation of conservation area – wetland areas and associated buffers	Conservation and maintenance of valuable landscape and habitat – benefit to local and regional biodiversity	3 4	2 2	2 3	4 6	28 42	SBM SAM	L M	Delineation of the conservation area prior to commencement of construction activities Education of construction workers regarding the value of the conservation area

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Environmental Component	Activity	Potential Impact	Environmental Significance Score							Mitigation Measures	
			P	D	S	M	Total	When	Rating		
		by minimising fragmentation of ecological systems									
Socio-economic Impacts											
Noise pollution	All construction activities	Nuisance to surrounding land owners	4 3	3 3	2 1	6 4	54 28	SBM SAM	M L	Locate noisy machines and equipment maintenance areas as far away from sensitive receptors as possible Adherence to acceptable working hours Adherence to Occupational Health and Safety Act Ear protection for workers that may be affected by noise For further information please refer to the Draft EMP (Annexure K)	
Visual integrity	Construction activities	Visibility of dust and construction activities from surrounding roads, properties and tourist locations	3 2	3 3	2 2	6 4	48 28	SBM SAM	M L	Apply dust control measures diligently, especially on provincial roads Apply recommendations of specialist regarding colour and construction of site structures during the Construction Phase	
Sites of cultural significance	No areas of cultural significance were found on the proposed development site									Should any potentially culturally significant artefacts or graves, etc be found during construction activities all activities should be stopped until an assessment by a Cultural Heritage practitioner has been completed For further information please refer to the Draft EMP (Annexure K)	
Safety and security	Construction workers in the area	Increase in crime in area and increase in squatters of vacant land	4 2	3 3	3 2	8 4	80 28	SBM SAM	H L	Proper management and planning No construction work will be allowed on sundays A limited number of workers along with security guards will be allowed to sleep on site, however within a cordoned-off secure area All staff will carry identification, access control will be enforced and the site will be swept and a search will be done each night The development will have 24-hour access control and security A CLO (Community Liaison Officer) should be employed For further information please refer to the Draft EMP (Annexure K)	
	Construction works	Migration of job seekers into the	3 2	3 3	2 2	6 4	48 28	SBM SAM	M L	No on-site recruitment is to take place The CLO (Community Liaison Officer) to be consulted regarding employment of	

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Environmental Component	Activity	Potential Impact	Environmental Significance Score							Mitigation Measures	
			P	D	S	M	Total	When	Rating		
		area in search of employment									members of the surrounding communities
		Increase in construction traffic	4 3	3 3	3 2	8 4	80 32	SBM SAM	H M		The access of large trucks will be investigated to provide a suitable access route that does not become a nuisance to existing residents Only a specified number of trucks at any one time will be allowed onto the property Construction vehicles and activities must aim to avoid peak hour traffic times (weekdays 7-8am and 5-6pm) Establish an all-weather site access and wheel wash or shake down to prevent soil and materials from being trekked onto the road
		Decrease in safety due to increased traffic	4 3	3 3	2 2	10 6	90 48	SBM SAM	H M		Security fencing and barriers Perimeter fence patrols
Local services	Construction activities that utilise local services	Inadequate service provision to adjacent properties and malfunctioning of services	2 1	3 3	2 2	4 2	28 12	SBM SAM	L L		The service systems are to be designed according to the minimum requirements of, and submitted to the Local authority for approval. No construction activities must commence on site prior to obtaining the necessary approval
Fire	Cooking fires by construction workers	Veld fires	3 1	3 3	3 2	6 4	54 24	SBM SAM	M L		A designated area shall be assigned for fire making by the construction workers, so as to ensure that run-away veld fires do not occur This will reduce air pollution by excessive smoke
Improved tax base for local municipality	Employment of construction workers	Decrease in unemployment and crimes related to unemployment	4 5	3 3	2 2	8 8	72 80	SBM SAM	M H		Local labour to used as far as possible for the installation of services and the construction of the retirement village and associated infrastructure Local training and capacity building programmes Construction timeframe could be lengthy due to the extent and phased nature of the proposed development
		BEE development opportunities	2 3	3 3	2 2	4 6	28 48	SBM SAM	L M		Contract requirements to involve and train BEE companies
	Local demand for goods and services	Decrease in unemployment and empower of local trade and industry	2 3	3 3	2 2	4 6	28 48	SBM SAM	L M		Local products, goods and services to be utilised as far as possible during the construction phase Local training and capacity building programmes

15.5.2 Operational Phase

Table 14: Quantification of impacts related to the operational phase

Environmental Component	Activity	Potential Impact	Environmental Significance Score							Mitigation Measures	
			P	D	S	M	Total	When	Rating		
Physical Impacts											
Geology	There are no expected operational related impacts on the geology of the proposed development site and surrounding areas										None, although geological monitoring should possibly commence during the Construction Phase by the Geotechnical engineer.
Topography	Construction activities including levelling of road and building surfaces continued during operational phase	Erosion	4 3	2 2	2 1	6 4	48 24	SBM SAM	M L	Demolition and construction activities should preferably take place during the dry months. All surface run-offs shall be managed in such a way so as to ensure erosion of soil does not occur. All surfaces that are susceptible to erosion shall be covered with a suitable vegetative cover as soon as construction is completed. Where erosion may potentially occur, dissipaters such as gravel beds or straw bales must be installed to prevent erosion. For further information please refer to the Draft EMP (Annexure K)	
Air quality	Construction activities and vehicles on site.	Dust pollution that affects adjacent developments.	3 2	2 2	2 1	6 4	42 20	SBM SAM	M L	Dust to be minimised by spraying down (water truck) of construction site daily	
Soils and land capability	Site clearance for road construction and construction of units and other structures continued during operational phase	Compaction of topsoil	4 2	2 2	1 1	6 4	42 20	SBM SAM	M L	The top (200-300mm) layer (as applicable) of all areas to be excavated for the purposes of construction shall be stripped and stockpiled in areas where this material will not be damaged, removed or compacted This stockpiled material shall be used for the rehabilitation of the site Weeds appearing on the stockpiled topsoil shall be removed by hand before seeding For further information please refer to the Draft EMP (Annexure K)	
Water quality and availability	General usage of water (household, business, irrigation, etc)	Water wastage	4 2	4 1	3 2	6 4	66 20	SBM SAM	M L	Waste water to be recycled and re-used as far as possible to ensure that minimum amounts are required for aspects like irrigation. Good monitoring and management measurements to be set in place by facilities managers	

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Environmental Component	Activity	Potential Impact	Environmental Significance Score							Mitigation Measures
			P	D	S	M	Total	When	Rating	
	Malfunctioning of sewage treatment plant or any other serious pollution event	Water pollution	3 2	3 2	3 1	8 6	72 30	SBM SAM	H M	Adequate measures to be put in place to prevent surface and groundwater contamination of any kind – responsibility of civil engineers No French drains allowed All sewage infrastructure is to be maintained and checked at yearly intervals A plan should be put in place that caters for the event of a large fuel spill in the water – to form part of the recommendations of the RoD by KZNDAAE
	There will be no operational activities that should impact on the quantity of groundwater available to surrounding borehole users									
Biophysical Impacts										
Flora	General human interference and impact	Loss of species diversity and habitat characteristics	4 2	4 1	1 1	6 4	54 16	SBM SAM	M L	Walkways throughout the open spaces and conservation zones will be strategically placed and users will be enforced to only use delineated walkway areas so as not to damage surrounding habitats Landscaping guidelines which include an allowable indigenous vegetation list that attracts fauna is to be formulated and made a condition of sale No exotic vegetation will be allowed
Fauna	General human interference and impact	Loss of species diversity and habitat characteristics	4 2	4 1	1 1	6 4	54 16	SBM SAM	M L	Walkways throughout the open spaces (drainage line area) will be strategically placed and users will be enforced to only use delineated walkway areas so as not to damage surrounding habitats Landscaping guidelines which include an allowable indigenous vegetation list that attracts fauna is to be formulated and made a condition of sale Minimal to no exotic vegetation will be allowed
Sensitive landscapes	General human interference and impact	Loss of valuable landscape and habitat associated to drainage line to the west of the proposed development site	4 2	4 1	1 1	6 4	54 16	SBM SAM	M L	Walkways through sensitive landscapes will be strategically placed and users will be enforced to only use delineated walkway areas so as not to damage surrounding habitats

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Environmental Component	Activity	Potential Impact	Environmental Significance Score							Mitigation Measures
			P	D	S	M	Total	When	Rating	
Conservation	Delineation of conservation corridor associated to floodlines – western drainage corridor	Rehabilitation, conservation and maintenance of this landscape and habitat – benefit to local and regional biodiversity by minimising fragmentation of ecological systems	2 4	1 4	2 5	4 8	20 88	SBM SAM	L H	Conservation management to be done in collaboration with the local municipality
Socio-economic Impacts										
Noise pollution	As the site will be established and due to the Commercial/Light Industrial activities related to the operational phase no major impacts are expected, however, due to the phased nature of the project construction activities will continue for a lengthy period									Please refer to the noise mitigation measures during construction phase (Table 14), as well as the Draft EMP (Annexure K)
Visual integrity	Higher density caused by development and change in land use	Change in sense of place of the specific site, however appropriate and good design will result in an improved urban character and will positively enhance the site and surrounding urban context potentially raising economic value of	4 3	4 4	2 2	8 4	80 36	SBM SAM	H M	Architectural guidelines (including aspects of roof and wall finishes, colours, heights of buildings, and lighting), as well as Landscape Architectural guidelines (screening, buffering, functioning, aesthetics etc) for the development will be developed to promote the enhancement of this urban area and therefore creating new and valuable places with a modified and positive urban sense of place that is vibrant and diverse

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Environmental Component	Activity	Potential Impact	Environmental Significance Score							Mitigation Measures
			P	D	S	M	Total	When	Rating	
		surrounding areas								
Sites of cultural significance	Structures and areas of cultural significance will be managed according to SHARA guidelines									Should any potentially culturally significant artefacts or graves, etc be found during the operational phase, the development management is to be informed and a Cultural Heritage practitioner is to be contacted to decide on a way forward
Safety and security	Active operational phase with variety of functions and activities ranging from residential, business and Commercial/Light Industrial	Decrease in crime due to the creation of a more secure environment and minimising of vacant land	2 4	2 4	1 2	4 8	20 80	SBM SAM	L H	Security provided via passive surveillance Appropriate environmental design to address safety and security issues (CSIR publication) Good accessibility for emergency and police services
Traffic increase	Increase of residents and users of the area	Additional vehicles on road	4 3	4 3	3 2	8 4	88 24	SBM SAM	H L	All requirements of local municipality to be adhered to All improvements to road infrastructure as recommended by traffic engineer to be adhered to
Local services	Operational activities not to influence the availability of services to surrounding land owners									The engineers compiling the services report and designing services are to ensure that adequate measures are in place to ensure adequate service delivery that does not influence surrounding areas All requirements by local municipality to be adhered to regarding service reticulation and delivery
Fire	There are no expected operational related occurrences other than normal urban activities that may result in site fires									Adequate positioning of fire hydrants according to CoJ standards.
Improved tax base for local municipality	Employment of workers during the operational phase – business sector, landscaping and maintenance, cleaning, medical	Decrease in unemployment and crimes related to unemployment	4 5	2 4	2 3	4 8	32 96	SBM SAM	M H	Local labour and employees to be made use of as far as possible for all aspects of the operational phase Local training and capacity building programmes

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Environmental Component	Activity	Potential Impact	Environmental Significance Score							Mitigation Measures
			P	D	S	M	Total	When	Rating	
	staff, etc.									
		BEE development opportunities	2 3	2 4	2 2	4 6	24 54	SBM SAM	L M	BEE companies to be trained and involved in during the operational phase of the development – e.g. Management of retail facilities, maintenance, landscaping, etc.
	Local demand for goods and services	Decrease in unemployment and empowerment of local trade and industry	2 3	2 4	2 2	4 6	24 54	SBM SAM	L M	Local products, goods and services to be utilised as far as possible during the operational phase – shops, frail care centre, craft centre, etc. Local training and capacity building programmes
	Increase in service delivery and number of even	Increase in taxes raised on property								None required
Bulk Contributions	Improvement of infrastructure	Increased service provision, minimisation of traffic congestion								Should we well planned and strategically implemented in coordination with the local municipality and KZN Roads

16.0 CONCLUSIONS AND RECOMMENDATIONS

The development proposal has no fatal flaws in terms of the institutional, bio-physical or socio-economic environments. In fact, it is believed that the proposed development compliments the required and desired balance to be achieved between socio-economic and ecological / environmental factors.

It is undeniable, that the proposed development has an optimal location within the urban realm adjacent to existing urban amenities, services and infrastructure and that it is a logical area for infill development, especially with regard to the environmental authorisations that have been obtained for all the areas surrounding the proposed development site. Should this site not be developed, it will remain as an isolated and unconnected land area that will be vulnerable to crime and potential illegal informal occupation.

It is recommended that the Residential Development with ancillary uses which has been identified as the preferred alternative is used. It is further recommended that this application be approved with the following conditions:

- All requirements from the Local Municipality be adhered to including:
- Engineering services report addressing provision of services.
- Conditions and recommendations by the Engineering Geologists be adhered to
- All other state departments' comments and input be adhered to, including but not limited to:
- Department of Water Affairs and Forestry
- South African Heritage Resource Agency
- General recommendations:
- All mitigation measures as described in this report and specialist reports are adhered to by the developer (these measures will be made part of the EMP).
- The conditions of the Record of Decision from KZNDAEA be written into the EMP and be implemented as such.
- The EMP, as attached to this document, should be made part of the contractual documents of contractors. The project manager must also account for the cost of this document's implementation before construction takes place.
- An Environmental Control Officer (ECO) should be appointed to audit the EMP on a bi-weekly basis during construction phase.
- A penalty system is set up for non-compliance to the EMP to be severe enough to practically control construction and operational activities on site.
- The EMP must be made issued to individual stand developers for implementation
- That the surrounding community be kept up date through the Town Planning Application process and during Construction Phase of the project.

