GEORGE
TEL: +27 (0) 44 873 4923 **FAX:** +27 (0) 44 874 5953
EMAIL: info@sescc.net **WEBSITE:** www.sescc.net
ADDRESS: 102 Merriman Street, George 6530
PO BOX: 9087, George , 6530

CAPE TOWN
TEL: +27 (0) 21 554 5195 **FAX:** +27 (0) 86 575 2869
EMAIL: betsy@sescc.net **WEBSITE:** www.sescc.net
ADDRESS: Tableview, Cape Town, 7441
PO BOX: 443, Milnerton, 7435

DRAFT SCOPING REPORT (SR)

PROPOSED KURLAND HOUSING DEVELOPMENT ON ERF 940 (A PORTION OF ERF 562), KURLAND, PLETTENBERG BAY, WESTERN CAPE

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:	Bitou Local Municipality Contact: Mr V W Felton Contact: Mr F Maki
ENVIRONMENTAL CONSULTANT:	Sharples Environmental Services cc Author: Ameesha Sanker (EAPASA: 4372) Reviewer: Betsy Ditcham (EAPASA: 1480)
DEA & DP PROJECT REFERENCE:	16/3/3/6/7/2/D1/10/0030/21
SES REFERENCE NUMBER:	CT14/PLETT/KUR/DSR/1222
DATE:	December 2022

PROJECT INFORMATION

Report Ref. No:	14
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COMPILATION		
Role:	**Name:**	**E-Mail Address:**
Owner:	Sharples Environmental Services cc	info@sescc.net
Author:	Ameesha Sanker	ameesha@sescc.net
Reviewer:	Betsy Ditcham	betsy@sescc.net

Expertise

Sharples Environmental Services cc (SES) 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.

Author: AMEESHA SANKER (Environmental Assessment Practitioner) - Ameesha obtained her BSc. Geological Science (Environmental and Engineering), from the University of KwaZulu-Natal and a BSc. (Hons) in Environmental Management from UNISA. Her experience extends to 9+ years' in environmental management, assessments and compliance monitoring, predominantly in the infrastructure, water and sanitation industry. Ameesha is registered with EAPASA as a certified Environmental Practitioner (EAPSA # 4372).

Report Reviewer: BETSY DITCHAM (Director and Principle Environmental Assessment Practitioner) - 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 14 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 shareholder of SES and registered with EAPASA as a certified Environmental Practitioner (EAPSA # 1480).

GLOSSARY OF TERMS

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.

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 Environmental Authorization.

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

i. The land, water and atmosphere of the earth;
ii. Micro-organisms, 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 Authorization (EA) – The authorization 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 Plan (EMP) - A management programme designed specifically to introduce the mitigation measures proposed in the Reports and contained in the Conditions of Approval in the Authorization.

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.

NEMA EIA Regulations - The EIA Regulations means the regulations made under 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.

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.

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.

ABBREVIATIONS

BA	Basic Assessment
BAR	Basic Assessment Report
BLM	Bitou Local Municipality
CA	Competent Authority
CBA	Critical Biodiversity Area
DFFE	Department of Environment, Forestry and Fisheries (National)
DEA&DP	Department of Environmental Affairs & Development Planning (Provincial)
DM	District Municipality
DWS	Department of Water and Sanitation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMP	Environmental Management Framework
EMPr	Environmental Management Programme
ESA	Ecological Support Area
GRDM	Garden Route District Municipality
GCFR	Greater Cape Floristic Region
GN	Government Notice
HOA	Home Owners' Association
HWC	Heritage Western Cape
I&AP	Interested and Affected parties
IDP	Integrated Development Plan
LED	Local Economic Development
LM	Local Municipality
LSDF	Local Spatial Development Framework
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
TIA	Traffic Impact Assessment
VIS	Visual Impact Statement
WCPSDF	Western Cape Provincial Spatial Development Framework
ZVI	Zone of Visual Influence

BACKGROUND AND PURPOSE OF THIS 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 subject 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.

Due to the time restrictions now applicable, it is required to conduct pre-application public and Authority consultation before an application form is submitted (pre-application phase), in order to resolve key issues of concern from the public and Authorities, before an application is submitted **and the time restrictions apply.** This pre-application consultation was held in the form of a meeting, on the 25th of March 2021, at the Kurland Community Hall, and an attendance register was taken (not to be released to the public as it contain private information). Attendance was noted from members of the following organizations/departments:

- Sharples Environmental Services.cc
- Kurland PSC
- Ward Committee
- Bitou Local Municipality
- Ward Councillor
- Town Planner

This Pre-Application Draft Scoping Report is being made available for public comment: **(10th January 2023 – 9th February 2023) (30 days).** The Pre-Application Draft Scoping Report will be available for free download and review directly from our website (www.sescc.net) under the public documents tab.

Following the Pre-Application public participation period, an Application for Environmental Authorization Form will be completed and submitted to the Department of Environmental Affairs and Development Planning (DEA&DP – Region 3).

As per the legislated process, the Pre-Application Draft Scoping Report will be 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 to review in order to provide comment**.** Following the second round of public participation, the Post-Application Draft Scoping Report will be finalised and submitted to DEA&DP for consideration (Acceptance/Rejection).

REQUIRED CONTENT OF A SCOPING REPORT AS PER THE 2014 NEMA EIA REGULATIONS

Appendix 2 of Government Notice 326 (7 April 2017) of the National Environmental Management Act No.107 of 1998 (NEMA) 2014 Environmental Impact Assessment (EIA) Regulations states the requirements for the content of a **Final Scoping Report** to be as per the table below. For ease of reference, we have noted in the table below where this required information can be found.

"A scoping report must contain the information that is necessary for a proper understanding of the process, informing all preferred alternatives, including location alternatives, the scope of the assessment, and the consultation process to be undertaken through the environmental impact assessment process, and must include the following:"

a) details of- **(i) the EAP who prepared the report; and** **(ii) the expertise of the EAP, including a curriculum vitae;**	**Section 1.3 and Annexure I**
b) the location of the activity, including- **(i) the 21 digit Surveyor General code of each cadastral land parcel;** **(ii) where available, the physical address and farm name;** **(iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;**	**Section 4.1 and Annexure A**
(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**
(d) a description of the scope of the proposed activity, including- **(i) all listed and specified activities triggered;** **(ii) a description of the activities to be undertaken, including associated structures and infrastructure;**	**Section 2.5 and Section 4.2**
(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 2**
(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;	**Section 7**
(h) a full description of the process followed to reach the proposed preferred activity, site and location within the site, including - **(i) details of all the alternatives considered;** **(ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;** **(iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them;** **(iv) the environmental attributes associated with the alternatives focusing on the geographical,**	**Section 5 – Alternatives** **Section 6 – Environmental Attributes** **Section 8 – Public Participation** **Section 9 – Impacts & Risks** **Section 10 – Concluding Statement**

physical, biological, social, economic, heritage and cultural aspects; **(v) the impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts-** **(aa) can be reversed;** **(bb) may cause irreplaceable loss of resources; and** **(cc) can be avoided, managed or mitigated;** **(vi) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives;** **(vii) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;**	
(viii) the possible mitigation measures that could be applied and level of residual risk; **(ix) the outcome of the site selection matrix;** **(x) if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such and** **(xi) a concluding statement indicating the preferred alternatives, including preferred location of the activity;**	
(i) **a plan of study for undertaking the environmental impact assessment process to be undertaken, including-** **(i)a description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity;** **(ii) a description of the aspects to be assessed as part of the environmental impact assessment process;** **(iii) aspects to be assessed by specialists;** **(iv) a description of the proposed method of assessing the environmental aspects, including a description of the proposed method of assessing the environmental aspects including aspects to be assessed by specialists;** **(v) a description of the proposed method of assessing duration and significance;** **(vi) an indication of the stages at which the competent authority will be consulted;**	**Annexure H**

(vii) particulars of the public participation process that will be conducted during the environmental impact assessment process; and (viii) a description of the tasks that will be undertaken as part of the environmental impact assessment process; (ix) identify suitable measures to avoid, reverse, mitigate or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored.	
(j) an undertaking under oath or affirmation by the EAP in relation to- (i) the correctness of the information provided in the report; (ii) the inclusion of comments and inputs from stakeholders and interested and affected parties; and (iii) any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties;	**Annexure L**
(k) an undertaking under oath or affirmation by the EAP in relation to the level of agreement between the EAP and interested and affected parties on the plan of study for undertaking the environmental impact assessment;	**Annexure L**
(l) where applicable, any specific information required by the competent authority; and	**N/A**
(m) any other matter required in terms of section 24(4)(a) and (b) of the Act.	**N/A**

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Note: Annexures in *Green* will be included into the Final Scoping Report

1. INTRODUCTION AND BACKGROUND

1.1. Background to the Proposed Project

Bitou Local Municipality proposes to develop a residential settlement consisting of approximately 1500 units, services, a variety of support facilities, and open spaces on ERF940, (a portion of Erf 562), Kurland, following the rezoning and subdivision of this Erf. **This property falls within the urban edge of the Bitou Local Municipality**. Please refer to **Section 4** of this report for the detailed description of what is proposed to be developed.

Figure 1: Location of the development site highlighted in red (courtesy of Google Earth).

According to the Town Planning report, plans for the alternative utilization of Erf 940 (A Ptn of Ptn 562) trace back to the zoning thereof for resort rights, many years ago. The Department of Rural Development and Land Reform (DRDLR) bought the property from the original owners, for land reform purposes in 2007. A few structures were erected on site. Various large erven [Erf 564 (Now erven 574 to 583), Erf 939, Erf 563 (Now erven 565 to 573) and Erf 536 Kurland] along Forrest Hall Road and in the central part of Erf 562)] were subdivided (as per SG diagrams) and some offered/sold/transferred to beneficiaries. Recently Erf 393 was also divided (SG Diagram 1919/2020) from Erf 562 (division not yet registered).

The Town Planning Report indicated that the DRDLR is the custodian of the property. After negotiations, they have recently decided to transfer the Erf to the Municipality of Bitou to accommodate the intended housing project, with the exception of two parts of the site, which they wish to retain:

- An area and building in the north-east of the property, to be transferred to the identified occupant (shown on diagram SG 1919/2020); and
- And the southern portion of the site for an agricultural project. The subdivision of the relevant portions was approved by the Municipality. Surveying and transfer is managed by DRDLR

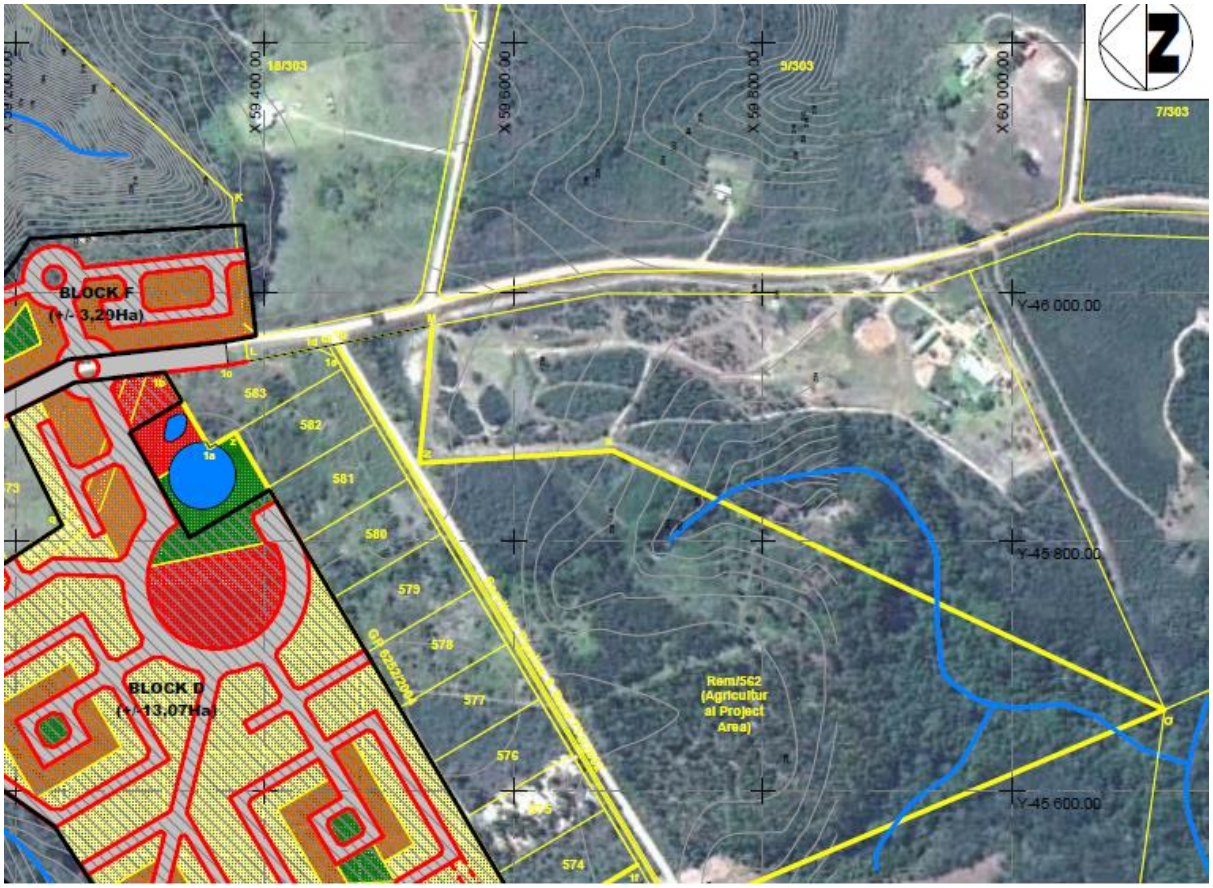


Figure 2: Areas excluded from development as described above (extracted from original schematic).

The site (95.7ha) may be described in three components, with various technical features to be considered, as noted throughout this report, including:

- Central: (west and south of Forrest Hall Road; north of Holdings 574-583; west of Erven 565 to 573):
  - Approximately 56ha.
  - This area is directly south of the existing Kurland Village infrastructure, with some urban supportive facilities currently accommodated on the project site, such as the ablution facility and clubhouse of the upgraded Kurland and New Horizon Sports Facility;
  - Note the exclusion of the gate-house area (north-west site corner, (delineation to be confirmed) and Erf 536 (Sports field);
  - Environmental features (steep slope/low lying strips of land/aquatic buffer areas) and the alignment of Forest Hall Road create six development components/blocks, of which four fall in the central zone. See Figure 2.
  - Municipal Engineering service components and Eskom power lines are located within the Forrest Hall road servitude area and around the sports fields;
  - Directly adjacent land uses, including cemeteries, churches, open spaces, natural areas, residential grain, street network are noted;

Figure 3: Anticipated development blocks (Extract of the Kurland Land Use Context Plan Ref. K3.1.3.Rev3)

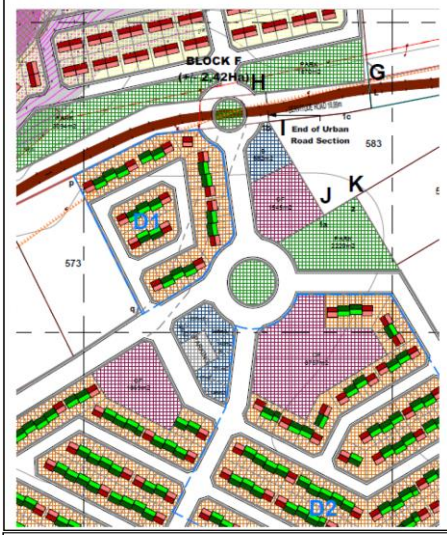
- East: (east of Forrest Hall Road):
  - Approximately 29ha.
  - The greater part (east) of this area has a steep slope and is considered a conservation/natural area due to the occurrence of good quality fynbos as identified in the relevant environmental reports, hence an area of approximately 22ha was excluded from the anticipated development footprint area;
  - The road to the sewer works and the Kurland Fire Substation (Bitou Municipality) falls within the project area, as does a part of the sports field near Solomon- and Freedom Streets. The sports fields accommodate an ablution facility/block, lights. These features, as well as power lines (proposed servitudes) will be accommodated in the area anticipated for development;
  - Directly adjacent land uses, including municipal works area, sports fields and associated infrastructure, open spaces, natural areas, residential grain, fire station, street network are noted;
- South: (south of Holdings 574-583 and the access road to the Teniqua Wildlife Awareness Centre):
  - Approximately 11 ha.
  - This area has previously been earmarked as a project area by the Western Cape Department of Rural Development and Land Reform for agriculture project purposes. The principal division of the site, to register the agriculture project as a separate area, was concluded in 2020 by the Bitou Municipality. The division is in the process of being registered.

Based on the aforementioned planning and consideration the trailing layout (Figure 4) and proposed land use (Table 2) are proposed for development.

1.2. Summary of Development Proposal

The applicant proposes to develop residential houses and associated infrastructure on Erf 940, a Portion of Erf 562. According to the Town Planners report (Appendix G.1), there are six neighbourhoods/sections (Blocks A-F), proposed, which form part of an over-all development extension, integrated/linked on an external and internal level and includes, at this stage, the following uses:

Table 2: Proposed land uses (Town Planning Report, 2021).

	Proposed Land Use	No of Erven	Area (ha)
	Row Housing	1339	12,03
	Semi- detached housing	28	0,4
	Single residential (average 180m²)	125	2,56
	High density housing (flats; 11units)	1	0,22
	School	1	3,36
	Community Facility	13	2,61
	Mixed use (retail/tourism/business/recreation/ municipal/community facility/ utilities)	1	1,98
	Business	17	0,86
	Parking/maket	3	0,35
	Active Parks	11	1,94
	Conservation	2	11,56
	Municipal	1	0,12
	Roads		

All blocks are estimated at approximately 18m deep and may accommodate single storey- or double storey linked units on individual erven generally ranging from 72 to 300m². The proposed development will aim to establish an integrated housing project, including houses of various typologies (based on a maximum 1500 units, to be accommodated in phases to be implemented over time), infrastructure and the following standard/required provision support facilities (if required, on total site area):

- Internal active/passive open space (not conservation areas); neighbourhood- and community parks (at least seven sites);
- Community sports fields (at least one site);
- Three Creche sites;
- One School site;

- Two community facility/mixed use node areas (to accommodate supportive uses, job creation uses, retail, market, mobile services (library/clinic); post boxes, etc;
- Two or three church/religious sites;
- Areas of small business;
- Open spaces suitable for job creation projects;
- Conservation areas

The above is proposed to be developed as per the **draft Site Layout Plan,** shown in **Appendix C** and in the **figure** below.

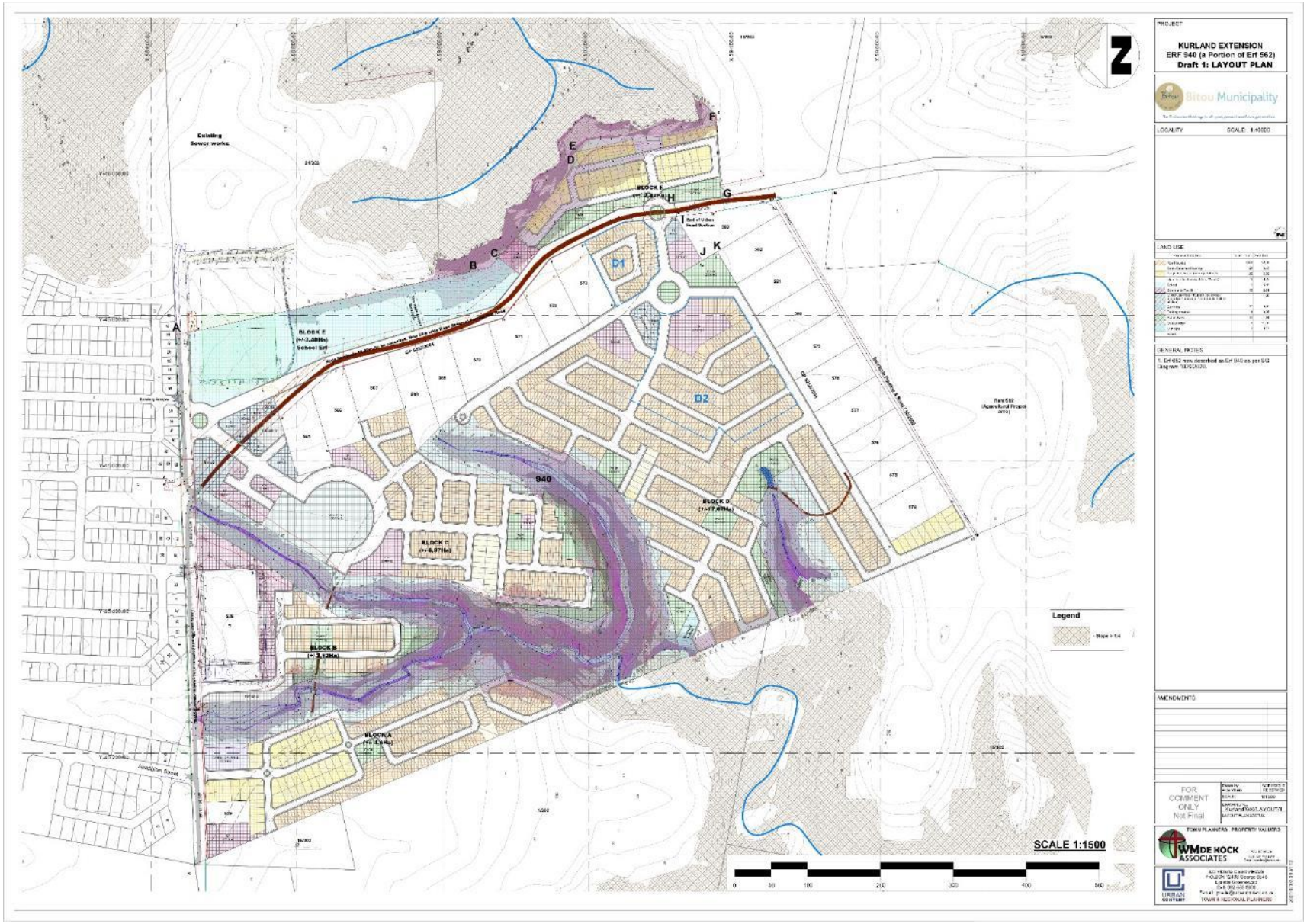


Figure 4: Proposed Draft Layout Plan.

The applicant is aware that the proposed development will require an upgrade to the existing bulk water and sewer facilities and pipelines. However, this has not been included within the scope of works of this environmental application, as it will be addressed in a separate environmental application.

1.3. Details of the Environmental Assessment Practitioner (EAP)

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 **Ameesha Sanker**.

Ameesha has a Bachelor of Science Honours Degree in Environmental Management from the University of South Africa in 2019 and a Bachelor of Science Degree (Geological Science) obtained from the University of Kwa-Zulu Natal in 2014. She has 9+ years' experience in the environmental field, including environmental assessments, legal compliance, and on-site compliance monitoring. In her time as a consultant, she has assisted in the compilation of a number of environment assessments and management plans for both private and governmental clients. Ameesha is registered with EAPASA as a certified Environmental Practitioner (EAPSA # 4372).

2. LEGISLATION AND POLICY PERTAINING TO THIS APPLICATION

2.1. The Scoping / EIA Process

Due to the fact that a residential housing and 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**, an **Application Phase, a post-application Scoping Phase and associated consultation Phase and an Environmental Impact Assessment Phase and associated consultation** as illustrated in the Figure below. We are currently in the Pre-Application Public & Authority Participation (Scoping Stage).

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

- 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.

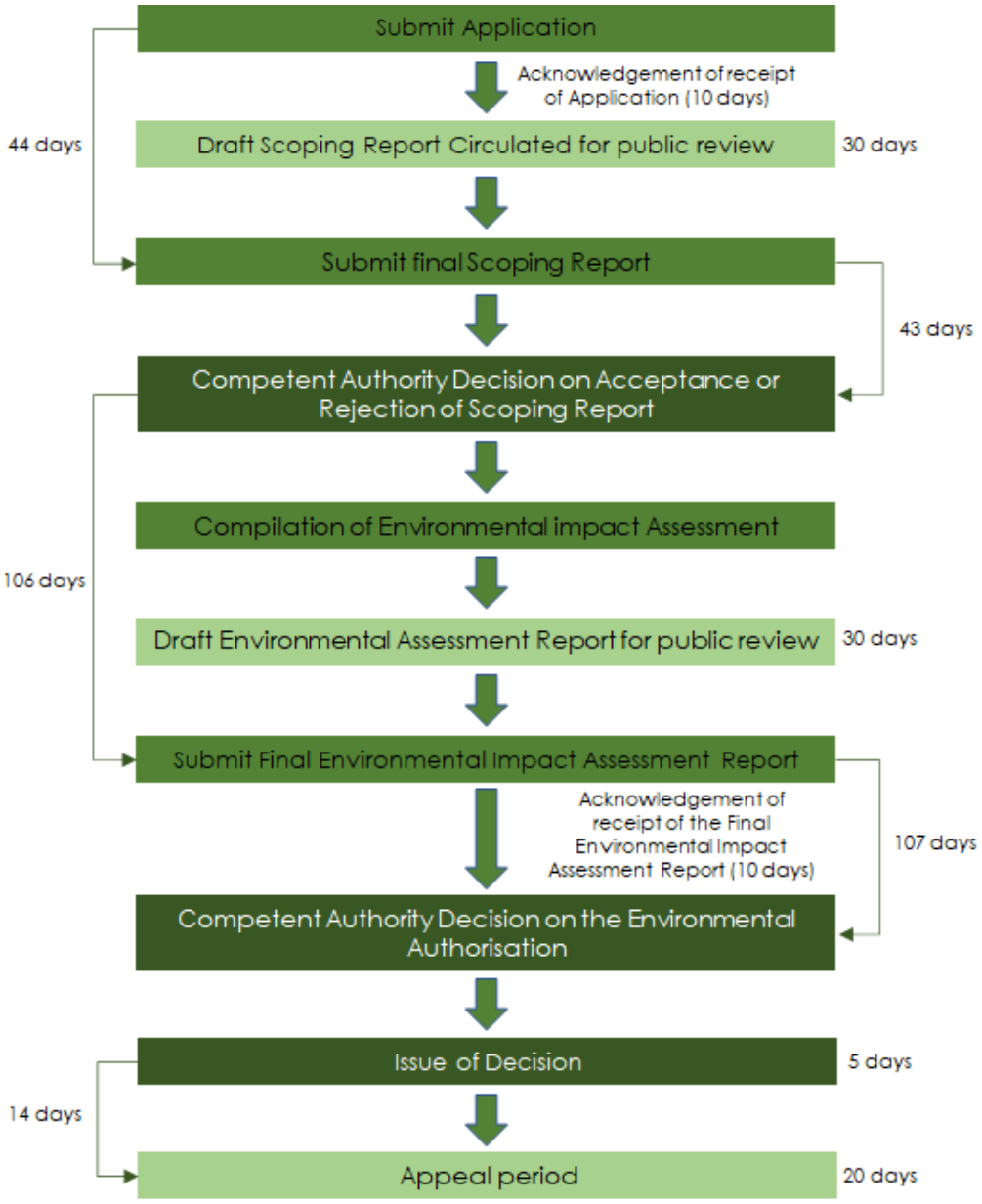


Figure 5: The Scoping / EIA Process

2.2. List of Significant 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, including Government Notices 982, 983, 984 and 985;
- 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);

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

- 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 (2017);
- 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.
- Protocols for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts (March 2020) on:
  - Agricultural Resources
  - Aquatic Biodiversity

- Terrestrial Biodiversity
- Protocols for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts (October 2020) on:
  - Plant Species
  - Animal Species

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) 2022 - 2025;
- Bitou Local Municipality Spatial Development Framework (SDF) (2019);
- Bitou Housing Settlement Plan (2010);
- Bitou Local Municipality Land Use Planning By-Law (2015); and
- Zoning Scheme By-Law (2020).

2.3. Summary Description of Most Significant Policy Documents

2.3.1.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.

2.3.2.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 will trigger an activity listed in the EIA Regulations, Listing Notice 2, a Full Scoping & EIA Process is required, and the respective reports (Scoping and EIA) must be submitted to the Department of Environmental Affairs & Development Planning

(DEA&DP) before they issue Bitou Municipality with an Environmental Authorisation (either approval or rejection of the development proposal).

2.3.3.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.

2.3.4.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, through 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. The Agricultural Impact Assessment will further discussion the applicability of the Act on the proposed project.

2.3.5.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.

The project will require a Water Use Authorisation or General Authorisation in terms of Section 21 (c) and (i) of the National Water Act (NWA), Act 36 of 1998, as the development will impact watercourses.

The following water uses have been identified for the project:
- Section 21 (c): Impeding or diverting the flow of a watercourse
- Section 21 (i): Altering the bed, banks, course or characteristics of a watercourse

These water uses will be associated with the following activities:
- Construction within 500 m of the boundary of a wetland.
- Establishment of sewer pipes within and/or in close proximity to watercourse.
- The construction of road crossing on a watercourse
- Earthworks and storm water runoff and erosion/sediment during construction
- Storm water runoff management during operation

A water use license is currently being applied for through the online eWULAAs system and with the BGCMA.

2.3.6.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 Sate 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.

One protected tree species (in terms of the National Forests Act 84 of 1998) was recorded in the western part of site, namely *Afrocarpus falcatus*. The removal of this tree requires a permit from the Department of Forestry, therefore should the proposal and construction activities not manage to avoid this species, the applicant must apply for the relevant permit.

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

The protection and management of South Africa's heritage resources is 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:

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 m^2 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 m^2 in extent;

A Notice of Intent to develop will be submitted to Heritage Western Cape (HWC), and feedback will be implemented in the EIA phase.

2.3.8.The National Development Plan 2030 (2012)

In 2009 the South African government established the National Planning Commission (NPC). The NPC 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.

The National Development Plan aims to eliminate poverty and reduce inequality by 2030. The National Development Plan explains that South Africa can realise these goals by drawing on the energies of its people, growing an inclusive economy, building capabilities, enhancing the capacity of the state, and promoting leadership and partnerships throughout society.

The proposed development will support the National Development Plans aim to eliminate and tackle poverty by aligning with the Objectives and Actions identified by the National Development Plan to reach its goal. The following objectives will be supported by this development:

- Economic Infrastructure - The proportion of people with access to the electricity grid should rise to at least 90 percent by 2030, with non-grid options available for the rest.
- Economic Infrastructure - Ensure that all people have access to clean, potable water.
- Transforming Human Settlements - Upgrade all informal settlements on suitable, well located land by 2030.
- Social Protection - All children should enjoy services and benefits aimed at facilitating access to nutrition, health care, education, social care and safety.

Figure 6: Sustainable Development Goals.

It is proposed that affordable and gap housing with some urban supportive facilities be constructed. The provision of supportive facilities, such as clinics, educational centres and community centres contribute towards an improved social protection by providing facilities which are safe and formalised.

The Municipal Spatial Development Framework (2022) estimates that the projected additional population up to 2025 is about 17 968 people, representing 7 755 additional households. Should this trend continue, the Bitou LM would need to accommodate an estimated additional 107 000 people, representing approximately 42 808 households by 2040. When adding the current housing backlog of 8 238 units (households) to the 7 755 additional households, then approximately 548 ha of land would be required for urbanisation purposes up to 2025 (based on an average gross density of about 29 units/ha). About 242 ha of the 548 ha represents land required to accommodate the existing backlog. This includes 350 ha for housing purposes and 198 ha for other land uses, e.g. community facilities, economic activities, streets, open space etc. Attributing to multiple objectives within multiple sectors indicates the broad social and economic benefits the proposed development will have, while in support of the National Development Plan 2030 (2012).

The NDP notes that the single most important investment any country can make is in its people.

2.3.9.Western Cape Spatial Development Framework (2014)

The Provincial Spatial Development Framework (PSDF) published in 2014 explains that 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.

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.

The PSDF provides a basis for coordination, planning and implementation of government's spatial development intentions. In doing this, the PSDF has essentially created a platform for developments within the province to ensure that the identified guiding principles are met. According to the Western Cape Land Use Planning Act, No 3 of 2014 (LUPA), based on the national legislation for spatial planning (SPLUMA) reiterates the land use planning principles of SPLUMA which must be applied in land use planning.

These SPLUMA, spatial principles, represent a new approach to address the spatial injustices of the past and to prevent unsustainable development.

The five founding principles as set out in Section 7 (a) to (e) of SPLUMA that apply throughout the country and to all SDFs are (as quoted from the Eden SDF):

1. Spatial Justice: Redressing past spatial and other development imbalances through improved access to and use of land by disadvantaged communities.

2. Spatial Sustainability: Relates to the need to promote spatial planning and land use management and land development systems that are based on and promote the principles of socio-economic and environmentally sustainable development in South Africa.

3. Efficiency: The spatial efficiency pillar places significant importance on the optimization of existing resources and the accompanying infrastructure, including the oiling of development application procedures in order to promote growth and employment.

4. Spatial Resilience: Relates to mitigation, adaptability and innovations to secure communities from spatial dimensions of socio-economic and environmental (climate change) shocks.

5. Good Administration: Spatial planning vision and objectives are not only highly dependent upon a strong co-ordinating role of central government, but is also predicated upon good governance mechanisms, incorporating meaningful consultations and coordination with a view to achieving the desired outcomes across the various planning spheres and domains.

Based on these principles, a township layout is designed, with due consideration to the spatial dynamics of the area and how it will function as a future residential neighbourhood.

The proposed development is further supported by the PSDF (2014) by noting that access to housing as a key guiding principle identified to be implemented in order to achieve the Western Cape PSDF's (2014) spatial agenda. The PSDF (2014) notes the importance of housing development to alleviate the 25% housing backlog. Housing development is considered important to improve human health, livelihood, and environmental health. The PSDF (2014) Policy on Developing Integrated and Sustainable Settlements has five policy objectives:

1. Protect and enhance sense of place and settlement patterns;
2. Improve accessibility at all scales;
3. Promote an appropriate land use mix and density in settlements;

4. Ensure effective and equitable access to social services and facilities;
5. Support inclusive and sustainable housing.

To achieve the above objectives, the PSDF promotes an integrated approach to housing delivery which includes housing and social services. The PSDF aligns with OneCape 2040 which proposes "sustainably upgrading the built environment to directly respond to community needs through shifting from a focus on housing to one on accessible and integrated service delivery." Improving access to services is essential to achieving the settlement transitions identified by the National Development Plan 2030.

The proposed development aligns with the guiding principles and will contribute towards achieving the aims identified by this PSDF. The proposed development seeks to provide an opportunity for past spatial and other development imbalances to be redressed through the improved access and use of infrastructure for families who are on the housing backlog due to past challenges and imbalances. The development of mixed-use and support facilities will improve accessibility, quality and liveability of the overall development by constructing facilities, such as medical and educational centres, that are enabled to support and react to the social requirements of a community while still supporting the surrounding local economy. In doing this, a resilient and sustainable development is created due to the developments ability to provide accessible support to the residents and react to their needs.

2.3.10. Western Cape Department of Human Settlements: Strategic Plan for 2020 – 2025

The vision set out in the Western Cape Department of Human Settlements Strategic Plan (2020 – 2025) is for residents of the Western Cape to have access to liveable, accessible, safe and multi-opportunity settlements. The mission of the Department of Human Settlements is:

- To provide settlements that offer good basic and socio-economic services;
- To offer a range of rental and ownership options that respond to the varied needs and incomes of households; and
- To consistently improve settlements through joint citizen and government effort supported by private sector contributions.

The Strategic Plan for 2020-2025 released by the Western Cape Government: Department of Human Settlements explains the need for such a plan by explaining that Chapter 2 (Bill of Rights) of The Constitution, Section 26 requires the state to:

- Take reasonable legislative and other measures, within its available resources, to achieve the progressive realisation of everyone's right of access to housing; and
  Ensure no-one is evicted from their home, or has their home demolished, without an order of the court made after considering all the relevant circumstances.

The Constitution further provides that housing is a competency that is held concurrently by national and provincial governments, resulting in the development of this Strategic Plan by the provincial government.

The Strategic plan explains that the provincial department is committed to accelerating delivery, while promoting social cohesion through the development of sustainable, integrated and resilient human settlements in an open society. The proposed development seeks to create such a society. Through the provision of affordable housing, a more integrated and open society may be achieved, while promoting social cohesion and improving resilience by developing supporting facilities. The triggering pf Listed Activities in terms of National Environmental Management Act No. 107 of 1998 and the Environmental Impact Assessment Regulations, 2014 as amended (2017) requires the developer to obtain Environmental Authorisation and follow the EIA process. The EIA

process will is guided by a variety of specialists and will seek to improve the sustainability of the proposed development and reduce the environmental impact.

The Strategic plan lists its aims as the following;

- Provide settlements that offer good basic and socio-economic services;
- Offer a range of rental and ownership options that respond to the varied needs and incomes of households; and
  Consistently improve settlements through joint citizen and government effort supported by private sector contributions.

Through developing supportive facilities along with residential units, such as educational centres and clinics, the socio-economic status of the development will be transformed. The resilience, social cohesion and overall liveability of the proposed development will be improved by the supportive facilities because the individuals who will occupy the residential units will be provided with access to facilities which provide support and aid a healthy social environment.

2.3.11. Eden Spatial Development Framework (2017)

The recent draft ESDF, among many other directives for efficient growth of the region, promotes containing urban growth to sustain a stronger economy, mitigate disaster risks and to protect the environment. It also promotes the development of settlements where the access, economic, social and educational needs are met. The densification of the urban areas and a more effective use of space for large urban uses are emphasized. For example, a more effective use of sites for schools are proposed by clustering/sharing social/educational/recreational use areas, where possible and the 'wrapping' some of the boundaries of school by housing. The proposed development layout is in line with these principles.

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

The 2022 – 2027 Integrated Development Plan (IDP) released by the Bitou Local Municipality states its mission to be "We partner with communities and stakeholders to sustainably deliver quality services so that everyone in Bitou can live and prosper together". The IDP continues to outline the importance of sustainably providing services through the identified Key Performance Areas (KPA);

- 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.
- KPA 2 Economic Development
    - Objective 2.1: Grow local economy, create jobs, empower previously disadvantaged, transform ownership patterns;
    - Objective 2.2: Economic development of local economy.
- KPA 3 Community and Social Development:
    - Objective 3.1: Eradicate poverty and uplift previously disadvantaged communities, promote social cohesion;
- KPA 4 Infrastructure Development:
    - Objective 4.1: Universal access to decent quality of services.
- KPA 7 Public Participation

- Objective 7.1: An active and engaged citizenry, able to engage with and shape the municipality's programme.

KPA's are identified to ensure that specific objectives are implemented to fulfil the needs of the people and the aims of the IDP.

KPA1 speaks to spatial integration. The proposed development will focus on housing opportunities for people of a low-income bracket, many of whom are of previously disadvantaged backgrounds. The selected site is directly opposite the Kurland Township, from which local labour will be sourced, during construction, which provides for ease of access. The proposed development will integrate multiple support developments, which will be aimed at providing opportunities for local businesses and local employees, of various skill sets.

KPA2 focuses on job creation, economic growth and skills transfer. The proposal, as mentioned previously, will offer multiple job opportunities for personnel of various skill levels during both construction and operational phase. It will be recommended that 100% of the unskilled labour be sourced from the local community, and materials and suppliers be sourced from the local area (where possible). The construction will continue for many years as it will be undertaken in phases, therefore, job creation will be generated continuously over this period. For an individual employee with no skillset this offers opportunities for skills transfer, a salary and an opportunity to improve one's quality of life. This in turn can help support the recipients' families, which in turn can assist in supporting and improving their quality of life. Furthermore, as employees earn salaries, they are able to purchase goods from local businesses, which supports the local economy.

KPA 3 is quite direct by identifying the need to eradicate poverty and uplift communities as one of the main objectives. The proposed development of new housing and supportive facilities for the community located in Kurland provides an opportunity for this objective to be met. The provision of formal housing with basic services will create a solid base from which poverty can be tackled. There will be no need to leave your home and find water or electricity. Families won't need to worry about their structure collapsing or the lack of safety, a door can be closed and locked.

These aspects, along with the provision of supportive facilities will allow upliftment of the community and promote social cohesion. By reducing poverty and providing a safe community, social cohesion will be facilitated. No social cohesion can be expected from a community which are constantly fighting the challenges of poverty.

KPA 4 identified by the Bitou municipality's IDP (2017) places emphasis on developing infrastructure with the objective of improving access to decent quality services. By creating access to services, one is able to improve the functionality of communities, by improving conditions and quality of life. The provision of good quality services will ensure that access to those services remains uninterrupted and uncompromised. The proposed development will provide serviced infrastructure and associated infrastructure to be utilised by previously disadvantaged individuals for housing and various other supportive uses. As this will be a new development, new infrastructure and modern technology will be utilized, this will improve the quality of the services provided by reducing maintenance required, ensuring optimum efficiency and improving sustainability.

KPA7 speaks to public participation. By subjecting this proposal to the Environmental Assessment process, this unlocks an opportunity for active participation of the local community, in engaging with the planning team, and shaping the outcome of the proposal.

The IDP goes on to describe some of the key issues and priorities. In Ward 1, Kurland priorities and key issues include:

- Water and Sanitation: Additional water for informal areas plus toilets & maintenance, Old Houses – Build toilets on the Houses
- Roads and Stormwater - Provide proper street names, Walkway- N2 to monkey land, All roads to be rebuilt, Stormwater problem (Vark Plaas), Aandblom and Swarthoud Streets, Walkways on all the roads, Stormwater problem in Bidekom, Upgrade road to clinic, Construction of speed humps.
- Electricity: Street lighting from N2 forest Hall Road, Street Lights, Witbank Street, Geelhout Street, All New Houses.
- Waste Removal: Wheelie Bins, Green Waste plus Builders Rubble, Recycling Project identification – Kurland Recycling Centre and Swop Shop, construction of waste drop off facility.
- Skills Development: Skills Development Centre, SMME Support and Agricultural support.
- Business Incubation: Joint venture Wine and Tourism in Job Creation, Keep nature clean, Sightseeing, hiking trails, honeybush farming, Township Tourism Development, Encourage investors to bring business to township e.g. Usave etc., Agricultural Projects, Land for Businesses, Incubation, Agriculture.
- Housing: Proper Housing needed no shacks, Renovate old houses.
- Sport Arts and Culture - Soccer Field, Fencing of the existing sports field.
- Crime: 24 hours managed Police station, First Aid Trainee in the Building, Reservist, Surveillance Cameras, Arrest Drug dealers and clean streets from drugs.
- Health - Poor Services – Not enough help and shortage of staff, Poor Ambulance Service – Ambulance availability, there is a need for a permanent doctor.
- Education - Xhosa school for Grade R to Grade 7.
- Community Halls - Upgrade community hall, and include office space for councilor and boardroom.
- Land - Land for crop and livestock farming, Land for Churches.

The proposed development will aim at establishing to address the aforementioned priority and key issues, identified for the Kurland Area.

2.3.13. Bitou Local Municipality Spatial Development Framework (2022)

The development objectives of the BSDF are based on the SPLUMA principles referred to above. Based on the existing urban structure, population projections and a land use budget, Kurland is seen as a second order activity node. With regard to sustainable human settlements, the BSDF emphasizes that they should be based on Smart Growth principles. In short, these principles entail the following:

- A mixed of different kinds of land uses e.g. residential, retail, business and recreational opportunities.
- Well-designed compact neighborhoods.
- A variety of transportation choices including private, public and non-motorized transport.
- A variety of housing opportunities in terms of function, form and affordability.
- Encourage growth in existing communities through infrastructure upgrade, urban renewal, new amenities and densification.
- Preserve open spaces, natural beauty and environmentally sensitive areas.
- Protect and enhance agricultural land and secure these as a productive land base for food security, employment, etc.

- Smaller and cheaper infrastructure and green buildings and promoting renewable and sustainable technologies.
- Foster a unique neighborhood identity building on the unique and diverse characteristics of each community.
- Nurture engaged citizens through residential, work, and play areas.
- Engage citizens to participate in community life and decision -making.

The BSDF, 2022, indicates the Growth and Land Use Budget Summary 2025, 2040, as per the table below.

Annual Increase: Assumptions	Scenario 2: 2025 1993 People 871 Households	Scenario 2: 2040 1993 People 871 Households
Population Increment	17 968	47 843
Household Increment	7 755	20 894
Population Total	77 125	107 000
Household Total	29 669	42 808
Land Required (Incl. Backlog)* (ha)	548	1 066
- Housing (ha)	350	692
- Other Land Uses (ha)	198	374
Average Gross Density (du/ha)	29	27

*Note: * Existing Bitou LM Backlog = 8 238 units*

***Existing Urban Footprint = 2 157 ha*

According to the BSDF, 2022, the municipalities population has increased at a rate of 3.8% per annum (1 998 persons/annum) over the period 2001-2016. Similarly, the number of households has been increasing at a rate of about 5.7% (871 households per annum). The projected additional population up to 2025 is about 17 968 people, representing 7 755 additional households. Should this trend continue, the Bitou LM would need to accommodate an estimated additional 107 000 people, representing approximately 42 808 households by 2040. When adding the current housing backlog of 8 238 units (households) to the 7 755 additional households, then approximately 548 ha of land would be required for urbanisation purposes up to 2025 (based on an average gross density of about 29 units/ha). About 242 ha of the 548 ha represents land required to accommodate the existing backlog. This includes 350 ha for housing purposes and 198 ha for other land uses, e.g. community facilities, economic activities, streets, open space etc. It should also be noted that the 548 ha is based on projected permanent residents and does not specifically cater for additional holiday accommodation (non-permanent residents. By 2040 the amount of land required to accommodate permanent residents will stand at about 1 066 ha comprising 692 ha for housing and 374 ha for other uses (average density = 27 units /ha). The 1 066 ha required from now up until 2040 represents about 49.5% of the existing urban footprint of the Bitou LM, estimated at about 2 157 ha. The above figures are based on certain assumptions in terms of population growth and development density (as described) and are merely intended to be indicative and are not absolute.

With particular reference to Kurland, the BSDF notes that economic development potential of Kurland is limited while the demand for housing (884 units) continuously increases. Expansion options for Kurland are limited to two areas: Farm 562 to the south (the proposal) and two private owned farm portions (intensively used for agricultural purposes) located towards route N2 to the west.

In particular, and with regard to Erf 562, the BSDF provides the planned Kurland Spatial Structure (see Figure 7) and the following guidelines:

- Erf 562 is recognized as an area for future provision of housing.
- Certain nodes and corridors are earmarked for business and community facilities.
    - Provision be made for a secondary school in the new development, if feasible.

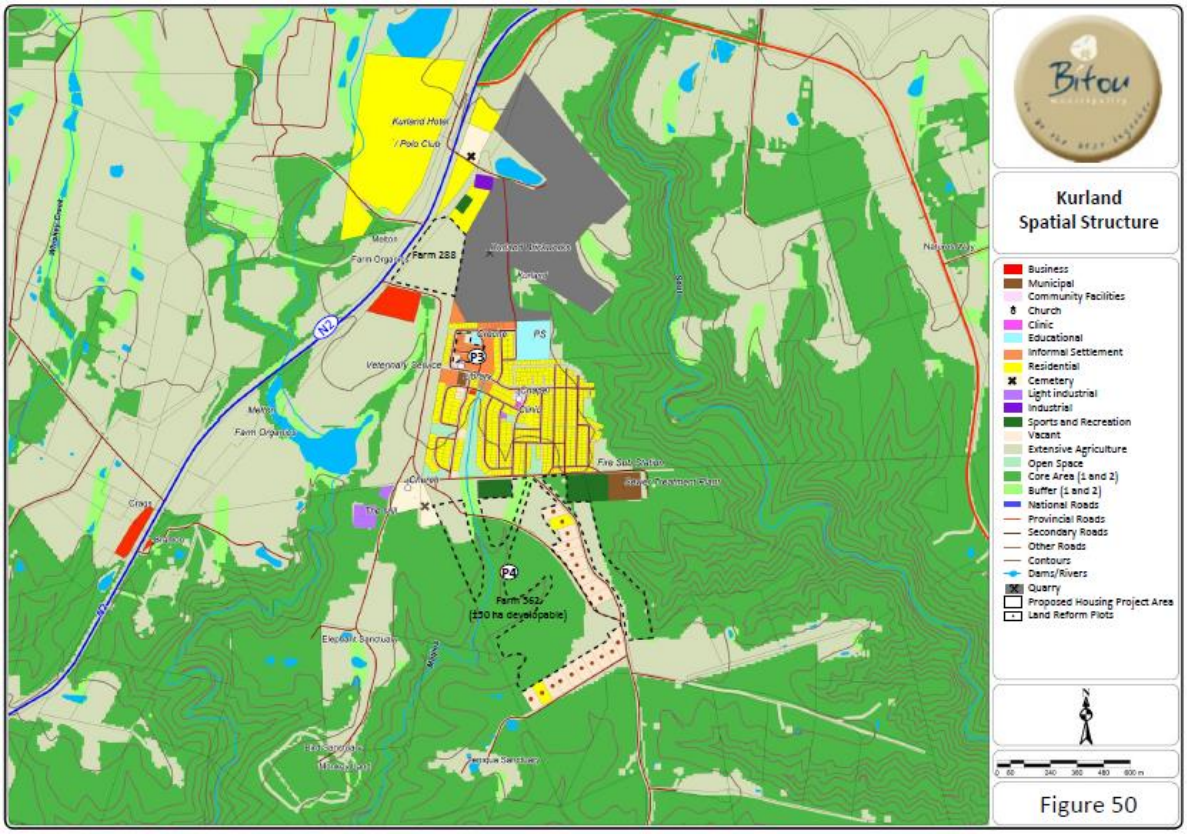


Figure 7: Kurland Spatial Structure (BSDF, 2022)

2.3.14. Bitou Housing Settlement Plan (2010)

The Housing Settlement Plan (HSP) is dated 2010 and the housing demand figures are out of date. The areas identified for housing have since been analyzed and more clearly demarcated. No mention was made of the site concerned as the availability of the land was confirmed after the HSP was drafted. The present IDP and BSDF provide more accurate and recent information on the housing demand and supply pipelines that are envisaged.

2.3.15. Bitou Land Use Planning Bylaw (2015)

The Bitou Planning Bylaw prescribes the procedure for applying for a change in land use, rezoning and subdivision and will be complied with in the planning applications to follow. Note that the environmental impact assessment study is a principle input to the finalization of a development/layout plan. Conversely the EIA has to relate to an intended land use – hence the environmental and planning processes area managed on an iterative basis to derive a feasible layout and land use rights combination.

2.3.16. Zoning Scheme By-Law (2020)

The municipality is in the process of compiling their new Zoning Scheme Bylaw. The created erven, within the proposed layout, will be zoned in terms of this By-law. This By-law will be based on the Provincial Standard Draft Zoning Scheme By-law and, in the meanwhile, the preliminary future zonings of the erven shown in the layout will be based on this Standard By-law.

2.4. Required Pre-Construction and Planning Phase - Approvals

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 3: 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 in section 2.5 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;
Heritage Western Cape (HWC)	National Heritage Resources Act (NHRA) – Section 38	Confirmation/ROD from Heritage Western Cape that no further requirements are needed in terms of compliance with NHRA Section 38.
Bitou Local Municipality	Section 36 of LUPA and Section 17 and 20 of the Bitou Land Use Planning Bylaw	The **rezoning and subdivision** of the consolidated portion into portions as shown on the layout plan need to be approved by the Municipality.

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

2.5. EIA Regulations (2017) Listed Activities

Listed Activities in terms of the NEMA Environmental Impact Assessment Regulations (2014), as amended in 2017, that are proposed to be triggered and therefore require an application for Environmental Authorisation to be submitted to the DEA & DP, as listed below.

Table 4: Listed activities.

LISTING NOTICE 1 (GN No. R327 of 7th April 2017): Basic Assessment

Activity #	Description of Activity as per GN No. R 327	Reason for Listing or NOT listing.
12	**The development of—** (i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres; or **(ii) infrastructure or structures with a physical footprint of 100 square metres or more;** **where such development occurs—** (a) within a watercourse; (b) in front of a development setback; or **(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse; —** excluding— (aa) the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour; (bb) where such development activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies; (cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies; (dd) where such development occurs within an urban area; (ee) where such development occurs within existing roads, road reserves or railway line reserves; or (ff) the development of temporary infrastructure or structures where such infrastructure or structures will be removed within 6 weeks of the commencement of development and where indigenous vegetation will not be cleared.	The proposed infrastructure will exceed 100 square metres, and will occur within 32 metres of a watercourse. This activity **IS** therefore triggered.
19	The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse; but excluding where such infilling, depositing, dredging, excavation, removal or moving— (a) will occur behind a development setback;	Potential for infilling/depositing of material into the watercourse, of a volume exceeding 10m^3.

	(b) is for maintenance purposes undertaken in accordance with a maintenance management plan; (c) falls within the ambit of activity 21 in this Notice, in which case that activity applies; (d) occurs within existing ports or harbours that will not increase the development footprint of the port or harbour; or (e) where such development is related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies	
24	The development of a road— (i) [a road] for which an environmental authorisation was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Government Notice 545 of 2010; or (ii) [a road] with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres;	Road reserve widths will be 8 – 10 meters for residential streets and 13 – 16 meters for collectors (bus routes). Although the residential road reserve width is below 13m's, the bus routes will be 13 – 16m's.
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;	More than 5ha of land, utilized for agricultural purposes, will be transformed to accommodate residential housing and related services infrastructure. 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. i. 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	The proposed development will accommodate roads of wider than 4m's with a reserve less than 13.5m, in an areas containing indigenous vegetation. Although the site is within the Municipal urban edge, it may be considered outside of the

	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.	urban area due to its undeveloped state. This activity **IS** therefore triggered.
~~12~~	~~The clearance of an area of 300m^2 or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance plan.~~ ~~(i) In Western Cape:~~ ~~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.~~	This activity **IS NOT APPLICABLE,** as the CBA area has been identified to the north of the proposed development. The development will occur on fallow lands and degraded fynbos
LISTING NOTICE 2 (GN No. R325): Scoping & Environmental Impact Reporting		
15	The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for- (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.	More than 20ha of indigenous vegetation will be cleared to accommodate the proposed housing development. This activity **IS** therefore triggered.

Therefore, in Summary the following activities are being applied for:

- Listing Notice 1: Activity No. 12; 19; and 28
- Listing Notice 2: Activity 15;
- Listing Notice 3: Activity 2; 4; and 12.

3. ASSUMPTIONS AND LIMITATIONS

EAP:

- The impact tables in Section 9 below include the potential environmental impacts and risks identified for each alternative, 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 are however only "scoping" stage assumptions and will be refined with input from the relevant specialists in the EIA Phase.
- No civil engineering design report has been supplied.

Preliminary Aquatic Freshwater Input:
The following assumptions and limitations are relevant:

- The location of the proposed development was extrapolated from data provided by the client. No shapefiles with a more accurate layout have been provided as of yet. The layout has very limited detail which makes it difficult to accurately identify and assess impacts.
- No alternatives were provided for assessment as of yet.
- No stormwater plan was provided by the client as of yet.
- Civil engineering designs have not been undertaken. It is assumed that pipeline crossings will be along the proposed roadways and that no additional crossings will be required.
- Aquatic ecosystems vary both temporally and spatially. Once-off surveys such as this are therefore likely to miss certain ecological information due to seasonality, thus limiting accuracy and confidence.
- Infield soil and vegetation sampling was only undertaken within a specific focal area around the proposed development, while the remaining watercourses were delineated at a desktop level with limited accuracy.
- No detailed assessment of aquatic fauna/biota was undertaken.
- The vegetation information provided is based on observation not formal vegetation plots. As such species documented in this report should be considered as a list of dominant and/or indicator wetland/riparian species and only provide a very general indication of the composition of the riverine vegetation communities. Please see the Botanical Report (Berry, 2020) for more information.
- The assessment of impacts and recommendation of mitigation measures was informed by the site-specific ecological concerns arising from the field survey and based on the assessor's working knowledge and experience with similar development projects. The degree of confidence is considered good.
- The study does not include flood line determination or offset calculations.
- No information regarding the proposed activities in the agricultural project area is available. It is assumed that cultivation or similar activities, will take place and that it will not occur within the watercourses of the area.
- The past land use disturbances to the soil profile and vegetation composition of this area, as well as the highly seasonal nature of the systems, decrease the accuracy of infield delineations.

Preliminary Botanical Survey:

- Since fieldwork was carried out in the summer season, flowering plants that only flower at other times of the year (e.g. winter to spring), such as certain bulbs (*Iridaceae* and *Orchidaceae*), may have been missed.
- The overall confidence in the completeness and accuracy of the botanical findings is however considered to be moderate to good.

4. DETAILED DESCRIPTION OF THE PROPOSED PROJECT

4.1. Site Location and Description of Property

4.1.1.Summary Table and Site Details

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

Table 5: Summary Table - Site Details

<table>
<tr><td>Province</td><td>Western Cape</td></tr>
<tr><td>District Municipality</td><td>Garden Route District Municipality</td></tr>
<tr><td>Local Municipality</td><td>Bitou Local Municipality</td></tr>
<tr><td>Ward number(s)</td><td>Ward No 1</td></tr>
<tr><td>Nearest town(s)</td><td>Kurland Town</td></tr>
<tr><td>Portion name(s) and numbers</td><td>Erf 940 (Portion of Erf 562), Kurland</td></tr>
<tr><td colspan="2">List of Properties, Ownership & Extent of each Property Associated with Proposed Affordable Housing Development:
<table>
<tr><th>Property*</th><th>Size (ha)</th><th>Owner</th><th>Document</th><th>Zoning</th></tr>
<tr><td>Erf 940 (A Ptn of Ptn 562) Kurland (to be registered. See Par 7.1)</td><td>74,8530</td><td rowspan="2">National Government of Republic of South Africa</td><td>S G Diagram SG.No 1920/2020</td><td rowspan="2">Agriculture</td></tr>
<tr><td>Erf 562 Kurland</td><td>95.7567 ha</td><td>Title Deed T 13951/2007</td></tr>
</table></td></tr>
<tr><td>Extent of Site (Development Footprint / Disturbed Area)</td><td>The estimated developable footprint is 43ha, and approximately 52.7ha will be retained as a natural area in the project site (excluding active parks).</td></tr>
<tr><td>SG Code</td><td>C03900060000056200000</td></tr>
<tr><td>Physical Address</td><td></td></tr>
<tr><td>Co-ordinates of the site:</td><td>33°57'27.73"S; 23°29'36.52"E</td></tr>
</table>

4.1.2.Proposed Development Location

The subject property, being Erf 940, a portion of portion Erf 562, Kurland ('the Erf"/"the subject property"), is situated south of/ adjacent to the existing Kurland area (Kurland Bricks and Kurland Village Settlement), approximately 20km north-east of Plettenberg Bay.

On a local level, the property lies south of the east-west section of Forrest Hall Road (OP 07220, servitude, tarred road), south of Kurland town, on both sides of the north-south portion of Forrest Hall Road (OP 07220, servitude, dirt road), nearly up to the Tanique access road turn-off. The Site Boundary Plan, below, shows the site boundaries and area exclusions.

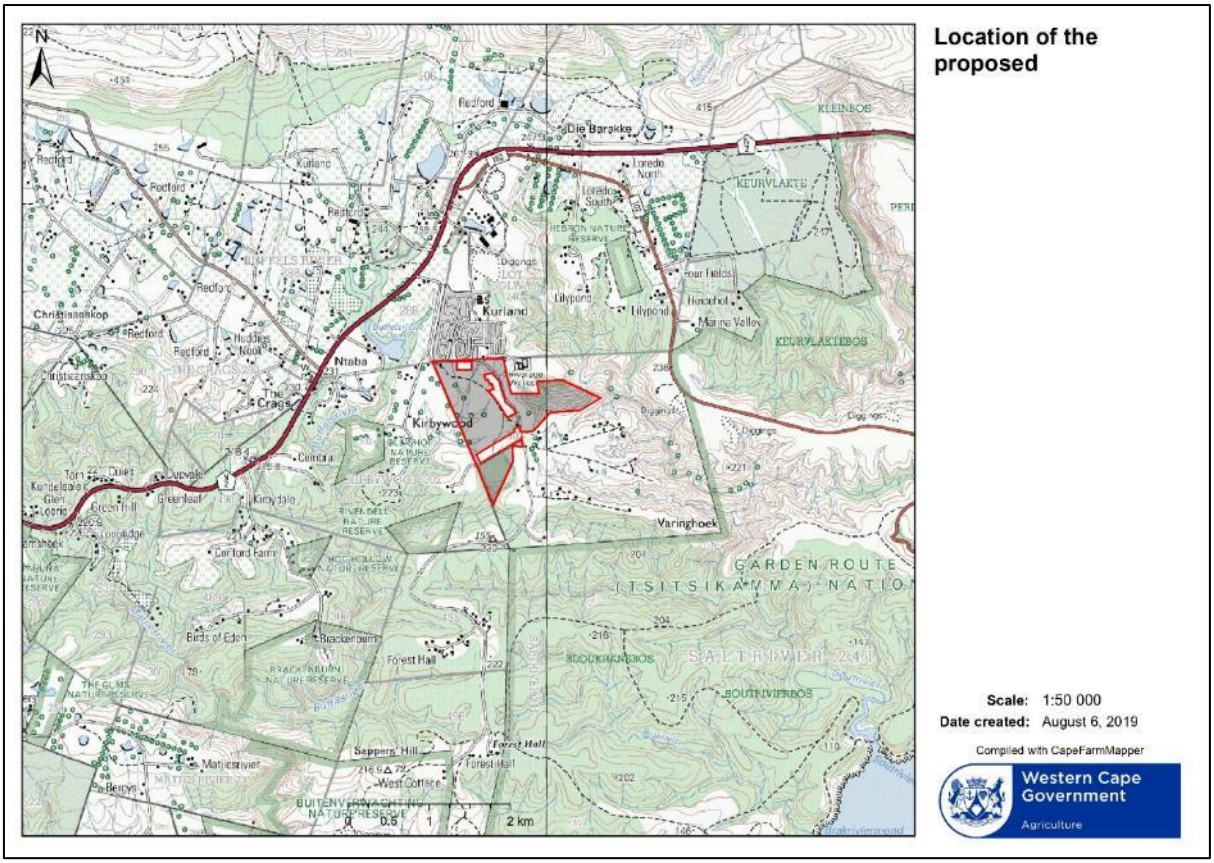


Figure 8: Locality map of Erf 562 Kurland (Source: CapeFarmMapper, 2021).

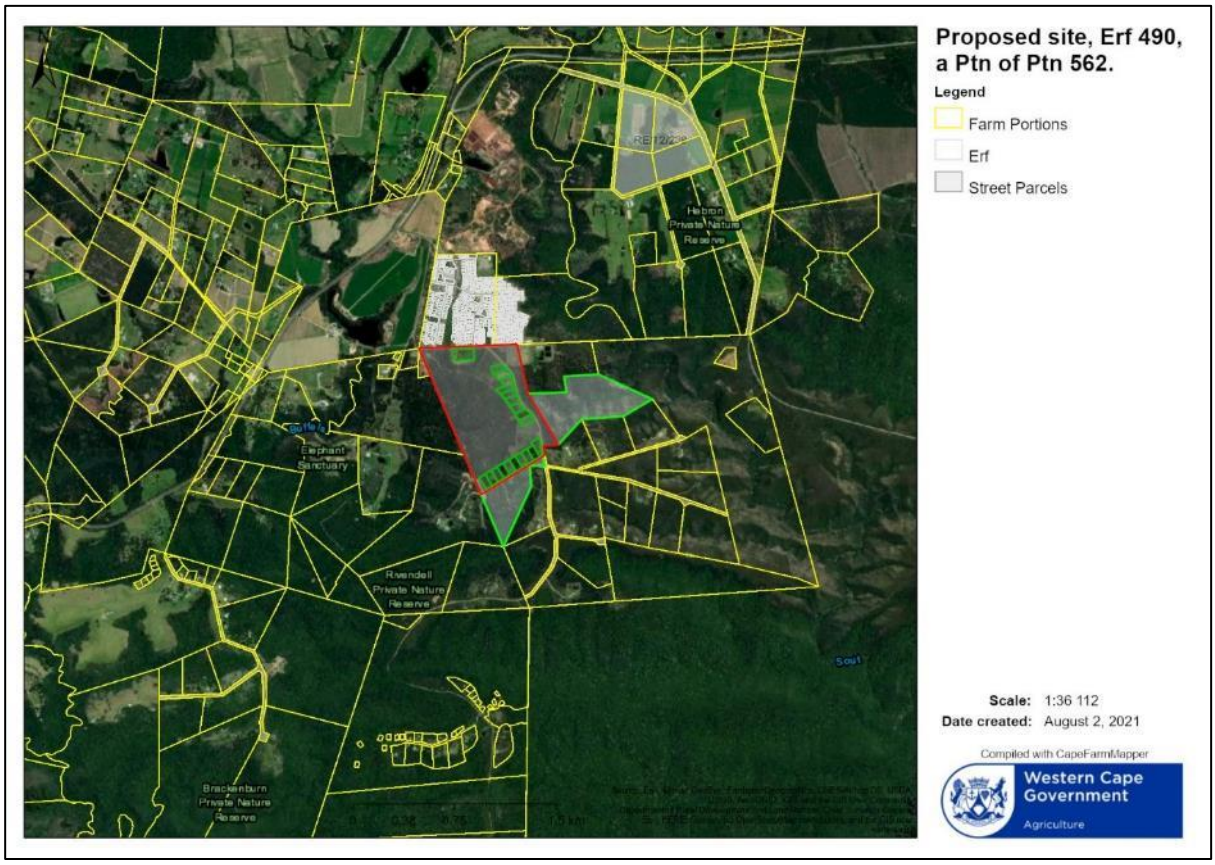


Figure 9: Proposed Site, Erf 940 (Ptn of Erf 562), Kurland.

4.2. Detailed Description of the Proposed Development

4.2.1.Proposed Development

The applicant proposes to develop residential houses and associated infrastructure on Erf 940, a portion of portion Erf 562. In essence, the Draft 1 layout plan includes six neighbourhoods/sections (Blocks A-F).
Approximate Block Areas

- Block A – 4.6ha
- Block B – 2.82ha
- Block C – 8.97ha
- Block D – 17.07ha
- Block E – 3.40ha
- Block F – 2.42ha

The aforementioned blocks form a part of an over-all development extension, integrated/linked on an external and internal level and includes, at this stage, the following land uses:

LAND USE

Proposed Land Use	No. of Erven	Area (ha)
Row Housing	1339	12,03
Semi- Detached Housing	28	0,40
Single Residential (average 180m2)	125	2,56
High Density Housing (Flats; 11units)	1	0,22
School	1	3,36
Community Facility	13	2,61
Mixed Use (Retail/Tourism / business / recreation / municipal / community facility / utilities)		1,98
Business	17	0,86
Parking / market	3	0,35
Active Parks	11	1,94
Conservation	2	11,56
Municipal	1	0,12
Roads		

Figure 10: Proposed land uses as per Proposed Layout Plan.

The proposed residential houses are likely to connect to the existing municipal bulk services, however the confirmation of availability of services will be confirmed during the Environmental Impact Assessment process.

All blocks are estimated at approximately 18m deep and may accommodate single storey- or double storey linked units on individual erven generally ranging from 72 to 300m². This development is proposed to establish an integrated housing project, including houses of various

typologies (based on a maximum 1500 units), with associated internal infrastructure including necessary services and the following intended support facilities (if required, on total site area):

- Internal active/passive open space (not conservation areas); neighbourhood- and community parks (at least seven sites);
- Community sports fields (at least one site);
- Three Creche sites;
- One School site;
- Two community facility/mixed use node areas (to accommodate supportive uses, job creation uses, retail, market, mobile services (library/clinic); post boxes, etc;
- Two or three church/religious sites;
- Areas of small business;
- Open spaces suitable for job creation projects;
- Conservation areas

This is proposed taking into account the Western Cape Government, Department of Environmental Affairs and Development Planning's specifications on "Quick Reference for the Provision of Facilities within Settlements of the Western Cape" (I.e. development parameters relating to supportive land uses).

The Schedule below provides an indication of the type of, and extent/order of facilities envisioned, which can affect the proposed land use intent as detailed above, depending on input received during the planning participation process.

<table>
<tr><th colspan="2">LAND USE</th><th>STANDARD WC:DEADP</th><th>TECHNICAL PROVISION BENCHMARK, BASED ON 1000-1500UNITS</th></tr>
<tr><td colspan="2">GENERAL LAYOUT AND DESIGN PRINCIPLES</td><td colspan="2">Strive for:
– A compact/dense settlement – to also rationalize facility size, encourage walkability, lower paring requirements and facilitate accessibility
– Space Utilization Efficiency, Multi-functionality and Clustering;
– Economies of Scale, Strategic Resource Allocation and achieving maximum impact
Four persons per dwelling unit to be used for calculation in this table.</td></tr>
<tr><td rowspan="2">RECREATIONAL FACILITIES AND OPEN SPACE</td><td>SMALL NEIGHBORHOOD PLAY LOTS/ PARK</td><td>WCD EA&DP
• Quality space, may be combined with other uses, central in neighborhoods
• 1 per 250 dwelling
• Size: 400m²
• 500m -750m walking distance from users
• Could do fewer, but better quality (for of safety/maintenance)
• Promote multi-functionality</td><td>4-6 Small Parks required (0,24ha max required)</td></tr>
<tr><td>COMMUNITY/FUNCTIONAL PLAY PARKS</td><td>WCD EA&DP
• Serves broader area
• Formal and informal recreation</td><td>0,36-0,54ha required</td></tr>
</table>

LAND USE		STANDARD WC:DEADP	TECHNICAL PROVISION BENCHMARK, BASED ON 1000-1500UNITS
		• Adjacent to schools or natural areas / multi use areas/ community uses/ agriculture plots • Not as localized as play lots • Serving wider community: accessible • 0,9ha per 250 dwellings • Minimum 1.5ha • 1-3km walking distance • Clustering of uses important	
	COMMUNITY SPORTS- FIELD	**WCD EA&DP** • May be formal or informal • Size determined by type of activity • Min size 0,2ha • Not more than 2km away from schools • 1 per 1250 dwelling units	One required – 0,2ha
	REGIONAL PARKS/ STADIUMS	**WCD EA&DP** • Regional Park: Serves region – 1 per 5000units • Within 10km • Greater upkeep requirement	Not applicable
	CEMETERIES	**WCD EA&DP** • Space intensive – not at settlement core • Ideally next to open space/ police stations/ places of public worship, in urban-rural transition area • From 0.8ha for 1250 units • A cemetery is a high-order facility and, as such, generally should only be provided at 1 per 100 000 people along public transport routes • Should not be close to hydrological features, floodplain or sensitive areas	Approx. 0,8ha space to be provided/available for 1250 units – smaller community facility – if required. Available facilities to be investigated/ requirement to be confirmed
EDUCATIONAL FACILITIES	ECD (Early Childhood Development Centers/Pre-	**WCD EA&DP** • 0,15m² per person of the residential population it serves	Note: – acknowledge existing facilities in Kurland

LAND USE		STANDARD WC:DEADP	TECHNICAL PROVISION BENCHMARK, BASED ON 1000-1500UNITS
	primary school, including Daycare, crèche nursery school, after-care.	• Min building footprint: 130m² to 500m² (large ECD) • 1.5m² per child (site area) • walking distance 750m (15min) • 1 ECD for every 600 families needed • Preferably on route to school	– Crèches may be operated from residential premises (with consent, if larger) Three formal ECD sites may be required (combined 900m²)
	PUBLIC PRIMARY SCHOOL	**WCD EA&DP** • 1 Primary school per 1000 dwellings, if required by the Education Department • Min size 1.4ha (excluding sports-fields) or 2,8ha if sports-fields included • Walking distance 1.5Km (30min walking) • Linkage to food-garden areas to be encouraged • Preferably on a higher order road, flat area	Primary school site not required by the Department of Education
	PUBLIC SECONDARY SCHOOL	**WCD EA&DP** • 1 Primary school per 1500 dwellings (some schools serve up to 6250 families) • Min size 2,6ha, if not shared and 3ha if includes sports-fields • Walking distance 1.5Km (30min walking) • Linkage to food-garden areas to be encouraged • Preferably on a higher order road	1 Secondary school site required by the Department of Education.
	TERTIARY FACILITIES	**WCD EA&DP** - Generally speaking, tertiary education facilities are regional facilities, serving the population far beyond its immediate surrounds - The site size needs to be determined by the size of facility to be provided, which should be benchmarked against the site size of similar educational facilities	Best suited in larger urban centers – no requirement on the specific site for such regional facility.

LAND USE		STANDARD WC:DEADP	TECHNICAL PROVISION BENCHMARK, BASED ON 1000-1500UNITS
		- Minimum threshold = 37500- 250 000 families, depending on the type of facility	
HEALTH & WELFARE FACILITIES	MOBILE CLINIC	**WCD EA&DP** • 1 per 1250 units • The mobile clinic should be placed in a central/accessible location to capture the majority of surrounding potential users and generally within walking distance • The ideal location for a mobile clinic may be a centrally located local park, community centre, or government facility precinct – if it should exist • The mobile clinic should appear in the same place, generally at the same times and in a predictable manner • Sheltered waiting areas and ablutions preferable • walking distance 1Km • preferably at cluster of community facilities/uses	Reach and capacity of existing clinic to be confirmed Space to be identified for possible mobile clinic
	COMMUNITY HEALTH- LOCAL PUBLIC CLINIC	**WCD EA&DP** • 1 per 5000 dwellings in rural areas • Close to public transport routes, away from environmentally sensitive areas • Size depends on population served: 0,125ha per 5000 people 0,25ha per 10000 people 0,5ha per 20000 people 1ha for 40 000 people • Walking distance 2-5Km or on public transport route	Capacity of existing Kurland clinic to be confirmed Community too small to warrant an additional facility – to be confirmed
	PUBLIC HOSPITALS (SECONDARY FACILITIES)	**WCD EA&DP** • Regional / District Facility • Close to highway • 1 per 112 500 dwellings	Regional – See Spatial Development Framework

LAND USE		STANDARD WC:DEADP	TECHNICAL PROVISION BENCHMARK, BASED ON 1000-1500UNITS
	PUBLIC HOMES FOR THE AGED	**WCD EA&DP** • 1 per 16 250 dwellings • Examples 0,3-2.2ha • Based on need (as per the Department of Social Development) and policy of governing authority re home based care • Close to public health care facilities and other amenities, public transport	Regional – See Spatial Development Framework
	CHILDRENS HOMES	**WCD EA&DP** • Need based on demand • Generally: 1 per 10-15 000 dwellings • Near to schools/community facilities • 30min walk to primary school • Size 2ha, or smaller if clustered with other support uses	Refer to Socio-Economic study Note that Places of Safety may house children in residential homes, with the required permits.
	LIBRARIES	**WCD EA&DP** • 1 per 2500 dwellings • Clustered with other community facilities • 0.1 to 0.2 ha • walking distance 4-5Km • Mobile libraries may be considered	Library (extent and reach) in Kurland to be confirmed
	PLACES OF WORSHIP	**WCD EA&DP** • Placed within walking distance of its users, and be located along main roads of a neighborhood • 1 per 500 dwellings (depending on religious diversity) • From 150m² to 0,3ha • Within 1.5km walking distance	2-3 sites to be provided
	COMMUNITY CENTRES/HALLS	**WCD EA&DP** • Central to overall community, combined with other uses such as libraries, clinics, etc. • 1 per 2500 dwellings • Walking distance 500m (15min walk) to 2.5km	Existing Kurland Community Hall provided

LAND USE		STANDARD WC:DEADP	TECHNICAL PROVISION BENCHMARK, BASED ON 1000-1500UNITS
		• 5min walk from public transport point	
PUBLIC SERVICE FACILITIES	MAGISTRATES COURT	**WCD EA&DP** • Regional Facility – one per magistrates district	Magistrates court situated along N2 in New Horizons
	HIGH COURT	**WCD EA&DP** • Regional Facility • 1 per 50 000 families (minimum) • In major urban nodes	Not applicable
	MUNICIPAL OFFICE	**WCD EA&DP** • Central – in urban node • Minimum population: 50 000 (12500 units) • Min size: 3 000 m², depending on clustering of uses • 2km walking distance or on public transport route	Main municipal office not required – regional function Municipal pay-point/general multi use space may be considered
	POST OFFICE	**WCD EA&DP** • 1 per 2500 units • Min size 100 m² • walking distance 1.2km/public transport • Could be space in shopping facility • Can be clustered with municipal uses	Space provision/allocation in greater community area to be confirmed by PO
	POLICE STATION	**WCD EA&DP** • Central in regions they serve 1 per 6250 units in a rural setting • Min size: 0.1-1ha • Within 4-8km, within developed (settlement) areas. Not always possible in a rural context • Satellite facilities may be considered by SAPS	Regional Function Extent and reach of the Crags Police Station to be confirmed
	FIRE STATIONS	**WCD EA&DP** • On higher order road – central and/or close to risk areas • Allowing for 8-13min response time (23min in rural areas) 1 per 15 000 units • Min size: 1.2ha • Not directly adjacent to residential areas (noise /24hour factor)	Extent and reach of existing fire service to be investigated.

LAND USE	STANDARD WC:DEADP	TECHNICAL PROVISION BENCHMARK, BASED ON 1000-1500UNITS
	• Not in highly congested areas	
WASTE MANAGEMENT FACILITIES	**WCD EA&DP** • Regional Municipal Facility – from 90ha • Should not be within or adjacent to sensitive ecological areas, heritage areas or water catchment areas or steep areas • The Minimum Requirements for Waste Disposal at Landfill, 2nd Edition (Department of Water Affairs and Forestry, 1998) provides a comprehensive set of locational criteria.	Regional facility not required, Waste transfer site/ recycling initiatives may be investigated.
WASTE WATER TREATMENT FACILITY	**WCD EA&DP** • Technical requirements determine size • There are no accessibility, distance and site spacing criteria for a wastewater treatment facility, however, cognizance must be taken of the National Water Act, 1998 (Act No. 36 of 1998) requirements, where the treatment facility should be located 100m away from a watercourse. • The site must not be proximally windward of any residential area or a buffer area may be required • Sewage Treatment Facilities must cater for the size of the population and anticipated future growth; average dry weather flow, wet weather flow and storm water ingress. • DWAF effluent standards apply • All wastewater treatment facilities must cater for	Technical determination of existing facility's capacity and upgrading requirement to be done.

LAND USE	STANDARD WC:DEADP	TECHNICAL PROVISION BENCHMARK, BASED ON 1000-1500UNITS
	the volume of effluent produced.	

4.2.1.1. Residential

The key component of this development proposal is the proposed subsidy, gap and affordable housing. According to the Bitou Spatial Development Framework, there is an estimated 4 298 families, accounting for the Bitou housing backlog. A large portion of the informal population reside in additional/backyard structures within the area, furthermore, the SDF estimates that approximately 64% of the households in the identified population qualifies for subsidy housing.

As per the Town Planning Report, 2021, the project intent is to accommodate the current backlog (waiting list of 870 families) and expected increase in demand which could be accommodated on the developable portion of the project site to another 630 families, giving as total of ± 1500 families. This intent translates to the density proposed, therefore alternative densities may result in an additional demand for the purchase/expropriation of land, in the Kurland area, to accommodate the expressed need. The required densities, in turn, dictates the housing typologies to be accommodated on site.

A proportion of the developable land component will be dedicated to the provision of urban supportive facilities, such as education-, retail/commercial-; social/health-; recreational and other urban supportive uses. This integrated approach makes the effective use of residential land more critical. The layout makes provision for more than the present (previously calculated/established) demand for subsidy housing but rather for the potential of the site.

Proposed design, densities and typologies as per the Town Planning Report, 2021:

- Five clusters/parts of neighbourhood/village cells are formed by the formative elements on site;
- One of these components/parts should accommodate a school/sport area – two alternative positions have been investigated thus far. The option of placing the school site adjacent to the eastern sportsfield, to be used in conjunction with the municipal area (21/303) is preferred since there is sufficient space and a skills/educational/recreational node can be considered;
- Draft alternative layouts, for discussion purposes, is based on 18m deep blocks, which may accommodate single storey- or double storey linked units on individual erven generally ranging from 72 to 300m² (principle designs below)_ anticipated 250m²;
- To accommodate the backlog on site, linked units, on a small development footprint is proposed, rather that large, single unit erven, spread over a much larger footprint (more than one extension area);
- Residential use will be clustered into neighbourhoods, around central 'square' areas;
- Linked blocks should, as far as possible be placed on the contour and no more than six units to be linked;
- The side units of the linked blocks, should in some instances, be single storey units for specific allocation to older beneficiaries and the disabled;
- Units in linked blocks to be placed in such a way that back-yards don't abut 'visible' roads;
- Preferably pan-handle design should not be used.

4.2.1.2. Road Network

- Road hierarchy adopted: 20m; 16m, 13m; 10m wide reserves as required by the Bitou Municipality Minimum Standards for Civil Engineering Infrastructure.
- Forrest Hall Road, from north-west corner of the site, to the south eastern corner of the central area, deemed to be a seam, i.e. spine within a developed area: Fully designed, 20m wide reserve, traffic calming circles proposed (to be designed – detailed traffic input to be incorporated);
- Forrest Hall Road reserve area to be widened to 20m, depending on position of engineering services, upgrading (road and service) design. Outline Services Reports/Input to advise;
- Circles (or other design functions) introduced to increase legibility and reduce speed on main road network;
- Intersection to north-west of site (external) to be considered to facilitate split in traffic to Animal Alley and Church/cemetery/ woman on the move and other use areas;
- Existing road to Municipal works to be formalized and extension to be facilitated in design;
- Existing linkage lines into Kurland Village to be used to foster integration;
- A secondary spine to be accommodated to separate walking residents, away from the main spine or the main spine to be designed to enable separated pedestrian movement;
- Street design to enable access to holdings along Forrest Hall Road, although future uses on these properties will be subject to separate traffic impact investigations;
- Some access linkage to the south, from the Central portion, (across the agricultural holdings) and to the west to be investigated;
- Street naming process to be initiated. Theme provisionally proposed: Forrest trees/plants (linking to Forrest Hall Road);
- Public Transport terminus not required internally (Subject to TIA)– lay-byes to be provided in higher order road reserves only.

4.2.1.3. Open Spaces

- Low lying 'fingers' (guided by contours) and aquatic buffer areas excluded from the development area, where practical. Retained in the layout as interconnected open space;
- Majority of demarcated sensitive biodiversity areas excluded from development area, subject to practical layout considerations and maintenance considerations;
- Green spaces to be extended to form human-scale linkage between cells;
- Open Space system extended to include storm water management areas and soft open spaces;
- Green space vehicular crossings kept to a minimum;
- Distinction to be made between active and passive/conservation green spaces;
- Residential design to allow roads along the open space and/or 'eyes on site' – views from double storey units. Open spaces should not be too wide. Views across these 'fingers' to be facilitated;
- The majority of the eastern part of the site (21ha of the 28ha) will remain undeveloped based on environmental input/area delineation;
- The 'dam area' in the central part should possible be kept as part of a park and is not considered a permanent water feature.

4.2.2.Civil Engineering Services

According to the Preliminary Design Report for Internal Civil Services for Erf 562, Kurland, Bitou Municipality September 2021 (Rev 0), compiled by Niel Lyners and Associates (Pty) Ltd, the following preliminary designs were indicated:

4.2.2.1. Design Criteria

All design criteria will be based on the "Guidelines for Human Settlement Planning and Design"referred to as the "Red Book", the National Building Regulation (SABS 0400) and will be considered in conjunction with "DOHS: Minimum design and construction standards for internal A Grade engineering services". Furthermore, all standards will comply with the Civil Engineering Department of Bitou Municipality where applicable.

4.2.2.2. Provisional Layout & Number of Units

Provisionally the requirement in terms of the number of units are in accordance with the table below:

ERF NUMBER	NUMBER OF UNITS	CUMULATIVE UNITS	DEVELOPABLE AREA	DENSITY	NOTE
562	1500	1500	51.9 ha	28.9 units/ha	Primary Scope
562	74	1574	N/A	N/A	Infill housing
565-573	237	1811	4.56 ha	52 units/ha	Additional (Private property surrounded by Erf 562. High probability that erven will be developed by Bitou Municipality in the future)
574-583	269	2080	5.18 ha	52 units/ha	

Figure 11: Provisional road layer works and deatil (Extracted from Appendix F3).

4.2.2.3. Roads

The structural design period of all pavement layers should be 20 years. Structural design of layers will be in accordance with the TRH4 and the "Red Book" requirements and the envisaged traffic. ITS (Pty) Ltd traffic engineers were appointed for a traffic statement.

- *Access*

Access to the development will be via Western Cape Government (WCG) OP7220 which links directly to National Route 2. WCG traffic engineers recommended that OP7220 must be de-proclaimed as a provincial road to become a municipal road. The recommendation is based on the fact that upgrading it to municipal standards will be more affordable for Bitou Municipality if both the capital and maintenance costs of the upgrades are considered. Upgrading to provincial

standards will be approximately 20% more expensive. Bitou Municipality will have to maintain the road on an annual basis with a potential reseal once every fifteen (15) years.

Detail outlining the required upgrades of the access road is included in Traffic Impact Assessment done by ITS under Annexure C (Appendix F3).

- *Internal Road Specifications*
  - Road Reserve Widths
    Road reserve widths will be 8 – 10 meters for residential streets and 13 – 16 meters for collectors (bus routes).
  - Road Widths
    Road widths will be 4.5 meters for residential streets and 7.4 meters for collectors (bus routes).
  - Bellmouth Radii and Proposed Refuse Truck Route
    In keeping with the urban design philosophy, the bellmouth radii will be kept as small as possible. The radii will vary between 8 meters and 12 meters. The 12 meters radii will be provided along the proposed refuse truck routes.
  - Provisional Road Layerworks:
    The following minimum specification applies to the layerworks:

LAYER	4.5m WIDE RESIDENTIAL	7.4m BUS ROUTE
SURFACING	30mm continuously graded asphalt. Alternative: Interlocking brick or block paving	40mm continuously graded asphalt. Alternative: Interlocking brick or block paving
BASE COURSE	150mm G4 commercial source natural gravel to have CBR of 80 compacted to 98% MOD AASHTO	Preferred: 150mm G3 commercial source crushed stone compacted to 98% MOD AASHTO Alternative: 150mm G3 commercial source natural gravel to have CBR of 80 compacted to 98% MOD AASHTO
SUBBASE	150mm G5 commercial source natural gravel to have CBR of 45 compacted to 95% MOD AASHTO	150mm G5 commercial source natural gravel to have CBR of 45 compacted to 95% MOD AASHTO
ROADBED/SUBGRADE	150mm G7 compacted to 93% MOD AASHTO	150mm G7 compacted to 93% MOD AASHTO

  - Kerb
    The following kerbs are considered a conventional application for this type of development:

ROAD DESCRIPTION	KERBING	
	HIGH	LOW
7.4m Bus Route	BK2 & C1	BK2 & C1
4.5m Wide Residential	MK10	CK5

➢ Miscellaneous Road Design Detail

DESCRIPTION	SPECIFICATION
BRICK PAVING	73mm bricks, laid herringbone interlocking patten on 20mm clean bedding sand. Bricks to conform to SANS227, class FBXE, 21 MPa min
ROAD MARKINGS AND SIGNAGE	To comply with South Africa Road Traffic Sign Manual (SARTSM)
CROSSFALL	Minimum 2%
DESIGN SPEED	40km/h

4.2.2.4. Water Supply

- Water demand

The peak hour demand (PHD) is calculated in the table below incorporating the following parameters:

- Household Water Demand: 600 □ /day/unit
- Peak Hour Demand / Instantaneous Peak (PHD): PF (hr) = 4,0
- Un-accounted Water (UAW) = 10%

ERF NUMBER	NUMBER OF UNITS	CUMULATIVE UNITS	AADD (+UAW) (kℓ/d)	AADD CUMULATIVE (kℓ/d)	PEAK HOUR DEMAND (ℓ/s)	PEAK HOUR CUMULATIVE DEMAND (ℓ/s)
562	1500	1500	990.00	990.00	45.83	45.83
562	74	1574	48.84	1038.84	2.26	48.09
565-573	237	1811	156.42	1195.26	7.24	55.34
574-583	269	2080	177.54	1372.80	8.22	63.56

At detailed design stage the internal network will be designed to accommodate the required peak hour demand of 63.56 l/s during peak hours without exceeding the maximum velocity. In addition to the peak hour demand, the network will be designed to comply with the requirements of design fire flow as per the "Red Book". In terms of the operating pressures, the network will be designed to not drop below six (6) meters head during instantaneous peak demand conditions and also not to exceed above (sixty) 60 meters head during any time of operation.

- Internal Water Network

The internal water reticulation system will consist of uPVC pipes varying in size ranging between

90mm and 160mm diameter with the necessary provision made for isolating valves, pressure reducing valves, fire hydrants, required erf connections and water meters. Isolating valves will be installed so that it requires a maximum of four (4) valves to close a pipe section. No valves shall be located in the road surface. All water infrastructure relating to bulk supply and distribution will be located in the road reserve as far as practically possible.

For erf connections, 25mm ID (two erven on other side of road), 20mm ID (two erven on same side of the road) and 15mm ID (one erf) erf connections will be installed.

Pipes will be installed with minimum cover of 800mm.

- Bulk Water Supply Infrastructure

The existing bulk water supply to the Kurland area needs to be supplemented to ensure sufficient bulk water supply for the existing Kurland Township, for the development on Erf 562 as well as for future growth of the area over the next 20 years.

This will be addressed in a separate proposal.

4.2.2.5. Sewerage

- Design Flow Erf 562

The instantaneous peak dry weather flow (IPDWF) & instantaneous peak wet weather flow (IPWWF) generated by the development of erf 562 is calculated in the table below incorporating the following parameters:

- Household Average Daily Flow: 500 l/day/unit
- Peak Factor: 2.5
- Extraneous Flow: 100% Average Daily Dry Weather Flow (ADDWF)

- Design Flow to Existing Kurland PS1 (Pumpstation)

GLS's 2020 Sewer Masterplan recommends that the existing Kurland PS1 be decommissioned. Inevitably a pumpstation needs to be constructed downstream of existing Kurland PS1 to accommodate the flow from development of erf 562. It is not considered feasible to keep Kurland PS1 operational considering a pumpstation will be constructed downstream that can accommodate the flow of existing Kurland PS1.

Decommissioning Kurland PS1 will result in reduced operational and maintenance cost for the municipality. The instantaneous peak dry weather flow (IPDWF) & instantaneous peak wet weather flow (IPWWF) generated by existing housing upstream of Kurland PS1 is calculated in the table below incorporating the following parameters:

- Household Average Daily Flow: 500 □ /day/unit
- Peak Factor: 2.5
- Extraneous Flow: 100%

ERF NUMBER	NUMBER OF UNITS	ADDWF (k ℓ /d)	IPDWF (ADF * 2.5) (ℓ /s)	IPWWF (IPDWF + 100% ADDWF) (ℓ /s)
VARIOUS	475	237.5	6.87	9.61

Alternative sewer outfall concepts will be explored.

- Crossing Non-Perennial Drainage Lines

Where required non-perennial drainage lines will be crossed by means of open excavation and laying the pipe underground. In conjunction with material density requirements for backfill, the pipe and backfill material will be protected with gabion mattresses to avoid future erosion and damage to the pipeline during flood conditions. A typical detail of this type of crossing is included in Annexure G (Appendix F3).

Pending a detailed design, crossing of non-perennial drainage lines may require crossing over the drainage lines if excavations exceed minimum depths for underground crossings. Crossing over drainage lines will be done by means of pipe bridges if required. Considering the information available at this stage, it is estimated that crossing over drainage lines may only be required at the locations as shown on Figure 5.1 and Figure 5.2 (Appendix F3). A detail of this type of crossing is included in Annexure G (Appendix F3).

- Pumpstations

Pumpstations will be designed to have an overflow storage capacity of four (4) hours considering the average daily flow rate. The overflow storage for the large (West 1) pumpstation will be accommodated in an open lined pond as it is considered the most feasible in terms of cost considering the large volumes. Other pumpstations overflow storage will be accommodated in the sumps.

Sumps will be sized, and pump operating controls placed so as to restrict pump starts to a maximum of six times per hour. Typical detail of a sewage pond and pumpstation including generator room is included in Annexure H (Appendix F3).

Screens will be included in the design for the protection of pumping equipment.

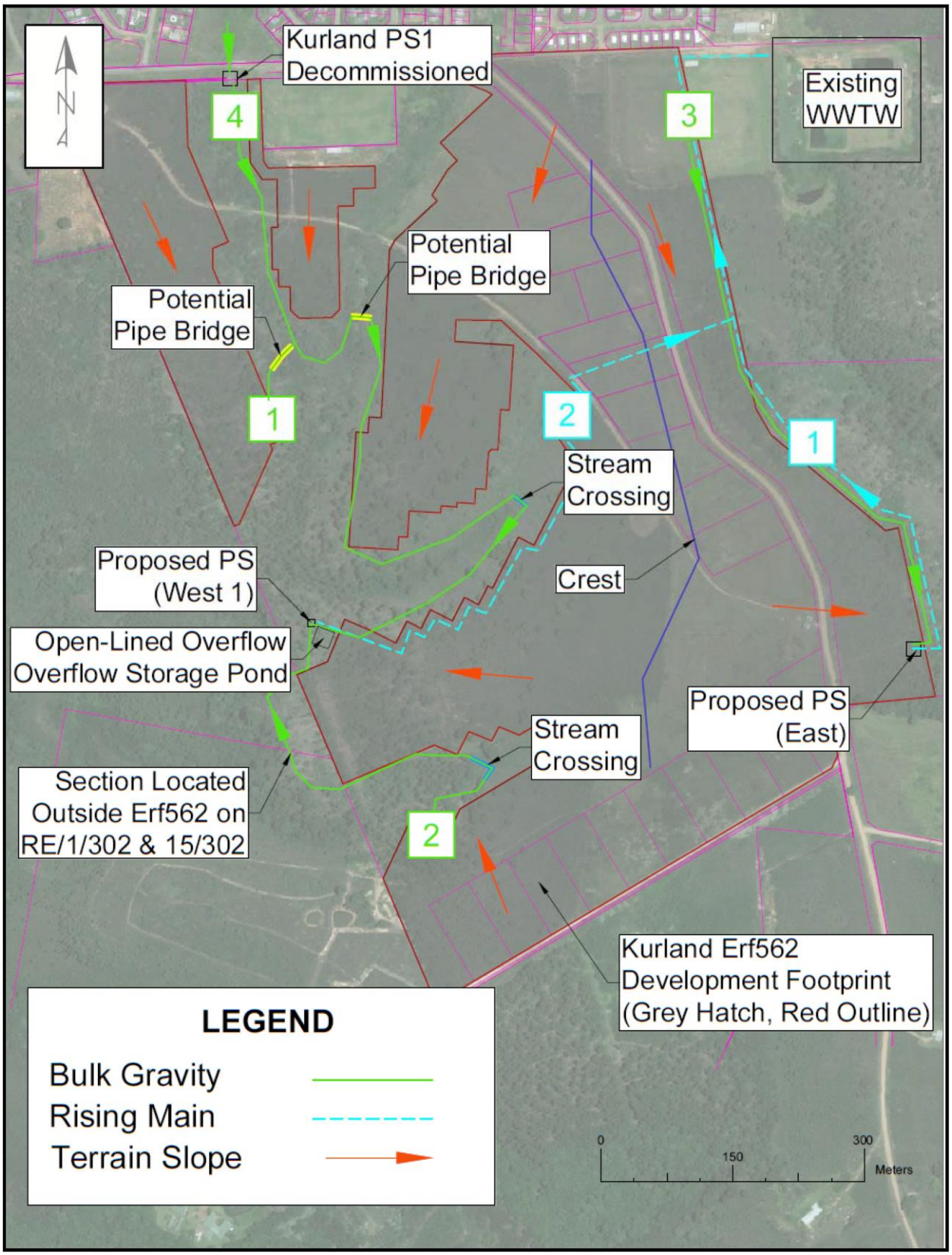


Figure 12: Preferred Sewer Outfall Concept (Appendix F3).

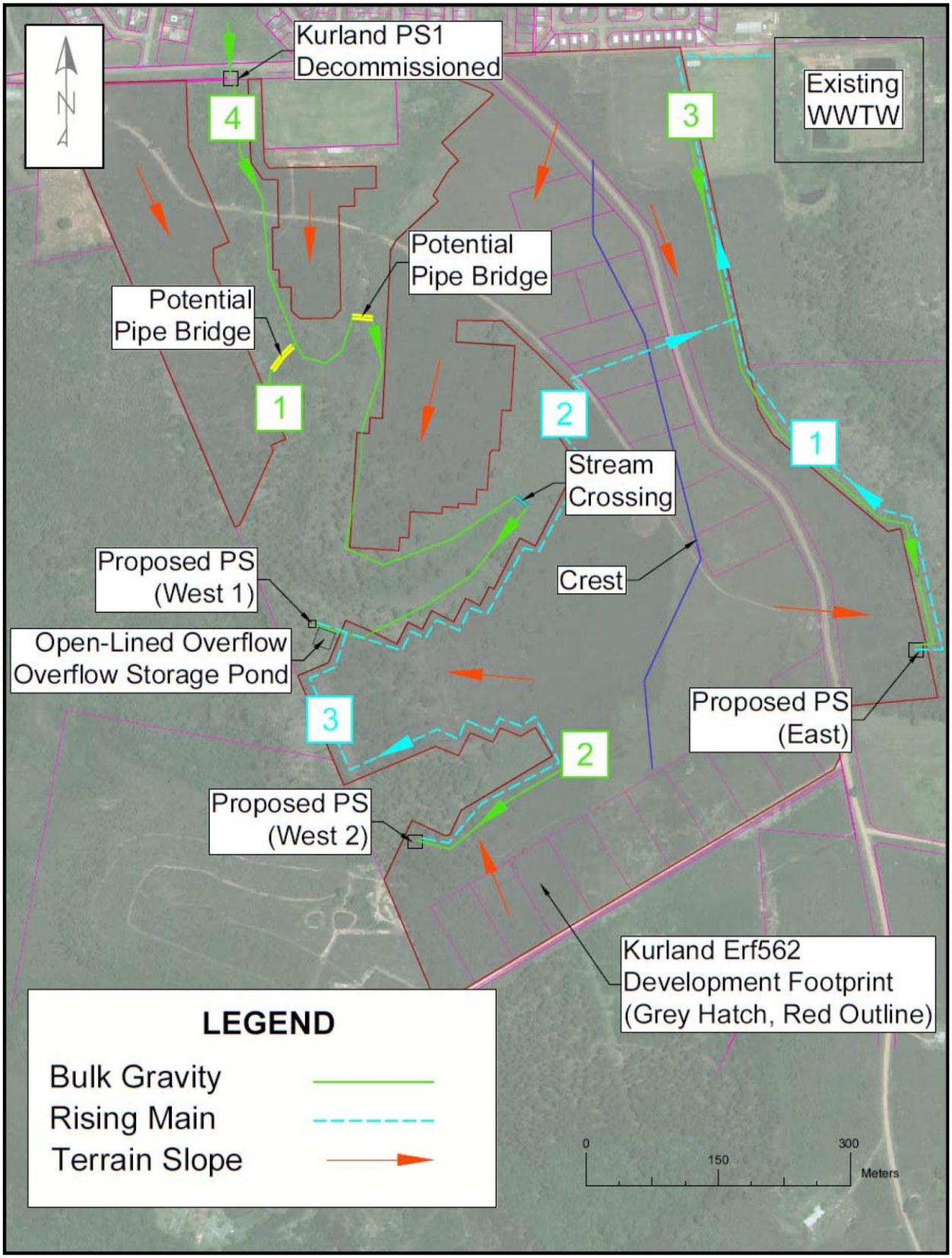


Figure 13: Alternative Sewer Outfall Concept (Appendix F3).

- Rising Mains

The minimum diameter rising main to be incorporated in the design will be 90mm diameter uPVC. Pending detail design, it is foreseen that the largest rising main to be installed can have a potential

size of up to 250mm diameter. Rising mains will be designed to have a velocity of between 0.7 m/s and 2.5m/s. Ideally the velocity will be kept as close to 1.2m/s as possible for optimum energy consumption. Rising mains will be fitted with air release valves and scour valves in accordance with "Red Book" standards.

- Bulk Sewer Infrastructure (WWTW)

The existing activated sludge plant servicing the area seems to function very well. However, increased treatment capacity is required to enable accommodation of an estimated increase future flow and load. Based on the actual flow and load data available, the rated capacity of the current infrastructure is roughly 0.6Ml/d or a population equivalent of roughly 5 200.

The existing WWTW is proposed to be upgraded to a capacity of 1.35 ML/day to accommodate the proposed flows from Erf562 and surrounding erven to be developed as described under section 5 of this report. Bitou Municipality plans to (and have budgeted) upgrade the existing WWTW over the next three (3) financial years and have appointed consulting engineers for the planning and design phases.

See attached Annexure E and F which includes GLS's Master Planning and a technical memorandum detailing the upgrades required for Kurland WWTW (Appendix F3).

4.2.2.6. Stormwater

- Design Approach

The storm water drainage will be designed in accordance with the philosophy of providing for a minor and major system. Careful attention will be given to the layout of the road reserves to drain captured and overland storm water away from the proposed development.

The major system will consist of roads and open channels to ensure overland escape routes for the larger storm run-offs. The minor system will consist of kerb inlet catch pits and underground storm water pipes.

The minor system will be designed to accommodate the 1 in 2-year return period run-offs and the major systems for the 1 in 20-year run-offs. The minimum pipe diameters will be 450 mm for longitudinal runs and catch-pit connections as per the Bitou Municipality's standards. The maximum size outfall stormwater pipes are expected to be 800mm in diameter.

Refer to Annexure K for stormwater management plan (Appendix F3).

- Stormwater Drainage Systems

As per environmental study by Sharples Environmental Services cc dated February 2020, three natural stormwater drainage systems (non-perennial drainage lines) exist on the site. The three stormwater systems are shown on the figure below:

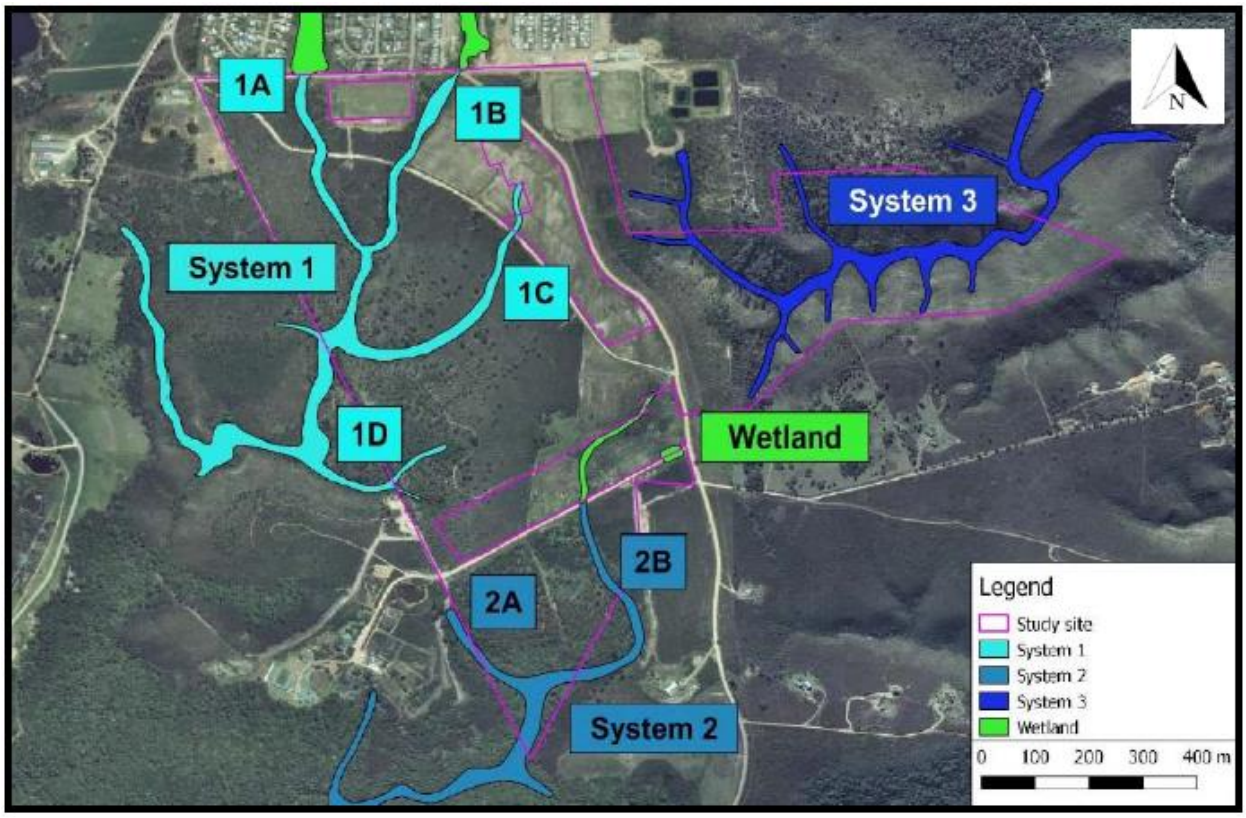


Figure 14: ERF 562 natural stormwater drainage systems.

- Direction of Post Development Flow

The detailed stormwater design will aim at maintaining the proportioning of the run-off between the three natural stormwater drainage systems.

- Outlets

At major outlet structures provision for energy dissipation and erosion protection will be provided where required. A typical detail of an outlet structure including erosion protection is included in Annexure I (Appendix F3).

- Pre/Post Runoff

Considering the relatively undeveloped area downstream of the catchments of the three natural stormwater systems, attenuation dams is not deemed necessary in the design. Any flooding downstream as a result of the development is not foreseen.

4.2.2.7. Solid Waste

The development will be incorporated in the existing municipal waste infrastructure and the municipality will collect the solid waste at approved collections points. At a rate of 2 kg/person per day and 5 persons per unit the mass of waste that will be generated by the full development (Erven 562, 565-573 & 574-583) will be 20.8 tons per day.

4.2.2.8. Bulk Earthworks

Bulk earthwork planning will be done for the individual phases and will be planned and optimised with the layout and phasing of the various areas. It is foreseen that platforms will be formed for the roads along sloped areas but no platforms will be required on the erven as erven are only developed on slopes of less than 1:4 gradient.

4.2.2.9. Recommendations

The following are recommendations to facilitate the successful development of this site, were made by the consulting engineers:

- Cadastral boundary and required servitudes to be finalised;
- Cost estimate of required civil engineering services to be completed.

4.2.3.Geotechnical Input

According to the "Phase 1 Geotechnical Report - Proposed Subsidy Housing Project on Erf 562 Kurland, Bitou Municipality, Western Cape" undertaken by Outeniqua Geotechnical Services, on the 17 May 2021 (Rev 0). It was concluded that the site is potentially suitable for subsidy housing purposes, but there are some significant geotechnical constraints which may have an impact on the engineering design and subsidy variations. Some recommendations are offered for consideration by the civil and structural engineers. Special precautionary measures were recommended as follows:

- A geotechnical specialist should be involved in earthworks and the construction of foundations to assist the engineer with quality control.
- Compaction control testing is essential during construction.

Further to this, the following was advised as per the various activities:

- **Foundation and Earthworks:**

The applicable geotechnical subsidy variations have been tabulated below, and utilized to classify the site in relation to the geotechnical terrains:

Geotechnical Conditions	Category or type	Criteria	Precautionary measures	Applicable areas	Comment
Seepage / groundwater	Category 1	Permanent or perched water tables less than 1.0m below ground surface	Subsurface drainage/improved damp-proofing measures to houses, service trenches to be dewatered during construction	All areas	Seasonal
	Category 2	Permanent or perched water tables more than 1m but less than 1.5m below ground level	Service trenches to be dewatered during construction	N/A	
Erodability of soil	Category 1	High risk (Erodability index 1-8)	Retaining walls & earthworks to reduce slopes & surface drainage	N/A	
	Category 2	Medium risk (Erodability index 9-15)	Retaining walls & earthworks to reduce slopes	N/A	
Hard excavation	Category 1	Hard rock excavation to a depth of 1.5m	Additional cost of trench and foundation excavation	N/A	
	Category 2	Boulder excavation to a depth of 1.5m	Additional cost of trench, foundation and road excavation	N/A	
Dolomite	Category 1	Risk class 1&2 (Dolomite area class D2)	Additional cost of foundations	N/A	
	Category 2	Risk class 3&4 (Dolomite area class D3)	Additional cost of foundations	N/A	
Expansive Clays	Category 1	H1	Foundation design, building procedures and precautionary measures: Modified normal	N/A	
	Category 2	H2	Foundation design, building procedures and precautionary measures: Stiffened raft	All areas	Improved foundation systems
	Category 3	H3	Foundation design, building procedures and precautionary measures: Cellular rafts/piles	N/A	
Compressible and Collapsible soils	Category 1	C1	Foundation design, building procedures and precautionary measures: Modified normal	N/A	
	Category 2	C2	Foundation design, building procedures and precautionary measures: Light or heavy raft	N/A	
Compressible soils	Category 1	S1	Foundation design, building procedures and precautionary measures: Modified normal	All areas	

Geotechnical Conditions	Category or type	Criteria	Precautionary measures	Applicable areas	Comment
	Category 2	S2	Foundation design, building procedures and precautionary measures: Light or heavy raft	N/A	
Mining subsidence	Category 1	Old undermining to a depth of between 90-240m below surface where stope closure has ceased	Additional cost of foundations: Compaction below footings or raft	N/A	
	Category 2	Old undermining to a depth of between 90-240m below surface where total extraction has taken place	Additional cost of foundations: additional earthworks or soil reinforcement	N/A	
Seismic activity	Category 1	Mining induced seismic activity > 100cm/s^2	Additional cost of foundations: Stiffened strip footings or raft	N/A	
	Category 2	Natural seismic activity > 100cm/s^2	Additional cost of foundations: Stiffened strip footings or raft	N/A	
Topography	Category 1	Average ground slope flatter than 1:20	Increase depth of sewer & provision of pump station		
	Category 2	Average ground slope of between 1:11 and 1:20	Terracing for houses & additional earthworks to roads & storm water control measures	Estimated from 5m contours	
	Category 3	Average ground slope of between 1:7.5 and 1:10	Terracing for houses & additional earthworks to roads & storm water control measures		
	Category 4	Average ground slope of between 1:5 and 1:7.4	Terracing for houses & additional earthworks to roads & storm water control measures		
	Category 5	Average ground slope steeper than 1:5	Terracing for houses & additional earthworks to roads & storm water control measures		
SCCCA	Southern Cape Coastal Condensation Area	Area subjected to severe condensation conditions	Plaster and paint on all external walls & 6.4mm gypsum plasterboard ceilings & 80mm thick glass fibre insulation	Yes	
Location of development site		Site more than 20km from major centres	Additional cost of transportation	Yes	George 115km

Figure 15: Site specific geotechnical subsidy variations

Based on the table above, the geotechnical terrains were classified and mapped as follows:

Terrain Unit	Geotechnical Constraint	Expected movement (mm)	NHBRC Site Classification
Terrain 1	Potentially active soil	15-30	H2
	Potentially compressible soil	10-20	S1
Terrain 2	Potentially saturated soil/marshy ground		P

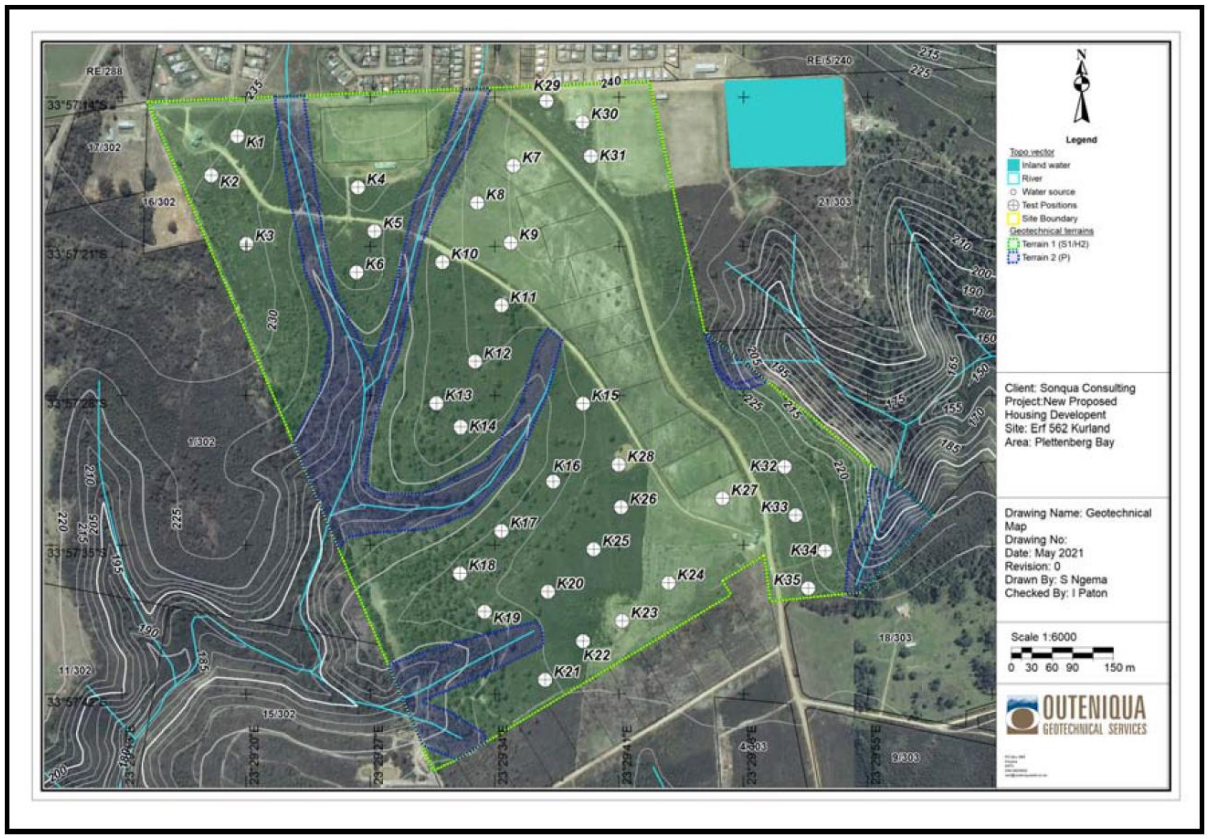


Figure 16: Geotechnical classification map and table (Outeniqua Geotchnical Services, 2021).

As per the above findings, it is recommended that the earthworks be designed and conducted in accordance with SABS 1200D, COLTO 3300 or any site-specific specifications provided by the engineer.

Foundations should be designed and constructed in accordance with the NHBRC Home Builders Manual, SANS 10400-H and/or as specified by the structural engineer.

The development layout should take into account the topography of the site and due consideration should be given to development in or directly adjacent to natural water courses (Terrain 2, as per Figure 12), where saturated soil and marshy surface conditions can be expected, requiring special engineering (e.g. for road crossings). If any uncontrolled fill material is uncovered, such as rubble, plastic, etc., it should be completely removed from house platforms or treated as per the engineers instructions.

Some bulk earthworks and possibly low retaining walls may be required to create level platforms on sites where slopes exceed 1:10. In cut to fill operations, all organic matter should be removed from the footprint area before bulk earthworks. The in-situ soils may not be suitable for use in bulk fills, unless the material is approved by the engineer and can be effectively compacted to the

specified level. Platforms should be cut and rolled to achieve a minimum of 93% of the Modified AASHTO density (<30mm/blow of DCP). It is recommended that platforms are capped off with minimum 150mm G5 or G7 gravel (compacted to 95% MDD) prior to excavation of foundation trenches.

The recommended foundation system for the proposed single/double storey structures is inverted-T beams, founded at a nominal depth of 0.8m below GL on in-situ soils or engineered fill with design bearing pressures limited to 75kPa. The structural engineer can consider the placement of a layer of engineered fill, such as G5 crushed rock, in trenches to improve founding conditions and to facilitate compaction. Alternative methods can include stiff raft foundations placed directly on insitu soil.

- Road pavements

Access roads should be constructed in accordance with SABS 1200, COLTO, TRH4, TRH14, The Red Book or other applicable specifications and standards, or as directed by the engineer. Test results indicate that the insitu soil is typically poor-quality material and improvement of the subgrade is recommended with lower and upper SSG layers included in the design of roads at the engineers discretion.

General preparation of the roadbed (subgrade) should include the following:

- Cut to line and level.
- Compact to 90% MDD. Recommended moisture content before rolling is optimum moisture content (OMC) minus 2%.
- Remove any incompressible or wet soil and reinstate with G9 material or as directed by the engineer.

Table 6: Road layerworks recommendations (Cat C in wet climate).

Layer	*Material*	*Thickness mm*	*Required Compaction*
Seal	HMA or Cape Seal	TBD by engineer	
Base	Imported G2/3	150	100% MDD
Subbase	Imported G5/C4	150	95% MDD
USSG	Imported G7	150	93% MDD
LSSG	Imported G7/9	150	90% MDD
OR			
Seal	n/a	n/a	n/a
Base	Interlocking cement pavers	80	n/a
Subbase	Imported G5/C4	150	95% MDD
USSG	Imported G7	150	93% MDD
LSSG	Imported G7/9	150	93% MDD

- **Storm water drainage recommendations**

The design and construction of storm water drainage should be carried out in accordance with SABS 1200LE, COLTO, The Red Book or other applicable standards, or as directed by the engineer. Minor flood events can be handled with kerb inlets and underground pipes, which discharge at suitable points into existing stormwater network or natural drainage lines, as directed by the engineer.

Stormwater from major flood events can be contained within the road prism but should not overflow into adjacent erven. Well-designed access roads with sufficient level difference from the adjacent property, and adequate side drains and culverts is recommended. Subsoil drains are recommended along roads as a precaution to keep the subgrade drained.

The ponding of storm water around the exterior of houses can be avoided by shaping the ground levels around the exterior to create a fall away from the house and constructing a 1m wide a concrete apron with a 10% fall away from the house. This will also assist in minimizing erosion around the house. The finished floor level of all houses should be a minimum of 150mm above final ground level to prevent flooding.

5. ALTERNATIVES

"Alternatives", in relation to a proposed activity, denotes 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.

5.1. Description of Process to Reach Preferred Alternative

5.1.1.Development Site Location and Layout Alternative

No other layout alternatives will be considered. As an intensive process was followed (detailed below – Section 5.1.1.1.), in conjunction with community input, to determine the preferred layout. Therefore, the Preferred Alternative 1 – is the Preferred.

5.1.1.1. Process to Reach Preferred Alternative Location & Layout

Plans for the alternative utilization of Erf 562 trace back to the zoning thereof for resort rights, many years ago. The Department of Rural Development and Land Reform (DRDLR) bought the property from the original owners, for land reform purposes in 2007. A few structures were erected on site. Various large erven [Erf 564 (Now erven 574 to 583), Erf 563 (Now erven 565 to 573) and Erf 536 Kurland] along Forrest Hall Road and in the central part of Erf 562 were subdivided and sold to beneficiaries.

The DRDLR is the custodian of the property. After negotiations, they have recently decided to transfer the Erf to the Municipality of Bitou to accommodate the intended housing project, with the exception of two parts of the site, which they wish to retain:

- An area and building in the north-east of the property, to be transferred to the identified occupant; and
- And the southern portion of the site for an agricultural project. The subdivision of the relevant portions was approved by the Municipality. Surveying and transfer is managed by DRDLD.

Land available to accommodate a housing project in the beneficiaries' vicinity is scarce. Area topography, conservation- and active use areas, price ownership (private) and other factors contribute to making the securing of land for housing projects difficult. From a strategic perspective, it is preferable to extend the urban fabric of Kurland, rather than creating a separate settlement in the area. Land situated north-west of the existing Kurland township was also considered but the owner is still farming there and does not wish to sell. Erf 562 belongs to the state and in a spirit of good corporate governance the decision was made to utilize the land to address the residents' housing need, subject to due process.

Only one Layout has been proposed and will be referred to as the **Preferred Proposed Layout 1**, henceforth. This will be assessed during the EIA Phase. The preferred layout has responded to identified freshwater and terrestrial constraints to the development. However, further revisions to the layout proposed may occur as the layout must also respond to potential further comments from I&APs and Authorities. **NO-GO Alternative – Proposed Layout Alternative 2**, will indicate that the current status quo of the site will persist, and no development will take place.

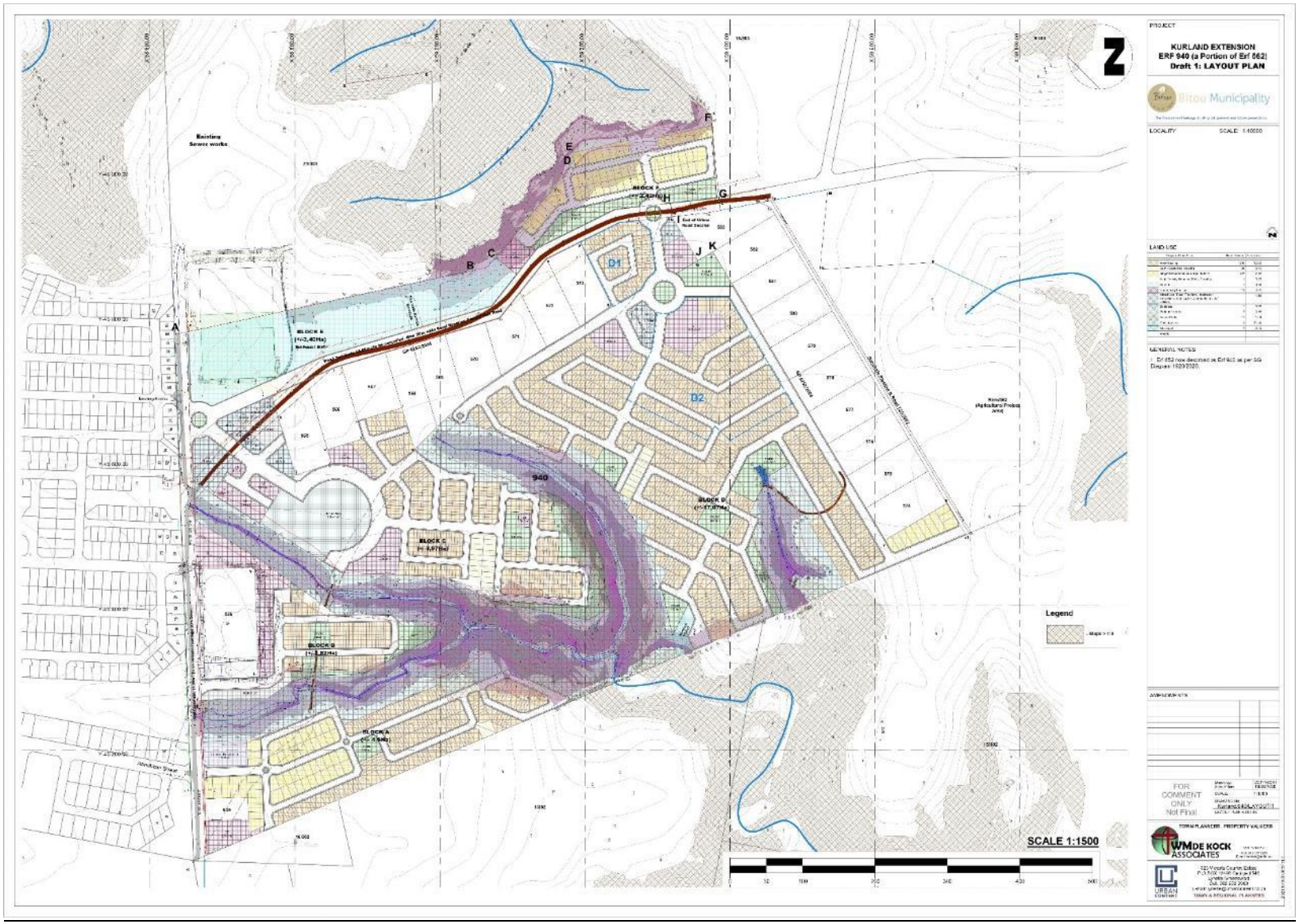


Figure 17: Proposed Preferred Layout 1 (see Appendix C for full-scale drawing).

5.2. Alternatives Assessed

According to the Town Planning Report, July 2021, six design alternatives were considered (April 2020 to June 2021) in respect to:

- Activity spines and nodes – additional/alternative considerations.
- Placement of supportive facilities – additional/alternative considerations.
- Housing density and typology – options.
- Other design/layout considerations.

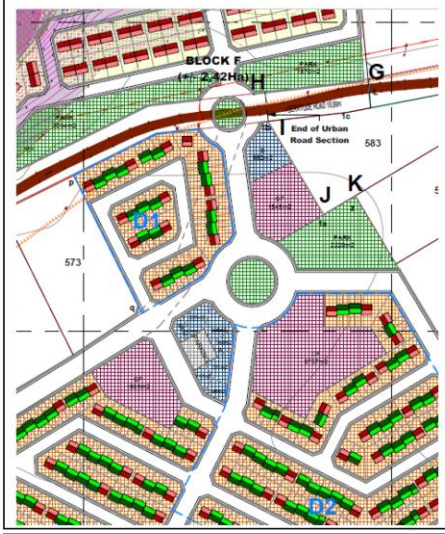
Although initially only 3 design options (Design options 1 – 3) were considered, following community input and technical information and comments from the project team and municipality, an additional 3 design options (Design options 4 -6), were considered. This has been detailed in Section 9.3 "Design Options", of the Town Planning Report, July 2021 (Appendix G.1).

Design Options 1 to 3 were presented for discussion in Nov 2020. At that stage the designers had queries regarding the status of the treed area along the western project area boundary. It was confirmed that the relevant area is not deemed an indigenous forest area. The areas that are suitable for development use, based on the gradient analysis and the environmental buffer delineation and subsequent specialist input, were incorporated into the development layout/use of blocks A and D.

5.2.1.Layout Alternatives

The Proposed Preferred Layout Alternative 1 (Figure 12, and Appendix C), discussed in **Section 5.1** will be assessed against the No-Go Alternative. This preferred layout is referred to as the Draft 1 Layout of Kurland Erf 940 as per the Town Planning Report, July 2021. Note that such plan is a synthesis of technical base information and comments received in respect of the various previous Design Concepts. The Proposed Preferred Layout Alternative 1 represents the land use proposal which will be circulated and presented for further comment (official and I&AP's/the public) and may thus change during the layout plan finalization process.

In essence the Proposed Preferred Layout Alternative 1, includes six neighbourhoods/sections (Blocks A-F), which form part of an over-all development extension, integrated/linked on an external and internal level and includes, at this stage, the following uses:



Proposed Land Use	No of Erven	Area (ha)
Row Housing	1339	12,03
Semi- detached housing	28	0,4
Single residential (average 180m²)	125	2,56
High density housing (flats; 11units)	1	0,22
School	1	3,36
Community Facility	13	2,61
Mixed use (retail/tourism/business/recreation/ municipal/community facility/ utilities)	1	1,98
Business	17	0,86
Parking/maket	3	0,35
Active Parks	11	1,94
Conservation	2	11,56
Municipal	1	0,12
Roads		

Figure 18: Land uses as per the Proposed Preferred Layout Plan.

5.2.2.Design Alternatives

5.2.2.1. Design Alternative – Density

According to the Town Planning report, the guiding principles for all development, as contained in SPLUMA, advocate the effective use of the available areas. Higher density not only relates to efficient use of land and services but also translates to more viable/sustainable social- and commercial land use. At an individual residential stand size (200m² average), approximately 500units may be accommodated on the available area (1:2.5), which implies that additional land for housing developments needs to be identified and that the provision of supportive facilities needs to be duplicated in such area.

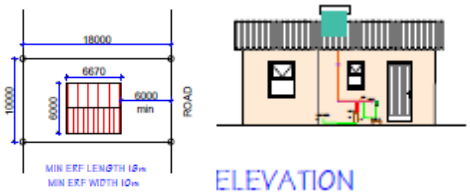
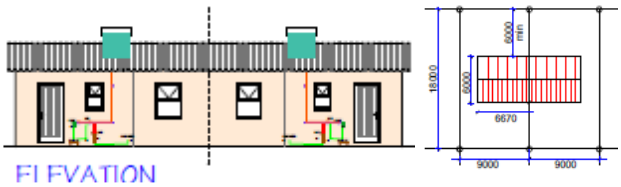
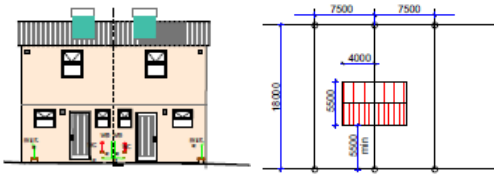
- Preferred Design Alternative 1: Medium – High Density Housing
- Design Alternative 2: High Density Housing
- Design Alternative 3: Low Density Housing

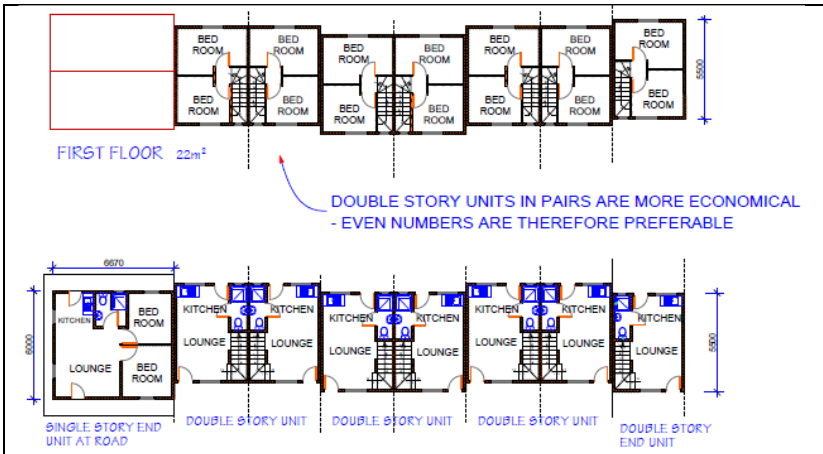
Of the three considered Design Alternatives: Density, the proposed Alternative 1 is preferred, based on the available development footprint, services available and the proposed scope of works. The Design Alternatives: Density, 2 would entail the construction of flats/high density/3 storey-walk up sectional title units which is more congruent with an 'inner city' context, and would create a greater strain on services, and other factors such as traffic during operational phases, etc. Design Alternatives: Density, 3 would result in mostly single units in open yards, for

instance, which will result in an additional requirement for the purchase/expropriation of land, in the Kurland area, to accommodate the expressed future need.

5.2.2.2. Design Alternative (Housing Typologies)

The required densities, in turn, dictates the housing typologies to be accommodated on site. Four Design Alternatives were considered for the Housing Typologies (as per Figure 19). With the Design Alternative (Housing Typologies) 3, being the preferred Alternative.

Design principle	**Density and yield estimate**
Design Alternative (Housing Typologies) 1: Individual erven- single units – free standing, single storey	
 Sketch source: Keith Lourie Architecture	
One free standing house per erf (average 180m²), or double storey.	Estimate 25units/ha Yield 575 units on the provisional block area
Design Alternative (Housing Typologies) 2: Individual erven- pairs of linked houses – free standing, single storey	
 Sketch source: Keith Lourie Architecture	
Single storey, semi-detached (average 160m²)	Estimate 28units/ha Yield 644 units on the provisional block area
Design Alternative (Housing Typologies) 2: Individual erven- pairs of linked houses – free standing, double storey	
 Sketch source: Keith Lourie Architecture	
Double storey, semi-detached (average 135m²)	Estimate 30units/ha Yield 690 units on the provisional block area
Preferred Design Alternative (Housing Typologies) 3: Individual erven – linked housing units, single and double storey combination	



Sketch Source: Keith Lourie Architecture

Double and single storey row houses on individually registered erven ranging between 72 to 162m² (average)	Estimate 65units/ha Yield 1495 units on the provisional block area

Preliminary/ illustrative rendering of the Kurland design concept

Figure 19: Proposed Kurland Housing Typologies (Town Planning Report, 2021)

As per the Town Planning Report, July 2021, the aforementioned housing typologies apply. Comments regarding the requirement to include FLISP (Finance linked subsidy) erven were received. In the absence of final figures regarding the number of families qualifying for such funding, a provisional area to accommodate 8% of the planned erven have been identified at the entrance to Blocks A and D. Erf sizes are an average of 180m²average size. Should more FLISP erven be required, the final layout will be updated to incorporate such requirement (individual erven, rather than linked-units). Note that the general/road layout will be affected. As noted, the layout may accommodate the following housing options:

- Design Alternative (Housing Typologies) 1: Individual houses (double or single storey)
- Design Alternative (Housing Typologies) 2: Semi-detached single or double storey houses
- Preferred Design Alternative (Housing Typologies) 3: Single and double storey row (linked) houses
- Design Alternative (Housing Typologies) 4: Rental units

5.2.2.3. Design Alternatives - Access

According to the Town Planning Report, Forrest Hall Road (OP 07220) links the site, Kurland Village and numerous privately owned properties to the N2 highway. Such road, being protected via a registered 18.89m wide Right of Way servitude traverse the site. Various roads, from within Kurland Village are planned (registered) to intersect with Forrest Hall Road, including Zimris Street, Geelhout Street and Witbaraks Street. Three options have been explored:

- The road within the section of the Forrest Hall Road servitude, which runs along the southern boundary of Kurland Village has been extended (over Erf 562) to provide access to the Fire Safety Facility, the municipal sewer works and a municipal property (Portion 21/303). Freedom Street links the Kurland Village area to the site, in this area.
- A Right of Way Servitude, linking the Teniqua Wildlife Awareness Centre to Forest Hall Road, bisects the site, running just south of excluded erven 574 to 583 Kurland.
- In addition to the Forrest Hall Road Servitude, a secondary servitude was surveyed, providing a parallel running access-way across the site.

Please refer to the Town Planning Report, July 2021, Section 9.3 on page 32, in respect to:

- Detail on activity spines and nodes – additional/alternative considerations

5.2.2.4. Design Alternative – Sewer Outfall Concepts

Two sewer outfall concepts will be considered:

- Preferred Sewer Outfall Concept: General residential housing.
- Alternative Sewer Outfall Concept.

The preferred sewer layout is shown on Figure 20 which entails two (2) new pumpstations and the decommissioning of existing pumpstation (Kurland PS1) situated north of the proposed development. Considering this layout, the proposed pumpstation on the west will accommodate most of the flow from the development of erf 562 and all of the flow upstream of existing Kurland PS1.

A servitude may result from this preferred layout considering that the bulk gravity pipeline (green line referenced "2") needs to be located outside the boundaries of erf 562 on erf RE/1/302 and erf 15/302.

An alternative concept is therefore included but will result in three (3) pumpstations.

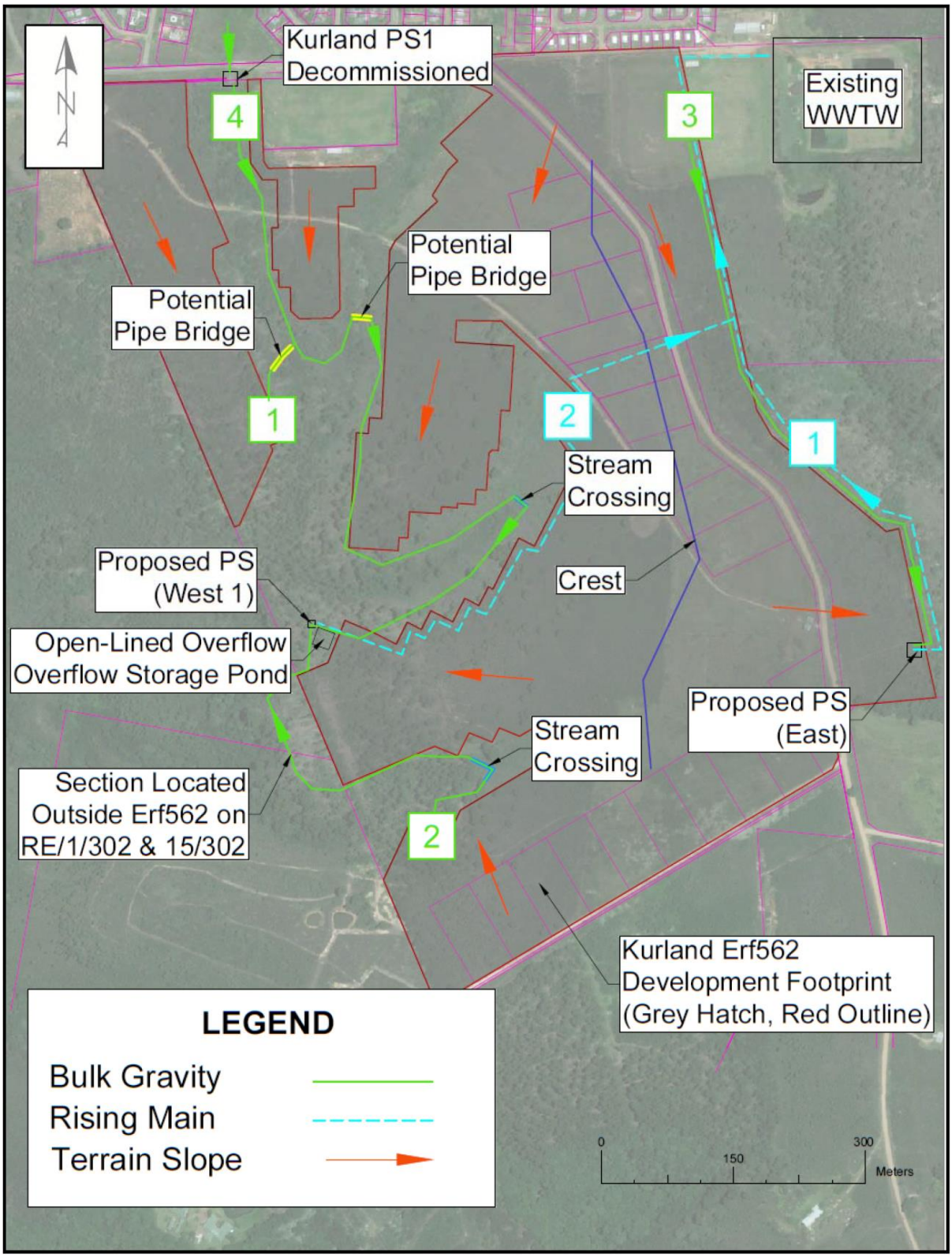
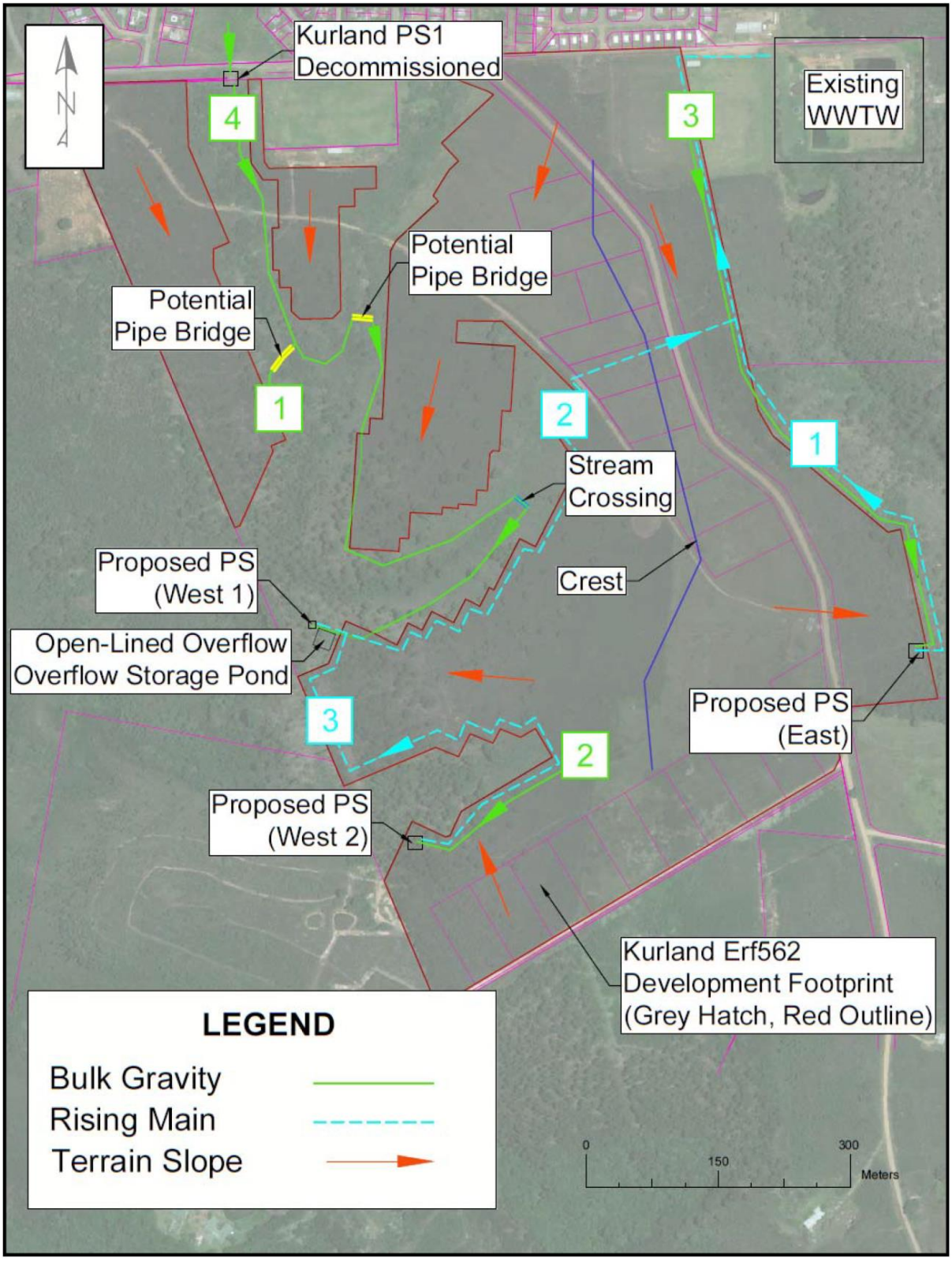


Figure 20: Preferred outfall concept.

The alternative sewer layout is shown on Figure 13. The layout incorporates an additional pumpstation on the western side to avoid the encroachment onto erf RE/1/302 and erf 15/302. Avoiding the encroachment is the only deviation from the preferred sewer outfall concept. This option

is not considered more ideal in comparison to the preferred layout considering the additional capital, operational and maintenance costs and environmental risk because of the additional pumpstation.



5.2.3.Technology Alternatives

5.2.3.1. Technology Alternatives

There are three Technology Alternatives, including:

- Technology Alternative 1: Pipe bridge watercourse crossings
- Technology Alternative 2: Excavations across watercourses
- Technology Alternative 3: Combination of Pipe Bridges and Excavations across non-perennial watercourses.

Where required non-perennial drainage lines will be crossed by means of open excavation and laying the pipe underground. In conjunction with material density requirements for backfill, the pipe and backfill material will be protected with gabion mattresses to avoid future erosion and damage to the pipeline during flood conditions. A typical detail of this type of crossing is included in Annexure G (Appendix F3). Pending a detailed design, crossing of non-perennial drainage lines may require crossing over the drainage lines if excavations exceed minimum depths for underground crossings. Crossing over drainage lines will be done by means of pipe bridges if required. Considering the information available at this stage, it is estimated that crossing over drainage lines may only be required at the locations as shown on Figure 4 and 5(Appendix F3). A detail of this type of crossing is included in Annexure G (Appendix F3).

5.2.4.Operational Alternatives

5.2.4.1. Operational Alternatives

There are two Operational Alternatives (Housing), including:

- Preferred Operational Alternatives (Housing) 1: General residential housing.
- Operational Alternatives (Housing) 2: Retirement residential housing.

Of the three considered Operational Alternatives, the proposed Alternative 1 is preferred, based on the available development footprint, services available and the proposed scope of works. The Operational Alternative 2 would entail the construction of flats/high density/3 storey walk up sectional title units which is more congruent with an 'inner city' context, and would create a greater strain on services, and other factors such as traffic during operational phases, etc. Operational Alternative 3 will not be in line with the surrounding development and will have special requirements that are beyond the existing designs, but in line with the requirements of for support of an elderly community.

5.2.5.No-Go Alternative

The "No Go" alternative is the option of not developing the proposed development and associated infrastructure and will be considered Alternative 4. The no-development option would result in a lost opportunity in terms of the housing, so as to address the existing housing backlog, employment opportunities associated with the construction and operation phase, as well as the benefits associated with the provision of a support facilities including clinics, parks, creches, etc, that can cater to the new development as well as the Crags community located just north of the proposed site.

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". Considering it has been

determined that the site currently consists of degraded Fynbos and fallow land, the opportunity to transform the site will improve the sense of place and prevent further degradation of the land.

The socio-economic benefits of this project however outweighs the impacts in an area which is already earmarked for development purposes in the Municipal SDF (within the urban edge). The No-Go Alternative, and future use of the site, will be investigated further in the Environmental Impact Assessment Phase.

6. THE ENVIRONMENTAL ATTRIBUTES

6.1. *Climate*

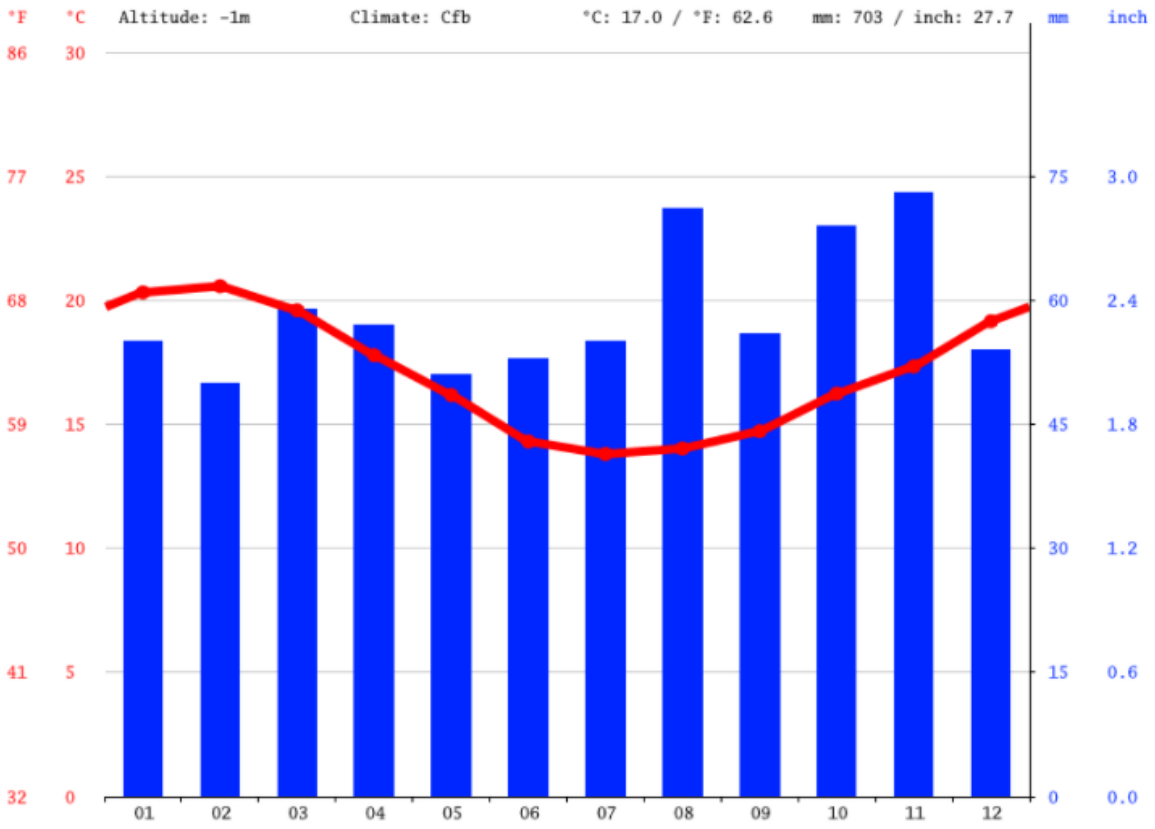


Figure 21: Keurbooms annual climate (climate.org).

The closest recorded town is Keurbooms, which is located to the south of the proposed Housing Site. According to climate.org, the driest month is February. There is 50 mm | 2.0 inch of precipitation in February. The greatest amount of precipitation occurs in November, with an average of 73 mm | 2.9 inch.

6.2. *Topography*

The proposed site is located on an elevated coastal platform, approximately 220-240 m above sea level. It is characterized by gently sloping as well as deeply incised topography. Parts of the site are inaccessible due to overgrown and steep slopes, notably the eastern portion.

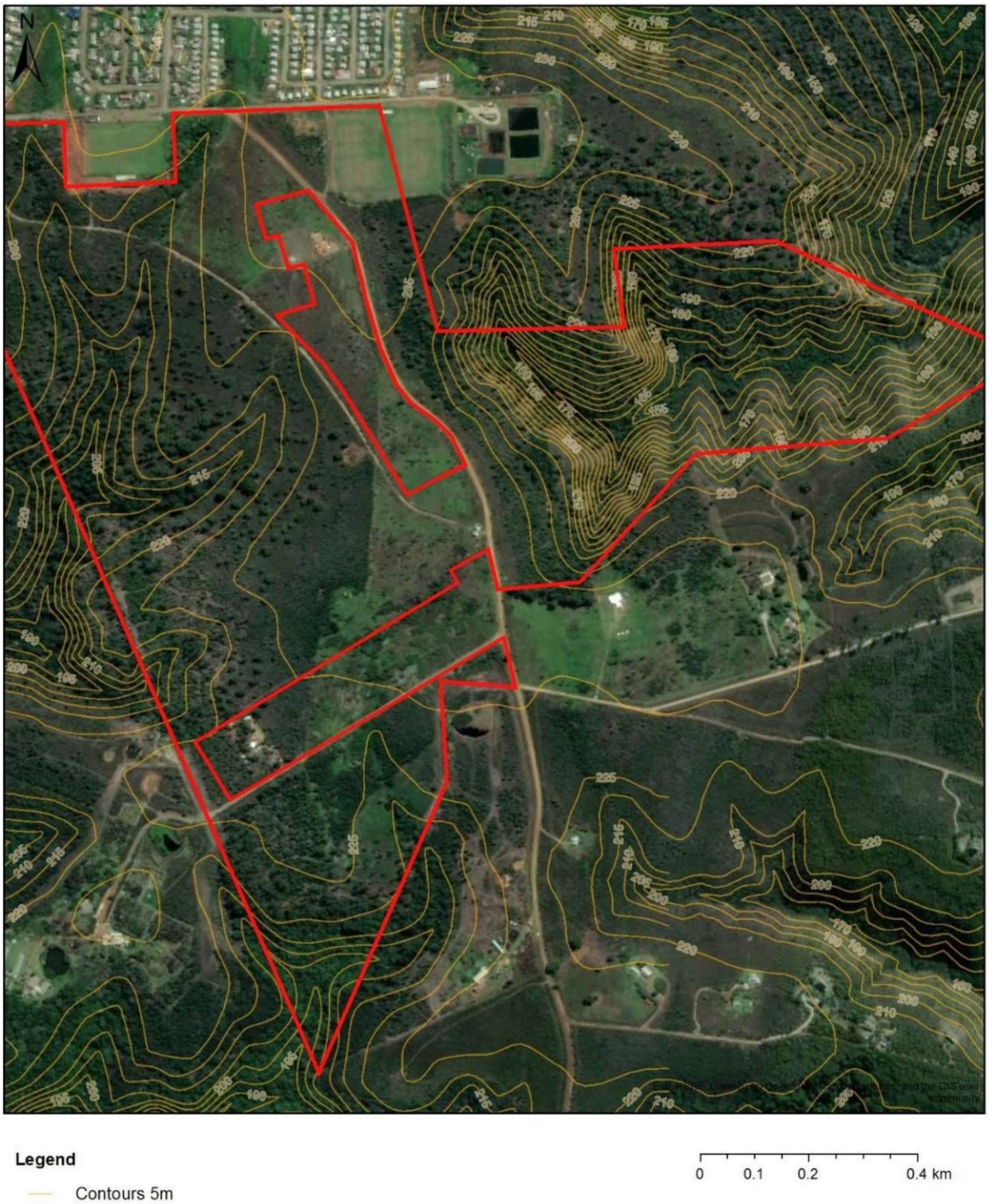


Figure 22: Topography of proposed site.

6.3. Freshwater Resources

6.3.1.The Aquatic Environment

The study area of the proposed project is located within the DWS Quaternary Catchment K70A and falls within the Breede Gouritz Water Management Area. The major rivers in the catchment are the Groot and Bobbejaan River.

The screening tool indicated that the Proposed Kurland site has a Very-High Aquatic Biodiversity theme.

There are two watersheds within the property. Surface runoff is split east, southwest and south. The developable area is largely drained in a southwest to west direction. The area that drains east is largely too steep for development. The drainage lines in the west of the property are also steep, but less so than in the east. The majority of the development is proposed to occur on the hilltop areas due to favourable topography.

The runoff that drains in a western and southern direction ends up in the Buffels River which merges with the Matjies River before reaching the ocean close to Keurboomstrand. The runoff draining east flows into the Sout River, shortly before it mouths into the ocean. All these rivers flow through protected areas.

6.3.1.1. Wetland

As per the Preliminary Freshwater Impact Assessment, it has been determined that no NFEPA wetlands occur on site. However, a Non-FEPA wetland was identified to the west of the site within the 500m regulated area. This wetland is a dam and artificial in nature. Furthermore, it is on the other side of the watershed and highly unlikely to be impacted by the proposed development activities.

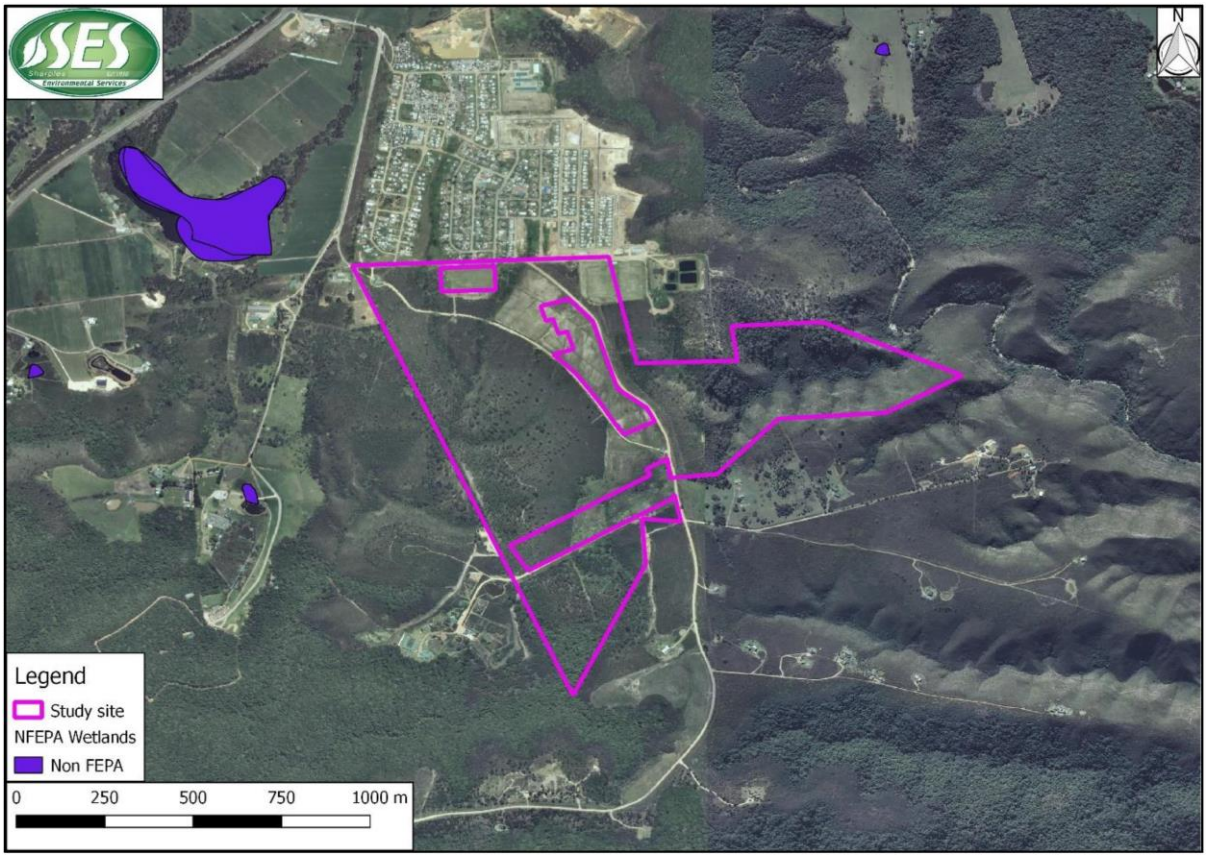


Figure 23: Wetlands identified by the National Freshwater Ecosystem Priority Area project. According to the project there are wetlands in the vicinity of the site, but they are not freshwater.

6.3.1.2. Drainage Systems

Three drainage systems were identified on site (as per Figure 19). The northern most sections of System 1 are comprised of wetland habitat. These areas are within the existing Kurland township. The wetlands are modified and degraded to a critical extent due to encroachment of housing infrastructure and various sources of pollution. However, since the new development will be downstream of the wetlands, it is not expected to impact on this degraded upslope part of the system. Therefore, it was not assessed further as part of System 1, and only noted due to it being within 500m of the development.

A small patch of wetland habitat is situated next to the road leading to Tenikwa Wildlife Rehabilitation and Awareness Centre. This wetland is likely artificial in nature and originated when the road and a berm to the south was constructed, which caused impoundment. This area is not currently included in the residential portion of the proposed development and will therefore not be impacted. The area could potentially be included in stormwater management by using it as a retention area which will assist in pollutant trapping and slowing runoff. This will depend on whether it is included in development in future. This artificial wetland area was not assessed further.

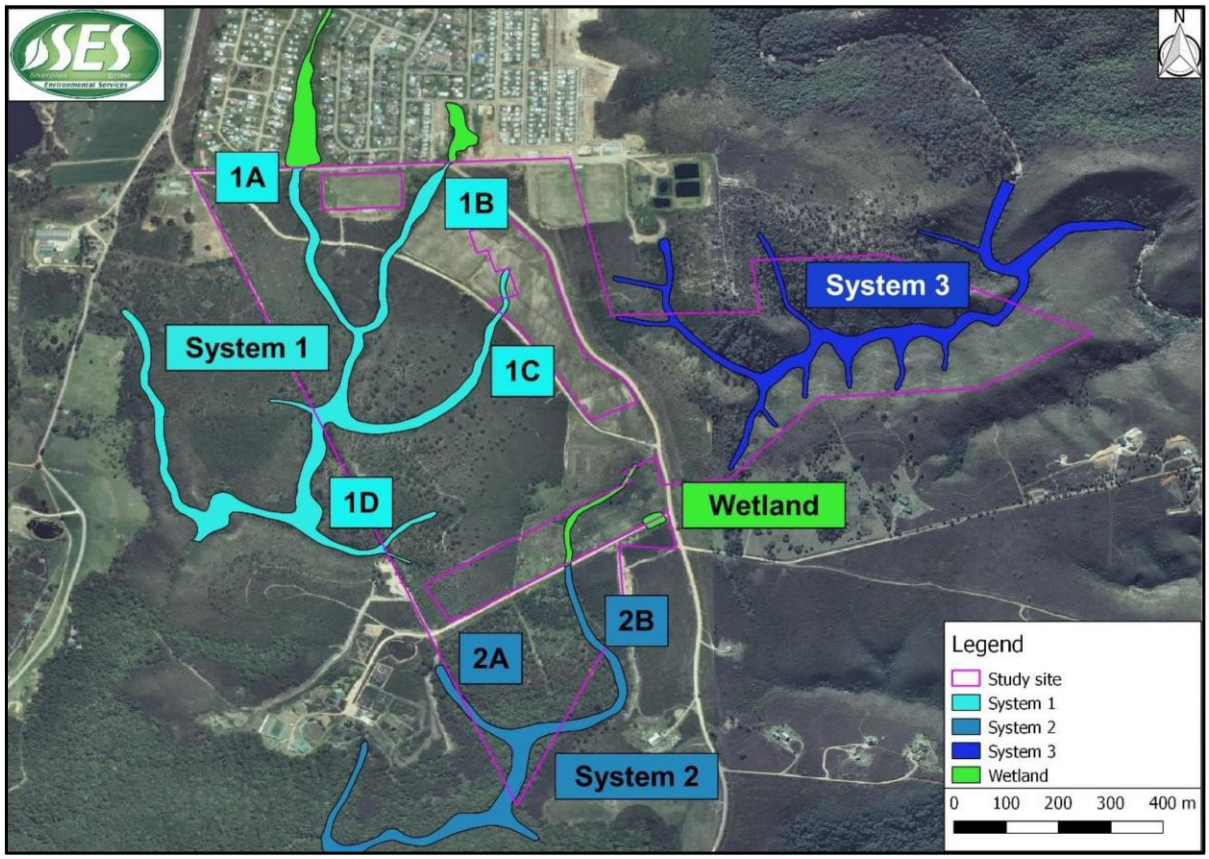


Figure 24: Delineation of freshwater habitat within the Remainder of Erf 562 and the existing Kurland township to the north of the study area.

According to the Preliminary Aquatic Assessment, System 1 is likely to be most impacted due to the topography of the areas surrounding these drainage lines being most favourable for development. The system has characteristics of a Transitional river system with average gradients of 2% - 4%. In the lower reaches of 1A and 1B, the gradient decreases and becomes more characteristic of an Upper foothills river. Transitional and Upper foothills systems both have moderately steep channels with limited floodplain development and reach types that include plane bed, pool-riffle and pool-rapid. The rivers are all non-perennial drainage lines that are up to three meters wide and has a sandy substrate. The system is incised below culverts which led to banks with a height of up to two meters.

The northern section of this system starts off as two drainage lines. They originate in the existing urban development, and merge within the area proposed to be developed. The western drainage line is referred to as 1A and the eastern as 1B. Drainage line 1C originates further east and joins the main system south of where 1A and 1B merge. Approximately in the middle of the property, two short drainage lines (1D) merge before joining the main system beyond the study area.

6.3.2.Conservation Context

The Western Cape Biodiversity Spatial Plan (WCBSP) is recognized by both the Department of Environmental Affairs and South African National Biodiversity Institute. 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.

Critical Biodiversity Areas (CBA's) are required to meet biodiversity targets. These areas have high biodiversity and ecological value and therefore must be kept in a natural state without further loss of habitat or species. Low-impact, biodiversity sensitive land uses are the only land uses allowed in CBA's. Critically Endangered (CR) ecosystems, critical corridors for maintaining landscape connectivity and areas required to meet biodiversity pattern targets, are included in CBA's. The WCBSP made a distinction between areas likely to be in a natural condition (CBA1) and areas that could be degraded (CBA2).

Ecological Support Areas (ESA's) are not essential for meeting biodiversity targets but are important as they support the functioning of CBA's and Protected Areas (PA's). ESA's support landscape connectivity, surrounds ecological infrastructure that provide ecosystem services, and strengthen resilience to climate change. These areas include Endangered vegetation; water source and recharge areas; and riparian habitat around rivers and wetlands. The WCBSP also made a distinction between ESA's in a functional condition (ESA1) and degraded areas in need of restoration (ESA2).

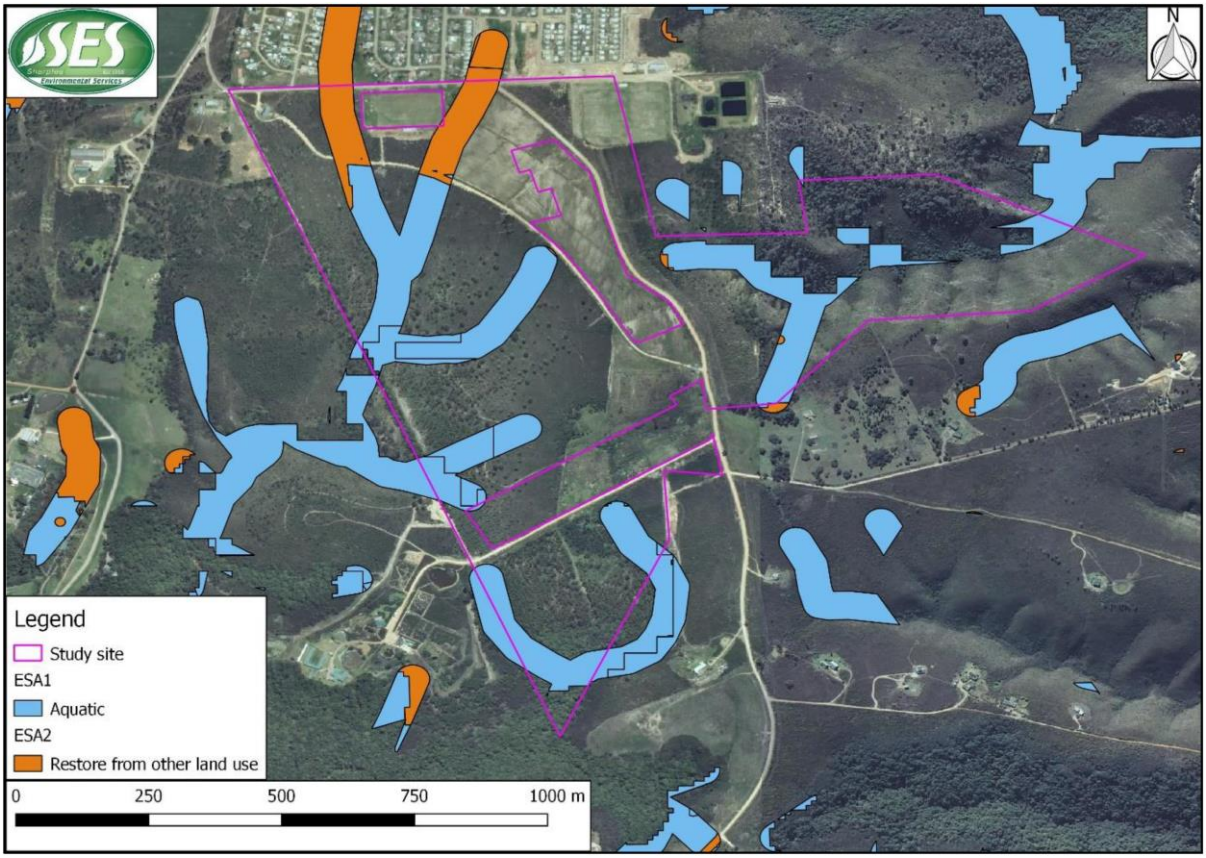


Figure 25: The site in relation to Western Cape Spatial Biodiversity Plan (Pence, 2016).

As indicated in the figure above, no aquatic CBAs are located within or near the study area. There are however portions of terrestrial and forest CBAs within the study area. The drainage lines in the property are classified as ESAs.

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

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

As per the Aquatic Freshwater Impact Assessment, No NFEPA wetlands occur on site. However, a Non-FEPA wetland was identified to the west of the site within the 500m regulated area (Figure 19). This wetland is a dam and artificial in nature. Furthermore, it is on the other side of the watershed and highly unlikely to be impacted by the proposed development activities.

6.4. SoilGeology and Agriculture

6.4.1.Soil & Geology

As per the Phase 1 Geotechnical Report, by Outeniqua Geotechnical Services, May 2021, the Geology comprises of mainly quartzitic sandstone, with subordinate shale, underlain by the Goudini Formation (formerly the Tchando Formation) in accordance with the official geological map on a 1:250 000 scale, of the Table Mountain Group. The Goudini Formation rocks are composed of fine to coarse grained brownish weathering sandstones and shale.

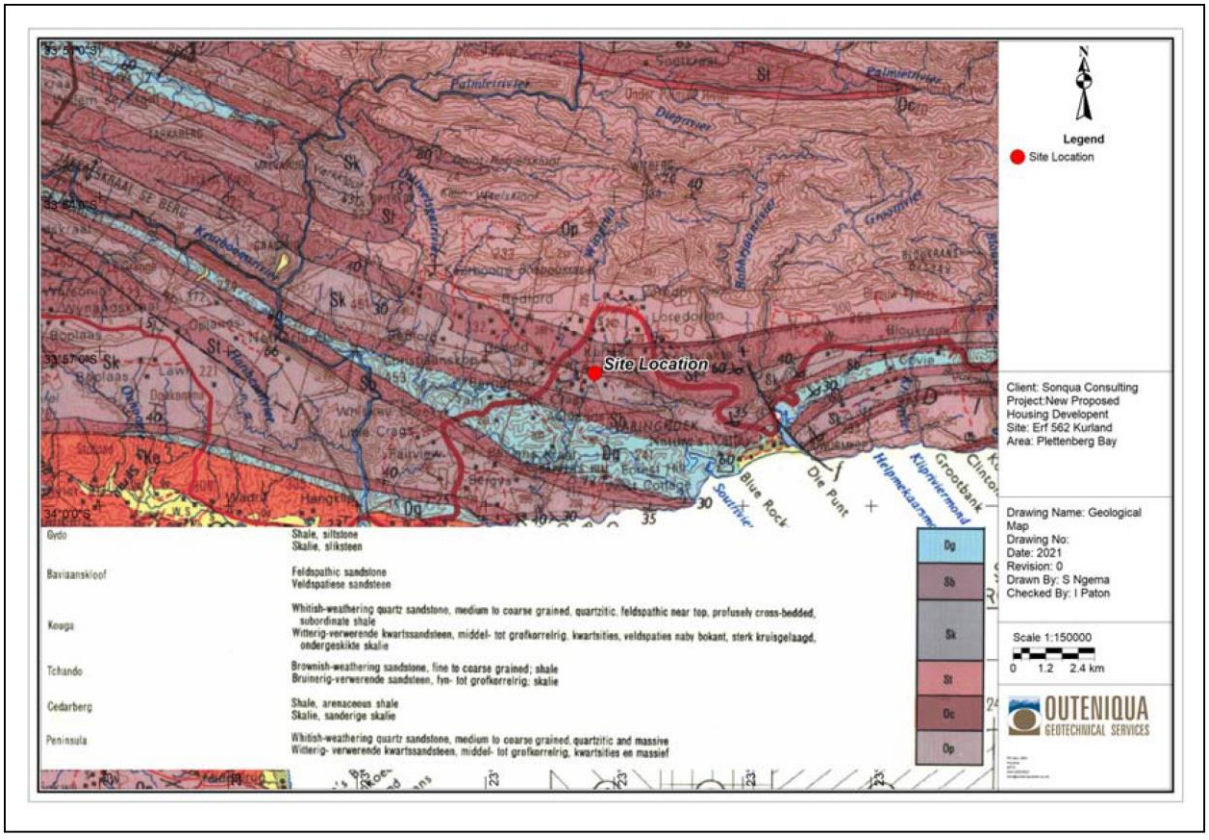


Figure 26: Geology and Soil Characteristics (Outeniqua Geotechnical Service, May 2021).

According to the Phase 1 Geotechnical Report undertaken by Outeniqua Geotechnical Services, May 2021, it was noted that there are no major geological faults in the immediate vicinity of the site, and there is a low risk of seismic activity in the area. The geology is generally macro-stable on low to moderate slopes, and is generally suitable for urban development with no risk of dissolution (i.e. dolomitic rock or karst terrain).

6.4.2.Agricultural Potential

According to CapeFarmMapper, 2021, the land capability category is described as medium sensitivity and occurs sporadically (see Figure 22), the context of sensitivity is indicated as commercial scale wind and solar PV installations.

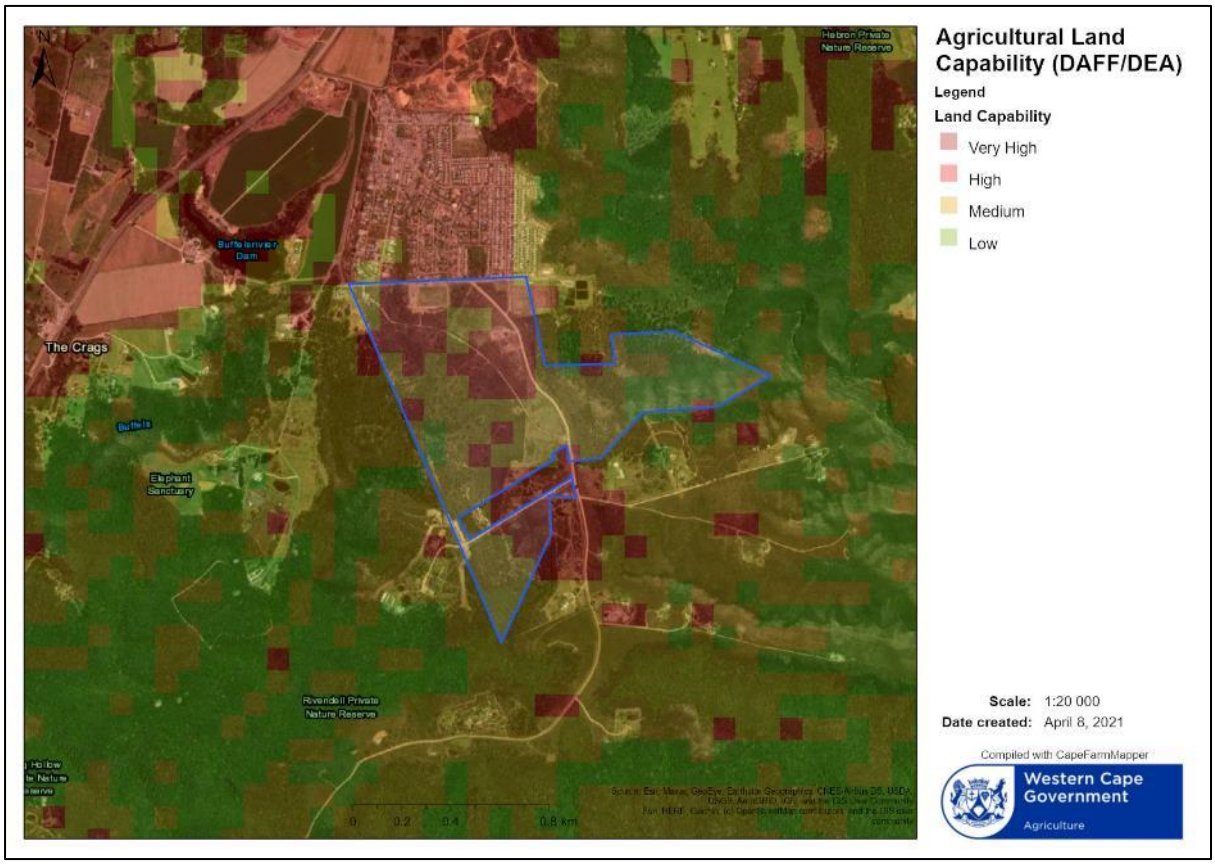


Figure 27: Agricultural land capability (Source: CapeFarmMapper, 2021).

The DEA Screening Tool undertaken in 2021, has identified the agricultural sensitivity as high (see Figure 28). High sensitivity is observed along the central portion of the site, and is dominated to the north, which has been transformed by development. An agricultural impact assessment will be undertaken to address this significance and inform the EIA.

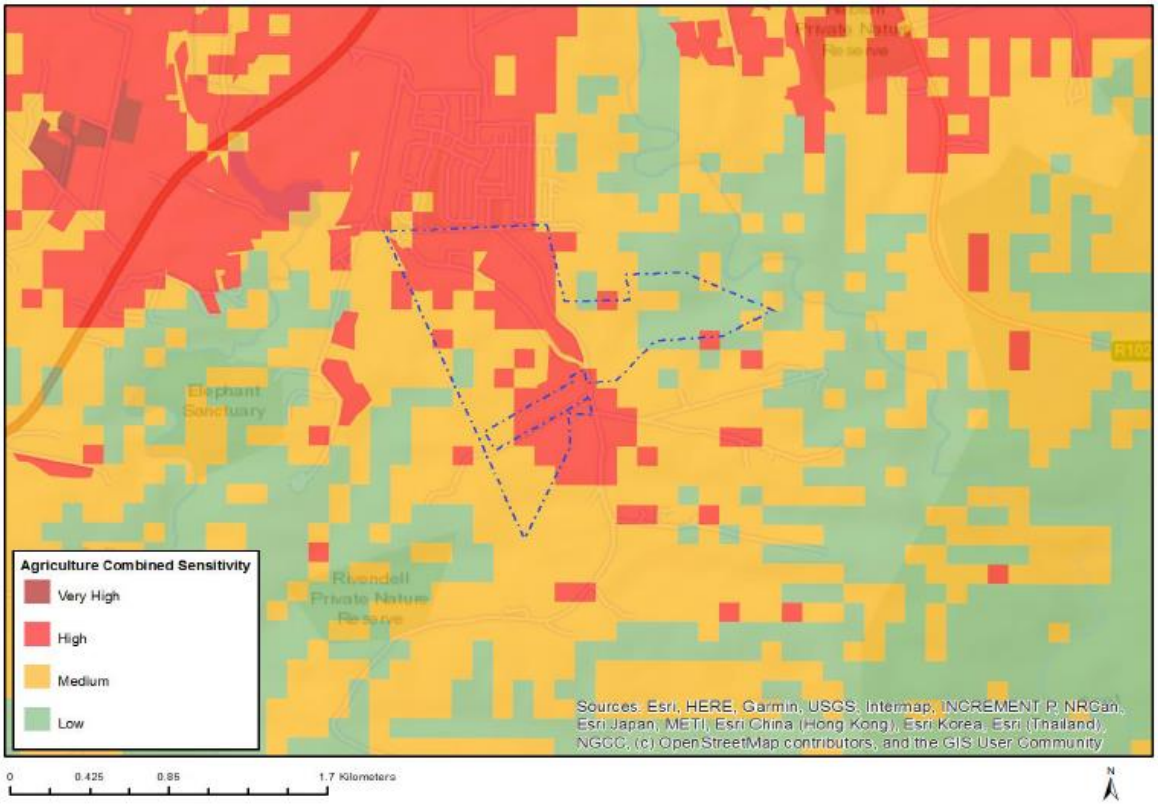


Figure 28: Agricultural Sensitivity (DEA Screening Tool)

During baseline verification by the relevant specialists, the Aquatic specialist indicated that based on her observation and desktop assessment, the general area has been subject to agricultural activities and forestry in the past and this has transformed the geomorphological characteristics, surface flow patterns, retention capability and vegetation composition. The Botanical specialist indicated that the presence of dense stands of black wattle, blackwood and gums are indicative of past disturbances or agricultural activities, further to this a significant area has been transformed by past agricultural activities (fallow land), as well as other disturbances. There are no current agricultural activities being conducted on the site.

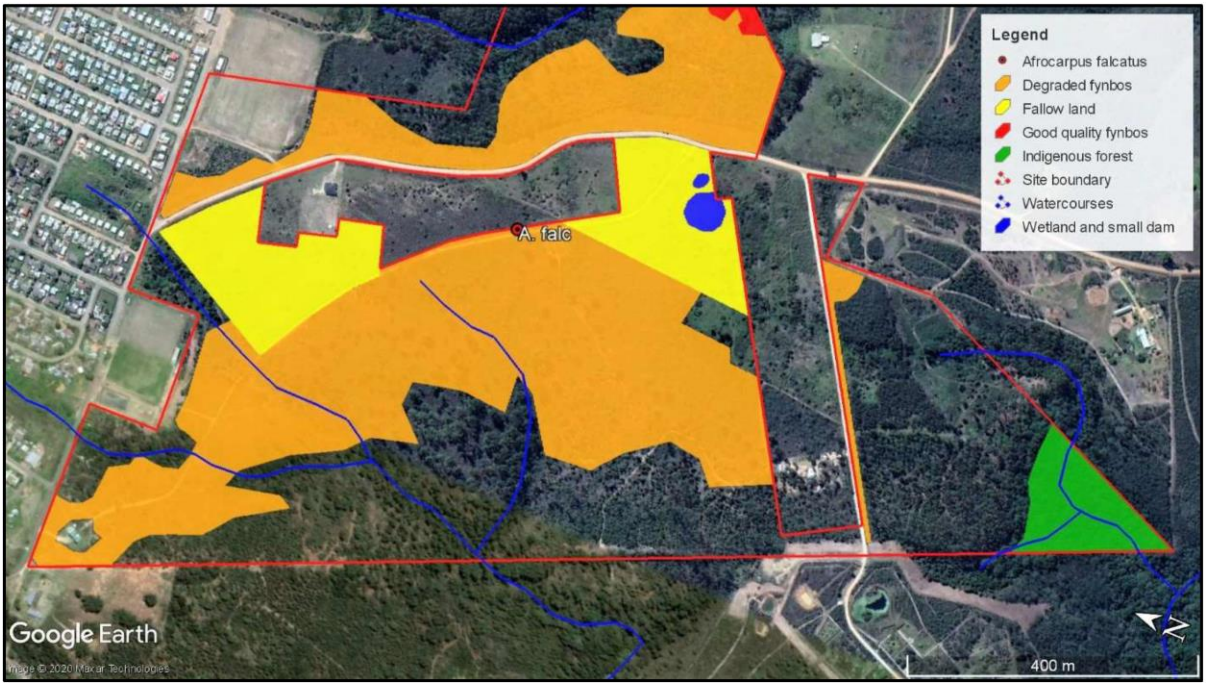


Figure 29: Biodiversity attributes as indicated by the Botanical specialist, including fallow land (Mark Berry Environmental Consultants, 2020)

6.5. Vegetation

6.5.1. Vegetation Type

The DEA Screening Tool undertaken in 2021, reported the Plant Species theme as being of Medium sensitivity, and the Terrestrial Biodiversity theme as being of Very High sensitivity. A Preliminary Biodiversity Survey was undertaken by Mark Berry Environmental Consultants (2020).

According to the survey, the study area falls within the Tsitsikamma Sandstone Fynbos vegetation units of the Vegetation Map of South Africa, Lesotho and Swaziland (Mucina et al, 2012). This vegetation type is distributed along the Tsitsikamma Mountains from Uniondale to Cape St Francis, north of the Keurbooms River and south of Langkloof (Mucina & Rutherford 2006). In the study area it extends north towards the Tsitsikamma and eastwards towards Nature's Valley.

The southern part of the site, where it drops down into a small but steep valley, intrudes into Southern Afrotemperate Forest. This typically comprises of tall evergreen tree species, including yellowwoods, saffron, candlewood, ironwood, false ironwood, etc. It is mainly found in the Western and Eastern Cape Provinces, with the largest complex found in the southern Cape between Mossel Bay in the west and Humansdorp in the east (Mucina & Rutherford 2006). It grows on sheltered (fire-protected) slopes, plateaux, coastal scarps and valleys (Mucina & Rutherford 2006).

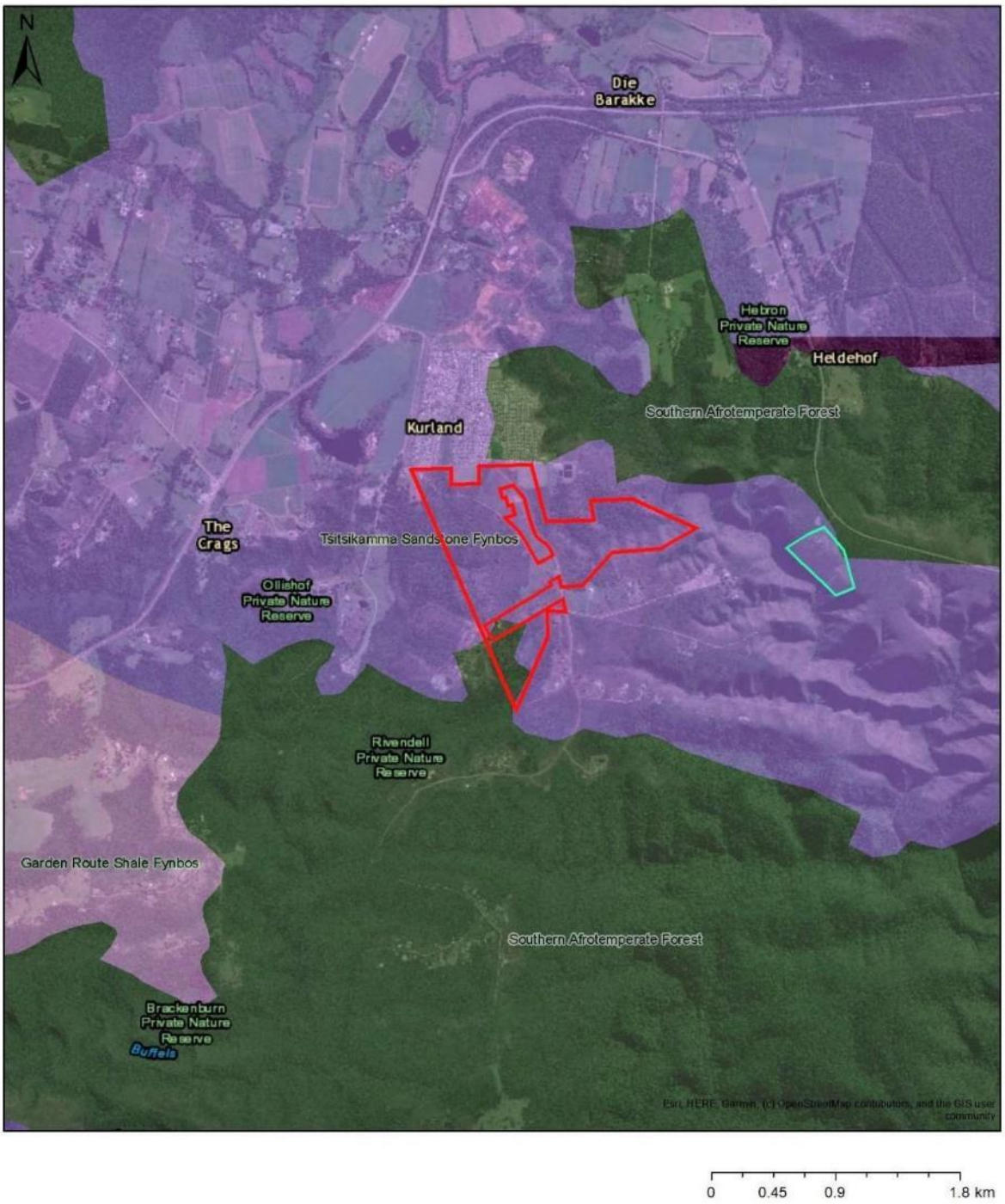


Figure 30: Extract of the 2012 SA Vegetation Map (Source: Cape Farm Mapper), showing the position of the site)

Being located at the Southern Cape (Garden Route area) in close proximity to the coast, the site lies in a typical coastal fynbos environment. This is confirmed by the presence of fynbos species, such as *Erica sparsa, E. discolor, Protea neriifolia* and *Leucadendron salignum*.

No Species of Conservation Concern or regional endemics were recorded on site. One protected tree species (in terms of the National Forests Act 84 of 1998) was recorded in the western part of site, namely *Afrocarpus falcatus*. The removal of this tree requires a permit from the Department of Forestry.

The site comprises of a mixture of fynbos, fallow land, alien forest/woodland and some indigenous forest. Fynbos in the remainder of the site, such as the road verges and areas infested with woody aliens, has been mapped as degraded. However, it should be noted that this does not mean that this fynbos has a low conservation value. Considerable senescence was also noted in the fynbos.

6.5.1.1. Shrub Species

According to the ground truthing undertaken by the Botanical Specialist, shrub species recorded in the fynbos include:

- *Metalasia trivialis,*
- *M. pungens,*
- *Helichrysum odoratissimum,*
- *H. felinum,*
- *H. cymosum,*
- *H. foetidum (wet areas),*
- *Osteospermum moniliferum,*
- *Senecio ilicifolius,*
- *S. tamoides,*
- *Athanasia dentata,*
- *Euryops virgineus,*
- *Oedera calycina,*
- *Stoebe alopecuroides,*
- *Seriphium plumosum,*
- *Nidorella ivifolia,*
- *Hippia frutescens (wet areas),*
- *Protea neriifolia,*
- *Erica discolor,*
- *E. densifolia,*
- *E. sparsa,*
- *E. formosa,*
- *E. scabriuscula,*
- *E. seriphiifolia,*
- *Berzelia intermedia,*
- *Pelargonium cordifolium (wet areas),*
- *Chironia tetragona,*
- *Passerina corymbosa,*
- *Penaea cneorum,*
- *Otholobium stachyerum,*
- *Aspalathus opaca ssp. rostriloba,*
- *Phylica axillaris,*
- *Searsia tomentosa,*
- *S. lucida,*
- *Lanaria lanata,*
- *Cliffortia stricta,*
- *C. strobilifera (*wet areas*),*
- *Rubus sp. (*wet areas*),*
- *Anemone vesicatoria,*
- *Lobelia tomentosa,*
- *Asparagus africanus,*
- *Selago corymbose;*
- *Halleria sp. (*no flowers*).*

6.5.1.2. Pioneer Forest / Thicket

According to the Botanical Survey, a fair number of indigenous forest species were recorded in the understorey of the alien forest area in the southern part of the site, including:

- *Rapanea melanophloeos,*
- *Vepris lanceolata,*
- *Diospyros dichrophylla,*
- *Searsia chirindensis,*

- *S. angustifolia,*
- *Gymnosporia buxifolia,*
- *Maytenus cf. nemorosa,*
- *Burchellia bubalina,*
- *Lachnostylis hirta,*
- *Agathosma ovata,*
- *Rhoicissus tomentosa,*
- *Calodendrum capense, and*
- *Helichrysum petiolare.*

It is likely that these areas were previously covered by fynbos, but the subsequent infestation by tall woody aliens created a suitable nursery plant effect for the establishment of indigenous forest species in the understorey.

6.5.1.3. Alien Species

According to the Botanical Survey, alien species recorded, include:

- *Acacia mearnsii* (black wattle),
- *A. melanoxylon* (blackwood),
- *Pinus sp.* (pines),
- *Eucalyptus sp*. (gums),
- *Hakea sericea* (silky hakea),
- *Paraserianthes lophantha* (stink bean, watercourses),
- *Verbena bonariensis* (purple top),
- *Melaleuca viminalis* (weeping bottlebrush),
- *Paspalum urvillei*, and
- *Pennisetum clandestinum* (kikuyu).

The majority of these are listed invasive aliens. In terms of the National Environmental Management:
Biodiversity Act (Act 10 of 2004) Alien and Invasive Species List (2016), the harbouring of black wattle and blackwood on a property is prohibited without a permit. The presence of dense stands of black wattle, blackwood and gums is indicative of past disturbances or agricultural activities. Black wattle has also invaded the watercourses and along with the other woody aliens present a serious fire risk. There are signs of wood cutting or alien clearing.

6.5.1.4. Highly Disturbed and Transformed Areas

The site comprises of a mixture of fynbos, fallow land, alien forest/woodland and some indigenous forest (see Figure 26). The latter is confined to a sheltered, low-lying area (valley) in the southern part of the site. Due to inaccessibility, this area was not surveyed by the author, but local knowledge was obtained from Bruce Kietzmann of the nearby Garden Route Natural Science Research Facility (Academia Naturalis). The eastern part of the site is considered to contain the best quality fynbos on the steep north-facing slopes above the valley.

Fynbos in the remainder of the site, such as the road verges and areas infested with woody aliens, has been mapped as degraded. This does not mean that this fynbos has a low conservation value. Considerable senescence was also noted in the fynbos. It can be observed that significant areas have been transformed by past agricultural activities (fallow land), sports fields or invaded by mainly *Acacia mearnsii* (black wattle), *A. melanoxylon* (blackwood), pines and gums.

The fallow land to the west of the main gravel road through the site shows early succession of pioneer fynbos species returning. Structurally, the fynbos can be described as a tall closed ericoid shrubland following Campbell's (1981) classification. Some of the taller fynbos shrubs, such as *Leucadendron eucalyptifolium*, reach over 4 m in height.

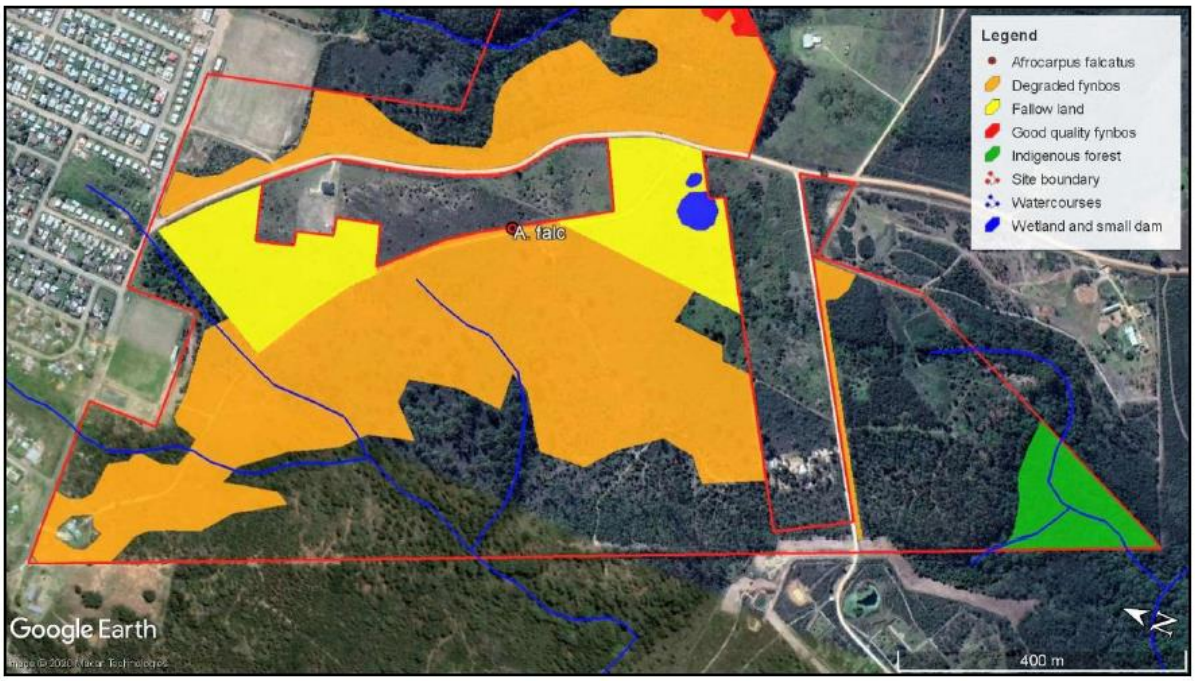


Figure 31: Aerial photograph showing the biodiversity attributes of the western part of study site.

6.5.2. Biodiversity Sensitivity

With regards to the local biodiversity network the site is relatively complex comprising terrestrial Critical Biodiversity Areas (CBA's), terrestrial Ecological Support Areas (ESA's) and aquatic ESA's. The latter are associated with several watercourses that pass through the site. The terrestrial CBA's include a small degraded fynbos area on the northern side bordering onto the village, an area indicated as a forest CBA in the eastern part of the site, as well as a small forest CBA at the southern tip of the site.

The degraded fynbos area has little merit for its mapped status, while the forest CBA is clearly a mapping error since the area is covered with pines and gums. The least sensitive parts of the site are the areas alongside the main gravel road that passes through the site and the degraded or transformed areas on northern side. The terrestrial ESA in the north-western part of the site corresponds roughly with the mapped degraded fynbos (see Figure 32).

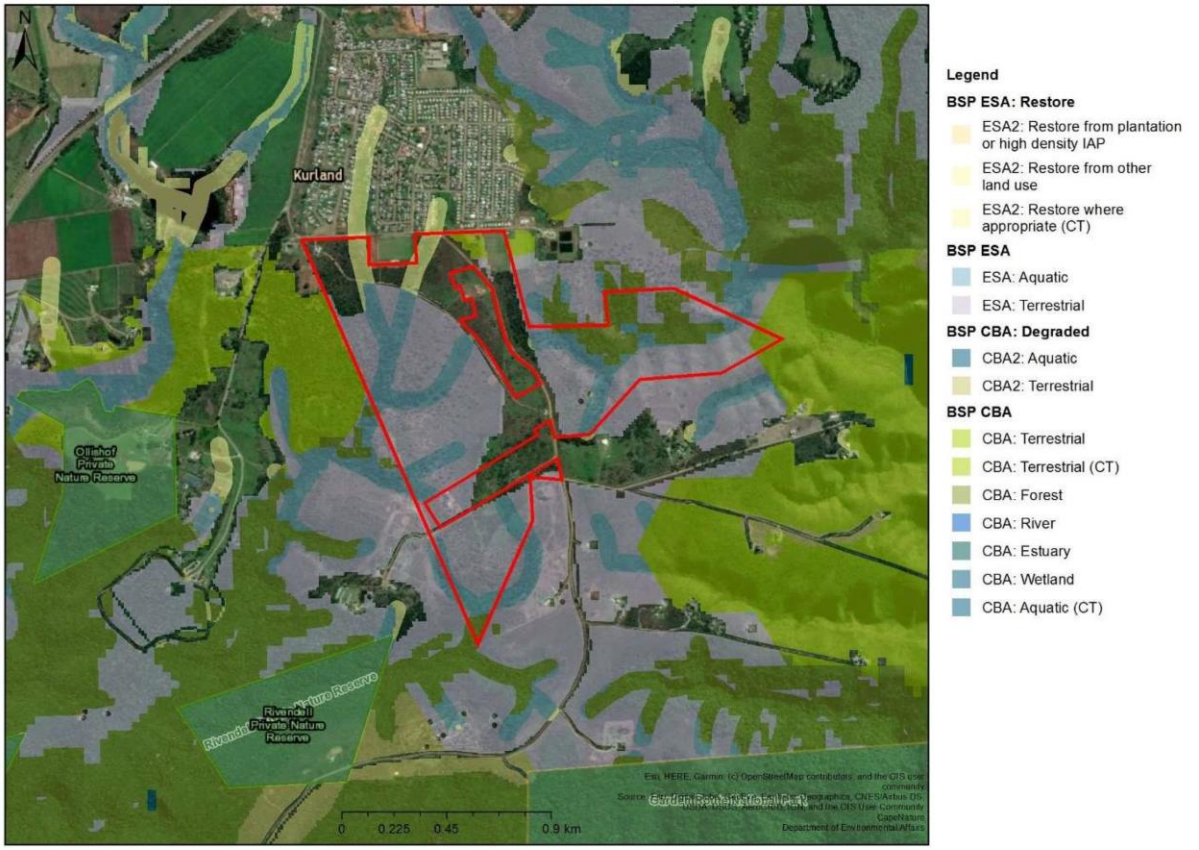


Figure 32: Critical Biodiversity Areas.

CBA's are areas that are required to meet biodiversity targets for species, ecosystems or ecological processes and infrastructure (Pool-Stanvliet et al. 2017). These 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. Only low-impact, biodiversity-sensitive land uses are considered appropriate. ESA's are not essential for meeting biodiversity targets, but play an important role in supporting the functioning of protected areas and CBA's (Pool-Stanvliet et al. 2017). They include features such as regional climate adaptation corridors, water source and recharge areas, riparian habitat surrounding rivers or wetlands, and endangered vegetation.

6.5.3.Conservation Status

According to Mucina & Rutherford (2006), 40% of Tsitsikamma Sandstone Fynbos is conserved in the Garden Route National Park, while 33% is transformed through cultivation and afforestation. Being well represented in the larger area and well protected, Tsitsikamma Sandstone Fynbos is not listed as a threatened vegetation type (DEA 2011). This view is supported in the more recent Western Cape Biodiversity Spatial Plan Handbook (Pool-Stanvliet et al. 2017). The situation is even better for Southern Afrotemperate Forest, with about 97% still left (Mucina & Rutherford 2006). Nearly 60% of its original area is formally conserved in the Garden Route National Park, Table Mountain National Park and numerous nature reserves. Only a small portion of forest has been transformed for plantations.

6.6. Fauna

The study area lies at the Bitou municipal urban edge and has been subjected to significant anthropogenic activities, including development to the north of the site (The Crags), and the agricultural activities, as well as anthropogenic disturbances like forestry activities, municipal maintenance activities including road tracks, etc. Predatory domestic dogs and cats from the adjacent residential areas have also contributed to faunal disturbance.

There is uncertainty at this stage of what fauna still remains on site at present, as no fauna was observed during the site observations/ground truthing by any of the specialist that have already provided input. However, the DEA Screening Tool undertaken for the proposed Kurland Housing Site indicates a High Sensitivity. The following features were identified as per the Screening Tool Report:

Sensitivity	Feature(s)
High	Aves-Circus maurus
High	Aves-Bradypterus sylvaticus
High	Aves-Turnix hottentottus
Medium	Invertebrate-Sarophorus punctatus
Medium	Invertebrate-Aneuryphymus montanus
Medium	Invertebrate-Forest invertebrate
Medium	Amphibia-Afrixalus knysnae
Medium	Aves-Circus maurus
Medium	Aves-Turnix hottentottus
Medium	Insecta-Tsitana dicksoni
Medium	Mammalia-Chlorotalpa duthieae
Medium	Sensitive species 7

Figure 33: Faunal Features Identified within the Proposed Kurland Housing Site.

A faunal specialist will be appointed to assess the proposed site and provide specialist feedback.

6.7. Archaeology & Heritage

According to the DEA Screening Tool the archaeology theme is indicated as Low Sensitivity, while the Palaeontology theme is indicated as Medium sensitivity within the southern portion of the proposed site, not proposed for development.

A NID Application will be completed, in terms of the National Heritage Resources Act (Act 25 of 1999) and will be submitted to Heritage Western Cape. Based on HWC's feedback, a heritage specialist will be appointed if necessary.

6.8. Socio Economic Environment of Kurland

6.8.1. Administrative Context

The study area is located in the Bitou Local Municipality (BLM). The Bitou LM is the easternmost coastal LM within the Western Cape Province (WCP). The Bloukrans River which constitutes the LM's eastern boundary is also the boundary between the WCP and Eastern Cape Province (ECP). The Bitou LM borders onto the Knysna LM (Eden DM) to the west, the George LM (Eden DM) to the north, the Kou-Kamma LM (ECP) to the east, and the Indian Ocean to the south.

The Bitou LM area is relatively small, namely 992 km^2. The northern portion of the LM 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. Nature and coastal-based tourism are the key drivers 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.

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 LM's population lives in Plettenberg Bay and these surrounding townships. 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.

The BSDF, 2022, indicates the Growth and Land Use Budget Summary 2025, 2040, as per the table below.

According to the BSDF (Bitou Spatial Development Framework), 2022, the municipalities population has increased at a rate of 3.8% per annum (1 998 persons/annum) over the period 2001-2016. Similarly, the number of households has been increasing at a rate of about 5.7% (871 households per annum). The projected additional population up to 2025 is about 17 968 people, representing 7 755 additional households. Should this trend continue, the Bitou LM would need to accommodate an estimated additional 107 000 people, representing approximately 42 808 households by 2040. When adding the current housing backlog of 8 238 units (households) to the 7 755 additional households, then approximately 548 ha of land would be required for urbanisation purposes up to 2025 (based on an average gross density of about 29 units/ha). About 242 ha of the 548 ha represents land required to accommodate the existing backlog. This includes 350 ha for housing purposes and 198 ha for other land uses, e.g. community facilities, economic activities, streets, open space etc.

The BSDF, further estimates that by 2040 the amount of land required to accommodate permanent residents will stand at about 1 066 ha comprising 692 ha for housing and 374 ha for other uses (average density = 27 units /ha). The 1 066 ha required from now up until 2040 represents about 49.5% of the existing urban footprint of the Bitou LM, estimated at about 2 157 ha.

The N2 provides easy access to the larger towns of Knysna and George, located 39 km and 107 km west of Plettenberg Bay via the N2, respectively. The Bitou LM consists of 7 Wards. The proposed development is located in Ward 1.

An appropriately qualified specialist will be appointed to undertake a Socio-Economic Assessment to inform the EIA.

6.8.1.1. Kurland

The municipality has one main settlement, Plettenberg Bay, which serves as the main service centre providing higher order medical, educational, commercial and administrative services. Three secondary settlements are dependent on Plettenberg Bay for major facilities. One of which being Kurland, which is accessible off of the N2. Kurland is identified as a settlement with a high social and low development need with a population less than 5000.

According to the Bitou Local Municipality, Spatial Development Framework (SDF) Kurland and The Crags have a well-defined tourism character, with numerous accommodation establishments on small holdings and farms. It also has timber and brick yards, dairies and a winery, which give it a different, service industrial character. Its theme should thus relate to the tourism attractions in an agricultural setting, while permitting the urban component to expand. Urban expansion should create a spread of market sectors, to complement the existing low-income residential neighbourhood, while not detracting from the rural land uses and tourism attractions. The SDF should make proposals for this to become a balanced urban settlement according to the principles of walking distance access and functional and socio-economic integration.

It is note that Kurland should be promoted as a functionally and socio-economically integrated urban settlement whose form, structure and layout is determined by the settlement planning principles. The proposed development has been highlighted in the SDF, indicating that Kurland has an audited housing demand for approximately 670 units, and there is currently sufficient land for this demand if the DLA land to the south is used, the proposed development is located within the delineated urban edge, and will provide approximately 1500 units, and will be located on DLA land.

6.8.2. Demographic Profile

6.8.2.1. Population

According to the Integrated Development Plan (2017 – 2022), Bitou has the second smallest population in the district which according to the community survey of 2016 stands at 59, 157. This figure is the only official figure that will be used by all statistics users because of its verification and endorsement by the statistician general. According to the Table 7 below, records show that the population of Bitou has grown with about 10, 000 people since the last census of 2011. This increase translates to 3.77 percent annual growth rate from 2011 to 2016.

Table 7: Population as in 2016 (StatsSA), extracted from IDP (2017 -2022).

	1996	2001	2011	2016	2030
POPULATION	18,010	29,182	49,162	59,157	138776

According to population trends since 1996 – 2011, an exponential growth trend is observed, that will sooner if not later have a very negative effect on the municipal sustainability. Which will have a proportionate increase in the demand for municipal services. The demand for more services will have a direct effect on the cost of providing that service and local government will be forced to push that cost to the already tax burdened rate payers.

A 2021 CENSUS was planned for this year, however due to the impact and constraints of the COVID19 pandemic this has yet to be completed.

According to Census 2011 the Bitou LM has a population of 49 162, representing 8.5% of the Eden DM population (574 265). Census 2011 indicates that 89.7% of the Bitou population is urbanised. Commercial farms account for the balance (10.3%), with none of the population classified as living in traditional areas. Plettenberg Bay is by far the largest town (31 804), accounting for nearly 65% of the Bitou population.

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%. The dominant language within the Municipality is Afrikaans (~42.3%), followed by isiXhosa (~37%) and English (~13%)(Census 2011).

The Bitou population has increased by more than 20 000 in the decade between the 2001 and 2011 Census counts – an increase more than double the 1996 Bitou population (18 427). Between 1996 and 2011 the population has been growing at an average of 5.4% per year – the fourth fastest growth rate of any LM in South Africa, and the second fastest in the WCP. If this rate is maintained, the Census 2011 population is likely to double by 2025, and reach 138 776 by 2030. As pointed out in the IDP, this is probably the greatest challenge facing the LM, and has significant implications for timeous service provision and infrastructure development in the LM (Bitou IDP, 2016).

As noted in the Spatial Planning Report, the broad urban/development pattern of Bitou, Kurland is deemed a second order activity node. Kurland Village consists of about 930 formal dwellings and an informal settlement, Xawa Xawa, in the north-western part of the village. Many backyard dwellings are included in the urban fabric. The BSDF population projection was stated as 4693 people in 2016 with an estimated increase to 7893 by 2040. In terms of dwelling units, the increased demand is estimated at 2109 by 2025 and 2941 by 2040.

7. PROJECT NEED AND DESIRABILITY

7.1. Regional Need & Desirability

The vision set out in the Western Cape Department of Human Settlements Strategic Plan (2015-2020) is for residents of the Western Cape to have access to live-ability, accessible, safe and multi-opportunity settlements. The mission of the Department of Human Settlements is:

- To provide settlements that offer good basic and socio-economic services;
- To offer a range of rental and ownership options that respond to the varied needs and incomes of households; and
- To consistently improve settlements through joint citizen and government effort supported by private sector contributions.

The strategy notes that in order to achieve the Department's vision, it will focus on increased housing opportunities and improved settlement functionality, efficiencies and resilience. Three strategic priorities have been developed to deliver on this mandate:

- Shift more resources to upgrade informal settlements in order to deal with problems of poor living conditions and insufficient access to basic services;
- Clean up the Housing Demand Database in municipalities in order to ensure that limited 'Building New Ground' (BNG) opportunities are allocated to the most deserving beneficiaries; and
- Embark on strategic partnerships in order to provide GAP/Affordable Housing and rental opportunities.

The Strategy notes that the National Development Plan (NDP) highlights the need for spatial transformation as a national priority. For the Western Cape, spatial planning is informed by the Western Cape Provincial Spatial Development Framework (PSDF). There are a number of key policy objectives that underpin the PSDF that are of relevance to the proposed development, namely:

- A strong sense of place and quality environments within settlements at all scales is increasingly recognised as an essential dimension of sustainable development.
- Accessibility to opportunities and services is a keystone to building a strong regional economy and facilitating equitable access to opportunities and services in a financially sustainable manner;
- The provision of sustainable and effective social services requires that these are rationalised, clustered and managed in an integrated manner; and
- The provision and facilitation of an integrated and multi-modal transport system, relies on the appropriate location of mixed-use areas and increased settlement densities to ensure adequate thresholds for sustainable public transport.

The investments by the Department of Human Settlements are aimed at meeting these objectives. As such, a number of catalytic projects have been identified for implementation over the next five years. The Strategy also lists 9 Strategic Goals. Strategic Goal 2, 3, 6, 7, 8 and 9 are relevant to the proposed development:

- Strategic Goal 2: Improved functionality, efficiencies and resilience of human settlements. The Department will implement an evidence-based planning approach and consolidate effective inter-governmental and transversal spatial planning and coordination. This will contribute to the improvement of spatial planning, urban design, alignment and scheduling of settlement programmes and projects;
- Strategic Goal 3 Accelerated housing opportunities: The Department will increase the supply of housing opportunities through the implementation of a diversified housing programme with greater emphasis on incremental opportunities;
- Strategic Goal 6 Improved living conditions of beneficiaries through the upgrading of housing units and promoting ownership of property: The Department will upgrade informal settlements and existing housing units, as well as promote security of tenure;
- Strategic Goal 7 Enable an increased supply of land for affordable housing and catalytic projects: The Department will establish partnerships with various role-players to secure suitable land for affordable housing, as well as catalytic projects, to enable an increasing supply thereof and decreasing the cost whilst increasing the affordability level of the gap market earning between R1 501 and R15 000;
- Strategic Goal 8 Facilitate job creation and empowerment opportunities: The Department will award tenders to contractors and provide work opportunities to enterprises that have historically disadvantaged individuals (HDI), women, youth and black representation within the housing sector;

- Strategic Goal 9 Promote innovation and the better living concept: Utilise innovative technologies for the construction of housing units that responds to issues pertaining to construction, energy, water and sanitation, as certified by Agreement South Africa and National Home Builders Registration Council (NHBRC).

According to the Bitou Local Municipalities IDP (2018), it has been highlighted that the Municipality's most critical development and internal transformation needs, that can be met by the implementation of this development includes:

- 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
- Housing: Development of affordable (social and gap) housing.
- Public Engagement: Limited public participation and communication with communities.

In line with the National Need and Desirability Guideline, 2017, the proposed development aligns as follows:

Reference	Need description as per the Guideline	Description
"Securing ecological sustainable development and use of natural resource"		
1. How will this development (and its separate elements/aspects) impact on the ecological integrity of the area?		
1.1	How were the following ecological integrity considerations taken into account?:	
	1.1.1. Threatened Ecosystems,	An appropriately registered specialist was appointed to address the Plant Species and Terrestrial Biodiversity (See Section 6). The specialists undertook baseline studies, with site sensitivity verifications, to inform the preferred layout. A detailed impact assessment will be undertaken in the EIA phase.
	1.1.2. Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries, wetlands, and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure,	
	1.1.3. Critical Biodiversity Areas ("CBAs") and Ecological Support Areas ("ESAs"),	
	1.1.4. Conservation targets,	
	1.1.5. Ecological drivers of the ecosystem,	
	1.1.6. Environmental Management Framework,	No EMF exists for this area.
	1.1.7. Spatial Development Framework, and	The alignment with the local SDF has been discussed in Section 2.3.
	1.1.8. Global and international responsibilities relating to the	Climate Change adaption and mitigation measures have been integrated into the

Reference	Need description as per the Guideline	Description
"Securing ecological sustainable development and use of natural resource"		
1. How will this development (and its separate elements/aspects) impact on the ecological integrity of the area?		
	environment (e.g. RAMSAR sites, Climate Change, etc.).	planning and operational phase, see Section 9.
1.2	How will this development disturb or enhance ecosystems and/or result in the loss or protection of biological diversity?	During the EIA phase, the impact assessment on the receiving environment will be assessed.
	What measures were explored to firstly avoid these negative impacts, and where these negative impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts?	A part of the plan of study of the Environmental Impact Assessment phase of the process, it is proposed that a number of specialists be approached in order to identify the sensitivity of the study area. As part of the Scoping phase, the baseline reports (including the findings of the field verifications, where applicable) has been included. These findings have been used to inform the developable areas of the proposed development.
	What measures were explored to enhance positive impacts?	The positive impacts of the proposed development are rooted in the socio-economic aspect, and in turn infrastructural requirements of the regional and national environment. The proposal will result in temporary and permanent job creation, but most significantly, will provide vital housing to address the existing backlog, with appropriate support structures/services, including a school and water and sewer services, which will result in a significant improvement to people's quality of life, health and well-being, as the development is aimed at those in a low-income bracket.
1.3	How will this development pollute and/or degrade the biophysical environment?	Potential risks and impacts have been identified as per Section 9. A more detailed assessment will be conducted during the EIA Phase.
	What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were	Specialist input was sourced to identify the sensitivity of the area, in order to inform the layout plan. A more detailed assessment will be conducted during the EIA Phase.

Reference	Need description as per the Guideline	Description
"Securing ecological sustainable development and use of natural resource"		
1. How will this development (and its separate elements/aspects) impact on the ecological integrity of the area?		
	explored to minimise and remedy (including offsetting) the impacts?	
	What measures were explored to enhance positive impacts?	The impacts on the receiving environment and mitigation measures proposed have been provided in Section **Error! Reference s ource not found.**. These impacts will be refined as part of the EIA phase of the process. The specialist observations and baseline input, was utilized to identify areas of high impact based on the sensitivity, and these areas were avoided, when establishing the proposed layout plan.
1.4	What waste will be generated by this development?	General waste, green waste, as well as construction/building waste will be generated during construction. Waste of both a hazardous and non-hazardous nature will be generated and managed appropriately, in line with Section 9.5.1.5. Tools such as the EMPr, will accompany the EIA with detailed measures, to ensure implementation, should the proposal be authorized.
	What measures were explored to firstly avoid waste, and where waste could not be avoided altogether, what measures were explored to minimise, reuse and/or recycle the waste?	
	What measures have been explored to safely treat and/or dispose of unavoidable waste?	
1.5	How will this development disturb or enhance landscapes and/or sites that constitute the nation's cultural heritage?	No cultural heritage sites will be impacted upon.
	What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts?	
	What measures were explored to enhance positive impacts?	
1.6	How will this development use and/or impact on non-renewable natural resources?	The proposal will utilize the existing Eskom infrastructure, thereby depending on coal powered electricity, however, where possible energy saving

Reference	Need description as per the Guideline	Description
"Securing ecological sustainable development and use of natural resource"		
1. How will this development (and its separate elements/aspects) impact on the ecological integrity of the area?		
		techniques/technology will be applied to lower the developments dependence on Eskom infrastructure, such as solar panels/solar geysers, etc. See Section 9.4.1.
	What measures were explored to ensure responsible and equitable use of the resources?	It will be recommended that energy saving technologies/techniques, be applied to conserve energy and where possible, renewable alternative technology be integrated. See Section 9.4.1.
	How have the consequences of the depletion of the non-renewable natural resources been considered?	In terms of the planning phase, green building materials, water and energy saving technologies have been recommended to be integrated into the design, where possible and feasible.
	What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts?	The undertaking of the EIA process stands to provide an opportunity for all feasible and reasonable alternatives to be considered, in order to reduce and avoid potential significant impacts. This process has allowed for the identification of the actual site sensitivities, which have been used to influence the proposed layout plan and avoid environmentally sensitive areas as much as possible.
	What measures were explored to enhance positive impacts?	The impacts on the receiving environment and mitigation measures proposed therefore have been provided in Section **Error! Reference source not found.**. These i mpacts will be refined as part of the EIA phase of the process.
1.7	How will this development use and/or impact on renewable natural resources and the ecosystem of which they are part?	Based on specialist findings, only degraded and disturbed areas will be utilized for the proposed development. CBA areas and watercourses have been identified and significant development has been located outside of these areas. Where possible renewable energy technology alternatives, such as solar panels, have been recommended to be integrated into the final design.
	Will the use of the resources and/or impact on the ecosystem jeopardise the integrity of the resource and/or system taking into account carrying capacity restrictions, limits of acceptable change, and thresholds?	

Reference	Need description as per the Guideline	Description
"Securing ecological sustainable development and use of natural resource"		
1. How will this development (and its separate elements/aspects) impact on the ecological integrity of the area?		
	What measures were explored to firstly avoid the use of resources, or if avoidance is not possible, to minimise the use of resources?	The undertaking of the EIA process stands to provide an opportunity for all feasible and reasonable alternatives to be considered, in order to reduce and avoid potential significant impacts. This process has allowed for the identification of the actual site sensitivities, which have been used to influence the proposed layout plan and avoid environmentally sensitive areas as much as possible.
	What measures were taken to ensure responsible and equitable use of the resources?	Section 9 of the Scoping Report includes the anticipated 'Scoping' Impacts of the proposed development.
	What measures were explored to enhance positive impacts?	
	1.7.1. Does the proposed development exacerbate the increased dependency on increased use of resources to maintain economic growth or does it reduce resource dependency (i.e. de-materialised growth)? (note: sustainability requires that settlements reduce their ecological footprint by using less material and energy demands and reduce the amount of waste they generate, without compromising their quest to improve their quality of life)	The most significant positive impacts are in relation to the socio-economic impacts that will be created, these include: • Addressing the existing housing backlog faced by the municipality. • Creation of essential infrastructure, aimed at improving the quality of resident's lives and livelihoods. • Creation of significant employment opportunities during the construction phase. • Long-term support for the community and investment into the future growth of the community, by establishing community support facilities including a school.
	1.7.2. Does the proposed use of natural resources constitute the best use thereof? Is the use justifiable when considering intra- and intergenerational equity, and are there more important priorities for which the resources should be used (i.e. what are the opportunity costs of using these resources this the proposed development alternative?)	The proposed site contains fallow land, degraded fynbos, and woody alien invasive species. The layout will allow for the avoidance of direct impacts on sensitive natural features, including watercourses and an identified CBA located to the east of the site. Considering that the Kurland Village is located directly north of the site, and the proposal will be aligned with the neighbouring properties, and create a greater network within the Kurland area, building on community and community

Reference	Need description as per the Guideline	Description
"Securing ecological sustainable development and use of natural resource"		
1. How will this development (and its separate elements/aspects) impact on the ecological integrity of the area?		
		services. Furthermore the site has been earmarked for housing development, according to the Municipal SDF
	1.7.3. Do the proposed location, type and scale of development promote a reduced dependency on resources?	The site has natural features limiting the extent of the development, including steep slopes, drainage systems and forested areas to the south and good quality fynbos to the east, that have been considered and will remain intact.
1.8	How were a risk-averse and cautious approach applied in terms of ecological impacts?	
	1.8.1. What are the limits of current knowledge (note: the gaps, uncertainties and assumptions must be clearly stated)?	The Gaps in the Knowledge, Uncertainties and Assumptions made during this study have been identified and described in Section **Error! Reference source not found.** of t his report.
	1.8.2. What is the level of risk associated with the limits of current knowledge?	The risk lies with providing an accurate representation of the impacts of the proposed development. To mitigate this risk, where needed, specialists were appointed to provide anticipated impacts relative to the themes (as extracted from the DFFE Screening Tool Report) they were appointed to address.
	1.8.3. Based on the limits of knowledge and the level of risk, how and to what extent was a risk-averse and cautious approach applied to the development?	The Alternatives and the rationale followed toward identifying the alternatives and the feasibility thereof have been discussed in Section **Error! Reference source not found.**. T his describes the approach followed toward obtaining the preferred layout alternative for the proposed development. As of the Scoping Report, the impacts assessed provide an indication of the anticipated aspects that would be associated impacts. These impacts and mitigation measures will be refined during the EIA phase of the proposed development.
1.9	How will the ecological impacts resulting from this development impact on people's environmental right in terms following.	

Reference	Need description as per the Guideline	Description
"Securing ecological sustainable development and use of natural resource"		
1. How will this development (and its separate elements/aspects) impact on the ecological integrity of the area?		
	1.9.1. Negative impacts: e.g. access to resources, opportunity costs, loss of amenity (e.g. open space), air and water quality impacts, nuisance (noise, odour, etc.), health impacts, visual impacts, etc. What measures were taken to firstly avoid negative impacts, but if avoidance is not possible, to minimise, manage and remedy negative impacts?	It has been determined that the site is zoned for Agricultural use, however it contains degraded vegetation, and fallow lands, indicating past agricultural land use. Vegetation includes both indigenous species and alien invasive woody species, which will be impacted upon during construction. Other natural areas, CBA, forest and watercourses, were identified, using specialist input, which aided in establishing a layout plan, that allowed for these areas to be avoided, while still meeting the housing requirements aimed to be achieved through this proposal, which will result in improvement to residents' quality of life, and overall health and well-being for years to come. Nuisance and visual impacts will be created during the construction phase however, they will be temporary, and during operational phase, these impacts will align with the neighbouring Kurland Village. Open spaces will be provided as a part of the proposed development, to be utilized by the existing and new community. The impacts on the receiving environment and mitigation measures proposed have been provided in Section **Error! Reference source not found.**. These impacts will be refined as part of the EIA phase of the process.
	1.9.2. Positive impacts: e.g. improved access to resources, improved amenity, improved air or water quality, etc. What measures were taken to enhance positive impacts?	The positive impacts of the proposed development are rooted in the socio-economic and in turn infrastructural requirements of the regional and national environment. These will be seen in the amount of employment opportunities created during the construction phase, and the long-term benefits aimed at improving the quality of life for current and future residents of Kurland.

Reference	Need description as per the Guideline	Description
"Securing ecological sustainable development and use of natural resource"		
1. How will this development (and its separate elements/aspects) impact on the ecological integrity of the area?		
		The impacts on the receiving environment and mitigation measures proposed therefor have been provided in Section **Error! R eference source not found.**. These impacts will be refined as part of the EIA phase of the process.
1.10	*Describe the linkages and dependencies between human wellbeing, livelihoods and ecosystem services applicable to the area in question and how the development's ecological impacts will result in socio-economic impacts (e.g. on livelihoods, loss of heritage site, opportunity costs, etc.)?*	It is acknowledged that the site has been identified for such a development, for many years, in order to address the housing backlog faced by the municipality. Specialist input has allowed for areas of sensitivity to be identified and avoided where possible, and where necessary to reduce significant impacts. It is not clear what type of ecosystem services this area provides, due to the dense vegetation both alien and indigenous, although there is evidence of areas of fallow land portions located adjacent to the existing access track. It is known that the proposed development will aim to provide much needed housing for current and future Kurland residents, which will allow for an improvement on their quality of life, and over all well-being. In addition, the proposal will integrate multiple community facilities, to strengthen and integrate the Kurland settlement community.
1.11	*Based on all of the above, how will this development positively or negatively impact on ecological integrity objectives/targets/considerations of the area?*	Specialist input has been sourced to identify sensitive areas and features, and these areas have been considered when determining the layout. Sensitive areas have been avoided, including CBA's and watercourse. Mitigation measures have been integrated into the Scoping Report, to avoid anticipated potential direct impacts. The approach followed toward identifying the Alternatives for the proposed
1.12	Considering the need to secure ecological integrity and a healthy biophysical environment, describe how the alternatives identified (in terms of all the different elements of the development and all the	

Reference	Need description as per the Guideline	Description
"Securing ecological sustainable development and use of natural resource"		
1. How will this development (and its separate elements/aspects) impact on the ecological integrity of the area?		
	different impacts being proposed), resulted in the selection of the "best practicable environmental option" in terms of ecological considerations?	development has been detailed in Section **Error! Reference source not found.**.
1.13	*Describe the positive and negative cumulative ecological/biophysical impacts bearing in mind the size, scale, scope and nature of the project in relation to its location and existing and other planned developments in the area?*	The proposed development has been designed as such, to minimize the impact on the natural resources located within the proposed development area, while, simultaneously allowing for the most feasible extent for a housing development, that can adequately address the housing backlog for the Kurland area, while still providing efficient support infrastructure. Sensitive areas identified to the east and south, have been avoided, in order to confine development to disturbed portions. The most significant positive cumulative impacts are in relation to the socio-economic impacts that will be created, these include: • Addressing the existing housing backlog faced by the municipality. • Creation of essential infrastructure, aimed at improving the quality of resident's lives and livelihoods. • Creation of significant employment opportunities during the construction phase. • Long-term support for the community and investment into the future growth of the community, by establishing community support facilities including a school. Cumulative positive ecological and biophysical impacts include: • Sensitive areas identified to the east and south, have been avoided. • The natural topography of the site has been taken into consideration, and the sloped areas have been

Reference	Need description as per the Guideline	Description
"Securing ecological sustainable development and use of natural resource"		
1. How will this development (and its separate elements/aspects) impact on the ecological integrity of the area?		
		avoided, which are areas that may have resulted in significant runoff. • The disturbed portions of land have been utilized for this proposal, thereby removing alien invasive species, from encroaching further into natural areas. Cumulative negative impacts include: • Increase in surface runoff as a result of hardened surfaces, that can impact upon the downstream environment. • Loss of natural vegetation. • The development of this area allows for access into the surrounding areas, that otherwise may have proven difficult to access.

Reference	Desirability description as per the Guideline	Description
"Promoting justifiable economic and social development"		
2.1	What is the socio-economic context of the area, based on, amongst other considerations, the following considerations?:	
	2.1.1. The IDP (and its sector plans' vision, objectives, strategies, indicators and targets) and any other strategic plans, frameworks of policies applicable to the area,	Refer to Section 2.3 of the Scoping Report.
	2.1.2. Spatial priorities and desired spatial patterns (e.g. need for integrated of segregated communities, need to upgrade informal settlements, need for densification, etc.),	
	2.1.3. Spatial characteristics (e.g. existing land uses, planned land uses, cultural landscapes, etc.), and	

Reference	Desirability description as per the Guideline	Description
"Promoting justifiable economic and social development"		
	2.1.4. Municipal Economic Development Strategy ("LED Strategy"),	
2.2	Considering the socio-economic context, what will the socio-economic impacts be of the development (and its separate elements/aspects), and specifically also on the socio-economic objectives of the area?	The proposal will positively impact on one of the most significant municipal socio-economic initiatives – addressing the housing backlog. These will lead to social development opportunities, improved quality of life, a sense of safety and hope, and a sense of community.
	2.2.1. Will the development complement the local socio-economic initiatives (such as local economic development (LED) initiatives), or skills development programs?	
2.3	How will this development address the specific physical, psychological, developmental, cultural and social needs and interests of the relevant communities?	The development will allow for: • The establishment of housing infrastructure, based on a reliable and integrated design. • This will lead to the improvement of the quality of their lives, as well as create opportunities for future growth and well-being. • The proposal will allow for the expansion of the Kurland community, as well as social facilities. • By accommodating facilities like a school, open areas, community centres, the youth will have an opportunity to socialize, develop skills, and have access to facility devoted to giving them access to an education and a future. • The development will lead to creating an expanded and efficient sense of community, for some this development will create a sense of safety not always familiar and accessible. Improved infrastructure including accessible road and walkways for residents, healthy and improved sewer and water services community facilities, can create a hopeful and positive impact on people's health and
2.4	Will the development result in equitable (intra- and inter-generational) impact distribution, in the short- and long-term? Will the impact be socially and economically sustainable in the short- and long-term?	

Reference	Desirability description as per the Guideline	Description
"Promoting justifiable economic and social development"		
		well-being, as well as creating a hopeful perspective for youth. This development will prove to be socially and economically sustainable in the long-term for the residents it will cater to.
2.5	In terms of location, describe how the placement of the proposed development will:	
	2.5.1. result in the creation of residential and employment opportunities in close proximity to or integrated with each other,	Labour will be sourced from the Kurland Village located to the north of the site, and from other local areas, if the need arises.
	2.5.2. reduce the need for transport of people and goods,	It will be that goods be sourced locally. Given that the site is in close proximity to the N2, a national road network, this allows for goods to be easily transported to site.
	2.5.3. result in access to public transport or enable non-motorised and pedestrian transport (e.g. will the development result in densification and the achievement of thresholds in terms public transport),	One of the most significant aspects to this development was densification. Allowing for land to be utilized efficiently, accommodating an acceptable number and type of housing, with the integration of access routes, for both motorized and non-motorized transport.
	2.5.4. compliment other uses in the area,	The proposed development will align with the Kurland Village, it will further expand the Kurland community and expand increase social facilities that can be utilized by all residents.
	2.5.5. be in line with the planning for the area,	The proposal is in line with the municipal SDF, and was identified for this use, to serve amongst others, this purpose, see section 2.3.
	2.5.6. for urban related development, make use of underutilised land available with the urban edge,	
	2.5.7. optimise the use of existing resources and infrastructure,	The proposal will utilize existing tracks and infrastructure where possible.
	2.5.8. opportunity costs in terms of bulk infrastructure expansions in non-priority areas (e.g. not aligned with the bulk infrastructure planning for the settlement that reflects the spatial reconstruction priorities of the settlement),	The existing wastewater treatment works is located to the north east of the site, and taking this proposal into consideration, the municipality intends to upgrade the existing bulk services, which will benefit not just the proposed site, but the existing Kurland residents and infrastructure.

Reference	Desirability description as per the Guideline	Description
"Promoting justifiable economic and social development"		
	2.5.9. discourage "urban sprawl" and contribute to compaction/densification,	As noted above, the design of this proposal focused on efficient densification on the site, avoiding significant natural areas, and the integration of open spaces. The site is ideally located to the south of the existing Kurland Village, expanding this urban infrastructure into an already disturbed adjacent portion of land, avoiding urban sprawl.
	2.5.10. contribute to the correction of the historically distorted spatial patterns of settlements and to the optimum use of existing infrastructure in excess of current needs,	
	2.5.11. encourage environmentally sustainable land development practices and processes,	
	2.5.12. take into account special locational factors that might favour the specific location (e.g. the location of a strategic mineral resource, access to the port, access to rail, etc.),	The proposed development is located within walking proximity of the existing Kurland area, as well as to the to N2 allowing ease of access to public transport routes.
	2.5.13. the investment in the settlement or area in question will generate the highest socio-economic returns (i.e. an area with high economic potential),	The proposed development will focus on the expansion of the Kurland settlement, providing multiple socio-economic benefits to improve the quality of life, safety and access to multiple amenities that will lead to long term benefits for the existing residents and future residents.
	2.5.14. impact on the sense of history, sense of place and heritage of the area and the socio-cultural and cultural-historic characteristics and sensitivities of the area, and	No heritage resources have been identified on this site.
	2.5.15. in terms of the nature, scale and location of the development promote or act as a catalyst to create a more integrated settlement?	The proposal will create significant improvements for the community, and integration for the original residents, by creating accessible routes and additional amenities that can be used by the entire community.
2.6	How were a risk-averse and cautious approach applied in terms of socio-economic impacts?:	
	2.6.1. What are the limits of current knowledge (note: the gaps, uncertainties and assumptions must be clearly stated)?	The municipality has targeted the Kurland settlement for local growth and expansion, providing improved amenities and opportunities. A socio-economic impact assessment will be undertaken to inform this environmental

Reference	Desirability description as per the Guideline	Description
"Promoting justifiable economic and social development"		
	2.6.2. What is the level of risk (note: related to inequality, social fabric, livelihoods, vulnerable communities, critical resources, economic vulnerability and sustainability) associated with the limits of current knowledge?	assessment in order to address any gaps, uncertainties and assumptions.
	2.6.3. Based on the limits of knowledge and the level of risk, how and to what extent was a risk-averse and cautious approach applied to the development?	
2.7	How will the socio-economic impacts resulting from this development impact on people's environmental right in terms following:	
	2.7.1. Negative impacts: e.g. health (e.g. HIV-Aids), safety, social ills, etc. What measures were taken to firstly avoid negative impacts, but if avoidance is not possible, to minimise, manage and remedy negative impacts?	There are predominantly positive socio-economic impacts that will occur as a result of this development. As with any construction, individuals with nefarious intentions can be attracted by the storage of goods, etc, however, it is anticipated that the labour will be sourced from the local Kurland Village, who will be made aware that the development is intended to promote a better quality of life and community for their settlement, which will aid in discouraging such behaviour.
	2.7.2. Positive impacts. What measures were taken to enhance positive impacts?	The socio-economic impacts of the proposed development are significant and long-term. Further to this the integration of energy and water saving technology will lead to awareness of such key aspects, in the community.
2.8	Considering the linkages and dependencies between human wellbeing, livelihoods and ecosystem services, describe the linkages and dependencies applicable to the area in question and how the development's socio-economic impacts will result in ecological impacts (e.g. over utilisation of natural resources, etc.)?	The proposed design endeavours to reduce impacts on natural areas, by avoiding sensitive areas, and where possible salvaging indigenous vegetation for integration into open spaces.

Reference	Desirability description as per the Guideline	Description
"Promoting justifiable economic and social development"		
2.9	What measures were taken to pursue the selection of the "best practicable environmental option" in terms of socio-economic considerations?	The proposed developments focused on densification, to efficiently accommodate a significant amount of housing, of various typologies, with supporting infrastructure, while avoiding sensitive natural areas.
2.10	What measures were taken to pursue environmental justice so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons (who are the beneficiaries and is the development located appropriately)?	Specialist input was sourced to advise on the environmental sensitivities of the site, in order to integrate the layout in such a manner as to not compromise the natural resources identified in the area. The proposed development will provide efficient housing infrastructure and resources, to cater to the residents who have been significantly impacted by the housing backlog that has faced the municipality and compromised their quality of life. Alternatives have been discussed as per Section 5.
	Considering the need for social equity and justice, do the alternatives identified, allow the "best practicable environmental option" to be selected, or is there a need for other alternatives to be considered?	
2.11	What measures were taken to pursue equitable access to environmental resources, benefits and services to meet basic human needs and ensure human wellbeing, and what special measures were taken to ensure access thereto by categories of persons disadvantaged by unfair discrimination?	The proposal will focus on the existing Kurland settlement, by providing improved infrastructure, additional amenities, improving access for motorized and non-motorized transport, integrating and integrating open spaces, the proposal will positively impact on the quality of life of the citizens affected by the housing backlog.
2.12	What measures were taken to ensure that the responsibility for the environmental health and safety consequences of the development has been addressed throughout the development's life cycle?	During construction environmental health and safety will be addressed in the EMPr for implementation. The property owners and community will be responsible for the environmental health and safety during operational phase. Infographics have been recommended to be integrated into public areas, providing guidance on waste management, and water saving techniques.
2.13	What measures were taken to:	

Reference	Desirability description as per the Guideline	Description
"Promoting justifiable economic and social development"		
	2.13.1. ensure the participation of all interested and affected parties,	Public participation proposed for this development is detailed in Section 8.
	2.13.2. provide all people with an opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation,	Public participation proposed for this development is detailed in Section 8. An open day is proposed, so as to allow members of the community who are interested, to have the proposal explained to them and allow them to provide input on the proposed development, project area, or any other relevant information for the project team to note.
	2.13.3. ensure participation by vulnerable and disadvantaged persons,	
	2.13.4. promote community wellbeing and empowerment through environmental education, the raising of environmental awareness, the sharing of knowledge and experience and other appropriate means,	
	2.13.5. ensure openness and transparency, and access to information in terms of the process,	
	2.13.6. ensure that the interests, needs and values of all interested and affected parties were taken into account, and that adequate recognition were given to all forms of knowledge, including traditional and ordinary knowledge, and	Human Need and Desirability is addressed in Section 7.3.
	2.13.7. ensure that the vital role of women and youth in environmental management and development were recognised and their full participation therein were be promoted?	An open day is proposed, so as to allow members of the community who are interested, to have the proposal explained to them and allow them to provide input on the proposed development, project area, or any other relevant information for the project team to note. Further to this, it will be recommended that woman and youth be included in the employment process undertaken during construction, to allow them to benefit from the salary opportunity, as well as the skills building opportunity, such a role provides.

Reference	Desirability description as per the Guideline	Description
"Promoting justifiable economic and social development"		
2.14	Considering the interests, needs and values of all the interested and affected parties, describe how the development will allow for opportunities for all the segments of the community (e.g.. a mixture of low-, middle-, and high-income housing opportunities) that is consistent with the priority needs of the local area (or that is proportional to the needs of an area)?	Human Need and Desirability is addressed in Section 7.3.
2.15	What measures have been taken to ensure that current and/or future workers will be informed of work that potentially might be harmful to human health or the environment or of dangers associated with the work, and what measures have been taken to ensure that the right of workers to refuse such work will be respected and protected?	Environmental awareness training will be recommended as per the EMPr.
2.16	Describe how the development will impact on job creation in terms of, amongst other aspects:	
	2.16.1. the number of temporary versus permanent jobs that will be created,	There will be multiple job opportunities created over the construction period, which will be undertaken as a phased activity, thereby creating jobs for multiple consecutive years, for people of various skill levels, particularly those with limited skills. Permanent employment directly related to the development will be limited to the businesses included in the mixed use and business zones, however, the development will provide an improved quality of life for residents, which will support peoples health, and well-being, and support their growth toward more opportunities.
	2.16.2. whether the labour available in the area will be able to take up the job opportunities (i.e. do the required skills match the skills available in the area),	The development will predominantly create job opportunities for the people with limited skills, which will allow for residents of Kurland Village, both formal and informal dwellings, regardless of their knowledge, experience or qualification, to take up the dominant

Reference	Desirability description as per the Guideline	Description
"Promoting justifiable economic and social development"		
		labour roles proposed by this development.
	2.16.3. the distance from where labourers will have to travel,	Labour will mostly be sourced from the Kurland Village, which is separated from the proposed site by a single road, Forrest Hall Road, making it easily accessible to these residents. Furthermore, if labour is sourced from outside Kurland Village, the site is easily accessible from the N2, via Forrest Hall Road.
	2.16.4. the location of jobs opportunities versus the location of impacts (i.e. equitable distribution of costs and benefits), and	All direct impacts will be created on disturbed, degraded areas, and impacts will be contained on site. However, the benefits created by the potential job opportunities will not only impact on the labour working on site, but have a ripple effect on their families and local economy, for years to come.
	2.16.5. the opportunity costs in terms of job creation (e.g. a mine might create 100 jobs, but impact on 1000 agricultural jobs, etc.).	As the site is not utilized for agricultural use anymore, based on the degraded nature of the site, while the development will create a significant number of jobs for people of various skill levels,
2.17	What measures were taken to ensure:	
	2.17.1. that there were intergovernmental coordination and harmonisation of policies, legislation and actions relating to the environment, and	The proposed development will be subjected to an environmental assessment, which will address multiple policies, legislation and enforce sustainable and positive impacts, that will allow for the inter relations between the development, environment and people, to be harmonized, emphasizing benefits, while managing and reducing negative impacts that can't be avoided.
	2.17.2. that actual or potential conflicts of interest between organs of state were resolved through conflict resolution procedures?	The proposed development will be subject to stringent public participation, allowing for Organs of State, relevant to the proposal to provide input. If there are conflicts raised it will be managed in line with this process.
2.18	What measures were taken to ensure that the environment will be held in public trust for the people, that the beneficial use of environmental resources will serve the public interest, and that the environment will be protected as the people's common heritage?	Specialist input was sourced to identify environmentally sensitive areas, that will be avoided. Green spaces will be integrated into the proposed development, and enhanced from the degraded state, so as to allow the community to enjoy these natural spaces.

Reference	Desirability description as per the Guideline	Description
"Promoting justifiable economic and social development"		
2.19	Are the mitigation measures proposed realistic and what long-term environmental legacy and managed burden will be left?	All mitigation measures presented at this stage can be efficiently and realistically applied. By ensuring that development remains outside of natural areas, these areas can be retained, and thrive.
2.20	What measures were taken to ensure that he costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects will be paid for by those responsible for harming the environment?	The environmental assessment will provide guidance to the design and planning phase, and allow for monitoring of the construction phase, to ensure that there is compliance with relevant environmental documentation. Furthermore, the EMPr will integrate fining for non-compliance, that will be implemented during the construction phase.
2.21	Considering the need to secure ecological integrity and a healthy bio-physical environment, describe how the alternatives identified (in terms of all the different elements of the development and all the different impacts being proposed), resulted in the selection of the best practicable environmental option in terms of socio-economic considerations?	Note Section 5.
2.22	Describe the positive and negative cumulative socio-economic impacts bearing in mind the size, scale, scope and nature of the project in relation to its location and other planned developments in the area?	The anticipated positive cumulative impacts include: • The creation of opportunities for future growth and well-being. • By accommodating facilities like a school, open areas, community centres, the youth will have an opportunity to socialize, develop skills, and have access to facility devoted to giving them access to an education and a future. • The development will lead to creating an expanded and efficient sense of community, for some this development will create a sense of safety not always familiar and accessible. Improved infrastructure including accessible road and walkways for residents, healthy and

Reference	Desirability description as per the Guideline	Description
"Promoting justifiable economic and social development"		
		improved sewer and water services community facilities, can create a hopeful and positive impact on people's health and well-being, as well as creating a hopeful perspective for youth. • This development will prove to be socially and economically sustainable in the long-term for the residents it will cater to. The anticipated negative cumulative impacts include: • As urban growth occurs, social incidents may occur, such as crime. • Misuse of services and resources can result in strain on services. • Poor maintenance of infrastructure can lead to environmental incidents.

7.2. Desirability of the Site Location

Erf 490, a portion of Erf 562, has been earmarked for housing development, according to the Municipal SDF. Situated to the south of Kurland Village, the proposed development land use will be aligned with the neighbouring properties, and create a greater network within the Kurland area, building on community and community services. The site already has existing features such as a sports field, a Waste Water Treatment Works, access, and exhibits degradation of vegetation, and disturbance from past agricultural activities.

The site has natural features limiting the extent of the development, including steep slopes, drainage systems and forested areas to the south and good quality fynbos to the east, that can be taken into account and will remain intact.

7.2.1.1. Location Factors Favoring the Proposed Development

The proposed site is earmarked for residential development as per the Municipal SDF. Considering the area available, the proposed development is best suited to be accommodated on the proposed site, and the area exhibits disturbance and degraded Fynbos.

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.***

7.3. Human Needs & Resource Efficiency

7.3.1. Provision of Housing

The provision for proper housing is identified as a key issue and priority of Ward 1. The project intent is to accommodate the current backlog (waiting list of 870 families) and expected increase in demand which could be accommodated on the developable portion of the project site to another 630 families, giving as total of ± 1500 families.

7.3.2. Demand

Subsidy Housing
As reported in the Town Planning Report, the need for housing has to be evaluated in terms of the municipal surveys of the demand for subsidy housing in the Bitou municipal area. The BSDF estimates the total Bitou housing backlog at 4 298 families. A large portion of the informal population reside in additional/backyard structures within the area.

By analyzing the income profile of the population, the BSDF estimates that 64% of the households in the identified population qualifies for subsidy housing, being households that earn less than R 3 500 per month. The average household income of the Kurland population is estimated at R 2447-26.

The housing demand in Kurland, as it relates to the housing waiting lists of the Municipal Housing Department, is about 870 families currently residing in informal housing in Xawa Xawa and in backyards. The data base of Crags and Kurland confirms this number.

Gap Housing
The demand for affordable and gap housing is difficult to estimate since the families in the related income bracket may be absorbed in the existing rental units and/or may not appear in the formal data base. In a report on affordable housing in the Eden District, several strategies are proposed to address the affordable housing challenge.

One such solution is to provide small gap housing (bonded or partially-bonded/FLISP) opportunities in areas where large subsidy projects are planned. Portions of land may be set aside for this purpose and may be sold or developed in partnership with a developer, if viable.

From the Income Profile (2011 figures) in the BSDF the income levels give an indication of the percentage of the population that may qualify for FLISP (Finance Linked Individual Subsidy Program) housing:

ANNUAL INCOME	% OF HOUSEHOLDS
R 38 201 – R 76 400	13.8
R 76 401 – R 153 800	9.0

ANNUAL INCOME	% OF HOUSEHOLDS
R 153 801 – R 307 600	6.7

The maximum income for FLISP qualifiers is R 270 000 pa (R 22 500 pm). It means that the households that qualify for FLISP, based on 2011 income figures, will be less than 29.5% but more than 22.8% of the total households.

The settlement planning and layout process creates erven to accommodate housing opportunities. A variety of unit types, whether fully subsidized of FLISP, may be accommodated on site, within a variety of layout typologies.

7.3.3.Supply side impacts

According to the Town Planning Report, the draft concept layout options are based on technical data sets available to date and will provide the structure for detailed layout planning and the submission of rezoning and subdivision applications to follow. The project intent is to accommodate the current backlog (waiting list of 870 families) and expected increase in demand which could be accommodated on the developable portion of the project site to another 630 families, giving as total of ± 1500 families.

This intent translates to the density proposed, below. Alternative densities (see calculations below) may result in an additional demand for the purchase/expropriation of land, in the Kurland area, to accommodate the expressed need. The required densities, in turn, dictates the housing typologies to be accommodated on site. Note that a proportion of the developable land component must be dedicated to the provision of urban supportive facilities, such as education-, retail/commercial-; social/health-; recreational and other urban supportive uses. This integrated approach makes the effective use of residential land more critical. It is to be noted that it is good practice to plan the site as whole, both for the purpose of efficient layout design and for the purpose of economic engineering design. The layout therefore makes provision for more than the present (previously calculated/established) demand for subsidy housing but for rather for the potential of the site.

7.3.4.Additional Benefits

7.3.4.1. Economic Stability

The proposed development will create temporary employment during the construction phase, as well as permanent jobs during the operational phase, via the support facilities proposed such as:

- Three Creche sites;
- One School site;
- Two community facility/mixed use node areas (to accommodate supportive uses, job creation uses, retail, market, mobile services (library/clinic); post boxes, etc;
- Areas of small business;

7.3.4.2. Provision of public facilities and open spaces

The proposed development makes provision for the establishment of public open spaces, and a community sports fields, as well as two community facility/mixed use node areas (to accommodate supportive uses, job creation uses, retail, market, mobile services (library/clinic); post boxes, etc.

7.3.4.3. 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.

As per the development proposal, Road/access alignments as per existing/registered servitudes are to be retained as roads and/or walkways/ access.

It should be further noted that the proposed site is located directly south of the existing Kurland Village, and is easily accessible from the N2, off of Forrest Hall Road, making it easily accessible to a main highway.

7.3.4.4. Safety, Health and Well-Being of the Surrounding Community

The proposed development will allow for a change in land use, and construction of new and safe infrastructure to ensure safe travel for pedestrians and motorists, as well as improved health and well-being of the community to be housed by including formal services, including the bulk infrastructure.

No excessive pollution would be generated on site and the nature of the proposed activities would not have any effects on the health of the surrounding community.

7.3.4.5. 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.

7.3.4.6. Resource Efficiency

In order to address water efficiency in the proposed development, bulk water services will be upgraded, all toilets, taps and showers will have water use reducing measures installed. Bulk services will be addressed in a separate environmental assessment. In addition, the inclusion of renewable energy sources and green building principles as part of the design of the overall development will be investigated.

8. PUBLIC PARTICIPATION PROCESS

8.1. Opportunity to Comment

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.

Due to the time restrictions now applicable once an application for Environmental Authorisation is submitted (in terms of number of days allowed before a Final Scoping Report must be submitted), it is required to conduct pre-application public and Authority consultation before an application form is submitted (pre-application phase) in order to resolve key issues of concern from the public and Authorities.

There are therefore two 30-day Public & Authority Consultation phases during the Scoping Phase, the first one on the Pre-Application Draft Scoping Report and then a second 30-day Public & Authority Consultation Phase on the Post-Application Draft Scoping.

In addition, a round of Public Participation in the form of the circulation of a Background Information Document to the neighbouring landowners and Authorities will be conducted during Pre-Application Public Participation .

The **Pre-Application Draft Scoping Report** (first round of Public & Authority Consultation) is being made available to identified Potential Interested & Affected Parties **(30+ days).** The Pre-Application Draft Scoping Report will be available for free download and review directly from our website (www.sescc.net) under the public documents tab. A Background Information Document will also be circulated to Identified I&APs.

Please note that all comments submitted to SES in writing on the Pre-Application Draft Scoping Report will be responded to in the Comments & Response Table. All those that submit comment will be automatically registered on the database and will be notified for the remainder of the EIA process of all reports available for review and comment.

Following the Pre-Application public participation period, an Application form will be completed and submitted to the Department of Environmental Affairs and Development Planning (DEA&DP).

As per the legislated process, the Pre-Application Draft Scoping Report will be 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 to review in order to provide comment.

Following the second round of public participation, the Post-Application Draft Scoping Report will be finalised and submitted to DEA&DP for consideration (Acceptance/Rejection).

8.2. Interested & Affected Party Register

A desktop assessment was undertaken in order to ascertain the erven and farm numbers of the adjacent affected landowners & occupiers.

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

8.3. 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 custodian of the land is the Department of Rural Development and Land Reform (DRDLR). After negotiations, they have recently decided to transfer the Erf to the Municipality of Bitou to accommodate the intended housing project.

8.4. Site Notice

Site notices, in English and Afrikaans, will be positioned at the proposed entrance/s to the development site, notifying potential Interested and Affected Parties (I & AP's) of the availability of the Pre-Application Draft Scoping Report and inviting I & AP's to register on the database as Registered Interested & Affected Parties.

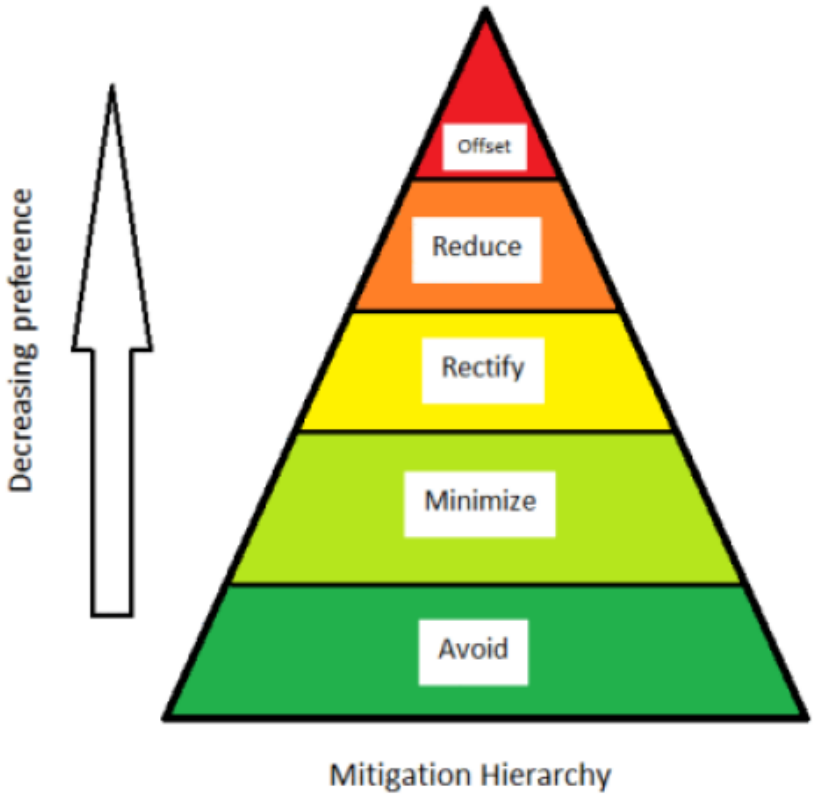
8.5. Newspaper Advertisement

A newspaper advertisement, will be positioned in the local newspaper (Knysna Plett Herald) in English and Afrikaans, notifying potential Interested and Affected Parties (I & AP's) of the availability of the Pre-Application Draft Scoping Report and inviting I & AP's to register on the database as Registered Interested & Affected Parties.

8.6. Open Day

The EAP intends to hold an open day, which will allow for interactions between the planning team and the community, whereby issues/concerns can be raised, information gathered and clarity provided.

9. DESCRIPTION OF THE IMPACTS & RISKS IDENTIFIED



The impact tables in section 9 below include the identified potential environmental impacts and risks identified for each alternative, 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 are based on "scoping" stage information. The findings of the impact tables therefore at this stage are largely only based on initial specialist input and the professional opinion of the EAP may change considerably once more detailed specialist impact assessments occur and once we have received input for the public and the Authorities.

9.1. 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 D5**. Table 8 shows the findings of the tool, dated the 25th of April 2022:

Table 8: DEA Screening Tool Results for the Proposed Kurland Housing Site.

THEME	VERY HIGH SENSITIVITY	HIGH SENSITIVITY	MEDIUM SENSITIVITY	LOW SENSITIVITY
Agriculture		X		
Animal Species		X		
Aquatic Biodiversity	X			

THEME	VERY HIGH SENSITIVITY	HIGH SENSITIVITY	MEDIUM SENSITIVITY	LOW SENSITIVITY
Archaeological and Cultural Heritage				X
Civil Aviation			X	
Defense				X
Palaeontology			X	
Plant			X	
Terrestrial Biodiversity	X			

DEA&DP advised that the Screening Tool Report be repeated for the following classifications:

- "Transformation of land – indigenous vegetation" and "Transformation of land – from agriculture or afforestation"

The outcome of the Proposed Development Area Environmental Sensitivity, were the same as Table 8, dated 25th of April 2022. The only additional protocol recommended was Agriculture.

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
- Hydrology Assessment
- Socio-Economic Assessment
- Plant Species Assessment
- Animal Species Assessment

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

- Terrestrial Biodiversity Impact Assessment with Plant and Animal Species Assessment.
- Freshwater Habitat Assessment.
- Socio-Economic Assessment.
- Engineering Services Report (Appendix F3).
- Traffic Impact Assessment Report (Technical).
- Notice of intent to Develop (NID) to Heritage Western Cape.
- Groundwater Assessment.
- Agricultural Assessment/Statement.

9.2. Potential Environmental Impacts Identified

9.2.1.Pre-Construction Phase

Climate Change Considerations

Designs must take into account climate change risks, and final designs should focus on integrating green building materials, water saving and energy saving technologies/ infrastructure where feasible, as well as have an appropriately designed stormwater management plan. All appropriate approvals must be obtained and remain valid, prior to the start of construction, or non-compliances and penalties may apply.

9.2.2.Construction Phase

The following potential environmental impacts have been identified by the EAP and by initial input from Botanical and Freshwater 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

According to CapeFarmMapper the proposed housing site is classified as very high dryland potential, while the DEA Screening Tool recommended a "High" sensitivity for this theme. It was confirmed by the botanical specialist that the site exhibits areas of fallow land, clearly indicating past agricultural use, adjacent to the central spine road, Forrest Hall Road, as depicted in the screening tool. An agricultural specialist will be appointed to address the existing land capability and loss of the identified fallow land, that may have been utilized for cultivation of crops or other agricultural purposes (opportunity cost). The area is fairly small, as it is limited by steep slopes.

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, in terms of the housing development, clearance will be permanent in most areas, with designated open space areas where natural cover will be restored. It has been noted in the botanical survey, that the potential impact on vegetation type *per se* is not of a great concern.

Botanical Impact - Loss of Species of Conservation Concern during pre-construction site clearing activities:

No Species of Conservation Concern were identified within the proposed housing site, however, fynbos (although degraded), is considered conservation worthy and one protected tree species (i.e. *Afrocarpus falcatus*) was recorded in the western part of site, this species could be damaged or removed during construction.

Soil Erosion and Slope Stability:

The proposed housing site is surrounded by slopes > 1:4, therefore consideration must be given to the removal of vegetation cover and construction activities leading to soil disturbance, which may result in some areas being susceptible to soil erosion after completion of the activity.

Contamination & Pollution Impact – Associated with Construction Activities

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.

Dust & Noise Impact:

Temporary 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.

Impacts on faunal species due to construction activities:

Animal Species sensitivity is recorded as high, according to the DEA Screening Tool. Activities associated with vegetation clearing and killing of perceived dangerous fauna, may lead to increased mortalities among faunal species.

Freshwater Resources Impact – Disturbance/Loss of aquatic vegetation and habitat:

Indigenous aquatic vegetation within the stream catchments, and possibly within the riparian zone, will be removed and disturbed due to construction activities such as excavations and infilling, as well as machinery and workers on site. The movement of topsoil and incorrectly placed stockpiles could bury aquatic habitat. This will be a direct and immediate impact resulting in short to medium term vegetation loss. 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 aquatic 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. This 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 might also occur. 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. The magnitude of this impact is increased by the steep topography adjacent to these drainage lines.

Freshwater Resources Impact – Water Pollution:

During construction there are a number of potential pollution inputs into the aquatic habitat (such as hydrocarbons and raw cement). 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 may enter 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.

Freshwater Resources Impact – Flow Modification:

Land clearing and earth works upslope of aquatic habitat 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. Altered water inputs from upslope disturbances as well as modified water distribution and retention patterns will ultimately affect the hydrological integrity of water resources. This impact is likely to be magnified by the steep slopes around drainage lines.

Socio-Economic Impacts - Encroachment onto Private Property:

Privately owned properties are located along the proposed central road along the proposed site. The proposed development will encroach upon these areas. This can result in disgruntled owners or occupiers, regarding the encroachment and the establishment of subsidy housing around their properties.

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 positive benefit for the local construction and building sector in the Garden Route District Municipality (GRDM) 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 GRDM and BLM. A significant portion of the annual wage bill will be spent in the local GRDM and BLM. The long-term economic impacts will be massive given the scale and duration of the proposed housing development. Most of the labour will be made up of Historically Disadvantaged Individuals (HIDs).

Traffic & Safety Impact:

It is proposed that there will be multiple deliveries of 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, particularly as Forest Hall Road is the only access into the Crags and Kurland. 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.

9.2.3.Operational 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.

Faunal Impact - Loss of faunal species due to operational activities:

Faunal species loss due to increased vehicle activity, noise and lighting.

Freshwater Resources Impact – Disturbance/Loss of aquatic vegetation and habitat:

There is less direct risk to aquatic habitat during the operational phase as it will have been transformed already during construction. However, any remaining habitat is at threat due to the possibility of urban sprawl encroaching into aquatic 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 lead to erosion in the systems.

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. Cultivation in the agricultural area may lead to increased sedimentation since large areas will be left unvegetated for periods of time. The steep slopes increase the magnitude of this impact.

Freshwater Resources Impact – Water Pollution:

Micro-litter such as cigarette butts may travel through certain stormwater grids and grids may not be regularly cleared. The increase in vehicles on the property due to the development increases the potential for pollutants to enter the systems. During maintenance of the development there could be water pollution impacts similar to those encountered in the construction phase. It is assumed that all wastewater will be disposed of via existing infrastructure and will not be treated on the property.

It is likely that wastewater will be treated at the existing WWTW adjacent to the development, if there is capacity. 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. The agricultural area might be subject to fertiliser use which will lead to pollution from excess nutrients when runoff from these areas enter the aquatic habitat.

Freshwater Resources Impact – Flow Modification:

Hardened/artificial infrastructure will alter the natural processes of rainwater infiltration and surface runoff, promoting increased volumes and velocities of storm water runoff, which can be detrimental to the aquatic habitat receiving concentrated flows off of these areas. 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 aquatic habitat will alter the natural ecology, increasing the risk of erosion and channel incision/scouring. Irrigation on the agricultural area may lead to altered and increased runoff when not managed properly.

Socio-Economic Impact - Provision of housing:

The proposed development will assist to address some of the housing backlog in the area.

Socio-Economic Impact - Provision of public open spaces:

The development proposal makes allowance for the provision of public open space.

Socio-Economic Impact - Provision of sports field:

The proposed development makes provision for the establishment of a sports field to be utilized by the community. These components will not only contribute to an improved quality of life for the various members of the community but will also provide a safe and well-equipped environment for the youth to come together and learn new skills.

Socio-Economic Impact - Employment and business:

The support facilities of both business, educational and commercial components, in the form of a shops, school, and creche will create employment opportunities for local residents. The majority of the employment opportunities are likely to benefit Historically Disadvantaged Individuals (HDIs), who will be housed in this community. Given the high unemployment levels in Kurland, coupled with the low income and education levels, this would represent a positive social impact.

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.

Socio-Economic Impact - Property Values of surrounding landowners:

Values of real estate are driven by various factors, among others supply and demand, interest rates, the contraction or expansion of the local economy, population growth rates and changes in disposable income to debt ratios. With the increase in facilities, it is likely that surrounding properties values may increase due to their proximity.

Traffic & Safety impact

A significant increase in traffic is expected to occur in the area as a result of the proposed development. 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 degraded Fynbos and fallow land, to significantly dense housing development, with additional support facilities. The proposed development would impact on the "sense of place" of the area to sensitive receptors that can see the development.

Visual Impact - Visual intrusion of night lighting:

With the establishment of housing and roadways, the additional lighting these features will create a visual impact at night, which would be visible from the surrounding landscape.

Climate Change Impacts:
A lack of awareness/knowledge of the climate risks faced by the community (including, storm risks, water shortages, fire risks, etc). and the integrated designs/technologies aimed at lowering climate risks, will not allow residents/community leaders to understand the importance and risks related to climate change, and what can be done within the community, in the future to address these risks. A lack of knowledge can lead to infrastructure being improperly managed, and potentially compromised.

Pollution and Contamination Management:
Sewer infrastructure failure as a result of overflows or electrical faults that may affect pumps, needs to be considered.

Failure to manage solid waste, and other waste products can lead to litter of the surrounding environments, and contamination of affected natural areas. As well as lead to unsafe conditions for the public, or kids playing out in public areas.

9.3. Methodology Applied in Impact Assessment

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 9: Methodology in determining the extent, duration, probability, significance, reversibility and cumulative impact of an environmental impact (to be read with section 9.2 impact tables below).

Determination of Extent (Scale):

Site Specific	1	The impact is limited to the development site (development footprint) or part thereof.
Local	2	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	3	The impact would affect the broader region (e.g. neighbouring towns) beyond the boundaries of the adjacent properties.
National	4	The impact would affect the whole country (if applicable).

Determination of Duration:

Temporary	1	The impact will be limited to part of the construction phase or less than one month.
Short term	2	The impact will continue for the duration of the construction phase, or less than one year.
Medium term	3	The impact will continue for part the operational phase
Long term	4	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	5	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	1	The possibility of the impact occurring is very low, due either to the circumstances, design or experience.
Probable	2	There is a possibility that the impact will occur to the extent that provisions must therefore be made.
Highly probable	3	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	4	The impact will take place regardless of any prevention plans.

Determination of Significance (without mitigation):

No significance	1	The impact is not substantial and does not require any mitigation action.
Low	2	The impact is of little importance, but may require limited mitigation.
Medium	3	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	4	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	5	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	6	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	1	The impact will be mitigated to the point where it is regarded to be insubstantial.
Low	2	The impact will be mitigated to the point where it is of limited importance.
Medium	3	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	4	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	1	The impact is reversible with implementation of minor mitigation measures
Partly Reversible	2	The impact is partly reversible but more intense mitigation measures
Barely Reversible	3	The impact is unlikely to be reversed even with intense mitigation measures
Irreversible	4	The impact is irreversible and no mitigation measures exist

Determination of Degree to which an Impact can be Mitigated:

Can be mitigated	1	The impact can be completely mitigated
Can be partly mitigated	2	The impact can be partly mitigated
Can be barely mitigated	3	It is possible to mitigate the impact only slightly

Not able to mitigate	4	It is not possible to mitigate the impacts

Determination of Loss of Resources:

No loss of resource	1	The impact will not result in the loss of any resources
Marginal loss of resource	2	The impact will result in marginal loss of resources
Significant loss of resources	3	The impact will result in significant loss of resources
Complete loss of resources	4	The impact will result in a complete loss of all resources

Determination of Cumulative Impact:

Negligible	1	The impact would result in negligible to no cumulative effects
Low	2	The impact would result in insignificant cumulative effects
Medium	3	The impact would result in medium cumulative effects
High	4	The impact would result in significant cumulative effects

The Significance ratings have been calculated based on the Consequence, Probability and the Reversibility of the impacts.

The following formulas were used to calculate the Significance:

Significance = (Consequence x Likelihood) + Reversibility

where:

Consequence = Degree of Loss + Extent + Duration

and:

Likelihood = Probability + Level of Mitigation

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

POSITIVE IMPACTS	Rating	NEGATIVE IMPACTS
Very High	90-108	Very High

High	76-90	High
Medium-High	61-75	Medium-High
Medium	46-60	Medium
Low-Medium	31-45	Low-Medium
Low	16-30	Low
Negligible	0-15	Negligible

9.4. Pre-Construction Phase Impact Table

9.4.1. Legislative Compliance and Design Considerations including Climate Change

	Legislative Compliance and Design Considerations including Climate Change	
	Proposed Preferred Layout Alternative 1	Proposed Alternative Layout 2: NO – GO
DESCRIPTION OF IMPACT:	When finalizing the design, climate change risks must be considered, and planned for, where possible. All relevant financial and time allowances for meeting the requirements of any conditions or requirements of the approved licences/permits/authorizations, including the approved EMPr, must be planned for and integrated into appropriate tender documents and other relevant agreements. All relevant approvals/licenses/permits must be obtained and valid before construction commences, or the specific activity is commenced with, if relevant (such as Water Use Authorizations, for specific activities).	No Impact, as land could still be utilized for agricultural purposes. Should be managed in line with the Climate Change Adaptation and Mitigation Plan for the South African Agricultural and Forestry (when promulgated).
Nature of impact:	Negative	No Impact
Extent and duration of impact:	Site Specific; Temporary	-N/A
Probability of occurrence:	Improbable	-N/A
Degree to which the impact can be reversed:	Completely reversible	-N/A
Degree to which the impact may cause irreplaceable loss of resources:	No loss of resources	-N/A

	Legislative Compliance and Design Considerations including Climate Change	
	Proposed Preferred Layout Alternative 1	Proposed Alternative Layout 2: NO – GO
Cumulative impact prior to mitigation:	Medium	-N/A
Significance rating of impact prior to mitigation	Medium	-N/A
Degree to which the impact can be mitigated:	Can be mitigated	-N/A
Proposed mitigation:	General: • Planning and design team must take into consideration on relevant conditions of any relevant licenses/permits/authorizations. • All relevant licenses/permits/authorizations must be obtained prior to the start of construction. • Local contractors, suppliers, labour must be utilized. • The appointed consulting engineer must ensure that the aforementioned conditions/requirements are integrated into appropriate contractual documentation, including the tender document. • An appropriately registered/qualified ECO must be appointed prior to construction to ensure that all pre-construction conditions are met. • An appropriately registered/qualified Environmental Auditor must be appointed prior to construction to ensure that all pre-construction conditions are met. Climate Change Considerations: • Final designs must include:	-N/A

	Legislative Compliance and Design Considerations including Climate Change	
	Proposed Preferred Layout Alternative 1	Proposed Alternative Layout 2: NO – GO
	- Green building materials must be integrated into the development as much as possible. - Apply soft engineering techniques, where possible. - Take into consideration floodline/drainage areas that can be exacerbated during flooding/storm surge events. - Incorporate thermal efficiency into designs and use climate-resilient technologies. - Water saving technologies/techniques (jo-jo tanks for rainwater collection) and energy saving technologies/techniques (solar geezers/solar panels on roofs, potentially in for light poles, etc. and utilizing energy saving bulbs where possible). - An appropriate stormwater management plan must be compiled and approved. - Ensure materials are sourced locally, and consider Life Cycle of all materials utilized, when selecting materials.	
Cumulative impact post mitigation:	Low	-N/A
Significance rating of impact after mitigation	Low (-)	-N/A

9.5. Construction Phase Impact Tables

Note: There is only one site location proposed for the development, and one layout alternative. The Proposed Preferred Layout Alternative has been compared to the NO-GO **(Layout Alternative 2).**

9.5.1.Construction Phase Impacts

9.5.1.1. Agricultural Potential Impact – Loss of Agricultural Land

	Agricultural Potential Impact – Loss of Agricultural Land	
	Proposed Preferred Layout Alternative 1	Proposed Alternative Layout 2: 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 development site has been mapped to have a High agricultural sensitivity, although this area is fairly small, as it is located at an elevation and surrounded by steep slopes.	No Impact, as land could still be utilized for agricultural purposes.
Nature of impact:	Negative	No Impact
Extent and duration of impact:	Site Specific; Long Term	-N/A
Probability of occurrence:	Definite	-N/A
Degree to which the impact can be reversed:	Barely Reversible	-N/A
Degree to which the impact may cause	Marginal loss of resource	-N/A

	Agricultural Potential Impact – Loss of Agricultural Land	
	Proposed Preferred Layout Alternative 1	Proposed Alternative Layout 2: NO – GO
irreplaceable loss of resources:		
Cumulative impact prior to mitigation:	Medium	-N/A
Significance rating of impact prior to mitigation	Low	-N/A
Degree to which the impact can be mitigated:	Can be barely mitigated	-N/A
Proposed mitigation:	No mitigation is proposed or necessary given the low impact and current disturbed state of the site.	-N/A
Cumulative impact post mitigation:	Low	-N/A
Significance rating of impact after mitigation	Low (-)	-N/A

9.5.1.2. Botanical Impact – Permanent Loss of Indigenous Vegetation

	Botanical Impact – Permanent Loss of Indigenous Vegetation	
	Proposed Preferred Layout Alternative 1	Proposed Alternative Layout 2: NO – GO
DESCRIPTION OF IMPACT:	Site clearing before construction will result in the blanket clearing of vegetation within the affected footprint, containing degraded vegetation and fallow land, clearance will be permanent in most areas, with designated open space areas where natural cover will be restored.	Possible land invasions due to land remaining vacant and access existing via Forest Hall Road, can result in unmanaged removal of vegetation.

	Botanical Impact – Permanent Loss of Indigenous Vegetation	
	Proposed Preferred Layout Alternative 1	Proposed Alternative Layout 2: NO – GO
	It has been noted in the botanical survey, that the potential impact on vegetation type per se is not of a great concern.	
Nature of impact:	Negative	Negative
Extent and duration of impact:	Local; Permanent	Local; Permanent
Probability of occurrence:	Definite	Definite
Degree to which the impact can be reversed:	Barely Reversible	Irreversible
Degree to which the impact may cause irreplaceable loss of resources:	Marginal loss of resource	Marginal loss of resource
Cumulative impact prior to mitigation:	Medium	High
Significance rating of impact prior to mitigation	Medium	High
Degree to which the impact can be mitigated:	Can be barely mitigated	Can be barely mitigated
Proposed mitigation:	• Ensure sufficient quality, quantity and connectivity of habitat remains throughout the area of the property. • Remove alien invasive plants and rehabilitate.	No mitigation exists as access cannot be limited or controlled.

	Botanical Impact – Permanent Loss of Indigenous Vegetation	
	Proposed Preferred Layout Alternative 1	Proposed Alternative Layout 2: NO – GO
	• Develop and implement fire management program, by establishing suitable firebreaks. • Development of an EMPr to control construction impacts. • Set aside areas for public open space system and managed as such. • Attempt to reutilize degraded fynbos, in proposed vegetated areas, ie. sidewalks, etc.	
Cumulative impact post mitigation:	Low	High
Significance rating of impact after mitigation	Low (-)	High (-)

9.5.1.3. Botanical Impact – Loss of Species of Conservation Concern

	Botanical Impact – Loss of Species of Conservation Concern	
	Proposed Preferred Layout Alternative 1	Proposed Alternative Layout 2: NO – GO
DESCRIPTION OF IMPACT:	No Species of Conservation Concern were identified within the proposed housing site, however, fynbos (although degraded), is considered conservation worthy and one protected tree species (i.e. *Afrocarpus falcatus*) was recorded in the western part of site, this species could be damaged or removed during construction.	Possible land invasions due to land remaining vacant and access existing via Forest Hall Road, can result in unmanaged and unpermitted loss of the *Afrocarpus falcatus*.
Nature of impact:	Negative	Negative
Extent and duration of impact:	Site Specific; Permanent	Site Specific; Permanent

	Botanical Impact – Loss of Species of Conservation Concern	
	Proposed Preferred Layout Alternative 1	Proposed Alternative Layout 2: NO – GO
Probability of occurrence:	Unlikely	Possibly
Degree to which the impact can be reversed:	Barely Reversible	Irreversible
Degree to which the impact may cause irreplaceable loss of resources:	High	High
Cumulative impact prior to mitigation:	Medium	High
Significance rating of impact prior to mitigation	Medium	High
Degree to which the impact can be mitigated:	Medium	Low
Proposed mitigation:	If intended to be maintained: • Demarcate tree species. • Indicate this as a no-go area. • Ensure labour and construction vehicle operators are well aware of the importance of maintenance of this tree. • Remove alien invasive plants and rehabilitate. • Development of an Environmental Management Programme (EMPr) to control construction impacts. If intended to be removed:	No mitigation exists as access cannot be limited or controlled.

	Botanical Impact – Loss of Species of Conservation Concern	
	Proposed Preferred Layout Alternative 1	Proposed Alternative Layout 2: NO – GO
	• Follow procedures required to obtain a permit for removal from the Department of Forestry. • Remove alien invasive plants and rehabilitate • Development of an Environmental Management Programme (EMPr) to control construction impacts.	
Cumulative impact post mitigation:	Low	High
Significance rating of impact after mitigation	Low (-)	High (-)

9.5.1.4. Erosion and Sedimentation

	Erosion and Sedimentation	
	Proposed Preferred Layout Alternative 1	Proposed Alternative Layout 2: NO – GO
DESCRIPTION OF IMPACT:	The proposed housing site is surrounded by slopes > 1:4, and according to the proposed layout there are sections where the proposed housing infrastructure will be located along these slopes. The layout shows consideration for this factor and has attempted to accommodate open spaces closer to these slopes, as much as possible. Consideration must be given to the removal of vegetation cover and construction activities leading to soil disturbance, which may result in some areas being susceptible to soil erosion. Poorly situated stockpiles, and poorly planned construction activities, particularly during or immediately after wet weather, can lead to erosion.	No Impact, as no development will take place.

	Erosion and Sedimentation	
	Proposed Preferred Layout Alternative 1	Proposed Alternative Layout 2: NO – GO
Nature of impact:	Negative	No Impact
Extent and duration of impact:	Local, long-term	-N/A
Probability of occurrence:	Medium	-N/A
Degree to which the impact can be reversed:	Barely Reversible	-N/A
Degree to which the impact may cause irreplaceable loss of resources:	Moderate	-N/A
Cumulative impact prior to mitigation:	Medium - High	-N/A
Significance rating of impact prior to mitigation	Medium - High	-N/A
Degree to which the impact can be mitigated:	Medium	-N/A
Proposed mitigation:	**Planning:** • All activities should be set back from steep slopes. • Stockpiled materials should be situated away from steep slopes. • Suitable measures must be implemented in areas that may be susceptible to erosion. • Areas must be rehabilitated immediately after construction.	-N/A

	Erosion and Sedimentation	
	Proposed Preferred Layout Alternative 1	Proposed Alternative Layout 2: NO – GO
	• Stormwater management measures must be implemented appropriately. • Development of an Environmental Management Plan (EMP) to control construction impacts. • Observe recommended 19m aquatic buffer. Ensure this is established, and silt fencing is in place to capture runoff downslope. **Stockpiles:** • Bund stockpiles. • Do not exceed 2 metres in height. • Do not locate next to slopes, particularly when wet weather is expected. **Earthworks:** • Should be planned appropriately. • Slope stability measures should be implemented during construction to avoid collapse of slope side of excavations, when establishing foundation. • Heavy machinery should not be permitted along steep slopes. • A geotechnical specialist should be involved in earthworks and the construction of foundations to assist the engineer with quality control. • Compaction control testing is essential during construction. • Earthworks should be designed and conducted in accordance with SABS 1200D, COLTO 3300 or any site-specific specifications provided by the engineer. • Foundations should be designed and constructed in accordance with the NHBRC Home Builders Manual, SANS 10400-H and/or as specified by the structural engineer.	

	Erosion and Sedimentation	
	Proposed Preferred Layout Alternative 1	Proposed Alternative Layout 2: NO – GO
	• The development layout should take into account the topography of the site and due consideration should be given to development in or directly adjacent to natural water courses (Terrain 2 as per Figure 16), where saturated soil and marshy surface conditions can be expected, requiring special engineering (e.g. for road crossings). • If any uncontrolled fill material is uncovered, such as rubble, plastic, etc., it should be completely removed from house platforms or treated as per the engineers instructions. • Some bulk earthworks and possibly low retaining walls may be required to create level platforms on sites where slopes exceed 1:10. In cut to fill operations, all organic matter should be removed from the footprint area before bulk earthworks. • The insitu soils may not be suitable for use in bulk fills, unless the material is approved by the engineer and can be effectively compacted to the specified level. Platforms should be cut and rolled to achieve a minimum of 93% of the Modified AASHTO density (<30mm/blow of DCP). • It is recommended that platforms are capped off with minimum 150mm G5 or G7 gravel (compacted to 95% MDD) prior to excavation of foundation trenches. • The recommended foundation system for the proposed single/double storey structures is inverted-T beams, founded at a nominal depth of 0.8m below GL on insitu soils or engineered fill with design bearing pressures limited to 75kPa. • The structural engineer can consider the placement of a layer of engineered fill, such as G5 crushed rock, in trenches to improve founding conditions and to facilitate compaction.	

	Erosion and Sedimentation	
	Proposed Preferred Layout Alternative 1	Proposed Alternative Layout 2: NO – GO
	• Alternative methods can include stiff raft foundations placed directly on insitu soil. **Road Pavements:** • Access roads should be constructed in accordance with SABS 1200, COLTO, TRH4, TRH14, The Red Book or other applicable specifications and standards, or as directed by the engineer. • Improvement of the subgrade is recommended with lower and upper SSG layers included in the design of roads at the engineers discretion. • General preparation of the roadbed (subgrade) should include the following: - Cut to line and level. - Compact to 90% MDD. Recommended moisture content before rolling is optimum moisture content (OMC) minus 2%. - Remove any incompressible or wet soil and reinstate with G9 material or as directed by the engineer. **Stormwater management**: • An appropriately designed stormwater management plan should be drawn up and approved by the municipality. • This must be adopted for construction and operational management of the site. • Implement all necessary measures, as recommended by aquatic specialist. • The design and construction of storm water drainage should be carried out in accordance with SABS 1200LE, COLTO, The Red Book or other applicable standards, or as directed by the engineer. • Minor flood events can be handled with kerb inlets and underground pipes, which discharge at suitable points into	

	Erosion and Sedimentation	
	Proposed Preferred Layout Alternative 1	Proposed Alternative Layout 2: NO – GO
	existing stormwater network or natural drainage lines, as directed by the engineer. • Stormwater from major flood events can be contained within the road prism but should not overflow into adjacent erven. Well-designed access roads with sufficient level difference from the adjacent property, and adequate side drains and culverts is recommended. • Subsoil drains are recommended along roads as a precaution to keep the subgrade drained. • The ponding of storm water around the exterior of houses can be avoided by shaping the ground levels around the exterior to create a fall away from the house and constructing a 1m wide a concrete apron with a 10% fall away from the house. This will also assist in minimizing erosion around the house. The finished floor level of all houses should be a minimum of 150mm above final ground level to prevent flooding.	
Cumulative impact post mitigation:	Low	-N/A
Significance rating of impact after mitigation	Low - Medium (-)	-N/A

9.5.1.5. Contamination & Pollution Impact – Associated with Construction Activities

	Contamination & Pollution	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
DESCRIPTION OF IMPACT:	Construction activities will generate waste. In addition, fuel, oil, lubricants and other pollutants may leak from vehicles/machinery or be accidently spilled and contaminate the soil. Pollution and soil contamination could also occur from chemical toilets, cement mixing directly on the soil and be distributed via runoff carrying contaminants off-site.	No Impact, as no development will take place.
Nature of impact:	Negative	No Impact
Extent and duration of impact:	Local; Medium term	-N/A
Probability of occurrence:	Probable	-N/A
Degree to which the impact can be reversed:	Partly reversible	-N/A
Degree to which the impact may cause irreplaceable loss of resources:	Marginal loss of resources	-N/A
Cumulative impact prior to mitigation:	Medium	-N/A
Significance rating of impact prior to mitigation	Medium – High	-N/A
Degree to which the impact can be mitigated:	Medium	-N/A
Proposed mitigation:	General:	-N/A

	Contamination & Pollution	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
	• Appoint an independent Environmental Control Officer (ECO) to monitor construction activity. • Site inspections should be undertaken on a regular basis, for the duration of the construction phase. • ECO monitoring audit reports should compiled, reporting on the compliance against the conditions of the Environmental Authorisation and the approved EMP. **General Pollution Management:** • No pollution of surface water or ground water resources may occur due to any activity on the site. • No storm water runoff from any premises containing waste, or water containing waste emanating from construction activities may be discharged into the environment. • Polluted stormwater must be contained on the site. • Cement batching / mixing may not take place directly on the soil surface, it must be done on an impervious lining that will prevent cement particles from contaminating the soil. **General Waste Management:** • Dedicated waste bins or skips must be provided on site and kept in a demarcated area on an impermeable surface. • Separate waste bins/skips must be provided for recyclable waste, general waste and hazardous waste. Recovered builder's rubble & green waste may be stockpiled on the ground within the site camp, or in separate skips until removal. • Waste must be placed in the appropriate waste bins/skips/ stockpiles. • Hazardous waste bins must be kept on an impermeable bunded surface capable of holding at least 110% of the volume of the bins.	

	Contamination & Pollution	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
	• Skips/ bins must be provided with secure lids or covering that will prevent scavenging and windblown waste or dust. • Waste bins/skips must be regularly emptied and must not be allowed to overflow. • Construction workers must be instructed not to litter and to place all waste in the appropriate waste bins provided on site. • The Contractor must ensure that all workers on site are familiar with the correct waste disposal procedures to be followed. • Waste generated on site must be classified and managed in accordance with the National Environmental Management: Waste Act – Waste Classification and Management Regulations (GN No. R. 634 of August 2013). • Disposal of waste to landfill must be undertaken in accordance with the National Environmental Management: Waste Act – National Norms and Standard for the Assessment of Waste for Landfill Disposal (GN No. R. 635 of August 2013). • All waste, hazardous as well as general, which result from the proposed activities must be disposed of appropriately at a licensed Waste Disposal Facility (WDF). **Pollution Management – hydrocarbons (oil, fuel etc.)** • Vehicles and machinery must be in good working order and must be regularly inspected for leaks. • If a vehicle or machinery is leaking pollutants it must, as soon as possible, be taken to an appropriate location for repair. The ECO has the authority to request that any vehicle or piece of equipment that is contaminating the environment be removed from the site until it has been satisfactorily repaired. • Repairs to vehicles/ machinery may take place on site, within a designated maintenance area at the site camp. Drip trays,	

	Contamination & Pollution	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
	tarpaulin or other impermeable layer must be laid down prior to undertaking repairs. • Refuelling of vehicles/ machinery may only take place at the site camp or vehicle maintenance yard. Where refuelling must occur, drip trays should be utilised to catch potential spills/ drips. • Drip trays must be utilised during decanting of hazardous substances and when refilling chemical/ fuel storage tanks. • Drip trays must be placed under generators (if used on site) water pumps and any other machinery on site that utilises fuel/ lubricant, or where there is risk of leakage/spillage. • Where feasible, fuel tanks should be elevated so that leaks are easily detected. • A spill kit to neutralise/treat spills of fuel/ oil/ lubricants must be available on site, and workers must be educated on how to utilise the spill kit. • Soil contaminated by hazardous substances must be excavated and disposed of as hazardous waste. **Pollution Management – Ablution facilities** • Chemical toilets should be kept at the site camp, on a level surface and secured from blowing over. • Toilets must be located well outside of any storm water drainage lines and may not be linked to the storm water drainage system in any way. • Chemical toilets must be regularly emptied, and the waste disposed of at an appropriately registered waste water disposal/ treatment site. Care must be taken to prevent spillages when moving or servicing chemical toilets. **Pollution Management – Hazardous Substances**	

	Contamination & Pollution	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
	• Any hazardous substances (materials, fuels, other chemicals etc.) that may be required on site must be stored according to the manufacturers' product-storage requirements, which may include a covered, waterproof bunded housing structure. • Material Safety Data Sheets (MSDSs) shall be readily available on site for all chemicals and hazardous substances to be used on site. Where possible and available, MSDSs should additionally include information on ecological impacts and measures to minimise negative environmental impacts during accidental releases. • Hazardous chemicals and fuels should be stored on bunded, impermeable surfaces with sufficient capacity to hold at least 110% of the capacity of the storage tanks. **Cement Batching:** • Cement batching must take place on an impermeable surface large enough to retain any slurry or cement water run-off. If necessary, plastic/ bidem lined detention ponds (or similar) should be constructed to catch the run-off from batching areas. Once the water content of the cement water/ slurry has evaporated the dried cement should be scraped out of the detention pond and disposed of at an appropriate disposal facility authorised to deal with such waste • Cement batching should take place on already transformed areas within the footprint of the facility. • Unused cement bags must be stored in such a way that they will be protected from rain. Empty cement bags must not be left lying on the ground and must be disposed of in the appropriate waste bin.	

	Contamination & Pollution	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
	• Washing of excess cement/concrete into the ground is not allowed. All excess concrete/ cement must be removed from site and disposed of at an appropriate location.	
Cumulative impact post mitigation:	Low	-N/A
Significance rating of impact after mitigation	Low (-)	-N/A

9.5.1.6. Dust & Noise Impact – Associated with Construction Activities

	Dust and Noise	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
DESCRIPTION OF IMPACT:	Temporary dust and noise impacts may result due to construction activities on the site and the proposed routes. 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 development will take place.
Nature of impact:	Negative	No Impact
Extent and duration of impact:	Site Specific; Temporary	-N/A
Probability of occurrence:	Highly probable	-N/A

	Dust and Noise	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
Degree to which the impact can be reversed:	Irreversible	-N/A
Degree to which the impact may cause irreplaceable loss of resources:	No loss of resource	-N/A
Cumulative impact prior to mitigation:	Low	-N/A
Significance rating of impact prior to mitigation	Medium	-N/A
Degree to which the impact can be mitigated:	Can be partly mitigated	-N/A
Proposed mitigation:	**Dust Mitigation:** • Land clearing and earthmoving activities should not be undertaken during strong winds, where possible. • Cleared areas should be provided with a suitable cover as soon as possible, and not left exposed for extended periods of time. • Stockpiles of topsoil, spoil material and other material that may generate dust must be protected from wind erosion (e.g. covered with netting, tarpaulin or other appropriate measures. Note that topsoil should not be covered with tarpaulin as this may kill the seedbank). • The location of stockpiles must take into account the prevailing wind direction, and should be situated so as to have the least possible dust impact to surrounding residents, road-users and other land-users.	-N/A

	Dust and Noise	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
	• Speed limits must be enforced in all areas, including public roads and private property to limit the levels of dust pollution. • The speed limit should be set at 20-40km/h. • Dust must be suppressed on access roads and the construction site during dry periods by the regular application of water or a biodegradable soil stabilisation agent. Water used for this purpose must be used in quantities that will not result in the generation of excessive run off. • Dust suppression measures such as the wetting down of sand heaps as well as exposed areas around the site must be implemented especially on windy days. • The use of straw worked into the sandy areas may also help and the ECO must advise when this is necessary. • If dust appears to be a continuous problem the option of using shade cloth to cover open areas may be necessary or the erecting of shade netting above the fenced off area may need to be explored. • All vehicles transporting sand need to have tarpaulins covering their loads which will assist in any windblown sand occurring off the trucks. • Work on site must be well-planned and should proceed efficiently so as to minimise the handling of dust generating material. • Dust levels specified in the *National Dust Control Regulations* (GN 827 of November 2013) may not be exceeded. i.e. dust fall in residential areas may not exceed 600mg/m^2/day, measured using reference method ASTM D1739; • A Complaints Register must be available at the site office for inspection by the ECO of dust complaints that may have been received. **Noise Mitigation:** • A noise complaints register will be opened.	

	Dust and Noise	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
	• Excavations and earth-moving activities must be restricted to normal construction working hours (7:30 – 17:30) as far as possible. • Work on site must be well-planned and should proceed efficiently so as to limit the duration of the disturbance. • Vehicles and equipment must be kept in good working condition. • Machinery and equipment should be fitted with mufflers/ exhaust silencers. • No unnecessary disturbances should be allowed to emanate from the construction site. • Due to the proximity of the proposed development site to residents, noise levels must be kept to a minimum at all times. If excessive noise is expected on the boundary of the residential erven bordering the site they must be informed in advance of when the high noise levels will occur and for how long they will occur. • Workers should be educated on how to control noise-generating activities that have the potential to become disturbances, particularly over an extended period of time. • Noise levels must comply with the relevant health & safety regulations and SANS codes and should be monitored by the Health & Safety Officer as necessary and appropriate. • Affected parties must be informed of the excessive noise factors. • The noise management and monitoring measures prescribed in the EMPr must be adhered to. **General**: The appointed Environmental Control Officer (ECO) must undertake a site inspection once 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.	

	Dust and Noise	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
Cumulative impact post mitigation:	Low	-N/A
Significance rating of impact after mitigation	Low (-)	-N/A

9.5.1.7. Faunal Impact – Loss of Species and Habitat

	Faunal Impact – Loss of Species and Habitat	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
DESCRIPTION OF IMPACT:	Animal Species sensitivity is recorded as high, according to the DEA Screening Tool. Activities associated with vegetation clearing and killing of perceived dangerous fauna, may lead to increased mortalities among faunal species.	No Impact.
Nature of impact:	Negative	No Impact
Extent and duration of impact:	Local; Long Term	-N/A
Probability of occurrence:	Low	-N/A
Degree to which the impact can be reversed:	Irreversible	-N/A
Degree to which the impact may cause	Medium	-N/A

	Faunal Impact – Loss of Species and Habitat	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
irreplaceable loss of resources:		
Cumulative impact prior to mitigation:	Medium	-N/A
Significance rating of impact prior to mitigation	Medium	-N/A
Degree to which the impact can be mitigated:	Can be partly mitigated	-N/A
Proposed mitigation:	**Faunal Management:** • The appointed Environmental Control Officer (ECO) must undertake site awareness talks (environmental inductions) for new labour/contractors, this should include, but not be limited to: - Identifying fauna that is common to the area and site. - Encouraging labour to avoid interactions with fauna, where possible. - Monitoring removal of any fauna that needed to be relocated as they were at risk of being harmed. - Recommending that working corridor/fence lines be established, with appropriate shade netting, to limit wandering fauna onto site. - Advise on appropriate emergency numbers for animal rescue and • Ensure all necessary measures are taken to avoid harming fauna on site. • Search and rescue of fauna should be undertaken prior to demarcation of site, and on a daily basis prior to the commencement of activities.	-N/A

	Faunal Impact – Loss of Species and Habitat	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
	• Emergency numbers should be available in case of animal encounters.	
Cumulative impact post mitigation:	Low	-N/A
Significance rating of impact after mitigation	Low (-)	-N/A

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

	Freshwater Impact - Disturbance/loss of aquatic vegetation and habitat.	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
DESCRIPTION OF IMPACT:	Indigenous aquatic vegetation within the stream catchments, and possibly within the riparian zone, will be removed and disturbed due to construction activities such as excavations and infilling, as well as machinery and workers on site. The movement of topsoil and incorrectly placed stockpiles could bury aquatic habitat. This will be a direct and immediate impact resulting in short to medium term vegetation loss. Due to construction, alien invasive species may encroach further into any disturbed areas and outcompete indigenous vegetation thereby reducing aquatic biodiversity.	No Impact.
Nature of impact:	Negative	No Impact
Extent and duration of impact:	Local; Medium	-N/A

	Freshwater Impact - Disturbance/loss of aquatic vegetation and habitat.	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
Probability of occurrence:	Highly Likely	-N/A
Degree to which the impact can be reversed:	Irreversible	-N/A
Degree to which the impact may cause irreplaceable loss of resources:	Significant loss of resource	-N/A
Cumulative impact prior to mitigation:	Medium	-N/A
Significance rating of impact prior to mitigation	Medium	-N/A
Degree to which the impact can be mitigated:	High	-N/A
Proposed mitigation:	**Design and Planning** • The mitigation measures should be included in financial planning of the construction phase. • Standard management measures should be implemented to ensure that any on-going activities do not result in a decline in water resource quality. Consideration should also be given to the rehabilitation of watercourses where feasible. Mitigation measures related to the impacts associated with the construction activities are intended to augment standard/generic mitigation measures included in the project-specific Environmental Management Programme (EMPr).	-N/A

	Freshwater Impact - Disturbance/loss of aquatic vegetation and habitat.	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
	• Ensure monitoring by a suitably qualified independent Environmental Control Officer with an appropriately timed audit report. In the case where there is extensive damage to any aquatic system, where rehabilitation is required, a suitably qualified aquatic specialist must audit the site. • Monitoring for non-compliance must be done on a daily basis by the contractors. • Photographic records of all incidents and non-compliances must be retained. • A 19m buffer area from the boundary of the riparian habitat must be adopted and demarcated. The buffer is measured from the edge of the delineated aquatic habitat which includes riparian vegetation. • Set back infrastructure to outside of the aquatic buffer areas where possible. **Construction:** • Manage the runoff generated by the development and introduce it responsibly into the receiving environment. • The stormwater flows must enter the wetland areas in a diffuse flow pattern without pollutants. • Implement a formal stormwater management plan. • Soft infrastructure must be considered where practical. • Stormwater managed by the development should 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-	

	Freshwater Impact - Disturbance/loss of aquatic vegetation and habitat.	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
	mattresses) must be established to reflect the natural slope of the surface and located at the natural ground level. • Stockpiles must not be located within the buffer zones around aquatic habitat. • 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.	
Cumulative impact post mitigation:	Low	-N/A
Significance rating of impact after mitigation	Low (-)	-N/A

9.5.1.9. Freshwater Resources Impact – Sedimentation and Erosion

	Freshwater Impact - Sedimentation and Erosion.	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
DESCRIPTION OF IMPACT:	Vegetation clearing and exposure of bare soils directly within and adjacent to the aquatic 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. This 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 might also occur. 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	No Impact.

	Freshwater Impact - Sedimentation and Erosion.	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
	the artificial creation of preferential flow paths due to construction activities, will result in increased quantities of flow entering the systems. The magnitude of this impact is increased by the steep topography adjacent to these drainage lines.	
Nature of impact:	Negative	No Impact
Extent and duration of impact:	Regional; Long Term	-N/A
Probability of occurrence:	Definite	-N/A
Degree to which the impact can be reversed:	Partly Reversible	-N/A
Degree to which the impact may cause irreplaceable loss of resources:	Significant loss of resource	-N/A
Cumulative impact prior to mitigation:	Medium	-N/A
Significance rating of impact prior to mitigation	Medium	-N/A
Degree to which the impact can be mitigated:	Can be partly mitigated	-N/A

	Freshwater Impact - Sedimentation and Erosion.	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
Proposed mitigation:	• Construction must be carried out during the dry season where possible and contingency plans must be in place for high rainfall events during construction. • Before any work commences, sediment control/silt capture measures (e.g. bidim/silt curtains) must be installed downstream/downslope of the active working areas. • Silt fences/curtains must be regularly checked and maintained (de-silted to ensure continued capacity to trap silt) and repaired where necessary. • When de-silting takes place the silt must not be returned to the watercourse. • Excavated rock and sediments from the construction zone, and including any foreign materials, should not be placed within the delineated rivers and riparian areas in order to reduce the possibility of material being washed downstream. • All bare slopes and surfaces to be exposed to the elements during clearing and earthworks must be protected against erosion using rows of silt fences, sandbags, hay bales and/or earthen berms spaced along contours at regular intervals. The spacing interval must be smaller for steeper slopes and if required the ECO should advise in this regard. • Stockpiles must not be located within the buffer zones around aquatic habitat. • 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

	Freshwater Impact - Sedimentation and Erosion.	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
	• Adopt an appropriately designed stormwater management plan, that integrates the aforementioned measures and additional technical input.	
Cumulative impact post mitigation:	Low	-N/A
Significance rating of impact after mitigation	Low (-)	-N/A

9.5.1.10. Freshwater Resources Impact – Water Pollution

	Freshwater Impact – Water Pollution	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
DESCRIPTION OF IMPACT:	During construction there are a number of potential pollution inputs into the aquatic habitat (such as hydrocarbons and raw cement). 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 may enter 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	No Impact.

	Freshwater Impact – Water Pollution	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
	ablution facilities may result in sewage and chemicals entering the systems.	
Nature of impact:	Negative	No Impact
Extent and duration of impact:	Local; Short Term	-N/A
Probability of occurrence:	Probable	-N/A
Degree to which the impact can be reversed:	Partly Reversible	-N/A
Degree to which the impact may cause irreplaceable loss of resources:	No loss of resource	-N/A
Cumulative impact prior to mitigation:	Medium	-N/A
Significance rating of impact prior to mitigation	Medium	-N/A
Degree to which the impact can be mitigated:	Can be mitigated	-N/A
Proposed mitigation:	**Design and Planning** • The mitigation measures should be included in financial planning of the construction phase. • Standard management measures should be implemented to ensure that any on-going activities do not result in a decline in	-N/A

	Freshwater Impact – Water Pollution	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
	water resource quality. Consideration should also be given to the rehabilitation of watercourses where feasible. Mitigation measures related to the impacts associated with the construction activities are intended to augment standard/generic mitigation measures included in the project-specific Environmental Management Programme (EMPr). • Ensure monitoring by a suitably qualified independent Environmental Control Officer with an appropriately timed audit report. In the case where there is extensive damage to any aquatic system, where rehabilitation is required, a suitably qualified aquatic specialist must audit the site. • Monitoring for non-compliance must be done on a daily basis by the contractors. • Photographic records of all incidents and non-compliances must be retained. • A 19m buffer area from the boundary of the riparian habitat must be adopted and demarcated. The buffer is measured from the edge of the delineated aquatic habitat which includes riparian vegetation. • Set back infrastructure to outside of the aquatic buffer areas where possible. **Construction:** • Manage the runoff generated by the development and introduce it responsibly into the receiving environment. • The stormwater flows must enter the wetland areas in a diffuse flow pattern without pollutants. • Implement a formal stormwater management plan. • Soft infrastructure must be considered where practical.	

	Freshwater Impact – Water Pollution	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
	• Stormwater managed by the development should 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. • Stockpiles must not be located within the buffer zones around aquatic habitat. • 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.	
Cumulative impact post mitigation:	Low	-N/A
Significance rating of impact after mitigation	Low (-)	-N/A

9.5.1.11. Freshwater Resources Impact – Flow Modification

	Freshwater Impact – Flow Modification	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
DESCRIPTION OF IMPACT:	Land clearing and earth works upslope of aquatic habitat 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	No Impact.

	Freshwater Impact – Flow Modification	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
	gully erosion. Altered water inputs from upslope disturbances as well as modified water distribution and retention patterns will ultimately affect the hydrological integrity of water resources. This impact is likely to be magnified by the steep slopes around drainage lines.	
Nature of impact:	Negative	No Impact
Extent and duration of impact:	Regional, Medium Term	-N/A
Probability of occurrence:	Highly Likely	-N/A
Degree to which the impact can be reversed:	Partly Reversible	-N/A
Degree to which the impact may cause irreplaceable loss of resources:	Minimal loss of resources	-N/A
Cumulative impact prior to mitigation:	Medium	-N/A
Significance rating of impact prior to mitigation	Medium	-N/A
Degree to which the impact can be mitigated:	Can be mitigated	-N/A
Proposed mitigation:	**Design and Planning** • The mitigation measures should be included in financial planning of the construction phase.	-N/A

	Freshwater Impact – Flow Modification	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
	• Standard management measures should be implemented to ensure that any on-going activities do not result in a decline in water resource quality. Consideration should also be given to the rehabilitation of watercourses where feasible. Mitigation measures related to the impacts associated with the construction activities are intended to augment standard/generic mitigation measures included in the project-specific Environmental Management Programme (EMPr). • Ensure monitoring by a suitably qualified independent Environmental Control Officer with an appropriately timed audit report. In the case where there is extensive damage to any aquatic system, where rehabilitation is required, a suitably qualified aquatic specialist must audit the site. • Monitoring for non-compliance must be done on a daily basis by the contractors. • Photographic records of all incidents and non-compliances must be retained. • A 19m buffer area from the boundary of the riparian habitat must be adopted and demarcated. The buffer is measured from the edge of the delineated aquatic habitat which includes riparian vegetation. • Set back infrastructure to outside of the aquatic buffer areas where possible. **Construction:** • Manage the runoff generated by the development and introduce it responsibly into the receiving environment. • The stormwater flows must enter the wetland areas in a diffuse flow pattern without pollutants. • Implement a formal stormwater management plan.	

	Freshwater Impact – Flow Modification	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
	• Soft infrastructure must be considered where practical. • Stormwater managed by the development should 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. • Stockpiles must not be located within the buffer zones around aquatic habitat. • 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.	
Cumulative impact post mitigation:	Low	-N/A
Significance rating of impact after mitigation	Low (-)	-N/A

9.5.1.12. Socio-Economic Impact – Encroachment onto Private Property

	Socio-Economic Impact – Potential Encroachment onto Private Property	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
DESCRIPTION OF IMPACT:	Privately owned properties are located along the proposed central road along the proposed site. The proposed development will encroach upon	No Impact

	Socio-Economic Impact – Potential Encroachment onto Private Property	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
	these areas. This can result in disgruntled owners and occupiers, regarding the encroachment and the establishment of subsidy housing around their properties.	
Nature of impact:	Negative	N/A
Extent and duration of impact:	Local; long-term	N/A
Probability of occurrence:	Likely	N/A
Degree to which the impact can be reversed:	Low	N/A
Degree to which the impact may cause irreplaceable loss of resources:	Low	N/A
Cumulative impact prior to mitigation:	High (-)	N/A
Significance rating of impact prior to mitigation	High (-)	N/A
Degree to which the impact can be mitigated:	Low	N/A
Proposed mitigation:	**General:** • Communicate proposed development to all private landowners, including timeframes, etc. whose properties may be directly affected, or who's access may be obstructed.	The NO-GO Alternative assumes no mitigation. It assumes the status quo.

	Socio-Economic Impact – Potential Encroachment onto Private Property	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
	• Where encroachment is proposed, obtain landowner consent and register survey. **Planning**: • Plan works appropriately to ensure encroachment is limited as much as possible. • Notify landowners when obstruction of access may occur, and when construction may occur directly adjacent to their fence line. • Erect signage to notify surrounding community of works, and any other necessary signage, including site information board, communicating applicants, contractors, engineers, and ECO's details. • Keep an open line of communication, for public to liaise with project team. **Visual Impacts**: • Ensure that works are screened from neighbouring properties, by establishing a fenced working area. This can also prohibit material from encroaching into private areas. • Utilize shade cloth, or other suitable material, along the fence perimeter of the site camp and construction site. • Work on site must be well-planned and well-managed so that work proceeds quickly and efficiently, thus minimizing the disturbance time. • Use of lighting (if required) should take into account surrounding residents and land users and should present little or no nuisance. Downward facing, spill-off type lighting is recommended.	

	Socio-Economic Impact – Potential Encroachment onto Private Property	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
Cumulative impact post mitigation:	High (negative)	N/A
Significance rating of impact after Mitigation	High (-)	N/A

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

	Socio-Economic Impact –Creation of Business & Employment Opportunities	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
DESCRIPTION OF IMPACT:	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 Garden Route District Municipality (GRDM) 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 GRDM and BLM. A significant portion of the annual wage bill will be spent in the local GRDM and BLM. The long-term economic impacts will be massive given the scale and duration of the proposed housing development. Most of the labour will be made up of Historically Disadvantaged Individuals (HIDs).	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.
Nature of impact:	Positive	Negative
Extent and duration of impact:	Regional; temporary	Regional; temporary
Probability of occurrence:	Definite	Definite

	Socio-Economic Impact –Creation of Business & Employment Opportunities	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
Degree to which the impact can be reversed:	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	No loss of resource
Cumulative impact prior to mitigation:	Medium (positive)	Medium (negative)
Significance rating of impact prior to mitigation / **enhancement:**	Medium (positive)	High (negative)
Degree to which the impact can be mitigated:	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:	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: • 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 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.	The NO-GO Alternative assumes no mitigation. It assumes the status quo.

	Socio-Economic Impact –Creation of Business & Employment Opportunities	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
Cumulative impact post mitigation:	High (positive)	Medium (negative)
Significance rating of impact after **enhancement**	High (+)	High (-)

9.5.1.14. Traffic & Safety Impact – Associated with Construction Vehicles

	Traffic & Safety Impact – Associated with Construction Vehicles	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
DESCRIPTION OF IMPACT:	It is proposed that there will be multiple deliveries of significant amounts 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, particularly as Forest Hall Road is the only access into the Crags and Kurland. 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.	No Impact.
Nature of impact:	Negative	-No Impact
Extent and duration of impact:	Local; Temporary	-N/A

	Traffic & Safety Impact – Associated with Construction Vehicles	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
Probability of occurrence:	Highly Probable	-N/A
Degree to which the impact can be reversed:	Completely reversible	-N/A
Degree to which the impact may cause irreplaceable loss of resources:	No loss of resource	-N/A
Cumulative impact prior to mitigation:	Medium	-N/A
Significance rating of impact prior to mitigation	Medium	-N/A
Degree to which the impact can be mitigated:	Can be partly mitigated	-N/A
Proposed mitigation:	General: • 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.	-N/A

	Traffic & Safety Impact – Associated with Construction Vehicles	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
	• 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.	
Cumulative impact post mitigation:	Low	-N/A
Significance rating of impact after mitigation	Low (-)	-N/A

9.5.1.15. Visual Impact – Associated with Construction Activities

	Visual Impact – Associated with Construction Activities	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: 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.
Nature of impact:	Negative	-No Impact
Extent and duration of impact:	Site Specific. Temporary	-N/A
Probability of occurrence:	Definite	-N/A
Degree to which the impact can be reversed:	Partly reversible	-N/A
Degree to which the impact may cause irreplaceable loss of resources:	No loss of resource	-N/A
Cumulative impact prior to mitigation:	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	-N/A
Proposed mitigation:	• 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.	-N/A

	Visual Impact – Associated with Construction Activities	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
	• Waste must be managed according to the EMPr 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 other suitable material. • Special attention should be given to the screening of highly reflective material. • Use of lighting (if required) should take into account surrounding residents and land users and should present little or no nuisance. Downward facing, spill-off type lighting is recommended. • Construction vehicles must enter and leave the site during working hours. • 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.	
Cumulative impact post mitigation:	Low	-N/A

	Visual Impact – Associated with Construction Activities	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
Significance rating of impact after mitigation	Low (-)	-N/A

9.6. Operational Phase Impact Tables

9.6.1.Operational Phase Impacts

9.6.1.1. Botanical Impact – Invasion by exotic and alien species

	Botanical Impact - Invasion by exotic and alien species	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: 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.	No Impact.
Nature of impact:	Negative	No Impact
Extent and duration of impact:	Site Specific; Medium Term	-N/A
Probability of occurrence:	Probable	-N/A
Degree to which the impact can be reversed:	Reversible	-N/A
Degree to which the impact may	Moderate loss of resource	-N/A

	Botanical Impact - Invasion by exotic and alien species	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
cause irreplaceable loss of resources:		
Cumulative impact prior to mitigation:	Medium	-N/A
Significance rating of impact prior to mitigation	Medium	-N/A
Degree to which the impact can be mitigated:	Can be mitigated	-N/A
Proposed mitigation:	• Draft an alien invasive monitoring, control and eradication plan, and integrate this into the management of the site, particularly in open spaces. • Implement initial and follow-up alien invasive clearing and rehabilitate the area post clearing. • An appropriate fire regime must be applied to all the remaining natural areas that require periodic fire for rejuvenation.	-N/A
Cumulative impact post mitigation:	Low	-N/A
Significance rating of impact after mitigation	Low (-)	-N/A

9.6.1.2. Botanical Impact – Disturbances to ecological processes

	Botanical Impact - Disturbances to ecological processes	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
DESCRIPTION OF IMPACT:	Activity may result in disturbances to ecological processes.	No Impact.
Nature of impact:	Negative	No Impact
Extent and duration of impact:	Local; Long Term	-N/A
Probability of occurrence:	Possibly	-N/A
Degree to which the impact can be reversed:	Barely Reversible	-N/A
Degree to which the impact may cause irreplaceable loss of resources:	Potential loss of resource	-N/A
Cumulative impact prior to mitigation:	Medium	-N/A
Significance rating of impact prior to mitigation	Medium	-N/A
Degree to which the impact can be mitigated:	Can be mitigated	-N/A
Proposed mitigation:	• No clearing outside of development and infrastructure footprints to take place.	-N/A

	Botanical Impact - Disturbances to ecological processes	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
	• Ensure rehabilitation is implemented in accordance with the EMPr and specialist recommendation.	
Cumulative impact post mitigation:	Low	-N/A
Significance rating of impact after mitigation	Low (-)	-N/A

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

	Freshwater Impact - Disturbance/loss of aquatic vegetation and habitat.	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
DESCRIPTION OF IMPACT:	There is less direct risk to aquatic habitat during the operational phase as it will have been transformed already during construction. However, any remaining habitat is at threat due to the possibility of urban sprawl encroaching into aquatic 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 lead to erosion in the systems.	No Impact.
Nature of impact:	Negative	No Impact

	Freshwater Impact - Disturbance/loss of aquatic vegetation and habitat.	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
Extent and duration of impact:	Local; Permanent	-N/A
Probability of occurrence:	Probable	-N/A
Degree to which the impact can be reversed:	Partly Reversible	-N/A
Degree to which the impact may cause irreplaceable loss of resources:	No loss of resource	-N/A
Cumulative impact prior to mitigation:	Medium	-N/A
Significance rating of impact prior to mitigation	Medium	-N/A
Degree to which the impact can be mitigated:	Can be mitigated	-N/A
Proposed mitigation:	• 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	-N/A

	Freshwater Impact - Disturbance/loss of aquatic vegetation and habitat.	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
	further structures and/or energy dissipaters. These structures must be incorporated within the layout area. • The use and maintenance of grease traps/oil separators is recommended 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 aquatic 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.	
Cumulative impact post mitigation:	Low	-N/A

	Freshwater Impact - Disturbance/loss of aquatic vegetation and habitat.	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
Significance rating of impact after mitigation	Low (-)	-N/A

9.6.1.4. Freshwater Resources Impact – Sedimentation and Erosion

	Freshwater Impact - Sedimentation and Erosion.	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: 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 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. Cultivation in the agricultural area may lead to increased sedimentation since large areas will be left unvegetated for periods of time. The steep slopes increase the magnitude of this impact.	No Impact.
Nature of impact:	Negative	No Impact
Extent and duration of impact:	Local; Permanent	-N/A
Probability of occurrence:	Highly Likely	-N/A
Degree to which the impact can be reversed:	Partly Reversible	-N/A

	Freshwater Impact - Sedimentation and Erosion.	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
Degree to which the impact may cause irreplaceable loss of resources:	No loss of resources	-N/A
Cumulative impact prior to mitigation:	Medium	-N/A
Significance rating of impact prior to mitigation	Medium	-N/A
Degree to which the impact can be mitigated:	Can be partly mitigated	-N/A
Proposed mitigation:	• Stormwater infrastructure must be inspected at least once every year (before the onset of rains) to ensure that it is working efficiently. • 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. • The mitigation of impacts must 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. • Any evidence of erosion from this stormwater system must be rehabilitated and the volume/velocity of the water reduced through	-N/A

	Freshwater Impact - Sedimentation and Erosion.	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
	further structures and/or energy dissipaters. These structures must be incorporated within the layout area.	
Cumulative impact post mitigation:	Low	-N/A
Significance rating of impact after mitigation	Low (-)	-N/A

9.6.1.5. Freshwater Resources Impact – Water Pollution

	Freshwater Impact – Water Pollution	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
DESCRIPTION OF IMPACT:	Micro-litter such as cigarette butts may travel through certain stormwater grids and grids may not be regularly cleared. The increase in vehicles on the property due to the development increases the potential for pollutants to enter the systems. During maintenance of the development there could be water pollution impacts similar to those encountered in the construction phase. It is assumed that all wastewater will be disposed of via existing infrastructure and will not be treated on the property. It is likely that wastewater will be treated at the existing WWTW adjacent to the development, if there is capacity. 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. The agricultural area might be subject to fertiliser use which will lead to pollution from excess nutrients when runoff from these areas enter the aquatic habitat.	No Impact.

	Freshwater Impact – Water Pollution	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
Nature of impact:	Negative	No Impact
Extent and duration of impact:	Local; Permanent	-N/A
Probability of occurrence:	Probable	-N/A
Degree to which the impact can be reversed:	Partly Reversible	-N/A
Degree to which the impact may cause irreplaceable loss of resources:	No loss of resource	-N/A
Cumulative impact prior to mitigation:	Medium	-N/A
Significance rating of impact prior to mitigation	Medium	-N/A
Degree to which the impact can be mitigated:	Can be mitigated	-N/A
Proposed mitigation:	• 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.	-N/A

	Freshwater Impact – Water Pollution	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
	• The use and maintenance of grease traps/oil separators is recommended 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 aquatic 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.	
Cumulative impact post mitigation:	Low	-N/A

	Freshwater Impact – Water Pollution	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
Significance rating of impact after mitigation	Low (-)	-N/A

9.6.1.6. Freshwater Resources Impact – Flow Modification

	Freshwater Impact – Flow Modification	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
DESCRIPTION OF IMPACT:	Hardened/artificial infrastructure will alter the natural processes of rainwater infiltration and surface runoff, promoting increased volumes and velocities of storm water runoff, which can be detrimental to the aquatic habitat receiving concentrated flows off of these areas. 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 aquatic habitat will alter the natural ecology, increasing the risk of erosion and channel incision/scouring. Irrigation on the agricultural area may lead to altered and increased runoff when not managed properly.	No Impact.
Nature of impact:	Negative	No Impact
Extent and duration of impact:	Local; Permanent	-N/A
Probability of occurrence:	Highly Likely	-N/A
Degree to which the impact can be reversed:	Partly Reversible	-N/A

	Freshwater Impact – Flow Modification	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
Degree to which the impact may cause irreplaceable loss of resources:	Significant loss of resource	-N/A
Cumulative impact prior to mitigation:	Medium	-N/A
Significance rating of impact prior to mitigation	Medium	-N/A
Degree to which the impact can be mitigated:	Can be mitigated	-N/A
Proposed mitigation:	• 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 use and maintenance of grease traps/oil separators is recommended 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.	-N/A

	Freshwater Impact – Flow Modification	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
	• Maintenance of the aquatic 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.	
Cumulative impact post mitigation:	Medium	-N/A
Significance rating of impact after mitigation	Medium (-)	-N/A

9.6.1.7. Socio-Economic Impact – Provision of Housing

	Socio-Economic Impact –Provision of Housing	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
DESCRIPTION OF IMPACT:	The proposed development will assist to address a significant portion of the housing backlog in the area.	The No-Development option would represent a lost opportunity in terms of the benefits associated with the provision of housing in the area.
Nature of impact:	Positive	Negative
Extent and duration of impact:	Regional extent; permanent	Regional; temporary
Probability of occurrence:	Definite	Definite
Degree to which the impact can be reversed:	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.	No loss of resource
Cumulative impact prior to mitigation:	Medium positive	Medium (negative)
Significance rating of impact prior to mitigation / **enhancement:**	Medium-High positive	Medium-High (negative)
Degree to which the impact can be mitigated:	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 –Provision of Housing	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
Proposed **enhancement** / mitigation:	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 (negative)
Significance rating of impact after **enhancement**	Medium-High (+)	Medium-High (negative)

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

	Socio-Economic Impact – Provision of formal Sports Facilities, Public Spaces and Enhanced access to the Dam	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
DESCRIPTION OF IMPACT:	▪ **Provision of public open spaces:** The development proposal makes allowance for the provision of public open space. ▪ **Provision of sports field**: The proposed development makes provision for the establishment of a sports field to be utilized by the community. These components will not only contribute to an improved quality of life for the various members of the community.	The No-Development option would represent a lost opportunity in terms of the benefits associated with the provision of a community sports field, however the public could continue to make use of the existing open spaces for exercise, and other recreational activities.
Nature of impact:	Positive	Negative
Extent and duration of impact:	Regional extent; permanent	Regional; temporary
Probability of occurrence:	Definite	Definite

	Socio-Economic Impact – Provision of formal Sports Facilities, Public Spaces and Enhanced access to the Dam	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
Degree to which the impact can be reversed:	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.	No loss of resource
Cumulative impact prior to mitigation:	Medium positive	Medium (negative)
Significance rating of impact prior to mitigation / **enhancement:**	Medium positive	Medium (negative)
Degree to which the impact can be mitigated:	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 NO-GO Alternative assumes no mitigation – status quo remains
Cumulative impact post mitigation:	Medium positive	Medium (negative)
Significance rating of impact after **enhancement**	Medium-High positive	Medium (negative)

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

	Socio-Economic Impact – Creation of business and employment opportunities	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
DESCRIPTION OF IMPACT:	The support facilities of both business, educational and commercial components, in the form of a shops, school, and creche will create employment opportunities for local residents. The majority of the employment opportunities are likely to benefit Historically Disadvantaged Individuals (HDIs), who will be housed in this community. Given the high unemployment levels in Kurland, coupled with the low income and education levels, this would represent a positive social impact.	The No-Development option would represent a lost opportunity in terms of the benefits associated with employment and business opportunities during the operation phase.
Nature of impact:	Positive	Negative
Extent and duration of impact:	Regional extent; permanent	Regional extent; permanent
Probability of occurrence:	Definite	Improbable
Degree to which the impact can be reversed:	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.	No loss of resource
Cumulative impact prior to mitigation:	High positive	High negative
Significance rating of impact prior to mitigation / **enhancement:**	High positive	High negative

	Socio-Economic Impact – Creation of business and employment opportunities	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
Degree to which the impact can be mitigated:	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 NO-GO Alternative assumes no mitigation – status quo remains
Cumulative impact post mitigation:	High positive	High negative
Significance rating of impact after **enhancement**	High (+)	High (-)

9.6.1.10. Socio-Economic Impact – Broaden the Rates Base

	Socio-Economic Impact – Broaden the rates base	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: 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. The current situation would continue whereby the George Municipality allocates funds annually on security for the area and does not have the budget to maintain the open spaces.
Nature of impact:	Positive	Negative
Extent and duration of impact:	Regional extent; permanent	Regional extent; permanent

	Socio-Economic Impact – Broaden the rates base	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
Probability of occurrence:	Definite	Improbable
Degree to which the impact can be reversed:	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.	No loss of resource
Cumulative impact prior to mitigation:	Medium positive	Low - Medium negative
Significance rating of impact prior to mitigation / **enhancement:**	Medium positive	Low - Medium negative
Degree to which the impact can be mitigated:	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.	Constructing the proposed development.
Cumulative impact post mitigation:	Medium positive	Medium negative
Significance rating of impact after **enhancement**	Medium (+)	Medium (-)

9.6.1.11. Socio-Economic Impact – Property Values of surrounding landowners

	Socio-Economic Impact – Property Values of surrounding landowners	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
DESCRIPTION OF IMPACT:	Values of real estate are driven by various factors, among others supply and demand, interest rates, the contraction or expansion of the local economy, population growth rates and changes in disposable income to debt ratios.	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	Negative
Extent and duration of impact:	Regional extent; permanent	Regional extent; permanent
Probability of occurrence:	Definite	Improbable
Degree to which the impact can be reversed:	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.	No loss of resource
Cumulative impact prior to mitigation:	Medium positive	Low - Medium negative
Significance rating of impact prior to mitigation / **enhancement:**	Medium positive	Low - Medium negative

	Socio-Economic Impact – Property Values of surrounding landowners	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
Degree to which the impact can be mitigated:	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.	Constructing the proposed development.
Cumulative impact post mitigation:	Medium positive	Medium negative
Significance rating of impact after **enhancement**	Medium (+)	Medium (-)

9.6.1.12. Traffic & Safety Impact

	Traffic & Safety Impact	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
DESCRIPTION OF IMPACT:	A significant increase in traffic is expected to occur in the area as a result of the proposed development. 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	No Impact
Extent and duration of impact:	Local extent; long term	-N/A
Probability of occurrence:	Probable	-N/A

	Traffic & Safety Impact	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
Degree to which the impact can be reversed:	Partly reversible	-N/A
Degree to which the impact may cause irreplaceable loss of resources:	No loss of resource	-N/A
Cumulative impact prior to mitigation:	Medium	-N/A
Significance rating of impact prior to mitigation	Medium	-N/A
Degree to which the impact can be mitigated:	Can be partly mitigated	-N/A
Proposed mitigation:	• Undertake a Traffic Impact Assessment to ensure the safety of vehicular and pedestrian traffic during the operational phase of the development. • Ensure appropriate signage has been erected to caution drivers, regarding speed limits in a residential area. • Consider traffic circles, speed bumps, pedestrian crossings, etc in final design of roads. • Consider accommodation of public transport embayment's.	N/A
Cumulative impact post mitigation:	Low	-N/A

	Traffic & Safety Impact	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
Significance rating of impact after mitigation	Low – Medium (-)	-N/A

9.6.1.13. Visual Impact - Land use character & "sense of place"

	Visual Impact - Land use character & "Sense of Place"	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
DESCRIPTION OF IMPACT:	It is proposed to change the land use character and existing sense of place of the site from degraded Fynbos and fallow land, to significantly dense housing development, with additional support facilities. The proposed development would impact on the "sense of place" of the area to sensitive receptors that can see the development.	No Impact
Nature of impact:	Negative	No Impact
Extent and duration of impact:	Local; Long Term	N/A
Probability of occurrence:	Definite	N/A
Degree to which the impact can be reversed:	Barely reversible	N/A
Degree to which the impact may cause irreplaceable loss of resources:	No loss of resource	N/A

	Visual Impact - Land use character & "Sense of Place"	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
Cumulative impact prior to mitigation:	Medium – High	N/A
Significance rating of impact prior to mitigation	Medium – High	N/A
Degree to which the impact can be mitigated:	Can be mitigated	N/A
Proposed mitigation:	• Infrastructure should be designed to conform to the natural topography. • Infrastructure should be positioned to allow adequate space for tree planting and other vegetation screening interventions. The following general mitigation measures should be implemented to reduce the identified visual impacts: • Infrastructure should be visually unobtrusive. • Materials and colours used for the development should blend into the surrounding landscape. • Infrastructure should be grouped in clusters with open spaces between clusters. • Infrastructure should not interfere with the skyline (ridgelines), landmarks, major views and vistas. • The development should not increase light or noise pollution. • The development should correspond to the historical, architectural and landscape style of surrounding layout and buildings	N/A
Cumulative impact post mitigation:	Medium	N/A

	Visual Impact - Land use character & "Sense of Place"	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
Significance rating of impact after mitigation	Medium (-)	N/A

9.6.1.14. Visual Impact - Visual Intrusion of Night Lighting

	Visual Impact - Visual intrusion of night lighting	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
DESCRIPTION OF IMPACT:	With the establishment of housing and roadways, the additional lighting along the road and as a result of the housing will create a visual impact at night, which would be visible from the surrounding landscape.	No Impact
Nature of impact:	Negative	No Impact
Extent and duration of impact:	Local; Long Term	N/A
Probability of occurrence:	Definite	N/A
Degree to which the impact can be reversed:	Barely reversible	N/A
Degree to which the impact may cause irreplaceable loss of resources:	No loss of resource	N/A
Cumulative impact prior to mitigation:	Medium	N/A

	Visual Impact - Visual intrusion of night lighting	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
Significance rating of impact prior to mitigation	Medium	N/A
Degree to which the impact can be mitigated:	Can be mitigated	N/A
Proposed mitigation:	• External lights will increase the visual impact of the project at night therefore attention must be given to their selection for the specific function. • All lighting therefore must be carefully considered with regard to the extent of illumination, the intensity and color of lights and the luminaire. • Light fittings must have shields to eliminate sight of the light source; • Down lighting of areas is preferred to up lighting; • Any perimeter lights are to be directed downwards and inwards to the development; • No light fittings will spill light upwards or be directed upwards from a distance towards the area or building to be illuminated. • It is now accepted practice that lighting of new projects should be subdued in terms of light emissions and energy efficient.	N/A
Cumulative impact post mitigation:	Medium	N/A
Significance rating of impact after mitigation	Low-Medium (-)	N/A

9.6.1.15. Climate Change Considerations

	Climate Change Impacts	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
DESCRIPTION OF IMPACT:	A lack of awareness/knowledge of the climate risks faced by the community (including, storm risks, water shortages, fire risks, etc). and the integrated designs/technologies aimed at lowering climate risks, will not allow residents/community leaders to understand the importance and risks related to climate change, and what can be done within the community, in the future to address these risks. A lack of knowledge can lead to infrastructure being improperly managed, and potentially compromised.	No Impact
Nature of impact:	Negative	No Impact
Extent and duration of impact:	Local; Long Term	N/A
Probability of occurrence:	Probable	N/A
Degree to which the impact can be reversed:	Reversible	N/A
Degree to which the impact may cause irreplaceable loss of resources:	Significant loss of resource	N/A
Cumulative impact prior to mitigation:	Medium	N/A

	Climate Change Impacts	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
Significance rating of impact prior to mitigation	Medium	N/A
Degree to which the impact can be mitigated:	Can be mitigated	N/A
Proposed mitigation:	General: • Educate residents and community leaders on the integrated designs, especially the purpose and signs of concern. • Where possible, such as in public places, eg: parks etc. integrate infographics on climate change measures and sustainable development, that can be adopted in a domestic set up, such as water saving techniques, waste re-use/recycling, switching off any unnecessary appliances, fire safety, etc. • The proponent is to ensure that all relevant maintenance works, that are the municipality's responsibility, are undertaken timeously. • The contact details for emergency services should be available on infographics in public areas, this should include fire safety/rescue, municipal services (for repairs), etc.	N/A
Cumulative impact post mitigation:	Low	N/A
Significance rating of impact after mitigation	Low (-)	N/A

9.6.1.16. Contamination and Pollution Management

	Contamination & Pollution	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
DESCRIPTION OF IMPACT:	Sewer infrastructure failure as a result of overflows or electrical faults that may affect pumps, needs to be considered. Failure to manage solid waste, and other waste products can lead to litter of the surrounding environments, and contamination of affected natural areas. As well as lead to unsafe conditions for the public, or kids playing out in public areas.	No Impact, as no development will take place.
Nature of impact:	Negative	No Impact
Extent and duration of impact:	Local; Long term	-N/A
Probability of occurrence:	Improbable	-N/A
Degree to which the impact can be reversed:	Irreversible	-N/A
Degree to which the impact may cause irreplaceable loss of resources:	Marginal loss of resources	-N/A
Cumulative impact prior to mitigation:	Medium	-N/A
Significance rating of impact prior to mitigation	Medium	-N/A
Degree to which the impact can be mitigated:	Medium	-N/A

	Contamination & Pollution	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
Proposed mitigation:	General: • Ensure solid waste collection points are clearly marked. • Ensure that the public is aware of the solid waste collection days. • Ensure that the waste points have clear signage indicating: - Separation of waste receptacles; - Advice on re-use/recycling potential of general waste; - Advise on waste that cannot be collected by the municipality, that must be directed to a specific registered waste disposal site. - Encourage green waste collection. - Utilize waste exchange initiative if available. **General Pollution Management:** • No pollution of surface water or ground water resources may occur due to any activity on the site. • No storm water runoff from any premises containing waste, may be discharged into the environment. • Polluted stormwater must be contained on the site. • All stormwater outfalls should potentially be fitted with waste capturing mechanisms like nets, etc. To be confirmed during detail design. **General Waste Management:** • Dedicated waste bins or skips must be provided on site and kept in a demarcated area on an impermeable surface. • Separate waste bins/skips must be provided for recyclable waste, general waste and hazardous waste. • Waste must be placed in the appropriate waste bins/skips/ stockpiles.	-N/A

	Contamination & Pollution	
	Proposed Preferred Layout Alternative 1	**Proposed Alternative Layout 2: NO – GO**
	• Hazardous waste bins must be kept on an impermeable bunded surface capable of holding at least 110% of the volume of the bins (if this is being accommodated). • Skips/ bins must be provided with secure lids or covering that will prevent scavenging and windblown waste or dust. • Waste bins/skips must be regularly emptied and must not be allowed to overflow. • Waste generated on site must be classified and managed in accordance with the National Environmental Management: Waste Act – Waste Classification and Management Regulations (GN No. R. 634 of August 2013). • All waste, hazardous as well as general, which result from the proposed activities must be disposed of appropriately at a licensed Waste Disposal Facility (WDF). **Maintenance of Infrastructure:** • Ensure regular maintenance of the sewer and water infrastructure, particularly exposed sewer infrastructure (pump stations and pipe bridges. • Erect signage including: - Emergency numbers. - Signs of failure or concern.	
Cumulative impact post mitigation:	Low	-N/A
Significance rating of impact after mitigation	Low (-)	-N/A

10. CONCLUDING ENVIRONMENTAL STATEMENT

10.1. Outcome of Comparative Assessment

10.1.1. Construction Phase Impacts Post Mitigation

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

- The Proposed Preferred Alternative 1 Layout, takes into consideration the preliminary environmental impacts, while still being able to support the required housing capacity and associated support facilities.
- The No-Go alternative will have a high negative impact, depriving people of an opportunity at a new home, improved living conditions, potential for employment, and opportunity at a better quality of life.
- Freshwater impacts in terms of erosion, water pollution and flow modification is expected to be mitigated to a medium to low level of impact significance, while loss of habitat is expected to have a Low-Negligible significance.
- Botanical impacts are expected to be mitigated to be of Low – Medium significance.
- The socio-economic impacts including the provision of housing, internal infrastructure, support facilities, and opportunity to create employment, is of Medium - High Positive impacts after enhancement.
- Traffic & Safety impacts were also identified as being relatively significant but can be reduced to a Low-Medium impact significance.
- Water saving and energy saving technologies can help reduce energy and water wastage, which can reduce the strain on existing services.

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.**

Table 10: Proposed Impacts After Mitigation - Construction.

CONSTRUCTION PHASE IMPACTS - HOUSING		
IMPACT	IMPACT SIGNIFICANCE (after mitigation)	
	Preferred Proposed Alternative Layout 1	Alternative 2: NO – GO
Agricultural Potential Impact – Loss of Agricultural Land	Low (-)	No Impact
Botanical Impact - Invasion by exotic and alien species		No Impact
Botanical Impact - Disturbances to ecological processes		No Impact
Erosion and Sedimentation		
Contamination & Pollution		
Dust & Noise		
Freshwater Resources Impact – Loss of Species and Habitat		No Impact
Freshwater Resources Impact – Sedimentation and Erosion		No Impact
Freshwater Impact – Water Pollution		No Impact
Freshwater Resources Impact – Flow Modification		No Impact
Socio-Economic Impacts - Encroachment onto Private Property	High (-)	No Impact
Socio-Economic Impact - Creation of Business & Employment Opportunities	High (+)	High (-)
Traffic & Safety Impacts	Low (-)	No Impact

CONSTRUCTION PHASE IMPACTS - HOUSING		
IMPACT	IMPACT SIGNIFICANCE (after mitigation)	
	Preferred Proposed Alternative Layout 1	Alternative 2: NO – GO
Visual Impact – Associated with Construction Activities	Medium - High (+)	Medium - High (-)
Legislative Compliance and Design Considerations including Climate Change	Low (-)	No Impact

10.1.2. Operation Phase Impacts Post 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.**

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

- The Proposed Preferred Alternative 1 Layout, takes into consideration the preliminary environmental impacts, while still being able to support the required housing capacity and associated support facilities.
- The No-Go alternative will have a high negative impact, depriving people of an opportunity at a new home, potential for employment, and opportunity at a better quality of life.
- Freshwater impacts in terms of erosion, water pollution and flow modification is expected to be mitigated to a medium to low level of impact significance, while loss of habitat is expected to have a Low-Negligible significance.
- Botanical impacts are expected to be mitigated to be of Low – Medium significance.
- The socio-economic impacts including the provision of housing, internal infrastructure, support facilities, and opportunity to create employment, is of Medium - High Positive impacts after enhancement.
- Traffic & Safety impacts were also identified as being relatively significant but can be reduced to a Low-Medium impact significance.
- By educating residents and community leaders on climate change risks, the proponent is providing awareness and allowing the community to understand and potentially adopt climate conscious behavior within their domestic duties.

Table 11: Proposed Impacts After Mitigation - Operational.

OPERATIONAL PHASE IMPACTS		
IMPACT	IMPACT SIGNIFICANCE (after mitigation)	
	Preferred Proposed Alternative Layout 1	Alternative 2: NO – GO
Botanical Impact - Invasion by exotic and alien species	Low (-)	No Impact
Botanical Impact - Disturbances to ecological processes		No Impact
Freshwater Resources Impact – Loss of Species and Habitat		No Impact
Freshwater Resources Impact – Sedimentation and Erosion		No Impact
Freshwater Impact – Water Pollution		No Impact
Freshwater Resources Impact – Flow Modification	Medium (-)	No Impact
Socio-Economic Impact - Creation of Business & Employment Opportunities	High (+)	High (-)
Socio-Economic Impact –Provision of Community Facilities and Public Spaces	Medium-High (+)	Medium (negative)
Socio-Economic - Provision of Housing	Medium-High (+)	Medium-High (negative)
Socio-Economic Impact – Broaden the rates base	Medium (+)	Medium (-)
Socio-Economic Impact – Property Values of surrounding landowners	Medium (+)	Medium (-)
Traffic & Safety Impacts	Low – Medium (-)	No Impact
Visual Impact - Land use character & "sense of place"	Medium (-)	No Impact
Visual Impact – Visual Intrusion of Night Lighting	Low-Medium (-)	N/A

OPERATIONAL PHASE IMPACTS		
IMPACT	IMPACT SIGNIFICANCE (after mitigation)	
	Preferred Proposed Alternative Layout 1	Alternative 2: NO – GO
Climate Change Considerations	Low (-)	No Impact
Contamination & Pollution Management	Low (-)	No impact

10.2. Concluding Environmental Statement

- The proposed site is the best situated site for the establishment of the proposed Kurland Housing.
- The "No-Go" alternative is the option of not developing the proposed 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 opportunities related to addressing the existing housing backlog faced in the municipality. **A significantly high negative socio-economic impact significance would occur if the proposed development is not constructed in terms of the lost opportunity.**
- The "No-Go" alternative could lead to the encroachment of illegal land invasions as access does exist via the Forest Hall Road, this would lead to unmanaged clearance, contamination and destruction of watercourses, and further social issues.
- 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 (2017). The entire proposed development is also located within the Urban Edge and has been earmarked for residential 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) and Botanical Impacts (loss of vegetation) and the expected visual impact as a result of the development in terms of the land use character of the site and "sense of place" of the area being significantly changed. Traffic and safety impacts are also noteworthy.
- The socio-economic benefits of the provision of a housing including numerous temporary job opportunities, possibility for permanent job opportunities, community facilities, largely outweigh the biophysical, visual and traffic impacts identified in an area which is mostly disturbed and planned for development purposes in the Municipal SDF (within the urban edge).
- 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 (Alternative 1) 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.

- It is proposed to include the following Specialist Impact Assessment Studies during the EIA Phase:
  - A **Freshwater Habitat Assessment**.
  - A **Biodiversity Survey, which would include both fauna and flora**
  - An **Agricultural Impact Assessment**
  - A **Socio-Economic Impact Assessment**
  - A **Traffic Impact Assessment**

This report will now be circulated for comment as per the Regulations and submitted to the Competent Authority for assessment. Once this has been completed the Impact Assessment phase can begin.

11. REFERENCES

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- Outeniqua Geotechnical Services (2021). *Phase 1 Geotechnical Report - Proposed Subsidy Housing Project on Erf 562 Kurland, Bitou Municipality, Western Cape* (Rev 0). 17 May 2021.
- W.M De Kock and Associates and Urban Content (2021) Proposed Development on Erf 940 (A Portion Of Portion 562*) Kurland, Bitou Municipal Area: Town Planning Input. Rev 4. June 2021.