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DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (DEIA) REPORT AND ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPR)



PROPOSED MIXED-USE DEVELOPMENT ON PORTION 9 OF THE FARM KRANSHOEK NO. 432, KNYSNA ROAD, PLETTENBERG BAY

Application in terms of the National Environmental Management Act of 1998 (Act No. 107 of 1998), as amended, and the 2014 Environmental Impact Assessment (EIA) Regulations, as amended.

APPLICANT:	Status Homes Property Developers Contact: Alphonso Les Lamour
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- Environmental Impact Assessments • Basic Assessments • Environmental Management Planning
- Environmental Control & Monitoring • Water Use License Applications • Aquatic Assessments



GLOSSARY OF TERMS

Activity - An activity or operation carried out as part of the construction or operation of the housing development and associated infrastructure.

Alternatives - In relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to –

- i. The property on which or location where it is proposed to undertake the activity;
- ii. The type of activity to be undertaken;
- iii. The design or layout of the activity;
- iv. The technology to be used in the activity, and;
- v. The operational aspects of the activity.

Anthropogenic Impacts - Impacts originating in human activity, e.g. pollution, mining, destruction of vegetation etc.

Biodiversity - The diversity, or variety, of plants, animals and other living things in a particular area or region. It encompasses habitat diversity, species diversity and genetic diversity.

Community - Those people who may be impacted upon by the construction and operation of the project. This includes neighbouring landowners, local communities and other occasional users of the area.

Consultation - A process for the exchange of views, concerns and proposals about a proposed project through meaningful discussions and the open sharing of information.

Construction Phase - The stage of project development comprising site preparation as well as all construction activities associated with the development.

Cumulative Impact: The impact of an activity that by itself may not be significant but combined with other existing and potential future impacts may be significant.

Department of Environmental Affairs and Development Planning (DEA&DP) - The Provincial Directorate of the National Department for Environmental Affairs and Tourism. This Department is responsible for evaluating the viability of the development proposal and issuing the appropriate Authorisation.

Ecology - The study of the interrelationships of organisms with and within their environment.

Ecosystem - The interconnected assemblage of all species populations that occupy a given area and the physical environment with which they interact.

Endemic / Endemism - Found only within the study area / tendency of being found only in the study area.

Environment - The surroundings within which humans exist and that are made up of

- i. The land, water and atmosphere of the earth;
- ii. Microorganisms, plant and animal life;
- iii. Any Part or combination of (i) and (ii) and the interrelationships among and between them; and
- iv. The physical, chemical, aesthetic and cultural properties and conditions of the foregoing that

influence human health and wellbeing.

Environmental Authorisation – The authorisation by a competent authority of a listed activity.

Environmental Assessment Practitioner (EAP) – The person responsible for planning, management and co-ordination of environmental impact assessment, strategic environmental assessments, environmental management plans or any other appropriate environmental instrument introduced through regulations.

Environmental impact - An environmental change caused by some human act.

Environmental Impact Assessment (EIA) – In relation to an application to which scoping must be applied, means the process of collecting, organizing, analyzing, interpreting and communicating information that is relevant to the consideration of that application. This process necessitates the compilation of an Environmental Impact Report, which describes the process of examining the environmental effects of a proposed development, the anticipated impacts and proposed mitigatory measures.

Environmental Impact Report (EIR) - A report assessing the potential significant impacts as identified during the Scoping phase.

Environmental Management Programme (EMPr) - A management programme designed specifically to introduce the mitigation measures proposed in the Reports and contained in the Conditions of Approval in the Authorisation.

Fauna - The collective animals of a region.

Flora - The collective plants growing in a geographic area.

Heritage resource - A building, area, a ritual, etc. that forms part of a community's cultural legacy or tradition and is passed down from preceding generations.

Hydrological - (The study of) surface water flow.

Impact - A change to the existing environment, either adverse or beneficial, that is directly or indirectly due to the development of the project and its associated activities.

Integrated Environmental Management - The practice of incorporating environmental management into all stages of a project's life cycle, namely planning, design, implementation, management and review.

Interested and Affected Party (I&AP) – Any individual, group, organization or associations which are interested in or affected by an activity as well as any organ of state that may have jurisdiction over any aspect of the activity.

Mitigation Measures - Design or management measures that are intended to avoid and/or minimise or enhance an impact, depending on the desired effect. These measures are ideally incorporated into a design at an early stage.

NEMA EIA Regulations - The EIA Regulations means the regulations made under section 24(5) of the National Environmental Management Act (Act 107 of 1998) (Government Notice No. R 324, R 325, R 326 and R 327 in the Government Gazette of 7th April 2017 refer).

No-go alternative – The option of not proceeding with the activity, implying a continuation of the current situation / status quo.

Operations Phase - The stage of the works following the Construction Phase, during which the development will function or be used as anticipated in the Environmental Authorisation.

Public Participation Process (PPP) - A process in which potential Interested and Affected Parties are given an opportunity to comment on, or raise issues relevant to, specific matters.

Red Data List - Species of plants and animals that because of their rarity and/or level of endemism are included on a Red Data List (usually compiled by the International Union for Conservation of Nature (IUCN)) which provides an indication of their threat of extinction and recommendations for their protection.

Registered Interested and Affected Party – All persons who, as a consequence of the Public Participation Process conducted in respect of an application, have submitted written comments or attended meeting with the applicant or environmental assessment practitioner (EAP); all persons who have requested the applicant or the EAP in writing, for their names to be placed on the register and all organs of state which have jurisdiction in respect of the activity to which the application relates.

Scoping process - A procedure for determining the extent of and approach to an EIA, used to focus the EIA to ensure that only the significant issues and reasonable alternatives are examined in detail.

Scoping Report – The report describing the issues identified during the scoping process.

Significant impact – Means an impact that by its magnitude, duration, intensity or probability of occurrence may have a notable effect on one or more aspects of the environment.

Spatial Development Framework (SDF) - A document required by legislation and essential in providing conservation and development guidelines for an urban area, which is situated in an environmentally sensitive area and for which major expansion is expected in the foreseeable future.

Specialist Study - A study into a particular aspect of the environment, undertaken by an expert in that discipline.

Stakeholders - All parties affected by and/or able to influence a project, often those in a position of authority and/or representing others.

Sustainable Development - Development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs. NEMA defines sustainable development as the integration of social, economic and environmental factors into planning, implementation and decision-making so as to ensure that development serves present and future generations.

ABBREVIATIONS

BA	Basic Assessment
BAR	Basic Assessment Report
BEE	Black Economic Empowerment
BNG	Breaking New Ground
CA	Competent Authority
CBA	Critical Biodiversity Area
DEA&DP	Department of Environmental Affairs & Development Planning
DWA	Department of Water Affairs
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMF	Environmental Management Framework
EMPr	Environmental Management Programme
ESA	Ecological Support Area
FLISP	Finance Linked Individual Subsidy Programme
HOA	Home Owners' Association
HWC	Heritage Western Cape
I&AP	Interested and Affected parties
IDP	Integrated Development Plan
LUPO	Land Use Planning Ordinance (Ordinance 15 of 1985)
NEMA	National Environmental Management Act, 1998
NEMPAA	National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003)
NEMWA	National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)
NHRA	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
PPP	Public Participation Process
SANS	South African National Standard
SDF	Spatial Development Framework
SES	Sharples Environmental Services cc
WCPSDF	Western Cape Provincial Spatial Development Framework

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REQUIRED CONTENT OF AN ENVIRONMENTAL IMPACT ASSESSMENT REPORT AS PER THE 2014 NEMA EIA REGULATIONS, AS AMENDED

Appendix 3 of Government Notice 326 of the National Environmental Management Act No.107 of 1998 (NEMA) Environmental Impact Assessment (EIA) Regulations (2014), as amended, states the requirements for the content of an Environmental Impact Assessment Report to be as follows:

“An Environmental Impact Assessment Report must contain the information that is necessary for the Competent Authority to consider and come to a decision on the application, and must include – “

Table 1 below lists the content requirements of an EIA Report and where in the EIA Report one can find the required content.

Table 1: Required content of an Environmental Impact Assessment Report according to the 2014 NEMA EIA Regulations, as amended, and a quick reference guide as to where to find the required content in this EIA Report.

REQUIREMENT	SECTION IN REPORT
a) details of- (i) the EAP who prepared the report; and (ii) the expertise of the EAP, including a curriculum vitae;	Section 1.3
b) the location of the activity, including- (i) the 21-digit Surveyor General code of each cadastral land parcel; (ii) where available, the physical address and farm name; (iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;	Table 8: Summary Table: Site and Farm Details
(c) a plan which locates the proposed activity or activities applied for at an appropriate scale, or, if it is- (i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or (ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken;	APPENDIX A: SITE LOCALITY MAP Table 8: Summary Table: Site and Farm Details
(d) a description of the scope of the proposed activity, including- (i) all listed and specified activities triggered; (ii) a description of the activities to be undertaken, including associated structures and infrastructure;	Table 2: Listed Activities in the NEMA EIA Regulations, 2014 Section 4: Description of the Proposed Project
(e) a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process;	Section 3: Legislation and Policy Pertaining to the Application.



<p>(f) a motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location;</p>	<p>Section 2: Project Need and Desirability</p>
<p>(g) a motivation for the preferred development footprint within the approved site;</p>	<p>Section 6.2: Concluding Statement Regarding Alternatives</p>
<p>(h) a full description of the process followed to reach the proposed development footprint within the approved site, including -</p> <p>(i) details of all the development footprint alternatives considered;</p> <p>(ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;</p> <p>(iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them;</p> <p>(iv) the environmental attributes associated with the development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;</p> <p>(v) the impacts and risks identified, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts-</p> <p style="padding-left: 40px;">(aa) can be reversed;</p> <p style="padding-left: 40px;">(bb) may cause irreplaceable loss of resources; and</p> <p style="padding-left: 40px;">(cc) can be avoided, managed or mitigated;</p> <p>(vi) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks;</p> <p>(vii) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;</p> <p>(viii) the possible mitigation measures that could be applied and level of residual risk;</p> <p>(ix) if no alternatives development footprint locations for the activity were investigated, the motivation for not considering such; and</p> <p>(x) a concluding statement indicating the preferred alternative development location within the approved site;</p>	<p>Section 6.1: Description of the Process Followed to Reach the Preferred Alternative.</p> <p>(i) Section 6.1.1: Mixed Use Development Site Location and Layout Alternative</p> <p>(ii) Section 7: Public Participation Process and APPENDIX E: PUBLIC PARTICIPATION</p> <p>(iii) Section 7: Public Participation Process and Appendix I: Comments and Response Tables</p> <p>(iv) Section 5: Description of the Affected Environment</p> <p>(v) Section 8: Impacts</p> <p>(vi) Section 8.3: Methodology Used in Determination of the Significance of Potential Impacts</p> <p>(vii) Section 8: Impacts and Section 8.1 Summary of Impacts Identified</p> <p>(viii) Section 8.5: Description and Assessment of the Significance of Impacts Prior and After Mitigation and APPENDIX M: ENVIRONMENTAL MANAGEMENT PROGRAMME</p> <p>(ix) Section 6.1: Description of the Process Followed to Reach the Preferred Alternative</p> <p>(x) Section 6.2: Concluding Statement Regarding Alternatives</p>
<p>(i) A full description of the process undertaken to identify, assess and rank the impacts the activity and associated structures and</p>	<p>Section 8.3: Methodology Used in Determination of the Significance of</p>



<p>infrastructure will impose on the preferred location through the life of the activity, including –</p> <p>i) a description of all environmental issues and risks that were identified during the environmental impact assessment process; and</p> <p>ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures;</p>	<p>Potential Impacts</p> <p>Section 8: Impacts</p>
<p>(j) an assessment of each identified potentially significant impact and risk, including-</p> <p>(i) cumulative impacts;</p> <p>(ii) the nature, significance and consequences of the impact and risk;</p> <p>(iii) the extent and duration of the impact and risk;</p> <p>(iv) the probability of the impact and risk occurring;</p> <p>(v) the degree to which the impact and risk can be reversed;</p> <p>(vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and</p> <p>(vii) the degree to which the impact and risk can be mitigated;</p>	<p>Section 8.4.4 Cumulative Impacts</p> <p>Section 8: Impacts</p> <p>Section 8.5: Description and Assessment of the Significance of Impacts.</p>
<p>(k) where applicable, a summary of the findings and recommendations of any specialists report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final assessment report;</p>	<p>Section 8.4: Summary of Key Findings & Recommendations of Specialist Assessments</p>
<p>(l) an environmental impact statement which contains-</p> <p>(i) a summary of the key findings of the environmental impact assessment;</p> <p>(ii) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructures on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers; and</p> <p>(iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;</p>	<p>Section 9: Environmental Impact Statement</p> <p>Section 9.1: Summary of Key Findings of Impact Assessment</p> <p>APPENDIX D2: CRITICAL BIODIVERSITY AREAS (CBA) MAP</p>
<p>(m) based on the assessment, and where applicable, recommendations from specialist report, the recording of proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation;</p>	<p>Section 8.5: Description and Assessment of the Significance of Impacts Prior and After Mitigation</p>
<p>(n) the final proposed alternatives which respond to the impact management measures, avoidance, and mitigation measures identified through the assessment;</p>	<p>Section 6: Alternatives</p>
<p>(o) any aspects which were conditional to the findings of the</p>	<p>Section 9.3: Recommendations for</p>



assessment either by the EAP or specialist which are to be included as conditions of authorisation	Conditions of the Environmental Authorisation
(p) a description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed;	Section 1.2: Assumptions and Limitations
(q) a reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that of that authorisation;	Section 9.2: EAP's Reasoned Opinion and Recommendations Section 9.3: Recommendations for Conditions of the Environmental Authorisation
(r) where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required and the date on which the activity will be concluded and the post construction monitoring requirements finalised;	N/A – this activity does include operational aspects.
(s) an undertaking under oath or affirmation by the EAP in relation to: (i) the correctness of the information provided in the reports; (ii) the inclusion of comments and inputs from stakeholders and I&APs; (iii) the inclusion of inputs and recommendations from the specialist reports where relevant; and (iv) any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties;	APPENDIX N: DECLARATION BY THE ENVIRONMENTAL ASSESSMENT PRACTITIONER
(t) where applicable, details of any financial provisions for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts;	N/A – It is not proposed to decommission this development.
(u) an indication of any deviation from the approved scoping report, including the plan of study, including- (i) any deviation from the methodology used in determining the significance of potential environmental impacts and risks; and (ii) a motivation for the deviation;	N/A – No deviation of POSEIA.
(v) any specific information that may be required by the competent authority; and	Appendix E13: Proof of Correspondence with DWS
(w) any other matters required in terms of section 24(4)(a) and (b) of the Act.	N/A

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EXECUTIVE SUMMARY

Project Overview

Status Homes Property Developers (Pty) Ltd proposes to construct an affordable housing development & associated infrastructure (water and sewage pipeline infrastructure). The proposed site for the housing development is on one property, namely Portion 9 of the Farm Kranshoek No 432. This property falls within the urban edge of the Bitou Municipality.

It is proposed to construct approximately 876 housing units consisting of a mix of affordable housing, business and commercial properties, schooling facilities (creche's), places of worship, and Public Open Spaces. The Public Open Spaces account for > 23% of the development proposal.

Various bulk water, stormwater and sewer infrastructure upgrades and new pipelines are proposed to be constructed to service the development.

Proposed Construction

The following is proposed to be constructed on site:

Development Proposed	No.	Size (ha)
Residential Zone 1: Dwelling Houses	457	8.95
Residential Zone 4: Flats	419	4.18
Business Zone 1: Shops, shopping centre	1	1.32
Institutional Zone 1: School & Creche	2	0.303
Institutional Zone 2: Place of Worship	2	0.19
Open Space Zone 1: Public Parks	2	5.72
Open Space Zone 2: Private Parks	4	0.51
Transport Zone 1: Private Roads	4	2.98
Transport Zone 1: Private Roads	-	1.83
TOTAL DEVELOPMENT FOOTPRINT		±25,98Ha

** These numbers are approximate and may change slightly during the detailed design phase of the project*

Need & Desirability

The clear need for the project has been explained in detail in the Environmental Impact Assessment Report. The settlement of Kranshoek is situated 8km from the main Plettenberg Bay urban area but is considered a functional element of the town of Plettenberg Bay. Kranshoek is connected to Plettenberg Bay by a growing public transport system, however Plettenberg Bay remains the main area of employment for residents of Kranshoek. Kranshoek finds itself as a node at the end of a corridor which will be linked into the Plettenberg Bay system. Road access (Robberg Road) is good despite the distance between the two nodes.

The Town Planning Motivation Report (Metroplan Town & Regional Planners, 2018) notes that the proposed

site is the best situated site for establishing an integrated town. The land development objectives, as they apply to Kranshoek through the BMSDF, proposes that Kranshoek develops as a future growth node (development occurring backwards to Plettenberg Bay along the airport road corridor) with growth commencing from the Kranshoek node eventually linking Kranshoek with Plettenberg Bay.

The BMSDF further suggests that residential development around Kranshoek should be on land continuous with Kranshoek with development upwards of 1 000 units at a maximum density of 25u/Ha gross. As such, Kranshoek should be promoted as a balanced, self-sufficient settlement with commercial and retail frontages on the main road.

The proposed development is compatible with and supports the key principles and objectives contained in the relevant key land use planning and policy documents that pertain to the area. The area has therefore been identified as suitable for development.

The social amenities and facilities provided for on the layout plan were specifically provided according to the guidelines in the Development Parameters for the Provision of Facilities Within Settlements in the Western Cape (2014). This location was chosen as an ideal location because of its proximity to the current locations of the affected communities.

At present the housing gap across all income brackets stands at 3 394 for the primary income categories (R1501 – R22000), and 9 042 overall across all income categories in the Bitou LM. When accounting for household indebtedness, the total gap for housing in the target income brackets could drop to as low as 2 036 in the primary income category. By 2028 this housing gap is expected to grow to 4 698 in the primary income categories and 12 518 overall.

There thus appears sufficient demand for the development of a new affordable housing development offering FLISP and other social housing rental units.

Overall Findings of Specialist Impact Assessments & Feasibility Studies

The following specialist impact assessments were undertaken to inform the Scoping & EIA Process:

- **Botanical** Impact Assessment;
- **Freshwater** Impact Assessment;
- **Residential Market** Assessment; and
- **Traffic** Impact Assessment;

In addition, input was obtained from professional consultants (technical feasibility) in terms of providing:

- Civil Engineering & Services Assessment
- Town Planning Motivation Report

None of the specialist impact assessment and technical feasibility studies identified any fatal flaws in the development.

Overall, the broad consensus from all of the impact assessment specialists is that the impacts expected to occur as a result of this development can be either avoided entirely or reduced to an acceptable level of

impact (in the low to low - medium range of significance) if all of their recommendations are implemented. Status Homes Developers is therefore committed to conducting the construction and operation phase of this development in line with the Environmental Management Programme, which includes the impact mitigation measures recommended by all of the specialists and the Environmental Assessment Practitioner.

Overall Findings of the EAP

In the professional opinion of Sharples Environmental Services cc, we believe that the development **should be authorised to go ahead** based on the following reasons:

- The proposed site is the best situated site for establishing an integrated town. The proposed property to be developed is located entirely within the Bitou Urban Edge and has been specifically set aside and planned for to be a future extension of the existing Kranshoek residential area in various Municipal Planning Frameworks, including the SDF and IDP. The current housing backlog at Kranshoek is 820 housing units with a future forecast of 1 007 to the year 2030, making a total of 1 493 units. The SDF goes on to state that there are more than 4829 households in need of housing in the whole Bitou area, of which 17% is in Kranshoek. This proposed development of approximately 876 units will make a major contribution towards meeting this need.
- The “No Go” alternative is the option of not developing the proposed affordable housing and associated infrastructure development. The no-development option would result in a lost opportunity in terms of the employment opportunities associated with the construction and operation phase as well as the benefits associated with the provision of more than 876 houses and other much needed social facilities. A significantly high negative socio-economic impact significance would occur if the proposed development is not constructed in terms of the lost opportunity to provide low and middle income housing, crechés, health care facilities, public spaces and other much needed social services.
- The NO-GO alternative would result in the conservation of the site and prevention of any further development (status quo). Should the site not be developed, one can expect that the impact of informal development and use of the open area within the site will continue. Thus, while this No-Go alternative has the least potential of directly impacting on the ecological features, one can pragmatically expect that informal development and its associated impact on the surrounding area will impact on these ecosystems, further deteriorating the water quality and modifying/reducing aquatic and terrestrial habitat.
- The proposed development is compatible with and supports the key principles and objectives contained in the relevant key land use planning and policy documents that pertain to the Western Cape and Bitou area, including the Western Cape Provincial Spatial Development Framework (2014), Bitou Local Municipality Integrated Development Plan 2017-2022 and the Bitou Local Municipality Spatial Development Framework (2018). The entire proposed development is also located within the Urban Edge. The proposed site has therefore been identified as a desirable site location for housing development.
- The most significant impacts associated with the proposed development, in the construction and operation phase, includes the expected impacts to the Freshwater Resources (habitat and biota), Botanical Impacts (loss indigenous vegetation) and the expected Visual Impact of the development in terms of the land use character of the site and “sense of place” of the area being significantly changed.
- The socio-economic benefits of this project including numerous job opportunities, the provision of affordable housing, crechés, schools and other much needed social facilities largely outweigh the biophysical, visual and traffic impacts identified in an area which is mostly degraded and already transformed and planned for development purposes in the Municipal SDF (within the urban edge).

- We believe that a “balanced approach” to impacts has been undertaken. We believe that although the proposed project will result in varying degrees of negative impacts in terms of visual, botanical and especially freshwater impacts, we are of the opinion that the Preferred Alternative layout and mitigation measures proposed will ensure that these impacts are reduced to an “acceptable” level of impact significance given the positive impact that this proposed development will have on the socio-economic environment.
- **Based on the findings of the EIA and the information presented by the specialists, the positive impacts of the preferred alternative outweigh the negative impacts of the NO-GO alternative and therefore the development should be authorised as long as the mitigation measures listed in this Report and the Environmental Management Programme are implemented.**



1. SUMMARY AND BACKGROUND

1.1. Summary of the Development Proposal

Status Homes Property Developers (Pty) Ltd proposes to construct an affordable housing development & associated infrastructure (water and sewage pipeline infrastructure). The proposed site for the housing development is on one property, namely Portion 9 of the Farm Kranshoek No 432 (as per Figure 1 below). **This property falls within the urban edge of the Bitou Municipality.**

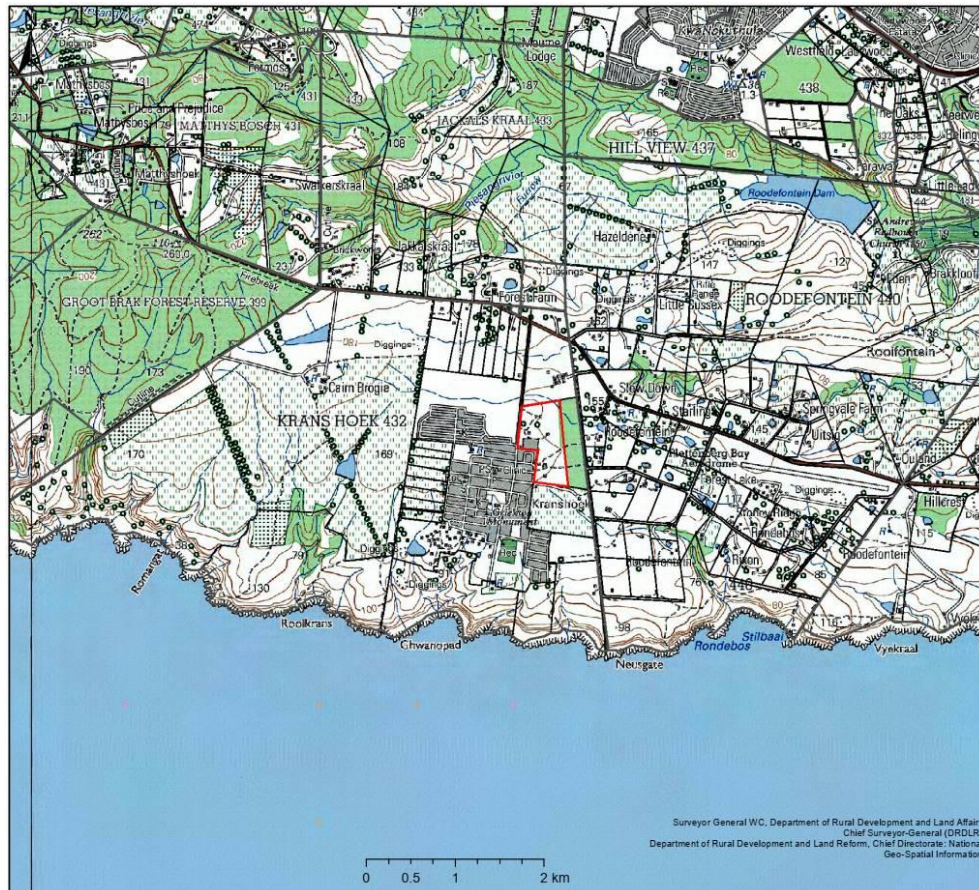


Figure 1: The proposed site for the affordable housing development (red border).

It is proposed to construct approximately 876 housing units consisting of a mix of affordable housing, business and commercial properties, schooling facilities (creche's), places of worship, a health clinic and Public Open Spaces. The Public Open Spaces account for > 23% of the development proposal. The following is proposed to be developed as per the **Site Layout Plans** shown in **Appendix C** and in the **figures** below:

Table 3: Size and number of each respective aspect proposed

Development Proposed	No.	Size (ha)
Residential Zone 1: Dwelling Houses	457	8.95
Residential Zone 4: Flats	419	4.18

Business Zone 1: Shops, shopping centre	1	1.32
Institutional Zone 1: School & Creche	2	0.303
Institutional Zone 2: Place of Worship	2	0.19
Open Space Zone 1: Public Parks	2	5.72
Open Space Zone 2: Private Parks	4	0.51
Transport Zone 1: Private Roads	4	2.98
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TOTAL DEVELOPMENT FOOTPRINT		±25,98Ha



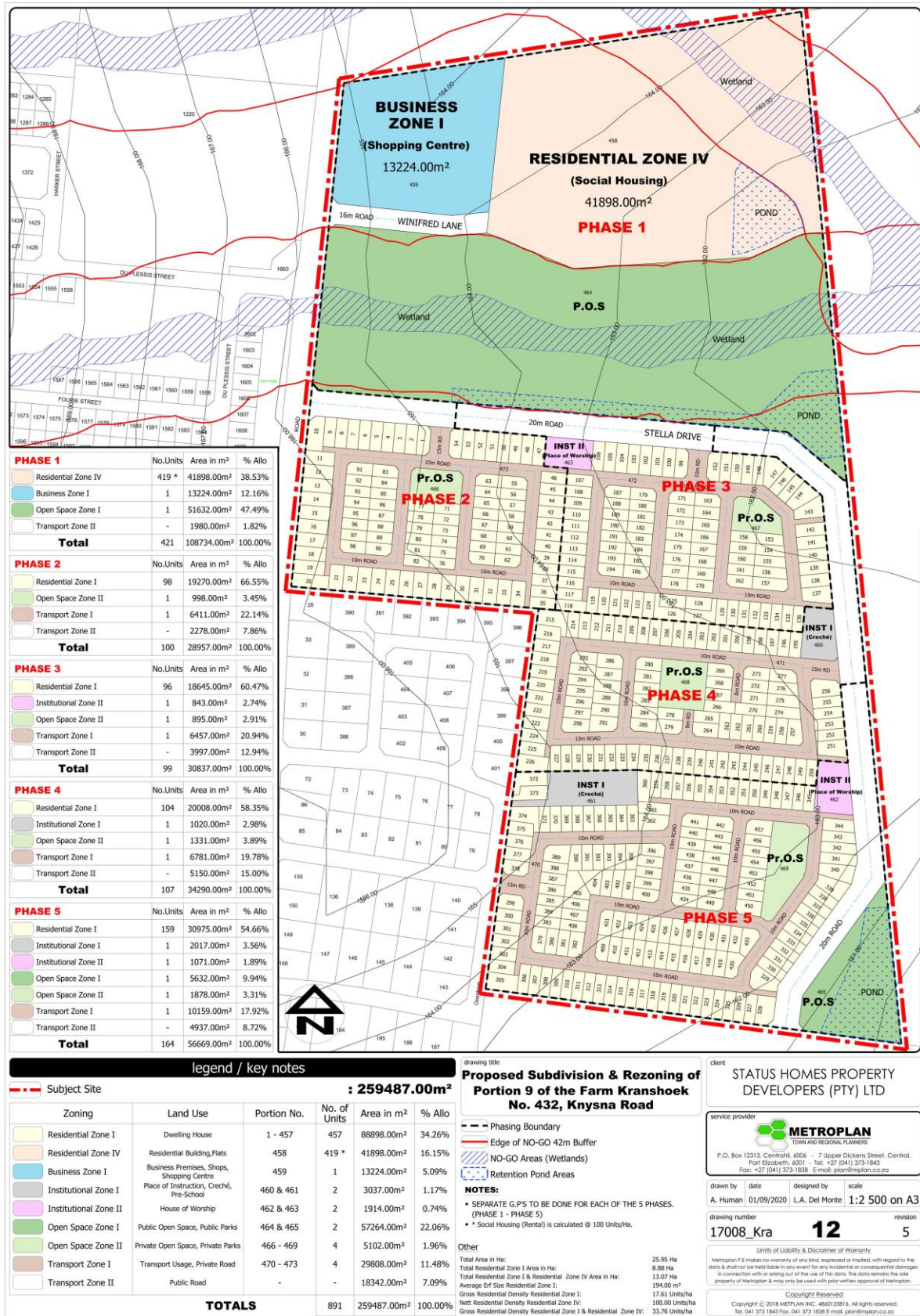


Figure 2: Proposed Preferred Site Layout Plan (as per Appendix C1)

- Environmental Impact Assessments • Basic Assessments • Environmental Management Planning
- Environmental Control & Monitoring • Water Use License Applications • Aquatic Assessments



1.2. Assumptions and Limitations

The findings of this report are subject to the following limitations:

- All information received from sources contributing to this project is assumed to be correct, unbiased and has been conducted by independent specialists;
- The proposed site layout is at this stage a conceptual layout, although fairly accurate, that has taken various constraints on the development into account in order to avoid impacting on the environment. The detailed design phase will include more detail in terms of the proposed infrastructure to be developed (detail design plans), which may include minor changes in terms of even and open space configuration, for example.

1.3. Details of the Environmental Assessment Practitioner

Sharples Environmental Services cc is an independent environmental consultancy and has since 1998 been actively engaged in the fields of environmental planning, assessment and management. We advise private, corporate and public enterprises on a variety of differing land use applications ranging from large-scale PV and CPV renewable energy facilities, residential estates, resorts and golf courses to municipal service infrastructure installations and the planning of major arterials. SES has offices in George and in Cape Town.

The Principal EAP for this proposed development is **Betsy Ditcham**. Betsy has a Bachelor of Science Honours Degree in Wildlife Management from the University of Pretoria and a Bachelor of Science Degree (Zoology and Ecology) obtained from the University of Cape Town in 2005. She has 9 years' experience in the environmental field, including environmental assessments, legal compliance, on-site compliance monitoring, cleaner production and business greening and sustainability (carbon and environmental footprinting). In her time as a consultant, she has compiled a number of environment assessments and management plans for both private and governmental clients. Betsy is a part-owner and Director of SES and has received her registration as an Environmental Impact Assessment Practitioner from EAPASA (Reg No: 1480).

2. PROJECT NEED AND DESIRABILITY

2.1. Regional Need & Desirability

The Bitou Local Municipality Integrated Development Plan (IDP) highlights the Bitou Municipalities phenomenal population growth over the past two decades. During the period 1996 – 2016, the Bitou population increased from 18 427 to 59 157 (more than triple). At this rate the population is anticipated to reach 138 776 by 2030.

The key challenges associated with this rate of population growth are:

- The need for additional housing opportunities;
- The need for additional infrastructure services and bulk infrastructure;
- Increasing backlogs of infrastructure maintenance;
- Encroachment and illegal dwellings;
- More Illegal electrical connections;
- Increased unemployment;
- Increased health hazards; and
- Increases in crime.

The IDP states that there are more than 8 800 households in need of housing in the whole Bitou area. This

proposed development of approximately 875 units will make a major contribution towards meeting this need in the region and the need to provide service infrastructure.

The Bitou SDF proposes that housing projects should adhere to 10 key principles. These principles are listed in the table below. The table also comments on the compatibility of the proposed development in terms of these principles which shows why the development is “needed and desired” in this region.

Table 4: Bitou SDF Key Principles and comment on compatibility (need and desirability) of the proposed development (source: Social Impact Assessment by Tony Barbour, 2016)

Key principles listed in SDF	Comment on compatibility (need and desirability) of the proposed development
Provide for a mix of different kinds of land uses, e.g. residential, retail, business, and recreational opportunities	The proposed development provides a mix of land uses, including provision for affordable housing, schools, retail, places of worship, public open spaces, health clinics etc.
Create well-designed compact neighbourhoods where the different activities are in close proximity to each other	The proposed development provide for the establishment of a compact neighbourhoods where the different activities are in close proximity to each other. The inclusion of apartments, and not just single dwelling residential units, assists with this principle.
Provide a variety of transportation choices, including private, public and non-motorised transport opportunities that are safe	The proposed development does cater for public and private transport. The final layout and design should also ensure that the needs of pedestrians are catered for by designing wide pavements etc.
Create a variety of housing opportunities, i.e. in terms of function, form and affordability	The proposed development provides a variety of housing opportunities, both in terms of affordability, size and density.
Encourage growth in existing communities this can be done through infrastructure upgrade, urban renewal new amenities and densification	The proposed development will support growth in the existing adjacent communities through the upgrading of existing and provision of new infrastructure.
Preserve open spaces, natural beauty, and environmentally sensitive areas	The proposed development does identify open spaces and makes provision for the conservation of these spaces and areas of natural beauty and environmental sensitivity.
Protect and enhance agricultural lands and secure these as a productive a land base for food security, employment, etc.	The site is located within the urban edge and has therefore been identified as suitable for development.
Utilize smarter, and cheaper infrastructure and green buildings and promote renewable and sustainable technologies	The developers must ensure that the final design and construction ensure the use of smarter, and cheaper infrastructure and the development of green buildings and the promotion of renewable and sustainable technologies, where possible.
Foster a unique neighbourhood identity building on the unique and diverse characteristics of each community	The proposed development represents a natural expansion of the existing Kranshoek residential area. The development will therefore create an opportunity to develop a new neighbourhood that is associated with the unique and diverse characteristics of the adjacent communities.

Key principles listed in SDF	Comment on compatibility (need and desirability) of the proposed development
Nurture engaged citizens through providing for residential, work, and play areas	The proposed development makes provision for open spaces and areas for recreation, as well as a business zone,
Engaged citizens to participate in community life and decision-making	The proposed development makes provision for places of worship, a health clinic and community social facilities which would bring the residents together to participate in community activities.

The Bitou IDP lists a number of key objectives. These objectives are listed in the table below. The table also comments on the compatibility (the need and desirability) of the proposed development in terms of these objectives.

Table 5: Bitou IDP Key Objectives and comment on compatibility (need and desirability) of the proposed development

Key Objectives identified in BLM IDP	Comment on compatibility of proposed development
KPA 1 Strategic Planning For Transformation: Objective 1.1 Spatially integrate areas separated by apartheid, promote access for poor to work, recreational and commercial opportunities	The proposed affordable housing development provides a combination of housing, retail and commercial options.
KPA 2 Economic Development: Objective 1.1 Grow local economy, create jobs, empower previously disadvantaged, transform ownership patterns 2. Economic development of local economy	The proposed development is aimed at meeting the needs of low to middle income households in an affordable and sustainable manner, while providing potential job opportunities through the development of the Business Zone and School. 2. The proposed development will create employment and business opportunities for the local economy and community during both the construction and operational phase.
KPA 3 Community and Social Development: Objective 3.1 Eradicate poverty and uplift previously disadvantaged communities, promote social cohesion	The proposed development is aimed at meeting the needs of low to middle income households thereby creating an opportunity for social development. However, due to the location of the site there are likely to be limited opportunities for community integration with higher income communities in the area.
KPA 4 - Infrastructure Development: Objective 4.1 Universal access to decent quality of services	The proposed development is aimed at addressing the backlog in services and housing.

Key Objectives identified in BLM IDP	Comment on compatibility of proposed development
KPA 5 Institutional Development: Objective 5.1 Build a capable, corruption-free administration that is able to deliver on developmental mandate	As this is a private development, this Objective is not applicable to the proposed project.
KPA 6 Financial Sustainability: Objective 6.1 Manage expenditure prudently, grow revenue base and build long term financial sustainability so as to invest in social and economic development	As this is a private development, this Objective is not applicable to the proposed project.
Objective 7 Public Participation: Objective 7.1 An active and engaged citizenry, able to engage with and shape the municipality's programme.	This environmental process will aim to engage with the affected citizens in the area and will provide them with an opportunity to comment on the proposed development and shape the outcome of the process.

2.2. Desirability of the Site Location

The settlement of Kranshoek is situated 8km from the main Plettenberg Bay urban area but is considered a functional element of the town of Plettenberg Bay. Kranshoek is connected to Plettenberg Bay by a growing public transport system, however Plettenberg Bay remains the main area of employment for residents of Kranshoek. Kranshoek finds itself as a node at the end of a corridor which will be linked into the Plettenberg Bay system. Road access (Robberg Road) is good despite the distance between the two nodes.

The region between Kranshoek and the greater Plettenberg Bay urban area is of key strategic spatial importance. The topography of the region and land ownership profile of makes further expansion of the main Plettenberg Bay town challenging and costly. The high costs of land and the challenging development environment limit the potential of low – middle income residential developments. Thus the likely growth path, especially for more affordable housing developments, is along the Robberg Road stretching between Plettenberg Bay and Kranshoek (Urban-Econ Development Economists, 2019).

The Town Planning Motivation Report (Metroplan Town & Regional Planners, 2018) notes that the proposed site is the best situated site for establishing an integrated town. The land development objectives, as they apply to Kranshoek through the BMSDF, proposes that Kranshoek develops as a future growth node (development occurring backwards to Plettenberg Bay along the airport road corridor) with growth commencing from the Kranshoek node eventually linking Kranshoek with Plettenberg Bay.

The BMSDF further suggests that residential development around Kranshoek should be on land continuous

with Kranshoek with development upwards of 1 000 units at a maximum density of 25u/Ha gross.

As such, Kranshoek should be promoted as a balanced, self-sufficient settlement with commercial and retail frontages on the main road and a possible resort onto the coast to the south. Some of the principles to give effect to this broad objective would be the need to develop an economic base in Kranshoek itself, improve accessibility into the larger system between Plettenberg Bay and balance the constraints and opportunities created by the airport which is seen as an economic catalyst half way between the two settlements.

Plettenberg Bay is known traditionally as a holiday town and summer playground of wealthy tourists; however, the town has started to mature in recent years into a more diverse and multi-faceted town. The town has seen a sharp rise in demand for permanent homes in recent years, attracting families in search of a better lifestyle as well as empty-nesters and retirees looking to enjoy their golden years in a scenic, tranquil setting. While much of this demand has originated from upper-middle to upper income households, this shift in the nature of the town has seen an increased demand for housing in the lower- and middle-income categories as local employment opportunities have increased (Urban-Econ Development Economists, 2019).

Emerging from a period of subdued performance, following the financial crisis of 2008/09, Plettenberg Bay has shown remarkably strong performance in recent years, with 2017 and 2018 showcasing remarkably strong performances for property sales and property prices. Despite a flailing economy and subdued market, in 2017 the coastal town achieved its highest ever sales in terms of Rand value, with transactions totalling R1.043 billion, up from R1.041 billion in 2016. Sotheby's International Realty Plettenberg Bay recorded an increase of 60% (year on year) for the first quarter of 2018. 2017 was a record year for the property market as a whole in the upmarket coastal resort town. Total sales value was the highest ever documented, breaking the R1 billion mark for the second time in history, and total average prices were also the highest recorded to date at R2,3 million, though the number of sales were down by 14% from 2016. While data for 2018 is still incomplete, interactions with local estate agents indicate that this strong performance continued throughout 2018 (Urban-Econ Development Economists, 2019).

Entry level prices have increased substantially. While this is a positive for property developers, it does put increased pressure on lower- and middle-income earners. The entry level for apartments is R800,000 and vacant land starts at about R275,000. The entry level for freestanding houses is around R1,8 million, though there are cheaper options in areas surrounding Plettenberg Bay, particularly found in townhouse styled cluster sectional title estates. It is becoming increasingly difficult to find houses below R2million.

There is an imbalance in the town's property market (something which is not commonly noted by estate agents in the area). There are a plethora of housing options for upper income earners, and growing low income areas, but very few options for middle income earners. This can be observed by looking at the average property prices per suburb, where suburbs are either filled with properties above R 1.2 million average price, or below R 200 000. As a result of this large gap in housing options, rental rates in middle income brackets are elevated when compared to other urban areas.

As such, it is no surprise that there is significant demand for housing in the lower income brackets. There is a dire need for houses between R 400 000 – R 600 000, of which there is currently non-existent supply available in this bracket.

At present the housing gap across all income brackets stands at 3 394 for the primary income categories

(R1501 – R22000), and 9 042 overall across all income categories in the Bitou LM. When accounting for household indebtedness, the total gap for housing in the target income brackets could drop to as low as 2 036 in the primary income category. By 2028 this housing gap is expected to grow to 4 698 in the primary income categories and 12 518 overall.

There thus appears sufficient demand for the development of a new affordable housing development offering FLISP and other social housing rental units.

*The proposed development is compatible with and supports the key principles and objectives contained in the relevant key land use planning and policy documents that pertain to the Western Cape and Bitou area, including the Western Cape Provincial Spatial Development Framework (2014), Bitou Local Municipality Integrated Development Plan 2017-2022 and the Bitou Local Municipality Spatial Development Framework (2018). The proposed development is also located within the Urban Edge. **The proposed site has therefore been identified as a desirable site location.***

2.3. Human Needs & Resource Efficiency

2.3.1. Provision of public facilities and open spaces

The proposed development makes provision for the establishment of public open spaces, informal sports fields, play grounds, crèches etc. These components will all contribute to an improved quality of life for many local residents of the receiving communities who currently are not well serviced and lack public facilities, such as parks and open spaces.

2.3.2. Non-Motorised Transport

Non-Motorised Transport (NMT) is a form of active transportation. Active transportation consists of human-powered forms of travel such as walking, cycling, rickshaws, skating/ roller-blading, shopping trolleys and manual wheelchairs. However, this could also be extended to include forms of transportation that do not rely on battery and/or fuel combustion driven mechanisms to be propelled, such as animal-drawn carts (especially in rural areas) (Pendulum Transportation Planning & Engineering Consultants, 2005).

The proposed development does cater for public and private transport. The final layout and design should also ensure that the needs of pedestrians are catered for by designing wide pavements etc.

2.3.3. Construction Materials

As far as reasonably possible, products and materials will be sourced and manufactured in the vicinity of a development. This would reduce the energy embodied in transporting materials over long distances to the site, which in turn could lower development costs and reduce the overall carbon footprint of the development.

In addition, all new buildings, and extensions to existing buildings, need to comply with the energy efficiency regulations, as set out in SANS 10400 XA. In response to the introduction of SANS 10400-XA, the Department of Human Settlements introduced amendments to the 'Norms and Standards for the Construction of Stand Alone Residential Dwellings' and 'Adjustment of the Housing Subsidy Quantum'. The new standards were based on the requirements of the SANS 10400-XA, which require the addition of measures to improve the thermal performance of dwellings.

Accordingly, all subsidy houses now require:

- The installation of a ceiling with a prescribed air gap for the entire dwelling;
- The installation of above-ceiling insulation comprising a 130 mm mineral fibre glass blanket for the entire house;
- Special low-emissivity clear and emissivity opaque safety glass for all window types;
- Plastering of the internal walls;
- Rendering on external walls;
- Smaller size windows; and
- Public-transport-orientated development

These regulations will be taken into consideration in the detailed design phase of the development.

2.3.4. Water Efficiency

In order to address water efficiency in the proposed development, all toilets, taps and showers will have water use reducing measures installed, which could include aerators to reduce water flow and cistern weights to interrupt flush flow.

2.3.5. Waste Management

The Bitou Solid Waste Disposal By-law has a range of directives that apply to both the generation and disposal of waste. These requirements have been addressed in the Draft Environmental Management Programme for the proposed development.

3. LEGISLATION AND POLICY PERTAINING TO THE APPLICATION

3.1. The Scoping / EIA Process

Due to the fact that a mixed use development of this size and nature is a “Listed” activity in the 2014 EIA Regulations promulgated in December 2014, and amended in 2017, it is required to undertake a Full Scoping and EIA Process. The Scoping and EIA Process is outlined in the figure below. The Competent Authority (Authority that will either grant or refuse the application) is the Provincial Department of Environmental Affairs & Development Planning, Western Cape (DEADP).

The EIA process is informed by the Environmental Impact Assessment (EIA) Regulations Government Notice No. R 326 (7th April 2017) and typically follows four main phases, namely, Pre-Application Public and Authority consultation Scoping Phase (*Optional*), an Application Phase, a Post-Application Scoping Phase and associated consultation and an Environmental Impact Assessment Phase and associated consultation as illustrated in the figure below. We are currently in the EIA phase Public & Authority Participation stage.

The objective of the “Scoping” Process, it to, through a consultative process:

- Identify the relevant policies and legislation relevant to the activity;
- Motivate the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;
- Identify and confirm the preferred activity and technology alternative through an identification of impacts and risks and ranking process of such impacts and risks;
- Identify and confirm the preferred site, through a detailed site selection process, which includes an

identification of impacts and risks inclusive of cumulative impacts and a ranking process of all the identified alternatives focusing on the geographical, physical, biological, social, economic, and cultural aspects of the environment;

- Identify the key issues to be addressed in the assessment phase;
- Agree on the level of assessment to be undertaken, including the methodology to be applied, the expertise required as well as the extent of further consultation to be undertaken to determine the impacts and risks the activity will impose on the preferred site through the life of the activity, including the nature, significance, consequence, extent, duration and probability of the impacts to inform the location of the development footprint within the preferred site; and
- Identify suitable measures to avoid, manage or mitigate identified impacts and to determine the extent of the residual risks that need to be managed and monitored.



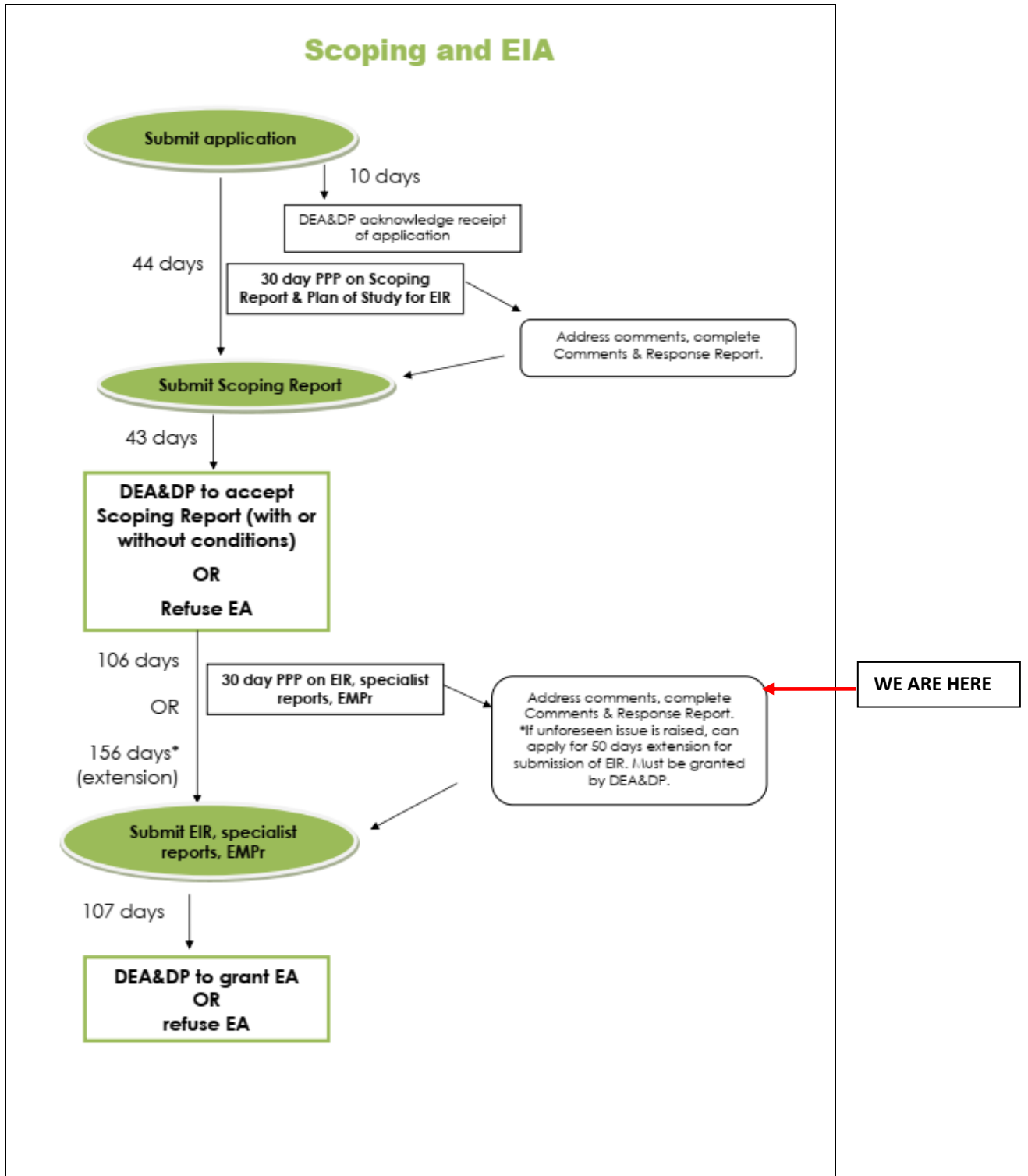


Figure 3: The Scoping / EIA Process

3.2. Summary of Regulations, Guidelines, Frameworks & Policies

The following Regulations (Acts) pertain to this development proposal and have been considered during the assessment process:

- The Constitution of South Africa (Act 108 of 1996);
- The National Environmental Management Act (NEMA), Act No 107 of 1998, as Amended;
- The Environmental Impact Assessment Regulations, December 2014, as amended;
- National Environmental Management Biodiversity Act (Act 10 of 2004);
- National Waste Act (Act No. 59 of 2008);
- National Water Act (Act No. 36 of 1998);
- National Forest Act (Act No. 84 of 1998);
- National Heritage Resources Act (Act No 25 of 1999);
- The National Veld and Forest Fire Act (Act No 101 of 1998)
- The National Health Act (No. 61 of 2003) and Health Act 63 of 1977;
- Conservation of Agricultural Resources Act – CARA (Act 43 of 1983);
- Subdivision of Agricultural Land Act (Act 70 of 1970);
- Occupational Health and Safety Act (Act 85 of 1993);
- National Building Regulations and Building Standards Act (Act No 103 of 1977);
- Infrastructure Development Act (Act No.23 of 2014);
- Land Use Planning Ordinance (LUPO) Section 8 Scheme Regulations;
- Land Use Planning Act (LUPA) (Act No. 3 of 2014);
- Spatial Planning and Land Use Management Act (Act No 16 of 2013);
- National Roads Act (No. 93 OF 1996);
- Road Traffic Management Corporation Act (No. 20 OF 1999);
- The Municipal Systems Act (Act 32 of 2000);
- The Physical Planning Act (Act 125 of 1999); and
- Development Facilitation Act (Act 67 of 1995)

The following guidelines pertain to this development proposal and have been considered during the assessment process:

- Circular EADP 0028/2014: One Environmental Management System
- Guideline for Determining the Scope of Specialist Involvement in EIA Processes;
- Guideline for the Review of Specialist Input into the EIA Process;
- Guideline for Involving Biodiversity Specialists in EIA Processes;
- Guideline for Involving Heritage Specialists in EIA Processes;
- Guideline for Involving Visual and Aesthetic Specialists in EIA Processes;
- Guideline for Environmental Management Plans;
- Guideline on Public Participation;
- Guideline on Alternatives;
- Guideline on Need and Desirability;
- DEAT (2002) Scoping, Information Series 2 ((Integrated Environmental Management Information Series: Impact Significance); and

- DEA (2010), Guideline on Need and Desirability, Integrated Environmental Management Guideline Series 9.

National, Provincial & Municipal Development Planning Frameworks considered during the assessment process include:

- National Development Plan 2030 (2012);
- Western Cape Provincial Spatial Development Framework (PSDF) 2014;
- Bitou Local Municipality Integrated Development Plan (IDP) 2012 -2017;
- Bitou Local Municipality Local Economic Development Framework (2013);
- Bitou Local Municipality Integrated Human Settlements Plan (2011);
- Bitou Local Municipality Spatial Development Framework (SDF) (2018) (Draft);
- Bitou Local Municipality Coming Together Initiative (2010);
- Bitou Land Use Planning By-Law; and
- Bitou Solid Waste Disposal By-Law

3.3. Description of Key Legislation and Policies Listed Above

3.3.1. The Constitution of South Africa (Act No 108 Of 1996)

The Constitution of South Africa is the supreme law of the country of South Africa. It provides the legal foundation for the existence of the republic, sets out the rights and duties of its citizens, and defines the structure of the government.

Section 24 of The Constitution states the following:

Everyone has the right —

- to an environment that is not harmful to their health or well-being; and
- to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that —
 - prevent pollution and ecological degradation;
 - promote conservation; and
 - secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

3.3.2. The NEMA, Act No 107 of 1998, as Amended, and the EIA Regulations (2014)

The National Environmental Management Act (NEMA; No. 107 of 1998, as amended) gives effect to the Constitution of the Republic of South Africa by providing a framework for co-operative environmental governance and environmental principles that enable and facilitate decision-making on matters affecting the environment. NEMA requires that an environmental authorisation be issued by a competent authority (CA) before the commencement of an activity listed in Environmental Impact Assessment Regulations Listing Notices G.N. 324, 325, 326 & 327 published on the 7th April 2017.

Due to the fact that this development proposal is an activity listed in the EIA Regulations, a Full Scoping & EIA Process is required and the respective reports (Scoping and EIA) must be submitted to the Department of Environmental Affairs and Development Planning before they issue Status Homes Property Developers with an Environmental Authorisation (either approval or rejection of the development proposal).

3.3.3. National Environmental Management: Biodiversity (Act 10 of 2004)

This Act controls the management and conservation of South African biodiversity within the framework of NEMA. Amongst others, it deals with the protection of species and ecosystems that warrant national protection, as well as the sustainable use of indigenous biological resources. Sections 52 & 53 of this Act specifically make provision for the protection of critically endangered, endangered, vulnerable and protected ecosystems that have undergone, or have a risk of undergoing significant degradation of ecological structure, function or composition as a result of human intervention through threatening processes.

3.3.4. Conservation of Agricultural Resources Act – CARA (Act 43 Of 1983)

CARA provides for the regulation of control over the utilisation of the natural agricultural resources in order to promote the conservation of soil, water and vegetation and provides for combating weeds and invader plant species. The Conservation of Agricultural Resources Act also defines different categories of alien plants.

The purpose of this act is to ensure the long term sustainable use and conservation of natural agricultural resources. The Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983) (CARA) has the objective to provide for the conservation of the natural agricultural resources of the Republic by the maintenance of the production potential of land, by the combating and prevention of erosion and weakening or destruction of the water sources, and by the protection of the vegetation and the combating of weeds and invader plants. It is the only legislation promoting the sustainable use of natural agricultural resources at farm level.

3.3.5. Subdivision of Agricultural Land (Act No. 70 of 1970)

The purpose of this Act is to control the subdivision and use of Agricultural Land. Subdivision is likely to be needed where various portions of various farms need to be excised from the current farms and consolidated into a new property.

3.3.6. National Water Act (Act No 36 of 1998)

The Act provides the framework for the sustainable management of South Africa's water resources. It aims to protect, use, develop, conserve, manage and control water resources as a whole, promoting integrated water resource management that involves participation of all stakeholders. The Act declares the national government to be the public trustee of the nation's water. The Act is administered by the national Department of Water Affairs (DWA) via regional offices. The following section 21 "water uses" **require Water Use Authorisation (either in the form of a Water Use License (WULA) or a General Authorisation (GA) Water Use Registration:**

- a) taking water from a water resource;
- b) storing water;

- c) impeding or diverting the flow of water in a watercourse;
- d) engaging in a stream flow reduction activity contemplated in section 36;
- e) engaging in a controlled activity identified as such in section 37(1) or declared under section 38(1);
- f) discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit;
- g) disposing of waste in a manner which may detrimentally impact on a water resource;
- h) disposing in any manner of water which contains waste from, or which has been heated in, any industrial or power generation process;
- i) altering the bed, banks, course or characteristics of a watercourse;
- j) removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people; and
- k) using water for recreational purposes.

This development proposal is within 500m of various watercourses. It is therefore required to apply for Water Use Authorisation in terms of section 21 above. An application has been submitted on the e-WULAAS system and the procedure to acquire authorisation is underway.

3.3.7. National Forest Act (Act No 84 of 1998)

The purpose of this Act is to:

- promote the sustainable management and development of forests for the benefit of all;
- create the conditions necessary to restructure forestry in State forests;
- provide special measures for the protection of certain forests and trees;
- promote the sustainable use of forests for environmental, economic, educational, recreational, cultural, health and spiritual purposes;
- promote community forestry;
- promote greater participation in all aspects of forestry and the forest products industry by persons disadvantaged by unfair discrimination.

This Act is governed by the National Department of Agriculture, Forestry and Fisheries who is a key commenting Authority in this EIA Process.

3.3.8. National Heritage Resources Act (Act No 25 of 1999)

The protection and management of South Africa's heritage resources are controlled by the National Heritage Resources Act (Act No. 25 of 1999). Heritage Western Cape (HWC) is the enforcing authority in the Western Cape, and is registered as a Stakeholder for this environmental process. In terms of Section 38 of the National Heritage Resources Act, HWC will comment on the development proposal.

Section 38(8) also makes provision for the assessment of heritage impacts as part of an EIA process. The National Heritage Resources Act requires relevant heritage authorities to be notified regarding this proposed development, as the following activities are relevant that require **Heritage Approval**:

- a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;

- b) the construction of a bridge or similar structure exceeding 50 m in length;
- c) any development or other activity which will change the character of a site—
 - i. exceeding 5 000 m² in extent; or
 - ii. involving three or more existing erven or subdivisions thereof; or
 - iii. involving three or more erven or divisions thereof which have been consolidated within the past five years; or
 - iv. the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;
- d) the re-zoning of a site exceeding 10 000 m² in extent;

A response was received from HWC, stating that no further action under Section 38 of the National Heritage Resources Act is required. A copy of this correspondence is included in **Appendix L4**.

3.3.9. The National Development Plan 2030 (2012)

In 2009 the South African government established the National Planning Commission (NPC). This Commission chaired by the Minister in the Presidency for national planning is charged with the responsibility to develop a long-term vision and strategic plan for South Africa. Given its responsibility to ensure greater synergy in terms of national planning imperatives, it is of paramount importance to align local government development and planning objectives with the overall national imperatives.

In November the NPC released its National Development Plan entitled “Vision for 2030”. The following are the key priority areas of the plan:

- Creating an economy that will create more jobs.
- Improving infrastructure.
- Ensuring the transition to a low carbon economy.
- Enduring an inclusive and integrated rural economy.
- Reversing the spatial effects of apartheid.
- Improving the quality of education, training and innovation.
- Quality healthcare for all.
- Social protection.
- Building safer communities.
- Reforming the public services.
- Fighting corruption.
- Transforming the society and uniting the country.

3.3.10. Development Facilitation Act (Act 67 of 1995)

Key planning principles listed in Section 3 of the DFA are applicable to the proposed development. The principles include:

- Promoting the integration of the social, economic, institutional and physical aspects of land development;
- Promoting integrated land development in rural and urban areas in support of each other;

- Promoting the availability of residential and employment opportunities in close proximity to or integrated with each other;
- Optimising the use of existing resources including such resources relating to agriculture, land, minerals, bulk infrastructure, roads, transportation and social facilities;
- Promoting a diverse combination of land uses, also at the level of individual erven or subdivisions of land;
- Discouraging the phenomenon of "urban sprawl" in urban areas and contributing to the development of more compact towns and cities;
- Contributing to the correction of the historically distorted spatial patterns of settlement in the Republic and to the optimum use of existing infrastructure in excess of current needs;
- Encouraging environmentally sustainable land development practices and processes;
- Promoting land development which is within the fiscal, institutional and administrative means of the Republic;
- Promoting the establishment of viable communities; and,
- Promoting sustained protection of the environment.

3.3.11. Provincial Spatial Development Framework (2014)

The overall policy objective of the PSDF is to secure environmentally sustainable development and the use of natural resources while promoting socio-economic development in the Western Cape Province.

Aim

The aim of the Western Cape PSDF is to:

- Give spatial expression to the national (i.e. NDP) and provincial (i.e. OneCape 2040) development agendas;
- Serve as basis for coordinating, integrating and aligning 'on the ground' delivery of national and provincial departmental programmes;
- Support municipalities to fulfil their Municipal Planning mandate in line with the national and provincial agendas; and
- Communicate government's spatial development intentions to the private sector and civil society.

Guiding Principles

The Western Cape's new PSDF is based on a number of spatial principles that is relevant to the proposed development, namely:

- Spatial justice – targeting the marginalised and disadvantaged groups in society. Inclusionary settlements focus on the public realm, supporting equitable access and making urban opportunities accessible to all, especially the poor.
- Sustainability and resilience – land development should be spatially compact, resource frugal, compatible with cultural and scenic landscapes and should not involve the conversion of high potential agricultural land or compromising ecosystems.
- Spatial efficiency – compaction as opposed to sprawl is preferred. Mixed use as opposed to mono-functional and prioritisation over public transport rather than private car use. When a settlement is compact higher densities provide thresholds to support viable public transport, reduce overall energy use and lower travel cost.
- Accessibility – Improving access to services, facilities, employment, training and recreation including

improving the choice of safe and efficient transport nodes.

- Quality and liveability – a good environment is one that is diverse, varied and unique. Public spaces are the living rooms to settlements where people meet, play and relax. They need to be safe and attractive.

The PSDF emphasizes the need for creating compact and inclusive communities. Infill development is seen as a key strategy. Policies in the PSDF that are of relevance to this development proposal include:

- Policy S3: Promote compact, mixed use and integrated settlements;
- Policy S5: Promote sustainable, integrated and inclusive housing;

It should be noted that losses of scenic and heritage rural character are taking place due to recent patterns of rural residential sprawl on the outskirts of urban centres associated with low-density property developments. A number of scenic landscapes of high significance are under threat and require strategies to ensure their long-term protection. Of relevance to the proposed development priority areas for proposed conservation and protection include:

- Rural landscapes of scenic and cultural significance situated on the major urban edges and under increasing development pressure.

Towards establishing a framework for addressing these challenges, the SDF lists a number of spatial implications that are relevant to design and development of the proposed development:

- In terms of landscape significance, the overall natural and cultural landscape, and the layered pattern of settlements in response to the natural landscape over time is worthy of protection;
- In terms of landscape integrity, retaining the essential character and intactness of wilderness, rural and urban areas in the face of fragmentation through unstructured urbanisation and commercial agriculture, must be achieved;
- In terms of landscape connectivity, continuity and interconnectedness of wilderness and agricultural landscapes must be retained, including ecological corridors and green linkages;
- In terms of landscape setting, maintain the role of the natural landscape as a 'container' within which settlements are embedded, the landscape providing the dominant setting or backdrop;
- In terms of the logic of landscape, recognise the intrinsic characteristics and suitability of the landscape and its influence on land use, settlement and movement patterns, in response to geology, topography, water, soil types and microclimate.

3.3.12. Bitou Local Municipality Integrated Development Plan (IDP) 2017 - 2022

The vision of the Bitou LM (Vision 2022) is *"To be the best together"*. Its mission statement states: *"We partner with communities and stakeholders to sustainably deliver quality services so that everyone in Bitou can live and prosper together"*.

The Bitou LM's most critical development and internal transformation needs include:

- **Local economic development:** Over-reliance on one economic driver; very limited industry or manufacturing base; lack of resort and hotel environment. Limited space for development.
- **Unemployment:** High unemployment and inequality, high levels of poverty.

- **Water:** No dams, limited water supply, lack of potable water.
- **Infrastructure:** Limited bulk infrastructure, landfill site needs, challenges with maintenance of infrastructure
- **Suitable staff:** Challenges in filling critical positions, attraction of skilled labourers.
- **Housing:** Development of affordable (social and gap) housing.
- **Alignment and integration:** Poor internal communication, staff working in silos and no centralised municipal building.
- **Public Engagement:** Limited public participation and communication with communities.

3.3.13. Bitou Local Municipality Spatial Development Framework (2018)

The Spatial Development Framework (SDF) for Bitou Local Municipality seeks to address spatial, environmental and socio economic issues confronting the municipality. It also aims to assist the municipality to manage current spatial development processes/ pressures efficiently and strategically prepare for projected future developments/ development trends in the municipal area.

More specifically, the MSDF aims towards achieving the following objectives:

- Providing a spatial representation of the land development policies, strategies and objectives of the municipality in the context of local, district, provincial and national directives;
- Coordinating and integrating the spatial expression of the sectoral plans of the local and/ or provincial sector departments;
- **Addressing inefficient, impoverished and scattered land use patterns where the poor is generally located far away from places of socio-economic opportunities;**
- **Indicate the desired and intended pattern of land use development in the urban and rural parts in the municipality, including the delineation of areas in which development in general or development of a particular type would not be appropriate;**
- **Managing the conflicting demand between agriculture/ forestry, urban expansion and biodiversity conservation areas (tourism focus areas);**
- Providing mechanisms for the establishment of a functional relationship between urban and rural areas – both spatially and economically;
- Identifying priority investment areas in urban and rural parts of the municipality;
- Focusing on defining the economic footprint of the municipality and formulating strategies on how this can be enhanced in a sustainable manner;
- Coordination and alignment of the municipal SDF with the district and provincial SDF and any other regional plans applicable;
- Spatial targeting will serve to channel public and private investment into priority areas and align the capital investment programmes of the municipality and different government departments into these areas in pursuit of the five SPLUMA principles;
- Link all of the above to the Municipal Budget via the Bitou Integrated Development Plan (IDP)

An important principle of the Bitou Municipal SDF is to promote the development of sustainable human settlements based on Smart Growth Principles in all the nodal points within the municipality.

The Smart Growth Principles include:

- Provide for a mix of different kinds of land uses, e.g. residential, retail, business, and recreational opportunities;
- Create well-designed compact neighbourhoods where the different activities are in close proximity to each other;
- Provide a variety of transportation choices, including private, public and non-motorised transport opportunities that are safe;
- Create a variety of housing opportunities, i.e. in terms of function, form and affordability;
- Encourage growth in existing communities this can be done through infrastructure upgrade, urban renewal new amenities and densification;
- Preserve open spaces, natural beauty, and environmentally sensitive areas;
- Protect and enhance agricultural lands and secure these as a productive a land base for food security, employment, etc.;
- Utilize smarter, and cheaper infrastructure and green buildings and promote renewable and sustainable technologies;
- Foster a unique neighbourhood identity building on the unique and diverse characteristics of each community;
- Nurture engaged citizens through providing for residential work, and play areas; and
- Engaged citizens to participate in community life and decision-making.

The SDF describes the greater Kranshoek area, including current residential households, community facilities and businesses. Kranshoek comprises approximately 820 households. Community facilities include a new primary school at the northern entrance to the village, a clinic on the corner of Van Rooyen and Loop Street with a frail care centre to the south thereof, and a Community Hall, Library and Office of the Department of Housing clustered in the Kranshoek Community Centre in the central part of the town.

A new Sports and Recreation facility has been developed to the south of the Kranshoek Community Centre. Adjacent, to the west of the Community Centre, is a Griqua monument while the village cemetery is located at the far-south-eastern end.

A waste transfer facility is located at the northern entrance of the village next to the school while an informal taxi holding area exists to the south thereof. Several small businesses (shops) exist within Kranshoek while the large business area to the southeast comprise a number of low-key service industries/ commercial activities.

There are also a number of small farms located adjacent to the west of the town which are actively farmed by members of the community. Some limited agricultural activity also occurs to the east of the village.

The Griqua Cultural Bridge initiative comprising hotel and conferencing facilities is planned at the south-western end of the village and it should be noted that all the land between the village and the coastline belongs to the Bitou Local Municipality.

The proposed site is specifically mentioned as being earmarked for future housing adjacent to the future Industrial Park to the north of the site.

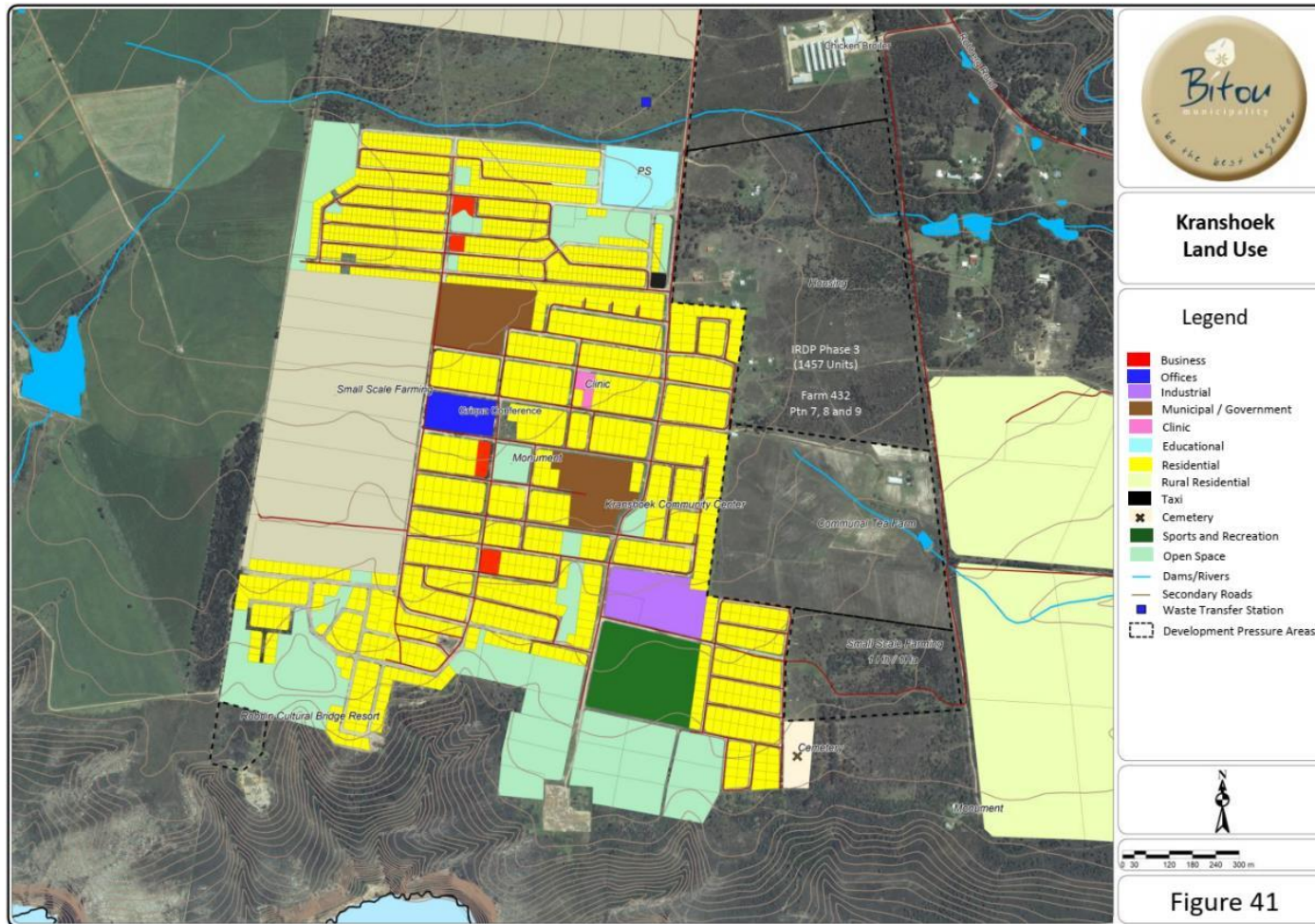


Figure 4: Kranshoek Landuse (Source: BMSDF 2018)



3.3.14. Bitou Local Municipality Housing Integrated Human Settlements Plan (2011)

The Bitou LM adopted an Integrated Human Settlement Plan in September 2011, which was later updated and revised in 2012. The plan makes provision for the following:

- A multi-year housing plan, high, medium and long terms;
- A municipal housing needs assessment;
- The identification, surveying and prioritization of informal settlements;
- The identification of well-located land for housing;
- The identification of areas for densification;
- Sustainability criteria on identified land, and
- A project pipeline and detailed implementation plans.
- Deriving linkages between housing and urban renewal and the integration of housing,
- Planning and transportation frameworks (Bitou IDP, 2016).

3.3.15. Bitou Local Municipality Coming Together Initiative (2010)

The Bitou Coming Together Initiative (2010) aims to integrate segregated urban areas, associated with economic disparities, as a result of Apartheid planning, within the Plettenberg Bay area. The project area includes this proposed New Horizons housing development area.

The key objective of the project is to bring economic development, government services and social services and facilities closer to the majority of the region's people. The initiative aims to shift the centre of economic investment, job creation and development in the coming decades towards the townships. Municipal and governmental services will be relocated closer to where the majority of the people are.

3.4. Approvals Required Pre-Construction and Planning Phase

The table below summarises the various environmental and planning approvals required from the various Authorities, before the construction of the development may take place.

Table 6: Summary Pre-Construction Environmental & Planning Approvals Required

Competent Authority	In terms of Legislation	Type of Approval / Licence / Required
The Western Cape Department of Environmental Affairs and Development Planning (DEA & DP)	National Environmental Management Act (NEMA) and the 2014 EIA Regulations (April 2017)	Environmental Authorisation required in terms of the NEMA EIA Regulations (2014), as amended, for the activities listed below.
Department of Water Affairs & Sanitation (DWS)	The National Water Act (NWA)	A Water Use Authorisation is required for approval of the following water uses: 21c) – impeding or diverting the flow of water in a watercourse; 21i) - altering the bed, banks, course or characteristics of a watercourse; Application has been made on the eWULAAS system.

Competent Authority	In terms of Legislation	Type of Approval / Licence / Required
Heritage Western Cape (HWC)	National Heritage Resources Act (NHRA) – Section 38	A Notice of Intent to Develop Application (NID) is required to be submitted. A “Final Comment” is required for approval of the following Section 38 activities: <ol style="list-style-type: none"> a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length; 1. any development or other activity which will change the character of a site— <ol style="list-style-type: none"> i. exceeding 5 000 m² in extent; or 2. the re-zoning of a site exceeding 10 000 m² in extent;
Bitou Local Municipality	Section 15 (2) (h) of the Municipal Planning Bylaw	The rezoning and subdivision of the consolidated portion into portions as shown on the layout plan.

The above approvals are informed by the Environmental Impact Assessment (EIA) process, an integrated process through which information regarding the proposed facility will be collected, organized, analysed and communicated to the relevant authorities for consideration.

3.5. Listed Activities Triggered in the NEMA EIA Regulations 2014, as amended

Table 7: Listed Activities in terms of the NEMA Environmental Impact Assessment Regulations (2014), as amended, that are proposed to be triggered and therefore require an application for Environmental Authorisation to be submitted to the DEA & DP.

LISTING NOTICE 1 (GN No. R327 of 7 th April 2017): Basic Assessment		
Activity #	Description of Activity as per GN No. R 327	Reason for Listing or NOT listing.
27	The clearance of an area of 1 hectare or more but less than 20 hectares of indigenous vegetation.	Although the study site (approximately 26Ha including the POS areas) is largely transformed, significant areas are still covered with Fynbos. This activity IS therefore triggered.

28	Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such development: i. will occur inside an urban area , where the total land to be developed is bigger than 5 hectares ; or ii. will occur outside an urban area , where the total land to be developed is bigger than 1 hectare ;	Portion 9 of Farm 432 is currently zoned as Agriculture and used for community tea farming. This activity IS therefore triggered.
LISTING NOTICE 3 (GN No. R324): Basic Assessment		
Activity #	Description of Activity as per GN No. R 324	Comment
4	The development of a road wider than 4 metres with a reserve less than 13.5 metres. Western Cape i. Areas zoned for use as public open space or equivalent zoning; ii. Areas outside urban areas; (aa) Areas containing indigenous vegetation; (bb) Areas on the estuary side of the development setback line or in an estuarine functional zone where no such setback line has been determined; or iii. Inside urban areas: (aa) Areas zoned for conservation use; or (bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority.	The proposed affordable housing development would include the development of roads of varying widths in areas containing indigenous vegetation and mapped as an Ecological Support Area and Other Natural Area. This activity IS therefore triggered.

12	<p>The clearance of an area of 300m² or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance plan.</p> <p>(i) In Western Cape:</p> <ul style="list-style-type: none"> i. Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004; ii. Within CBAs identified in bioregional plans; iii. Within the littoral active zone or 100m inland from the high water mark of the sea or an estuarine functional zone, whichever distance is the greater, excluding where such removal will occur behind the development setback line on erven in urban areas; or iv. On land, where at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning. v. On land designated for protection or conservation purposes in an EMF or a SDF adopted by the Minister. 	<p>The proposed affordable housing development would require the clearance of an area mapped as an Ecological Support Area and Other Natural Area.</p> <p>This activity IS therefore triggered.</p>
LISTING NOTICE 2 (GN No. R325): Scoping & Environmental Impact Reporting		
15	<p>The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for-</p> <ul style="list-style-type: none"> (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan. 	<p>Although the study site (approximately 26H) includes transformed areas, the majority of the site is still covered with indigenous vegetation.</p> <p>This activity IS therefore triggered.</p>

Therefore, in summary, the following activities will be applied for:

- **Listing Notice 1: Activity No: 27 and 28;**
- **Listing Notice 2: Activity No 15; and**
- **Listing Notice 3: Activity No: 4 and 12.**


4. DETAILED DESCRIPTION OF THE PROPOSED PROJECT

4.1. Site Location and Description of Property

4.1.1. Summary Table Site and Farm Details

Please refer to the table below which is a summary of the site and farm details associated with this proposed affordable housing development and associated services (water and sewage) infrastructure.

Table 8: Summary Table: Site and Farm Details

Province	Western Cape	
District Municipality	Eden District Municipality	
Local Municipality	Bitou Local Municipality	
Ward number(s)	Ward No 7	
Nearest town(s)	Kranshoek – directly adjacent	
Farm name(s) and number(s) and Portion name(s) and numbers	Portion 9 of Kranshoek Farm No. 432	
List of Properties, Ownership & Extent of each Property Associated with Proposed Affordable Housing Development		
PROPERTY	OWNERSHIP	EXTENT
Portion 9 of Kranshoek Farm No. 432	<u>Status Homes Property Developers</u>	25.94ha
Extent of Site (Development Footprint / Disturbed Area)	The proposed site development footprint for the affordable housing development area (as per Appendix C1) = total size of all properties (25.94ha)	
SG Code	C03900000000043200009	
Physical Address	Trekkerspad, Kranshoek, Plettenberg Bay, Western Cape	
Co-ordinates of the farm boundary:		

A	34° 4' 54.79" S	23° 18' 11.887"E
B	34° 5' 20.573"S	23° 18' 15.131E
C	34° 5' 19.357"S	23° 18' 2.54"E
D	34° 5' 9.825"S	23° 18' 4.085"E
E	34° 5' 9.249"S	23° 17' 56.592"E
F	34° 4' 56.582"S	23° 17' 58.137"E

4.1.2. Location of Proposed Mixed Use Development

The proposed affordable housing development is on Portion 9 of the Farm Kranshoek No 432. The proposed property to be developed is located within the Plettenberg Bay Urban Edge.

The farm portion (Portion 9) is positioned to the east of the town of Kranshoek and abuts Trekkerspad. Kranshoek is a residential township located west of the town of Plettenberg Bay in the Bitou Municipal Area. It is to the south of Robberg Road which connects the western parts of Plettenberg Bay to the N2 further west of Kranshoek, and north of the Indian Ocean coast.

Kranshoek is comprised of township extensions linked by gravel and tar roads. Urban development to the west of the proposed site are affordable housing and a school with mostly vacant land to the north and agricultural farm portions (Portions 7 and 8) to the east and south.

Portion 9 of the Farm Kranshoek No. 432 is not completely undeveloped and, in fact, has a number of residential buildings situated on it. The site was historically used for stock farming, however it is now used by some of the local community for informal tea farming.

4.2. Detailed Description of the Scope of the Proposed Activity

4.2.1. Description of Proposed Mixed Use Development

It is proposed to construct approximately 885 housing units on Portion 9 of the Farm Kranshoek No 432 comprising of a mix of single residential dwellings, apartments, retail and commercial properties, schooling facilities, places of worship, a park and Public Open Spaces. The following is proposed to be developed as per the **Site Layout Plan** shown in **Appendix C1** and in the table below:

Table 9: List of proposed development aspects

Development Proposed	No.	Size (ha)
Residential Zone 1: Dwelling Houses	457	8.95
Residential Zone 4: Flats	419	4.18
Business Zone 1: Shops, shopping centre	1	1.32
Institutional Zone 1: School & Creche	2	0.303
Institutional Zone 2: Place of Worship	2	0.19
Open Space Zone 1: Public Parks	2	5.72
Open Space Zone 2: Private Parks	4	0.51
Transport Zone 1: Private Roads	4	2.98
Transport Zone 1: Private Roads	-	1.83

TOTAL DEVELOPMENT FOOTPRINT	±25,98Ha
------------------------------------	-----------------

* These numbers are approximate and may change slightly in the detailed design phase

Please refer to the Site Layout Plan in **Appendix C1**.

The proposal is to roll out the development in phases and include the following:

- Phase 1 – Winifred Lane inclusive of a Business Zone for a shopping centre and Residential Zone for social housing in the form of apartment units to a density of 100 units/ha
- Phase 2 – Stella Drive inclusive of a Residential Zone for 98 residential erven
- Phase 3 – Extension of Stella Drive inclusive of a Residential Zone for 96 residential erven
- Phase 4 – Further extension of Stella Drive inclusive of a Residential Zone for 104 residential erven
- Phase 5 – Road tie-in to existing Kranshoek Road inclusive of a Residential Zone for 159 residential erven

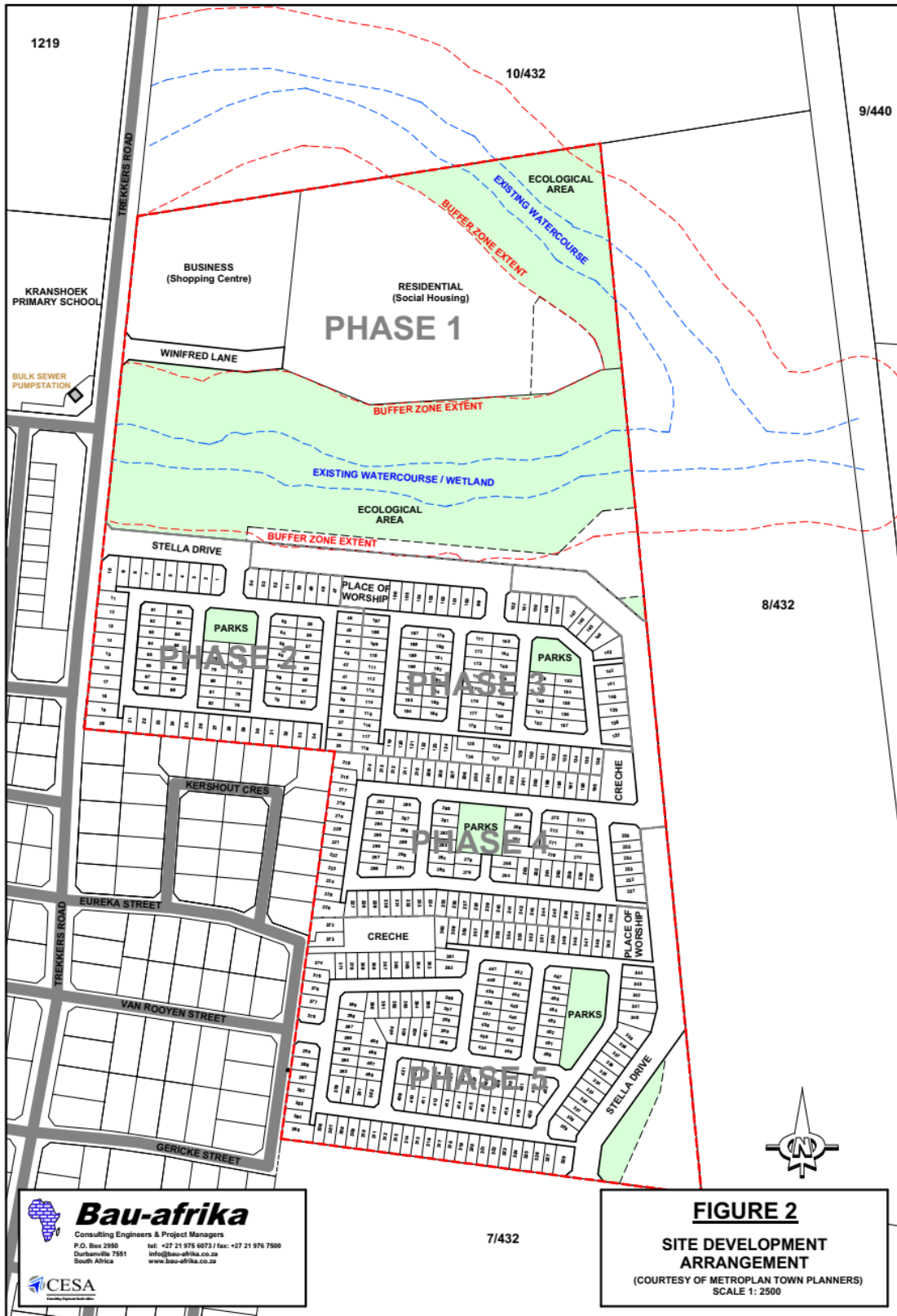


Figure 5: Proposed Phasing of the Development (Source: Bau-Africa 2020)

- Environmental Impact Assessments • Basic Assessments • Environmental Management Planning
- Environmental Control & Monitoring • Water Use License Applications • Aquatic Assessments



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CESA
Consulting Engineers & Project Managers

FIGURE 2
SITE DEVELOPMENT ARRANGEMENT
(COURTESY OF METROPLAN TOWN PLANNERS)
SCALE 1: 2500

Examples of typologies for these types of housing are shown below and more detailed drawings have been included in **Appendix D**.

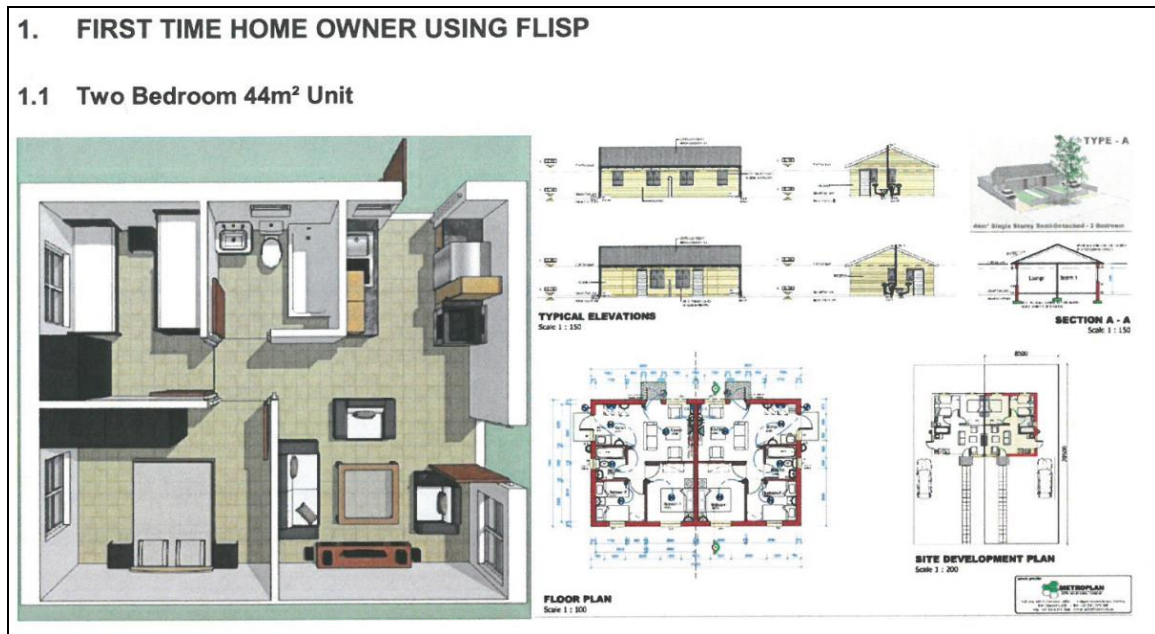


Figure 6: Example typology of two bedroom semi-detached residential units (FLISP)

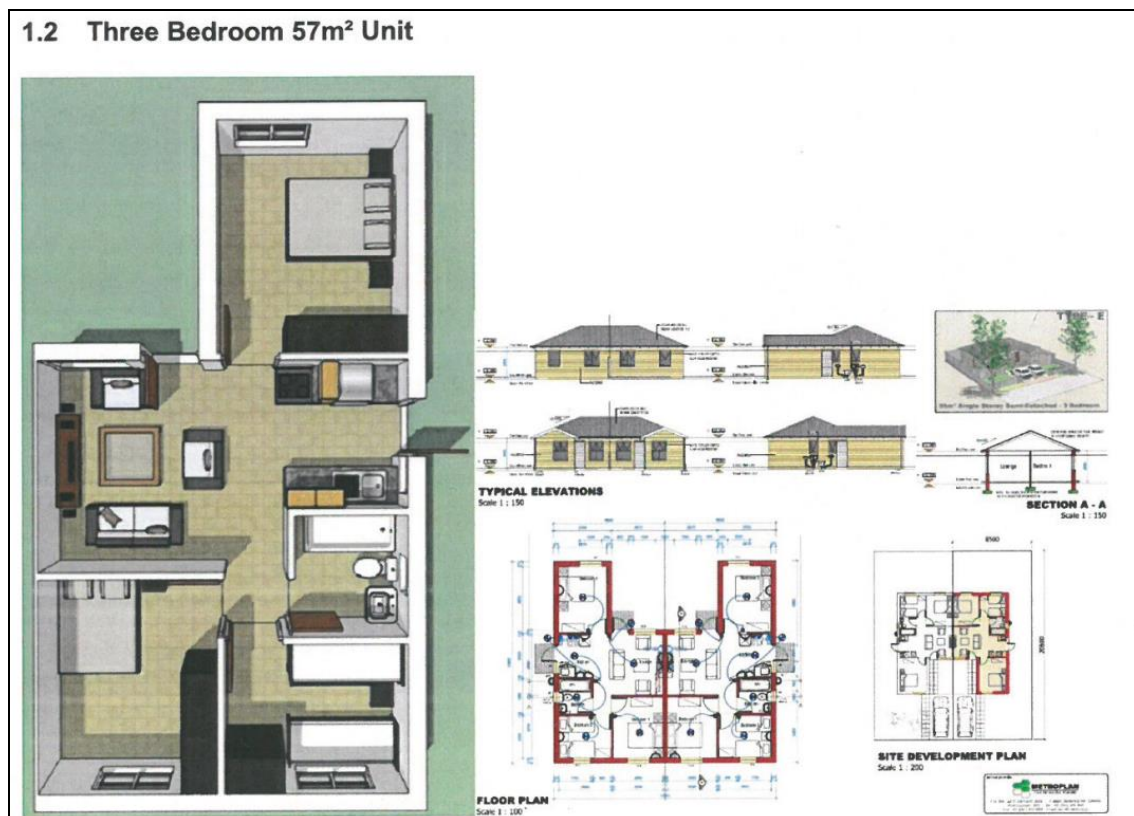


Figure 7: Example typology of three bedroom semi-detached residential units (FLISP)

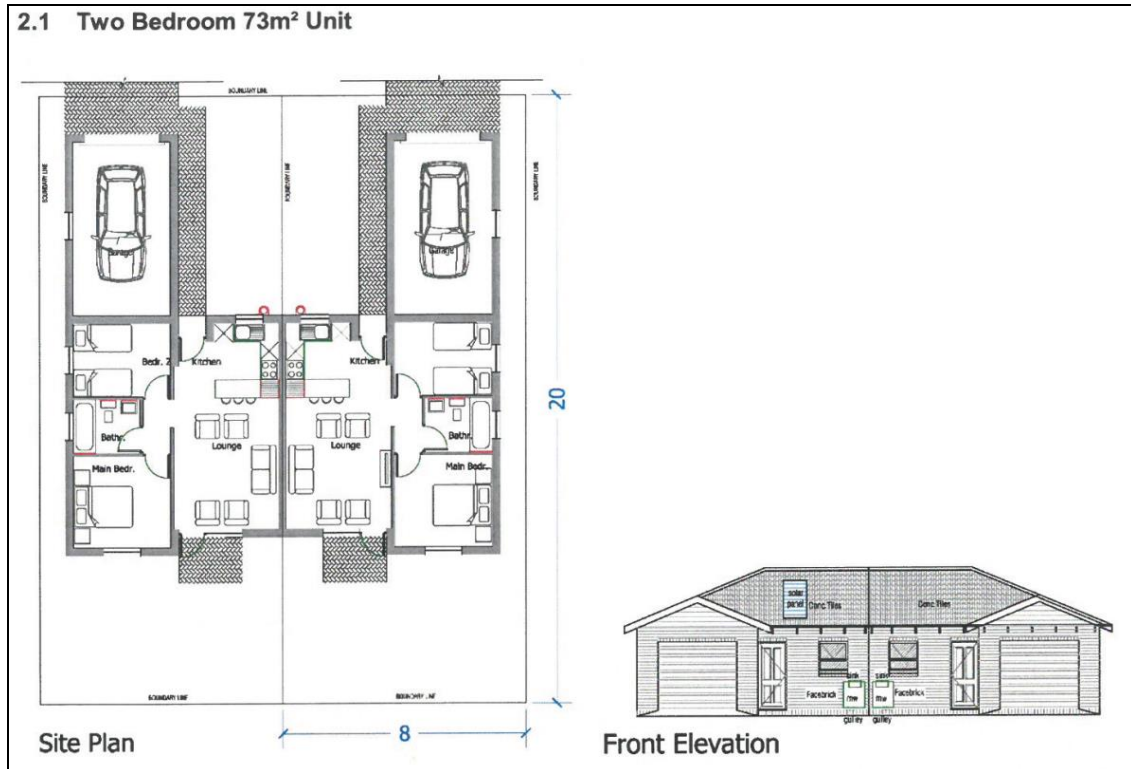


Figure 8: Example typology of two bedroom semi-detached residential units (Non-Government Subsidised)

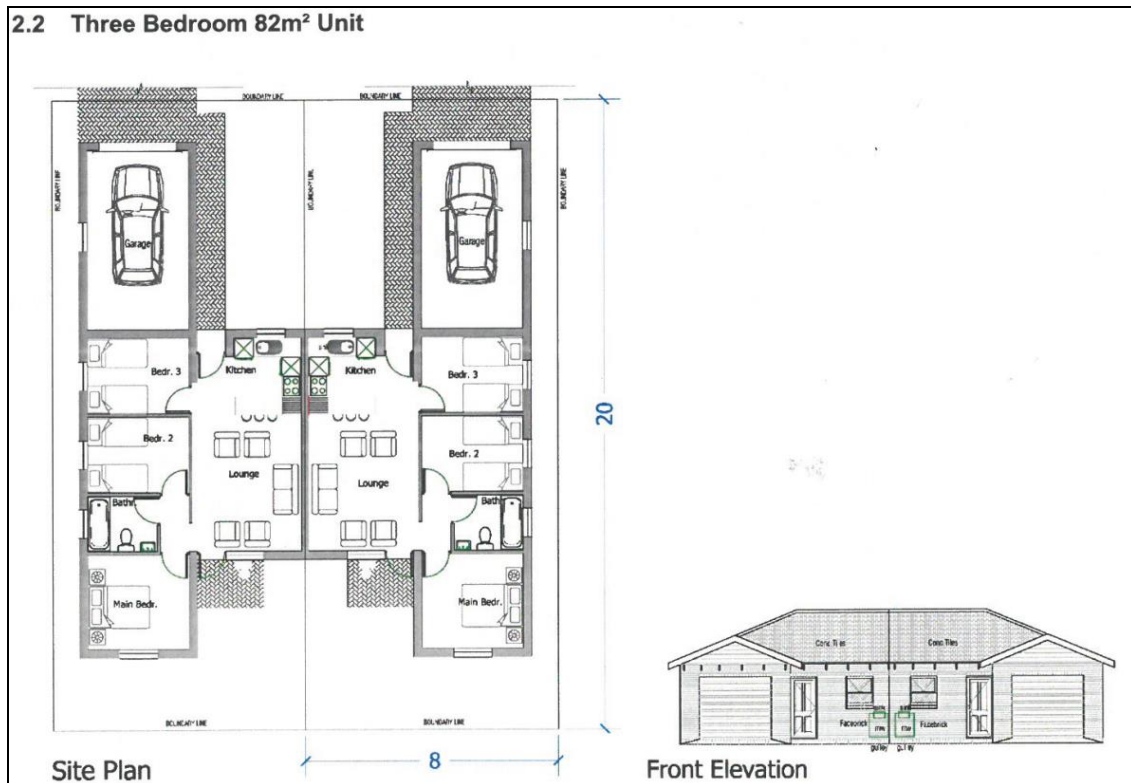


Figure 9: Example typology of three bedroom semi-detached residential units (Non-Government Subsidised)

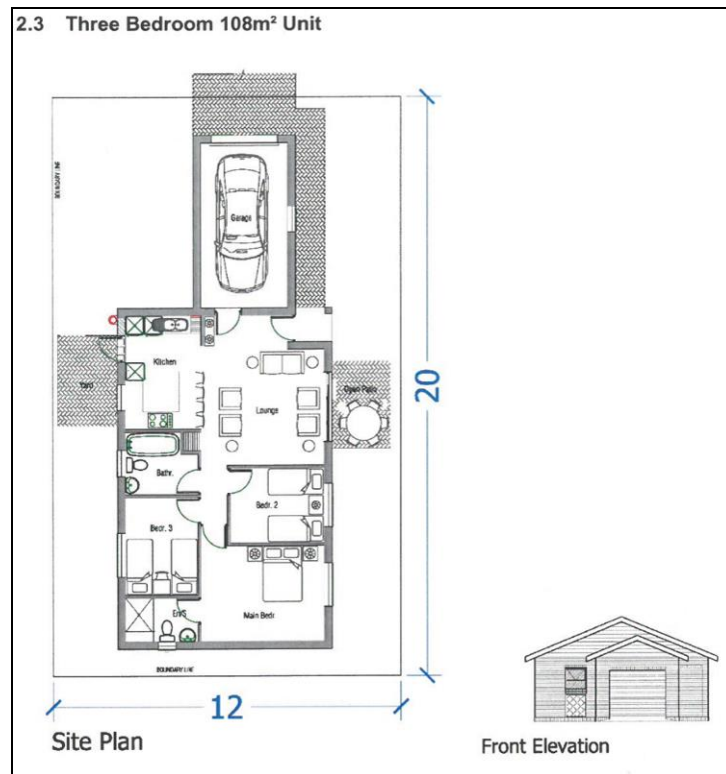
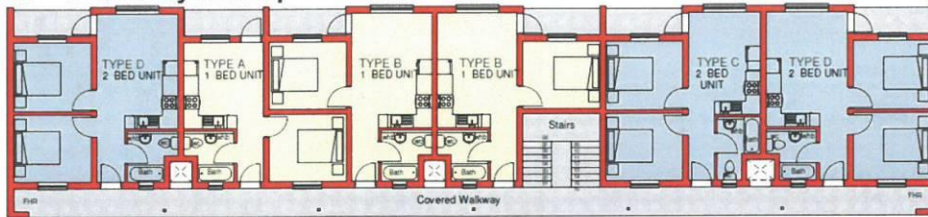


Figure 10: Example typology of three bedroom single residential unit (Non-Government Subsidised)

3. SOCIAL (RENTAL) HOUSING

One and Two Bedroom – Two and Three Storey Walk-Up Apartments

3.1 Two Storey Walk-Up



Typical Storey Plan (Scale 1:100)

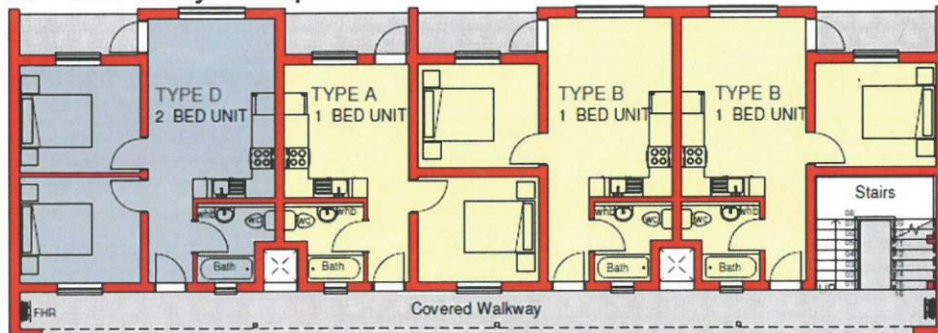


Typical Front Elevation



Typical Rear Elevation

3.2 Three Storey Walk-Up



Typical Storey Plan (Scale 1:100)



Typical Front Elevation

Figure 11: Example typologies of Social (Rental) Housing

4.2.1.1. Residential

Single and double storey residential housing units are proposed throughout the majority of the development. These will be registered to potential beneficiaries under Free Hold Title, making use of both Government Housing Subsidies such as BNG, FLISP, and Social Housing and non-subsidised commercial affordable housing with apartments in a consolidated area in the northern portion of the site. Provision is also made for an erf for Social (Rental Housing) with approximately 419 walk up rental apartments for both subsidised and non-subsidised development. This site is adjacent to the business site and provides an intensification of the node along Trekkerspad.

4.2.1.2. Business

A business site to house a shopping centre is located in the northern portion of the site to accommodate the expanding demand for retail space. One other lower level business site is strategically positioned to the south of the Framework.

4.2.1.3. Institutional Site

Four institutional sites provide for Places of Worship, Crèches and other unanticipated community social facilities. Two Institutional sites to house Places of Worship are strategically placed along the spine route. Apart from the existing Crèche resulting from a minor subdivision of Portion 9, an additional crèche site is provided centrally.

4.2.1.4. Open Space

Provision has been made for parks within definable residential clusters. Open Space accounts for approximately 23% of the total area. A hierarchy of Public Open Spaces is envisaged to make provision for play fields and play parks situated in strategic positions to serve the residential community with three smaller housing clusters served by small parks. A large buffer area around the wetlands on site has also been included.

4.2.2. Proposed Services

Information on Civil Engineering Services was extracted from the Civil Engineering Services Report compiled by Bau-Afrika (2020).

4.2.2.1. Existing Civil Engineering Services

The existing services are illustrated below and Appendix C3.

Existing Stormwater Drainage

On Site

- The site slopes in an easterly direction and discharge sheet flow toward the low valley areas.
- The site drains towards two areas with one located in the north-eastern and other south-eastern corners of the study area and is separated by a watershed midway.
- Low valley areas (natural watercourses) traverse the northern reaches of the site and follow a drainage path eastward to the sea.
- The southern reaches of the site forms the ridge of the northern drainage basin and a separate natural watercourse located south-east of the study area accommodates the runoff from the southern reaches.
- Both watercourses mentioned above are at best streams that intermittently have water within its valley areas and meanders east toward its separate mouths at the sea.

Adjacent to the Site

- Both watercourses mentioned provide the drainage path for upstream, neighbouring developments of the existing Kranshoek settlement.
- No stormwater management facilities are evident within the existing settlement and it is assumed that the road network provides the drainage path for the area.
- A road low point is evident along Trekkers Road and forms the source of the watercourse within the northern reaches.
- Another road low point can be found along Gericke Street and forms the source of the watercourse located along the southern boundary of the site

External Catchments

- Portion 9 of Farm 432 is influenced by runoff generated from external catchments located to the west of the site.
- These catchments span an area of 25ha to the north and 22ha to the south of Portion 9 and are made up of serviced affordable housing erven complete with buildings
- The external catchments discharges onto the site via the road low points located at Trekkers Road and Gericke Street.

Existing Sewer

The following sewer services are located in and around the site:

- Most of Kranshoek's sewer network discharges into the Kranshoek Sewer Pump Station located 1350m South West of the study area at the Trekkers Road cul-de-sac.
- The Kranshoek sewer network is predominantly a \varnothing 160mm pipe network with short \varnothing 110mm links along the upper reaches.
- A sewer rising main (pipe size to be confirmed) along Trekkers Road connects Kranshoek Sewer Pump Station with a Bulk Sewer Pump Station located adjacent to Kranshoek Primary School, opposite the study area.
- The Kranshoek bulk sewer rising main (pipe size to be confirmed) traverses the study area along the western and northern boundary and connects into a \varnothing 200mm bulk sewer outfall located within Robberg Road.
- This outfall sewer becomes part of the outfall network for Piesang Valley and the greater Plettenberg Bay area.

Existing Potable Water

The following potable water services are located in and around the site:

- A bulk water supply main (pipe size to be confirmed) exist and traverses the study area along its northern and western boundary.
- A water distribution main (pipe size to be confirmed) exist along the western boundary within Trekkers Road verge and follows a path north toward Robberg Road.
- This water distribution main is fed from the Kranshoek Reservoir located along Eureka Street approximately 450m west of the study area and supplies developments along Robberg Road inclusive of the Plettenberg Bay Airport.

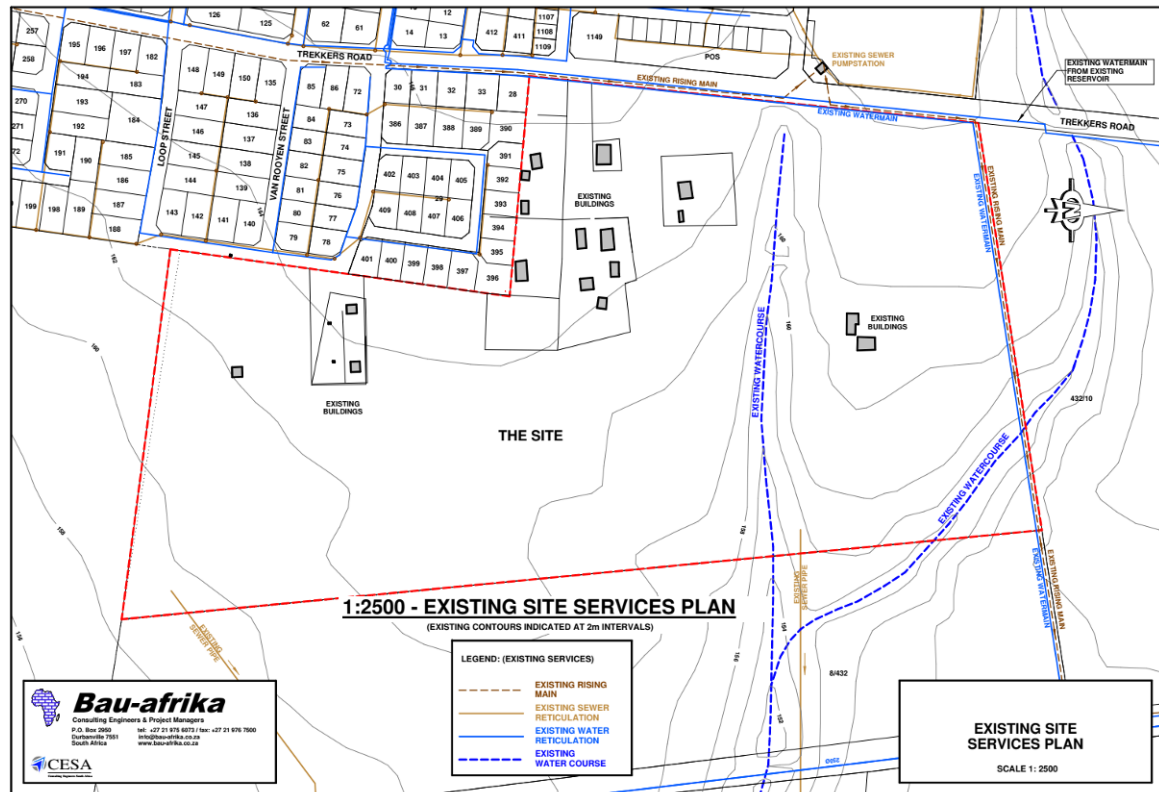


Figure 12: Existing Services Plan (Source: Bau-afrika 2019)

4.2.2.2. Proposed Water

The following existing municipal water services were considered to accommodate the Portion 9 of Farm 432 development:

- The water distribution main situated along Trekkers Road that is routed north and serving developments along Robberg Road.

The internal water reticulation will be provided to achieve the required fire flow conditions as guided by the “Guidelines for Provision of Engineering Services and Amenities in Residential Developments” as published by the CSIR.

The Bitou Municipality has plans for future water mains in the vicinity of the proposed development as per the Water Master Plan compiled by GLS Consulting which provides a tie in point for the bulk water.

The bulk water supply for the site is proposed as follows:

- A connection is to be made on Trekkers Road onto the existing water distribution main to service Phase 1 along Winifred Lane
- A 2nd connection is proposed on the above-mentioned main located south to service Phase 2 to 5 along Stella Drive.

Internal Reticulation

The water supply to Portion 9 of Farm 432 is based on the anticipated water demand for the different land uses

and consist of the following:

- The land use table as per the development layout provided by the Town Planner
- The annual average daily demands (AADD) for different land uses are based on the Guidelines for Human Settlement Planning and Design compiled by the CSIR:
 - Residential units = 600 l/day/unit
 - ECD (learners) = 20 l/day/learner with ECD @ 40 learners/ECD (max)
 - Place of Worship = 2 000 l/day/erf
 - Business (Office, shops and civic buildings) = 400 l/day for 100m²/GLA with GLA @ 60% of land area
- The peak flows are calculated on residential units only, as it will equate for the highest water demand scenario for this proposed development.
- Water peak demands are based on peak factors read off the “equivalent erven” figure (*Reference: Fig 9.11 of Guidelines for Human Settlement Planning*)

Portion 9 of Farm 432 will require the following demand on the water infrastructure:

FULLY DEVELOPED		Potable Water Demand		
Portion 9	Number	AADD (kl/d)	Peak Factor	Peak Demand (l/s)
Phase 1		163.0		
Phase 2		58.8		
Phase 3		59.6		
Phase 4		63.2		
Phase 5		98.2		
Total		442.8	6.1	31.2

Based on the results, the following conclusion were made by the Engineers:

- Two municipal connections are proposed for the development
- Pipe sizes foreseen to range from ø110mm to ø160mm
- The working water velocity and pressure will be reviewed at detail design stage to inform the water design for fire flow conditions.
- Water saving measures are being considered by the developer and will be communicated during detail design.

(Refer to Appendix C: Proposed Water Reticulation Plan)

4.2.2.3. Proposed Sewer

The following existing municipal sewer services were considered to accommodate the Portion 9 of Farm 432 development:

- The gravity sewer pipe located within the public open space and Kranshoek Primary School along Trekkers Road that discharge into the Bulk Sewer Pump Station situated adjacent to the school
- The Kranshoek bulk sewer rising main that traverse the study area along the western and northern boundary and connect to Robberg Road
- The ø200mm bulk sewer outfall located within Robberg Road that becomes part of the outfall network for Piesang Valley and the greater Plettenberg Bay area



Although the Bitou Municipality has plans for future bulk sewer improvements as developed by GLS Consulting in their Sewer Master Plan dated April 2016, the development of Portion 9 of Farm 432 is exploring utilising the current infrastructure.

The internal sewer reticulation for the development is divided into two catchment areas, namely a northern and southern area.

The sewer design for the site proposes the following:

- The Northern area discharge into a new gravity system linked to new sewer pump station serving only Phase 1 of the Portion 9 development and will be pumped to the existing gravity main along Trekkers Road
- The Southern area discharge into a new gravity system proposed to serve Phase 2 to 5 and will be linked to a new sewer pump station located in Phase 5 and will be pumped along Stella Drive to the existing gravity main along Trekkers Road

The sewer calculation results are as follows:

Fully Developed		Sewer Water Demand		
Portion 9	Phase	AADD (kl/d)	Peak Factor	Peak Demand (l/s)
Northern	1	138.5	3.67	5.7
	2	237.7	3.42	9.2
Southern	3			
	4			
	5			
Total		376.2		

Figure 13: Total Domestic Sewer Demand Results (Source: Bau-afrika 2020)

The following sewer conclusion was made by the Engineers:

- Two (2) sewer pump stations are proposed for the development
- The pump stations will be positioned at each area's gravitational low point
- The new rising mains will be positioned within the road reserves and follow a path to Trekkers Road to tie into the existing gravity mains in close proximity
- All gravity mains in the Kranshoek area discharges into the Bulk Sewer Pump Station located adjacent to Kranshoek Primary School

(Refer to Appendix C: Proposed Sewer Reticulation Plan)

4.2.2.4. Proposed Stormwater

Stormwater Management Strategy

The Stormwater Master Plan objective is to reduce the post-development stormwater flow of the site to meet the pre-development flow of the existing site area. The development of the site will increase stormwater runoff. In order to reduce the runoff impact, the following management strategy has been adopted:

- Plan and design the proposed stormwater system in accordance with the best design practices.
- Plan and design the proposed stormwater system to support the Water Sensitive Urban Design

(WSUD) and attain a Sustainable Urban Drainage System (SUDS).

A Sustainable Urban Drainage System can be achieved through applying the following:

- Control the quantity and rate of stormwater runoff to reduce any possible flooding threat.
- Improve the quality of the stormwater runoff to protect the natural aquatic environment and maintain recreational water quality.
- Encourage natural groundwater recharge to reduce the volumes of stormwater runoff.

Stormwater Drainage Systems

The drainage pattern is based on the following:

- Site topography
- Conceptual vertical alignments of corridors (roads)
- The hydrological catchments as based on the conceptual vertical alignments
- Corridor low points to drain into formal bulk stormwater system
- Formal bulk stormwater system to drain into existing stormwater system

In order to control the stormwater runoff, the proposed stormwater system would be designed to accommodate runoff from both major and minor storm events and is categorised as follows:

- Primary System
- Secondary System
- Bulk System

Primary System

Based on the land use proposed, the Primary System is designed for the following:

- Accommodate runoff generated by a storm up to a maximum of 1:5 year return interval
- The runoff is conveyed along kerbs and channels within roads and parking areas and discharge into underground pipe systems via catchpits / inlets.

Secondary System

The Secondary System is designed for the following:

- To accommodate runoff generated by all storm events in excess of 1:5 year RI and up to a 1:50 year RI
- The road network is utilised and designed to accommodate the above storms and convey runoff along kerbs and channels to road chutes into swales and detention ponds.
- Runoff conveyed within roads will function in conjunction with the Primary system.

Bulk System

The Bulk system is designed as follows:

- Receive stormwater from the Primary and/or Secondary systems to convey into the stormwater management areas such as the detention ponds.
- Constructed enhanced swales are to meander alongside the protected ecological areas and bulk roads complete with weirs to reduce flow rates.
- The external runoff to discharge into the Bulk System en route to the stormwater management areas.
- The road crossings and bulk network is sized to accommodate flows generated from storm events up to 1:100 year RI

Runoff Quantity Control

Stormwater runoff generated on the developed site is to be managed to mitigate the effects of increased runoff peak rates, volumes and velocities. The stormwater management facilities proposed will control the flow rate downstream and reduce the flooding threat.

Through controlling stormwater quantity from the developed site, downstream infrastructure will have Channel Protection (CPV), Overbank Flood Protection (Qp) and Extreme Flood Protection (Qf).

Runoff quantity can be controlled through applying the following:

- For CPV, the runoff up to a 1:1 year RI storm is to be detained and gradually released over a 24 hour period to protect the downstream channels from eroding.
- For Qp, the peak flow rate up to a 1:10 year RI storm is to be reduced to its predevelopment peak flows to protect downstream properties from frequent nuisance flooding.
- For Qf, the peak flow rate up to a 1:50 year RI storm is to be reduced to its predevelopment peak flows to protect floodplain properties from extreme flooding conditions.
- The effects of a 1:100 year RI storm will to be assessed to finalise the development's unit floor levels and provide guidance for future downstream developments

Through applying Best Management Practice (BMP) the above design criteria can be achieved by implementing the recommended controls.

Portion 9 of Farm 432 has three catchment areas of different sizes and outlines the drainage area for the development. The external stormwater follows the road drainage pattern of the existing Kranshoek settlement along the western boundary and discharge onto the study area at the Trekkers Road & Gericke Street low points into the natural watercourse through and along the site before exiting at its eastern boundary.

All existing stormwater runoff from the study area occurs overland as sheet flow and enters the natural watercourse along its banks.

The proposed stormwater system will be designed for minor and major storm events and is categorised as provided below.

- The underground stormwater pipes and catchpits are designed to accommodate the more frequent storms up to 1:2 year RI (minor storm events)
- The development runoff is conveyed along kerbs and channels of roads entering the underground system at catchpits and other inlet structures
- Catchpits are constructed with silt traps for sediment removal purposes
- The underground system conveys stormwater to the gravitational low area of the catchment and discharges into a stormwater management area.
- External runoff from storms up to 1:½ year RI is captured along the western boundary and proposed to be channelled to link up with the stormwater management area along perimeter of the ecological protected area.

Considering the site characteristics, drainage size and the application of the facility within the development, the following stormwater facilities are recommended:

- Stormwater Ponds – Micropool Extended Detention (ED) Pond (Refer to Figure 14)

- Enhanced swales – Dry Swales (Refer to Figure 15)

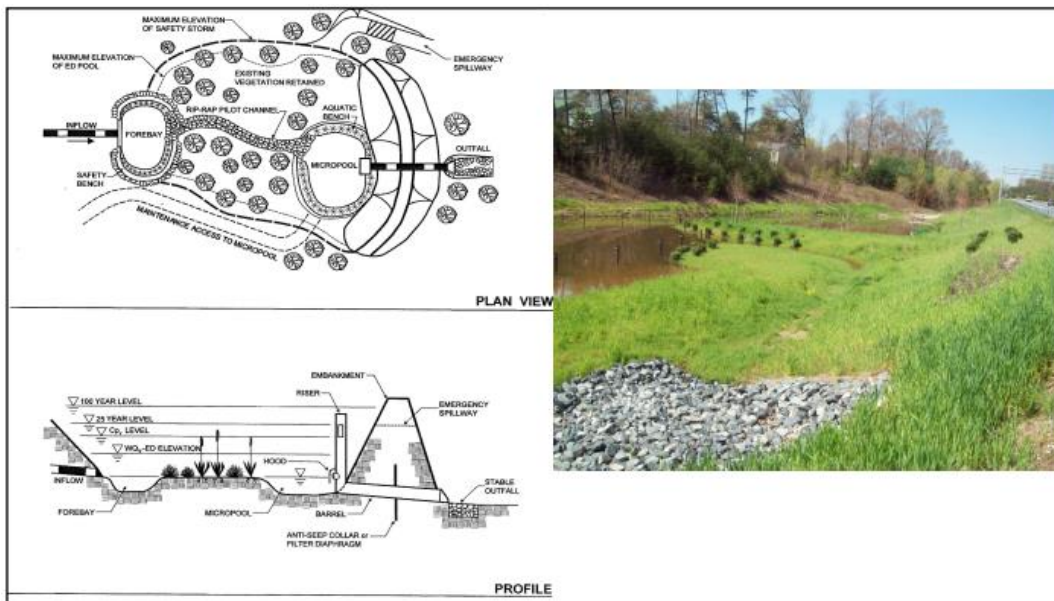


Figure 14: Example of Stormwater ponds - Micropool Extended Detention Pond

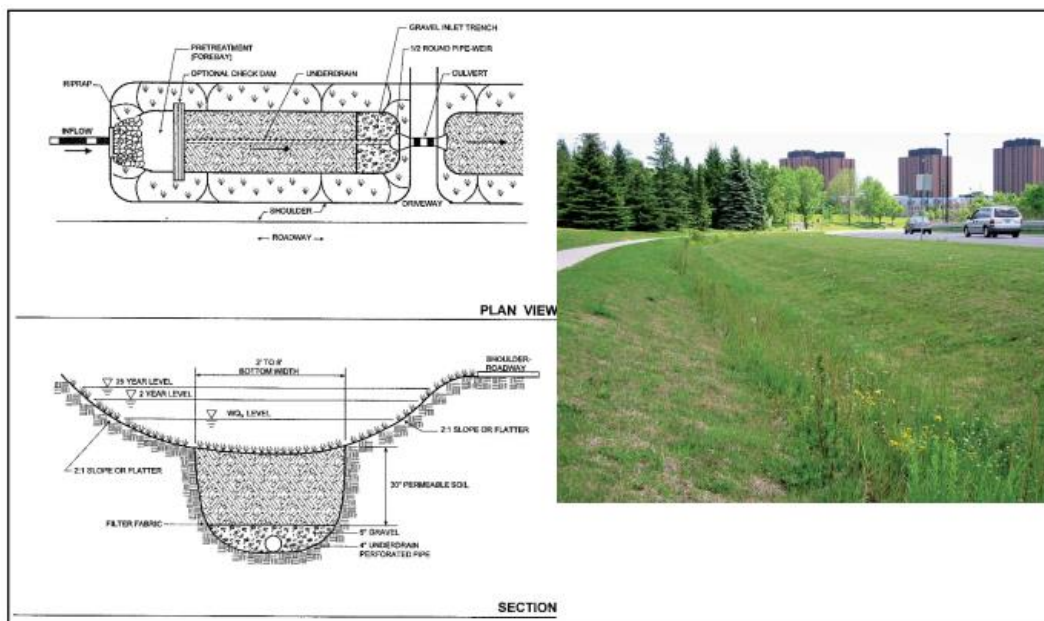


Figure 15: Example of Enhanced swales - Dry Swales

The proposed drainage plan, with the locations of the proposed stormwater management ponds and new stormwater flow paths, is shown below.

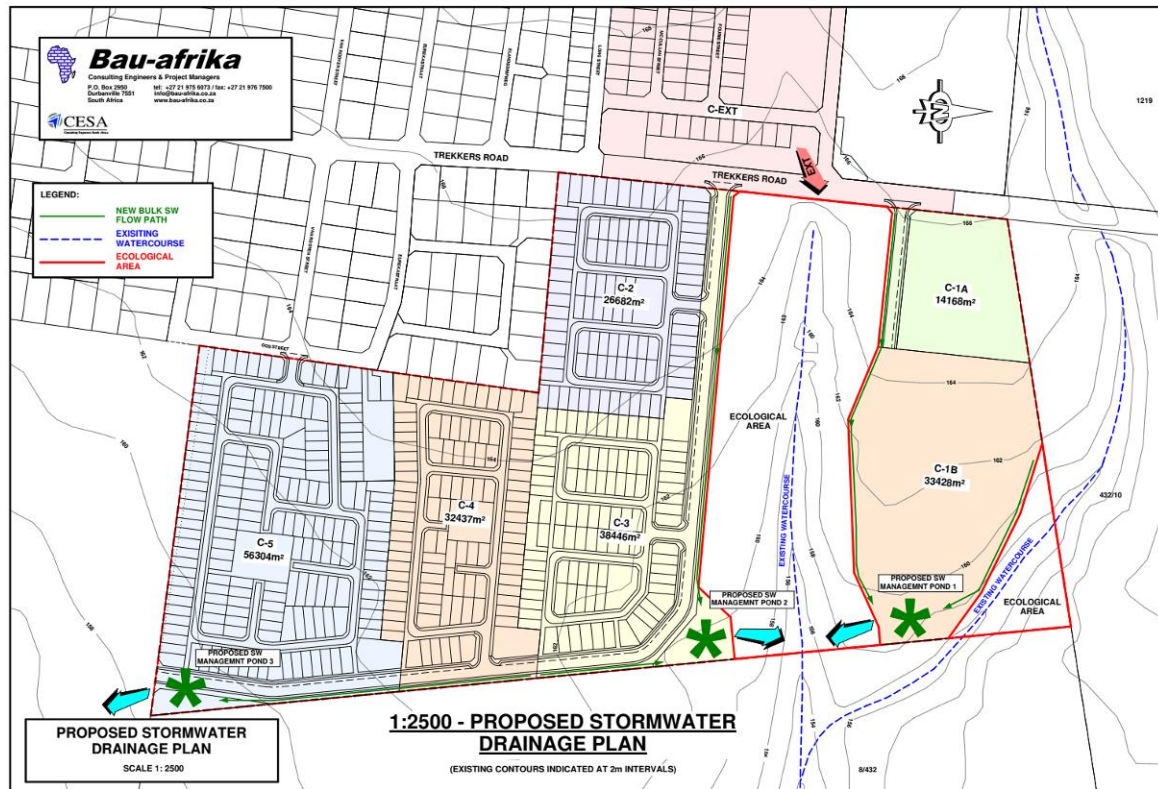


Figure 16: Proposed Post-Development Drainage Plan (Source: Bau-Afrika 2019)

Improving Runoff Quality

Stormwater runoff is to be treated to remove at least 80% of the total suspended solids (TSS). The requirement is quantified and expressed as the Water Quality Volume (WQV) and equals the runoff generated on the site during a specific amount of rainfall.

Runoff quality can be improved by doing the following:

- Calculate the WQV = total runoff of the 1:½ year RI
- Treat the WQV to achieve the following treatment goals:
 - 80% reduction of Total Suspended Solids (TSS).
 - 45% reduction of Total Phosphorus (TP).

Through applying the technology based water quality performance of each stormwater facility, the treatment train performance can be calculated for the developed site. The stormwater will therefore pass through a series of treatment structures, each contributing to the improvement of the stormwater runoff quality.

The following treatment structures are being considered in achieving the treatment of the WQV:

- Micropool Extended Detention (ED) Pond (Refer to Figure 14)
- Enhanced Dry Swale (Refer to Figure 15)
- Grass channels (noted as open drains) (Refer to Figure 16)

In addition to the above, water quality loads can be reduced by implementing the following:

- Litter traps at inlet points to bulk systems (Refer to Figure 17)
- Silt/sediment traps built in catchpits (Refer to Figure 18)
- Street cleaning at regular periods

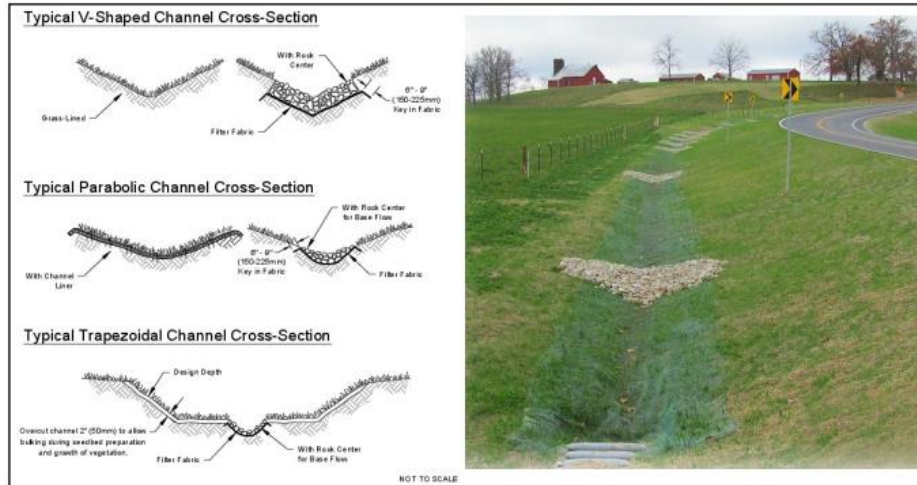


Figure 17: Example of Grass Channels - Open drains



Figure 18: Examples of litter traps - inlet pollution controls



Figure 19: Examples of Sediment traps - Sediment collection in catchpits

Post Development Attenuation

By implementing the stormwater management strategy described above, the proposed stormwater system will be designed to release the same or less flow as the predevelopment. It is also designed to provide a drainage pattern for the developed site that:

- Supports the Water Sensitive Urban Design (WSUD)
- Attains a Sustainable Urban Drainage System (SUDS)
- Conforms to the Municipality's policies

The proposed site drainage pattern is influenced by the following:

- The proposed internal road network
- The protected ecological areas
- The surrounding areas draining toward internal roads or into bulk stormwater systems
- The internal road network draining into catchpits with sediment traps for quality treatment and controlled release into bulk systems
- The bulk systems along the protected ecological areas and bulk roads consisting of enhanced swales and open drains (grass channels)
- The stormwater runoff discharges into stormwater ponds for quality treatment and controlled release to downstream systems through an outlet structure
- The design of the outlet structure to control runoff up to a 1:50 year RI

Proposed Stormwater Drainage Conclusion

The following conclusion was made by the Engineers:

- Three pond areas have been proposed for the stormwater management of the development.
- The three ponds are located on the downstream side of the catchments.
- The development layout accommodates the required space for the stormwater management areas in order to achieve the management strategy
- The peak attenuated flows from the developed property will not exceed the pre-developed flows for the 1:2, 1:5, 1:10, 1:20 and 1:50 year RI
- An emergency outlet will be designed to accommodate flows from storm events greater than 1:50 year RI and up to 1:100 year RI without overtopping the banks of the pond
- The stormwater outflow into the watercourse will require further discussions with Freshwater

specialists and Bitou municipality to determine the ecological treatment of the outfall into the watercourse.

4.2.2.5. Proposed Telecommunication

Telecommunication and data sleeves will be provided in accordance with the reticulation layouts of future service providers. The installation of telecom sleeves will be covered with the detail design of the development and form part of the construction of the civil engineering services. The installation of all telecommunication sleeves will comply with the requirements of SABS 1200 LC.

4.2.2.6. Proposed Electrical Services

An electrical service assessment was done by Clinkscales Maughan-Brown (2019). The electrical supply authority for the area is Eskom therefore the distribution network will comply with their requirements and standards.

It has been assumed that the existing Eskom 22kV overhead line across the site will be relocated to follow the road reserves and that the network will be extended and augmented to accommodate the planned development. The electrical demand based on the original layout design is estimated as follows:

a)	559 Dwelling houses @ 6.9kVA each x 0.3df	= 1 157 kVA
b)	316 Flats @ 6.9kVA each x 0.3df	= 654 kVA
c)	Shops @ 500kVA x 0.7df	= 350 kVA
d)	School / creche @ 100kVA x 0.7df	= 70 kVA
e)	Place of worship @ 40kVA x 0.7df	= 28 kVA
f)	Health Clinic @ 40kVA x 0.7df	= 28 kVA
TOTAL		= 2 287 kVA

The installation of electrical sleeves will be covered with the detail design of the development and form part of the construction of the civil engineering services. The installation of all electrical sleeves will comply with the requirements of SABS 1200 LC.

4.2.3. Proposed Transport, Access and Internal Roads

4.2.3.1. Existing Road Network

Robberg Road (DR02770) is a provincial divisional road (class 3/4) road linking Plettenberg Bay in the east with the N2 in the west. Towards Plettenberg Bay the road consists of a single lane per direction with a narrow shoulder and is in a fair condition. Towards the west, the road is in a good condition with a slightly wider shoulder. The posted speed limit is 80km/h.

Trekker Road (DR07207) is a provincial access (class 4) road which currently links the Kranshoek residential area to Robberg Road and thence to Plettenberg Bay to the east and the N2 to the west. The road comprises of a single 3,5m wide surfaced traffic lane in each direction with no shoulder. The road is in a poor condition possibly as a result of a lack of drainage.

Du Plessis Street is a surfaced class 5 residential street serving the northern portion of Kranshoek. The road comprises of a single 3.4m lane per direction and is kerbed along both sides with a paved pedestrian walkway on either side. The road is in a good condition with a posted speed limit of 60km/h.

National Route 2 is a 7.4m wide surfaced class 1 national road linking Cape Town with the Mozambique border via Knysna, Port Elizabeth and Durban.

4.2.3.2. Proposed Internal Roads

The accesses to the development from Trekker Road are dictated by the position of the wetland and its buffer zones. As a result, it is not possible to gain access at a point opposite Du Plessis Street. Access to the northern portion is thus proposed from Trekker Road (DR07207) at a point approximately 65m north of Du Plessis Street.

Additional access is proposed from Trekker Road (DR07207) at a point approximately 85m south of Du Plessis Street and via the existing residential streets (Kiewit Avenue) which already intersect with Trekker Road.

Although traffic volumes are relatively low (303 and 415 during the AM and PM peak hours respectively), it is the intersection through which all vehicular traffic entering and exiting the Kranshoek area passes. The proposed intersection is also in close proximity to the primary school and learners from the new development area are likely to be accommodated in this school and would thus need to cross Trekker Road.

Given the close proximity to the Du Plessis Street intersection, its location along the main road into Kranshoek and nature of this phase it is proposed that an exclusive northbound right-turn lane be provided on Trekker Road to allow the northbound through movement to be uninterrupted by traffic waiting to turn right into the proposed development.

In addition, provision must be made to ensure children are able to cross Trekker Road safely, in the form of dedicated raised pedestrian crossings.



Figure 20: Proposed dedicated right-turn lane (Source: EAS 2020)

The development is traversed by a main spine road running due south providing access to all the residential clusters. Other main roads running west-east intersect with road reserves to the east and in the direction of Plettenberg Bay. This provides greater connectivity to the surrounding area.

Internal road systems giving direct access to the residential clusters consist of closed loops and short stub roads. Restricted access is placed along all the major roads to prevent traffic conflict. Road reserves account for approximately 19% of the total area.

The layout of the road network is based on a hierarchy of roads. These range from the arterials to the local access roads. Provision is made for a 20m wide road reserve which will serve as the main access road to the development. The internal road system provides direct access to residential erven by way of 10m road reserves. Stub roads of 8 – 10m reserve width provide access to clusters of units of not more than 50m in length. Entrance to the three clusters is provided with 16m wider reserves to accommodate refuse and security infrastructure, should the communities wish to be gated at a later stage.

4.2.3.3. Public Transport Access

At present, public transport services in the form of informal minibus taxi modes operate between the main taxi rank in Plettenberg Bay and Kranshoek. The route is serviced by both taxi associations operating in the Bitou Local Municipality.

A small taxi rank is located approximately 650m south of the Du Plessis Street intersection (next to the Kranshoek Multi-purpose Centre). In addition, learner transport services convey approximately 300 mainly secondary school learners to Plettenberg Bay Secondary School. Primary school learners are catered for at the Kranshoek Primary School.

Based on surveys conducted by Engineering Advice and Services, the current Integrated Transport Plan indicates that there is sufficient capacity during the morning peak period but that additional operating licences may be required during the evening peak period.

Paved pedestrian sidewalks are provided in Kranshoek alongside roads that have recently been upgraded

4.2.4. Resource Efficiency

The proposed development will address, inter alia, water, energy and resource demand management and efficiency measures to ensure that all devices and fittings are energy and water efficient, including, but not limited to the following:

- All toilets will have interruptible flush mechanisms, or the cistern will be supplied with a fitted weight to interrupt the flow.
- Dual flush toilet cisterns.
- All taps will include an aerator to reduce the flow of water to 6 litres / minute.
- Shower heads will have restrictor or aerators to reduce water flow to 10 litres / minute.
- Energy saving light bulbs such as CFL's and LED's will be installed instead of incandescent bulbs.
- Outdoor lighting will be restricted to a minimum.
- Adequate thermal insulation will be provided in roofs.
- Provision for installation of future solar geysers will be made.

These specifications will be brought through into the tender documentation in the design phase of the project.

5. DESCRIPTION OF THE AFFECTED ENVIRONMENT

5.1. Biophysical Environment

5.1.1. Climate

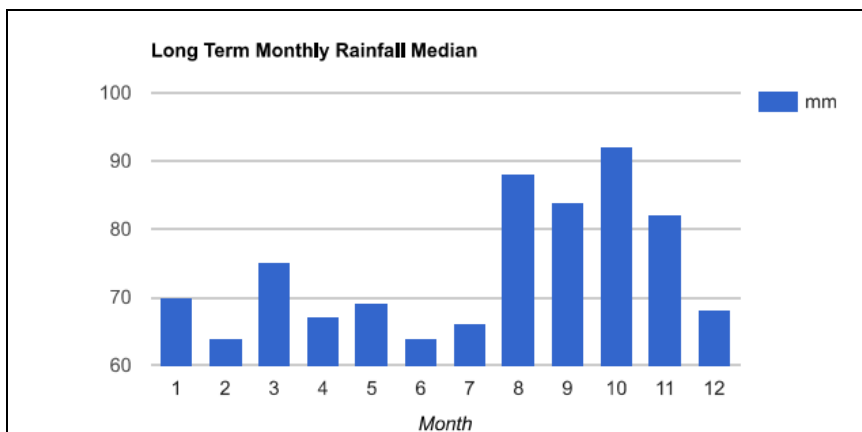
5.1.1.1. General Description of Regional Climate

The Western Cape is climatologically diverse, with many distinct micro- and macroclimates created by the varied topography and the influence of the surrounding ocean currents. These are the warm Agulhas Current which flows southwards along South Africa's east coast, and the cold Benguela Current which is an upwelling current from the depths of the South Atlantic Ocean along South Africa's west coast. Most of the province is considered to have a semi-arid Mediterranean climate, characterised by dry warm summer months (October to April) and wetter cool winter months (from May to September).

Plettenberg Bay is typified by an extremely mild maritime temperate climate with very few rainfall or temperature extremes. It is located within the Knysna Afromontane Forest biome, containing temperate gallery forest, supported by the mild temperatures and high, even distributed rainfall.

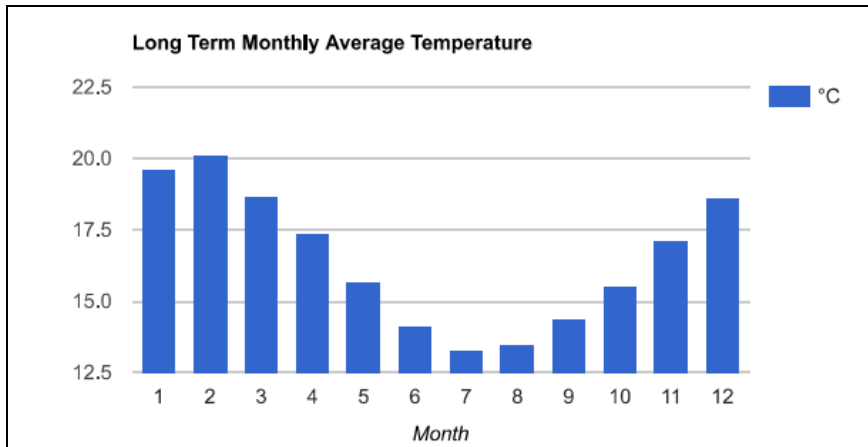
5.1.1.2. Temperature and Rainfall

According to Esri South Africa 2009 SA Atlas of Climatology and Agrohydrology (R.E. Schulze) the proposed site receives approximately 1030mm of rain per year with the most rain over the Winter and Spring period of August, September, October and November (approximately 85mm per month over this wet period).



Graph 1: Mean Annual Rainfall

The proposed site has an average temperature of 16.5 Degrees Celsius. The warmest months are in the summer period between December and February with mean monthly temperatures between 18 Degrees and 20 Degrees Celsius.



Graph 2: Mean Annual Temperature

5.1.2. Topography

The ancient wave-cut marine terrace on which Krantshoek and surrounding territories are located, falls gently towards the coastline and is crossed by a series of southdraining water courses. The cliffs along the coastline are near vertical in most places with caves and overhangs carved into the face by wave action, hence the name 'Neusgate' describing one of the embayments to the south-east of the site (Geotechnics Africa Western Cape, 2020).

The topographical survey provided by Geomatics (Cape), Land Surveying Consultants, highlights the following:

- The site generally slopes in an easterly direction at an average grade of 2%.
- Two low valley areas (natural watercourses) traverse Phase 1 in two locations:
 - In the north eastern portion and,
 - Through the southern central area.
- Phases 2 and 3 generally fall in a north easterly direction towards the low area (watercourse) to the south of Phase 1, also at an average grade of 2%.
- Phases 4 and 5 generally fall in a south easterly direction towards a low area in the south of Phase 5, also at an average grade of 2%.

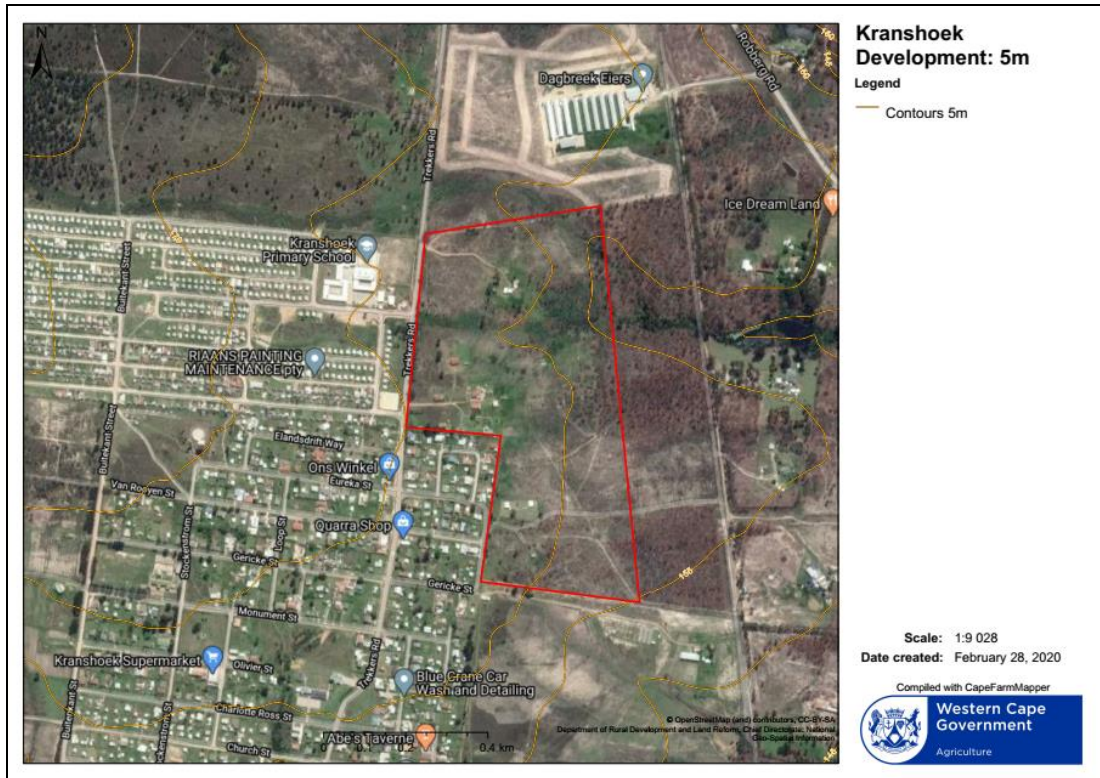


Figure 21: 5m contour map (Source: CapeFarmMapper v2.3.2.1).

5.1.3. Geology, Strata & Groundwater

5.1.3.1. General

An extract from the 1:250 000 geological series, Sheet 3322 Outshoorn, which includes Plettenberg Bay, shows the Kranshoek area to be underlain by quartzitic sandstone of the Peninsula Formation that belongs to the Table Mountain Group (TMG). However, the investigation revealed that the site is underlain by deeply weathered siltstone. More recent and updated geological information obtained from the Council for Geosciences indicate that the site falls into an area underlain by rocks of the Nardouw Subgroup also of the TMG, which includes siltstone. The possibility that the residual siltstone could be a completely weathered relic of the Cederberg Shale Formation, also of the TMG, cannot be discounted (Geotechnics Africa Western Cape, 2020).

5.1.3.2. Strata Encountered

The following generalised soil profiles were compiled from the detailed descriptions of the strata recorded in the thirty test pit exposures done by Geotechnics (2020):

Fill:- Fill was only encountered in the top 0,2m to 0,25m thick layer in test pits, TP2 and TP22. The material comprised medium dense intact silty SAND with scattered pieces of sandstone and quartz gravel in TP22.

Humified Sheetwash:- This generally 0,15m to 0,3m thick organic layer comprises dark grey-brown through grey-brown to light grey-brown predominantly loose to medium dense intact to slightly voided and voided clayey silty fine and medium SAND, or firm to stiff weakly shattered slightly organic sandy clayey SILT. It contains fine roots in the top 100mm to 200mm layer.

Sheetwash: A 0,4m to 1,4m thick light brown to yellow- or orangebrown blotched red- or yellow-brown firm through stiff to very stiff intact to slightly shattered and shattered clayey SAND-SILT to sandy clayey SILT and sandy SILT-CLAY was encountered in all the test pits.

Nodular Pedocrete/ Pebble Marker: A predominantly 0,15m to 0,5m thick layer of scattered or numerous to abundant ferricrete and/or calcrete NODULES & CONCRETIONS contained in a stiff to very stiff indistinctly to weakly shattered sandy CLAYSILT matrix. It is very poorly developed in places, e.g. in TP3, TP4, TP11, TP13, TP15 and TP19, where only traces to scattered ferricrete concretions occur at the base of the sheetwash horizon, i.e. at depths of between 1,0m and 1,6m below ground level. It could not be detected at the base of the sheetwash horizon in TP10 and TP18.

Reworked Residual Siltstone: This 0,15m to 1,2m thick biotically reworked horizon occurs from depths ranging between approximately 1,0m and 1,5m below ground level; it comprises a predominantly red-brown blotched orange-brown and light to pale grey firm through stiff to very stiff shattered to indistinctly or weakly shattered sandy CLAY-SILT to slightly sandy clayey SILT or sandy CLAY-SILT. It often contains scattered or some ferricrete concretions and nodules, in which case it is described as being ferruginous.

Partially Reworked Residual Siltstone:- The reworked residual siltstone becomes partially reworked and less ferruginous from depths ranging between 1,1m and 2,5m below ground level. It is generally pale to light grey blotched pale red- and/or orange-brown to pale pinkish-brown stiff to very stiff weakly shattered to intact silty sandy CLAY to sandy clayey SILT or sandy CLAY-SILT/ sandy SILT-CLAY.

The bedrock was not encountered in any of the test pits.

5.1.3.3. Groundwater

All the test pits remained dry for the duration of the field investigation, except for TP10, which was excavated in an old fenced-off abandoned cultivated field, evidently that was irrigated by a sprinkler system. It would appear that the very slight seepages encountered derive from a leak in the irrigation system.

Groundwater is also expected to be encountered in wetland zones along the two drainage features that cross the top third of the site. It is understood that there are no boreholes on the property and that a municipal pipeline on the northern boundary supplies potable water that is being used for both domestic and irrigation purposes.

5.1.4. Freshwater Resources

5.1.4.1. The Aquatic Environment

The study area of the proposed project is located within the DWS Quaternary Catchment K60G and falls within the Gouritz Water Management Area.

A screening assessment identified seven wetland systems within a 500 m radius of the site. The watercourses that may potentially be impacted upon by the proposed project were verified through infield soil samples and documentation of vegetation communities and species and key features within the landscape. The two wetlands that traverse the site, named WET/3 and WET/4 for the purposes of this study, would be directly impacted upon by the proposed development (Figure 9). WET/7 located near the southern boundary of the site is likely to be indirectly impacted upon.

The other freshwater habitat identified within the regulated study area will not be impacted and were therefore not assessed further.

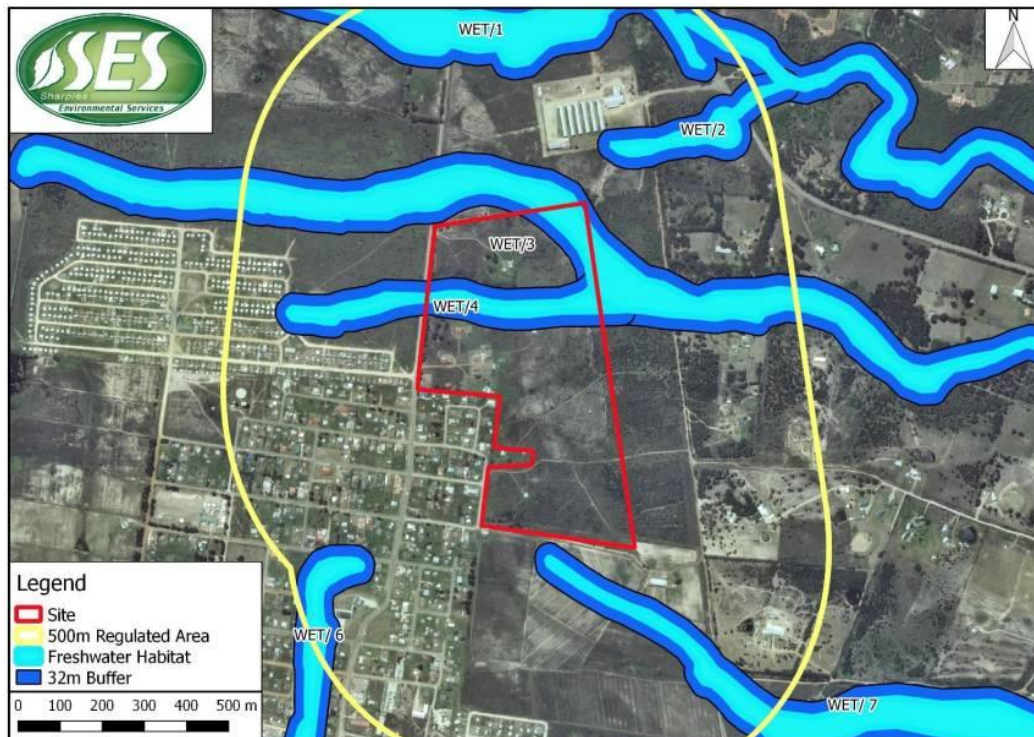


Figure 22: Freshwater ecosystems in relation to the proposed site and the DWS 500 m radius regulated area. (Source: Bekker, 2019)

A “watercourse” is defined in NEMA and the NWA as a “river or spring” or “a natural channel in which water flows regularly or intermittently” or a “wetland, pan, lake or dam into which, or from which, water flows”.

5.1.4.2. Description of impacted wetlands

WET/3

The WET/3 system is an unchannelled valley bottom wetland, with a large seasonal zone, situated in a shallow valley with a gentle slope. Although the system is in close proximity to the town of Kranshoek, and intersected by two roads, it is dominated by diffuse flows and little erosion is evident. However, in the lower reaches of the system, farming activities intensify, including dams, and cause significant erosion.

The soil disturbance has allowed for the encroachment of alien plant species, but the vegetation of the upper reaches remains largely natural. The dominant plant species identified in the system were *Cyperus congestus*, *Carpha glomerata*, *Leucadendron eucalyptifolium*, *Chrysanthemoides monilifera*, *Acacia cyclops*, *Acacia mearnsii*, and *Pinus pinaster*.



Figure 23: Photographs of WET/3 (Source: Bekker, 2019)

WET/4

The WET/4 system is a relatively small, unchannelled valley bottom wetland with a gentle gradient. The wetland is surrounded and intersected by housing and road infrastructure which has resulted in extensive habitat loss. The town has caused hardened surfaces in the catchment, increased water inputs from grey water and stormwater, as well as solid domestic waste. The road has impeded flows upslope and confined flows downslope through culverts. However, the low gradient and well vegetated state of the system limits the incision and diffuse flows still dominate.

The vegetation of the system consists largely of alien invasive plant species. The dominant species identified where *Eleocharis limosa*, *Cyperus congestus*, *Paspalum urvillei*, *Commelina benghalensis*, *Pennisetum clandestinum*, *Cortaderia selloana*, *Eucalyptus grandis*, *Pinus pinaster*, *Acacia mearnsii*, and *Acacia cyclops*.

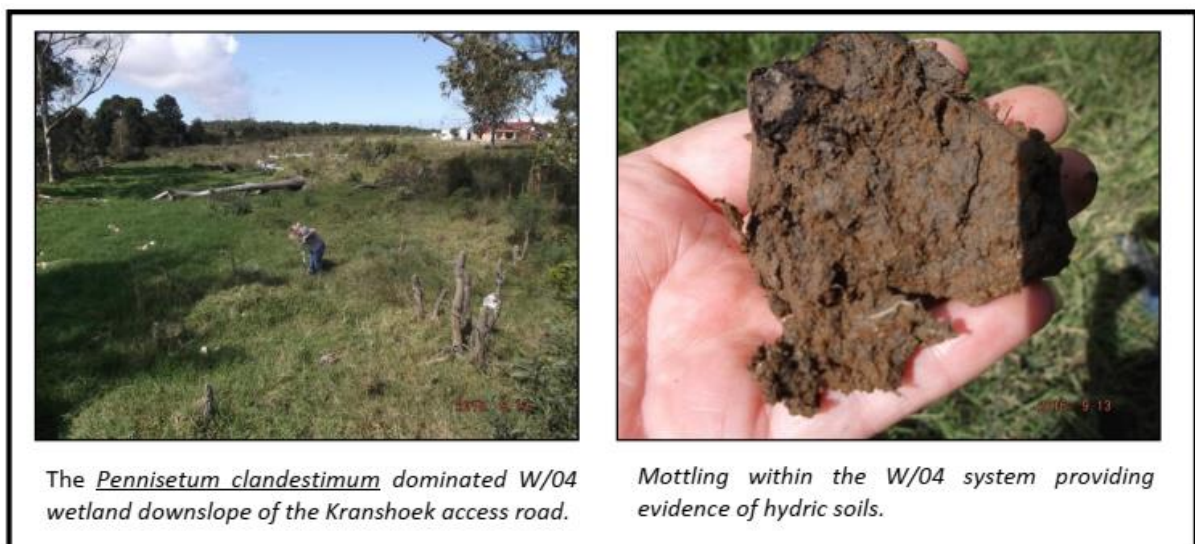


Figure 24: Photographs of WET/4 (Source: Bekker, 2019)

WET/7

The WET/7 system is a seasonal seep wetland to the south of the development proposal. It has incurred significant habitat loss and disturbance due to agriculture (forestry and more recently ploughed lands). In the area assessed at the head of the system, the wetland has almost completely lost ecological functioning.

It is currently covered by grass species and no obligate wetland plants were observed. However, despite the extensive soil disturbance, due to the soil characteristics and its position in the landscape it was delineated as wetland habitat.



Figure 25: Photographs of WET/7 (Source: Bekker, 2019)

5.1.4.3. Conservation Context

The Western Cape Biodiversity Framework (WCBF) is a spatial biodiversity plan recognized by both the Department of Environmental Affairs and South African National Biodiversity Institute. It identifies areas crucial for conserving a representative sample of biodiversity and maintaining ecosystem functioning. According to the WCBF (2017), *“ecosystem threat status tells us about the degree to which ecosystems are still intact or alternatively losing vital aspects of their structure, function and composition, on which their ability to provide ecosystem services ultimately depends”*.

Critical Biodiversity Areas are areas required to meet biodiversity targets for ecosystems, species and ecological processes, as identified in a systematic biodiversity plan. Ecological Support Areas are not essential for meeting biodiversity targets but play an important role in supporting the ecological functioning of Critical Biodiversity Areas and/or in delivering ecosystem services. The primary purpose of a map of Critical Biodiversity Areas and Ecological Support Areas is to guide decision-making about where best to locate development.

The site is not located near any CBA classified habitat but there is ESA 2 classified area within the north eastern corner as well as directly south of the site. The identified biodiversity areas are aligned with the drainage network of the area. Please refer to Section 6.4 for further detail.



Figure 26: The site in relation to Western Cape Spatial Biodiversity Plan (Pence 2017)

5.1.4.4. National Freshwater Ecosystem Priority Areas (NFEPA's)

The National Aquatic Ecosystem Priority Areas (NFEPA) map provides strategic spatial priorities for conserving South Africa's aquatic ecosystems and supporting sustainable use of water resources.

FEPAs were identified based on a range of criteria dealing with the maintenance of key ecological processes and the conservation of ecosystem types and species associated with rivers, wetlands and estuaries (Driver et al. 2011). The NFEPA project did not identify any rivers or wetlands within this study area.

5.1.4.5. Present Ecological State

Bekker (2019) states that the health/condition or Present Ecological State (PES) of the wetlands was assessed using the WETHHealth assessment tool (Macfarlane et al. 2008, 2018), which is based on an understanding of both catchment and on-site impacts and the impact that these aspects have on system hydrology, geomorphology and the structure and composition of wetland vegetation. It is based on the determination of the level of deviation from the perceived reference state of the system. The assessment was aided by an aerial photograph indicating the already disturbed state of the site in 1974.



Figure 27: A 1974 aerial photograph of the study area (red polygon) indicating the historic land use impacts (Source: Bekker, 2019)

A summary of the wetland PES scores is presented in **Table 9**.

Table 10: The PES Scores for the potentially impacted wetlands (Source: Bekker, 2019)

Wetland	Result	Hydrology	Geomorphology	Vegetation	Overall PES	
WET/3	Score	3.5	1.9	5.75	3.7	Good
	Category	C	B	D	C	
WET/4	Score	4	3.025	5.6	4.2	Fair
	Category	D	C	D	D	
WET/7	Score	4.6	6.5	6.95	6.1	Poor
	Category	D	E	E	E	

WET/3

The WET/3 system has been subjected to a large amount of habitat loss as it borders the Kranshoek town and there are more intense cultivation and farming activities in its lower reaches. These activities have significantly altered water inputs, flow patterns and the vegetation of the system. The geomorphology is moderately modified due to relatively extensive erosion in the lower reaches of the wetland. The overall PES of the wetland WET/3 can be regarded as being Good "C" Category. This category is indicative of a system where a moderate change in ecosystem processes and loss of natural habitat and biota and has occurred.

WET/4

The WET/4 wetland is a small system that flows through the Kranshoek town and its associated urban infrastructure. It is crossed by roads and pipelines, has raw sewage inputs, and litter in this area. The resultant land use and land cover changes have caused extensive habitat loss in this reach to the west of the proposed site. The water inputs and flow patterns are altered by domestic grey water inputs, sewage spills, increased stormwater inputs and the confinement of flows.

The geomorphology is largely modified due to infilling, excavations, and erosion. Additionally, there is a moderate level of alien plant species infestation. The overall PES of the wetland (WET/4) can be regarded as being Fair 'D' Category (Table 5). This category is indicative of a system where the change in ecosystem processes and loss of natural habitat and biota is large but some remaining natural habitat features are functional.

WET/7

The WET/7 seep has incurred the largest modifications from the natural condition and basic functioning has been critically compromised. Due to groundwater dominated water inputs there is some remaining habitat, however, the soils and vegetation are almost completely transformed from the reference state.

The overall PES of the wetland W/07 can be regarded as being Poor 'E' Category. This category is indicative of a system where the change in ecosystem processes and loss of natural habitat and biota is great but some remaining natural habitat features are still recognizable.

5.1.4.6. Functional Importance

Wetland benefits can be classified into goods/products (directly harvested from wetlands), functions / services (performed by wetlands), and ecosystem scale attributes.

The WET-EcoServices assessment highlights these benefits and the extent of each benefit for the wetlands. The assessment indicates that the wetlands to be impacted by the proposed project have a Low- Moderate functional importance.

WET/3 and WET/4 combine near the eastern site boundary, and within a relatively short distance, become a riparian system and flow into the Indian Ocean. They pass over various small holdings and supplement small dams. Therefore, the wetlands provide direct services to the landowners through water for domestic and agricultural use (crop irrigation and livestock grazing).

The seep wetland has similar characteristics but provides slightly less direct products. Indirectly, the remaining functional wetland habitat provides services such as habitat for biota, corridors, water recharge, erosion control, pollution management, amongst other benefits. These services will only become more important and valuable following development in the area.

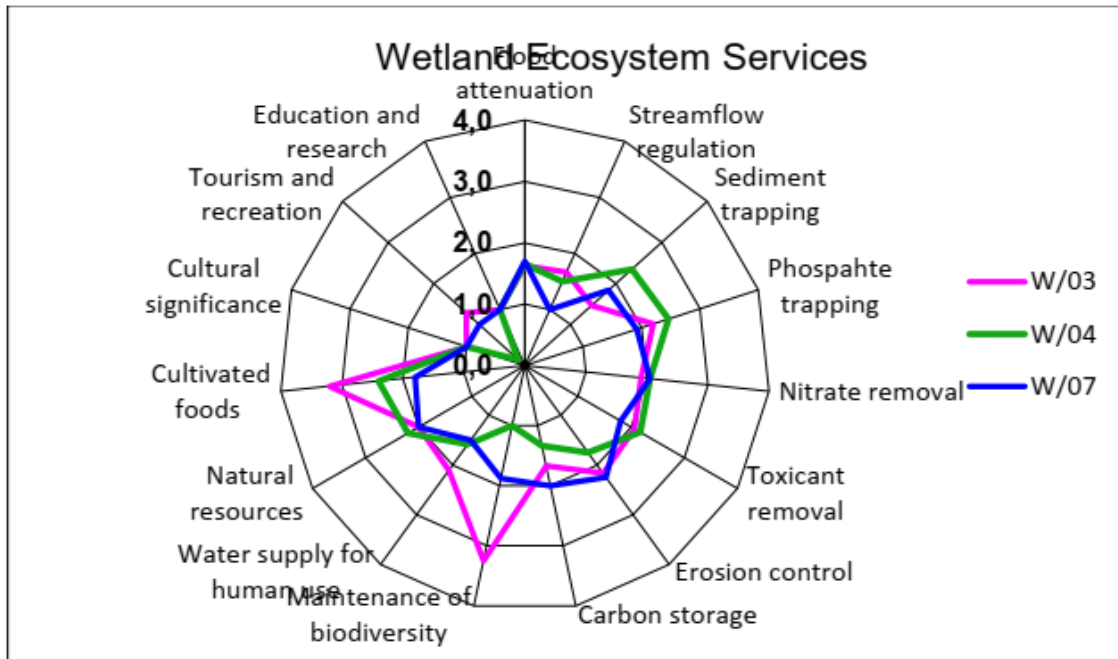


Figure 28: Functional importance results for the potentially impacted wetlands (Source: Bekker, 2019)

The WET/3 and WET/4 wetland systems assessed obtained a Moderate EIS score and the WET/7 wetland was determined to have Low EIS. The wetland systems of the study area provide limited direct human benefits yet have moderate significance regarding indirect services. Ecologically, the systems are not conserved in any way and no red data species or populations of unique species were identified in any of the wetlands. However, many of the wetlands assessed are sensitive to changes to flow regimes and periods of low flows.

Table 11: Wetland EIS Assessment Results (Source: Bekker, 2019)

HGM Unit	Ecological Importance and Sensitivity Categories							
	Ecological Importance		Functional/Hydrological Importance		Direct Benefits to Society		Overall Importance	
	Score (0-4)	Rating	Score (0-4)	Rating	Score (0-4)	Rating	Score (0-4)	Rating
W/03	2.8	Moderate	2.75	Moderate	2.33	Moderate	2.8	Moderate
W/04	2.33	Moderate	2.38	Moderate	1.67	Low	2.38	Moderate
W/07	1.8	Low	1.67	Low	1.8	Low	1.8	Low

5.1.5. Soil, Geology & Agricultural Potential

5.1.5.1. Soil & Geology

According to the 3322 Oudtshoorn 1:250 000 geological map, the site consists of the arenite quartzitic



sandstones of the Peninsula Formation from the Table Mountain Group, with soils depth of between 450mm and 750mm. Arenite is a sedimentary rock with sand grains of medium nature and is the hardest and most erosion resistant layer of the Cape Supergroup.

According to Mucina and Rutherford (2006) the area consists of acidic lithosol soils that are derived from the sandstone geology. The summarised biophysical characteristics are indicated below:

Table 12: Biophysical characteristics of the area around the proposed project site (Source: Bekker, 2019)

Biophysical categories	Biophysical characteristics	Source
Approx. Elevation (a.s.l.)	85 - 230 m	Google Earth™ & Surveyor General
Mean annual precipitation	860 mm	Schultz, 1998
Rainfall seasonality	All year	DWAF, 2007
Potential Evaporation	1576 mm	Schultz, 1998
Quaternary catchment	K60G	Schultz, 1998
DWA Ecoregion	South Eastern Coastal Belt	DWA, 2005
NFEPA	No	Driver et al. 2011

5.1.5.2. Agricultural Potential

As can be seen from the figure below, the Western Cape Department of Agriculture’s Cape Farm Mapper spatial tool maps the site as being of Moderate Potential Arable Land, despite being located within the urban edge.

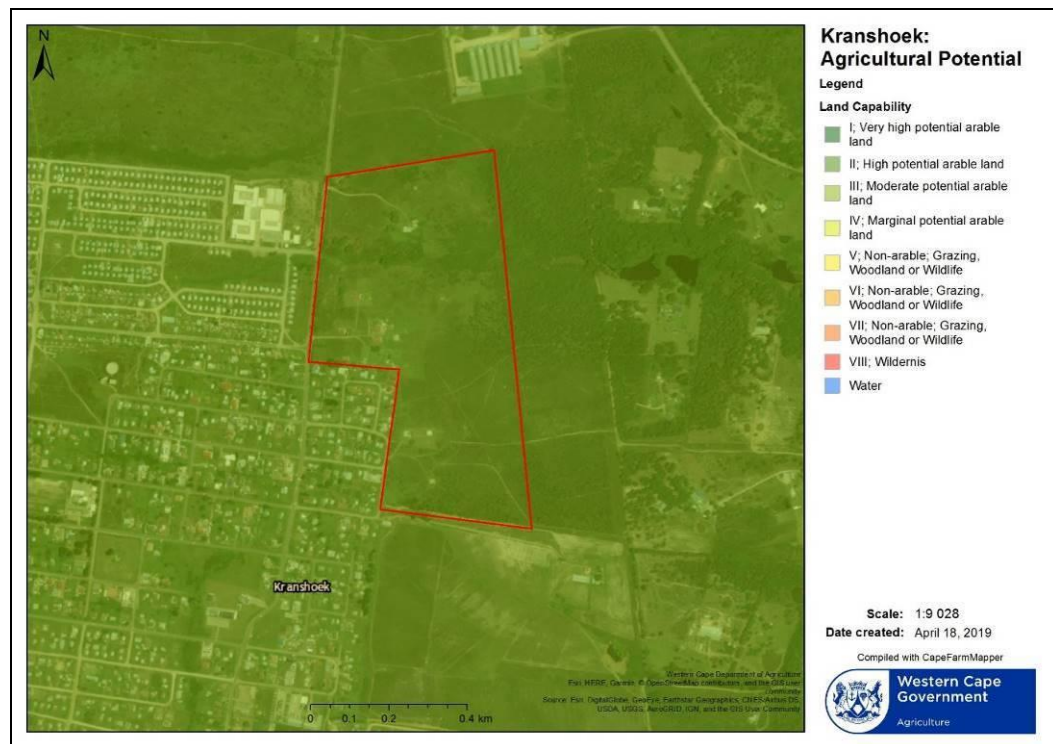


Figure 29: Agricultural Potential Map

5.1.6. Vegetation

5.1.6.1. Vegetation Type and Description

The Ecological Impact Assessment undertaken by Jamie Pote (2019) explains that the units primarily affected by the proposed development is South Outeniqua Sandstone Fynbos which has a Vulnerable Conservation Status. The site is also in the general vicinity of areas having Garden Route Shale Fynbos (Endangered) and Knysna Sand Fynbos (Endangered). No elements of these units were however noted to be present on the proposed site.

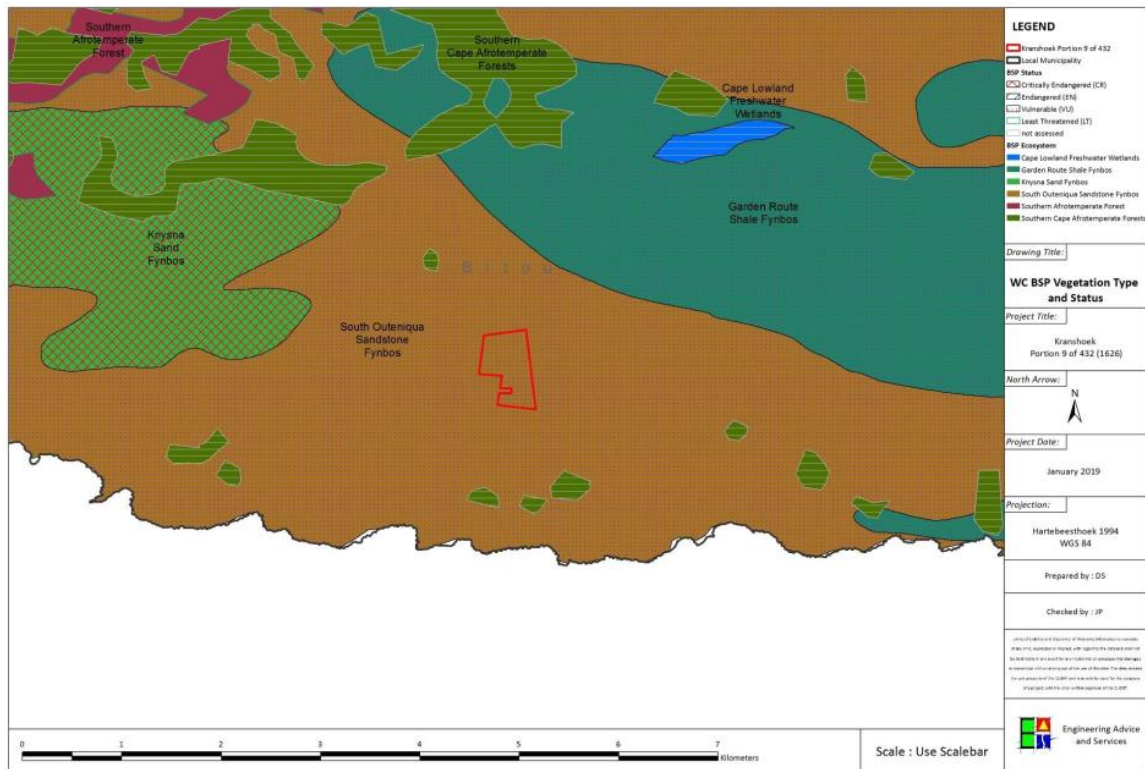


Figure 30: Vegetation Map of SA shows that the site falls within vegetation of South Outeniqua Sandstone Fynbos, with Garden Route Shale Fynbos to the north east of the site and Knysna Sand Fynbos to the northwest of the site.

5.1.6.2. South Outeniqua Sandstone Fynbos (FFs19)

Distribution

Western Cape Province: Southern slopes of the Outeniqua Mountains from the Cloetesberg northeast of Albertinia in the west to the upper reaches of the Keurbooms River where it borders on FFs 20 Tsitsikamma Sandstone Fynbos. It includes sandstone outcrops on the lowlands from the vicinity of the Goukamma River near Knysna in the west and Komkromma Point near Nature's Valley in the east. Altitude from the coast to 1 579 m on Cradock's Berg north of George.

Vegetation & Landscape Features

Gentle to steep south-facing slopes, over a 160 km long area, relatively broad with some moderately sloping intramontane valleys in the west where it is over 10 km wide. The dominant vegetation is a tall, open to

medium dense shrubland with medium dense, medium tall shrub understorey—mainly proteoid and restioid fynbos, with extensive ericaceous fynbos on the upper slopes. Some grassy fynbos at lower altitudes, and scrub fynbos in riverine areas. Patches of this unit are not confined to south-facing slopes, but are found on all slopes south of the highest peaks in the range. Thus there are extensive northern slopes in some intramontane valley systems, the most significant of those found in the Doring River Wilderness Area.

Geology & Soils

Acidic lithosol soils derived from Ordovician sandstones of the Table Mountain Group (CapeSupergroup). Land types mainly Ib, Gb and Fa.

Climate

MAP 360–1 170 mm (mean: 785 mm), with a slight bimodal winter and a low in December. Mean daily maximum and minimum temperatures 27.8°C and 4.8°C for January and July, respectively. Frost incidence 2–10 days per year.

Important Taxa

(Cape thickets, Wetlands) Small Tree:

Widdringtonia nodiflora. Tall Shrubs: *Chrysanthemoides monilifera* (d), *Laurophyllus capensis* (d), *Leucadendron conicum* (d), *L. eucalyptifolium* (d), *L. liginosum* subsp. *uliginosum* (d), *Metalasia densa* (d), *Protea neriifolia* (d), *P. repens* (d), *Anginon difforme*, *Dodonaea viscosa* var. *angustifolia*, *Halleria lucida*, *Leucospermum glabrum*, *Liparia hirsuta*, *Metalasia trivialis*, *Mimetes pauciflorus*, *Osteospermum junceum*, *Passerina falcifolia*, *Podalyria burchellii*, *P. sericea*, *Protea mundii*, *Psoralea affinis*, *Pterocelastrus tricuspidatus*.

Low Shrubs:

Berzelia intermedia (d), *Brunia nodiflora* (d), *Erica cordata* (d), *E. densifolia* (d), *E. glomiflora* (d), *E. triceps* (d), *E. uberiflora* (d), *Leucadendron ericifolium* (d), *Penaea cneorum* subsp. *cneorum* (d), *P. cneorum* subsp. *gigantea* (d), *Acmadenia maculata*, *A. tetragona*, *Anisodonteia scabrosa*, *Aspalathus angustifolia* subsp. *angustifolia*, *A. ciliaris*, *A. rubens*, *Cliffortia ilicifolia*, *C. stricta*, *Erica deflexa*, *E. discolor* variant 'speciosa', *E. formosa*, *E. fuscescens*, *E. gracilis*, *E. hispidula*, *E. lanata*, *E. nabea*, *E. similis*, *E. simulans*, *E. sparsa*, *E. versicolor*, *Euryops pinnatipartitus*, *Lachnaea diosmoides*, *Leucadendron comosum* subsp. *comosum*, *L. salignum*, *L. spissifolium* subsp. *fragrans*, *Leucospermum cuneiforme*, *L. wittebergense*, *inconia alopecuroidea*, *Lobelia neglecta*, *Mimetes cucullatus*, *Otholobium carneum*, *Phaenocoma prolifera*, *Phyllica confusa*, *Protea cynaroides*, *P. lorifolia*, *Pseudobaeckea cordata*, *Relhania calycina*, *Senecio glastifolius*, *Stoebe alopecuroides*, *Struthiola eckloniana*, *Syncarpha paniculata*, *Ursinia coronopifolia*, *U. scariosa* subsp. *scariosa*, *U. trifida*. Semiparasitic Shrub: *Thesium virgatum*.

Herbs:

Carpacoce spermacocea, *Centella affinis*, *C. virgata*, *Dichrocephala integrifolia* subsp. *integrifolia*, *Helichrysum felinum*, *Mairia crenata*. Geophytic Herbs: *Pteridium aquilinum* (d), *Blechnum attenuatum*, *Caesia contorta*, *Geissorhiza bracteata*, *G. fourcadei*, *G. inconspicua*, *Lanaria lanata*, *Romulea fibrosa*, *Tritoniopsis caffra*, *Watsonia fourcadei*. Carnivorous Herb: *Drosera trinervia*.

Herbaceous Parasitic Climber:

Cassytha ciliolata. Graminoids: *Cannomois parviflora* (d), *C. virgata* (d), *Ehrharta dura* (d), *E. rupestris* subsp. *tricostata* (d), *Elegia fistulosa* (d), *E. galpinii* (d), *E. juncea* (d), *Epischoenus adnatus* (d), *Hypodiscus alboaristatus* (d), *H. aristatus* (d), *H. striatus* (d), *H. synchroolepis* (d), *Ischyrolepis gaudichaudiana* (d), *Merxmullera*

rufa (d), *Pentameris distichophylla* (d), *Platycaulos anceps* (d), *P. compressus* (d), *Restio fourcadei* (d), *R. triticeus* (d), *Rhodocoma gigantea* (d), *Tetraria cuspidata* (d), *T. involucreta* (d), *T. microstachys* (d), *Andropogon appendiculatus*, *Anthochortus ecklonii*, *Cannomois scirpoides*, *Capeobolus brevicaulis*, *Chrysitrix capensis*, *Cyathocoma hexandra*, *Ficinia gracilis*, *Mastersiella purpurea*, *Merxmullera decora*, *Pentaschistis colorata*, *P. malouinensis*, *P. pallida*, *Restio strictus*, *Staberoha aemula*, *Tetraria capillacea*, *T. fimbriolata*, *T. sylvatica*, *T. thermalis*, *T. ustulata*, *Thamnochortus cinereus*, *Themeda triandra*, *Willdenowia teres*.

Endemic Taxa

(Wetlands) Low Shrubs:

Erica unicolor (d), *Penaea acutifolia* (d), *Acmadenia gracilis*, *A. rupicola*, *Agathosma alaris*, *A. planifolia*, *Amphithalea flava*, *Aspalathus bowieana*, *A. digitifolia*, *Erica aneimensa*, *E. gillii*, *E. inconstans*, *E. juniperina*, *E. lehmannii*, *E. outeniquae*, *E. priorii*, *E. velatiflora*, *Leucadendron olens*, *Leucospermum hamatum*, *Phyllica curvifolia*, *Prismatocarpus rogersii*, *Psoralea vlokii*, *Xiphotheca phyllicoides*, *Zyrphelis outeniquae*. Succulent Shrub: *Lampranthus pauciflorus*.

Herb:

Linum villosum.

Geophytic Herb:

Geissorhiza outeniquensis.

Conservation

Vulnerable. Target 23%. Statutorily conserved (47%) in the proposed Garden Route National Park, Doring River Wilderness Area as well as in Ruitersbos and Witfontein Nature Reserves. About 2% protected in private nature reserves. Some 28% transformed (pine plantations, cultivation). Alien *Pinus pinaster* and *Hakea sericea* scattered over part of the area. Erosion very low.

Implications

47% of the vegetation type is statutorily conserved in the proposed Garden Route National Park, Doring River Wilderness Area as well as in Ruitersbos and Witfontein Nature Reserves. About 2% protected in private nature reserves. The vegetation type is thus well conserved.

5.1.6.3. Botanical Sensitivity

Subtropical Ecosystem Planning (STEP)

No thicket vegetation is present on the site (Keurbooms Grassy Fynbos). A large portion (southern) of the site is indicated as transformed by STEP.

Western Cape Biodiversity Spatial Plan (WC BSP)

The Western Cape Biodiversity Spatial Plan (WC BSP) is a spatial tool that forms part of a broader set of national biodiversity planning tools and initiatives that are provided for in national legislation and policy. It comprises the Biodiversity Spatial Plan (BSP) map of biodiversity priority areas, accompanied by contextual information and land use guidelines that make the most recent and best quality biodiversity information available for use in land use and development planning, environmental assessment and regulation, and natural resource management.

Critical Biodiversity Areas (CBAs)

Areas that are required to meet biodiversity targets for species, ecosystems or ecological processes and infrastructure.

These include:

- All areas required to meet biodiversity pattern (e.g. species, ecosystems) targets;
- Critically Endangered (CR) ecosystems (terrestrial, wetland and river types);
- All areas required to meet ecological infrastructure targets, which are aimed at ensuring the continued existence and functioning of ecosystems and delivery of essential ecosystem services; and
- Critical corridors to maintain landscape connectivity.

CBAs are areas of high biodiversity and ecological value and need to be kept in a natural or near-natural state, with no further loss of habitat or species. Degraded areas should be rehabilitated to natural or near-natural condition.

Only low-impact, biodiversity-sensitive land uses are appropriate.

Implications

No Critical Biodiversity Areas are affected within the site.

Ecological Support Areas (ESAs)

Areas that are not essential for meeting biodiversity targets, but that play an important role in supporting the functioning of PAs or CBAs, and are often vital for delivering ecosystem services. They support landscape connectivity, encompass the ecological infrastructure from which ecosystem goods and services flow, and strengthen resilience to climate change. They include features such as regional climate adaptation corridors, water source and recharge areas, riparian habitat surrounding rivers or wetlands, and endangered vegetation.

ESAs need to be maintained in at least a functional and often natural state, in order to support the purpose for which they were identified, but some limited habitat loss may be acceptable. A greater range of land uses over wider areas is appropriate, subject to an authorisation process that ensures the underlying biodiversity objectives and ecological functioning are not compromised. Cumulative impacts should also be explicitly considered.

Implications

A small portion of Ecological Support Area is identified along the north-eastern boundary. This area should be maintained as Open Space to protect ecological processes and connectivity with surrounding area (In line with guidelines).

Other Natural Areas (ONAs)

Areas that have not been identified as a priority in the current biodiversity spatial plan but retain most of their natural character and perform a range of biodiversity and ecological infrastructure functions. Although they have not been prioritised for meeting biodiversity targets, they are still an important part of the natural ecosystem. ONAs should be managed or utilised in a manner that minimises habitat and species loss and ensures ecosystem functionality through strategic landscape planning. These 'other natural areas' offer considerable flexibility in terms of management objectives and permissible land uses, but some authorisation

may still be required for high impact land uses.

Implications

A small portion of Other Natural Area is identified within the site. The site is located directly adjacent to an existing urban area. The vegetation type is well conserved regionally and has a widespread distribution. The vegetation on site is comprised of a mosaic of near-natural, degraded and transformed vegetation with some alien infestation (predominantly Pine). The vegetation on site has a low species diversity compared to surrounding areas. Species of Conservation Concern are generally absent from the site and thus has a low potential contribution to conservation.

Retention of a buffer around the drainage lines as well as the north-eastern portion (Ecological Support Area) as Open Space as well as the overall development of a 'compact urban settlements, whilst maintaining an open space system' thus means that the proposed development is possible whilst meeting the guideline recommendations.

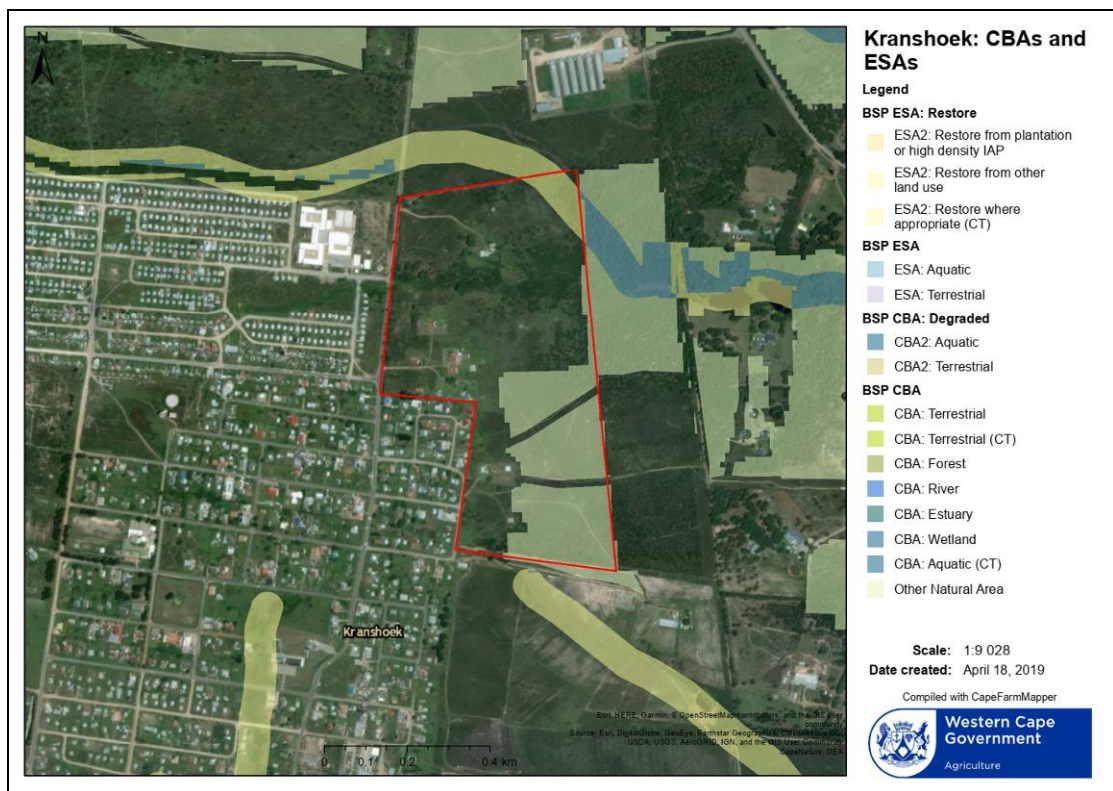


Figure 31: Mapped CBA and ESA areas on and surrounding the proposed site

5.1.6.4. Species of Concern

Based on a desktop Assessment of existing online databases as well as field verification, the potential list of flora and fauna species that may occur in the vicinity of the development, is quite extensive. After a site visit however, it was found that species diversity is low compared to surrounding areas.

Table 13 provides a detailed list of species protected in term of the P.N.C.O. and NFA, for which permits may be required should they occur. Due to limited sampling time, presence or absence of all species could not be



confirmed by the Ecological Specialist without detailed seasonal site visits, but the risk of any Critically Endangered or Endangered species being present is deemed to be Low.

Table 13: Indigenous Species of Conservation Concern noted to be present (Source: Pote, 2019)

Botanical Name	Family	Status**	Pres	Comment
<i>Bobartia orientalis</i>	IRIDACEAE	PNCO	Y	Few scattered clumps
<i>Erica formosa</i>	ERICACEAE	PNCO	Y	Widespread
<i>Erica sessiliflora</i>	ERICACEAE	PNCO	Y	Widespread
<i>Erica sparsa</i>	ERICACEAE	PNCO	Y	Widespread
<i>Erica versicolor</i>	ERICACEAE	PNCO	Y	Widespread
<i>Hypoxis hemerocallidea</i>	HYPOXIDACEAE	PNCO	Y	Few scattered clumps
<i>Leucadendron conicum</i>	PROTEACEAE	PNCO	Y	Widespread
<i>Leucadendron eucalyptifolium</i>	PROTEACEAE	PNCO	Y	Widespread
<i>Restio fourcadei</i>	RESTIONACEAE	PNCO	Y	Widespread
<i>Restio triticeus</i>	RESTIONACEAE	PNCO	Y	Widespread
<i>Restio triticeus</i>	RESTIONACEAE	PNCO	Y	Widespread
<i>Watsonia fourcadei</i>	IRIDACEAE	PNCO	Y	Few scattered individuals
<i>Watsonia knysnana</i>	IRIDACEAE	PNCO	Y	Widespread

**PNCO – Provincial Nature Conservation Ordinance (19 of 1974); NFA – National Forests Act; End - Endemic

Implications

The proposed expansion and disturbance during construction of the site is thus unlikely to result in any significant impact to species conservation

5.1.6.5. Invasive Flora

A number of invasive alien species were found to occur within the site. These consist predominantly of *Pinus pinaster* (Pine), with *Acacia mearnsii* (Black Wattle), *Acacia saligna* (Port Jackson), *Eucalyptus spp.* (Bluegum) and *Acacia melanoxylon* (Australian Blackwood) in low to dense (along eastern boundary and drainage line) infestation. Various ruderal weeds as well as exotic and indigenous grasses are also in abundance for approximately 25 % (6 Ha) of the site, specifically surrounding the watercourse. Indications are that the site has become invaded over the last few years, possibly with a series of intense fires, which are likely to have affected the natural seed bank and ecology.

Areas that have low alien infestation generally have normal ecological functioning, however the heavily invaded areas (along the eastern boundary and along the drainage line) have experienced significant changes to ecological functioning. Should the site be cleared of aliens, the heavily invaded areas would most likely regenerate to a limited extent, but is unlikely to attain a completely pre-disturbance state.\

5.1.6.6. Terrestrial Habitat Sensitivity Assessment

An overall sensitivity assessment was conducted to include relative conservation and ecological importance of the vegetation communities, presence of indigenous Species of Conservation Concern (SCC's) and extent of invasion, as well as the degree to which successful rehabilitation can take place.

- Areas scoring a low sensitivity are those areas that are degraded or transformed or is unlikely that they could be rehabilitated to a normal functioning state without extreme effort and expense. *This includes the portions of the site that are invaded by aliens or areas containing old residences with gardens.*
- Areas of moderate (medium) sensitivity are those areas that contain a reasonably intact habitat and



- intact ecological functioning. *Within the site, this comprises the intact vegetation.*
- Areas scoring a high sensitivity on site are those having an important ecological function, having specialized habitats, significant populations of Species of Conservation Concern. *In this case the Ecological Process areas (Riparian vegetation) and watercourses have been given a high sensitivity.*

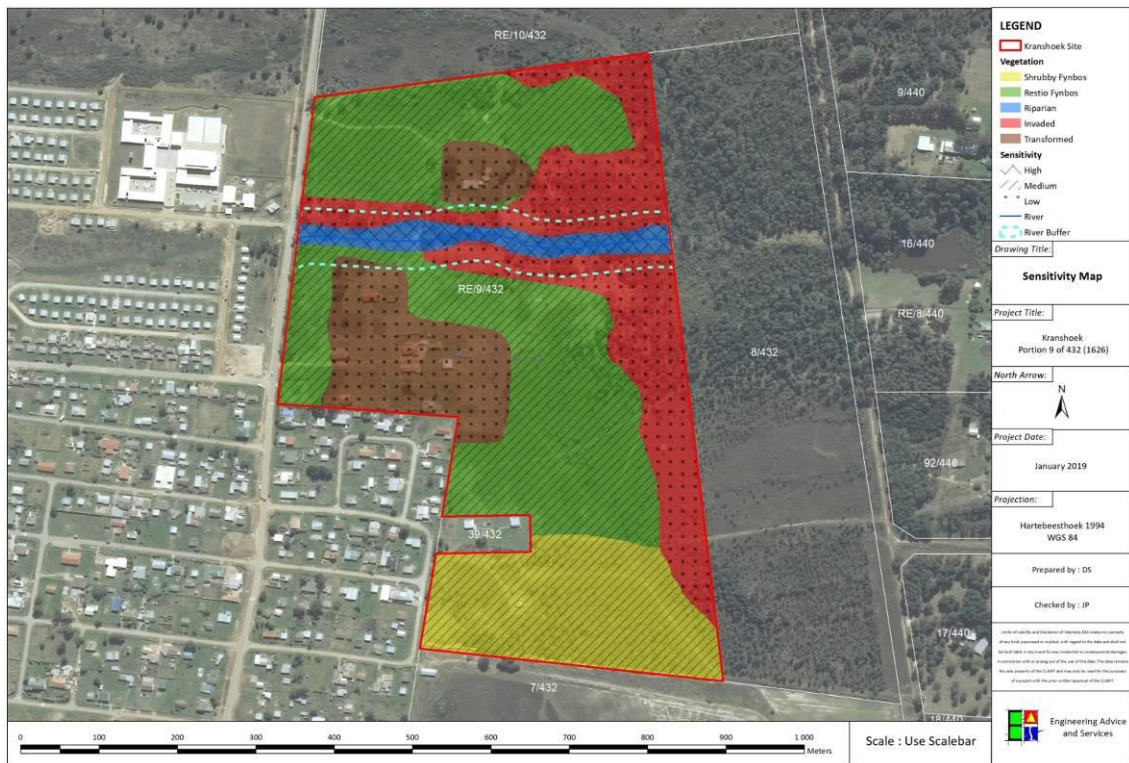


Figure 32: Sensitivity and Vegetation Cover Map (Source: Pote, 2019)

5.1.7. Fauna

The habitat on-site will provide transient habitat for some small mobile mammals, birds, reptiles and amphibians, but will be limited in densely invaded areas. A non-perennial drainage line and small dam is likely to provide habitat to amphibians.

Faunal species are most likely to be common transient species and no Species of Conservation Concern are likely to be present permanently. During construction a faunal search and rescue should be conducted before commencement. Mobile mammals and reptiles are likely to move away from the site during construction.

5.2. Archaeology & Heritage

The SAHRIS PaleoSensitivity Map shows the entire Kranshoek area to be of High Sensitivity.



Figure 33: Paleontological Sensitivity of the Kranshoek area. Orange signifies High Sensitivity (Source: SAHRIS PaleoSensitivity Mapping Tool)

However, comment was received from Heritage Western Cape confirming that there was no reason to believe that the development would impact on heritage resources and no further action under Section 38 of the National Heritage Resources Act was required.

5.3. Socio Economic Environment

5.3.1. Administrative Context

The Bitou Local Municipal Area is relatively small at only 992 km². The northern portion of the municipal area is mountainous (Tsitsikamma range) and the settlement pattern is concentrated along the coast and on the coastal plain. Due to the mountainous terrain and other factors, only a small percentage of the area is considered suitable for intensive agriculture. Consequently the agricultural sector does not constitute the backbone of the local economy. Instead nature and coastal-based tourism is the key driver of the Bitou economy. The portion of the N2 through Bitou forms part of the internationally renowned Garden Route, with Plettenberg Bay – marketed by Plett Tourism as the “jewel of the Garden Route” - an established key attraction (Barbour, 2016).

Bitou settlements include Plettenberg Bay, Nature’s Valley, Kranshoek, Covie, Harkerville, Keurbooms, Kurland, Wittedrift, Qolweni, Bossiesgif, New Horizons and Kwa-Nokothula. Plettenberg Bay is the only large town in the LM. Qolweni, Bossiesgif, New Horizons and Kwa-Nokothula are essentially Apartheid era satellite suburbs of Plettenberg Bay. The vast bulk of the municipality’s population lives in Plettenberg Bay and these surrounding townships (Barbour, 2016).

Plettenberg Bay is as the main service centre in the LM, providing higher order medical, educational, commercial and administrative services. Kurland, Kranshoek and Nature’s Valley are regarded as secondary settlements and the balance as small rural villages. All of them are reliant on Plettenberg Bay or other nearby large towns such as Knysna and George for major services (Barbour, 2016).

5.3.2. Demographic

5.3.2.1. Population

Urban Econ explains that the Bitou Local Municipality population is relatively small and the economy is less

diverse than nearby Knysna and George and reliant mostly on tourism to drive the economy.

According to Census 2011 the Bitou LM has a population of 49 162, representing 8.5% of the Eden DM population. Kranshoek has a population of 5 597, which comprises of only 5.6% of the population of the Bitou LM. Plettenberg Bay is by far the largest town (31 804), accounting for nearly 65% of the Bitou population. The population growth rate for Bitou over a period of 2007 and 2018 was 3.61 % p.a. compound annual growth rate (CAGR). The majority of people moving to the Bitou LM area, are from the Eastern Cape. 28.9% of residents are born in the Eastern Cape making the Eastern Cape the biggest contributor to the current migrations patterns.

Census 2011 indicates that the majority of the Bitou population is Black African (45.2%), followed by Coloured (31.2%), and Whites (16.9%). Other groups accounted for 6.1%. This is in contrast with Kranshoek, which has a population of 53.46% Coloured, 36.11% Other, 8.97% Black African, 1% Indian/Asian and 0.48% Whites.

The dominant language within the Municipality is Afrikaans (~42.3%), followed by isiXhosa (~37%) and English (~13%)(Census 2011). This is very similar to Kranshoek, however 87.9% of the population speak Afrikaans.

There were approximately 17 125 households in Bitou in 2018, with the average number of persons per household at 2.97. Kranshoek made up 8.4% of these households, at 1442 households at a density of 116.99 per km².

The MSDF states that the Kranshoek population pyramid has a wide base, however narrowing towards the top of the pyramid. The definite triangle-shaped pyramid, indicating high fertility levels, with low life expectancy levels. The population segment aged 0-4 and 5-10 represents 21.2% of the total population, whereas the population segment aged 60+ merely represents 5.6%.

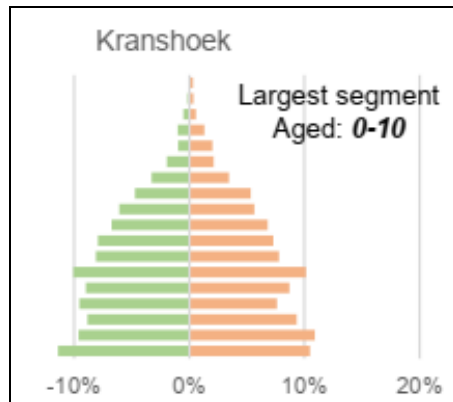


Figure 34: Age Profile of Kranshoek (Source: Bitou Municipal SDF, 2018)

Table 14: Overview of key demographic indicators for Eden DM and Bitou LM Compiled from StatsSA Census 2011 Municipal Fact Sheet

ASPECT	EDEN DM		BITOU LM	
	2001	2011	2001	2011
Population	454 924	574 265	29 182	49 162
% Population <15 years	28.5	25.9	26	25.2

% Population 15-64	65.1	66.3	68.2	68.4
% Population 65+	6.4	7.8	5.8	6.4
No of Households	119 306	164 110	8 763	16 645
Household size (average)	3.7	3.3	3.2	2.8
Formal Dwellings %	83.1	83.8	79.8	72.2
Dependency ratio per 100 (15-64)	53.5	50.7	46.6	46.1
Unemployment rate (official) - % of economically active population	26.5	22.5	26.3	30.1
Youth unemployment rate (official) - % of economically active population 15-34	33.9	29.9	33.4	37.9
No schooling - % of population 20+	8	3.7	7.3	2.4
Higher Education - % of population 20+	9.9	10.9	11.4	12.1
Matric - % of population 20+	22.7	28	24.5	28.2

5.3.2.2. Employment levels

The Bitou Local Municipality has the highest unemployment rate of the 7 local municipalities comprising the Eden District. This is reflected in the high level of households in the Bitou Local Municipality that live close to or below the poverty line (64.1%). The Bitou Local Municipality also witnessed the highest rate of increase of the 7 local municipalities during the period 2001-2011. In this regard, while the Eden DM witnessed a 4% decrease to 22.5%, the Bitou unemployment rate increased by 3.8% to 30.1%. This figure is higher than the provincial average of 28.1%. This trend is also reflected in terms of youth unemployment (15-34 age group). Whilst the level for the Eden DM dropped 4% to 29.9%, unemployment in Bitou increased with 4.5% to 37.9% - 8% higher than the DM rate (Barbour, 2016).

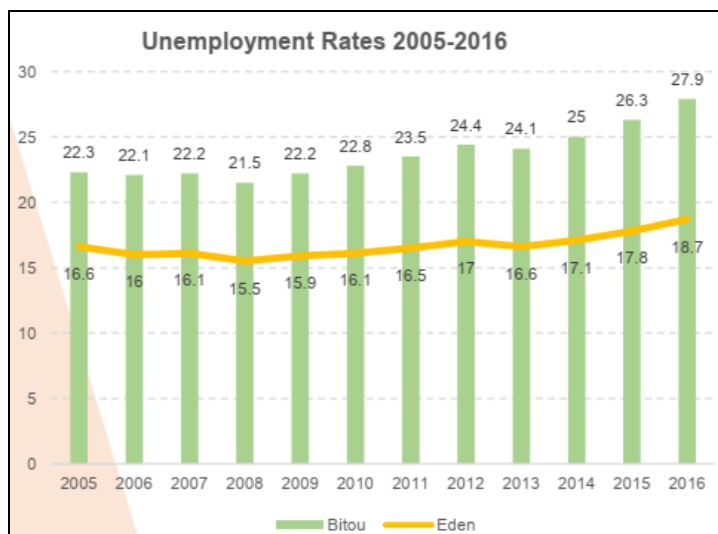


Figure 35: Unemployment Rates in Bitou Local Municipality compared to Eden District Municipality (Source: Bitou Municipal SDF, 2018)

5.3.2.3. Household income

Based on the data from the 2011 Census, a significantly high 18.1 % of the population of the Bitou Local Municipality have no formal income, 4.4 % earn between R1 and R 4 800, 5.5 % earn between R 4 801 and R 9 600 per annum, 16.4 % between R 9 601 and R19 600 per annum and 19.7 % between R 19 600 and R 38 200 per annum (Census 2011).

5.3.2.4. Economic Activity

The Bitou municipal area has a regional gross domestic product amounting to R2.79 billion (2015). Economic activity in the Bitou municipal area is dominated by the tertiary sector which amounted to R1.97 billion (or 70.7%) in 2015. The tertiary sector is estimated to have grown by 1.6% in 2016, boosted by the finance, insurance, real estate and business services sector and the wholesale, retail trade, catering and accommodation sector. The finance, insurance, real estate and business services sector recorded an average growth of 2.7% between 2005 and 2015, and has continuously reported high growth rates post the 2008 recession.

The secondary sector has also been recovering from the 2008 recession with even higher growth rates than the tertiary sector. The secondary sector, which totaled R671 million in 2015, grew by an average of 4.2% between 2005 and 2015. Real GDP growth for the secondary sector is slower in 2016 compared to 2012 but still positive, with a recording of 1.8% growth estimated for 2016. The secondary sector within the Bitou municipal economy is largely supported by the construction industry which recorded high growth rates in 2012 and 2013 at 5.0% and 4.8% respectively. However, this high growth in the construction industry slowed down a little in 2016 with 2.0%.

The primary sector, which totaled R145 million in 2015, continues to struggle in terms of growth. Both the agriculture, forestry and fishing subsector, as well as mining and quarrying declined significantly by 5.5% and 7.5% respectively.

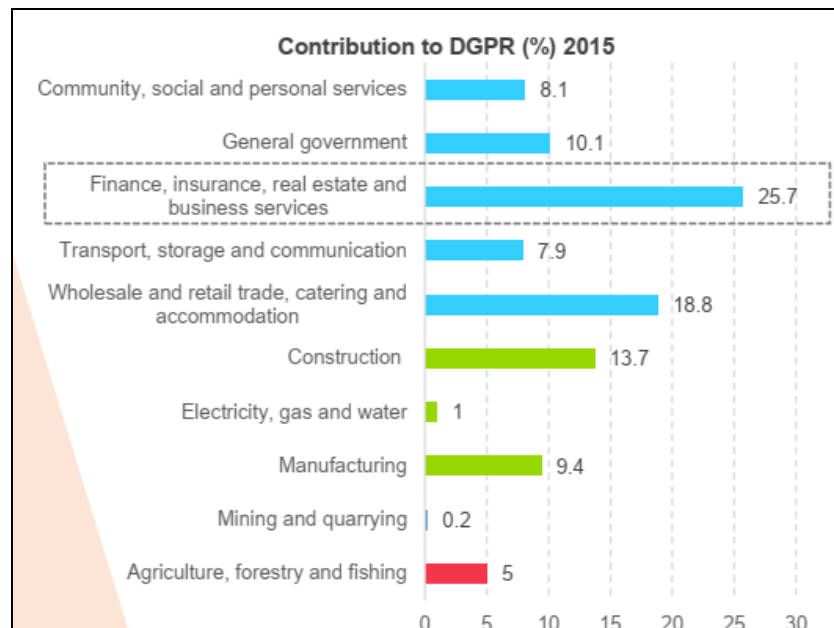


Figure 36: Industry Contribution to DGPR in Bitou LM (Source: Bitou MSFD, 2018)

Figure 34 illustrated the number of jobs provided by the top 5 economic sectors in Bitou LM in 2015. The top contributing Sector was Wholesale and Retail, Catering and Accommodation (4 557 jobs), followed by Community, Social and Personal Services (3 676 jobs) and Construction (2 959 jobs). The Construction Industry is followed closely by Finance, Insurance, Real Estate and Business Services (2 908 jobs), with General Government contributing 1 662 jobs.

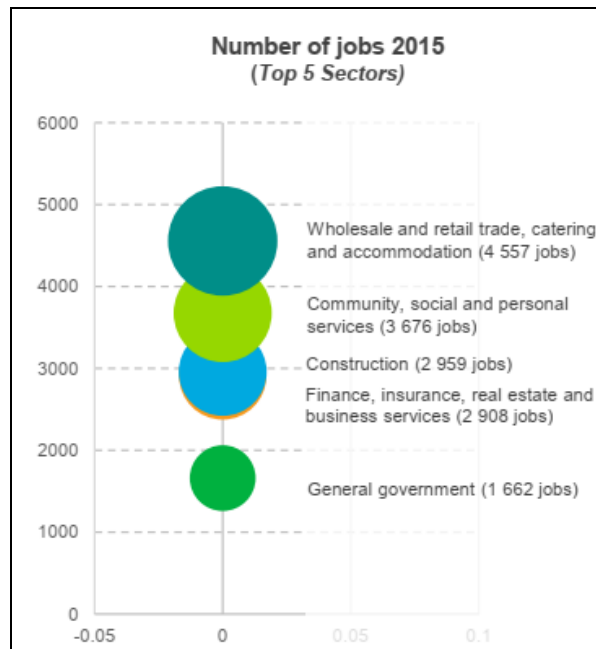


Figure 37: Number of Jobs provided per Sector (Source: Bitou MSDf, 2018)

5.3.2.5. Housing

According to the report entitled “Affordable Rental Housing Strategy and Plan” prepared for the Bitou Municipality in 2017, Bitou experience a population growth of 5,4% with 33% of the households housing incomes between R1 983 to R7 928 and a further 14% housing incomes between R7 929 to R15 850.

There is a direct relationship between population growth and increase in the number of households in Bitou. In 2011 there were 16 645 households in Bitou. As per the 2016 community survey, the number of households has increased to 21 914 which equates to 31.7 percent growth of the 2011 base.

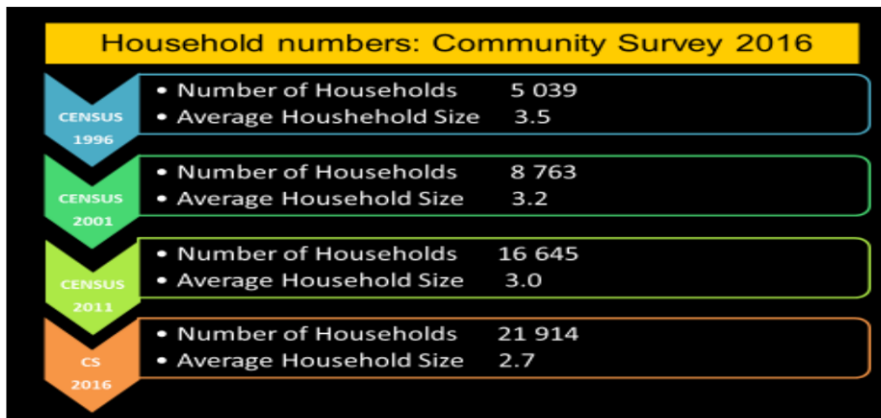


Figure 38: Household numbers: Community Survey 2016 (Source: Bitou IDP 2017-2022)

Plettenberg Bay is known traditionally as a holiday town and summer playground of wealthy tourists; however, the town has started to mature in recent years into a more diverse and multi-faceted town. The town has seen a sharp rise in demand for permanent homes in recent years, attracting families in search of a better lifestyle as well as empty-nesters and retirees looking to enjoy their golden years in a scenic, tranquil setting. While much



of this demand has originated from upper-middle to upper income households, this shift in the nature of the town has seen an increased demand for housing in the lower- and middle-income categories as local employment opportunities have increased (Urban-Econ Development Economists, 2019).

The BMSDF of 2017 states that the current housing backlog at Kranshoek is 486 housing units with a future forecast of 1 007 to the year 2030, making a total of 1 493 units.

As such, there is significant and mounting pressure on existing facilities and a high demand for additional housing in the area.

6. ALTERNATIVES

“Alternatives”, in relation to a proposed activity, means different means of meeting the general purposes and requirements of the activity, which may include alternatives to –

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

6.1. Description of the Process Followed to Reach the Preferred Alternative

6.1.1. Mixed Use Development Site Location and Layout Alternative

6.1.1.1. Process to Reach Preferred Alternative Location & Layout

The site layout plan shown in the figure below (and in Appendix C2) is the first layout option that was designed. This site layout plan was specifically designed to take into consideration the mapped CBA (ESA) area. The social amenities and facilities provided for on the layout plan were specifically provided according to the guidelines in the Development Parameters for the provision of facilities within settlements in the Western Cape. This location was chosen as an ideal location because it is located within the Plettenberg Bay Urban Edge and has been specifically set aside and planned for to be a future extension of the existing Kranshoek residential area in various Municipal Planning Frameworks, including the SDF and IDP.

As explained, the current housing situation in Bitou is that there are almost no alternative vacant sites within the urban edge that can be compared to investigate which site is the preferred site. Almost all sites adjacent to Plettenberg Bay and the existing rural settlements, infrastructure, transport services etc are proposed to be infilled by subsidized housing given the phenomenal rate of population increase in Bitou and dire need to meet the housing demand.

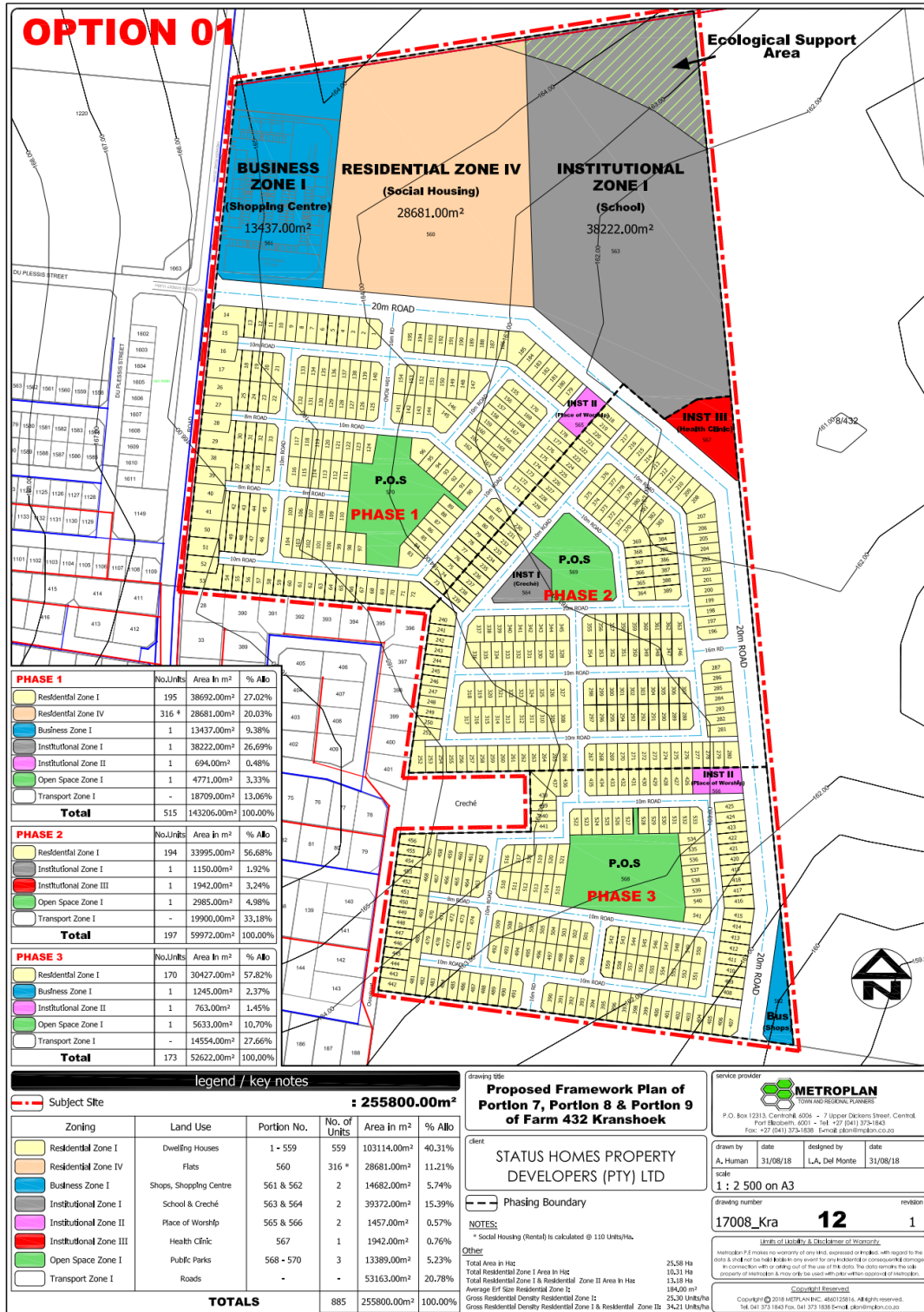


Figure 39: Original Conceptual Site Layout Plan (Alternative A: Option 1) as per Appendix C2.

Following the conceptual design of the first version of the site layout plan shown above, a Freshwater Impact Assessment and an Ecological Impact Assessment were undertaken on this original site layout plan. A revised

- Environmental Impact Assessments • Basic Assessments • Environmental Management Planning
- Environmental Control & Monitoring • Water Use License Applications • Aquatic Assessments



Site Layout Plan (**Appendix C1**) was then designed taking into account the following recommendations made by the freshwater and ecological specialists.

Ecological Impact Assessment Recommendations Made on First Version Site Layout shown in Appendix C2:

- A small portion of Ecological Support Area is identified along the north-eastern boundary. This area should be maintained as Open Space to protect ecological processes and connectivity with surrounding area.
- A 32 m buffer from the edge of the main drainage line must be accommodated and should be cleared of alien and weed species and rehabilitated.
- The small drainage line along the north-eastern boundary should be incorporated into open space and cleared of alien invasive trees.
- The minor drainage line in the south should be incorporated into open space and used for stormwater retention.

Freshwater Impact Assessment Recommendations made on First Version Site Layout shown in Appendix C2:

- The assessment identified three freshwater ecosystems within the 500 m regulated area that are likely to be impacted by the proposed development.
- There are two small wetlands that flow from west to east across the study area, and a very degraded seep wetland located directly south of the site boundary.
- It is highly recommended that the layout be amended ideally to avoid wetland habitat completely and adopt a 42 m buffer area.
- It is advisable that an alternative such as this be presented for assessments before offsets are considered.

Based on the findings and recommendation made by the specialists, the site layout plan was amended (Option 2) to firstly avoid freshwater and botanical impacts, and where unavoidable, they were reduced (mitigated).

There were unavoidable impacts as a result of the road intersection being placed in line with Du Plessis Street. Unfortunately, this resulted in the road being in the same location as the wetland. The wetland serves a critical function in the area and, as recommended by the specialist, should be avoided to reduce the impacts.

A site meeting was held on 27 June 2019, attended by representatives from the Applicant, EAP, DEADP, CapeNature, BGCMA and the Bitou Municipality. The impacts relating to the proposed development were discussed and means to address these presented. Based on the outcomes of this meeting, a revised layout (Option 3) was compiled and is being presented as the Preferred Alternative.

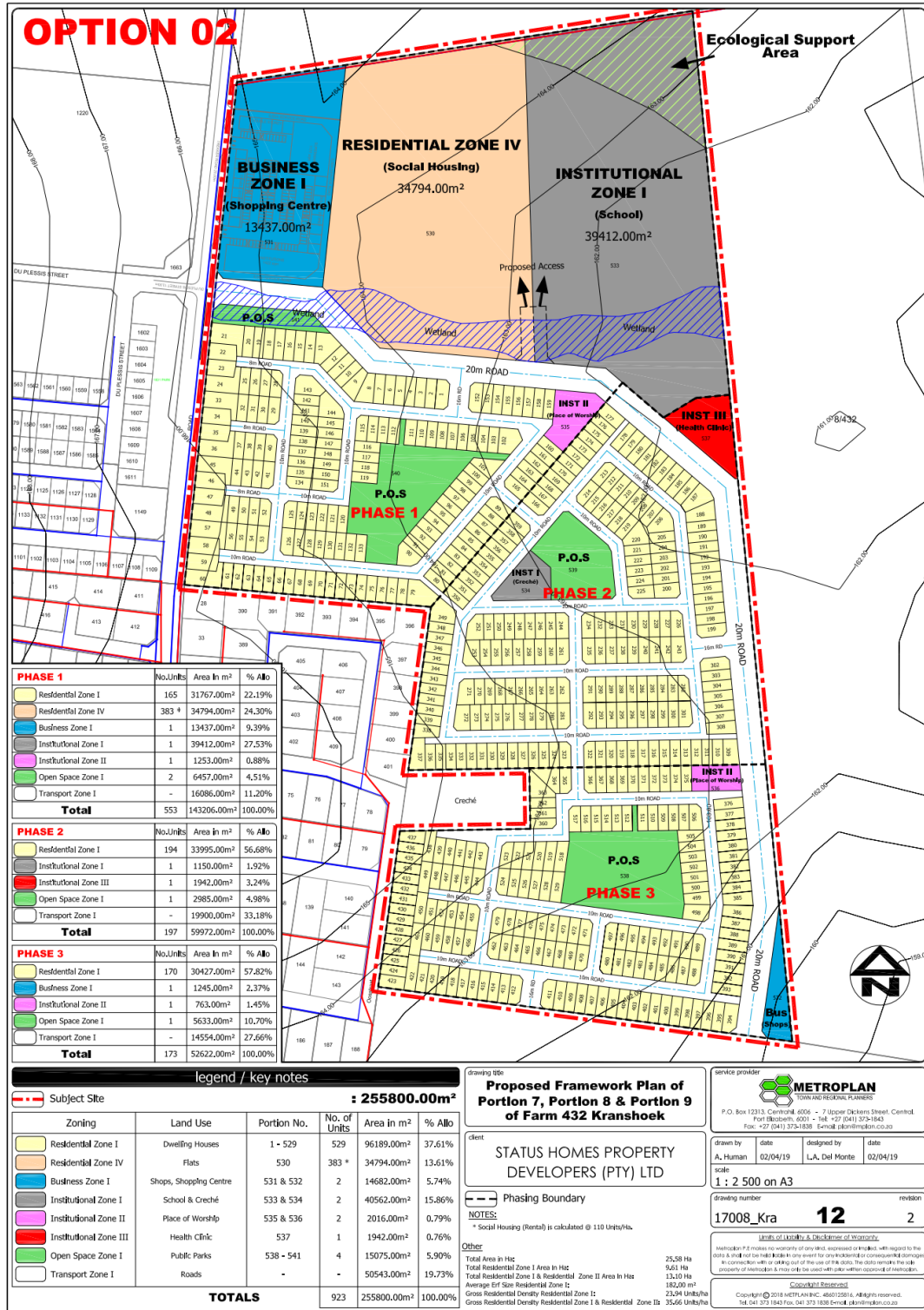


Figure 40: Revised Conceptual Site Layout Plan (Alternative A: Option 2) as per Appendix C2.

- Environmental Impact Assessments • Basic Assessments • Environmental Management Planning
- Environmental Control & Monitoring • Water Use License Applications • Aquatic Assessments



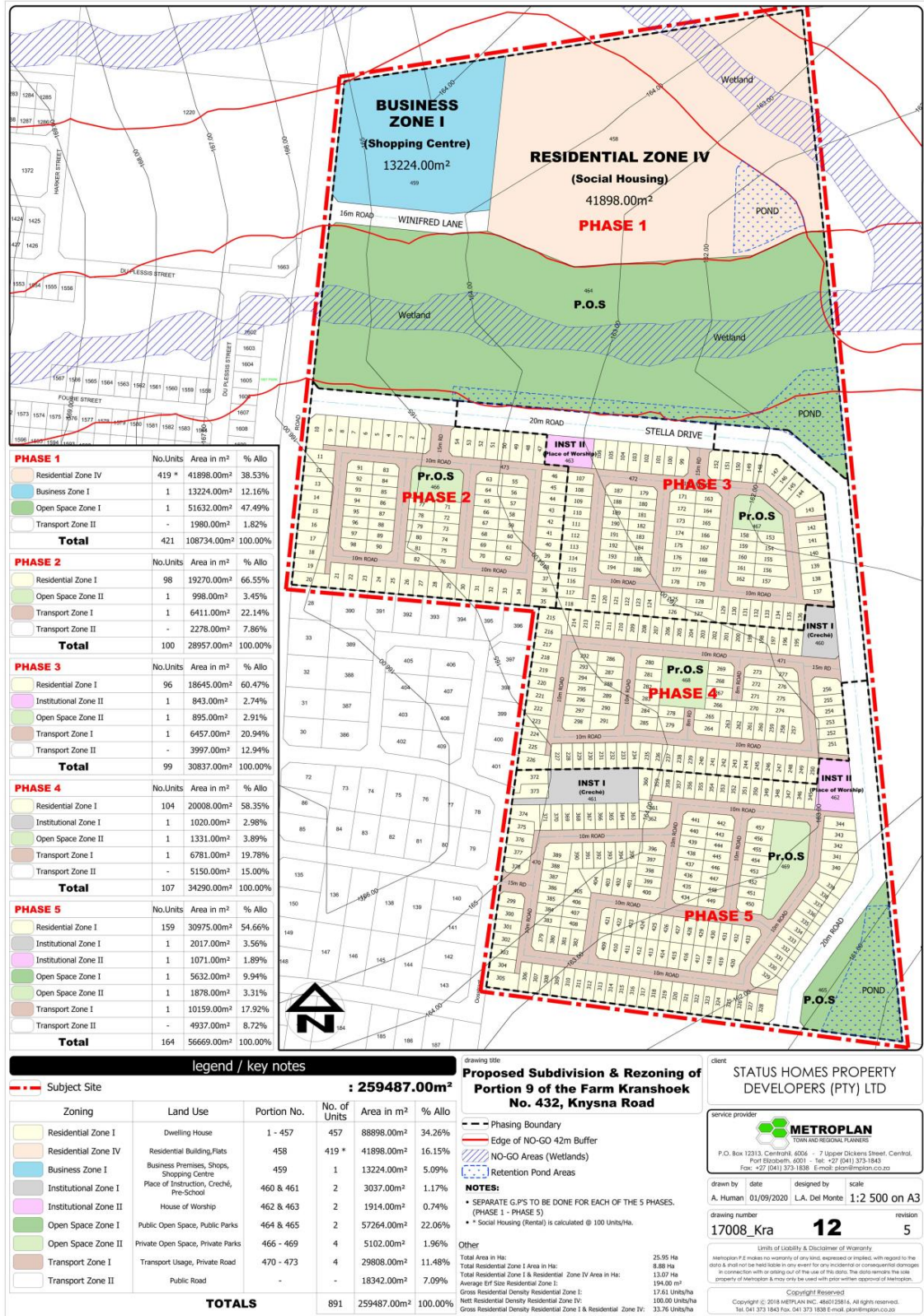


Figure 41: Revised Conceptual Site Layout Plan (Option 3 - Preferred) as per Appendix C1.

- Environmental Impact Assessments • Basic Assessments • Environmental Management Planning
- Environmental Control & Monitoring • Water Use License Applications • Aquatic Assessments



6.2. Concluding Statement Regarding Alternatives

The following layout Alternatives have, therefore, been comparatively assessed in the Environmental Impact Assessment Process:

1. **Alternative A: Option 3 (Preferred):** The Proposed Site Layout for the Mixed Use Development & Associated Bulk Infrastructure as shown in **Appendix C**– as described in detail in the description of the development above.
2. **Alternative A: Option 2:** The Proposed Site Layout for the Mixed Use Development & Associated Bulk Infrastructure as shown in **Appendix C**, with the access road encroaching onto the watercourse on site and the inclusion of the school in the northeast corner.

Table 15 below identifies the site layout differences between the two layout Alternatives.

Table 15: Summary of Alternatives Assessed

Development Proposed	No.	Size (ha)
Residential Zone 1: Dwelling Houses	457	8.95
Residential Zone 4: Flats	419	4.18
Business Zone 1: Shops, shopping centre	1	1.32
Institutional Zone 1: School & Creche	2	0.303
Institutional Zone 2: Place of Worship	2	0.19
Open Space Zone 1: Public Parks	2	5.72
Open Space Zone 2: Private Parks	4	0.51
Transport Zone 1: Private Roads	4	2.98
Transport Zone 1: Private Roads	-	1.83
TOTAL DEVELOPMENT FOOTPRINT		±25,98Ha

In addition to the differences in the number of units proposed, Alternative Options 2 and 3 have revised road layouts, taking into consideration the mapped wetland area to varying degrees.

3. **Alternative B:** The NO-GO Alternative. The “No Go” alternative is the option of not developing the proposed mixed use development and associated infrastructure. The land would continue to be used for residential purposes, with the option of agricultural use in line with its current zoning.

It is anticipated that the no-development option would result in a lost opportunity in terms of the employment opportunities associated with the construction and operation phase as well as the benefits associated with the provision of more than 800 houses and other much needed social facilities.

Bekker (2019) explains in the Freshwater Impact Assessment that the Present Ecological State of the affected wetlands would remain as determined (should the NO-GO alternative; i.e. no further development (status quo) go ahead).

Pote (2019) states that under status quo conditions (No-Go option) it is likely that large portions of the site will continue to undergo alien invasion, with associated increase in fire, as well as ongoing degradation of the site (including illegal dumping) should no other development occur. It is likely that

the site would continue on a trajectory of ongoing degradation, without intervention.

The “no-go” alternative will result in the visual environment staying the same with the natural character of the area contributing to the “sense of place”.

The socio-economic benefits of this project greatly outweigh the impacts in an area which is mostly degraded and already transformed and planned for development purposes in the Municipal SDF (within the urban edge).

7. PUBLIC PARTICIPATION PROCESS

7.1. Public Participation Round 1: Opportunity for Registration and Public & Authority Review of the Draft Scoping Report

It is a requirement according to the National Environmental Management Act (NEMA) Environmental Impact Assessment (EIA) Regulations of 2014, as amended, that once an application is submitted to obtain an Environmental Authorisation in terms of the NEMA EIA Regulations, that potential or registered Interested and/or Affected Parties (interested in the proposed development or affected by the proposed development) are subjected to a consultation period (at least 30 days) on the Draft Scoping Report before their comments are taken into account and responded to in a Final Scoping Report which is then submitted for decision making.

The Pre-Application Draft Scoping Report (first round of Public & Authority Consultation) was made available to identified Potential Interested & Affected Parties and Automatically Registered Key Authorities to review in order to provide comment on from 16 May 2019 – 13 June 2019 (30+ days). The Pre-Application Draft Scoping Report was posted in hardcopy to Key Authorities and was also available for free download and review directly from our website (www.sescc.net) under the public documents tab. The Report was also available in hardcopy at the Kranshoek Public Library.

Following the Pre-Application public participation period, an Application form was completed and submitted to the Department of Environmental Affairs and Development Planning (DEA&DP) on 24 October 2019.

As per the legislated process, the Pre-Application Draft Scoping Report was revised based on comments received and the Post-Application Draft Scoping Report made available to identified Potential Interested & Affected Parties and Automatically Registered Key Authorities from 31 October 2019 – 29 November 2019 (30 days) to review in order to provide comment.

Following the second round of public participation, the Post-Application Draft Scoping Report was finalised and submitted herewith to DEA&DP for consideration (Acceptance/Rejection). Acceptance was received from DEA&DP on **30 January 2020**.

7.1.1. Register of Interested & Affected Parties

A desktop assessment was undertaken in order to ascertain the erven and farm numbers of the adjacent affected landowners & occupiers. The figure below shows a map of the farm and the adjacent erven and farms that were identified as being Potential Interested & Affected Parties. Letter drops were conducted to these identified properties.

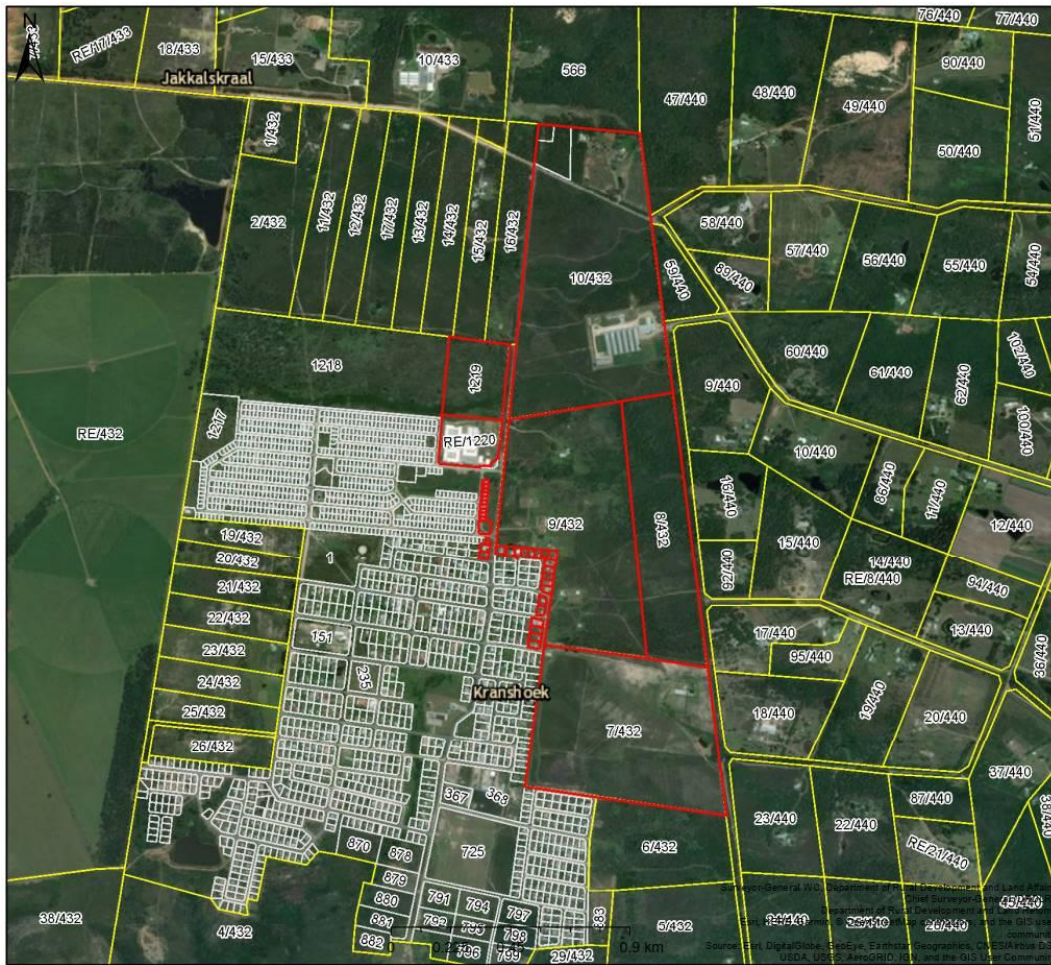


Figure 42: All erven and farms highlighted in red (adjacent landowners & occupiers) have been identified as Potential Interested & Affected Parties

Key Authorities (automatically registered) and other key stakeholders have also been identified and placed on the Register.

The following authorities were informed of the proposed project:

- WCG: Department of Environmental Affairs and Development Planning
- WCG: Department of Transport and Public Works
- WCG: Department of Agriculture
- WCG: Human Settlements
- WCG: Department of Health
- Breede-Gouritz Catchment Management Agency
- Department of Agriculture, Forestry and Fisheries
- Heritage Western Cape
- Cape Nature
- Garden Route District Municipality (Community Services / Roads)
- Bitou Municipality (Municipal Manager / Economic Development Management / Town Planning / Community Services)



7.1.2. Landowner Consent

It is a requirement in terms of the NEMA EIA Regulations of 2014, as amended, to obtain Landowner Consent for non-linear developments. The property has been purchased by the developer, on condition that the developer is granted all required approvals. Please therefore refer to Appendix E2, proof of purchase of the property.

7.1.3. Site Notice

A site notice, in English, was placed at the proposed entrance to the affordable housing development site (along Trekkerspad), notifying potential Interested and Affected Parties (I & AP's) of the availability of the Draft Scoping Report and inviting I & AP's to register on the database as Registered Interested & Affected Parties. Please refer to Appendix E3 for the content of the site notice and proof of placement..

7.1.4. Newspaper Advertisement

A newspaper advertisement was placed in the local newspaper (Knysna-Plett Herald) notifying potential Interested and Affected Parties (I & AP's) of the availability of the Draft Scoping Report and inviting I & AP's to register on the database as Registered Interested & Affected Parties. Please refer to Appendix E4 for the content of the newspaper and proof of placement.

7.2. Public Participation Round 2: Opportunity for Public & Authority Review of the Draft Environmental Impact Assessment Report

As per the legislated process, the Pre-Application Draft Scoping Report was revised based on comments received and the Post-Application Draft Scoping Report (second round of Public & Authority Consultation) was made available to registered Interested & Affected Parties and Registered Key Authorities to review in order to provide comment on from the **31 October 2019 – 29 November 2019** (30 days). The Draft Report was posted or hand delivered in hardcopy to Key Authorities and made available for free download and review directly from our website (www.sescc.net) under the public documents tab. The Report was also available in hardcopy at the Kranshoek Public Library.

7.3. Summary of Key Issues Raised by I & AP's during Rounds 1 & 2

To view all comments received in writing during the first two phases of public participation (Pre-Application and Post-Application Scoping Phases) please refer to **APPENDIX E** (comments received on the Draft Scoping Report before Final Scoping Report was submitted). In summary, the Key Issues raised in the "Scoping Phase" were as follows:

- Layout Design Concerns:
 - Erven sizes
 - Vehicular linkages
 - Visual impact
 - Hierarchy of Public Open Space
 - Buffer of Egg Laying Facility
- Biological Concerns:
 - Buffer zone around on-site watercourse
 - Alien invasive clearing
 - Water pollution mitigation
 - Fire breaks & burning regime
 - Faunal movement & relocation

- Establishment of a cooperative Kranshoek Wetland Management Committee
- Socio-Economic Concerns:
 - Compensation for existing residents
 - Location of the health clinic to service existing community
 - Water safety of detention ponds
 - Inclusion of a High School
- Technical Concerns:
 - Resource Conservation measures
 - Unallocated services capacity

Please refer to the **Comments and Response Table** to view the detailed response to each comment received.

7.4. Public Participation Round 3: Opportunity for Public & Authority Review of the Draft Environmental Impact Assessment Report

The Draft Environmental Impact Assessment Report (third round of Public & Authority Consultation) is being made available to registered Interested & Affected Parties and Registered Key Authorities to review in order to provide comment on from the **13 November 2020 – 14 December 2020** (30 days). The Draft Report has been made available for free download and review directly from our website (www.sescc.net) under the public documents tab. The Report will also be made available in hardcopy should this be requested.

8. IMPACTS

8.1. Summary of Impacts Identified

The impact tables in the section below include the identified potential environmental impacts and risks identified, including the nature, significance, consequence, extent, duration and probability of impact, the degree to which the impact can be reversed, may cause irreplaceable loss of resources and can be avoided, managed or mitigated.

These impact tables have been informed by the Botanical Impact Assessment, Freshwater Impact Assessment, Residential Market Assessment and Traffic Impact Assessment.

8.1.1. Screening Tool Results

The Department of Environmental Affairs (DEA) has developed a screening tool for an Environmental Authorization which identifies potential environmental sensitivities on the proposed site. The results of the tool can be found in **Appendix E**. Table 15 shows the findings of the tool:

Table 16: Results of the DEA Screening Tool for Portion 12 of Cape Farm 508

THEME	VERY HIGH SENSITIVITY	HIGH SENSITIVITY	MEDIUM SENSITIVITY	LOW SENSITIVITY
Agriculture	X			
Animal Species		X		
Aquatic Biodiversity	X			
Archaeological and Cultural Heritage		X		
Civil Aviation		X		
Paleontology			X	
Plant Species			X	



THEME	VERY HIGH SENSITIVITY	HIGH SENSITIVITY	MEDIUM SENSITIVITY	LOW SENSITIVITY
Defense				X
Terrestrial Biodiversity	X			

Based on these results, the Screening tool recommended the following specialist assessments be conducted:

- Landscape / Visual Impact Assessment
- Archaeological and Cultural Heritage Impact Assessment
- Paleontology Impact Assessment
- Terrestrial Biodiversity Impact Assessment
- Aquatic Biodiversity Impact Assessment
- Avian Impact Assessment
- Socio-Economic Assessment
- Plant Species Assessment
- Animal Species Assessment

In response to these recommendations, the following studies were compiled for the proposed development, which is felt addresses all of the potential impact concerns:

- Ecological Assessment with Plant Species Assessment
- Aquatic Biodiversity Impact Assessment
- Socio-Economic Assessment
- Engineering Services Report
- Visual Statement

An avian impact assessment was not considered necessary, as the proposed development would not significantly increase the nesting / perching habitat of birds in the area, and would therefore not affect the number of birds at the nearby airport.

A comment regarding the potential Heritage Resources on the site has been provided from Heritage Western Cape (see **Appendix L4**), wherein they note that the proposed development will not impact on heritage resources and therefore no further action is required. Heritage Impacts have, therefore, not been further investigated.

8.2. Potential Environmental Impacts Identified

8.1.2. Construction Phase

The following potential environmental impacts have been identified by the EAP and by input from Botanical, Freshwater and Traffic specialists as impacts that may occur during the construction phase that need to firstly be avoided and if unavoidable, mitigated to an acceptable level of impact significance.

- **Agricultural Potential Impact - Loss of agricultural land** that has the potential to be used for cultivation of crops or other agricultural purposes (opportunity cost).
- **Botanical Impact - Permanent or temporary loss of vegetation cover as a result of site clearing:** Site clearing before construction will result in the blanket clearing of vegetation within the affected footprint.
- **Botanical Impact - Loss of Species of Conservation Concern during pre-construction site clearing activities:** Numerous Species of Conservation Concern are present within the affected area, which will be

destroyed during site preparation.

- **Botanical Impact - Susceptibility of some areas to erosion as a result of construction related disturbance:** Removal of vegetation cover and soil disturbance may result in some areas being susceptible to soil erosion after completion of the activity.
- **Dust & Noise Impact:** Limited dust and noise impacts may result due to construction activities on the site. Excavations and associated earth-moving activities may generate noise and vibration which may pose a nuisance to surrounding residents and other land users. Movement of heavy vehicles to & from the site may generate noise, which may affect surrounding residents.
- **Faunal Impact - Loss of Faunal Habitat:** Activity will result in the loss of habitat for faunal species.
- **Faunal Impact - Loss of faunal species due to construction activities:** Activities associated with bush clearing and ploughing, and killing of perceived dangerous fauna, may lead to increased mortalities among faunal species.
- **Freshwater Resources Impact – Disturbance/Loss of aquatic vegetation and habitat:** The previous layouts (Options 1 & 2) indicated a road and associated infrastructure where wetland habitat is located. In order to construct this, wetland habitat would be completely lost as a result of clearing, excavations and infilling. There was potential for loss or disturbance of riparian zone vegetation during construction from machinery, vehicles and workers. The movement of topsoil and incorrectly placed stockpiles could also bury aquatic habitat. Due to construction, alien invasive species may encroach further into any disturbed areas and outcompete indigenous vegetation thereby reducing aquatic biodiversity.
- **Freshwater Resources Impact – Erosion of the banks and sedimentation of the watercourses:** Vegetation clearing and exposure of bare soils directly within and adjacent to the wetland habitat during construction will decrease the soil binding capacity and cohesion of the upslope soils and thus increase the risk of erosion and sedimentation downslope. The gentle slope of the study area does limit the magnitude of this impact to a degree, but it is highly likely to affect all of the identified wetlands. This activity may cause the burying of aquatic habitat. Ineffective site stormwater management, particularly in periods of high runoff, can lead to soil erosion from confined flows. Formation of rills and gullies from increased concentrated runoff. This increase in volume and velocity of runoff increases the particle carrying capacity of the water flowing over the surface. Soil compaction resulting in reduced infiltration and increased surface runoff together with the artificial creation of preferential flow paths due to construction activities, will result in increased quantities of flow entering the systems.
- **Freshwater Resources Impact – Water Pollution:** During construction there are a number of potential pollution inputs into the wetlands (such as hydrocarbons and raw cement). The likelihood of these entering the WET/4 wetland is larger should there be direct construction works within the system. These pollutants alter the water quality parameters such as turbidity, nutrient levels, chemical oxygen demand and pH. These alternations impact the species composition of the systems, especially species sensitive to minor changes in these parameters. Sudden drastic changes in water quality can also have chronic effects on aquatic biota in general and result in localised extinctions. Hydrocarbons, including petrol/diesel and oils/grease/lubricants associated with construction activities (machinery, maintenance, storage, handling) may potentially enter the system by means of surface runoff or through dumping by construction workers. Raw cement entering the systems through incorrect batching procedure and/or direct disposal. The incorrect positioning and maintenance of the portable chemical toilets and use of the surrounding environment as ablution facilities may result in sewage and chemicals entering the systems.
- **Heritage Impact:** The loss of Heritage resources, including Archaeological and Paleontological: Due to land clearing and excavations on the site.
- **Pollution & Contamination of Soil and Water Resources:** Construction activities will generate waste. In

addition, fuel, oil, lubricants and other pollutants may leak from vehicles/ machinery and contaminate the soil. Pollution and soil contamination could also occur from chemical toilets, cement mixing directly on the soil and storm water runoff may flow over the site camp area and carry contaminants off-site.

- **Socio-Economic Impact – Creation of business and employment opportunities:** The majority of work during the construction phase is likely to be undertaken by local contractors and builders. The proposed development will therefore represent a substantive positive benefit for the local construction and building sector in the Eden District Municipality (EDM) and Bitou Local Municipality (BLM). The majority of the building materials associated with the construction phase will be sourced from locally based suppliers from the EDM and BLM. A significant portion of the annual wage bill will be spent in the local EDM and BLM.
- **Traffic & Safety Impact:** It is proposed to deliver a significant amount of materials and equipment to the site during the construction phase of the development. Numerous truck trips will be required every day that could cause a temporary disturbance to traffic in the area. Impacts are expected to occur to the traffic in the area due to increased truck and construction vehicle traffic expected during the construction phase. Construction vehicles may impact on the existing road conditions (road capacity and congestion). Vehicles may impact on road safety conditions due to an increase in construction phase vehicles entering and exiting the site and they may impact on the condition of the existing road network.
- **Visual Impact:** The construction phase is associated with temporary disturbance as a result of construction (trench excavations, vehicles, machinery, fencing & signage) that may have a negative visual impact to the area.

8.1.3. Operation Phase

- **Botanical Impact - invasion by exotic and alien species:** Post construction disturbed areas having no vegetation cover are often susceptible to invasion by weedy and alien species, which can not only become invasive but also prevent natural flora from becoming established.
- **Botanical Impact - Disturbances to ecological processes:** Activity may result in disturbances to ecological processes.
- **Freshwater Resources Impact – Disturbance/Loss of aquatic vegetation and habitat:** There is less direct risk to aquatic habitat during the operational phase. However, habitat would be at threat due to the possibility of urban sprawl encroaching into wetland habitat or increase pressure from livestock. The project may promote the establishment of disturbance-tolerant biota, including colonization by invasive alien species, weeds and pioneer plants if there is any ongoing disturbance near the riparian zone. Although this impact is initiated during the construction phase it is likely to persist into the operational phase. Additionally, the stormwater infrastructure of the housing and associated road network will increase and concentrate flows into the systems. This may indirectly lead to erosion in the remaining wetland habitat that compromises the remaining vegetated habitat.
- **Freshwater Resources Impact – Erosion of the banks and sedimentation of the watercourses:** Where soil erosion problems and bank stability concerns initiated during the construction phase are not timeously and adequately addressed, these can persist into the operational phase of the development project and continue to have a negative impact downstream. The increase in hardened surface by development, and the impact of road and pipe crossings will be considerable and, if not mitigated against, will result in further erosion. Surface runoff and velocities will be increased, and flows will be concentrated by stormwater infrastructure.
- **Freshwater Resources Impact – Water Pollution:** If not prevented, litter, and contaminants, including sand, silt, and dirt particles, will enter storm water runoff and pollute the wetlands. Micro-litter such as

cigarette butts may travel through certain stormwater grids and grids may not be regularly cleared. The number of vehicles on the property due to the development increases the potential for pollutants to enter the system. During maintenance of the development there could be water pollution impacts similar to those encountered in the construction phase. The establishment of sewer pipes within and/or in close proximity to watercourse always poses a long term threat to the water quality and ecological health of freshwater ecosystems due to the relatively high likelihood that surcharge events will occur at some point in the future. A complete shift in the structure and composition of aquatic biotic communities is the result, as well as a general degradation in water resource quality that could have negative impacts to downstream human users e.g. dams used for domestic water and agriculture. Over the lifetime of the development, surcharge events and/or pipe leakages will likely occur and as a result some pollution as a result of sewerage infrastructure is inevitable. However, the proposed mitigation measures will go a long way to reducing the intensity of pollution events and ultimately reduce pollutant loads.

- **Freshwater Resources Impact – Flow Modification:** One has to ensure that surface flows are slowed and enter the river in a diffuse pattern. Ultimately, the operational surface will alter the natural processes of rain water infiltration and surface runoff, promoting increased volumes and velocities of storm water runoff, which can be detrimental to the wetlands receiving concentrated flows off of the area. According to the SANRAL (2006), urbanisation typically increases the runoff rate by 20 -50%, compared with natural conditions. Increased volumes and velocities of storm water draining from the area and discharging into the wetlands will alter the natural ecology, increasing the risk of erosion and channel incision/scouring.
- **Socio-Economic Impact - Provision of affordable income housing:** The proposed development will assist to address the housing backlog in the area, specifically the housing needs of the low and middle income households. This will represent a significant social benefit for the households in the local municipality that currently live in informal areas.
- **Socio-Economic Impact - Provision of public facilities and public spaces:** The proposed development makes provision for the establishment of schools (Alternative A: Option 2), public open spaces, play grounds, crèches etc. These components will all contribute to an improved quality of life for many residents in the local municipality who currently live in informal areas that are not well serviced and lack public facilities, such as parks and open spaces.
- **Socio-Economic Impact - Employment and business:** The business and commercial components will create employment opportunities for local residents. The residential component may also create some opportunities for domestic workers and gardeners etc. However due the low income levels these opportunities are likely to be limited. Additional employment opportunities will also be created by the proposed schools (Alternative A: Option 2) and health clinic. The majority of the employment opportunities are likely to benefit Historically Disadvantaged Individuals (HDIs). Given the high unemployment levels in the surrounding areas, coupled with the low income and education levels, this would represent a positive social impact. The operational phase will also create opportunities for local businesses, such as local maintenance and building companies, garden services and security companies, petrol stations, shops and restaurants etc. and create opportunities for new businesses to develop. The increased number of households will also create opportunities for the taxi sector. The local estate agencies in the area and legal firms would also benefit from the sale and resale of properties associated with the new development.
- **Socio-Economic Impact - Broaden the rates base:** The development will result in an increase in the rates base. In addition, the proposed development would also generate revenue for the local municipality from the consumption of water and electricity (Barbour, 2016).
- **Traffic & safety impact:** A significant increase in traffic is expected to occur in the area as a result of more

than 876 erven and various social amenities proposed. Vehicles may impact on the existing road network and road safety conditions due to an increase in vehicles entering and exiting the site.

- **Visual Impact – Land use character & “sense of place”:** It is proposed to change the land use character and existing sense of place of the site from a largely undeveloped site in a rural environment to a built up mixed use development of approximately 25ha. The proposed development could impact on the “sense of place” of the area to sensitive receptors that can see the development.

8.3. Methodology Used in Determination of the Significance of Potential Impacts

The following assessment methodology was used by the Specialists and the EAP. It has been adapted from the DEAT (2002) Information Series 5, Integrated Environmental Management Information Series on Impact Significance:

Table 17: Methodology in determining the extent, duration, probability, significance, reversibility and cumulative impact of an environmental impact.

Determination of Extent (Scale):

Site Specific	The impact is limited to the development site (development footprint) or part thereof.
Local	The impacted area includes the whole or a measurable portion of the site, but could affect the area surrounding the development, including the neighbouring properties and wider municipal area.
Regional	The impact would affect the broader region (e.g. neighbouring towns) beyond the boundaries of the adjacent properties.
National	The impact would affect the whole country (if applicable).

Determination of Duration:

Temporary	The impact will be limited to part of the construction phase or less than one month.
Short term	The impact will continue for the duration of the construction phase, or less than one year.
Medium term	The impact will continue for part the operational phase
Long term	The impact will continue for the entire operational lifetime of the development, but will be mitigated by direct human action or by natural processes thereafter.
Permanent	This is the only class of impact that will be non-transitory. Such impacts are regarded to be irreversible, irrespective of what mitigation is applied.

Determination of Probability:

Improbable	The possibility of the impact occurring is very low, due either to the circumstances, design or experience.
Probable	There is a possibility that the impact will occur to the extent that provisions must therefore be made.

Highly probable	It is most likely that the impacts will occur at some stage of the development. Plans must be drawn up to mitigate the activity before the activity commences.
Definite	The impact will take place regardless of any prevention plans.

Determination of Significance (without mitigation):

No significance	The impact is not substantial and does not require any mitigation action.
Low	The impact is of little importance, but may require limited mitigation.
Medium	The impact is of sufficient importance and is therefore considered to have a negative impact. Mitigation is required to reduce the negative impacts to acceptable levels.
Medium-High	The impact is of high importance and is therefore considered to have a negative impact. Mitigation is required to manage the negative impacts to acceptable levels.
High	The impact is of great importance. Failure to mitigate, with the objective of reducing the impact to acceptable levels, could render the entire development option or entire project proposal unacceptable. Mitigation is therefore essential.
Very High	The impact is critical. Mitigation measures cannot reduce the impact to acceptable levels. As such the impact renders the proposal unacceptable.

Determination of Significance (with mitigation):

No significance	The impact will be mitigated to the point where it is regarded to be insubstantial.
Low	The impact will be mitigated to the point where it is of limited importance.
Medium	Notwithstanding the successful implementation of the mitigation measures, the impact will remain of significance. However, taken within the overall context of the project, such a persistent impact does not constitute a fatal flaw.
High	Mitigation of the impact is not possible on a cost-effective basis. The impact continues to be of great importance, and, taken within the overall context of the project, is considered to be a fatal flaw in the project proposal.

Determination of Reversibility:

Completely Reversible	The impact is reversible with implementation of minor mitigation measures
Partly Reversible	The impact is partly reversible but more intense mitigation measures



<i>Barely Reversible</i>	The impact is unlikely to be reversed even with intense mitigation measures
<i>Irreversible</i>	The impact is irreversible and no mitigation measures exist

Determination of Degree to which an Impact can be Mitigated:

<i>Can be mitigated</i>	The impact can be completely mitigated
<i>Can be partly mitigated</i>	The impact can be partly mitigated
<i>Can be barely mitigated</i>	It is possible to mitigate the impact only slightly
<i>Not able to mitigate</i>	It is not possible to mitigate the impacts

Determination of Loss of Resources:

<i>No loss of resource</i>	The impact will not result in the loss of any resources
<i>Marginal loss of resource</i>	The impact will result in marginal loss of resources
<i>Significant loss of resources</i>	The impact will result in significant loss of resources
<i>Complete loss of resources</i>	The impact will result in a complete loss of all resources

Determination of Cumulative Impact:

<i>Negligible</i>	The impact would result in negligible to no cumulative effects
<i>Low</i>	The impact would result in insignificant cumulative effects
<i>Medium</i>	The impact would result in medium cumulative effects
<i>High</i>	The impact would result in significant cumulative effects

Significance ratings of impacts after mitigation have been colour coded for ease of reference, as follows:

POSITIVE IMPACTS	NEGATIVE IMPACTS
High	High
Medium-High	Medium-High
Medium	Medium
Low-Medium	Low-Medium



Low	Low
Negligible	Negligible

8.4. Summary of Key Findings & Recommendations of Specialist Assessments

8.4.1. Botanical Impact Assessment

8.4.1.1. Key Findings

- Engineering Advice & Services conducted an ecological impact assessment on the study area in February 2019.
- Pote (2019) explains that the units primarily affected by the proposed development is South Outeniqua Sandstone Fynbos which has a Vulnerable Conservation Status.
- The site is also in the general vicinity of areas having Garden Route Shale Fynbos (Endangered) and Knysna Sand Fynbos (Endangered). No elements of these units were however noted to be present on the proposed site.
- Some protected species were noted to be present, but all are commonly occurring species with widespread distribution or not of significant concern.
- No forest elements are present on site.
- Significant alien infestation was noted throughout the area. Predominantly *Pinus pinaster* (Pine), with *Acacia mearnsii* (Black Wattle), *Acacia saligna* (Port Jackson), *Eucalyptus* spp. (Bluegum) and *Acacia melanoxylon* (Australian Blackwood) in low to dense (along eastern boundary and drainage line) infestation. Various ruderal weeds as well as exotic and indigenous grasses also in abundance for approximately 25 % (6 Ha) of the site, specifically surrounding the watercourse. Indications are that the site has become invaded over the last few years, possibly with a series of intense fires, which are likely to have affected the natural seed bank and ecology
- The overall botanical impact of the proposed development layout is Medium-Low negative (before mitigation) and Low-Negligible negative (after mitigation).
- Provided that the recommendations in the Botanical Impact Assessment can be implemented **the proposed project presents no botanical Fatal Flaws, and will therefore have an acceptable level of botanical impact.**

8.4.1.2. Key Impacts Identified

- During construction, the main impacts would be **permanent loss of any vegetation cover, loss of species of conservation concern and erosion.**
- During operation, disturbance to the **ecological processes and invasion by exotic and alien species** may occur.

8.4.1.3. Recommended Mitigation Measures

- Blanket clearing of vegetation must be limited to the approved development footprint, and the area to be cleared must be demarcated before any clearing and grubbing commences.
- No clearing outside of development and infrastructure footprint area to take place.
- Final positioning of the development footprint should be undertaken in consultation with respective specialists, including a botanist.
- Open Space to be incorporated in final plan to include ecological corridors and riparian areas as described in the report.
- Respective permits must be obtained timeously (2 - 3 months) before site clearing commences and a flora

search and rescue plan must be implemented beforehand.

- Permits from DEA&DP must be kept on site and in the possession of the flora search and rescue team at all times.
- Rescued plants should be replanted into a nearby disturbed area of similar habitat or for open space rehabilitation.
- Once flora search and rescue is complete, a certificate of clearance must be issued by the botanist and copies supplied to DEA&DP.
- Removed topsoil should be used in rehabilitation of transformed areas that are within the open space areas.
- Alien plants must be removed from the site as per NEMBA requirements.
- A suitable weed management strategy to be implemented in construction and operation phases to eradicate and control regeneration.
- After any clearing is completed, an appropriate cover crop should be planted where any weeds or exotic species are removed from disturbed areas timeously.
- Suitable measures must be implemented in areas that may be susceptible to erosion, including but not limited to gabions and runoff diversion berms (if necessary).
- Areas must be rehabilitated and a suitable cover crop planted once specific phases of construction is completed.
- If site development does not occur soon after preparation of the site, a suitable cover crop to be established as a temporary measure.

8.4.2. Freshwater Impact Assessment

8.4.2.1. Key Findings

- Sharples Environmental Services conducted a Freshwater Habitat Impact Assessment on the study area in March 2019.
- The study found that the proposed project is located within the DWS Quaternary Catchment K60G and falls within the Gouritz Water Management Area.
- A screening assessment identified seven wetland systems within a 500 m radius of the site. Following this, the watercourses that may potentially be impacted upon by the proposed project were verified through infield soil samples and documentation of vegetation communities and species and key features within the landscape.
- The two wetlands that traverse the site, named WET/3 and WET/4 for the purposes of this study, will be directly impacted upon by the proposed development. WET/7, located near the southern boundary of the site is likely to be indirectly impacted upon.

8.4.2.2. Key Impacts Identified

- During construction and operation, the main impacts would be **Loss and disturbance of aquatic vegetation & habitat, Erosion & Sedimentation and Water Pollution.**

8.4.2.3. Recommended Mitigation Measures

- Construction Phase
 - The stormwater flows must enter the wetland areas in a diffuse flow pattern without pollutants.
 - When developing a stormwater management plan for the site, the plan must be developed with appropriate ecological input and be based on Sustainable Drainage Systems (SUDS).

- Soft infrastructure must be considered where practical. For example, permeable surfaces can be done via permeable concrete block pavers (such as Amorflex), brick pavers, stone chip, and gravel and may contribute to slowing surface flows (especially if maintained).
- Stormwater managed by the development could be discharged into porous channels / swales ('infiltration channels or basins') running near parallel or parallel to contours within and along the edge of the development.
- Frequent stormwater outlets must be designed to prevent erosion at discharge points. All erosion protection measures (e.g. Reno-mattresses) must be established to reflect the natural slope of the surface and located at the natural ground level.
- Stormwater exit points must include a best management practice approach to trap any additional suspended solids and pollutants originating from the proposed development. Also include the placement of stormwater grates (or similar).
- The use of grease traps/oil separators to prevent pollutants from entering the environment from stormwater is recommended. To ensure the efficiency of these, they must be regularly maintained. Key maintenance will include litter and sediment clearing and the servicing and maintenance of key collection points like catch pits, detention tanks etc. Such maintenance should be the responsibility of either the local municipality or, where possible, the relevant owners/estate associations, and budgeted for.
- Stockpiles must not be located within 50 metres of the wetlands. The furthest threshold must be adhered to. They should not be placed in vegetated areas that will not be cleared.
- Erosion control measures including silt fences, low soil berms and/or shutter boards must be put in place around the stockpiles to limit sediment runoff from stockpiles. Alternatively, the exposed slopes must drain into small temporary stormwater and silt traps/ponds.
- Regular inspections during the construction phase should also be undertaken to ensure that functions are not undermined by inappropriate activities.
- Post Construction / Rehabilitation
 - The area must be maintained through alien invasive plant species removal and the establishment of indigenous vegetation cover to filter run-off before it enters the freshwater habitat.
 - The solid domestic waste must be removed and disposed of offsite. All post-construction building material and waste must be cleared in accordance with the EMPr.
 - Removal of vegetation must only be when essential for the continuation of the project. Do not allow any disturbance to the adjoining natural vegetation cover or soils.
 - Erosion features that have developed due to construction within the aquatic habitat due to the project are required to be stabilised. This may also include the need to deactivate any erosion headcuts/rills/gullies that may have developed.
 - It is the contractor's responsibility to continuously monitor the area for newly established alien species during the contract and establishment period, which if present must be removed. Removal of these species shall be undertaken in a way which prevents any damage to the remaining indigenous species and inhibits the re-infestation of the cleaned areas.
 - Alien/ invasive species shall not be stockpiled, they should be removed from site and dumped at an approved site.
 - Any use of herbicides in removing alien plant species is required to be investigated by the ECO before use, for the necessity, type proposed to be used, effectiveness and impacts of the product on aquatic biota.
 - A monitoring programme shall be in place, not only to ensure compliance with the EMPr throughout the construction phase, but also to monitor any post-construction environmental issues and impacts such as increased surface runoff. The monitoring should be regular and additional visits must be taken when

there is potential risk to watercourses.

- Operational Phase
 - The stormwater management infrastructure must be designed to ensure the runoff from the development is not highly concentrated before entering the buffer area. The volume and velocity of water must be reduced through discharging the surface flow at multiple locations surrounding the development, preventing erosion.
 - Any evidence of erosion from this stormwater system must be rehabilitated and the volume/velocity of the water reduced through further structures and/or energy dissipaters. These structures must be incorporated within the layout area.
 - The recommended use and maintenance of grease traps/oil separators to prevent pollutants from entering the environment from stormwater.
 - Appropriate waste water infrastructure must be designed to prevent any such water from entering the surrounding environment.
 - Maintenance of the wetland habitat and buffer area must be implemented for it to remain effective. Apart from erosion control and alien invasive plant eradication, the encroachment of any further infrastructure or vehicles must be prevented.
 - The local authority should prevent illegal dumping in this area by providing suitable waste disposal facilities where waste can be recycled and disposed of in a controlled manner.
 - Engage with the community to explain the reasons why the buffer and the water resources are protected and what human activities are allowed. This could be targeted at learners to prevent the dumping of solid waste and other activities that threaten the watercourses and buffer zones.
 - The community could be involved in the monitoring.
 - Placement of signage near the boundary of the buffer zone should also be considered to help mark the boundary and educate the community about the purpose and value of protecting buffer zones. Information can include a description and visual of alien invasive plant species.

8.4.3. Traffic Impact Assessment

8.4.3.1. Key Findings

- Engineering Advice and Services conducted a Traffic Impact Assessment for the proposed development in March 2019. This report was revised in February 2020 to address comments received during the Scoping Phase.
- The purpose of the report was to assess the traffic and transportation impacts of the proposed development relating to the impact on the surrounding road network.
- The proposed mixed use housing development would generate approximately 269 additional peak hour vehicle trips.
- It is assumed that trips generated by the creche, clinic and places of worship will be predominantly internal trips.
- Access to the site is proposed from Trekker Road at a point 65m north of Du Plessis Street and 85m south of Du Plessis Street.

8.4.3.2. Key Impacts Identified

- The construction phase traffic expected as a result of the delivery of materials and employees driving to work and back could result in **traffic impacts on the existing road networks, especially at the key intersections.**

- **Damage to access roads** as a result of increased truck traffic.
- The operational phase traffic expected as a result of the residents travelling to work and back could result in **traffic impacts on the existing road networks**.

8.4.3.3. Recommended Mitigation

- It is recommended that the appropriate signage and information should be provided to the users of the key surrounding roads.
- Employees, contractors and truck drivers to ensure that they use the access route proposed and do not cause unnecessary traffic disruption or damage to lower grade roads.
- All drivers and machinery operators must be sensitised to the fact that they are working in an area with a potentially high volume of foot and vehicle traffic, and must exercise due caution when entering/ exiting the site.
- Speed of construction vehicles and other heavy vehicles must be strictly controlled to avoid dangerous conditions for other road users.
- Construction vehicles must adhere to the load carrying capacity of road surfaces and adhere to all other prescriptive regulations regarding the use of public roads by construction vehicles.
- The Contractor must ensure that any large or abnormal loads (including hazardous materials) that must be transported to/ from the site are routed appropriately, and that appropriate safety precautions are taken during transport to prevent road accidents.
- Where possible, construction traffic that may obstruct traffic flow on the surrounding roads should be scheduled for outside of peak traffic times.
- Where possible, heavy machinery should be parked within a secure demarcated area within the footprint of the site instead of moving the machinery to and from the site each day.
- A pre-inspection of surrounding road network should be conducted with Municipal officials and the Engineers prior to the start of construction to determine the current state of the road. A post-construction inspection will be conducted to determine whether any significant damage has been caused by the increased traffic relating to the construction of the development. Should it be found that significant damage has occurred, the onus is on the Developer to make the necessary repairs.
- The necessary road markings, traffic signage, speed limits and early warning systems will need to be developed as per the requirements of the relevant roads-authority (and outcome of the traffic impact assessment) to ensure the safety of vehicular and pedestrian traffic during the operational phase of the development.
- The TIA should be approved by the Bitou Local Municipality.
- Access to Portion 9 be approved from Trekker Road (North and South Access Road) and configured as indicated in the TIA, with the cost of all road adjustments being met by the developer.
- The North and South Access Roads with Trekker Road be upgraded as indicated in the TIA, including provision for safe pedestrian movement across Trekker Road.
- The proposed collector roads be constructed to a 7,4m surfaced width excluding kerb and channel, with sidewalks provided along both sides.

8.4.4. Cumulative Impacts

Cumulative impacts in relation to an activity are defined in the EIA Regulations as meaning **“the impact of an activity that in itself may not be significant, but may become significant when added to the existing and**

potential impacts eventuating from similar or diverse activities or undertakings in the area”.

The cumulative impact on existing services, specifically water, sewerage, and stormwater is noted as a potential issue. However, while new developments such as Kranshoek and other housing and mixed use developments in the area may place pressure on existing services, these developments are in response to the housing shortage in the Municipality and are, therefore providing an essential service.

- **Socio – Economic Impact: Impact on existing services:** The proposed development would have a negative impact on existing services, specifically the stormwater, water and sewer networks in the area. When one takes into account the large number of other proposed developments of the same kind, **this will have a medium negative cumulative impact.** However, as the need for additional services is a part of the development of these proposals, many would include the required upgrades of the various services in the area.

Expected positive operational cumulative impacts include the following:

- **Socio Impact – Provision of housing:** Once all of the proposed developments have been constructed and residents provided with housing, the backlog experienced within the municipality will have been minimised. The housing needs in the municipality are, however, unlikely to ever be fully addressed until the influx of population has stabilised. This will have a **high positive cumulative impact.**
- **Economic Impact – Provision of housing:** The cumulative impact on the economy of the region is based on the hundreds of households which would have a stable income as a result of the jobs created in the building industry. With the current unemployment rate, this cumulative impact would ensure safety and security, as well as property for the region. This will have a **high positive cumulative impact.**

8.5. Description and Assessment of the Significance of Impacts Prior and After Mitigation

8.5.1. Construction Phase Impacts

Note: There is only one site location proposed for the development, with one layout Alternative being assessed (Alternative B: Option3) against the NO-GO (Alternative C).

8.5.1.1. Agricultural Potential Impact – Loss of Agricultural Land

	Agricultural Potential Impact – Loss of Agricultural Land		
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO
DESCRIPTION OF IMPACT:	Loss of agricultural land that has the potential to be used for cultivation of crops or other agricultural purposes (opportunity cost). The land proposed for the affordable housing development site is currently zoned for Agriculture and has been mapped to have a moderate agricultural potential land use. However, due to the lack of water availability, the site is currently not used for crop production / food crops so the resulting opportunity cost lost is low.		No Impact as there would be no loss of agricultural land.
Nature of impact:	Negative	Negative	No Impact
Extent and duration of impact:	Site Specific; Long Term	Site Specific; Long Term	-N/A
Probability of occurrence:	Definite	Definite	-N/A
Degree to which the impact can be reversed:	Barely Reversible	Barely Reversible	-N/A
Degree to which the impact may cause irreplaceable loss of resources:	Marginal loss of resource	Marginal loss of resource	-N/A



	Agricultural Potential Impact – Loss of Agricultural Land		
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO
Cumulative impact prior to mitigation:	High	High	-N/A
Significance rating of impact prior to mitigation	Medium	Medium	-N/A
Degree to which the impact can be mitigated:	Can be barely mitigated	Can be barely mitigated	-N/A
Proposed mitigation:	No mitigation is proposed or necessary given the low impact and current land use of the site.		-N/A
Cumulative impact post mitigation:	Low	Low	-N/A
Significance rating of impact after mitigation	Low (-)	Low (-)	-N/A

8.5.1.2. Botanical Impact – Permanent Loss of Indigenous Vegetation

	Botanical Impact - Permanent Loss of Indigenous Vegetation		
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO
DESCRIPTION OF IMPACT:	Site clearing before construction will result in the blanket clearing of vegetation within the affected footprint.		Large portions of the site will continue to undergo alien invasion, with associated increase in fire, as well as ongoing degradation of the site (including illegal dumping). It is likely that the site would continue on a trajectory of ongoing degradation, without intervention.
Nature of impact:	Negative	Negative	Negative
Extent and duration of impact:	Site Specific; Long Term	Site Specific; Long Term	Site Specific; Long Term

	Botanical Impact - Permanent Loss of Indigenous Vegetation		
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO
Probability of occurrence:	Definite	Definite	Probable
Degree to which the impact can be reversed:	Barely Reversible	Barely Reversible	Reversible
Degree to which the impact may cause irreplaceable loss of resources:	Marginal loss of resource	Marginal loss of resource	Marginal loss of resource
Cumulative impact prior to mitigation:	High	High	High
Significance rating of impact prior to mitigation	Medium	Medium	Medium
Degree to which the impact can be mitigated:	Can be barely mitigated	Can be barely mitigated	Can be mitigated
Proposed mitigation:	<ul style="list-style-type: none"> Blanket clearing of vegetation must be limited to the approved development footprint, and the area to be cleared must be demarcated before any clearing and grubbing commences. No clearing outside of development and infrastructure footprint area to take place. Final siting of footprint should be undertaken in consultation with respective specialists, including a botanist. Open Space to be incorporated in final plan to include ecological corridors and riparian as described in the report. Removed topsoil should be used in rehabilitation of transformed areas that are within the open space areas. 		<ul style="list-style-type: none"> Alien invasive management by the landowner. Fire management by the landowner.



	Botanical Impact - Permanent Loss of Indigenous Vegetation		
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO
Cumulative impact post mitigation:	Low		Negligible
Significance rating of impact after mitigation	Low (-)		Negligible

8.5.1.3. Botanical Impact – Loss of Species of Conservation Concern

	Botanical Impact - Loss of Species of Conservation Concern		
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO
DESCRIPTION OF IMPACT:	Numerous Species of Conservation Concern as per the Provincial Nature Conservation Ordinance (19 of 1974) are present within the affected area, which will be destroyed during site preparation.		Large portions of the site will continue to undergo alien invasion, with associated increase in fire, as well as ongoing degradation of the site (including illegal dumping). It is likely that the site would continue on a trajectory of ongoing degradation, without intervention.
Nature of impact:	Negative	Negative	Negative
Extent and duration of impact:	Site Specific; Long Term	Site Specific; Long Term	Site Specific; Long Term
Probability of occurrence:	Definite	Definite	Probable
Degree to which the impact can be reversed:	Barely Reversible	Barely Reversible	Reversible
Degree to which the impact may cause irreplaceable loss of resources:	Marginal loss of resource	Marginal loss of resource	Marginal loss of resource

	Botanical Impact - Loss of Species of Conservation Concern		
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO
Cumulative impact prior to mitigation:	Medium	Medium	High
Significance rating of impact prior to mitigation	Medium	Medium	Medium
Degree to which the impact can be mitigated:	Can be barely mitigated	Can be barely mitigated	Can be mitigated
Proposed mitigation:	<ul style="list-style-type: none"> Respective permits must be obtained timeously (2 - 3 months) before site clearing commences and a flora search and rescue plan must be implemented beforehand. Permits from DEA&DP must be kept on site and in the possession of the flora search and rescue team at all times. Rescued plants should be replanted into a nearby disturbed area of similar habitat or for open space rehabilitation. Once flora search and rescue is complete, a certificate of clearance must be issued by the botanist and copies supplied to DEA&DP 		<ul style="list-style-type: none"> Alien invasive management by the landowner. Fire management by the landowner.
Cumulative impact post mitigation:	Low	Low	Negligible
Significance rating of impact after mitigation	Low (-)	Low (-)	Negligible

8.5.1.4. Botanical Impact – Susceptibility of some areas to erosion as a result of construction related disturbances.

	Botanical Impact - Susceptibility of some areas to erosion as a result of construction related disturbances.		
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO
DESCRIPTION OF IMPACT:	Removal of vegetation cover and soil disturbance may result in some areas being susceptible to soil erosion after completion of the activity.		No Impact, as no disturbance to the vegetation cover or soil would occur.



	Botanical Impact - Susceptibility of some areas to erosion as a result of construction related disturbances.		
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO
Nature of impact:	Negative	Negative	No Impact
Extent and duration of impact:	Site Specific; Medium Term	Site Specific; Medium Term	-N/A
Probability of occurrence:	Probable	Probable	-N/A
Degree to which the impact can be reversed:	Barely Reversible	Barely Reversible	-N/A
Degree to which the impact may cause irreplaceable loss of resources:	Marginal loss of resource	Marginal loss of resource	-N/A
Cumulative impact prior to mitigation:	Low	Low	-N/A
Significance rating of impact prior to mitigation	Low	Low	-N/A
Degree to which the impact can be mitigated:	Can be mitigated	Can be mitigated	-N/A
Proposed mitigation:	<ul style="list-style-type: none"> Suitable measures must be implemented in areas that may be susceptible to erosion, including but not limited to gabions and runoff diversion berms (if necessary). Areas must be rehabilitated and a suitable cover crop planted once specific phases of construction is completed. If site development does not occur soon after preparation of the site, a suitable cover crop to be established as a temporary measure. 		-N/A



	Botanical Impact - Susceptibility of some areas to erosion as a result of construction related disturbances.		
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO
Cumulative impact post mitigation:	Low	Low	-N/A
Significance rating of impact after mitigation	Negligible (-)	Negligible (-)	-N/A

8.5.1.5. Contamination & Pollution Impact – Associated with Construction Activities

	Contamination & Pollution Impact – Associated with Construction Activities		
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO
DESCRIPTION OF IMPACT:	Construction activities will generate waste. In addition, fuel, oil, lubricants and other pollutants may leak from vehicles/ machinery and contaminate the soil. Pollution and soil contamination could also occur from chemical toilets, cement mixing directly on the soil and stormwater runoff may flow over the site camp area and carry contaminants off-site.		No Impact, as no construction activities would occur on site.
Nature of impact:	Negative	Negative	No Impact
Extent and duration of impact:	Local; Medium term	Local; Medium term	-N/A
Probability of occurrence:	Probable	Improbable	-N/A
Degree to which the impact can be reversed:	Partly reversible	Partly reversible	-N/A
Degree to which the impact may cause irreplaceable loss of resources:	Significant loss of resources	Significant loss of resources	-N/A
Cumulative impact prior to mitigation:	Low	Low	-N/A



Contamination & Pollution Impact – Associated with Construction Activities			
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO
Significance rating of impact prior to mitigation	Medium - High	Medium - High	-N/A
Degree to which the impact can be mitigated:	Can be mitigated	Can be mitigated	-N/A
Proposed mitigation:	<p>The appointed Environmental Control Officer (ECO) must undertake at least one site inspection per week, for the duration of the construction phase, and to produce a short monthly ECO monitoring audit report, auditing on the compliance of the property developer with the conditions of the Environmental Authorisation and the approved EMP.</p> <p>In addition, the mitigation measures included under the following headings in the EMPr should be enforced:</p> <ul style="list-style-type: none"> • General Pollution Management • General Waste Management • Pollution Management – hydrocarbons (oil, fuel etc.) • Pollution Management – Ablution facilities • Pollution Management – Hazardous Substances • Cement Batching 		-N/A
Cumulative impact post mitigation:	Low	Low	-N/A
Significance rating of impact after mitigation	Low (-)	Low (-)	-N/A

8.5.1.6. Dust & Noise Impact – Associated with Construction Activities

Dust & Noise Impact – Associated with Construction Activities			
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO



	Dust & Noise Impact – Associated with Construction Activities		
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO
DESCRIPTION OF IMPACT:	Dust impacts may result due to construction activities and excavation activities on the site. Excavations and associated earth-moving activities may generate noise and vibration which may pose a nuisance to surrounding residents and other land users. Movement of heavy vehicles to & from the site may generate noise, which may affect surrounding residents.		No Impact, as no construction activities would occur.
Nature of impact:	Negative	Negative	No Impact
Extent and duration of impact:	Site Specific; Temporary	Site Specific; Temporary	-N/A
Probability of occurrence:	Highly probable	Highly probable	-N/A
Degree to which the impact can be reversed:	Irreversible	Irreversible	-N/A
Degree to which the impact may cause irreplaceable loss of resources:	No loss of resource	No loss of resource	-N/A
Cumulative impact prior to mitigation:	Low	Low	-N/A
Significance rating of impact prior to mitigation	Medium	Medium	-N/A
Degree to which the impact can be mitigated:	Can be partly mitigated	Can be partly mitigated	-N/A



	Dust & Noise Impact – Associated with Construction Activities		
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO
Proposed mitigation:	<p>The appointed Environmental Control Officer (ECO) must undertake at least one site inspection per week, for the duration of the construction phase, and to produce a short monthly ECO monitoring audit report, auditing on the compliance of the property developer with the conditions of the Environmental Authorisation and the approved EMP.</p> <p>In addition, the mitigation measures included under the following headings in the EMPr should be enforced:</p> <ul style="list-style-type: none"> • Dust Mitigation • Noise Mitigation 		-N/A
Cumulative impact post mitigation:	Low	Low	-N/A
Significance rating of impact after mitigation	Negligible (-)	Negligible (-)	-N/A

8.5.1.7. Faunal Impact – Loss of habitat

	Faunal Impact – Loss of habitat		
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO
DESCRIPTION OF IMPACT:	Activity will result in the loss of habitat for faunal species.		No Impact, as faunal habitat would remain intact.
Nature of impact:	Negative	Negative	No Impact
Extent and duration of impact:	Local; Permanent	Local; Permanent	-N/A
Probability of occurrence:	Definite	Definite	-N/A

	Faunal Impact – Loss of habitat		
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO
Degree to which the impact can be reversed:	Not Reversible	Not Reversible	-N/A
Degree to which the impact may cause irreplaceable loss of resources:	Marginal loss of resource	Marginal loss of resource	-N/A
Cumulative impact prior to mitigation:	Medium	Medium	-N/A
Significance rating of impact prior to mitigation	Medium	Medium	-N/A
Degree to which the impact can be mitigated:	Can be barely mitigated	Can be barely mitigated	-N/A
Proposed mitigation:	<ul style="list-style-type: none"> Blanket clearing of vegetation must be limited to the approved development footprint, and the area to be cleared must be demarcated before any clearing commences. Only areas to be constructed in the near future should be cleared. Open Space to be incorporated in the final plan to include ecological corridors and riparian zones. Open Space rehabilitation and removal of invasives should commence before site clearing commences. 		-N/A
Cumulative impact post mitigation:	Low	Low	-N/A
Significance rating of impact after mitigation	Low (-)	Low (-)	-N/A

8.5.1.8. Faunal Impact – Loss of Faunal Species



	Faunal Impact – Loss of Faunal Species		
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative B: NO – GO
DESCRIPTION OF IMPACT:	Activities associated with bush clearing and ploughing, killing of perceived dangerous fauna, may lead to increased mortalities among faunal species.		No Impact, as there would be no bush clearing or killing if perceived dangerous fauna.
Nature of impact:	Negative	Negative	No Impact
Extent and duration of impact:	Site specific; Long Term	Site specific; Long Term	-N/A
Probability of occurrence:	Definite	Definite	-N/A
Degree to which the impact can be reversed:	Partly Reversible	Partly Reversible	-N/A
Degree to which the impact may cause irreplaceable loss of resources:	Marginal loss of resource	Marginal loss of resource	-N/A
Cumulative impact prior to mitigation:	Low	Low	-N/A
Significance rating of impact prior to mitigation	Medium	Medium	-N/A
Degree to which the impact can be mitigated:	Can be partly mitigated	Can be partly mitigated	-N/A
Proposed mitigation:	<ul style="list-style-type: none"> Once site boundaries are demarcated, the area to be cleared of vegetation will be surveyed under the supervision of the ECO in order to identify and remove species suitable for rescue and relocation. Rescued fauna should be released into a nearby area of similar habitat away from any construction. 		-N/A



	Faunal Impact – Loss of Faunal Species		
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative B: NO – GO
Cumulative impact post mitigation:	Low	Low	-N/A
Significance rating of impact after mitigation	Low (-)	Low (-)	-N/A

8.5.1.9. Freshwater Resources Impact – Loss and disturbance of Aquatic Vegetation & Habitat

	Freshwater Impact - Disturbance/loss of aquatic vegetation and habitat.		
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO
DESCRIPTION OF IMPACT:	<p>The Alternative A layout indicates a road and associated infrastructure where wetland habitat is located. In order to construct this, portions of the wetland habitat would be completely lost as a result of clearing, excavations and infilling. There will be loss or disturbance of riparian zone vegetation during construction from machinery, vehicles and workers.</p> <p>The movement of topsoil and incorrectly placed stockpiles could bury aquatic habitat. Due to construction, alien invasive species may encroach further into any disturbed areas and outcompete indigenous vegetation thereby reducing aquatic biodiversity.</p>		<p>Large portions of the site will continue to undergo alien invasion, as well as ongoing degradation of the site (including illegal dumping). Although these activities as illegal, it is likely that the site would continue on a trajectory of ongoing degradation, without intervention.</p>
Nature of impact:	No Impact	Negative	Negative
Extent and duration of impact:	Local; short term	Local; Permanent	Site Specific; Long Term
Probability of occurrence:	Improbable	Definite	Probable
Degree to which the impact can be reversed:	Reversible	Barely Reversible	Reversible



	Freshwater Impact - Disturbance/loss of aquatic vegetation and habitat.		
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO
Degree to which the impact may cause irreplaceable loss of resources:	Marginal loss of resource	Significant loss of resource	Marginal loss of resource
Cumulative impact prior to mitigation:	Low	High	High
Significance rating of impact prior to mitigation	Low	Medium-High	Medium
Degree to which the impact can be mitigated:	Can be mitigated	Can be barely mitigated	Can be mitigated
Proposed mitigation:	<ul style="list-style-type: none"> The Alternative A development layout allows for the infilling and modification of a portion of wetland and this will have significant negative impacts. Therefore, in recognition of the fact that a net loss of wetland extent would result from this approach, it is recommended that wetland offsets be investigated. The Buffer area around the wetland, as per Alternative B, is to be adhered to at all times and no construction activities to occur within this buffer. No sewage pump stations must be located within 42 m of a watercourse. Stockpiles must not be located within 50 metres of the wetlands. Stockpiles should not be placed in vegetated areas that will not be cleared. 		<ul style="list-style-type: none"> Alien invasive management by the landowner. Fire management by the landowner.
Cumulative impact post mitigation:	Negligible	High	Negligible
Significance rating of impact after mitigation	Negligible	Medium-High (-)	Negligible

8.5.1.10. Freshwater Resources Impact – Sedimentation and Erosion



	Freshwater Impact - Sedimentation and Erosion.		
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO
DESCRIPTION OF IMPACT:	<p>Vegetation clearing and exposure of bare soils directly within and adjacent to the wetland habitat during construction will decrease the soil binding capacity and cohesion of the upslope soils and thus increase the risk of erosion and sedimentation downslope.</p> <p>The gentle slope of the study area does limit the magnitude of this impact to a degree, but it is highly likely to affect all of the identified wetlands. This activity may cause the burying of aquatic habitat. Ineffective site stormwater management, particularly in periods of high runoff, can lead to soil erosion from confined flows. Formation of rills and gullies from increased concentrated runoff. This increase in volume and velocity of runoff increases the particle carrying capacity of the water flowing over the surface.</p> <p>Soil compaction resulting in reduced infiltration and increased surface runoff together with the artificial creation of preferential flow paths due to construction activities, will result in increased quantities of flow entering the systems</p>		No Impact as no vegetation clearing or exposure of bare soils.
Nature of impact:	Negative	Negative	No Impact
Extent and duration of impact:	Local; Medium Term	Local; Medium Term	-N/A
Probability of occurrence:	Probable	Definite	-N/A
Degree to which the impact can be reversed:	Partly Reversible	Partly Reversible	-N/A
Degree to which the impact may cause irreplaceable loss of resources:	Significant loss of resource	Significant loss of resource	-N/A
Cumulative impact prior to mitigation:	Low	Medium	-N/A



Freshwater Impact - Sedimentation and Erosion.			
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO
Significance rating of impact prior to mitigation	Low	Medium	-N/A
Degree to which the impact can be mitigated:	Can be partly mitigated	Can be partly mitigated	-N/A
Proposed mitigation:	<ul style="list-style-type: none"> The stormwater flows must enter the wetland areas in a diffuse flow pattern without pollutants. It is draft stormwater management plan should be adhered to. Frequent stormwater outlets must be designed to prevent erosion at discharge points. All erosion protection measures (e.g. Reno-mattresses) must be established to reflect the natural slope of the surface and located at the natural ground level. Stormwater exit points must include a best management practice approach to trap any additional suspended solids and pollutants originating from the proposed development. Erosion control measures including silt fences, low soil berms and/or shutter boards must be put in place around the stockpiles to limit sediment runoff from stockpiles. Alternatively, the exposed slopes must drain into small temporary stormwater and silt traps/ponds. 		-N/A
Cumulative impact post mitigation:	Low	Low	-N/A
Significance rating of impact after mitigation	Negligible (-)	Low (-)	-N/A

8.5.1.11. Freshwater Resources Impact – Water Pollution

Freshwater Impact – Water Pollution			
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO



	Freshwater Impact – Water Pollution		
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO
DESCRIPTION OF IMPACT:	<p>During construction, there are a number of potential pollution inputs into the wetlands (such as hydrocarbons and raw cement). These pollutants alter the water quality parameters such as turbidity, nutrient levels, chemical oxygen demand and pH. The likelihood of these entering the WET/4 wetland is larger when there is direct construction works within the system (Alternative A). These alternations impact the species composition of the systems, especially species sensitive to minor changes in these parameters. Sudden drastic changes in water quality can also have chronic effects on aquatic biota in general and result in localised extinctions. Hydrocarbons including petrol/diesel and oils/grease/lubricants associated with construction activities (machinery, maintenance, storage, handling) may potentially enter the system by means of surface runoff or through dumping by construction workers. Raw cement entering the systems through incorrect batching procedure and/or direct disposal. The incorrect positioning and maintenance of the portable chemical toilets and use of the surrounding environment as ablution facilities may result in sewage and chemicals entering the systems.</p>		No Impact.
Nature of impact:	Negative	Negative	No Impact
Extent and duration of impact:	Regional; Medium Term	Regional; Medium Term	-N/A
Probability of occurrence:	Probable	Definite	-N/A
Degree to which the impact can be reversed:	Partly Reversible	Partly Reversible	-N/A
Degree to which the impact may cause irreplaceable loss of resources:	Moderate loss of resource	Moderate loss of resource	-N/A
Cumulative impact prior to mitigation:	Low	Medium	-N/A



	Freshwater Impact – Water Pollution		
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO
Significance rating of impact prior to mitigation	Low	Medium	-N/A
Degree to which the impact can be mitigated:	Can be mitigated	Can be mitigated	-N/A
Proposed mitigation:	<p>The appointed Environmental Control Officer (ECO) must undertake at least one site inspection per week, for the duration of the construction phase, and to produce a short monthly ECO monitoring audit report, auditing on the compliance of the property developer with the conditions of the Environmental Authorisation and the approved EMP.</p> <p>For Alternative B, the proposed buffer zone around the wetland needs to be strictly adhered to.</p> <p>In addition, the mitigation measures included under the following headings in the EMP should be enforced:</p> <ul style="list-style-type: none"> • General Pollution Management • General Waste Management • Pollution Management – hydrocarbons (oil, fuel etc.) • Pollution Management – Ablution facilities • Pollution Management – Hazardous Substances <p>Cement Batching</p>		-N/A
Cumulative impact post mitigation:	Low	Low	-N/A
Significance rating of impact after mitigation	Negligible (-)	Low (-)	-N/A



8.5.1.12. Freshwater Resources Impact – Flow Modification

	Freshwater Impact – Flow Modification		
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO
DESCRIPTION OF IMPACT:	<p>Land clearing and earth works in and adjacent to the wetlands associated with Option 2 will reduce infiltration rates and increase the surface runoff volume and velocity. Such changes in surface roughness and runoff rates may lead to some rill and gully erosion.</p> <p>Altered water inputs from upslope disturbances as well as modified water distribution and retention patterns will ultimately affect the hydrological integrity of water resources.</p> <p>In WET/4 there will be direct flow modification within the wetland due to the altering of the morphology via road and pipeline crossings and the impacts are therefore far greater in this scenario.</p>		No Impact.
Nature of impact:	No Impact	Negative	No Impact
Extent and duration of impact:	-N/A	Local; Medium Term	-N/A
Probability of occurrence:	-N/A	Definite	-N/A
Degree to which the impact can be reversed:	-N/A	Partly Reversible	-N/A
Degree to which the impact may cause irreplaceable loss of resources:	-N/A	Significant loss of resource	-N/A
Cumulative impact prior to mitigation:	-N/A	Medium - High	-N/A
Significance rating of impact prior to mitigation	-N/A	Medium - High	-N/A
Degree to which the impact can be mitigated:	-N/A	Can be mitigated	-N/A



	Freshwater Impact – Flow Modification		
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO
Proposed mitigation:	<ul style="list-style-type: none"> The proposed buffer around the wetland is to be strictly adhered to. 	<ul style="list-style-type: none"> The proposed development layout allows for the infilling and modification of a portion of wetland and this will have significant negative impacts. Therefore, in recognition of the fact that a net loss of wetland extent would result from this approach, it is recommended that wetland offsets be investigated. The mitigation of impacts should focus on managing the runoff generated by the development and introducing it responsibly into the receiving environment. The stormwater flows must enter the wetland areas in a diffuse flow pattern without pollutants. The stormwater management plan must give due consideration to the collection and treatment of stormwater prior to discharge into the natural environment. 	-N/A
Cumulative impact post mitigation:	-N/A	Medium	-N/A
Significance rating of impact after mitigation	-N/A	Medium (-)	-N/A

8.5.1.13. Heritage Impact

	Heritage Impact		
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO



	Heritage Impact		
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO
DESCRIPTION OF IMPACT:	The unlikely but possible loss of Heritage Resources, including Archaeological and Paleontological Resources, due to land clearing and excavations on the site.		No Impact, as no loss of Heritage resources
Nature of impact:	Negative	Negative	No Impact
Extent and duration of impact:	Site Specific; Permanent	Site Specific; Permanent	-N/A
Probability of occurrence:	Improbable	Improbable	-N/A
Degree to which the impact can be reversed:	Irreversible	Irreversible	-N/A
Degree to which the impact may cause irreplaceable loss of resources:	Marginal loss of resource	Marginal loss of resource	-N/A
Cumulative impact prior to mitigation:	Negligible	Negligible	-N/A
Significance rating of impact prior to mitigation	Low	Low	-N/A
Degree to which the impact can be mitigated:	Can be partly mitigated	Can be partly mitigated	-N/A



	Heritage Impact		
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO
Proposed mitigation:	<p>In the unlikely event that any heritage resources (human remains, grave stones, stone tools, artefacts, old coins and pottery, fossil shell middens, rock art and engravings, remains of old built structures etc.) are encountered during construction:</p> <ul style="list-style-type: none"> The finding should be protected from further disturbance (ideally left in situ) and the ECO and relevant Heritage Authority should be notified. The finding should be handled and/or removed from site as per instructions issued by the Heritage Authority or delegated heritage specialist. 		-N/A
Cumulative impact post mitigation:	Negligible	Negligible	-N/A
Significance rating of impact after mitigation	Low (-)	Low (-)	-N/A

8.5.1.14. Socio-Economic Impact –Creation of Business & Employment Opportunities

	Socio-Economic Impact –Creation of Business & Employment Opportunities		
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO
DESCRIPTION OF IMPACT:	<p>The majority of work during the construction phase is likely to be undertaken by local contractors and builders. The proposed development will therefore represent a positive benefit for the local construction and building sector in the EDM and BLM.</p> <p>The majority of the building materials associated with the construction phase will be sourced from locally based suppliers from the EDM and BLM. A significant portion of the annual wage bill will be spent in the local EDM and BLM. This would in turn benefit local business.</p>		<p>The no-development option would result in a lost opportunity in terms of the employment opportunities associated with the construction. A high negative socio-economic impact significance would occur if the proposed development is not constructed.</p>
Nature of impact:	Positive	Positive	Negative
Extent and duration of impact:	Regional; temporary	Regional; temporary	Regional; temporary



	Socio-Economic Impact –Creation of Business & Employment Opportunities		
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO
Probability of occurrence:	Definite	Definite	Definite
Degree to which the impact can be reversed:	N/A – this is a positive impact, proposed to be enhanced	N/A – this is a positive impact, proposed to be enhanced	N/A
Degree to which the impact may cause irreplaceable loss of resources:	N/A – this is a positive impact, proposed to be enhanced	N/A – this is a positive impact, proposed to be enhanced	No loss of resource
Cumulative impact prior to mitigation:	Medium (positive)	Medium (positive)	Medium (negative)
Significance rating of impact prior to mitigation / enhancement:	Medium (positive)	Medium (positive)	High (negative)
Degree to which the impact can be mitigated:	N/A – this is a positive impact, proposed to be enhanced	N/A – this is a positive impact, proposed to be enhanced	The NO-GO Alternative assumes no mitigation. It assumes the status quo.



Socio-Economic Impact – Creation of Business & Employment Opportunities			
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO
Proposed enhancement / mitigation:	<p>In order to enhance local employment and business opportunities associated with the construction phase of the project the following measures are proposed to be implemented:</p> <ul style="list-style-type: none"> The developer will inform the local authorities, local community leaders, organizations and councillors of the project and the potential job opportunities for local builders and contractors; The developer will establish a database of local construction companies in the area, specifically SMME's owned and run by HDI's, prior to the commencement of the tender process for the bulk services component of the project. These companies will be notified of the tender process and invited to bid for project related work; <p>The developer, in consultation with the appointed contractor/s, will look to employ a percentage of the labour required for the construction phase from local area in order to maximize opportunities for members from the local HD communities, in accordance with current legislation.</p>		The NO-GO Alternative assumes no mitigation. It assumes the status quo.
Cumulative impact post mitigation:	Medium (positive)	Medium (positive)	Medium (negative)
Significance rating of impact after enhancement	High (+)	High (+)	High (-)

8.5.1.15. Traffic & Safety Impact – Associated with Construction Vehicles

Traffic & Safety Impact – Associated with Construction Vehicles			
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO
DESCRIPTION OF IMPACT:	<p>It is proposed to deliver a significant amount of materials and equipment to the site during the construction phase of the development. Numerous truck trips will be required every day that could cause a temporary disturbance to traffic in the area. Impacts are expected to occur to the traffic in the area due to increased truck and construction vehicle traffic expected during the construction phase. Construction vehicles may impact on the existing road conditions (road capacity and congestion). Vehicles may impact on road safety conditions due to an increase in construction phase vehicles entering and exiting the site and they may impact on the condition of the existing road network.</p>		No Impact as no construction vehicles on site



	Traffic & Safety Impact – Associated with Construction Vehicles		
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO
Nature of impact:	Negative	Negative	-No Impact
Extent and duration of impact:	Local; Temporary	Local; Temporary	-N/A
Probability of occurrence:	Highly Probable	Highly Probable	-N/A
Degree to which the impact can be reversed:	Completely reversible	Completely reversible	-N/A
Degree to which the impact may cause irreplaceable loss of resources:	No loss of resource	No loss of resource	-N/A
Cumulative impact prior to mitigation:	Medium	Medium	-N/A
Significance rating of impact prior to mitigation	Medium	Medium	-N/A
Degree to which the impact can be mitigated:	Can be partly mitigated	Can be partly mitigated	-N/A



	Traffic & Safety Impact – Associated with Construction Vehicles		
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO
Proposed mitigation:	<ul style="list-style-type: none"> All construction vehicles must adhere to traffic laws when travelling to and from the site. All drivers and machinery operators must be sensitised to the fact that they are working in an area with a potentially high volume of foot and vehicle traffic, and must exercise due caution when entering/ exiting the site. Appropriate signage should be erected to warn other road users about the presence of construction vehicles. Speed of construction vehicles and other heavy vehicles must be strictly controlled to avoid dangerous conditions for other road users. Construction vehicles must adhere to the load carrying capacity of road surfaces and adhere to all other prescriptive regulations regarding the use of public roads by construction vehicles. The Contractor must ensure that any large or abnormal loads (including hazardous materials) that must be transported to/ from the site are routed appropriately, and that appropriate safety precautions are taken during transport to prevent road accidents. Where possible, construction traffic that may obstruct traffic flow on the surrounding roads should be scheduled for outside of peak traffic times. <p>Where possible, heavy machinery should be parked within a secure demarcated area within the footprint of the site instead of moving the machinery to and from the site each day.</p>		
Cumulative impact post mitigation:	Low	Low	-N/A
Significance rating of impact after mitigation	Low (-)	Low (-)	-N/A

8.5.1.16. Visual Impact – Associated with Construction Activities

	Visual Impact – Associated with Construction Activities		
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO
DESCRIPTION OF IMPACT:	The construction phase is associated with temporary disturbance as a result of construction (trench excavations, vehicles, machinery, fencing & signage) that may have a negative visual impact to the area.		No Impact as no construction activities would occur on site.



	Visual Impact – Associated with Construction Activities		
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO
Nature of impact:	Negative	Negative	-No Impact
Extent and duration of impact:	Site Specific. Temporary	Site Specific. Temporary	-N/A
Probability of occurrence:	Definite	Definite	-N/A
Degree to which the impact can be reversed:	Partly reversible	Partly reversible	-N/A
Degree to which the impact may cause irreplaceable loss of resources:	No loss of resource	No loss of resource	-N/A
Cumulative impact prior to mitigation:	Medium	Medium	-N/A
Significance rating of impact prior to mitigation	Medium	Medium	-N/A
Degree to which the impact can be mitigated:	Can be partly mitigated	Can be partly mitigated	-N/A



Visual Impact – Associated with Construction Activities			
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO
Proposed mitigation:	<p>The appointed Environmental Control Officer (ECO) must undertake at least once site inspection per week, for the duration of the construction phase, and to produce a short monthly ECO monitoring audit report, auditing on the compliance of the property developer with the conditions of the Environmental Authorisation and the approved EMP.</p> <ul style="list-style-type: none"> • Consult with the ECO when determining the appropriate site for the site camp. The site camp must be kept neat and tidy and free of litter at all times. • Waste must be managed according to the EMP and the mitigation measures listed above in terms of waste management. Good housekeeping practices on site must be maintained to ensure the site is kept neat and tidy. • The site camp, storage facilities, stockpiles, waste bins, and any other temporary structures on site should be located in such a way that they will present as little visual impact to surrounding residents and road users as possible. • Work on site must be well-planned and well-managed so that work proceeds quickly and efficiently, thus minimizing the disturbance time. • The site camp may require visual screening via shade cloth or suitable material, with special attention given to screening of highly reflective material. • Use of lighting (if required) should take into account surrounding residents and land users. Downward facing, spill-off type lighting is recommended. • Construction vehicles must enter and leave the site during working hours. 		-N/A
Cumulative impact post mitigation:	Low	Low	-N/A
Significance rating of impact after mitigation	Low (-)	Low (-)	-N/A



8.5.2. Operational Phase Impacts

8.5.2.1. Botanical Impact – Invasion by exotic and alien species

	Botanical Impact - Invasion by exotic and alien species		
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO
DESCRIPTION OF IMPACT:	Post construction disturbed areas having no vegetation cover are often susceptible to invasion by weedy and alien species, which can not only become invasive but also prevent natural flora from becoming established.		Large portions of the site will continue to undergo alien invasion, as well as ongoing degradation of the site (including illegal dumping). It is likely that the site would continue on a trajectory of ongoing degradation, without intervention.
Nature of impact:	Negative	Negative	Negative
Extent and duration of impact:	Site Specific; Medium Term	Site Specific; Medium Term	Site Specific; Long Term
Probability of occurrence:	Probable	Probable	Probable
Degree to which the impact can be reversed:	Reversible	Reversible	Reversible
Degree to which the impact may cause irreplaceable loss of resources:	Moderate loss of resource	Moderate loss of resource	Marginal loss of resource
Cumulative impact prior to mitigation:	Medium	Medium	High
Significance rating of impact prior to mitigation	Medium	Medium	Medium

	Botanical Impact - Invasion by exotic and alien species		
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO
Degree to which the impact can be mitigated:	Can be mitigated	Can be mitigated	Can be mitigated
Proposed mitigation:	<ul style="list-style-type: none"> Alien plants must be removed from the site as per NEMBA requirements. A suitable weed management strategy to be implemented to eradicate and control regeneration. After any clearing is completed, an appropriate cover crop should be planted where any weeds or exotic species are removed from disturbed areas timeously. 		<ul style="list-style-type: none"> Alien invasive management by the landowner. Fire management by the landowner.
Cumulative impact post mitigation:	Low	Low	Negligible
Significance rating of impact after mitigation	Low (-)	Low (-)	Negligible

8.5.2.2. Botanical Impact – Disturbances to ecological processes

	Botanical Impact - Disturbances to ecological processes		
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO
DESCRIPTION OF IMPACT:	Activity may result in disturbances to ecological processes.		No Impact on ecological services
Nature of impact:	Negative	Negative	No Impact
Extent and duration of impact:	Site Specific; Short Term	Site Specific; Short Term	-N/A
Probability of occurrence:	Probable	Probable	-N/A
Degree to which the impact can be reversed:	Barely Reversible	Barely Reversible	-N/A



	Botanical Impact - Disturbances to ecological processes		
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO
Degree to which the impact may cause irreplaceable loss of resources:	Marginal loss of resource	Marginal loss of resource	-N/A
Cumulative impact prior to mitigation:	Medium	Medium	-N/A
Significance rating of impact prior to mitigation	Medium	Medium	-N/A
Degree to which the impact can be mitigated:	Can be mitigated	Can be mitigated	-N/A
Proposed mitigation:	<ul style="list-style-type: none"> No clearing outside of development and infrastructure footprints to take place. Open Space to be incorporated in final plan to include ecological corridors and riparian zones. 		-N/A
Cumulative impact post mitigation:	Low	Low	-N/A
Significance rating of impact after mitigation	Low (-)	Low (-)	-N/A

8.5.2.3. Freshwater Resources Impact – Loss and disturbance of aquatic vegetation & habitat

	Freshwater Impact - Disturbance/loss of aquatic vegetation and habitat.		
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO



	Freshwater Impact - Disturbance/loss of aquatic vegetation and habitat.		
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO
DESCRIPTION OF IMPACT:	<p>There is less direct risk to aquatic habitat during the operational phase, however habitat is at threat due to the possibility of urban sprawl encroaching into wetland habitat or increased pressure from livestock. The project may promote the establishment of disturbance-tolerant biota, including colonization by invasive alien species, weeds and pioneer plants if there is any ongoing disturbance near the riparian zone.</p> <p>Although this impact is initiated during the construction phase it is likely to persist into the operational phase. Additionally, the stormwater infrastructure of the housing and associated road network will increase and concentrate flows into the systems. This may indirectly lead to erosion in the wetland habitat that compromises the vegetated habitat.</p>		<p>Large portions of the site will continue to undergo alien invasion, as well as ongoing degradation of the site (including illegal dumping). It is likely that the site would continue on a trajectory of ongoing degradation, without intervention.</p>
Nature of impact:	Negative	Negative	Negative
Extent and duration of impact:	Local; Permanent	Local; Permanent	Site Specific; Long Term
Probability of occurrence:	Definite	Definite	Probable
Degree to which the impact can be reversed:	Irreversible	Irreversible	Reversible
Degree to which the impact may cause irreplaceable loss of resources:	Marginal loss of resource	Significant loss of resource	Marginal loss of resource
Cumulative impact prior to mitigation:	Medium	High	High
Significance rating of impact prior to mitigation	Medium	Medium-High	Medium

	Freshwater Impact - Disturbance/loss of aquatic vegetation and habitat.		
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO
Degree to which the impact can be mitigated:	Can be barely mitigated	Can be barely mitigated	Can be mitigated
Proposed mitigation:	<ul style="list-style-type: none"> The stormwater management infrastructure must be designed to ensure the runoff from the development is not highly concentrated before entering the buffer area. The volume and velocity of water must be reduced through discharging the surface flow at multiple locations surrounding the development, preventing erosion. Any evidence of erosion from this stormwater system must be rehabilitated and the volume/velocity of the water reduced through further structures and/or energy dissipaters. These structures must be incorporated within the layout area. The recommended use and maintenance of grease traps/oil separators to prevent pollutants from entering the environment from stormwater. Appropriate wastewater infrastructure must be designed to prevent any such water from entering the surrounding environment. Maintenance of the wetland habitat and buffer are must be implemented, preventing encroachment of any further infrastructure or vehicles. Engage with the community regarding the wetland to discourage illegal dumping and ensure the water resources are protected. The community could be involved in the monitoring. Placement of signage near the boundary of the buffer zone should also be considered to help mark the boundary and educate the community about the purpose and value of protecting buffer zones. Information can include a description and visual of alien invasive plant species. 		<ul style="list-style-type: none"> Alien invasive management by the landowner. Securing the wetland area to discourage illegal dumping.
Cumulative impact post mitigation:	Medium	High	Low
Significance rating of impact after mitigation	Medium (-)	Medium-High (-)	Low (-)

8.5.2.4. Freshwater Resources Impact – Sedimentation and Erosion

	Freshwater Impact - Sedimentation and Erosion.
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	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO
DESCRIPTION OF IMPACT:	Where soil erosion problems and bank stability concerns initiated during the construction phase are not timeously and adequately addressed, these can persist into the operational phase of the development project and continue to have a negative impact downstream. The increase in hardened surface by development and the impact of road and pipe crossings associated with Option 2, will be considerable and, if not mitigated against, will result in further erosion. Surface runoff and velocities will be increased, and flows will be concentrated by stormwater infrastructure		No Impact.
Nature of impact:	Negative	Negative	No Impact
Extent and duration of impact:	Local; Permanent	Local; Permanent	-N/A
Probability of occurrence:	Probable	Highly Likely	-N/A
Degree to which the impact can be reversed:	Partly Reversible	Partly Reversible	-N/A
Degree to which the impact may cause irreplaceable loss of resources:	Significant loss of resource	Significant loss of resource	-N/A
Cumulative impact prior to mitigation:	Medium	Medium	-N/A
Significance rating of impact prior to mitigation	Medium	High	-N/A
Degree to which the impact can be mitigated:	Can be partly mitigated	Can be partly mitigated	-N/A



Freshwater Impact - Sedimentation and Erosion.			
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO
Proposed mitigation:	<ul style="list-style-type: none"> The stormwater management infrastructure must be designed to ensure the runoff from the development is not highly concentrated before entering the buffer area. The volume and velocity of water must be reduced through discharging the surface flow at multiple locations surrounding the development, preventing erosion. Any evidence of erosion from this stormwater system must be rehabilitated and the volume/velocity of the water reduced through further structures and/or energy dissipaters. These structures must be incorporated within the layout area. 		
Cumulative impact post mitigation:	Low	Low	-N/A
Significance rating of impact after mitigation	Low - Medium (-)	Medium (-)	-N/A

8.5.2.5. Freshwater Resources Impact – Water Pollution

Freshwater Impact – Water Pollution			
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO
DESCRIPTION OF IMPACT:	<p>If not prevented, litter, and contaminants, including sand, silt, and dirt particles, will enter storm water runoff and pollute the wetlands. Micro-litter such as cigarette butts may travel through certain stormwater grids and grids may not be regularly cleared. The number of vehicles on the developed area due to the development increases the potential for pollutants to enter the system.</p> <p>During maintenance of the development there could be water pollution impacts similar to those encountered in the construction phase. The establishment of sewer pipes within close proximity to watercourse always poses a long term threat to the water quality and ecological health of freshwater ecosystems due to the relatively high likelihood that surcharge events will occur at some point in the future.</p> <p>A complete shift in the structure and composition of aquatic biotic communities is the result, as well as a general degradation in water resource quality that could have negative impacts to downstream human users e.g. dams used for domestic water and agriculture.</p>		<p>If not prevented, litter, and contaminants, including sand, silt, and dirt particles, will continue to enter storm water runoff and pollute the wetlands. Micro-litter such as cigarette butts may travel through certain stormwater grids which are not regularly cleared.</p> <p>In addition, illegal dumping may continue.</p>



	Freshwater Impact – Water Pollution		
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO
Nature of impact:	Negative	Negative	Negative
Extent and duration of impact:	Regional; Permanent	Regional; Permanent	Regional; Long Term
Probability of occurrence:	Highly Likely	Highly Likely	Highly Likely
Degree to which the impact can be reversed:	Partly Reversible	Partly Reversible	Partly Reversible
Degree to which the impact may cause irreplaceable loss of resources:	Moderate loss of resource	Moderate loss of resource	Marginal loss of resource
Cumulative impact prior to mitigation:	Medium	Medium	Medium
Significance rating of impact prior to mitigation	Medium	Medium	Medium
Degree to which the impact can be mitigated:	Can be mitigated	Can be mitigated	Can be mitigated

Freshwater Impact – Water Pollution			
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO
Proposed mitigation:	<ul style="list-style-type: none"> The local authority should prevent illegal dumping in this area by providing suitable waste disposal facilities where waste can be recycled and disposed of in a controlled manner. Engage with the community to explain the reasons why the buffer and the water resources are protected and what human activities are allowed. This could be targeted at learners to prevent the dumping of solid waste and other activities that threaten the watercourses and buffer zones. The community could be involved in the monitoring. Placement of signage near the boundary of the buffer zone should also be considered to help mark the boundary and educate the community about the purpose and value of protecting buffer zones. 		<ul style="list-style-type: none"> The local authority should prevent illegal dumping in this area by providing suitable waste disposal facilities where waste can be recycled and disposed of in a controlled manner. Engage with the community to explain the reasons why the buffer and the water resources are protected and what human activities are allowed. This could be targeted at learners to prevent the dumping of solid waste and other activities that threaten the watercourses and buffer zones. The community could be involved in the monitoring. Placement of signage near the boundary of the buffer zone should also be considered to help mark the boundary and educate the community about the purpose and value of protecting buffer zones.
Cumulative impact post mitigation:	Medium	Medium	Medium
Significance rating of impact after mitigation	Medium (-)	Medium (-)	Medium (-)

8.5.2.6. Freshwater Resources Impact – Flow Modification

Freshwater Impact – Flow Modification			
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO



	Freshwater Impact – Flow Modification		
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO
DESCRIPTION OF IMPACT:	One has to ensure that surface flows are slowed and enter the river in a diffuse pattern. The operational surface will alter the natural processes of rain water infiltration and surface runoff, promoting increased volumes and velocities of storm water runoff, which can be detrimental to the wetlands receiving concentrated flows off of the area. According to the SANRAL (2006), urbanisation typically increases the runoff rate by 20 -50%, compared with natural conditions. Increased volumes and velocities of storm water draining from the area and discharging into the wetlands will alter the natural ecology, increasing the risk of erosion and channel incision/scouring		No Impact.
Nature of impact:	Negative	Negative	No Impact
Extent and duration of impact:	Local; Permanent	Local; Permanent	-N/A
Probability of occurrence:	Definite	Definite	-N/A
Degree to which the impact can be reversed:	Irreversible	Irreversible	-N/A
Degree to which the impact may cause irreplaceable loss of resources:	Significant loss of resource	Significant loss of resource	-N/A
Cumulative impact prior to mitigation:	Medium - High	Medium - High	-N/A
Significance rating of impact prior to mitigation	Medium - High	Medium - High	-N/A
Degree to which the impact can be mitigated:	Can barely be mitigated	Can barely be mitigated	-N/A



	Freshwater Impact – Flow Modification		
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO
Proposed mitigation:	<ul style="list-style-type: none"> The stormwater management infrastructure must be designed to ensure the runoff from the development is not highly concentrated before entering the buffer area. The volume and velocity of water must be reduced through discharging the surface flow at multiple locations surrounding the development, preventing erosion. Any evidence of erosion from this stormwater system must be rehabilitated and the volume/velocity of the water reduced through further structures and/or energy dissipaters. These structures must be incorporated within the layout area. Appropriate waste water infrastructure must be designed to prevent any such water from entering the surrounding environment. 		-N/A
Cumulative impact post mitigation:	Medium-High	Medium-High	-N/A
Significance rating of impact after mitigation	Medium-High (-)	Medium-High (-)	-N/A

8.5.2.7. Socio-Economic Impacts – Provision of Affordable Housing

	Socio-Economic Impact –Provision of Affordable Housing		
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO
DESCRIPTION OF IMPACT:	The proposed development will assist to address the housing backlog in the area, specifically the housing needs of the low and middle income households. This will represent a significant social benefit for the households in the local municipality that currently live in informal areas		The No-Development option would represent a lost opportunity in terms of the benefits associated with the provision of formal housing.
Nature of impact:	Positive	Positive	Negative
Extent and duration of impact:	Regional extent; permanent	Regional extent; permanent	Regional; temporary
Probability of occurrence:	Definite	Definite	Definite



	Socio-Economic Impact –Provision of Affordable Housing		
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO
Degree to which the impact can be reversed:	N/A – This is a positive impact proposed to be enhanced.	N/A – This is a positive impact proposed to be enhanced.	N/A
Degree to which the impact may cause irreplaceable loss of resources:	N/A – This is a positive impact proposed to be enhanced.	N/A – This is a positive impact proposed to be enhanced.	No loss of resource
Cumulative impact prior to mitigation:	High positive	High positive	Medium (negative)
Significance rating of impact prior to mitigation / enhancement:	High positive	High positive	High (negative)
Degree to which the impact can be mitigated:	N/A – This is a positive impact proposed to be enhanced.	N/A – This is a positive impact proposed to be enhanced.	The NO-GO Alternative assumes no mitigation. It assumes the status quo.
Proposed enhancement / mitigation:	The proposed development represents an enhancement measure on its own.	The proposed development represents an enhancement measure on its own.	The NO-GO Alternative assumes no mitigation – status quo remains
Cumulative impact post mitigation:	High positive	High positive	Medium (negative)
Significance rating of impact after enhancement	High (+)	High (+)	High (-)

8.5.2.8. Socio-Economic Impact – Provision of Public Facilities and Public Spaces

Socio-Economic Impact – Provision of Public Facilities and Public Spaces	
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	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO
DESCRIPTION OF IMPACT:	The proposed development makes provision for the establishment of public open spaces, play grounds, crèches, health care facilities etc. Alternative A also includes the provision of a school. These components will all contribute to an improved quality of life for many residents in the local municipality who currently live in informal areas that are not well serviced and lack public facilities, such as parks and open spaces.		The No-Development option would represent a lost opportunity in terms of the benefits associated with the provision of schools and public facilities such as Health Care Facilities.
Nature of impact:	Positive	Positive	Negative
Extent and duration of impact:	Regional extent; permanent	Regional extent; permanent	Regional; temporary
Probability of occurrence:	Definite	Definite	Definite
Degree to which the impact can be reversed:	N/A – This is a positive impact proposed to be enhanced.	N/A – This is a positive impact proposed to be enhanced.	N/A
Degree to which the impact may cause irreplaceable loss of resources:	N/A – This is a positive impact proposed to be enhanced.	N/A – This is a positive impact proposed to be enhanced.	No loss of resource
Cumulative impact prior to mitigation:	High positive	High positive	Medium (negative)
Significance rating of impact prior to mitigation / enhancement:	High positive	High positive	High (negative)
Degree to which the impact can be mitigated:	N/A – This is a positive impact proposed to be enhanced.	N/A – This is a positive impact proposed to be enhanced.	The NO-GO Alternative assumes no mitigation. It assumes the status quo.
Proposed enhancement / mitigation:	The proposed development represents an enhancement measure on its own.	The proposed development represents an enhancement measure on its own.	The NO-GO Alternative assumes no mitigation – status quo remains



	Socio-Economic Impact – Provision of Public Facilities and Public Spaces		
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO
Cumulative impact post mitigation:	High positive	High positive	Medium (negative)
Significance rating of impact after enhancement	High (+)	High (+)	High (-)

8.5.2.9. Socio-Economic Impact – Creation of Business and Employment Opportunities

	Socio-Economic Impact – Creation of business and employment opportunities		
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO
DESCRIPTION OF IMPACT:	<p>The business and commercial components will create employment opportunities for local residents. The residential component may also create some opportunities for domestic workers and gardeners etc. However due the low income levels these opportunities are likely to be limited. Additional employment opportunities will also be created by the proposed creche and health clinic.</p> <p>The majority of the employment opportunities are likely to benefit Historically Disadvantaged Individuals (HDIs). Given the high unemployment levels in the surrounding areas, coupled with the low income and education levels, this would represent a positive social impact. The operational phase will also create opportunities for local businesses, such as local maintenance and building companies, garden services and security companies, petrol stations, shops and restaurants etc. and create opportunities for new businesses to develop.</p> <p>The increased number of households will also create opportunities for the taxi sector. The local estate agencies in the area and legal firms would also benefit from the sale and resale of properties associated with the new development.</p>		<p>The No-Development option would represent a lost opportunity in terms of the benefits associated with employment opportunities during the operation phase.</p>
Nature of impact:	Positive	Positive	Negative
Extent and duration of impact:	Regional extent; permanent	Regional extent; permanent	Regional extent; permanent
Probability of occurrence:	Definite	Definite	Improbable

	Socio-Economic Impact – Creation of business and employment opportunities		
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO
Degree to which the impact can be reversed:	N/A – This is a positive impact proposed to be enhanced.	N/A – This is a positive impact proposed to be enhanced.	Completely reversible
Degree to which the impact may cause irreplaceable loss of resources:	N/A – This is a positive impact proposed to be enhanced.	N/A – This is a positive impact proposed to be enhanced.	No loss of resource
Cumulative impact prior to mitigation:	Medium positive	Medium positive	Low - Medium negative
Significance rating of impact prior to mitigation / enhancement:	Medium positive	Medium positive	Low - Medium negative
Degree to which the impact can be mitigated:	N/A – This is a positive impact proposed to be enhanced.	N/A – This is a positive impact proposed to be enhanced.	Can be mitigated
Proposed enhancement / mitigation:	The proposed development represents an enhancement measure on its own.	The proposed development represents an enhancement measure on its own.	The NO-GO Alternative assumes no mitigation – status quo remains
Cumulative impact post mitigation:	Medium positive	Medium positive	Medium negative
Significance rating of impact after enhancement	Medium (+)	Medium (+)	Medium (-)

8.5.2.10. Socio-Economic Impact – Broaden the Rates Base

	Socio-Economic Impact – Broaden the rates base
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	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO
DESCRIPTION OF IMPACT:	The development will result in an increase in the rates base. In addition, the proposed development would also generate revenue for the local municipality from the consumption of water and electricity.		The No-Development option would represent a lost opportunity in terms of the benefits associated with the an increase in the municipal rates base.
Nature of impact:	Positive	Positive	Negative
Extent and duration of impact:	Regional extent; permanent	Regional extent; permanent	Regional extent; permanent
Probability of occurrence:	Definite	Definite	Improbable
Degree to which the impact can be reversed:	N/A – This is a positive impact proposed to be enhanced.	N/A – This is a positive impact proposed to be enhanced.	Completely reversible
Degree to which the impact may cause irreplaceable loss of resources:	N/A – This is a positive impact proposed to be enhanced.	N/A – This is a positive impact proposed to be enhanced.	No loss of resource
Cumulative impact prior to mitigation:	Medium positive	Medium positive	Low - Medium negative
Significance rating of impact prior to mitigation / enhancement:	Medium positive	Medium positive	Low - Medium negative
Degree to which the impact can be mitigated:	N/A – This is a positive impact proposed to be enhanced.	N/A – This is a positive impact proposed to be enhanced.	Can be mitigated
Proposed enhancement / mitigation:	The proposed development represents an enhancement measure on its own.	The proposed development represents an enhancement measure on its own.	By rather constructing the proposed mixed use development.



	Socio-Economic Impact – Broaden the rates base		
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO
Cumulative impact post mitigation:	Medium positive	Medium positive	Medium negative
Significance rating of impact after enhancement	Medium (+)	Medium (+)	Medium (-)

8.5.2.11. Traffic & Safety Impact

	Traffic & Safety Impact		
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO
DESCRIPTION OF IMPACT:	An increase in traffic is expected to occur in the area as a result of more than 876 erven and various social amenities proposed. Vehicles may impact on the existing road network and road safety conditions due to an increase in vehicles entering and exiting the site.		No Impact
Nature of impact:	Negative	Negative	No Impact
Extent and duration of impact:	Local extent; long term	Local extent; long term	-N/A
Probability of occurrence:	Probable	Probable	-N/A
Degree to which the impact can be reversed:	Partly reversible	Partly reversible	-N/A
Degree to which the impact may cause irreplaceable loss of resources:	No loss of resource	No loss of resource	-N/A
Cumulative impact prior to mitigation:	Low	Low	-N/A



	Traffic & Safety Impact		
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO
Significance rating of impact prior to mitigation	Low	Low	-N/A
Degree to which the impact can be mitigated:	Can be partly mitigated	Can be partly mitigated	-N/A
Proposed mitigation:	<ul style="list-style-type: none"> Access to the site should be via Trekker Road (North & South access roads for Alternative B and one access across from Du Plessis Street for Alternative A) and configured as per the TIA. The North and South accesses to be upgraded as indicated in the TIA, including provision for safe pedestrian access. The proposed collector road be constructed to a 7,4m surfaced width excluding kerb and channel, with sidewalks provided along both sides. 		N/A
Cumulative impact post mitigation:	Low	Low	-N/A
Significance rating of impact after mitigation	Low (-)	Low - Medium (-)	-N/A

8.5.2.12. Visual Impact

	Visual Impact - Land use character & “sense of place”		
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO
DESCRIPTION OF IMPACT:	It is proposed to change the land use character and existing sense of place of the site from a largely undeveloped site in a rural environment to a built up mixed use development of approximately 25ha. The proposed development could impact on the “sense of place” of the area to sensitive receptors that can see the development.		No Impact
Nature of impact:	Negative	Negative	No Impact

	Visual Impact - Land use character & "sense of place"		
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO
Extent and duration of impact:	Local; Long Term	Local; Long Term	N/A
Probability of occurrence:	Definite	Definite	N/A
Degree to which the impact can be reversed:	Barely reversible	Barely reversible	N/A
Degree to which the impact may cause irreplaceable loss of resources:	No loss of resource	No loss of resource	N/A
Cumulative impact prior to mitigation:	Medium - High	Medium - High	N/A
Significance rating of impact prior to mitigation	Medium - High	Medium - High	N/A
Degree to which the impact can be mitigated:	Can be barely mitigated	Can be barely mitigated	N/A
Proposed mitigation:	<ul style="list-style-type: none"> A detailed Architectural Design Plan and Landscaping Plan should be compiled and included in the EMPR, post EA, before the development is constructed. <p>The mitigation measures included under the following sections of the EMPr should be implemented:</p> <ul style="list-style-type: none"> Colours for Roofs and Buildings Lighting 		N/A
Cumulative impact post mitigation:	Medium	Medium	N/A



	Visual Impact - Land use character & "sense of place"		
	Alternative B: Option 3 (Preferred)	Alternative A: Option 2	Alternative C: NO – GO
Significance rating of impact after mitigation	Medium (-)	Medium (-)	N/A



9. ENVIRONMENTAL IMPACT STATEMENT

9.1. Summary of Key Findings of Impact Assessment

9.1.1. Summary of Construction Phase Impacts after Mitigation

The table below is a summary of the projected impacts that could take place during the construction phase of the development and the associated significance of the impact, post mitigation. These results have been informed by the specialist impact assessment reports undertaken to support this EIA.

Table 18: Summary Table of Projected Construction Phase Impacts *after mitigation*

CONSTRUCTION PHASE IMPACTS			
IMPACT	IMPACT SIGNIFICANCE (<i>after mitigation</i>)		
	ALTERNATIVE B: OPTION 3	ALTERNATIVE A: OPTION 2	ALTERNATIVE C: NO – GO
Agricultural Potential Impact - Loss of agricultural land	Low (-)	Low (-)	No Impact
Botanical Impact - Permanent Loss of Indigenous Vegetation	Low (-)	Low (-)	Negligible (-)
Botanical Impact – Loss of Species of Conservation Concern	Low (-)	Low (-)	Negligible (-)
Botanical Impact – Susceptibility of some areas to erosion as a result of construction related disturbances	Negligible (-)	Negligible (-)	No Impact
Contamination & Pollution Associated with Construction Activities	Low (-)	Low (-)	No Impact
Dust & Noise Impact Associated with Construction Activities	Negligible (-)	Negligible (-)	No Impact
Faunal Impact – Loss of Habitat	Low (-)	Low (-)	No Impact
Faunal Impact – Loss of Faunal Species	Low (-)	Low (-)	No Impact
Freshwater Resources Impact – Loss and Disturbance of Aquatic Vegetation & Habitat	Negligible (-)	Medium-High (-)	Negligible (-)
Freshwater Resources Impact – Sedimentation and Erosion	Negligible (-)	Low (-)	No Impact
Freshwater Resources Impact – Water Pollution	Negligible (-)	Low (-)	No Impact
Freshwater Impact – Flow Modification	Negligible (-)	Medium	No Impact
Heritage	Low (-)	Low (-)	No Impact

CONSTRUCTION PHASE IMPACTS			
IMPACT	IMPACT SIGNIFICANCE (after mitigation)		
	ALTERNATIVE B: OPTION 3	ALTERNATIVE A: OPTION 2	ALTERNATIVE C: NO – GO
Socio-Economic – Creation of business and employment opportunities	High (+)	High (+)	High (-)
Traffic & Safety Impact	Low (-)	Low (-)	No Impact
Visual Impact Associated with Construction Activities	Low (-)	Low (-)	No Impact

The following conclusions can be drawn from the impact assessment findings as shown in the impact tables above for the construction phase:

- The proposed development Layout is expected to result in environmental impacts, during the construction phase, to the physical, social, cultural and biological environment as opposed to the NO-GO Alternative of not developing an affordable housing development site which is expected to result in minimal physical and biological impacts to the environment during the construction phase as degradation would continue to occur to the environment. The no-development option would also result in a lost opportunity in terms of the expected temporary employment opportunities associated with the construction phase.
- A high negative socio-economic impact significance in terms of employment and job opportunities would occur if the proposed development is not constructed (NO-GO Alternative B).
- Freshwater impacts in terms of loss of habitat and associated biota and flow modification is expected to be mitigated to a negligible level of impact significance, through the avoidance of the sensitive freshwater area.
- Botanical susceptibility to erosion and dust and noise are expected to be mitigated to a Negligible significance.
- The Creation of business and employment opportunities are expected to result in a High Positive impact after enhancement.
- All other identified impacts are expected to be mitigated to a Low negative significance, which means that it is expected to mitigate the impact to the point where it is of limited importance.

9.1.2. Summary of Operation Phase Impacts after Mitigation

The table below is a summary of the projected impacts that could take place during the operational phase of the development and the associated significance of the impact, post mitigation.

Table 19: Summary Table of Projected Operation Phase Impacts *after mitigation*

OPERATION PHASE IMPACTS			
IMPACT	IMPACT SIGNIFICANCE (after mitigation)		
	ALTERNATIVE B: OPTION 3	ALTERNATIVE A: OPTION 2	ALTERNATIVE C: NO – GO
Botanical Impact – Invasion by exotic and alien species	Low (-)	Low (-)	Negligible (-)
Botanical Impact – Disturbances to ecological processes	Low (-)	Low (-)	No Impact



OPERATION PHASE IMPACTS			
IMPACT	IMPACT SIGNIFICANCE (after mitigation)		
	ALTERNATIVE B: OPTION 3	ALTERNATIVE A: OPTION 2	ALTERNATIVE C: NO – GO
Freshwater Resources Impact – Loss and Disturbance of Aquatic Vegetation & Habitat	Medium (-)	Medium-High (-)	Low (-)
Freshwater Resources Impact – Sedimentation and Erosion	Medium-Low (-)	Medium (-)	No Impact
Freshwater Resources Impact – Water Pollution	Medium (-)	Medium (-)	Medium (-)
Freshwater Resources Impact – Flow Modification	Medium – High (-)	Medium-High (-)	No Impact
Socio-Economic Impact - Provision of affordable housing	High (+)	High (+)	High (-)
Socio-Economic Impact - Provision of Public Facilities and Public Spaces	High (+)	High (+)	High (-)
Socio-Economic Impact – Creation of Business and Employment Opportunities	Medium (+)	Medium (+)	Medium (-)
Socio-Economic Impact – Broaden the Rates Base	Medium (+)	Medium (+)	Medium (-)
Traffic & Pedestrian Safety Impact	Low (-)	Low – Medium (-)	No Impact
Visual Impact – Change of land use and “sense of place”	Medium (-)	Medium (-)	No Impact

The following conclusions can be drawn from the impact assessment findings as shown in the impact tables below for the operational phase:

- The proposed development Layout is expected to result in negative environmental impacts, during the operational phase, to the biological environment (freshwater and terrestrial systems), visual “sense of place” of the area, an increase in traffic as opposed to the NO-GO Alternative B of not developing an affordable housing development site which is not expected to result in any visual, traffic or botanical impacts because the NO-GO assumes the status quo will remain and no development will take place. However, the no-development option would result in a lost opportunity in terms of the expected employment and business opportunities associated with the operational phase.
- A high negative socio-economic impact significance in terms of the provision of housing, schools, public facilities and public open spaces would occur if the proposed development is not constructed (NO-GO Alternative B).
- Freshwater impacts are expected to be mitigated to a low-medium to medium-high level of impact significance.
- Botanical impacts are expected to be mitigated to a medium to low significance.
- The Provision of housing, creche’s, public facilities and open spaces are expected to result in High Positive impacts after enhancement. The creation of business and employment opportunities and the broadening of the rates base would have a Medium positive impact.
- Visual impacts were identified to be significant (Med-High) but they will be mitigated to a Medium



negative impact significance.

- Traffic & Safety impacts were also identified as being relatively significant but can be reduced to a Low impact significance.

9.2. EAP's Reasoned Opinion and Recommendations

- The proposed site is the best situated site for establishing an integrated township. The proposed property to be developed is located entirely within the Bitou Urban Edge and has been specifically set aside and planned for to be a future extension of the existing Kranshoek residential area in various Municipal Planning Frameworks, including the SDF and IDP. The current housing backlog at Kranshoek is 820 housing units with a future forecast of 1 007 to the year 2030, making a total of 1 493 units. The SDF goes on to state that there are more than 4829 households in need of housing in the whole Bitou area, of which 17% is in Kranshoek. This proposed development of approximately 876 units will make a major contribution towards meeting this need.
- The “No Go” alternative is the option of not developing the proposed affordable housing and associated infrastructure development. The no-development option would result in a lost opportunity in terms of the employment opportunities associated with the construction and operation phase as well as the benefits associated with the provision of more than 876 houses and other much needed social facilities. A significantly high negative socio-economic impact significance would occur if the proposed development is not constructed in terms of the lost opportunity to provide low and middle income housing, crechés, health care facilities, public spaces and other much needed social services.
- The NO-GO alternative would result in the conservation of the site and prevention of any further development (status quo). Should the site not be developed, one can expect that the impact of informal development and use of the open area within the site will continue. Thus, while this No-Go alternative has the least potential of directly impacting on the ecological features, one can pragmatically expect that informal development and its associated impact on the surrounding area will impact on these ecosystems, further deteriorating the water quality and modifying/reducing aquatic and terrestrial habitat.
- The proposed development is compatible with and supports the key principles and objectives contained in the relevant key land use planning and policy documents that pertain to the Western Cape and Bitou area, including the Western Cape Provincial Spatial Development Framework (2014), Bitou Local Municipality Integrated Development Plan 2017-2022 and the Bitou Local Municipality Spatial Development Framework (2018). The entire proposed development is also located within the Urban Edge. The proposed site has therefore been identified as a desirable site location for housing development.
- The most significant impacts associated with the proposed development, in the construction and operation phase, includes the expected impacts to the Freshwater Resources (habitat and biota), Botanical Impacts (loss indigenous vegetation) and the expected Visual Impact of the development in terms of the land use character of the site and “sense of place” of the area being significantly changed.
- The socio-economic benefits of this project including numerous job opportunities, the provision of affordable housing, crechés, schools and other much needed social facilities largely outweigh the biophysical, visual and traffic impacts identified in an area which is mostly degraded and already transformed and planned for development purposes in the Municipal SDF (within the urban edge).
- We believe that a “balanced approach” to impacts has been undertaken. We believe that although the proposed project will result in varying degrees of negative impacts in terms of botanical and especially freshwater impacts, we are of the opinion that the Preferred Alternative layout and mitigation measures proposed will ensure that these impacts are reduced to an “acceptable” level of impact significance given the positive impact that this proposed development will have on the socio-economic environment.
- Based on the findings of the EIA and the information presented by the specialists, the positive impacts of the preferred alternative outweigh the negative impacts of the NO-GO alternative and therefore the

development should be **authorised** as long as the mitigation measures listed in this Report and the Environmental Management Programme are implemented.

9.3. Recommendations for Conditions of the Environmental Authorisation

- An ECO must be appointed in the Pre- Construction and Construction Phase to monitor that the applicant is in compliance with all of the requirements of the EMPr and the EA.
- An engineer must design a Detailed Design Stormwater Management Plan based on detailed hydrological flood modelling. This must be done before any land clearing take place. This detailed design plan must take the Stormwater Plan included in the engineering services report findings into account. The Detailed plan must take into account avoiding contaminated runoff from the construction phase footprint area from entering the natural environment (appropriate grease traps and spill management plan).
- A detailed Architectural Design Plan and Landscaping Plan should be compiled and included in the EMPr, post EA, before the development is constructed.
- All of the mitigation measures listed in the EMPr and the specialist reports must be implemented.



10. REFERENCES

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