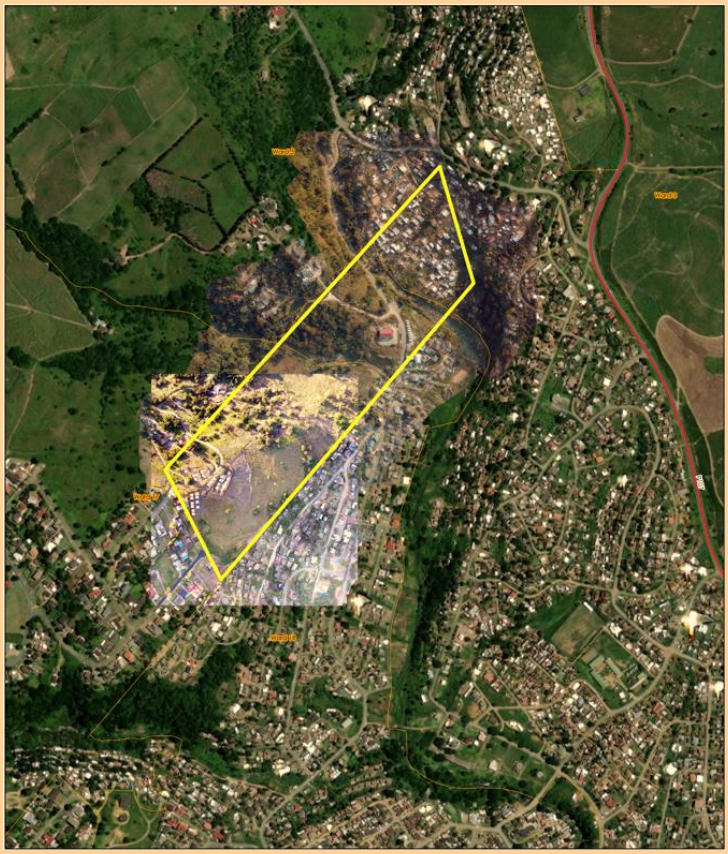
PROPOSED SHAKASPRING SUBSIDISED HOUSING DEVELOPMENT

DRAFT BASIC ASSESSMENT REPORT

Reference Number: DC29/0003/2023



MAY 2023

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DOCUMENT CONTROL RECORD

Project Title:	Proposed Shakaspring Subsidised Housing Development		
Client:	KwaDukuza Local Municipality		
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Report Type:	Draft Basic Assessment Report		
Project Number:	KZN E-272		
Version:	Draft		

Compiled and Authorised By:

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THE REPORT WAS COMPILED BY:

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Mr Thabiso Vincent Shinga

Qualifications:

- BSc Honours (Geography and Environmental Management) – University of KwaZulu Natal
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Work Experience:

- March 2023 - Present: Candidate Environmental Assessment Practitioner at K2M Environmental
- June 2022 - November 2022: Environmental Management Demonstrator at the University of KwaZulu Natal
- November 2019 - September 2020: Water and Wastewater Reticulation Learnership Facilitator at Effective Engineering and Artisan Centre
- February 2013 – November 2016: Part-time Pest Controller and Environmental Administrator at Dumile Cleaning and Construction

Independence:

I, Thabiso Vincent Shinga declare that this report has been prepared independently of any influence or prejudice as may be specified by the KwaZulu-Natal Department of Economic Development, Tourism and Environmental Affairs (KZN DEDTEA). A record will be kept of all comments received from Interested and Affected Parties (I&APs) and will be submitted in the Final Basic Assessment Report to KZN DEDTEA in the form of a Comments and Responses Report.

Ms. Thabiso Vincent Shinga Registered Candidate Environmental Assessment Practitioner EAPASA (2021/4194) K2M Environmental (Pty) Ltd	May 2023 Date

THE REPORT WAS REVIEWED BY:

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Qualifications:
B.Art. et. Scient. (Planning) - University of Potchefstroom
Advance Project Management (Project Management Body of Knowledge Methodology)
IEMA Approved Environmental Impact Assessment Course: The National Environmental Management Act Regulations – A Practical Approach
IEMA Approved Environmental Auditors Course

Work Experience:
2009- Present: Director for K2M Environmental
2005- 2009: Senior Environmental Consultant for K2M Technologies (Durban Office)
2002- 2005: Environmental Consultant for K2M Technologies (Rustenburg Office)

Expertise to undertake Environmental Impact Assessments:
K2M Environmental is an established environmental consultancy since 2008. The consultancy has been involved with more than 250 Environmental Impact Assessments and other environmental-related projects in KwaZulu Natal, Mpumalanga, Gauteng and the North-West Province over the last 15 years.

Independence:
I, Gert Watson declare that this report has been prepared independently of any influence or prejudice as may be specified by the KwaZulu-Natal Department of Economic Development, Tourism and Environmental Affairs (KZN DEDTEA). A record will be kept of all comments received from Interested and Affected Parties (I&APs) and will be submitted in the Final Basic Assessment Report to KZN DEDTEA in the form of a Comments and Responses Report.

Mr. Gert Watson EAPASA
(2022/5733)
K2M Environmental (Pty) Ltd
Director

May 2023
Date

TABLE OF CONTENTS

FIGURES:

TABLES:

MAPS:

LIST OF APPENDIXES:

1 BACKGROUND INFORMATION

1.1 INTRODUCTION AND BACKGROUND

The KwaDukuza Local Municipality has, through its IDP process and extensive consultation with respective communities residing within the Municipality, identified the need to provide a housing development within its area of jurisdiction. This process was initiated to address the Municipality's housing need due to the growth of the population in the area.

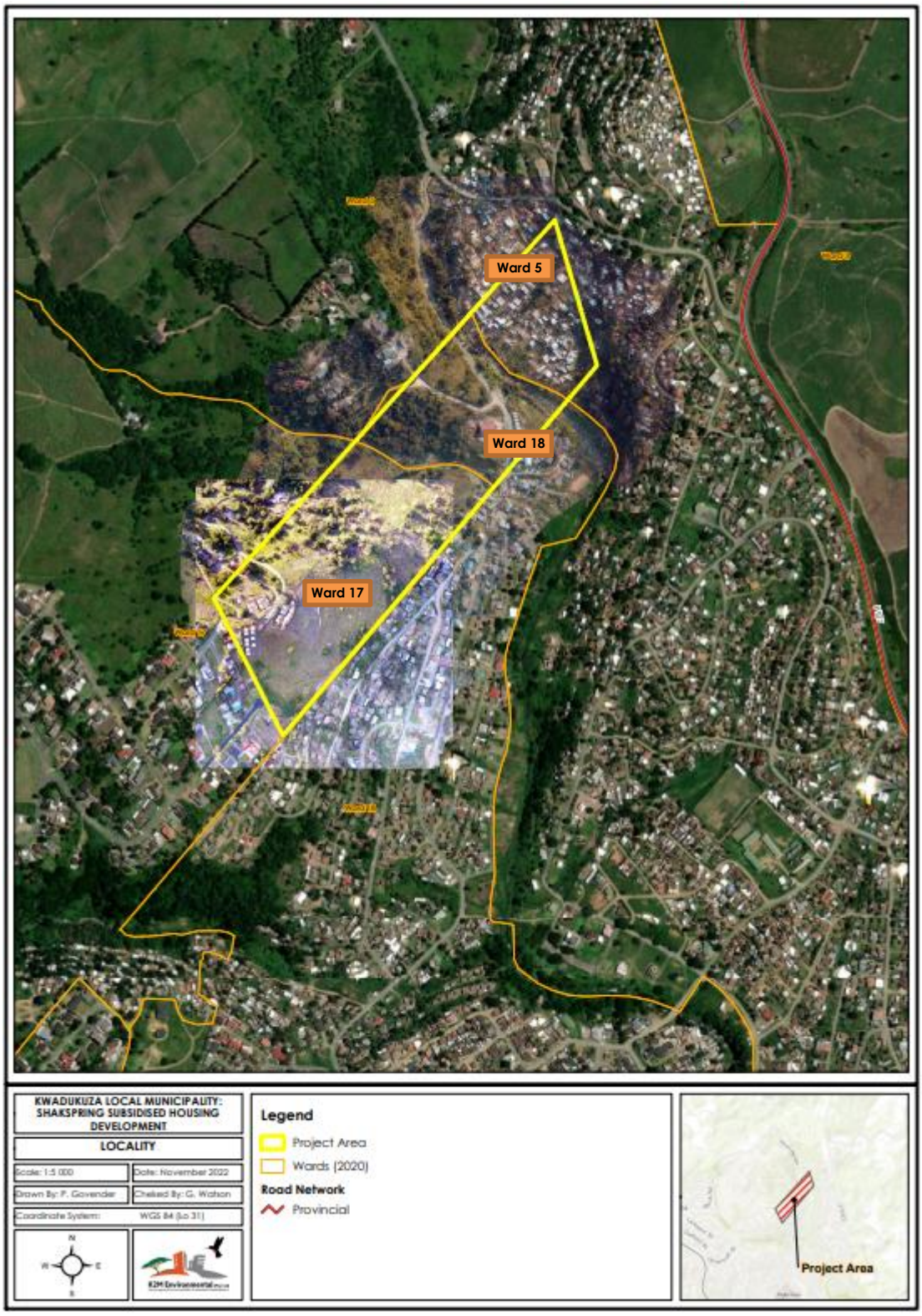
The KwaDukuza Local Municipality has appointed Mabune Consulting as the Project Managers for the proposed Shakaspring Subsidised Housing Development, which is located within Wards 5, 17 and 18 of the KwaDukuza Local Municipality. The project was originally known as the Monkeytown Subsidies Housing Project but the is now known as the Shakaspring Subsidised Housing Development. Subsequently, Mabune Consulting appointed K2M Environmental (Pty) as the independent Environmental Assessment Practitioner (EAP), to undertake the Environmental Impact Assessment for the proposed housing project.

The project area is located on the northern outskirts of Stanger, near the Highridge area. The proposed project area includes the total extend of Portion 3 of the Farm lot 11 No 1676, and is currently under the ownership of the KwaDukuza Local Municipality. The proposed site has a total extent of approximately 16.85 hectares and is situated approximately 2.82 km Northeast of the Stanger CBD.

The proposed project is largely a greenfield development and is aimed at providing suitable housing to beneficiaries, within the KwaDukuza Local Municipality. The majority of the site is vacant except for the northern section of the site which contains informal dwellings as well as some substantial housing structures. There is also an existing community hall located in the central portion of the project area, which the proposed current development plan has accommodated. The site contains two channelled valley bottom wetlands as well as Critical Biodiversity Irreplaceable Areas which are located to the North of the site.

The locality map of the project area in relation to the Municipal Wards is illustrated in Map 1.1 below, with portions of Wards 5, 17 and 18 located across the project area. (see **Appendix B – Locality Map**).

Map 1.1: Project Area



1.2 ENVIRONMENTAL IMPACT ASSESSMENT REGULATIONS

The Environmental Impact Assessment Regulations of 2014 (as amended) promulgated in terms of Section 24(5) of the National Environmental Management Act, (Act No. 107 of 1998) as amended, requires Environmental Authorisation from the competent authority (the KwaZulu-Natal Department of Economic Development, Tourism and Environmental Affairs (KZN DEDTEA)) for activities listed in Government Notices R324 and R327. Table 1.1 below identifies the activities that has been triggered for the proposed development.

Table 1.1: Triggered EIA Listed Activities

Activity No.	Description of Activity	Relevance to Project
Activity 9 of GN.R. 327	The development of infrastructure exceeding 1000 metres in length for the bulk transportation of water or storm water – (i) with an internal diameter of 0.36 metres or more; or (ii) with a peak throughput of 120 litres per second or more excluding where – (a) such infrastructure is for bulk transportation of water or storm water or storm water drainage inside a road reserve; or (b) where such development will occur within an urban area.	The proposed development will entail the construction of pipelines for the transportation of water supply, sewer reticulation and stormwater transportation. The proposed internal water pipelines will have a diameter ranging from 90mm to 150mm with a total pipeline length of 1720m, the sewer reticulation pipelines will be 160mm with a length of 2.2km and the internal stormwater pipelines will have a minimum diameter of 450mm and a total length of 550m. **From the detail provided in the engineering report it is now evident that this activity will NOT be triggered as part of this development.**
Activity 10 of GN.R. 327	The development and related operation of infrastructure exceeding 1000 metres in length for the bulk transportation of sewage, effluent, process water, wastewater, return water, industrial discharge or slimes- (i) with an internal diameter of 0.36 metres; or (ii) with a peak throughput of 120 litres per second or more excluding where – (a) such infrastructure is for bulk transportation of sewage, effluent, process water, wastewater return water, industrial discharge or slimes inside a road reserve; or (b) where such development will occur within an urban area.	The proposed development will entail the construction of pipelines for the purpose of transporting sewage from each house to the Stanger Wastewater Treatment Works. The proposed internal sewerage pipelines will have a 160mm diameter and will be located within the road reserve.

Activity No.	Description of Activity	Relevance to Project
		From the detail provided in the engineering report it is now evident that this activity will NOT be triggered as part of this development.
Activity 12 of GN.R. 327	The development of – (ii) infrastructure or structures with a physical footprint of 100 square metres or more; Where such development occurs – (a) within a watercourse (b) in front of a development setback; or (c) if no development setback exists, within 32 metres of a watercourse; -	The proposed development will entail the construction of two roads that will be 6m and 4.5m wide across the channelled valley bottom wetlands located within the project area. Furthermore, the development also entail the construction of infrastructure services as well as housing units within 32m of a watercourse. The Wetland Delineation Report recommended a wetland buffer of 24m. (See **Appendix H** for the wetland report and **Appendix E1** for the mapping affecting the watercourse and associated 32m buffer area.
Activity 19 of GN.R. 327	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; (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.	Road Crossing 1: Width of wetland: 28.61m Width of road: 11.12m Depth: 3m Volume: 954.43m^3 Road Crossing 2: Width of wetland: 18.42m Width of road: 10.04m Depth: 3m Volume: 554.81m^3 The impacts of the pipeline infrastructure on the receiving environment is included in Appendix E1 The proposed development will entail the infill and excavation of approximately 954.43m^3 and 554.81m^3 of material from the channelled valley bottom wetland for the construction of road Crossing 1 and 2, respectively. The pipeline crossing impact is mapped (see **Appendix E1**).

Activity No.	Description of Activity	Relevance to Project
Activity 27 of GN.R. 327	The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation, except where such clearance of indigenous vegetation is required for – (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.	The proposed development will entail the removal of approximately 7 ha of indigenous vegetation for the construction of residential units, pipelines, roads and other supporting land uses. See **Appendix E2** for the development layout overlay onto the environmental sensitive areas.
Activity 2 of GN.R. 324	The development of reservoirs, excluding dams, with a capacity of more than 250 cubic metres. d. Kwazulu-Natal: viii. Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; x. Areas designated for conservation in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purposes; xi. Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; xii. Outside urban areas: (aa) Areas within 10km from national parks or world heritage sites or 5km from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve; or (bb) Areas seawards of the development setback line or within 1km from the high-water mark of the sea if no such development setback line is determined; or xiii. In urban areas: (aa) Areas zoned for use as public open space (bb) Seawards of the development setback line or within 100 metres from the high-water mark of the sea if no such development setback line is determined; or (cc) Within urban protected areas.	The proposed development requires a storage reservoir of 1.5Ml that will be located on the highest level within the project area. It is clear from the proposed location of the reservoir, being the highest point on site(south western portion), that there are no CBA's or sensitivities as per the iLembe EMF, **hence this activity will NOT be triggered by the proposed development.**
Activity 4 of GN.R. 342	The development of a road wider than 4 metres with a reserve less than 13,5 metres d. Kwazulu-Natal: i. In an estuarine functional zone; ii. Trans-frontier protected areas managed under international conventions; iii. Community Conservation Areas; iv. Biodiversity Stewardship Programme Biodiversity Agreement areas; v. World Heritage Sites; vi. A protected area identified in terms of NEMPAA;	The proposed development will entail the construction of an internal road network with roads that are 6m and 4.5m wide, with road reserves of 18m and 10m, respectively; within a CBA and sensitive area as per the iLembe EMF. The CBA and EMF sensitivities are located within the northern portion of the project area, which is also the area where the informal

Activity No.	Description of Activity	Relevance to Project
	vii. Sites or areas identified in terms of an International Convention; viii. Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; ix. Core areas in biosphere reserves; x. Areas designated for conservation in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purposes; xi. Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; xii. Outside urban areas: (aa) Areas within 10km from national parks or world heritage sites or 5km from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve; or (bb) Areas seawards of the development setback line or within 1km from the high-water mark of the sea if no such development setback line is determined; or xiii. In urban areas: (aa) Areas zoned for use as public open space (bb) Seawards of the development setback line or within 100 metres from the high-water mark of the sea if no such development setback line is determined; or (cc) Within urban protected areas.	settlement has established in the past number of years. (See **Appendix E2**)
Activity 12 of GN.R. 324	The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan. d. KwaZulu-Natal: i. Trans-frontier protected areas managed under international conventions; ii. Community Conservation Areas; iii. Biodiversity Stewardship Programme Biodiversity Agreement areas; iv. 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; v. Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; vi. Within the littoral active zone or 100 metres inland from 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;	The proposed development will entail the removal of approximately 3.5 ha of KwaZulu-Natal Coastal Belt Grassland. The specialist however found no species of conservation concern and that it can be attributed to the area being poorly managed. A copy of the Biodiversity Assessment is attached as (See **Appendix I**), with a depiction of the vegetation proposed for clearance depicted on a Map included in **Appendix E1**.

Activity No.	Description of Activity	Relevance to Project
	vii. On land, where, at the times of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning; viii. A protected area identified in terms of NEMPAA, excluding conservancies; ix. World Heritage Sites; x. Sites or areas identified in terms of an International Convention; xi. Areas designated for conservation in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose; xii. Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; or xiii. In an estuarine functional zone.	
Activity 14 of GN.R. 327	The development of – (i) dams or weirs, where the dam or weir, including infrastructure and water surface area exceeds 10 square metres; or (ii) infrastructure or structures with a physical footprint of 10 square metres or more; Where such development occurs – (a) within a watercourse; (b) in front of a development setback; or (c) if no development setback has been adopted within 32 metres of a watercourse; Excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour d. KwaZulu Natal: i. In an estuarine functional zone; ii. Community Conservation Areas; iii. Biodiversity Stewardship Programme Biodiversity Agreement areas; iv. A protected area identified in terms of NEMPAA, excluding conservancies; v. World Heritage Sites; vi. Sites or areas identified in terms of an international convention; vii. Critical biodiversity areas or ecological support areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; viii. Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; ix. Core areas in biosphere reserves; x. Outside urban areas: (aa) Areas within 10 kilometres from national parks or world heritages sites or within 5 kilometres from any terrestrial	The proposed development will entail the construction of two roads across the channelled valley bottom wetlands located within the project area; within a CBA and sensitive area as per the iLembe EMF. Furthermore, the development also entail the construction of housing units within 32m (area between the recommended 24m buffer and 32m buffer) of the channelled valley bottom wetlands located within a CBA and sensitive area as per the iLembe EMF.

Activity No.	Description of Activity	Relevance to Project
	protected area identified in terms of NEMPAA or from the core area of a biodiversity reserve; (bb) Areas seawards of the development setback line or within 1 kilometre from the high-water mark of the sea if no such development setback line is determined; or xi. Inside urban areas: (aa) Areas zoned for use as public open space; (bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority, zoned for a conservation purpose; or (cc) Areas seawards of the development setback line or within 100 metres from the high-water mark of the sea if no such development setback line is determined.	

1.3 TERMS OF REFERENCE

Regulation 19 of the Environmental Impact Assessment Regulations of 2014 (as amended) determines that a Basic Assessment Procedure must be followed for all activities listed in Government Notice R327 and R324. K2M Environmental (Pty) Ltd has been appointed as the independent Environmental Assessment Practitioner (EAP) and will therefore be responsible for the Basic Assessment procedures concerned with the proposed development as specified in Sections 19 and 20 of Government Notice R326 promulgated in terms of Section 24(5) of the National Environmental Management Act, (Act No. 107 of 1998), as amended.

K2M Environmental has submitted the completed Application Form for Environmental Authorisation to the KwaZulu Natal Department of Economic Development, Tourism and Environmental Affairs (KZN DEDTEA) (see **Appendix C1** for the Application Form). KZN DEDTEA registered the project with Reference Number: DC29/0003/2023 in their letter dated 09th March 2023 (see **Appendix C2** for Letter of Acknowledgement from DEDTEA). This reference number is to be quoted in all correspondence with KZN DEDTEA for ease of reference.

1.4 APPROACH AND METHODOLOGY

The overall approach to this assignment included the following activities:

- Apply for Environmental Authorisation to the KZN DEDTEA regarding the proposed Subsidised Housing Development.
- A detailed analysis of the proposed development, the area where it will take place, and the identification of potential impacts.
- Identification of specialist input required and the facilitation of the studies.
- All legislative requirements in terms of the EIA Regulations and to provide KZN DEDTEA with sufficient information to take a decision regarding the development.

1.5 ASSUMPTIONS AND LIMITATIONS

The following assumptions and limitations apply to the EIA:

- The environmental authorization application has been initiated during the conceptual design and planning stages of the development.
- It is assumed that the information provided by the various specialists and project engineers are accurate.
- The EIA project team is of the view that an adequate level of information is provided in order to facilitate the required assessment of potential impacts of the proposed project alternatives and decision-making in this regard.
- The study involves the assessment of impacts on the current conservation value of affected land and not on either the historic or potential future conservation value.

1.6 BASELINE INFORMATION

Sufficient baseline information for the Draft Basic Assessment Report was available from a variety of desktop data sources, reports and relevant data bases. This was supplemented by site visits to the project area and inputs from other professionals involved in the project.

1.7 TIME CONSTRAINTS

There were no time constraints and sufficient time was available for the Basic Assessment Process.

1.8 REPORT STRUCTURE

- The report is structured as follows:
- **Section 2** consists of a summary description of the proposed activity.
- **Section 3** provides a description of the environment that may be affected by the activity.
- **Section 4** consists of the Engineering Services
- **Section 5** consists of a summary of the potential **impacts of the proposed activity** on the environment.
- **Section 6** provides describes the **public participation** process conducted during the scoping phase.

Supporting documents, reports, correspondence and other relevant information are contained in various Appendixes attached to this report. Table 1.2 has been included to assist the reader to find the relevant sections in the report.

Table 1.2: 2014 EIA Requirements for the Basic Assessment Report

Information Required	Document Section
Details of- (i) the EAP who prepared the report; and (ii) the expertise of the EAP, including a curriculum vitae;	Just after cover page, **Appendix O1** & **Appendix O2**
The location of the activity, including: (i) the 21-digit Surveyor General code of each cadastral land parcel; (ii) where available, the physical address and farm name; (iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;	Section 2.1
A plan which locates the proposed activity or activities applied for as well as associated structures and infrastructure at an appropriate scale; or, if it is- (i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or (ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken;	Section 2.1 & **Appendix D1**
A description of the scope of the proposed activity, including (i) all listed and specified activities triggered and being applied for; and (ii) a description of the activities to be undertaken including associated structures and infrastructure;	Sections 1.2 & 2.3
A description of the policy and legislative context within which the development is proposed including- (i) an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that are applicable to this activity and have been considered in the preparation of the report; and (ii) how the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools frameworks, and instruments;	Section 1.7
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 5.3.2
A motivation for the preferred site, activity and technology alternative;	Section 2.5
A full description of the process followed to reach the proposed preferred alternative within the site, including: (i) details of all the alternatives considered; (ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs; (iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them; (iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; (v) the impacts and risks 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	Sections 2.5, 3, 5 & 6.

Information Required	Document Section
(xi) a concluding statement indicating the preferred alternatives, including preferred location of the activity;	
A full description of the process undertaken to identify, assess and rank the impacts the activity will impose on the preferred location through the life of the activity, including- (i) a description of all environmental issues and risks that were identified during the environmental impact assessment process; and (ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures;	Section 5
An assessment of each identified potentially significant impact and risk, including- (I) cumulative impacts; (ii) the nature, significance and consequences of the impact and risk; (iii) the extent and duration of the impact and risk; (iv) the probability of the impact and risk occurring; (v) the degree to which the impact and risk can be reversed; (vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and (vii) the degree to which the impact and risk can be avoided, managed or mitigated;	Section 5
Where applicable, a summary of the findings and impact management measures identified in any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final report;	Sections 3.6, 3.7, 3.8 & 3.9
An environmental impact statement which contains- (i) a summary of the key findings of the environmental impact assessment; (ii) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers; and (iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;	Section 5.3.1 and 2.3.2
Based on the assessment, and where applicable, impact management measures from specialist reports, the recording of the proposed impact management outcomes for the development for inclusion in the EMPr;	Not Applicable
Any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorization;	Section 7
A description of any assumptions, uncertainties, and gaps in knowledge which relate to the assessment and mitigation measures proposed;	Section 1.5
A reasoned opinion as to whether the proposed activity should or should not be authorized, and if the opinion is that it should be authorized, any conditions that should be made in respect of that authorization;	Section 7
Where the proposed activity does not include operational aspects, the period for which the environmental authorization is required, the date on which the activity will be concluded, and the post construction monitoring requirements finalized;	Not Applicable
An undertaking under oath or affirmation by the EAP in relation to: the correctness of the information provided in the reports; (ii) the inclusion of comments and inputs from stakeholders and I&APs; (iii) the inclusion of inputs and recommendations from the specialist reports where relevant; and (iv) any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties; and	Just after cover page
Where applicable, details of any financial provisions for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts;	Not Applicable

Information Required	Document Section
Any specific information that may be required by the competent authority; and	Not Applicable
Any other matters required in terms of section 24(4)(a) and (b) of the Act.	Not Applicable

1.9 APPLICABLE LEGISLATION, POLICIES AND GUIDELINES

In addition to the Environmental Impact Assessment Regulations of 2014 (as amended), Table 1.3 below indicates other applicable legislation that has been considered in the preparation of this Draft Basic Assessment Report.

Table 1.3: Applicable Legislation

Legislation	Relevance to the development
Constitution of the Republic of South Africa (Act No. 108 of 1996)	All environmental aspects should be interpreted within the context of the Constitution. The Constitution has enhanced the status of the environment by virtue of the fact that environmental rights have been established in terms of Section 24.
National Environmental Management Act (No. 107 of 1998)	This development requires a Basic Assessment to be conducted in terms of the 2014 EIA Regulations, as amended. The purpose of the Basic Assessment is to ensure that the development does not impact on the natural environment.
National Environmental Management: Biodiversity Act (No. 10 of 2004)	A Biodiversity Assessment was undertaken to identify sensitive areas within the project area and to ensure that proper mitigation measures are in place to protect any endangered flora or faunal species that may be identified (See Appendix I for the Biodiversity Assessment Report).
National Water Act (No. 36 of 1998)	The proposed development will entail development within 500m of wetlands. A pre-application meeting will be arranged with the Department of Water and Sanitation to discuss the way forward in terms of the Water Use License.
KwaZulu-Natal Heritage Act (No. 4 of 1998)	This Act has been put into place to conserve, protect and conserve heritage resources within KwaZulu Natal. An enquiry was submitted to AMAFA for their comment. In their interim comment.
Agricultural Land Act (Act 70 of 1970)	The land for the proposed development belongs to the KwaDukuza Local Municipality; therefore, Act 70 of 1970 does not apply to this project.
National Environmental Management: Waste Act (No. 59 of 2008)	The overall purpose of the Waste Act is to manage waste in a manner that can protect the health of people as well as the environment (plants, animals, land, air, water etc). The management of waste during the construction phase has been taken into consideration and included into the Environmental Management Programme.
National Environmental Management: Air Quality Act and National Dust Control Regulations	Mitigation measures have been included into the EMPR which provides recommendations on how to manage pollution and dust during the construction phase.
Noise Regulations R2544	The EMPR provides recommendations on how to manage noise during the construction phase of the proposed development.
National Building Regulations and Building Standards Amendment Act no 45 of 1995	The purpose of this Act is to provide for the promotion of uniformity in the law relating to the erection of buildings in the areas of jurisdiction of local authorities.
Occupational Health and Safety Act (No. 85 of 1993)	The contractor needs to manage his staff and crew in strict accordance with the Occupational Health and Safety Act in order to prevent injuries to the staff.

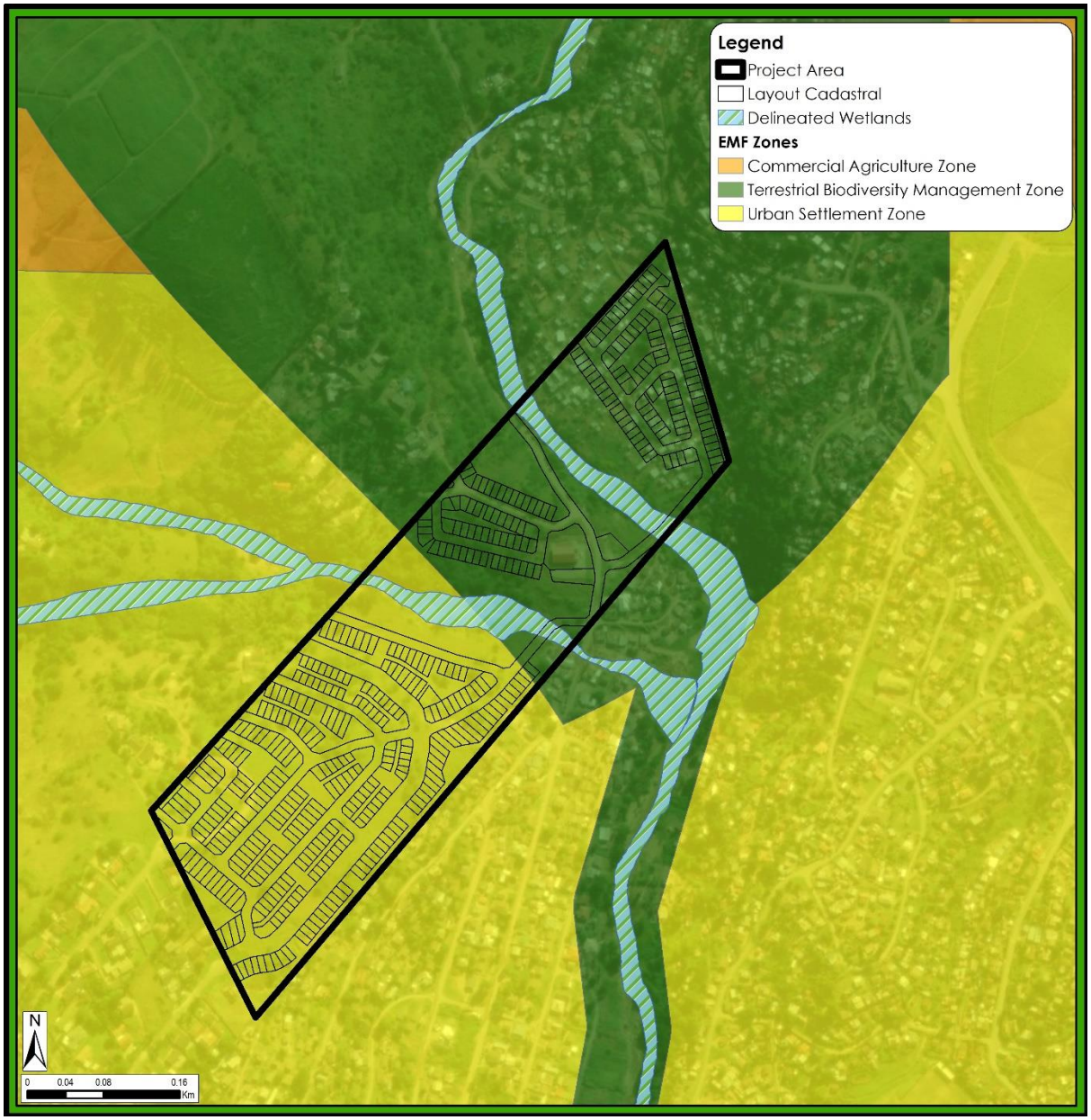
Legislation	Relevance to the development
Provincial Growth and Development Plan	The proposed development is aligned with the PGDP as it addresses the first goal of the PGDP which is that of job creation, which will take place during the construction phase and operational phase.
Polluters Pay Principal	The Polluters Pay Principal has been included into the preparation the EMPr.
KwaDukuza Local Municipality Integrated Development Plan (2022-2026)	Human settlement provision has been identified as a key challenge in the KwaDukuza Municipality's IDP. As stipulated in the IDP, the municipality experiences a housing backlog of 68 000. Furthermore, the Shakaspring Housing Development has been identified in the Municipal IDP as a prioritised planned urban housing project. As such, the proposed development is aligned with the Municipality's IDP as it entails the construction subsidised residential units together with provision of infrastructure for water and sanitation.
iLembe District Municipality Spatial Development Framework (2021)	The proposed Shakaspring Housing Development is aligned to the District Municipal SDF as it will assist in achieving the objective of sustainable human settlements within the district Municipality. According to the iLembe Districts SDF, the Kwadukuza Local Municipality experiences a housing backlog of 30%.
iLembe District Municipality EMF	The proposed project area is affected by the Draft iLembe EMF, the District EMF has not been promulgated and currently has no legal standing, however the proposed development zones from the EMF relevant to the project area has been analysis regardless of the legal standing of the District EMF.
KwaDukuza Local Municipality Housing Sector Plan (2022 - 2027)	According to the Municipal Housing Sector Plan, the overall housing backlog within the Municipality in 2007 was 35 000 households. In addition, the Natural growth rate for KwaDukuza is 1250 households. As such, once construction of the proposed development is completed, it will assist in reducing the municipal housing backlog / demand.

The subsections below unpack the relevant policies and legislation in table 1.3 that hold spatial reference to the project area.

1.9.1 The iLembe EMF

The iLembe EMF has not been promulgated; however, it still holds value in terms of environmental sensitivities within the Project Area. The EMF Zones relevant to the Project Area is depicted on Map 1.2 below. From the EMF zones it is clear that the majority of the project area has been identified for Urban Settlement, with the northern portion of the project area forming part of the Terrestrial Biodiversity Management Zone. The Terrestrial Biodiversity Zone has however been extensively degraded over the years through the growth of the informal settlement, the wetland and associated buffers is also largely part of the Terrestrial Biodiversity Zone and will be zoned for conservation purposes as part of the Town Planning Application.

Map 1.2: iLembe EMF Zones within the Project Area

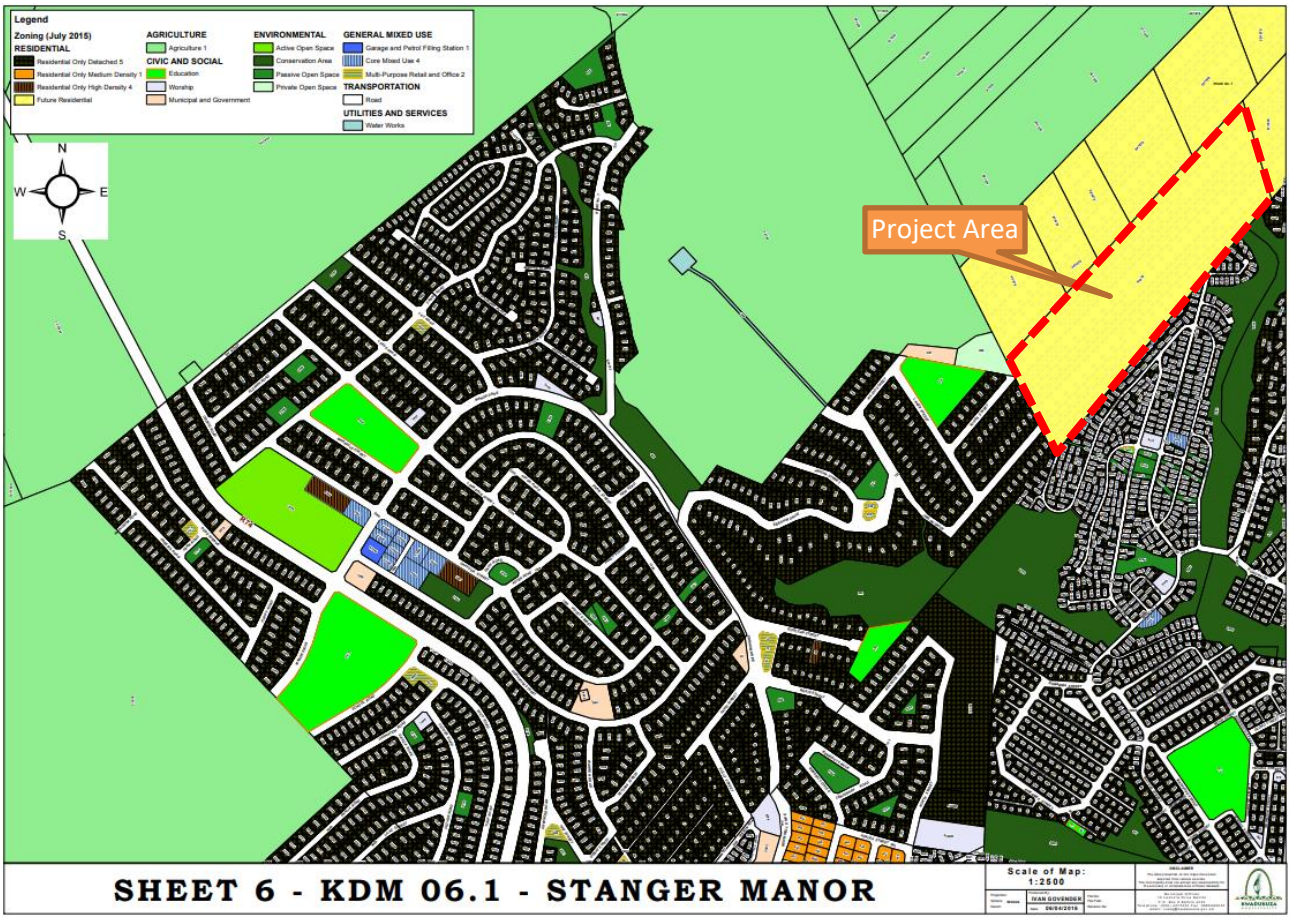


Data Source: iLembe EMF

1.9.2 The KwaDukuza Land Use Scheme

The current zoning of the project area as per the KwaDukuza Land Use Scheme is depicted on Map 1.3 below. The project area is currently zoned future residential.

Map 1.3: Land Use Scheme Map for Stanger Manor Area



Data Source: KwaDukuza Land Use Scheme

1.10 THE APPLICANT

The details of the applicant are as follows:

Applicant Name	: KwaDukuza Local Municipality
Contact Person	: Mr. N. Mdakane (Municipal Manager)
Tel	: 032 437 5000
Email	: municipalmanager@kwadukuza.gov.za
Address	: 14 Chief Albert Luthuli Street, KwaDukuza, 4450.

1.11 THE INDEPENDENT ENVIRONMENTAL ASSESSMENT PRACTITIONER

K2M Environmental (Pty) Ltd was appointed as the Independent EAP responsible for the following tasks:

- Processes, information, plans and reports produced in complying with the Regulations
- Ensuring that the relevant authority has access to all information

- Public Participation Process

The contact details of the independent Environmental Assessment Practitioner are as follows:

Name:	K2M Environmental (Pty) Ltd
Contact Person:	Mr. Gert Watson
Telephone:	031 764 6743
Fax:	086 622 7276
E-mail:	gert@k2m.co.za
Postal Address:	PostNet Suite #509, Private Bag X4, Kloof, 3640
EAPASA Registration Number:	2022/5733

2 DESCRIPTION OF THE PROPOSED ACTIVITY

2.1 PROJECT LOCATION

2.1.1 Co-ordinates

Table 2.1 below provides the co-ordinates of the perimeter of the proposed site.

Table 2.1: Co- ordinates of the projects area

Latitude /Longitude	Degrees	Minutes	Seconds
South	29°	18'	48.423''
East	31°	17'	53.264''

2.1.2 21 Digit Surveyor General Code

Table 2.2 below indicates the 21-digit surveyor general code.

Table 2.2: Surveyor General Code

Property Description	21- Digit Surveyor Code
Portion 3 of Farm lot 11 No. 1676	NOFU00000000167600003

2.2 ZONING OF PROPERTY

As per the KwaDukuza Local Municipality's Land Use Management Scheme, the property for the development area is currently zoned as "future residential".

2.3 ACTIVITY DESCRIPTION

2.3.1 Extent of Development

The total project area is approximately 16.89 ha in extent. The total development footprint is 10.14 hectares. The proposed development layout was prepared by K2M Technologies (Pty) Ltd in January 2023.

2.3.2 Description of the Proposed Activity

The proposed property, made up of a Portion 3 of farm lot 11 No. 1676, is owned by the KwaDukuza Local Municipality. The proposed site has a total extent of approximately 16.89 hectares and is situated approximately 2.56km North of Stanger Central. The project area is owned by the KwaDukuza Local Municipality and is zoned as future residential. The majority of the project extent is vacant however the dense informal settlement located on the northern portion of the project area is continuously

growing. There is a community hall located centrally within the project boundary, with a surfaced road traversing the northern portion of the project area from eat to west. There are two channelled valley bottom wetlands also located within the project area.

The proposed development will entail the removal of approximately 7 hectares of indigenous grassland vegetation to construct the following:

- **600 Low-income Residential units**

  The preferred layout plan proposed that both free-standing residential units (accommodation of existing well-built residential structures), as well as medium-density residential units be constructed. Approximately 533 Medium-density residential units, and 72 free-standing units, have been proposed.

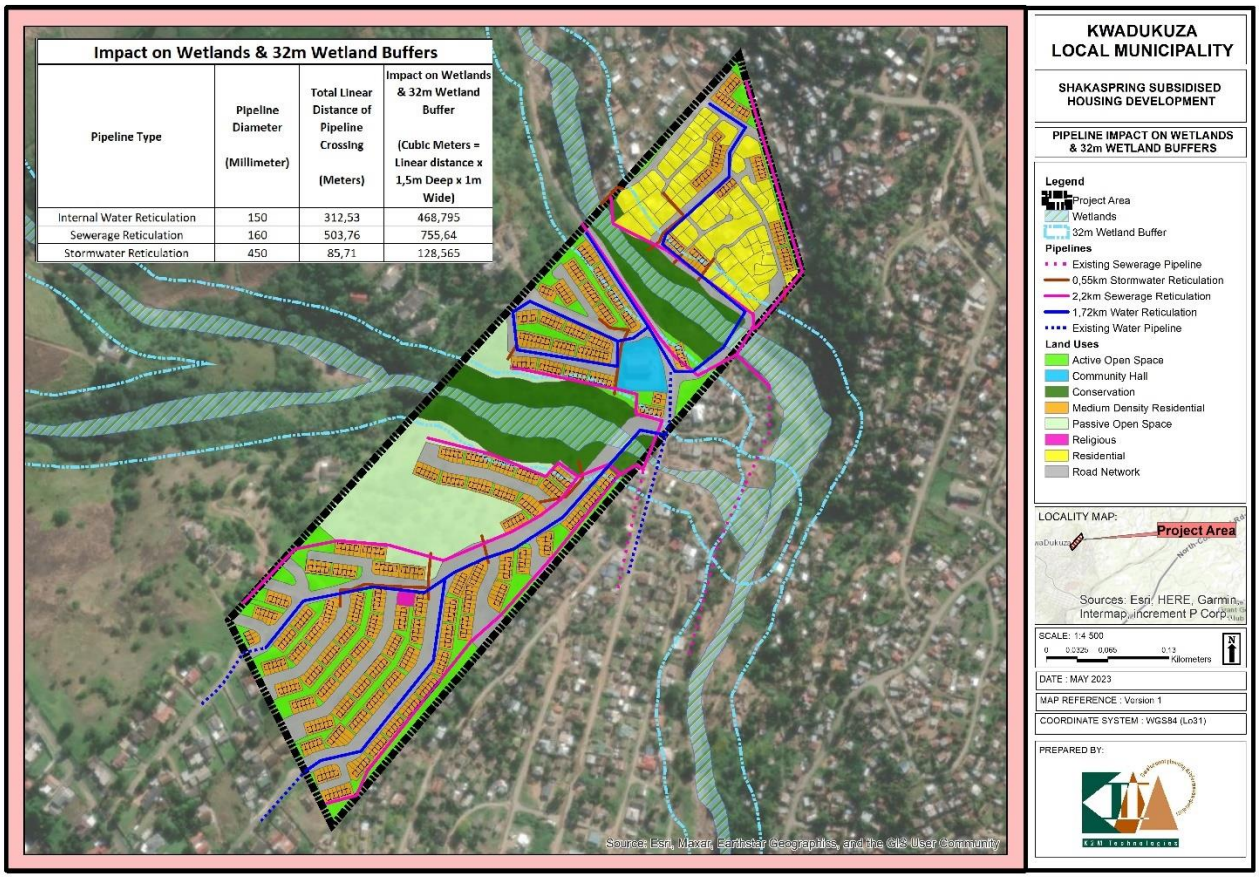
- **Pipelines for the transportation of water supply and the construction of a water storage reservoir**

  The proposed internal water pipelines will have a diameter ranging from 90mm to 150mm with a total pipeline length of 1720m. The proposed water storage reservoir will have a capacity of approximately 1.5Ml and will be situated on the highest point of the project area. The District Municipality confirmed that they do have sufficient water capacity for the proposed development in their bulk confirmation services letter dated the 26th of January 2015 (**Appendix K2**).

- **Pipelines for the transportation of waterborne sewage**

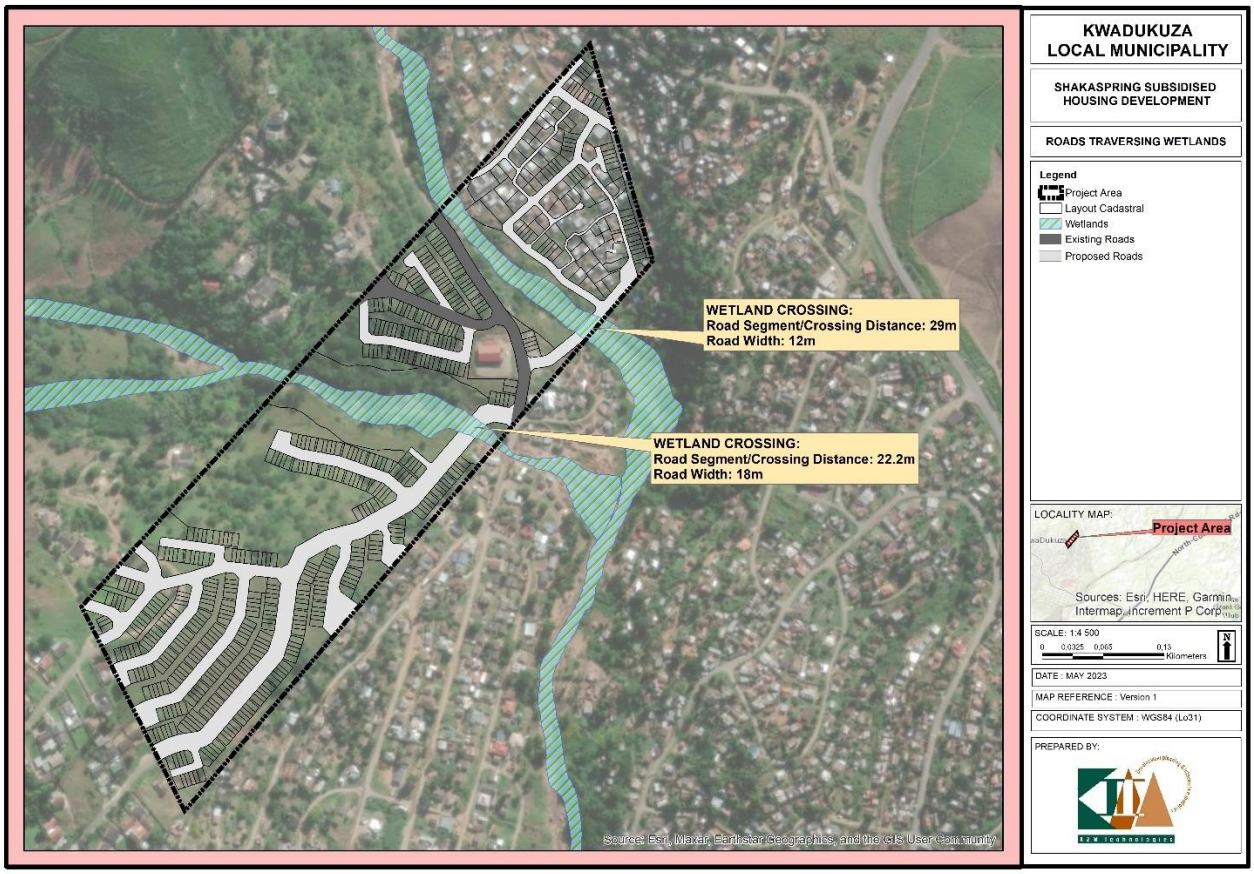
  The proposed pipelines are to be constructed for the transportation of sewage from the development to the Stanger Wastewater Treatment Works. The proposed internal sewerage pipelines will have a 160mm diameter and will be located within the road reserve with a total length of approximately 2200m. The existing Stanger WWTW had sufficient capacity to accommodate the proposed development in 2015 as stated in the letter dated the 26th of January 2015 and issued by the iLembe District Municipality (**Appendix K2**).

The environmental sensitive areas impacted on by the water, sewer and stormwater pipelines are depicted in the Map below (see **Appendix E1**).



- **Internal roads and stormwater infrastructure**

  The internal road network will have roads that are 6m and 4.5m wide, with road reserves of 18m and 10m, respectively. It should be noted that there will be two roads will cross watercourses (the channelled valley bottom wetlands) within the project area. Stormwater will be managed and controlled by surface drainage within road reserves which will then be fed into a piped stormwater reticulation system via kerb inlets and discharged into natural watercourses via outlet facilities complete with head and wing walls. The internal stormwater pipelines will have a minimum diameter of 450mm with a total length of 550m. Two new wetland crossings are being proposed as part of the development layout as depicted on the Map below (see **Appendix E1**).



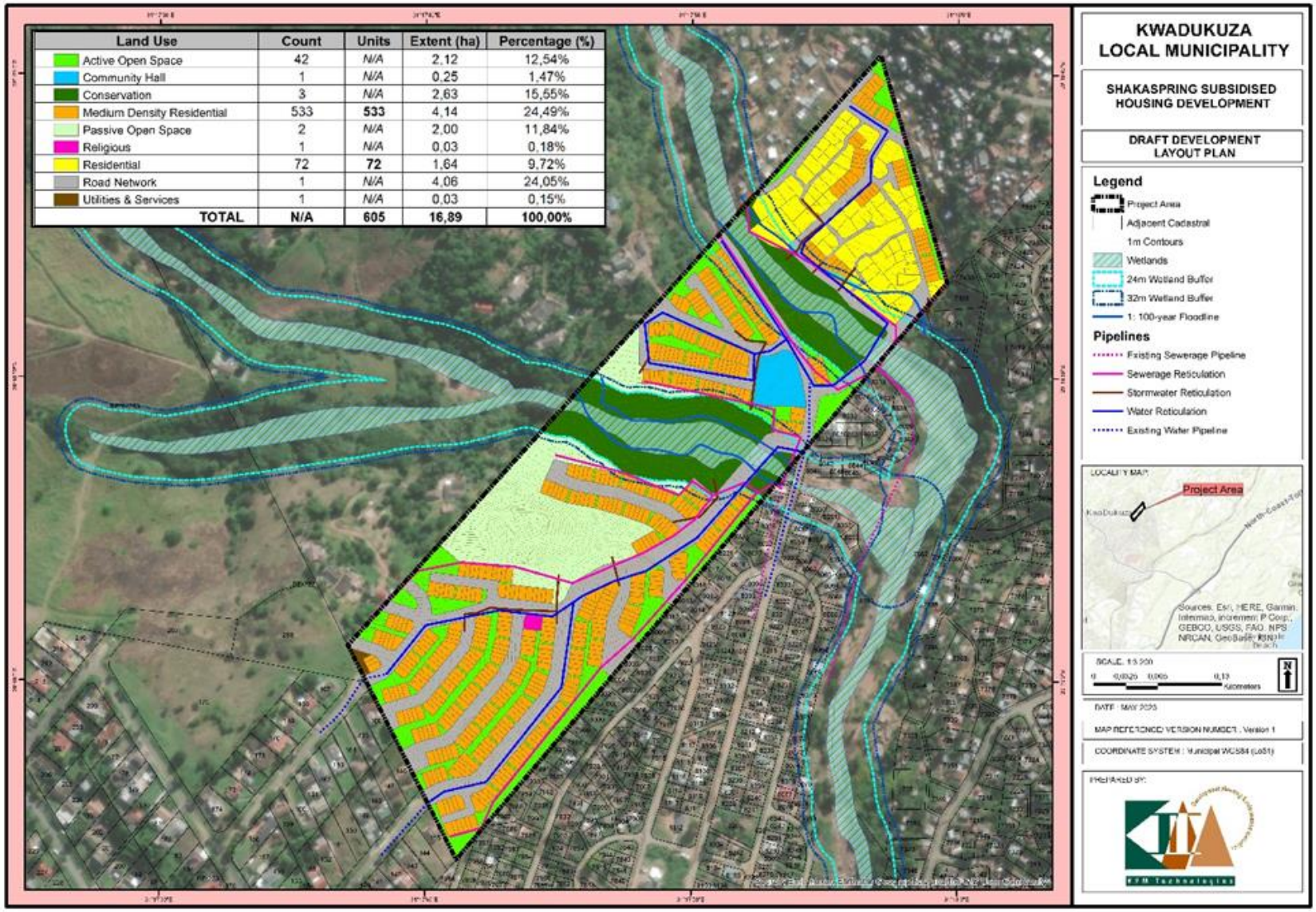
- **Erven will be set aside for place of worship land uses, active open space, a conservation area, a community hall and utilities.**

The proposed development layout plan for the Shakaspring Subsidised Housing Development was prepared by K2M Technologies (Pty) Ltd in January 2023 and is attached as **Appendix D1** and depicted in Map 2.1. The area of each of the proposed land uses is tabulated.

Table 2.3: Proposed Land Uses

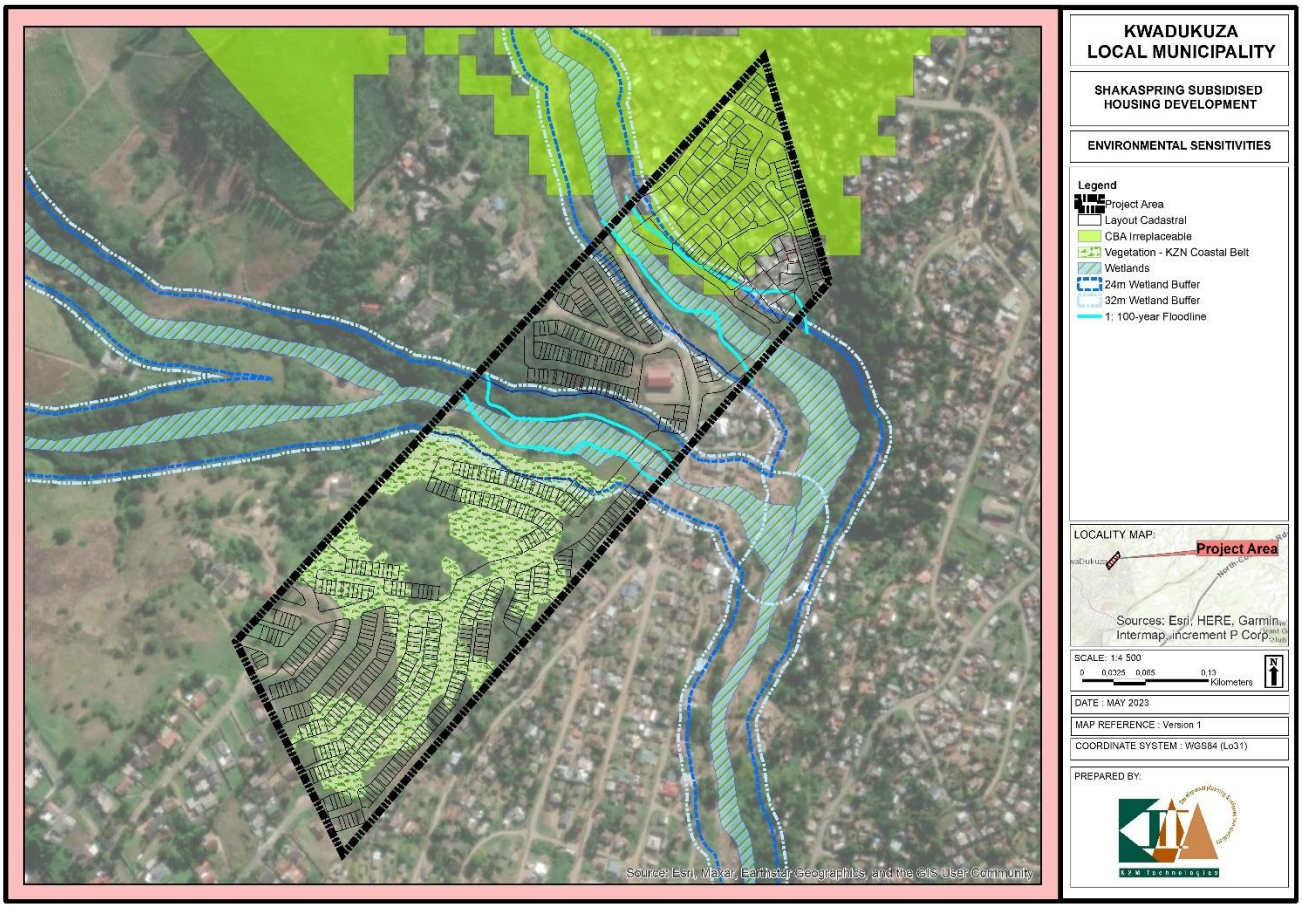
Land Use	Count	Units	Extent (ha)	Percentage (%)
Active Open Space	42	*N/A*	2,12	12,54%
Community Hall	1	*N/A*	0,25	1,47%
Conservation	3	*N/A*	2,63	15,55%
Medium Density Residential	533	**533**	4,14	24,49%
Passive Open Space	2	*N/A*	2,00	11,84%
Religious	1	*N/A*	0,03	0,18%
Residential	72	**72**	1,64	9,72%
Road Network	1	*N/A*	4,06	24,05%
Utilities & Services	1	*N/A*	0,03	0,15%
TOTAL	**N/A**	**605**	**16,89**	**100,00%**

Map 2.1: Proposed Development Layout



Map 2.2 below and **Appendix E1 and E2** illustrates the environmentally sensitive areas within the project area overlain with the draft development layout. As can be seen, there are two delineated wetlands that run through the project area. The development layout ensures that construction begins outside of the 1:100 Year Floodline which can be seen on the map below, there are however 5 existing substantial houses built slight below the 1 in 100 year flood area, these occupants must be made aware of the risk of their location and that the municipality will not be held responsible should they chose not to relocate. A small portion near the Northern boundary of the site is classified as a Critical Biodiversity Area which is irreplaceable, however this area has been informally settled over the years with all indigenous vegetation removed. The vegetation specialist has identified fragmented portion of grassland on within the southern and central portion of the project area. The specialist indicated that no species of conservation concern were found during his site analysis and that it can be attributed to the grassland being poorly managed. Portions of the grassland within the steeper areas as well as within the wetland buffer areas has been excluded from the development footprint. The steep nature of the excluded areas will deter the informal settling of the area.

Map 2.2: Environmentally sensitive area with preferred development layout



2.3.3 Access to the proposed development

The proposed housing development will occur on the REM of Portion 3 of Farm Lot 11 No.1676, which is situated on a portion of Ward's 5, 17 and 18 of the KwaDukuza Local Municipality. From the N2, take

exit 233 for the R74 towards Blythedale Beach/Stanger/Greytown. Turn left onto the R74, and travel for approximately 2.3km before turning right onto Flamboyant Drive. After approximately 41m, turn right at the first cross street onto Yellowwood Drive. Travel for 3.2km and then turn left onto Riverside Drive / D753. After approximately 600m, turn left and travel for a further 500m where the site will be entered.

2.3.4 Existing and Surrounding Land Uses

As illustrated in Figure 2.1 below, the development area is currently largely a greenfield development and is aimed at providing suitable housing to beneficiaries within the KwaDukuza Municipality. Majority of the site is vacant, except for the northern section of the site, which contains informal dwellings as well as substantial housing structures. There is also an existing community hall located in the central portion of the project area, which the proposed current development layout plan has accommodated. The site contains two channelled valley bottom wetlands as well as Critical Biodiversity Irreplaceable Areas which are located to the north of the site.

Figure 2.1: Existing situation on the site and surrounding areas

Source: Google Earth Imagery, 2023

2.4 PROJECT PHASING AND CONSTRUCTION PROGRAM

The construction of the project is scheduled to commence as soon as all the processes to comply with applicable legislation are completed. There will only be one phase in terms of construction, which will be completed from start to finish in one phase.

2.5 CONSIDERATION OF ALTERNATIVES

Alternatives are seen as different means of meeting the general purpose and need of a proposed activity. Alternatives could include, amongst others, the following:

- Activity Alternatives: This requires a change in the nature of the proposed activity. This alternative is most appropriate at a strategic decision-making level.
- Location Alternatives: Alternative locations for the entire project proposal, or for components of the project proposal.
- Layout Alternatives: This alternative allows different spatial configurations of an activity on a specific site.
- Scheduling Alternatives: also refer to alternative phasing options for the development. This alternative considers different phasing options during the implementation of the development.
- Infrastructure/ Input Alternatives: Also referred to as technological or equipment alternatives. This option considers various alternatives that will result in the same result.

Layout and Infrastructure (technology) alternatives are the most pertinent to this EIA process, however all the above-mentioned alternatives are briefly explored in the subsections below as well as the alternative of maintaining the status quo, commonly known as the "no-go" option.

2.5.1 Activity Alternatives

Due to the high demand for formal housing within the KwaDukuza Local Municipality, the preferred activity is to provide housing, together with supporting facilities and infrastructure (such as water and sewerage pipelines). Should the preferred activity not be granted, the housing demand will remain high within the Municipality. The project area is also experiencing continual growth of the informal settlement which will complicate the formalisation process should it be allowed to persist. The Municipal Land Use Scheme has also identified this area for future residential development.

Activity alternatives refer to the consideration of alternatives requiring a change in the nature of the proposed activity to be undertaken. One alternative is to leave the site in its current status quo; however, this will lead to the site being vulnerable to illegal occupancy as well as potential encroachment of alien invasive plant species as well as illegal dumping.

2.5.2 Location Alternatives

The location for the proposed housing development was identified by the Applicant (the KwaDukuza Local Municipality) prior to commencement with the EIA Process as part of a feasibility assessment. It should be noted that the proposed development is suitable to surrounding the land-use, since the municipality has zoned the property as future residential and is deemed a logical extension/growth of the town.

2.5.3 Layout Alternatives

An initial layout for the proposed Shakaspring Subsidised Housing Development was prepared in July 2019 by K2M Technologies (Pty) Ltd. The layout was then amended in 2023 to increase the number of free-standing BNG units and propose additional land uses. The advantages and disadvantages of the Preferred Layout and Alternative Layout 1 is provided in Table below.

Table 2.4: Advantages and Disadvantages of Development Layouts

Layout	Advantages	Disadvantages
Preferred Layout (**Appendix D1**)	A 24m buffer has been placed around the wetland to protect it.	Loss of a portion of the grassland as identified by the Specialist.
	Erven has been set aside for public open space.	
	Erven has been set aside for Conservation. With the increased density additional space was made available for conservation and passive open space. The steeper areas on site has also been excluded from development and will deter illegal settlement due to the topographical constraints.	
	A better use of space to accommodate for more units without encroaching into the wetland buffer.	
Alternative Layout 1 (**Appendix D2**)	Lower density.	Much less space has been set aside for conservation purposes.
		The layout encroaches into the 24m wetland buffer.
		A fewer number (453 units) of free-standing residential units proposed.
		Less area available for conservation and passive open space

2.5.4 Scheduling Alternatives

The detailed time frame for implementation and completion of the proposed residential development is not currently available. However, given the extent of demand for housing within the Municipality it is anticipated that construction will commence as soon as approval of necessary statutory processes and authorizations (including environmental authorization) is obtained. No scheduling alternatives were therefore considered.

2.5.5 Input Alternatives

Various types of materials can potentially be utilized during the construction phase of the project for both infrastructure and top structure purposes. This may include different material types (e.g. brick types, roof types and furnishings as well as green building designs. Green Building Guidelines have been recommended in this report to encourage sustainable development. It should be noted that the sections below have been adopted from the *Green Building Guideline: Medium Density Affordable Housing and the KwaDukuza Green Building Guidelines.*

2.5.5.1 Hot Water Systems

SANS 10400-XA refers to SANS 10252: At least half of the annual average hot water heating requirements shall be provided by means other than electrical resistance heating. The alternative means could be via but not limited to heat pumps, solar water heating, heat recovery from other processes or heating via gas. Hot water installations need to comply with further SANS requirements as provided in section 4.1 of SANS 10400-XA:

- All hot water pipes must be clad with insulation.
- Solar hot water systems must comply with the following standards which govern the quality and functioning of these systems: SANS 1307, SANS 10106, SANS 10254 and SANS 10252-.

2.5.5.2 Insulation for Roof and External Walls

The installation of insulation lowers the thermal conductivity of a building element. Once the thermal conductivity of the building element decreases its insulating properties increase. The thermal conductivity of the building is defined to be the quantity of heat that flows through a unit area in a unit of time, per unit difference in temperature. It is expressed in Watts per square meter Kelvin (W/m2K). It provides an indication of how much heat is transmitted through a material, but also includes losses due to convection and radiation. Insulation reduces the heat gained during warm summer months and reduces the heat lost during cold winter months.

2.5.5.3 High Efficiency Geyser for Hot Water

This initiative investigates the different energy sources that can be used to deliver hot water to a development. For this purpose, three fuels or sources of energy were investigated these include: electrical resistance, Liquid Petroleum Gas (LPG) and Natural Gas. The water heater selected must have a high efficiency. The different sources of energy are discussed further below:

- Electrical Resistance: This is a standard storage tank style water heater that suffers inefficiencies or losses in energy due to standby loss. As the hot water sits in the tank, heat may escape through the walls of the tank. Therefore, when considering increasing geyser efficiencies, a geyser blanket would be a good addition.
- LPG and Natural Gas: Water heaters that utilise gas can operate within both a conventional storage tank and tank less application. In the case of storage tanks, they may suffer the same heat losses as experienced with a conventional electric option unless a sealed combustion vent is included.

The purpose of having a high efficiency geyser specified is to reduce the demand for electricity that would otherwise, be required.

2.5.5.4 Solar Photovoltaics: Renewable Energy Generation

Photovoltaics (PV) utilises solar radiation to produced electrical energy. The outputted Direct Current (DC) voltage requires a solar panel array provision of 10m2 for 1kWp/day (required for 25% of project annual consumption). The DC can be converted to standard mains Alternating Current (AC) via an invertor for residential consumption. PV has a reduction in cost per kWh a proportion of the difference can be utilised to finance the uplift via alternative financing. It will also reduce the CAPEX associated with upfront electrical connection charges and provide a resilience buffer to power shortages.

2.5.5.5 Internal Lighting – Energy Savings Bulbs

Energy efficient lighting is commonly available in South Africa in the form of Compact Fluorescent Lamps (CFLs) and these have largely replaced traditional incandescent lighting as the preferred lighting choice due to reduced energy consumption and heat generation and longer life spans. While 75W incandescent bulbs require electrical resistance to heat a metallic element 'white hot', a 13W CFL bulb contains a gas mixture of argon and mercury which is excited by a small electric current. In 4W Light Emitting Diodes (LEDs) electrons are encouraged to 'jump' between energy levels releasing photons.

2.5.5.6 Low Flow Fixtures and Fittings

In order to reduce the water demand per unit, it is recommended that low flow water fixtures and fittings be utilised. This includes low flow showerheads, hand basin taps, water closets and kitchen taps. The difference between these fixtures and normal fixtures would be the application of a flow restrictor that determines the flow rate of the fixture or fitting.

2.5.6 Infrastructure Alternatives

The subsections below summarise the options to be considered in terms of sanitation.

2.5.6.1 Sanitation

For the purposes of this project three potential sanitation levels of services will be considered, such as:

- Onsite septic tanks
- Ventilated Improved Pit Latrines
- Waterborne sewage system

A brief description has been provided.

Onsite Septic Tanks (Alternative Option)

The option of an onsite septic tank to treat sewage on site was considered as an option, rather than the construction of a sanitation network to drain/pump the sewage to the Stanger WWTW. However, the disadvantage of a septic system is that it poses the risk of ground water contamination. Furthermore, once the tank has reached the end of its life cycle the sludge needs to be pumped out or a new system needs to be constructed.

VIP Sanitation (Alternative Option)

The household latrine used in low income communities varies enormously in design. Improved versions of the traditional pit latrine include a ventilation pipe or a cover plate for the squat hole. The collection chamber may vary from an unlined pit to a septic tank, a composting chamber or a connection into a sewer. The superstructure may be a crude shelter or an attractive brick or thatch construction with or without a vent pipe and with or without a seat.

Waterborne Sewage System (Preferred Option)

A waterborne sewerage system is proposed with individual connections to each site. The adjacent area is already serviced with a waterborne sanitation network and the existing waste water treatment facility has adequate capacity to service this development. The sewer reticulation from the development will tie into the existing sewer system by means of 160mm diameter pipes. It is proposed that a daily flow of 500 litres per unit) for low income units, a peak factor of 3.25 and an infiltration rate of 15% will be used. The sewerage will be taken to the Stanger Wastewater Treatment Works for treatment and the District has confirmed that the Stanger Wastewater Treatment Works does have capacity in their letter dated 26th January 2015. The Project Engineer has prepared a service level agreement which is currently being circulated for comment and signature between the Local Municipality, District Municipality and Implementing Agent.

2.5.7 "No-go" alternative

The "no-go" alternative should in all instances be considered as part of the EIA process. It assumes that the activity does not proceed, implying a continuation of the current situation of status quo. Should this development not go through, the following will apply:

- The housing demand will remain the same within the municipality unless there are other housing operations where construction has commenced or has been completed.
- The site will be left vulnerable to illegal occupation, dumping and informal housing.
- The area will continue to become encroached by alien and invasive plant species and degrade further.

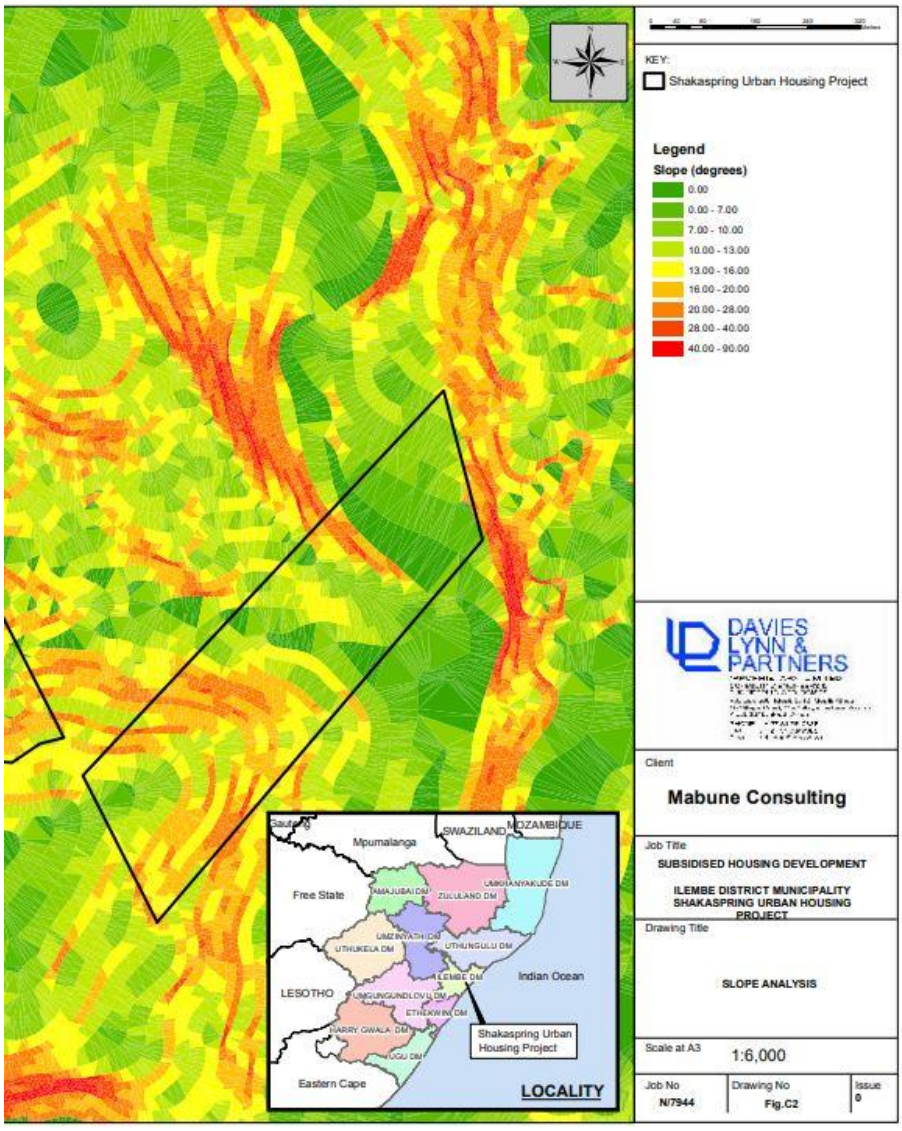
3 SITUATION ASSESSMENT OF PROJECT AREA AND AFFECTED ENVIRONMENT

3.1 PHYSICAL AND LANDSCAPE CHARACTERISTICS OF THE SITE

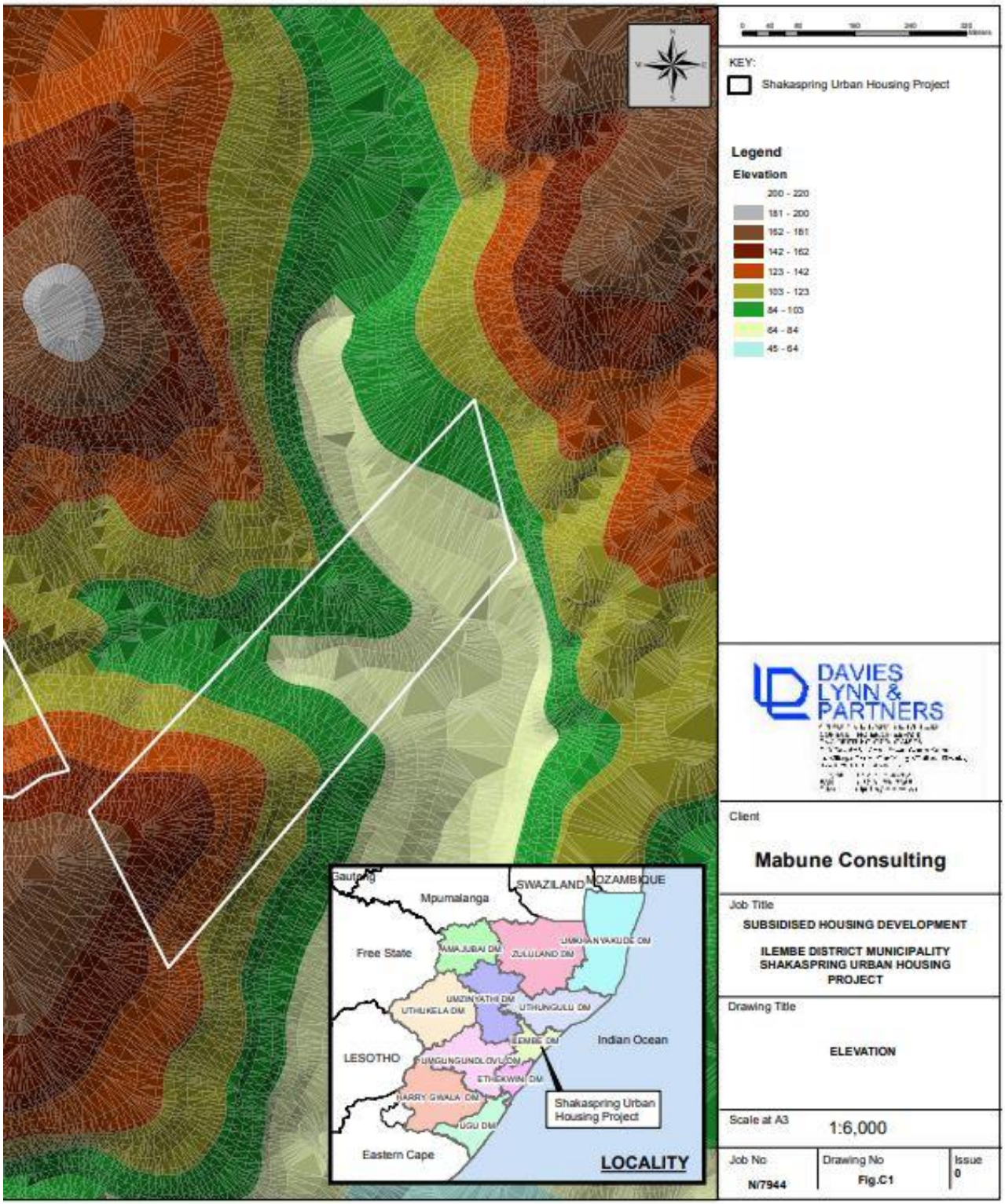
The project area is located on the northern outskirts of Stanger, near the Highridge area. The site is bounded by the Mbozamo river in the north. The additional area is bounded in the north by the District road and abuts the existing Stanger Heights housing development in the west.

The majority of the project area consists of moderately sloping terrain becoming steeply sloping toward the southern elevated ridge area. The variation in elevation range between 200m MSL in the elevated area in the north western sector of the project area to 78m MSL in the north eastern lower lying area along the Mbozamo River. Drainage is mainly dictated by the Mbozamo River and secondary drainage is aligned in an easterly and south easterly direction flowing from the high ground areas toward the Mbozamo river.

Map 3.1: Slope Analysis



Map 3.2: Elevation



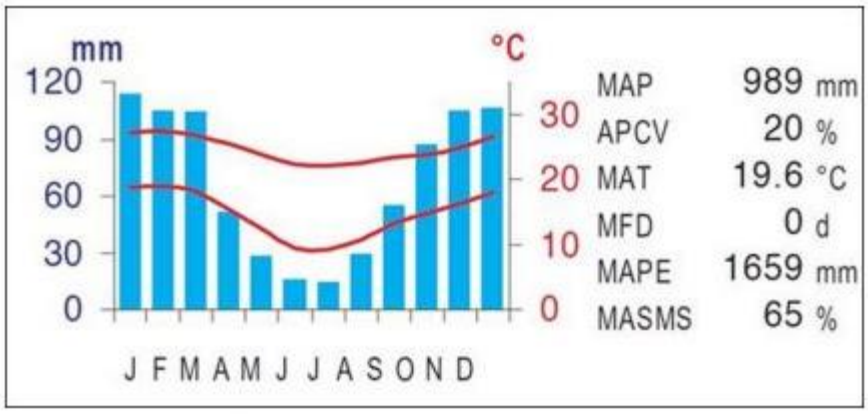
3.2 FLOODLINE REPORT

The Floodline Assessment was undertaken by Zamimpilo Consulting in April 2019. A copy of the report is attached as (**Appendix F**) in the Preliminary Design Report (of the Draft BAR). The findings of the report indicate that the project area is not at risk of inundation by the 1:50 and 1:100 year design flood events. It is recommended that the existing stormwater and culvert infrastructure be adequately maintained to ensure that the stormwater is drained efficiently during the design storm events, especially the 1:50 and 1:100 year events as this will aid in ensuring that the extent of the area inundated by the 1:50 and 1:100 year design flood events is not exacerbated due to blockages. The Floodline has also been depicted on the Development Layout (see Appendix D1), there are approximately 5 existing substantial housing structures that is located slightly below the 1 in 100 year floodline as depicted on the development layout. These community members should be made aware of the risk of their current location and motivated to relocate.

3.3 CLIMATE

This region is characterised by the summer rainfall, even though rainfall in the winter months are not uncommon. This region is frost-free and has high humidity. The mean maximum temperatures for this region is 32.6°C whereas the mean minimum temperatures for this region is 5.7 °C in January and July respectively, see Figure 3.4.1 (Mucina & Rutherford, 2006 cited on the Wetland Assessment Report, 2023).

Figure 3.1: The climate summary for local area.



3.4 GEOTECHNICAL ASSESSMENT

A Geotechnical Investigation was undertaken in January 2019 by Davies, Lynn and Partners and is attached as **Appendix G**.

3.4.1 Site Geology

3.4.1.1 Subsurface Conditions

The majority of the site in the southern sector is underlain by Dwyka Tillite of the Karoo Super Group. The new area added is underlain by the Natal Group Sandstone. Alluvial deposits are shown to be confined to the far south eastern corner of the project area.

Geology and soils (Biodiversity Assessment Report, 2023)
a) The underlying geology for the area was described by Mucina and Rutherford (2006) as comprising rock formations of the "Ordovician Natal group sandstone, Dwyka tillite, Ecca shale and Mapumulo gneiss…".

b) Soils on the surface of the site were sandy and deep, with little surface rock, but sandstone outcropping was evident on the steeper slopes where cut-and-fill methods have been used for construction of dwellings (Biodiversity Assessment Report, 2023).

The Biodiversity Assessment Report (2023) has examined that the Natal Group sandstones were exposed where cut-and-fill construction has taken place within the study area. Furthermore, the dominant soil forms found in the valley bottoms were the deposited Dundee soils from sediment washing downstream into channels and the Katspruit soil forms in areas with less deposition and more permanent water (Biodiversity Assessment Report, 2023).

a) Dwyka Tillite
The Dwyka Tillite bedrock is generally highly to completely weathered and of very soft rock strength near surface. Scattered hard corestone and boulders occur within a silty and clayey residium in certain areas. The soil cover varies typically between 0,3m to 1,4m with topographical variance across the site.

b) Natal Group Sandstone
The sandstone bedrock occurs at varying depth beneath the site governed by topographical variances. The typical subsurface profile comprises a dry, pale grey brown, intact, medium dense, silty fine SAND underlain by a dry to slightly moist, reddish brown to red mottled orange, nodulised, dense, slightly to moderately clayey SAND (residual Ferricrete), which in turn underlain by Sandstone bedrock. The bedrock unit typically occurs either as completely weathered, residual rock, and becomes progressively less weathered with increasing depth or moderately weathered hard rock lies close to surface.

The occurrence of fine grained sandy soils where collapse potential is possible overlying weathered sandstone bedrock classify the founding conditions as category C1 beneath the areas where shallow soils prevail and the potential for collapse type settlements exceed 20mm. Composite site classes leading to possible higher differential movements will occur across cut/fill platorms where bedrock is exposed in the deeper cut portion and colluvial and residual soils occur towards the cut/fill line. Class R/H2 designations occur where thicker potentially acute residual clayey soils occur above the bedrock.

3.4.1.2 Subsoil Variance

In general the derived soil cover capping the bedrock is moderately deep in extent along the convex sides of the hills, thickening along the broader concave valley heads and valley bottoms. Alluvial sediments within the major valley confines augment the deeper subsoil profile present in these areas. Shallow soils occur above the weathered bedrock beneath the hilltop and high ground areas.

3.5.2. Groundwater Seepage

In the elevated hilltop and ridge areas no groundwater seepage activity is anticipated. Below the ridge lines and hillside topographical areas in the vicinity of valley lines, shallow seasonal and perennial groundwater seepage activity is anticipated. Seepage may also occur over a broad portion of the site and along the geological contacts and fault margins in the north sector of the study area.

3.5 WETLAND ASSESSMENT

A Wetland Assessment for the proposed development was undertaken in May 2019 and was updated in May 2023 by The Biodiversity Company and is attached as **Appendix H**.

3.5.1 Desktop Assessment

3.5.1.1 Vegetation Types

The project area falls within the KwaZulu-Natal Coastal Belt Grassland (CB 3) vegetation unit. The KwaZulu-Natal Coastal Belt Grassland is a broad coastal strip along the KwaZulu-Natal coast, from near Mtunzini in the north, via Durban to Margate and just short of Port Edward in the south. Highly dissected undulating coastal plains which presumably used to be covered to a great extent with various types of subtropical coastal forest. Some primary grassland dominated by Themeda triandra still occurs in hilly, high-rainfall areas where pressure from natural fire and grazing regimes prevailed. At present the KwaZulu-Natal Coastal Belt Grassland is affected by an intricate mosaic of very extensive sugarcane fields, timber plantations and coastal holiday resorts, with interspersed secondary Aristida grasslands, thickets and patches of coastal thornveld (Mucina & Rutherford, 2006).

According to Mucina & Rutherford (2006), this vegetation type is classified as Endangered. The national target for conservation protection for this vegetation type is 25%, but only very small part statutorily conserved in Ngoye, Mbumbazi and Vernon Crookes Nature Reserves. About 50% is transformed for cultivation, by urban sprawl and for road-building. Alien species found in this vegetation type includes Chromolaena odorata, Lantana camara, Melia azedarach and Solanum mauritianum.

3.5.1.2 NFEPA Wetlands

No NFEPA wetlands were located within the 500m regulated assessment area of the proposed project.

3.5.2 Wetland Delineation and Description

During the field survey, one wetland type was identified, namely a channelled valley bottom wetland. A series of drainage channels originating from the project area into the channelled valley bottom system were also identified and delineated for the assessment. The majority of these drainage lines have been classified as "A Section" watercourses rather than wetlands due to the dominance of exposed bedrock. According to DWAF (2005), such a system rarely is saturated, and lacks wetland habitat and riparian vegetation. Such a system is much less sensitive than other watercourse types that are more often saturated.

The channelled valley bottom wetland (HGM 1) flows from north to south with a number of bridge crossings. A smaller channelled valley bottom system was also identified and flows from west to east and is a tributary of the main channelled valley bottom system.

Map 3.3: Delineated Wetlands

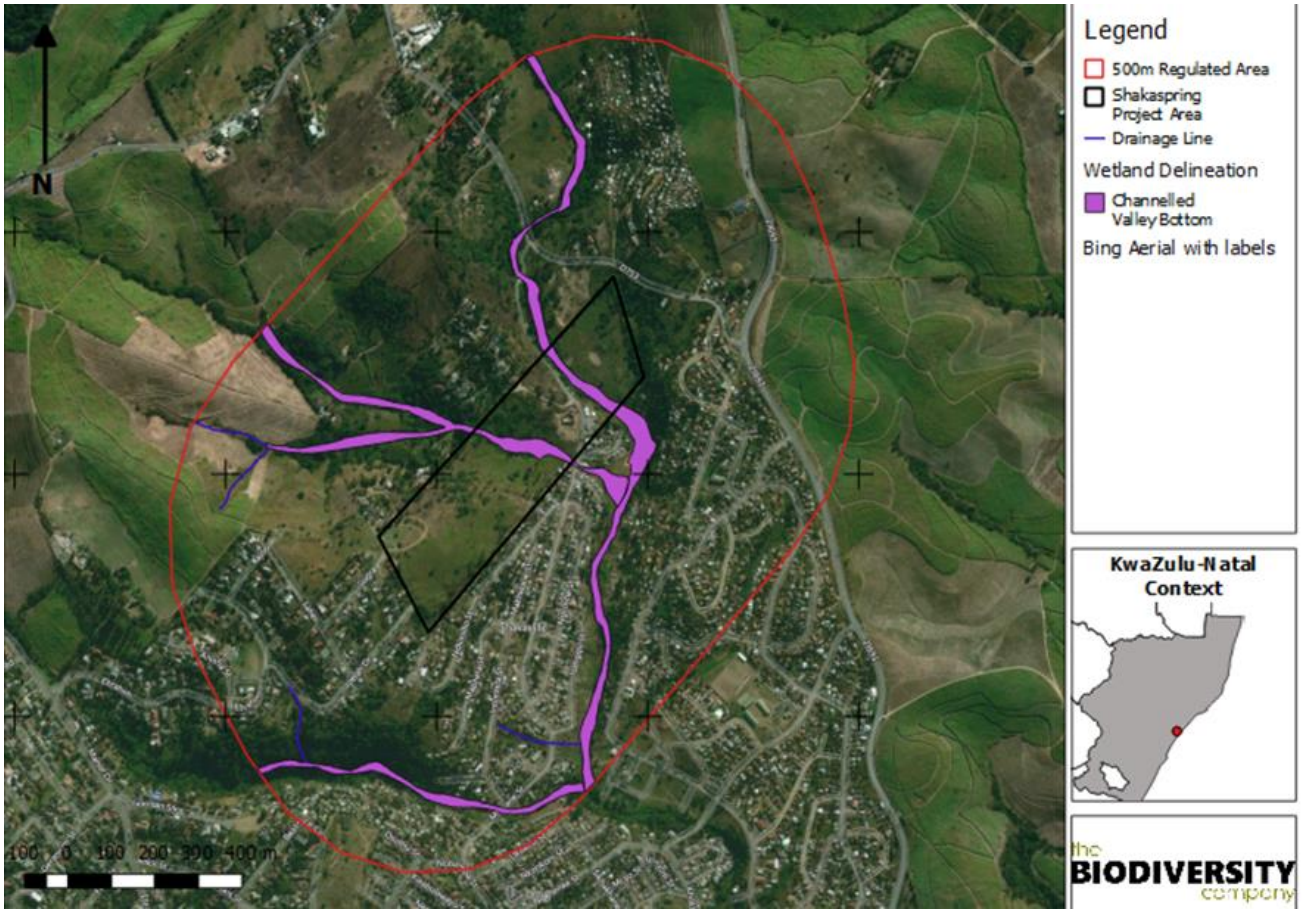


Photo 3.1: Wetlands identified within the 500 m regulated area – A & B: Channelled valley bottom wetland

Source: Wetland Assessment Report, 2023

3.5.3 Ecological Functional Assessment

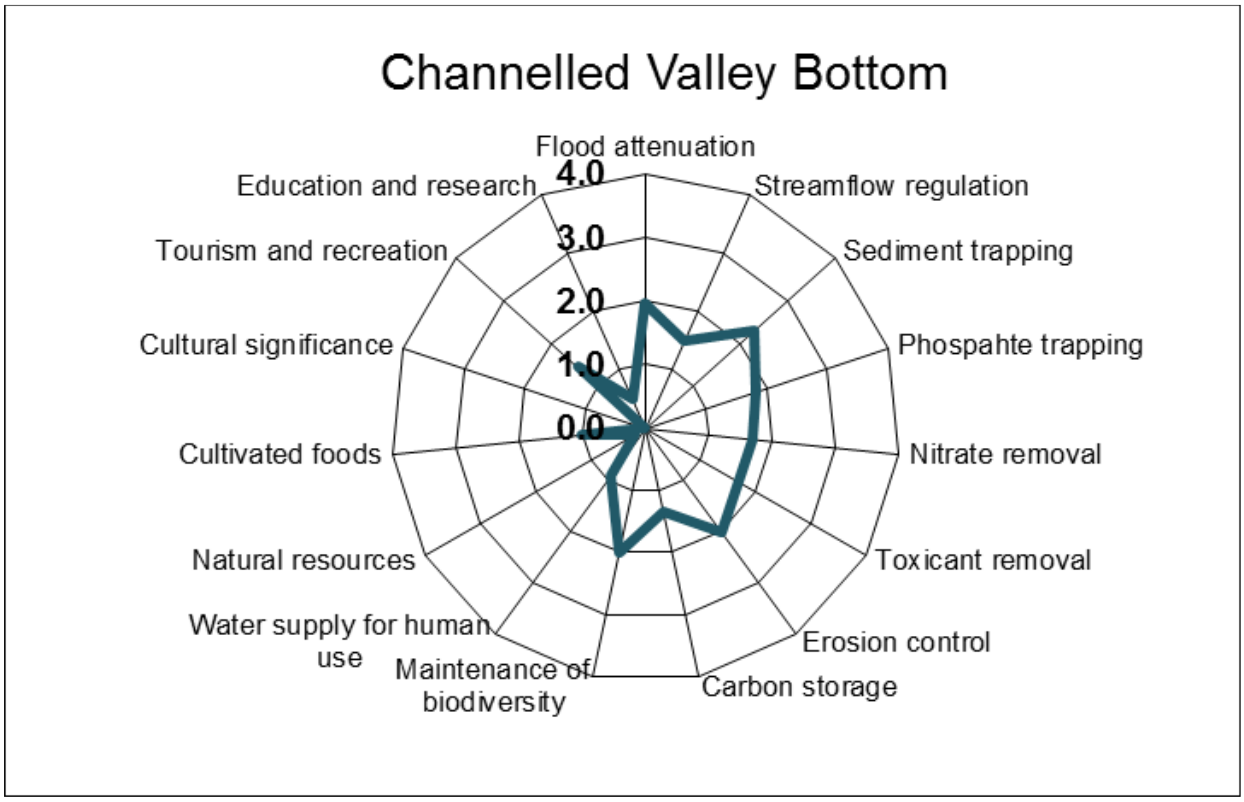
The ecosystem services provided by the wetlands identified on site was assessed and rated using the WET-EcoServices method (Kotze *et al*. 2008). The summarised results for HGM 1 is shown in Figure 3.2.

The average ecosystem services score has been determined to be "Intermediate", with services providing a High rating being; Sediment trapping, and nutrient/toxicant assimilation.

Channelled valley bottom wetlands tend to contribute less to sediment trapping and flood attenuation than other systems. Channelled valley bottom wetlands are well known to improve the assimilation of toxicants, nitrates and sulphates, especially in cases where sub-surface flows contribute to the systems' water source, (Kotze *et al.,* 2009).

These wetlands are often on steeper gradients and play a moderate role in flood attenuation and erosion control. The assimilation of phosphates, nitrates and toxicants can be significant if the wetlands are in a healthy state. They provide a link within the landscape for fauna as these areas are often the only areas that have not been transformed.

Figure 3.2: *Spider diagram for the channelled valley bottom systems*



Source: Wetland Assessment Report, 2023

3.5.4 Present Ecological State

The general features of the identified wetland units within the project area were assessed in terms of impacts on the integrity of these systems using the WET-Health methodology.

The identified impacts include activities such as dumping, damming, increased hardened surfaces due to the presence of development, bridges, and roads through wetlands, and alien plant species. Culverts, where roads cross wetlands, also contribute to the negative effects on wetlands. The

naturally diffuse nature of the water-flow through wetlands is altered, as culverts cause direct/ concentrated flow to occur, reducing the time for infiltration and promoting erosional processes.

The PES for the assessed HGM type is presented in Table 3.1. The hydrology component has been scored "Moderately Modified". The geomorphology component has been scored "Moderately Modified". The vegetation component has been rated "Moderately Modified". The overall PES score has been determined to be "Moderately Modified".

Table 3.1: Summary of the scores for HGM 1 PES (channelled valley bottom)

Component	PES Score	PES Rating	Description
Hydrology	3.5	C	**Moderately Modified**: The catchment is also largely by developments and the crossing structures alter the flow dynamics.
Geomorphology	2.6	C	**Moderately Modified**: Road fill across the wetland has resulted in concentration of flows which has restricted natural sediment deposition and erosion
Vegetation	3.6	C	**Moderately Natural**: The vegetation is largely encroached by alien vegetation; the crossing structures and limited sedimentation also had an effect on the rating.
Overall	3.3	C	**A moderate change in ecosystem processes and loss of natural habitat and biota has occurred, but the natural habitat remains largely intact.**

Source: Wetland Assessment Report, 2023

3.5.5 Environmental Importance and Sensitivity

The wetland EIS assessment was applied to the HGM units described in the previous section in order to assess the levels of sensitivity and ecological importance of the wetland. The results of the assessment are shown in Table 3.2.

A "Moderate" EIS score has been determined for HGM 1. The "Moderate" score determined is a result of the importance of the wetlands providing corridors for any fauna to move through, and also the vegetation being rated as Endangered.

The Hydrological/Functional Importance has been rated "Moderate" for HGM 1 due to the ability of the wetland to enhance water quality.

The Direct Human Benefits have been scored "Low" for HGM 1. Some signs of self-sustaining agriculture were identified; however, no signs of cultural benefits have been identified.

Table 3.2: EIS results for the delineated HGM Units

Wetland Importance and Sensitivity	Importance
	HGM 1
Ecological Importance and Sensitivity	2.0
Hydrological/functional Importance	2.0
Direct Human Benefits	0.5

Source: Wetland Assessment Report, 2023

3.5.6 Buffer Requirements

The wetland buffer zone tool was used to calculate the appropriate buffer required for the development. The model shows that the largest risks (Moderate) posed by the project during the construction phase is that of "increased sediment inputs and turbidity". During the operational phase, the High risks identified for the project included "alteration of flow volumes" and "altered patterns of flows" (Table 10). These risks are calculated with no prescribed mitigation and the calculated buffer requirement is presented in Table 8.

Table 3.3: Pre-mitigation buffer requirement

Required buffe before mitigation measures have been applied	
Construction Phase	26m
Operational Phase	36m

Source: Wetland Assessment Report, 2023

According to the buffer guideline (Macfarlane, *et al*. 2014) a high-risk activity would require a buffer that is 95% effective to reduce the risk of the impact to a low level threat. The risks were then reduced to acceptable levels with the prescribed mitigation measures and therefore the recommended buffer was calculated to be 24m (Table 3.6) for the construction and operational phases.

Table 3.4: Post-mitigation buffer requirements

Required buffe after mitigation measures have been applied	
Construction Phase	24m
Operational Phase	24m

Source: Wetland Assessment Report, 2023

A conservative buffer zone was suggested of 24m for the construction and operation phases respectively and is shown in Table 3.6, this buffer is calculated assuming mitigation measures are applied. This would typically include a commitment to rehabilitate and manage buffer zones to ensure that these areas function optimally. The KwaDukuza Local Municipality will have to assist the community to ensure the implementation of the proposed mitigation measures.

The project area falls within the wetland zone as well as the 24m buffer zone. The layout of the development must exclude any development within the proposed 24m buffer zone to serve as an effective mitigation measure.

3.5.7 Mitigation Measures

The following mitigation measures were prescribed by the wetland specialist:

- Site layout to avoid the wetland area and associated buffer zones where possible;
- Silt traps and sediment trapping berms must be in place in drainage lines around the construction site;
- Add green/soft engineering methods to the design and layout of the development, these may include:
    - Grey water recycling
    - Rain water harvesting
    - Solar water heaters and related plumbing
    - Efficient lighting. Includes Compact Fluorescent (CFL) Lightbulbs
    - Food Gardens
    - Clean-up and removal of solid-waste from the watercourse
    - Energy efficient street lights; and
    - Gardens/indigenous vegetation beds (sunken to catch run-off)
- A suitable stormwater plan must be compiled for the development. This plan must attempt to displace and divert stormwater from the road and discharge the water into adjacent areas without eroding the receiving areas. It is preferable that run-off velocities be reduced with energy dissipaters and flows discharged into the local watercourses;
- Stormwater infrastructure should be maintained regularly; and
- All removed soil and material must not be stockpiled within the watercourse and buffer. stockpiles must be protected from erosion, stored on flat areas where run-off will be minimised, and be surrounded by bunds.
- Make use of existing roads and road servitudes;
- To minimise the impact on both surface water flow and interflow, portions of the road must include a coarse rock layer that has been specifically incorporated to increase the porosity and permeability of the sub-layers of the road;
- Exposed road surfaces awaiting grading must be stabilised to prevent the erosion of these surfaces. Signs of erosion must be addressed immediately to prevent further erosion of the road; and
- Silt traps and fences must be placed in the preferential flow paths along the road to prevent sedimentation of the watercourse.
- The wetland areas outside of the specific project site area must be avoided;
- The construction vehicles and machinery must make use of existing access routes as much as possible, before adjacent areas are considered for access;

- Laydown yards, camps and storage areas must be beyond the wetland areas. Where possible, the construction of the pipeline and crossings must take place from the existing road servitudes;
- The contractors used for the project should have spill kits available to ensure that any fuel or oil spills are clean-up and discarded correctly;
- Construction must take place during the dry season (April-September) as much as possible. If construction will be over a prolonged period, ensure that clearing, excavation and foundations are laid down in the dry season to reduce the erosion potential of the exposed surfaces;
- Temporary stormwater management systems must be in place and preferential runoff channels be filled with aggregate and/or logs (branches included) to dissipate flows, limiting erosion and sedimentation;
- The footprint area of the must be kept a minimum. The footprint area must be clearly demarcated to avoid unnecessary disturbances to adjacent areas;
- Prevent uncontrolled access of vehicles through the wetland systems that can cause a significant adverse impact on the hydrology and alluvial soil structure of these areas;
- All chemicals and toxicants to be used for the pipeline construction must be stored outside the channel system and in a bunded area;
- All machinery and equipment should be inspected regularly for faults and possible leaks, these should be serviced off-site;
- All contractors and employees should undergo induction which is to include a component of environmental awareness. The induction is to include aspects such as the need to avoid littering, the reporting and cleaning of spills and leaks and general good "housekeeping";
- Adequate sanitary facilities and ablutions on the servitude must be provided for all personnel throughout the project area. Use of these facilities must be enforced (these facilities must be kept clean so that they are a desired alternative to the surrounding vegetation);
- Have action plans on site, and training for contactors and employees in the event of spills, leaks and other impacts to the aquatic systems;
- All removed soil and material must not be stockpiled within the system. Stockpiling should take place outside of the watercourse. All stockpiles must be protected from erosion, stored on flat areas where run-off will be minimised, and be surrounded by bunds;
- Erosion and sedimentation into drainage channels must be minimised through the effective stabilisation (gabions and Reno mattresses) and the re-vegetation of any disturbed banks;
- Temporary and permanent erosion control methods may include silt fences, flotation silt curtains, retention basins, detention ponds, interceptor ditches, seeding and sodding, riprap of exposed embankments, erosion mats, and mulching;
- Any exposed earth should be rehabilitated promptly by planting suitable vegetation (vigorous indigenous grasses) to protect the exposed soil;
- No dumping of construction material on-site may take place;

- All waste generated on-site during construction must be adequately managed. Separation and recycling of different waste materials should be supported.

3.5.8 Specialist's recommendation and opinion

The following recommendations are made to highlight some important aspects to consider in the development project.

- The layout must avoid wetlands and their associated buffer zones;
- In the event that the layout cannot be adjusted as recommended above, the wetland is directly affected, and a wetland offset strategy must be conducted;
- Add green/soft engineering methods to the design and layout of the development;
- Adhere to 24 m buffer, and management of the buffer zone; and
- An alien invasive plant management plan needs to be compiled and implemented post construction to control current invaded areas and prevent the growth of invasive on cleared areas.

It is the opinion of the specialist that should the buffer width be adhered to; no fatal flaws are expected for the project. Development of the project is feasible, but all mitigation measures and recommendations must be considered.

3.6 BIODIVERSITY ASSESSMENT

The Biodiversity Assessment was undertaken by Peter le Roux in May 2023. A copy of the report is attached as **Appendix I** and summarised below.

3.6.1 Vegetation Type and Status

- The vegetation of the proposed site and the surrounding area was classified by Mucina and Rutherford (2006) as CB3 KwaZulu-Natal Coastal Belt.
- The KwaZulu- Natal Coastal Belt is listed in the National List of Threatened Ecosystems (18 November 2022) as 'Endangered'.
- The KZN Biodiversity Sector Plan maps in the SANBI BGIS indicated that the vegetation on the site and surrounding area was KZN Coastal Belt, with a CBA irreplaceable component in the north of the proposed site.

3.6.2 Vegetation assessment

With the site having been previously assessed and reported on in June 2019, the focus of the current assessment (on 24 April 2023) was to determine whether any changes had occurred, and the implications of such changes. The property was traversed on foot for identifying plant species; evidence of fauna such as spoor, diggings, dung or nests was collected at the same time. Dense or

inaccessible areas were photographed by drone, which assisted in mapping habitats such as bush clusters, watercourses and riparian vegetation (See Figure 3.3 below).

At the plant species level, emphasis was on key indicator species and threatened species in habitats where they were most likely to occur. Verification of the Sensitivity Screening Tool outputs was undertaken, with emphasis on species listed within the relevant plant and animal themes. Maps were manually produced on a recent Google Earth image, to accurately depict existing habitats, indicator species, and assess their condition with emphasis on development constraints. The extent of alien plant spreading was detected by noting the abundance of young plants and seedlings. The smallest practical mapping units were 1 000m^2 (10% of one hectare). Any features smaller than this were marked as a point. The mapped vegetation patches were assessed to determine the extent to which they represented KwaZulu-Natal Coastal Belt Grassland, as described by Mucina & Rutherford (2006) and refined by Jewitt (2018). Key grasses, as listed in Mucina and Rutherford (2006) were used to establish whether the study site was representative of KZN coastal grassland; key species were added from 'benchmark' grassland sites in coastal nature reserves that the author has assessed since 1985. Examples of key grasses are: *Themeda triandra, Tristachya leucothrix, Alloteropsis semialata subsp. eckloniana, Eulalia villosa, Diheteropogon amplectens and Brachiaria serrata*.

Herbaceous species are particularly important indicators of primary (unmodified) coastal grassland and 43 species were listed by Mucina and Rutherford (2006); these, together with the key grasses listed above, were used as indicators of botanical diversity and for mapping primary grassland.

The wetland delineation and recommended buffers by Husted and Jackson (May 2019) were used for mapping non-developable areas. Aerial images were examined while on site to assess the viability of apparent ecological links with adjacent areas. Natural features such as topography, soils, wetland indicator species and water courses, were also noted and mapped during the field visit.

3.6.3 Vegetation Findings

Drone footage was very useful for detecting changes in size or density of woody plant clusters and riparian vegetation; also mapped by drone were the expansion and densification of developed sites. The wetland exclusion areas from the 2019 assessment were used again for the current assessment. The most significant changes in vegetation were increased density of woody clusters, which caused a reduction in grassland and severing of connectivity with adjacent grasslands. Similarly, the outputs of the Screening Tool for plant sensitivity were not supported by the vegetation findings. The extent of impacted areas had increased substantially, as indicated in the images below.

A sufficient list of plant species were identified to confirm the primary grassland, however the absence of the following species indicated that the grassland was degraded:

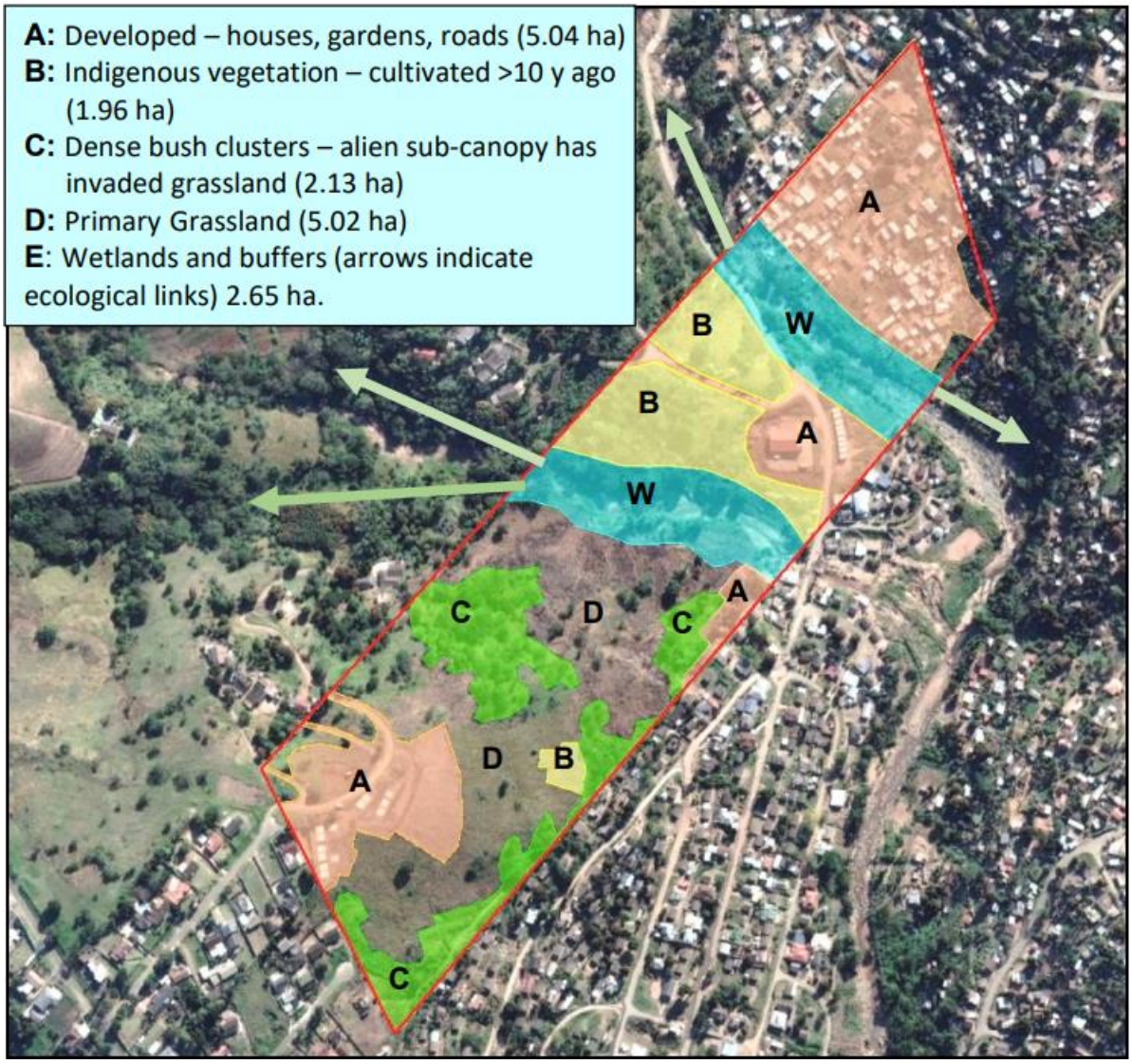
- Themeda triandra
- Berkheya setifera
- Tristachya leucothrix
- Berkheya umbellate
- Melinis nerviglumis
- Heteropogon contortus
- Alloteropsis semialata
- Wahlenbergia grandiflora
- Gazania krebsiana
- Eulalia villosa
- Brachiaria serrata
- Helichrysum decorum
- Athrixia phylicoides
- Helichrysum aureum
- Diheteropogon amplectens
- Watsonia spp.
- Diheteropogon filifolius
- Sebaea sedoides
- Eriosema salignum
- Hypoxis angustifolia
- Indigofera hilaris
- Crabbea hirsuta
- Acalypha peduncularis
- Satyrium and Disa spp.

Using the Figure 3.3 map for illustration, developable areas with low vegetation related constraints were the Area A sites (5.04 ha) that have been highly impacted and defined as Irreversibly modified in the Biodiversity Lexicon (2016).

Area B sites (1.96 ha) also comprised sites where development constraints are low with the area being cultivated in the past. Similarly, Area C sites (2.13 ha) that were previously part of the coastal grassland but have been altered by invasive alien plants, were no longer representative of the original vegetation, but were indigenous vegetation.

Area D sites were representative of coastal grassland which is an endangered ecosystem. Finally, the wetlands and buffers measuring 2.65 ha should be considered as a no-development zone for several reasons, which include flooding risks as experienced in the past year.

Figure 3.3: Vegetation Habitats



3.6.4 Vegetation Overview, Mitigation and Recommendations

- After combining the Screening Tool findings for the Animal Species Sensitivity with the above findings, it was clear that areas with the highest development constraints were the 2.65 ha wetland and 5.02 ha coastal grassland ecosystems.
- The ecological value of the two wetlands was enhanced by their connectivity with adjacent wetlands containing similar features as illustrated in Figure 3.3. It was therefore concluded that no development should be permitted within the areas demarcated in the wetland report by Husted and Jackson (May 2019, updated May 2023). The dimensions may be subject to amendment if an updated wetland delineation is provided as part of the current application process.
- The second area with high biodiversity constraints was the 5.02 ha coastal grassland ecosystem; this area had become smaller since 2019 but was intact and contained an adequate number of indicator species to be considered a representative example of coastal grassland, albeit in poor condition. A major concern was that some of the grassland had been removed since 2019 through

clearing for housing, together with an increase in the density of invasive alien plants; in the western area of the site this process has severed previous connectivity with grasslands outside the site.

- Having noted the general deterioration of the grasslands since 2019, it is predictable that the ongoing effects of inadequate defoliation (burning irregularly and at inappropriate times), no management of alien plants, isolation, and being too small to remain viable, will lead to this area being overrun with woody plants and invasive alien species within the next 3 to 5 years.
- It was concluded that the contribution of the 5.02 ha grassland towards conserving coastal grassland was minimal and that there would be little value in attempting to enforce management rules that were unlikely to be implemented.
- Mitigation by way of an offset is an option, but this should be considered with caution, i.e. only if the offset land is an expansion of an existing protected coastal grassland area that is being appropriately managed. Selection of an isolated patch that has no guarantee of effective management is likely to fail.
- Another option is to authorise development of the entire site excluding the wetlands and buffers. This is a substantial area for development of new housing and upgrading of the existing informal settlement in the northern part of the site. The development exclusion areas would become the two wetlands and their buffers, with an EMPr that addresses specific management requirements, including removal of alien plants and rehabilitation of affected sites. This will provide 2.65 ha of wetland and riparian vegetation that becomes an effective extension of similar habitats outside the property.

3.6.5 Fauna assessment Summary & Conclusion

- The sites with dwellings were generally poor habitats for fauna excepting for common fauna, so it was considered unlikely that any species of conservation concern would be found.
- The grasslands have diminished in size and condition, with dog spoor and traversing by people being evident; these factors would be negative for some species that occurred in the past, eg. Porcupines and Grey Duiker.
- The High category for Animal Species listed in the Sensitivity Screening Tool was not supported by the findings of this study.
- The wetlands and primary grassland were the most diverse areas, but being small, invaded by alien plants and interspersed with modified sites, made these habitats unsuitable for species of conservation concern.
- In conclusion, the recorded faunal diversity did not highlight significant development constraint areas, apart for the wetlands.
- Some species of conservation concern could possibly be discovered in the wetland areas at a cost of additional time and effort, which was beyond the budget and time frame for this study. Also, the effort would not be warranted for an area that needs to be automatically excluded from development.

3.7 AGRICULTURAL POTENTIAL ASSESSMENT

3.7.1 Summary findings

The Agricultural Assessment was prepared by Mzansi Agriculture in June 2019. A copy of the report is attached as **Appendix J** and summarised below.

- **Open Rangeland:** What might at one time have been attractive Lala Palm Savanna and Coastal Lowlands bush has deteriorated into a few scattered trees and the remnants of indigenous bush along the edges of a watercourse near the western boundary of the land parcel. The trees include Acacia species, Ficus species, Marula, Mahogany and similar Coastal Lowlands Savanna Species is now infested with alien invader plant species and poor-quality grasses.
- **Food Crops:** There is no evidence of food crops ever being grown on the site.
- **Industrial Crops:** There are no industrial crops on the site.
- **Livestock:** No livestock was seen.
- **Soil Profiles:** Access to the soils on the eastern boundary was through the grounds of existing homes where excavation for building had exposed profiles. These profiles consisted of sandy loams over hard rock, diagnostic of the Mispah Soil Form. The central portion and upper western portion revealed shallow topsoils over weathering rock, diagnostic of the Glenrosa Soil Form. The lower end of the property was characterized by a solid layer of Natal Group Sandstone covered by light sandy soils of varying depths.

3.7.2 Ecosystem services

The most important ecosystem service to the site is the high rainfall. Provision should be made for the trapping of storm water run-off. Unfortunately the stream at the north end of the property is flanked by already developed properties. The soils at the site and the topography mitigate against the use of this resource within the site.

3.7.3 Impact assessment and mitigation measures

It is inevitable that the proposed development will permanently impact on the agricultural potential of the site, even where shallow soils and steep slopes severely inhibit the production of economically viable crops. In this instance, the avoidance, prevention, and offset are not practical items in the mitigation hierarchy. Due to the nature of the terrain mitigation measures during construction and post construction rehabilitation measures will have to be at a civil engineering level and not at an agricultural level.

3.7.4 Concluding Remarks & Recommendation

The basic fact regarding this site is that soils are either too steep or too shallow or both to allow for any viable arable crop production.

It is recommended that the use of this land parcel be released for the purpose of constructing subsidized high-density housing. The protection of the watercourse and wetlands setback will be addressed by others. Management of storm water run-off will need to be addressed at a civil engineering level not an agricultural level.

3.8 SITES WITH ARCHEALOGICAL INTEREST

The KwaZulu-Natal Heritage Act requires that Amafa-Akwazulu-Natali (Heritage KwaZulu Natal) is to comment on the need for an archaeological assessment for proposed development if:

- Development area is larger than 5 000m²
- Development is longer than 300m
- The development area contains known archaeological sites.

Documentation pertaining to the proposed Shakaspring Low-income Housing Development was submitted to KZN Amafa for comment.

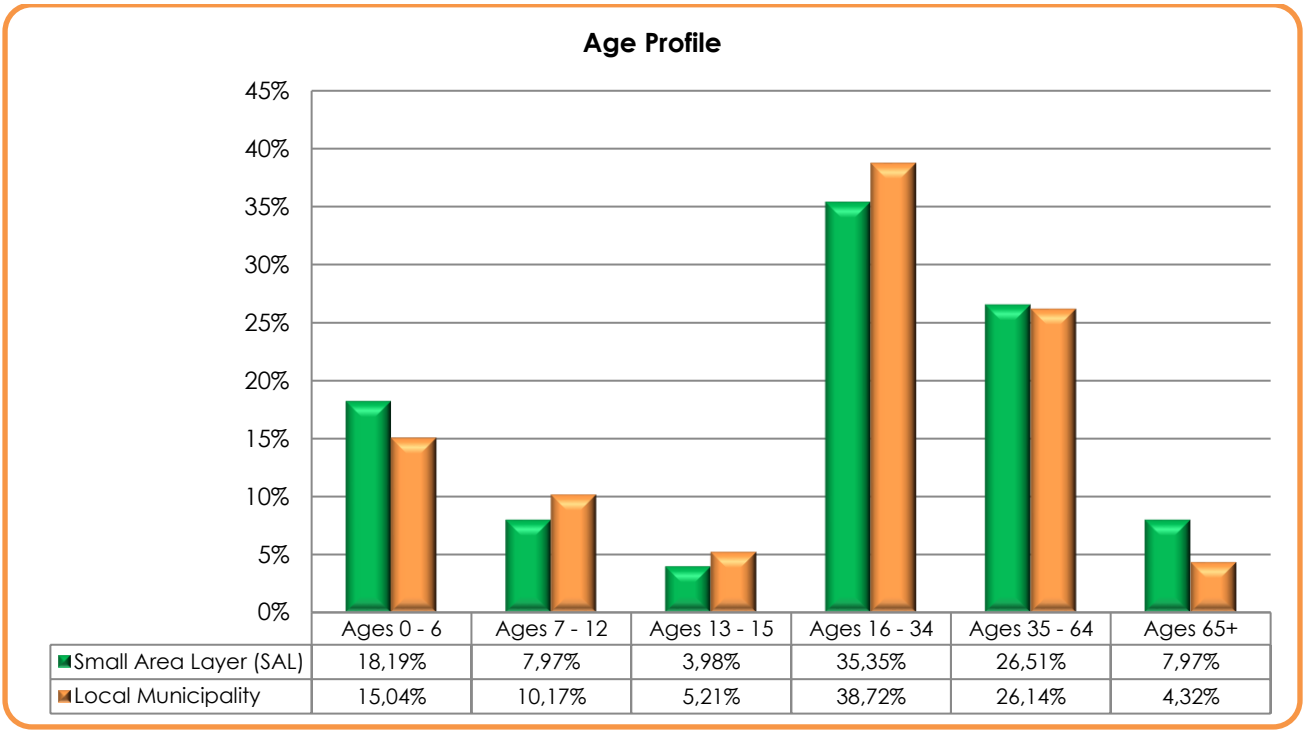
3.9 SOCIO ECONOMIC IMPACTS

Given that the proposed project site is both Greenfield and Brownfield, socio-economic data of the small area layer (SAL), which the project area falls within, is used in this section to present a socio-economic overview of the population within and surrounding the project area. The Shakaspring Subsidised Housing Development project area falls within the jurisdiction of the KwaDukuza local municipality, the figures of the small area layer are therefore presented together with the overall figures of the municipality to yield a comparative socio-economic overview for the study area. The total population of the small area layer is approximately 577 persons and the population of the municipality is estimated at 276 719 persons.

3.9.1 Age Profile

Figure 3.4 below provides the age profile of the study area in relation to the age profile of the KwaDukuza Local. Majority of the population within the small area layer (SAL) were aged between 16-34 years. It is evident from the graph that majority of the population within the local municipality is between 16 – 34 years of age. Within the small area layer, a total of 26.51% of the population are between the ages of 35-64 years, while only 7.97% of the total population are older that the age of 65 years. The figures also indicate that 30.42% of the population within the KwaDukuza Municipality is younger than 15 years of age, which is slightly higher when compared to the project area.

Figure 3.4: Age Profile



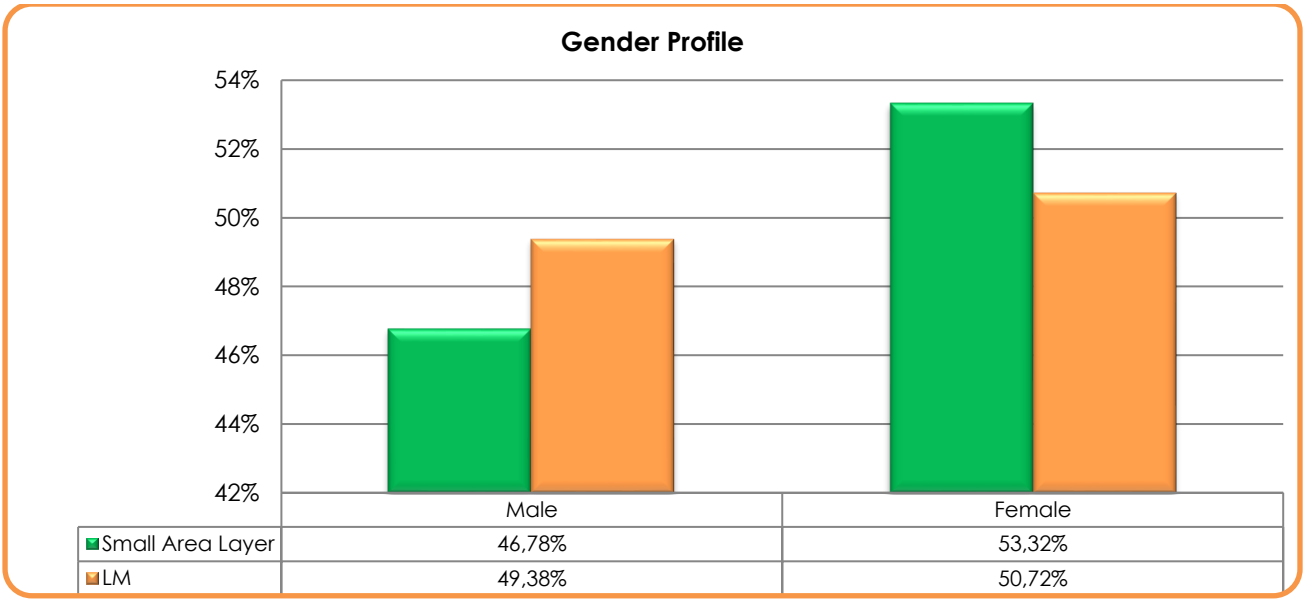
	Ages 0 - 6	Ages 7 - 12	Ages 13 - 15	Ages 16 - 34	Ages 35 - 64	Ages 65+
Small Area Layer (SAL)	18,19%	7,97%	3,98%	35,35%	26,51%	7,97%
Local Municipality	15,04%	10,17%	5,21%	38,72%	26,14%	4,32%

Source: Stats SA, 2011

3.9.2 Gender Profile

According to the 2011 census information in Figure 3.5 below, as much as 53.32% of the total population within the small area layer is female and 46.78% are male.

Figure.3.5: Gender Profile



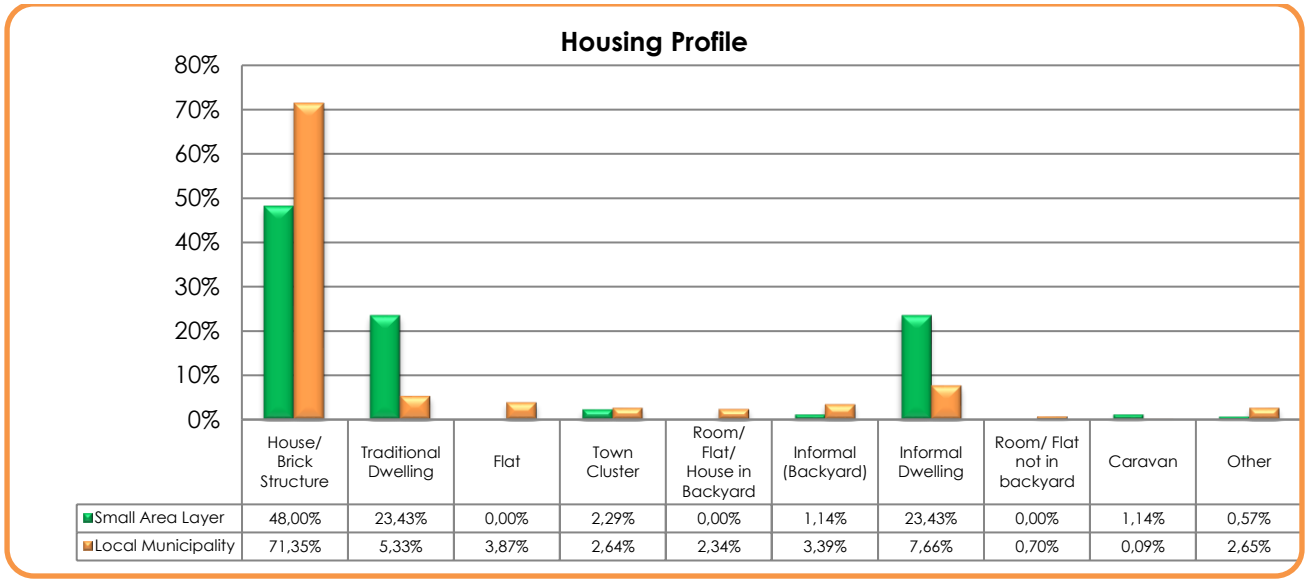
	Male	Female
Small Area Layer	46,78%	53,32%
LM	49,38%	50,72%

Source: Stats SA, 2011

3.9.3 Housing Profile

As can be seen from Figure 3.6, the most predominant housing type in the project area is the "House/Brick Structure" with 48.00% of houses falling into this category, followed by the "Traditional Dwellings" with 23.43%. The figures indicate that within the KwaDukuza Municipality, approximately 71.35% of houses fall in the "House/Brick Structure" housing category while 5.33% fall within the "Traditional dwellings" category and 7.66% fall within the "Informal dwellings" category.

Figure 3.6: Housing Profile



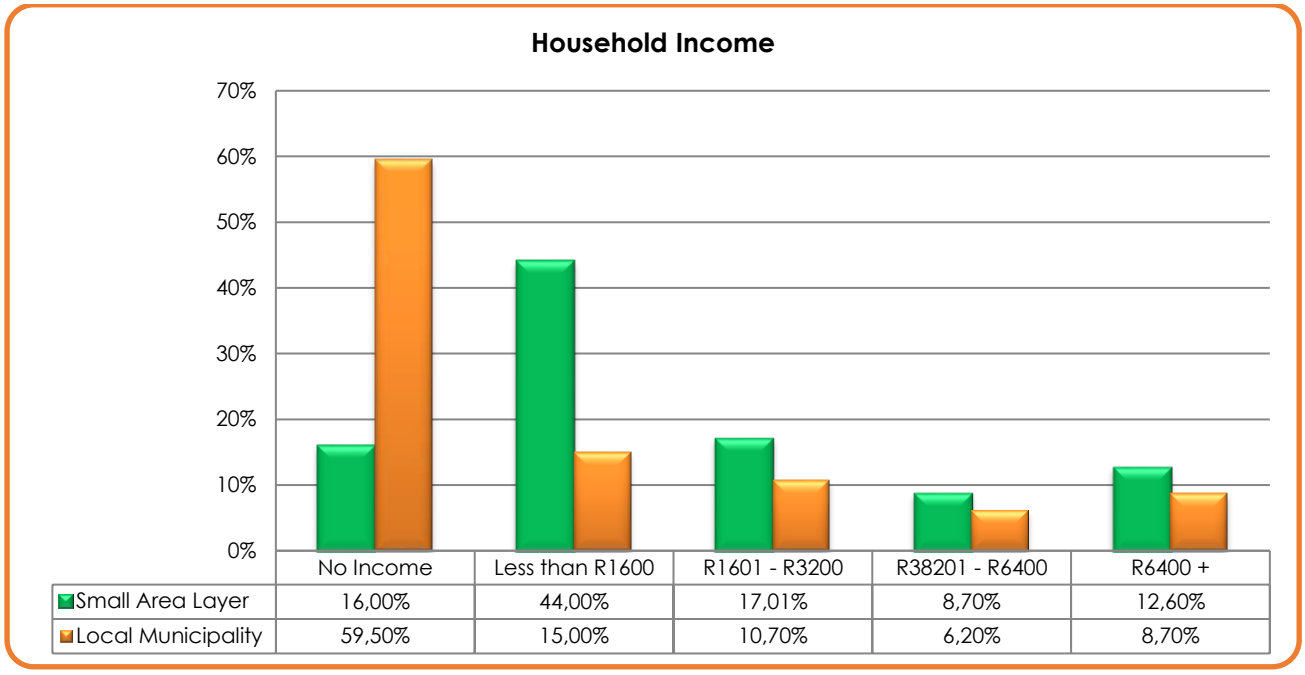
	House/ Brick Structure	Traditional Dwelling	Flat	Town Cluster	Room/ Flat/ House in Backyard	Informal (Backyard)	Informal Dwelling	Room/ Flat not in backyard	Caravan	Other
Small Area Layer	48,00%	23,43%	0,00%	2,29%	0,00%	1,14%	23,43%	0,00%	1,14%	0,57%
Local Municipality	71,35%	5,33%	3,87%	2,64%	2,34%	3,39%	7,66%	0,70%	0,09%	2,65%

Source: Stats SA, 2011

3.9.4 Household Income

As much as 16.00% of the total number of households within the small area layer indicated do not to have an income. The figures also show that 44.00% of the total number of households indicated a collective monthly household income of less than R1600, with 17.01% falling within the income range of R1600 – R3200 and 8.70% falling between R3200 and R6400. Approximately 12.60% of households earn more than R6400, which is much higher than the KwaDukuza Municipality percentage of 8.70%.

Figure 3.7: Household Income



	No Income	Less than R1600	R1601 - R3200	R38201 - R6400	R6400 +
Small Area Layer	16,00%	44,00%	17,01%	8,70%	12,60%
Local Municipality	59,50%	15,00%	10,70%	6,20%	8,70%

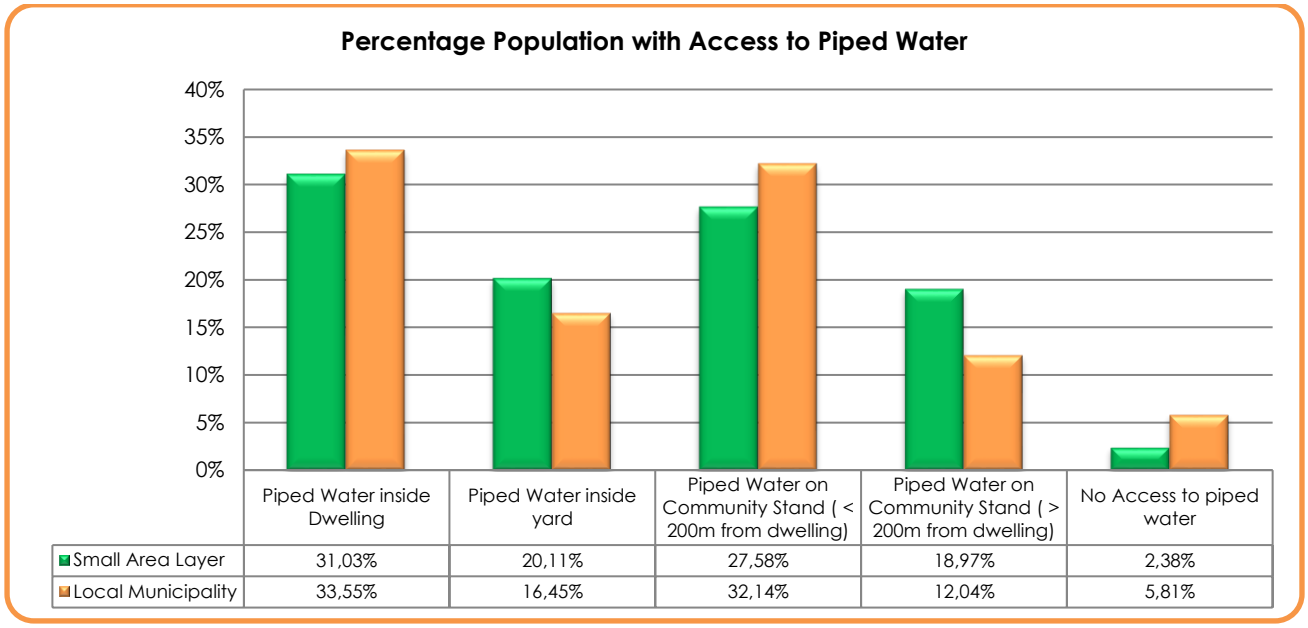
Source: Stats SA, 2011

3.9.5 Access to Piped Water

Figure 3.8 below illustrates the percentage of households which have access to piped water with the KwaDukuza LM and then Small Area Layer (SAL) where the site is located.

The overall figures for the KwaDukuza Municipality indicate that approximately 31.03% of the total number of households within the small area layer (SAL) have access to piped water "inside dwelling" and 20.11% have piped water "inside the yard". Approximately 27.58% of households within the small area layer have to walk less than 200m to get water, whilst 18.97% of households have to walk more than 200m to get water.

Figure 3.8: Access to Piped Water



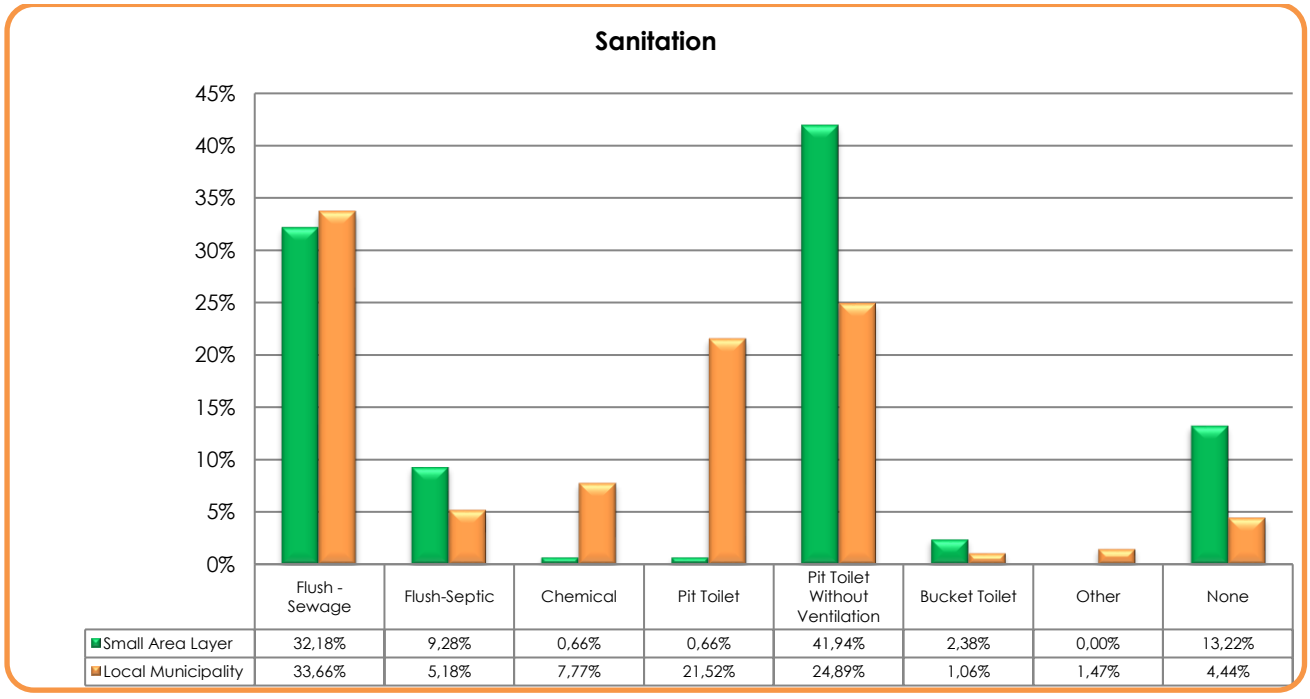
	Piped Water inside Dwelling	Piped Water inside yard	Piped Water on Community Stand (< 200m from dwelling)	Piped Water on Community Stand (> 200m from dwelling)	No Access to piped water
Small Area Layer	31,03%	20,11%	27,58%	18,97%	2,38%
Local Municipality	33,55%	16,45%	32,14%	12,04%	5,81%

Source: Stats SA, 2011

3.9.6 Access to Sanitation

Figure 3.9 illustrates that the majority (79.75%) of households in the Small Area Layer (SAL) use a pit toilet without ventilation, while 32.18% use flush toilets which are connected to a sewage system. The statistics of the overall KwaDukuza municipality indicates that the majority (33.66%) of households make use of flush toilets connected to a sewage system whilst 5.18%% utilise flush toilets connected to a septic tank.

Figure 3.9: Access to Sanitation



	Flush - Sewage	Flush-Septic	Chemical	Pit Toilet	Pit Toilet Without Ventilation	Bucket Toilet	Other	None
Small Area Layer	32,18%	9,28%	0,66%	0,66%	41,94%	2,38%	0,00%	13,22%
Local Municipality	33,66%	5,18%	7,77%	21,52%	24,89%	1,06%	1,47%	4,44%

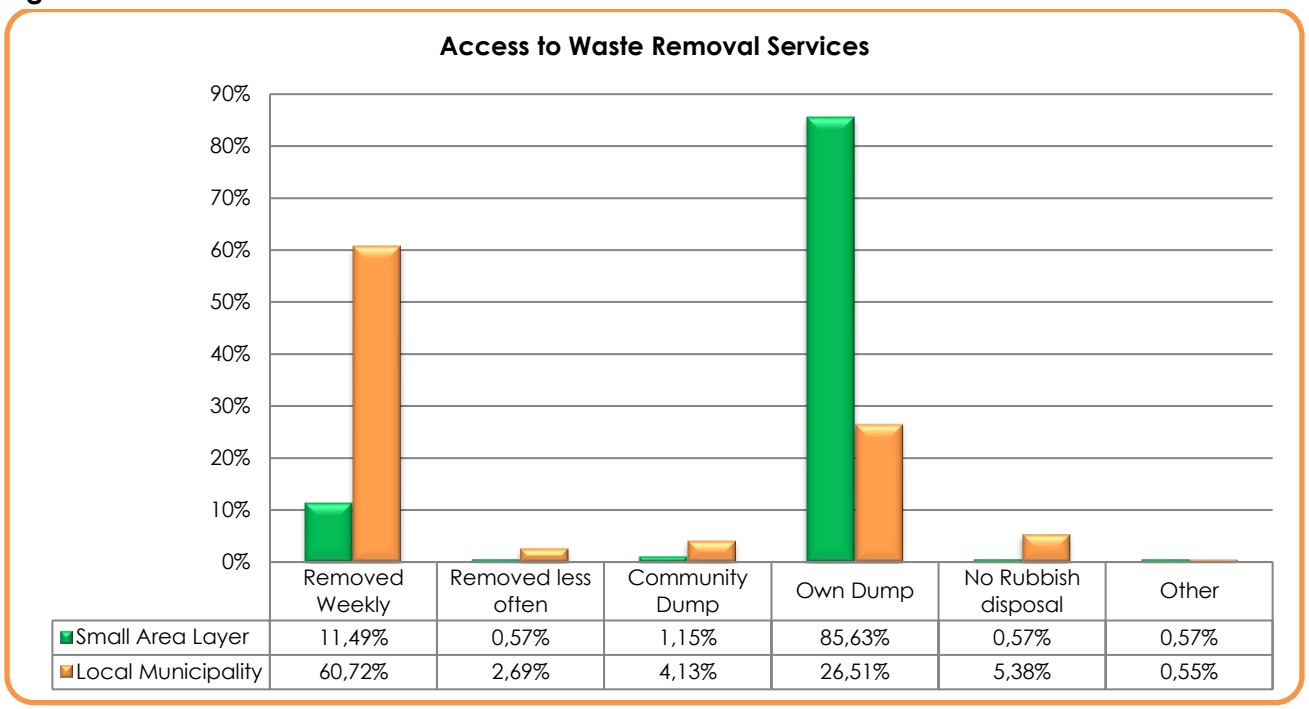
Source: Stats SA, 2011

3.9.7 Waste Removal Services

The graph in Figure 3.10 below depicts the various waste management/ removal methods recorded as being used by the various households within the study area and the overall Municipality.

As much as 11.49% of households within the study area indicated that their waste was removed weekly, whilst 85.63% indicated that they utilised their own dump. The figures from the graph indicate that 60.72% of the households in the KwaDukuza Municipality had their refuse collected once a week and 2.69% collected less often than on a weekly basis. Approximately 26.51% of the local municipality use their own dumps.

Figure 3.10: Access to Waste Removal Services



	Removed Weekly	Removed less often	Community Dump	Own Dump	No Rubbish disposal	Other
Small Area Layer	11,49%	0,57%	1,15%	85,63%	0,57%	0,57%
Local Municipality	60,72%	2,69%	4,13%	26,51%	5,38%	0,55%

Source: Stats SA, 2011

4 ENGINEERING SERVICES

A Preliminary Engineering Design Report was prepared by Undasa Project Partners (Pty) LTD in May 2023 and is attached as **Appendix K1**.

4.1 BULK AND LINE SERVICES

4.1.1 Bulk Sewerage

The closest existing sewerage pipeline has a diameter of 160mm within the eastern valley of the site. All the proposed sewer will be gravity fed down to and existing manhole. The adjacent area is already serviced with a water borne sanitation network and the existing waste water treatment facility has adequate capacity to service this housing development.

4.1.2 Bulk Water Supply

There is a 150mm diameter water line along the existing road, located south of the site. There will be adequate water supply from offtake 8 via the Umgeni system that is currently servicing the existing surrounding area. The construction of a storage reservoir will be required for the development.

4.1.3 Bulk Electricity and existing electrical infrastructure

The Shakaspring area has existing electrical infrastructure and the proposed development will be included in the current system.

4.1.4 Roads & Sormwater

On site attenuation will be used to attenuate the post-development runoff to pre-development. The storm-water is collected from the roadways and piped into the valley, where an attenuation feature will be constructed. Erosion protection will be provided at all discharge points.

4.2 INTERNAL ENGINEERING SERVICES

4.2.1 Sanitation

The sewer reticulation from the development will tie into the existing sewer system by means of 160mm diameter pipes at point A. A water borne sewerage system is proposed with individual connections to each site.

The design of the sewer network has been based on the following:	
Average dry weather flow	500/erf/day
Peak factor (PF)	According to the Hacmon formula
Daily peak demand	4 X PSD
Infiltration	15%
Ultimate Design Factor	1.5
Maximum velocity of flow	2.5 m/sec
Fire risk	Low
Minimum diameter of pipes	160 mm
Minimum cover over pipes	900 mm

Minimum Pipe Cover	
Verges	800mm
Roadways	1 000mm
Road crossings	1 200mm

Manholes

Manholes will be spaced at a maximum of 80m. They will be constructed from precast concrete rings with concrete covers. Type 2 Heavy Duty Ductile Iron covers will be used in the roads

Design

It is proposed that a daily flow of 500 litres per unit for low income units, a peak factor of 3.25 and an infiltration rate of 15% will be used. It is proposed that the design should have a reserve capacity of 0, 6 diameters, with a minimum design velocity of 0, 66m/s. The Ultimate Sewer Design flow for the proposed development is 1.710 l/s.

Pipe material

Gravity sewer pipes will be one of the following:

- Heavy Duty uPVC complying with SABS 791
- Structured wall pipes complying with SABS 1601

4.2.2 Water Supply Scheme

Water reticulation pipework will be by means of conventional pipework. A 150mm diameter water pipe will be required for the proposed development, from the existing pipe to reduce connection. The Ultimate water Design flow for the proposed development is 26.431l/s.

The design of the water reticulation would be based on the following:	
Average daily demand (ADD)	500 litre/erf/day
Peak summary demand (PSD)	1.5 x ADD
Daily peak demand	4 X PSD
Maximum velocity of flow	2.5M/SEC
Fire risk	Low risk
Minimum diameter of pipes	50mm
Minimum cover over pipeline	900mm

The pipeline infrastructure alignment has been included on the Development Layout (see **Appendix D1**).

Figure 4.1: Existing/proposed sewer and water layouts

4.2.3 Road and Stormwater infrastructure

The proposed storm water will be directed through underground pipes to the Northeast portion of the project where it will be discharged, into the valley/attenuation located both north and centre of the site. The proposed access is a 4.5m wide road. Due to the limited budget available by the Department of Human Settlements, the roads will be constructed to a gravel wearing coarse standard, in accordance to Red Book Standards. It is recommended that the municipality upgrade the roads, or top up the developments funding, to an asphalt surface standard, with its MIG budget, due to the surrounding existing roads, already being constructed to an asphalt surface standard.

The following criteria will be used in the design of the roads.	
Roads	4.5 m wide
Design Speed	30 km/hr.
Cross-fall	4%
Min. K Value:	4
Min V L length:	20m

Main Road Reserve	8m
Cut and fill slopes	1:1, 5
Longitudinal gradient	Close to natural ground Maximum 20%

Minor Earthworks and platforms

Platforms are to be cut/filled with a minimum of 95% Mod AASHTO. Cut embankments are to be terraced in 1: 1.5 and fill embankments are to be terraced in 1: 75. A balanced cut to fill platform model will be achieved to eliminate haulage costs.

Electricity supply

The electrical bulk supply will be designed according to municipal standards. All duct requirements will be met under the construction of the civil works.

Solid Waste

The local authority will supply the service of removing refuse from the project area.

Telkom

All duct requirements will be met under the construction of the civil works.

4.2.4 Concluding Remarks

The road access, sewer reticulation and water reticulation is available to serve this development (see Appendix K2 -Bulk Services Confirmation Letter). The proposed road access and bulk services will ensure adequate traffic and service solutions for the proposed development. The development will be phased in accordance with market demands. The road works and other services will be constructed in line with the development phasing. In general, provided that the recommendations specified are adhered to and that the works are supervised by a suitable qualified engineer, the proposed site is suitable for development.

5 IMPACT ASSESSMENT

5.1 INTRODUCTION

The impact assessment aims at identifying potential environmental impacts (both positive and negative impacts) and evaluating these impacts in terms of its significance. This assessment is provided in the form of a systematic analysis framework to evaluate the nature, extent, duration, intensity, probability and significance of the various impacts are considered both without and with mitigation and management measures.

5.2 IMPACT ASSESSMENT CRITERIA

The assessment of the potential impacts of the envisaged development is undertaken in accordance with the broad criteria required by the integrated environmental management procedure and includes the following:

5.2.1 Nature of impact

A brief description of the type of impact the proposed development will have on the affected environment.

5.2.2 Extent/Scale

The physical extent of the impact.

5.2.2.1 Footprint

The impacted area extends only as far as the actual footprint of the activity.

5.2.2.2 Site

The impact will affect the entire or substantial portion of the site/property.

5.2.2.3 Local

The impact could affect the area including neighbouring properties and transport routes.

5.2.2.4 Regional

Impact could be widespread with regional implication.

5.2.2.5 National

Impact could have a widespread national level implication.

5.2.3 Duration

The duration of the impact.

5.2.3.1 Short term

The impact is quickly reversible within a period of one year, or limited to the construction phase.

5.2.3.2 Medium term

The impact will have a medium term lifespan (project lifespan 1 – 10 years).

5.2.3.3 Long term

The impact will have a long term lifespan (project lifespan > 10 years).

5.2.3.4 Permanent

The impact will be permanent beyond the lifespan of the development.

5.2.4 Intensity

These criteria evaluate intensity of the impact and are rated as follows:

5.2.4.1 Minor

The activity will only have a minor impact on the affected environment in such a way that the natural processes or functions are not affected.

5.2.4.2 Low

The activity will have a low impact on the affected environment.

5.2.4.3 Medium

The activity will have a medium impact on the affected environment, but function and process continue, albeit in a modified way.

5.2.4.4 High

The activity will have a high impact on the affected environment which may be disturbed to the extent where it temporarily or permanently ceases.

5.2.4.5 Very high

The activity will have a very high impact on the affected environment which may be disturbed to the extent where it temporarily or permanently ceases.

5.2.5 Probability

This describes the likelihood of the impacts actually occurring.

5.2.5.1 Improbable

The possibility of the impact occurring is highly improbable (less than 5% of impact occurring).

5.2.5.2 Low

The possibility of the impact occurring is very low, due either to the circumstances, design or experience (between 5% to 20% of impact occurring).

5.2.5.3 Medium

There is a possibility that the impact will occur to the extent that provision must be made therefore (between 20% to 80% of impact occurring).

5.2.5.4 High

There is a high possibility that the impact will occur to the extent that provision must be made therefore (between 80% to 95% of impact occurring).

5.2.5.5 Definite

The impact will definitely take place regardless of any prevention plans, and there can only be relied on migratory actions or contingency plans to contain the effect (between 95% to 100% of impact occurring).

5.2.6 Determination of significance

Significance is determined through a synthesis of the various impact characteristics and represents the combined effect of the extent, duration, intensity and probability of the impacts.

5.2.6.1 No significance

The impact is not substantial and does not require any mitigatory action.

5.2.6.2 Low

The impact is of little importance but may require limited mitigation.

5.2.6.3 Medium

The impact is of importance and therefore considered to have a negative impact. Mitigation is required to reduce the negative impacts to acceptable levels.

5.2.6.4 High

The impact is of great importance. Failure to mitigate, with the objective of reducing the impact to acceptable levels, could render the entire development option or entire project proposal unacceptable. Mitigation and management is essential.

The following assessment scale is used to determine the significance of the identified potential impacts on the environment.

Significance = (probability + duration + scale) x intensity

Probability: 1 – 5
Extent: 1 – 5
Duration: 1 – 4
Intensity: 1 – 10

Significance rating criteria

>75	High environmental significance
50 – 75	Medium environmental significance
<50	Low environmental significance

5.2.6.5 Abbreviations for tables listed below:

WOM : Without Mitigation
WM : With Mitigation
O : Operational
C : Construction

5.2.7 Assessment of Potential Impacts

5.2.7.1 Physical and landscape characteristics

Nature	Phase	Type	Extent	Duration	Intensity	Probability	WOM	Mitigation	WM
1. Impact of development on natural drainage patterns, caused by surface clearance and associated decrease of vegetation cover, leading to increased surface runoff and erosion.	C/O	Negative	Local	Short	Medium	Medium	Low	1. Construction activities must be restricted to the construction site to minimize the impacts of the construction phase on drainage feature.	Low
2. Degradation and fragmentation of surrounding habitats.	C	Negative	Local	Long	Medium	Medium	Low	1. Sensitive areas must be clearly demarcated and regarded as a 'no-go' area. 2. Areas to be developed should be demarcated so that during the construction phase, only the demarcated areas be impacted upon and preventing movement of workers into surrounding environments.	Low

5.2.7.2 Ecological characteristics

Nature	Phase	Type	Extent	Duration	Intensity	Probability	WOM	Mitigation	WM
1. Introduction and spread of alien invasive vegetation.	C/O	Negative	Local	Permanent	Medium	Medium	Medium	1. Promptly remove all alien and invasive plant species that may emerge during construction (i.e. weedy annuals and other alien forbs). 2. Limit soil disturbance. 3. Appropriately stockpile topsoil cleared from the development footprint. 4. Minimize unnecessary clearing of vegetation beyond the infrastructure footprints. 5. Continue to remove all alien and invasive plant species as they arise during the	Low

Nature	Phase	Type	Extent	Duration	Intensity	Probability	WOM	Mitigation	WM
								operational phase (i.e. weedy annuals and other alien forbs).	
2. The negative impacts of the development on the wetland area could influence the functioning of the wetland system which would have additional negative ramifications	O	Negative	Local	Medium	Medium	Medium	High	1. All stormwater will be attenuated prior to entering the wetlands/watercourses. 2. No houses are to be constructed within the wetland and wetlands buffer. All housing encroaching the buffer must be removed. 3. Rehabilitation of Wetland Riparian Area.	Medium
3. Impact on surrounding vegetation during construction (e.g. collection of firewood, veld fires, etc.).	C	Negative	Local	Short	Medium	Low	Low	1. No harvesting of firewood from the site or from the areas adjacent to it. 2. Under no circumstances are the staff allowed to start a fire.	Low
4. Disruption/alteration of species activities (breeding, migration, feeding) due to noise, vibration, and dust.	C	Negative	Local	Medium	Low	Low	Low	1. Appropriate measures must be implemented to prevent excessive noise and vibration. No construction is to occur at night to avoid disturbance to amphibians. 2. Any areas that are excavated should have ramps to ensure that fauna have an opportunity to evacuate. The appropriate expert must be contacted if snakes need to be removed. 3. Staff should be educated about faunal species and measures should be put in place to deal with any species that are encountered during the construction process. The intentional killing of any animals should be strictly prohibited.	Low
5. Direct mortality of fauna and emigration due to disturbance.	C	Negative	Local	Medium	Medium	Low	Low	1. Appropriate measures must be implemented to prevent excessive noise and vibration. No construction is to occur at night to avoid disturbance to amphibians. 2. Any areas that are excavated should have ramps to ensure that fauna have an opportunity to evacuate. The appropriate expert must be contacted if snakes need to be removed. 3. Dust-reducing mitigation measures must be put in place and must be strictly	Low

Nature	Phase	Type	Extent	Duration	Intensity	Probability	WOM	Mitigation	WM
								adhered to, for all roads and dumps especially. 4. Staff should be educated about faunal species and measures should be put in place to deal with any species that are encountered during the construction process. The intentional killing of any animals should be strictly prohibited. 5. Where possible, work should be restricted to one area at a time.	
6. Removal of indigenous vegetation (partially degraded grassland).	C/O	Negative	Site	Short	Medium	High	Medium	1. The active open space and conservation areas must retain as much of the indigenous grassland species. Vegetation in the conservation area must not be removed or interfered with.	

5.2.7.3 Soil characteristics and geology

Nature	Phase	Type	Extent	Duration	Intensity	Probability	WOM	Mitigation	WM
1. Increased bare surfaces, floodpeaks and potential for erosion.	O	Negative	Local	Long	Medium	Medium	Medium	1. Keep scraping / excavation in the footprint area to a minimum and keep soil heaps neat and tidy. 2. Ensure soil stockpiles and concrete / building sand are sufficiently safeguarded against rain wash. 3. Mixing of concrete should not take place within the drainage feature and associated 10m buffer. 4. Scrape the area where mixing and storage of sand and concrete occurred to clean and regrass once finished. 5. Do not situate any of the construction material laydown areas within the drainage feature and associated 26m buffer zone. 6. Attempt to complete most of earthmoving activities during winter.	Low
2. Soil pollution (cement powder, diesel, oil etc.) during construction.	C	Negative	Site	Short	Medium	Medium	Low	1. Ensure soil stockpiles and concrete / building sand are sufficiently safeguarded against rain wash or water runoffs. 2. All machinery and equipment should be inspected regularly for faults and possible leaks, these should be serviced off-site.	Low

								3. No dumping of construction material on-site may take place.	
3. Dust pollution due to exposure to loose soils.	C	Negative	Site	Short	Low	Medium	Low	1. Any exposed earth should be rehabilitated promptly by planting suitable vegetation (vigorous indigenous grasses) to protect the exposed soil.	Low
4. Soil stockpiles that are left unattended during construction.	C	Negative	Site	Short	Medium	Medium	Low	1. All removed soil and material must not be stockpiled within the watercourse and buffer. 2. Stockpiles must be protected from erosion, stored on flat areas where run-off will be minimised, and be surrounded by bunds.	Low
5. Increased sediment loads to downstream reaches.	C/O	Negative	Site	Short	Medium	Medium	Medium	1. The drainage feature must be conserved during the proposed construction and operational phase with its recommended 10 buffer zone stayed clear of. 2. Re-instate topsoil and lightly till disturbance footprint, re-grass and irrigate. 3. Keep scraping / excavation in the footprint area to a minimum and keep soil heaps neat and tidy. 4. Ensure soil stockpiles and concrete / building sand are sufficiently safeguarded against rain wash. Mixing of concrete should not take place within the identified drainage feature or the associated buffer. 5. Scrape the area where mixing and storage of sand and concrete occurred to clean and regrass once finished. 6. Do not situate any of the construction material laydown areas within the drainage feature the associated buffer.	Low

5.2.7.4 Ground and surface water

Nature	Phase	Type	Extent	Duration	Intensity	Probability	WOM	Mitigation	WM
1. Contamination of drainage feature with hydrocarbons due to leaks and spillages from machinery, equipment & vehicles.	C/O	Negative	Local	Long	Medium	Medium	Low	1. The drainage feature must be conserved during the proposed construction and operational phase with its recommended 26m buffer zone stayed clear of. 2. Make sure all excess consumables and building materials / rubble is	Low

								removed from site and deposited at an appropriate waste facility. 3. Appropriately contain any generator diesel storage tanks, machinery spills (e.g. accidental spills of hydrocarbons oils, diesel etc.) or construction materials on site (e.g. concrete) in such a way as to prevent them leaking. 4. Mixing of concrete should not take place within the drainage feature and associated 10m buffer. 5. Check for oil leaks, keep a tidy operation, and promptly clean up any spills or litter. 6. Provide appropriate sanitation facilities for workers during construction and service them regularly. 7. The contractor should supply sealable and properly marked domestic waste collection bins and all solid waste collected must be disposed of at a licensed disposal facility; 8. The contractor must be in possession of an emergency spill kit that must be complete and available at all times on site. 9. Prevent uncontrolled access of vehicles through the water resources system that can cause a significant adverse impact on the hydrology and alluvial soil structure of these areas.	
2. Alteration to flow patterns and velocities.	C	Negative	Local	Long	High	Medium	Medium	1. Install appropriate erosion protection measures at the interface between the crossing infrastructure and the riverbanks in the form of gabions or reno mattresses. 2. Install sandbags around soil stockpiles to prevent soils washing into the system. 3. Culverts should avoid inundation (damming) by facilitating	Low

								streamflow and catering properly for both low flows and high flows.	
3. Excess rubble and construction material in channel.	C	Negative	Local	Short	Medium	Medium	Low	1. Once the crossing is finished, completely remove all building rubble and waste from the channel, re-landscape, stabilize and see the banks.	Low
4. Increased water inputs	O	Negative	Local	Medium	Medium	Medium	Medium	1. Ensure that leaks are promptly fixed to avoid artificially increasing inputs to and the potential for erosion within the drainage feature and associated 10m buffer.	Low

5.2.7.5 Archaeological, historical and cultural significance

Nature	Phase	Type	Extent	Duration	Intensity	Probability	WOM	Mitigation	WM
1. Impact on sites with valuable archaeological, history and cultural significance	C	Negative	Site	Short	Minor	Low	Low	1. Should any archaeological artifacts be exposed during excavation, work on the area where the artifacts were found, shall cease immediately and the ECO and AMAFA should be notified as soon as possible.	Low

5.2.7.6 Socio-economic impacts

Nature	Phase	Type	Extent	Duration	Intensity	Probability	WOM	Mitigation	WM
1. Direct employment creation, including construction workers, architects, draughtsmen, land surveyors, plumbers, electricians etc.	C	Positive	Local	Short	Minor	High	Medium	No mitigation required	Medium (Positive)
2. Indirect job creation (e.g. building suppliers) and induced job creation (broader local economy).	C/O	Positive	Local	Short	Minor	High	Medium	No mitigation required	Medium (positive)
3. Job creation during operation phase (domestic workers, maintenance, etc.).	O	Positive	Local	Long	Minor	Medium	Medium	No mitigation required	Medium (positive)

5.2.7.7 Safety and Security

Nature	Phase	Type	Extent	Duration	Intensity	Probability	WOM	Mitigation	WM

1. The construction phase of the proposed development may result in an increased security risk to adjacent properties and the residents thereof.	C	Negative	Local	Short	Medium	Low	Low	1. Staff should be informed that access to adjacent properties is strictly off-limits and that it will be deemed a serious offence (i.e. no fences should be jumped at any time and no gates are to be opened without permission from the relevant landowner).	Low
2. Construction activities on the proposed development may pose various risks to workers safety.	C	Negative	Local	Short	Medium	Medium	Medium	1. The site and crew are to be managed in strict accordance with the Occupational Health and Safety Act, 1993 (Act No.85 of 1993) and the National Building Regulations.	Low

5.2.7.8 Engineering Services

Nature	Phase	Type	Extent	Duration	Intensity	Probability	WOM	Mitigation	WM
1. Capacity of road network to handle additional traffic generated from the proposed development.	C/O	Negative	Local	Permanent	Medium	Medium	Low	1. It must be ensured that the municipality upgrade the roads, or top up the developments funding, to an asphalt surface standard, with its MIG budget, due to the surrounding existing roads, already being constructed to an asphalt surface standard. 2. It must be ensured that a backlog of traffic does not develop at access points during peak hours, through the implementation of an efficient and effective access control system.	Low
2. The roads will be constructed to a gravel wearing coarse standard, in accordance to Red Book Standards.	C/O	Negative	Local	Temporary	Meduim	Medium	Low	3. The surface layer of a pavement that takes the wear of traffic must be upgraded once the budget is obtained.	Low
3. Possibility of increased number of road accidents due to increased traffic volumes. Accident risk may be highest at the point where the site is accessed from.	C/O	Negative	Local	Long	Medium	Medium	Low	1. Employ people to help alert oncoming traffic and regulate the traffic during construction hours so that residents and visitors know about the construction taking place. 2. The transportation of infrastructure should be limited, and equipment should be stored on site, thus mitigating the number of trips.	Low
4. The area will be covered with impermeable surfaces (paving, roofs, parking areas), leading to an increase in stormwater	C/O	Negative	Local	Permanent	Medium	Medium	Low	1. The Plan will be included as part of the EMPr wherein conditions will be provided for the proposed development with regards to run-off and stormwater management.	Low

volume and intensification of stormwater peak flow.								2. Ensure protection of erosion is provided at all discharge points.	
5. Increased soil erosion due to increased quantity and flood peak intensity of stormwater flow, most significantly at stormwater outlets.	C/O	Negative	Site	Long	Medium	Medium	Low	1. The Plan will be included as part of the EMPr wherein conditions will be provided for the proposed development with regards to run-off and stormwater management. 2. Ensure protection of erosion is provided at all discharge points.	Low

5.2.7.9 Potential Environmental Impacts

Nature	Phase	Type	Extent	Duration	Intensity	Probability	WOM	Mitigation	WM
1. Increase in air pollution (dust) during construction (e.g. construction vehicles, excavation, earthworks, burning of waste products etc.). 2. Some phases of construction may cause odours that are detective over some distance (e.g. burning of plastic containers and bags). 3. Impact on the ambient air quality due to vehicle tailpipe emissions from increased traffic volumes.	C/O	Negative	Local	Short	Low	Medium	Low	1. Air filters on all mechanized equipment must be properly designed and maintained. 2. Onsite burning of waste is not permitted. 3. A dust suppression programme should be implemented by means of periodic water sprinkling. 4. All industrial activities are subject to operating within the conditions of national legislation, including the National Environmental Management: Air Quality Act No. 39 of 2004.	Low
4. Increase in ambient noise level affecting surrounding properties during construction.	C/O	Negative	Local	Short	Low	Medium	Medium	1. Silencers on diesel-powered equipment must be properly designed and maintained. 2. Construction activities should be limited to normal office hours. 3. Adjacent landowners should be notified of extremely noisy activities at least 24 hours prior to such activities commencing. 4. Construction should take place between 07:00- 17:00. Mondays to Fridays.	Low
5. Exiting Biodiversity impact Indigenous vegetation)	C/O	Negative/ Positive	Local	Long	Medium	High	Low	1. Ensure that the Architectural design and building colours is sympathetic to the surrounding areas. 2. All construction material must be stored in one place out of the direct eyesight of pedestrians. 3. Exiting indigenous vegetation that is found onsite should remain intact and rehabilitated, such as tree planting to be encouraged after construction.	

6. Impact of lighting on surrounding properties, including light trespass and over-illumination. Apart from being a visual impact, over-illumination is also a waste of energy.	C/O	Negative	Local	Long	Medium	High	Low	1. Avoid shiny metals in structures. If possible shiny metal structures should be darkened or screened to prevent glare. 2. Night-time light sources must be directed away from residential areas. 3. Incorporate measures for visual screening (e.g. using shade cloth) in the EMPr. 4. Avoid construction activities outside of normal working hours.	Low

5.3 ENVIRONMENTAL IMPACT STATEMENT AND SUMMARY ON NEED AND DESIRABILITY

5.3.1 Environmental Impact Statement

An impact statement is required as per the NEMA regulations with regards to the proposed development. The major environmental impacts, which are likely to result from this development, may be assessed according to the potential impacts of the proposed development on the surrounding land uses. The proposed project may result in short term negative impacts to the drainage feature and its associated 10m buffer; the degradation and spread of alien invasive species as well as impacts associated within stormwater runoff. Whilst these impacts can be rated as being of medium significance, they can be reduced to an acceptable level provided that the mitigation measures as proposed in this Draft BAR, Wetland Report, Biodiversity Report, Stormwater Management Plan and EMPr are effectively implemented.

With regards to the two identified unchanneled valley bottom wetlands traversing the northern portion of the project area, these wetland systems should be protected, with the development layout earmarking these areas for conservation purposes. The existing surfaced road that traversed the northern portion of the project area from east to west has already impacted on the wetland buffer hence the reduced wetland buffer area in that area.

Through the implementation of suitable mitigation measures associated with each of the possible impacts on surrounding land uses the effect thereof can to a large extent be mitigated to acceptable levels. Table 5.1 considers both the advantages and disadvantages of the proposed development.

Table 5.1: Advantages and Disadvantages of the proposed development

Advantages	Disadvantages
The proposed housing development will assist in reducing the housing backlog of the Municipality.	Lack of implementation of the stormwater management plan.
The proposed development will assist in reducing the establishment of informal settlements within the Municipality through the provision of affordable housing opportunities.	Potential illegal dumping in the environmentally sensitive area – the onsite drainage feature and recommended buffer area.
Basic services such as water and sanitation will be provided.	The clearance of approximately 3.5 hectares of KwaZulu-Natal Coastal Belt Grassland.
Employment opportunities during the construction phase.	
Optimal development on the site will reduce security risks and prevent illegal dumping on vacant pocket on land within the project area.	
Eradication of the ever-increasing informal settlement.	
The formally protection of 4,06 hectares of sensitive environment (wetland & portion of steep grassland area)	

5.3.2 Need and Desirability

The need and desirability for the Proposed Shakaspring Subsidised Housing Development is evident in the KwaDukuza Local Municipal IDP (2022/23) where the need for housing has been identified. The municipality has a challenge of the land scarcity for human settlement development and in instances where land is available, the landowners are asking for extremely high compensation (prizes). Therefore, the implementation of Shakaspring Subsidised Housing Development will reduce the housing backlog and provide housing for people who are living in very squalor or difficult conditions. This Subsidised housing development in Shakaspring will therefore, necessitates KwaDukuza Municipality to be proactive in providing decent living conditions for the people living at Shakaspring. Apart from reducing the housing backlog, the proposed development will enable the provision of water networks and proper sanitation infrastructure. By providing water and sanitation services to the proposed housing development, it will indirectly assist in reducing surface water and groundwater pollution.

The KwaDukuza Integrated Housing & Human Settlement Development Plan is linked to KwaDukuza Municipality's Integrated Development Plan.

In most instances, these people are living in very squalor or difficult conditions. This then necessitates KwaDukuza Municipality to be proactive in providing decent living conditions for these people e.g., Shakaspring.

Unavailability of Funds for Land Acquisition.

Table 5.2 below was adapted from the 2014 BAR Template of the Department of Environmental Affairs. This table was inserted to motivate for the need and desirability of the proposed development.

Table 5.2: Need and Desirability

1. Is the activity permitted in terms of the property's existing land use rights?		NO
The project area is located on the northern outskirts of Stanger, near the Highridge area. The proposed property, made up of a Portion 3 of Farm lot 11 No 1676, and is currently under the KwaDukuza Local Municipality. The proposed Shakaspring Subsidised Housing Development is located within Wards 5, 17 and 18 of the KwaDukuza Local Municipality and the proposed site has a total extent of approximately 16.85 hectares and is situated approximately 2.82 km Northeast of Stanger. The proposed project is a Greenfield development and is aimed at providing suitable housing to beneficiaries, within the KwaDukuza Municipality. The majority of the site is vacant except for the northern section of the site which contains informal dwellings as well as substantial housing structures. There is also an existing community hall located in the central portion of the project area, which the proposed current development plan has accommodated. The site contains two channelled valley bottom wetlands as well as critical biodiversity within irreplaceable areas which are located to the North of the site.		
2. Will the activity be in line with the following?		
(a) Provincial Spatial Development Framework (PSDF)	YES	
The proposed development addresses social inclusivity and sustainable services. The proposed development will contribute to the creation of sustainable and integrated human settlements that relate to the advancement of spatial transformation and consolidation of human settlements. It will also provide proper planning and development of integrated and sustainable settlements and a basis for social inclusivity and cohesion. Furthermore, the proposed development will make available the housing subsidies in Shakaspring that are sustainable and consisting of adequate (clean water, electricity, roads etc.). It will also ensure that the implementation of Shakaspring Subsidised Housing Development will reduce the housing backlog and provide housing for people who are living in a very squalor or difficult conditions.		

(b) Urban edge / Edge of Built environment for the area	YES	
The project area is located on the northern outskirts of Stanger, near the Highridge area. The proposed property is made up of a Portion 3 of Farm lot 11 No 1676, and is currently under the KwaDukuza Local Municipality. The proposed Shakaspring Subsidised Housing Development is located within Wards 5, 17 and 18 of the KwaDukuza Local Municipality and the proposed site has a total extent of approximately 16.85 hectares and is situated approximately 2.82 km Northeast of Stanger. The proposed project is largely a greenfield development and is aimed at providing suitable housing to beneficiaries, within the KwaDukuza Local Municipality.		
(c) Integrated Development Plan (IDP) and Spatial Development Framework (SDF) of the Local Municipality (e.g. would the approval of this application compromise the integrity of the existing approved and credible municipal IDP and SDF?).	YES	
KwaDukuza Integrated Housing and Human Settlement Development Plan is linked to KwaDukuza Municipality's Integrated Development Plan. Human settlement provision has been identified as a key challenge in the KwaDukuza Municipality's IDP especially in the Shakaspring. KwaDukuza Local Municipality (IDP) is proactive in providing decent living conditions for the people of Shakaspring. As such, the proposed development is aligned with the Municipality's IDP as it entails the construction subsidised housing development together with the provision of the infrastructure for water and sanitation. The proposed development will therefore not compromise the integrity of the IDP and SDF but would rather enhance the objectives of the policies.		
(e) An Environmental Management Framework (EMF) adopted by the Department (e.g. Would the approval of this application compromise the integrity of the existing environmental management priorities for the area and if so, can it be justified in terms of sustainability considerations?)		**Yes**
The KwaDukuza Local Municipality currently does not have an Environmental Management Framework, it only has the Low Emission Development Strategic Framework and Action Plan. However, the iLembe District Municipality has an EMF that shows the Irreplicable CBA situated on the northern side of the project area which consists of the terrestrial biodiversity and urban informal settlements. Most of the CBA zones are largely consisting of informal settlements.		
(f) Any other Plans (e.g. Guide Plan)	YES	
The rapid increase of population adds on the housing backlogs in KwaDukuza Local Municipality and unavailability of accommodation. The municipality also faces the issue of housing projects being blocked for some reasons and therefore, they are working together with Human Settlement to unblock those housing developments. KwaDukuza Municipality is classified as a Housing Developer, hence, the Municipality wants to facilitate provision of formal housing through the construction of high quality houses to reduce the housing backlog or demand.		
3. Is the land use (associated with the activity being applied for) considered within the timeframe intended by the existing approved SDF agreed to by the relevant environmental authority (i.e. is the proposed development in line with the projects and programmes identified as priorities within the credible IDP)?	YES	
Please see above (2c).		
4. Does the community/area need the activity and the associated land use concerned (is it a societal priority)?	YES	
The implementation of the subsidised housing development will assist in reducing the establishment of informal settlements and providing decent living conditions and reduce the housing backlog and within the Municipality. The proposed development will also include the provision of water and sanitation infrastructure as well as other supporting land uses.		
5. Is this development provided for in the infrastructure planning of the municipality, and if not what will the implication be on the infrastructure planning of the municipality (priority and placement of services and opportunity costs)?	YES	
The Department of Human Settlements together within the KwaDukuza Local Municipality will be responsible for the construction of the proposed subsidised housing development in Shakaspring. The proposed subsidised housing development in Shakaspring has been identified in the Municipal IDP. The Municipality is proactive in providing decent living conditions for the people of Shakaspring within Wards 5, 17 and 18.		
6. Is this project part of a national programme to address an issue of national concern or importance?	YES	
Throughout the country, there are many people without proper housing structures and access to basic services. The aim of this development is therefore to reduce the establishments of informal settlements and construct houses that can be utilised by low-income earners and provide decent living conditions for the people of Shakaspring.		

7. Do location factors favour this land use (associated with the activity applied for) at this place? (This relates to the contextualisation of the proposed land use on this site within its broader context.)	YES	
The proposed project is largely a greenfield development and is aimed at providing suitable housing to beneficiaries, within the KwaDukuza Municipality. The majority of the site is vacant except for the northern section of the site which contains informal dwellings as well as substantial housing structures. There is also an existing community hall located in the central portion of the project area, which the proposed current development plan has accommodated. The site contains two channelled valley bottom wetlands as well as critical biodiversity within irreplaceable areas which are located to the North of the site. The area has also been zoned for future residential purposes in the Municipality's Land Use Scheme.		
8. Will the benefits of the proposed land use/development outweigh the negative impacts of it?	YES	
The purpose of this development is to address the Municipality's housing backlog and need for more houses due to the expanding population and provide people with good living conditions that are living in informal settlements.		
9. Will the proposed land use/development set a precedent for similar activities in the area (local municipality)?	YES	
As per the Municipal IDP, there are many other proposed housing developments within the KwaDukuza Local Municipality. Some of the housing developments have been blocked and the Municipality is working together with the Human Settlement to unblocked those housing projects that have been blocked due to some reasons.		
10. Will any person's rights be negatively affected by the proposed activity/ies?		NO
This development will not infringe on any person's rights, as the proposed development will entail the construction of subsidised housing which can meet the housing demand and provide the needs for housing of low-income earners with good living conditions.		
11. What will the benefits be to society in general and to the local communities?		
• Provision of housing opportunities • Access to services such as water and sanitation • Job creation during the construction phase • Prevention of informal settlements • Provision of adequate housing opportunities • Provide decent living conditions		

6 PUBLIC PARTICIPATION

6.1 REQUIREMENTS OF THE ENVIRONMENTAL IMPACT ASSESSMENT REGULATIONS OF 2014 (AS AMENDED)

According to Section 41 of the Environmental Impact Assessment Regulations, the following is required for the public participation process:

Fixing a notice board at a place conspicuous to the public at the boundary or on the fence of the site where the activity to which the application relates is or is to be undertaken; and any alternative site;

Giving written notice in any of the manners provided for in section 47D of the Act, to-
the occupiers of the site and, if the proponent or applicant is not the owner or person in control of the site on which the activity is to be undertaken, the owner or person in control of the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
owners, persons in control of, and occupiers of land adjacent to the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
the municipal councillor of the ward in which the site or alternative site is situated and any organisation of ratepayers that represent the community in the area;
the municipality which has jurisdiction in the area;
organ of state having jurisdiction in respect of any aspect of the activity; and
any other party as required by the competent authority;

Placing an advertisement in –
one local newspaper; or
any official Gazette that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations;

placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or may have an impact that extends beyond the boundaries of the metropolitan or local municipality in which it is or will be undertaken: Provided that this paragraph need not be complied with if an advertisement has been placed in an official Gazette referred to in paragraph (c)(ii); and
using reasonable alternative methods, as agreed to by the competent authority, in those instances where a person is desiring of but unable to participate in the process due to-
Illiteracy;
disability; or
any other disadvantage.

6.2 SUBMISSION OF EIA APPLICATION FORM

The Environmental Authorisation application form was completed and submitted to DEDTEA as required by the EIA regulations. Reference Number **DC29/0003/2023** was allocated to the proposed development.

6.3 NEWSPAPER ADVERTISEMENTS AND SITE NOTICES

The EIA Regulations require that the proposed project be advertised in a local newspaper. As such, English and isiZulu adverts were published in the Stanger Weekly Newspapers on the 10th of May 2023 (see **Appendix M3 and Appendix M4** for the wording of the English and IsiZulu Adverts). A copy of the tear sheets will be provided in the Final BAR.

Site Notices were also placed at various locations on the site boundary to ensure that it is visible and accessible (see **Appendix M1 and Appendix M2** for a copy of the site notice). The purpose of the advertisements and site notice's is to notify I&APs of the EIA process for the proposed development and to invite them to register as I&APs.

In addition to the site notices and newspaper adverts, background information documents (**Appendix N**) were distributed to the surrounding communities.

6.4 PUBLIC CONSULTATION MEETING

A public meeting will be held should there be a number of concerns from Registered Interested and Affected Parties. The purpose of the meeting will be to address any issues and queries. Copies of the meetings and minutes will be included as part of the Final BAR, if any.

6.5 COMMENTS RECEIVED FROM THE DEPARTMENTS AND STAKEHOLDERS

The comments received from the Department and stakeholders regarding the Draft Basic Assessment Report will be included into the Final BAR, in the form of a Comments and Response Report.

6.6 REGISTER OF INTERESTED AND AFFECTED PARTIES

According to the Environmental Impact Assessment Regulations of 2014 (as amended), a register of interested and affected parties must be kept during the EIA process. A copy of the registered interested and affected parties will be included into the Final BAR.

6.7 DISTRIBUTION OF DRAFT BASIC ASSESSMENT REPORT

The following governmental and non-government authorities were provided with a copy of the Draft Basic Assessment Report for comment.

- KwaZulu Natal Department of Economic Development, Tourism and Environmental Affairs, iLembe District Office
- KwaZulu Natal Department of Agriculture and Rural Development
- KwaZulu Natal Department of Agriculture, Forestry and Fisheries
- KwaZulu Natal Department of Water and Sanitation
- KwaZulu Natal Department of Transport
- iLembe District Municipality
- KwaDukuza Local Municipality
- Stanger Manor Library
- Ezemvelo KZN Wildlife
- KZN Amafa & Research Institute
- Ward Councillors (Wards 5, 17 & 18).

7 SUMMARY RECOMMENDATIONS OF EAP

7.1 RECOMMENDATIONS

- An alien invasive plant management plan needs to be compiled and implemented post construction to control current invaded areas and prevent the growth of invasive on cleared areas.
- The portion of the site demarcated for conservation as per the development layout plan must be managed accordingly for conservation purposes.
- A Wetland Rehabilitation Plan should be prepared prior to construction.

7.2 OPINION OF EAP

It is the opinion of the Environmental Assessment Practitioner that the project can be supported on condition that the Mitigation and Management measures recommended by Specialists and in the Draft Environmental Management Programme (EMPr) (**Appendix A**) be strictly adhered to as well as provided that sensitive planning, design and good environmental management be carried out by the proponent during construction.

A variety of mitigation measures have been identified in the Draft EMPr that will serve to mitigate the scale, intensity, duration or significance of the impacts which have a medium significance rating. These include guidelines to be applied during the construction phase of the development. The proposed mitigatory measures, if implemented, will reduce the significance of the majority of the identified impacts to "low", and allow for the proposed project to precede with minimal effect to the environment, local community and surrounding land use practices. The recommendations made within Specialist Reports conducted for the proposed project must also be adhered to so as to ensure that the proposed project imposes as minimal an impact as possible.

Any decision regarding the granting of authorization of this activity should also be subject to the implementation of all the management recommendations as contained in the Draft EMPr.

It is the opinion of the EAP that the information contained in the Draft Basic Assessment Report, and the Specialist studies which have been compiled to address specific areas of concern, provided sufficient information to undertake a sound assessment of the proposal and provide an informed recommendation with a sufficient degree of confidence.