

DUKUDUKU HOUSING DEVELOPMENT: PRELIMINARY ENVIRONMENTAL ASSESSMENT



JUNE 2023

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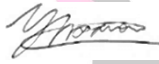

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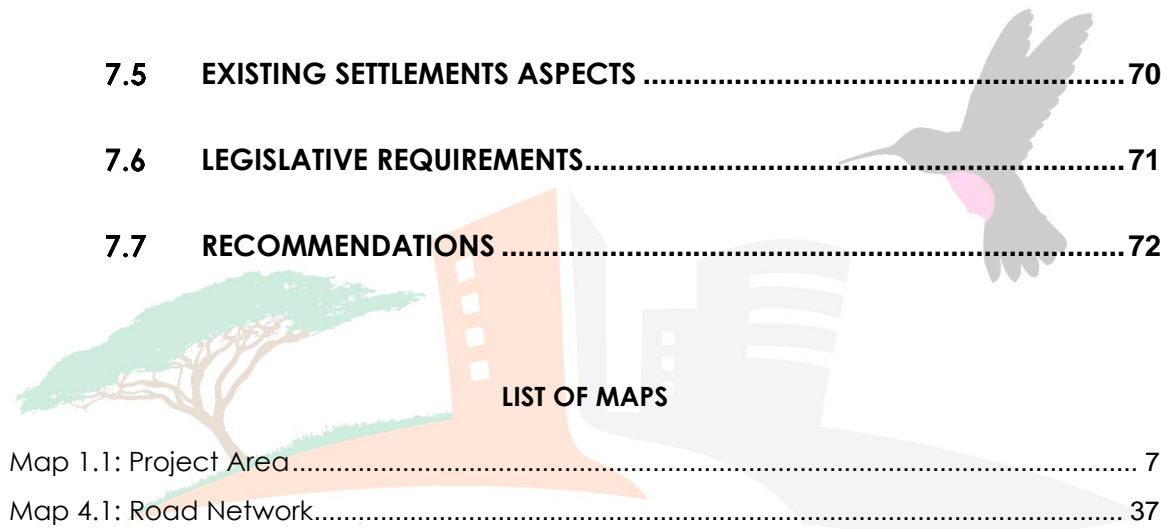
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1 INTRODUCTION

1.1 PROJECT BACKGROUND

K2M Environmental (Pty) Ltd was requested by Ubuhlebesu Projects Pty (Ltd) to undertake a Preliminary Environmental Assessment for the proposed Dukuduku Urban Housing Project, which is located in Wards 1 and 2 of the Mtubatuba Local Municipality.

This Preliminary Environmental Assessment will only provide an initial baseline environmental report that briefly describes potential environmental impacts of the proposed development and some preliminary recommended mitigation measures. This initial screening report will also provide an assessment of the viability of the proposed development for the developer in terms of environmental criteria. This document thus does not constitute an environmental scoping report as per the EIA Regulations but is an initial environmental study for the purposes outlined above.

1.2 SITE DESCRIPTION

The proposed site is approximately 5561.94 hectares in extent. Several non-perennial watercourses traverse the project area and two perennial rivers, namely the Hluhluwe and uMfolozi Rivers traverse the north-eastern and south-eastern borders of the project area respectively (**Map 1.1; Figure 1.1**). Furthermore, the project area is bordered by Critical Biodiversity Areas (CBA): Irreplaceable on its northern and southwestern portion. The land use is predominantly Residential. The project area in relation to the wards is depicted in Map 1.1 below.

Map 1.1: Project Area

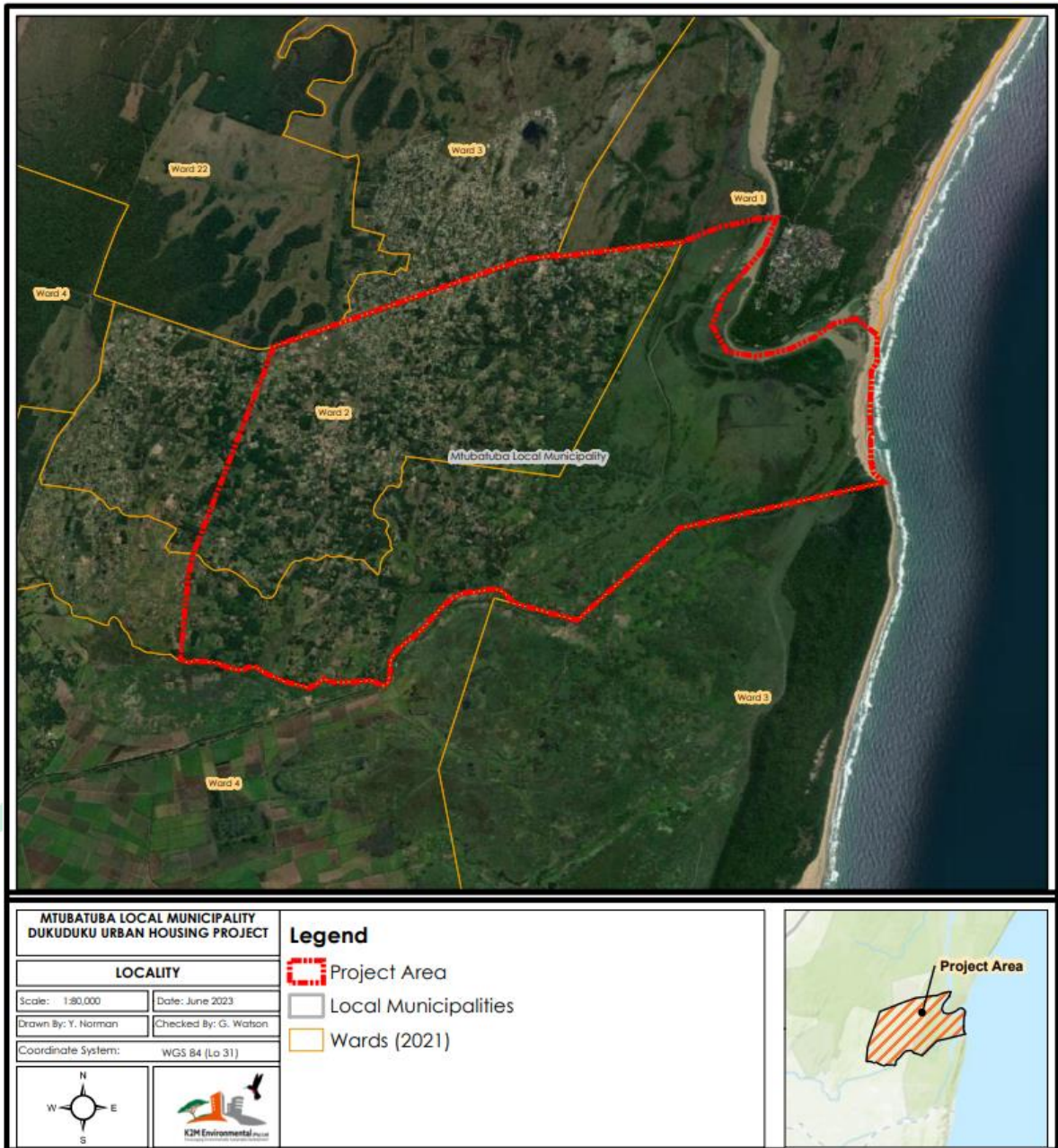
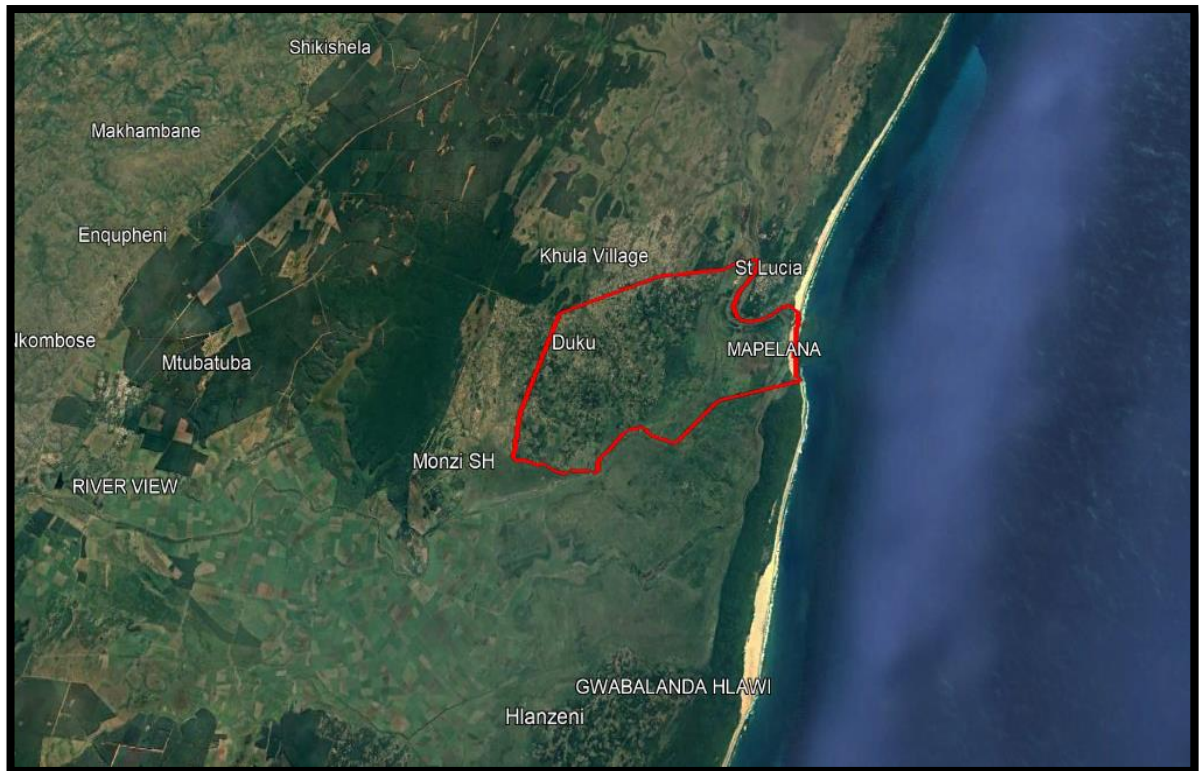


Figure 1.1: Aerial view of project area



1.3 PROPERTY DESCRIPTION

1.3.1 Co-ordinates

Table 1.1 below provides co-ordinates of the project area.

Table 1.1: Co-ordinates of the project area

Latitude /Longitude	Degrees	Minutes	Seconds
South	28°	24'	15.09''
East	32°	22'	26.48''

1.3.2 Property Description

Table 1.2 below provides the property description and ownership information of the site.

Table 1.2: Property Description

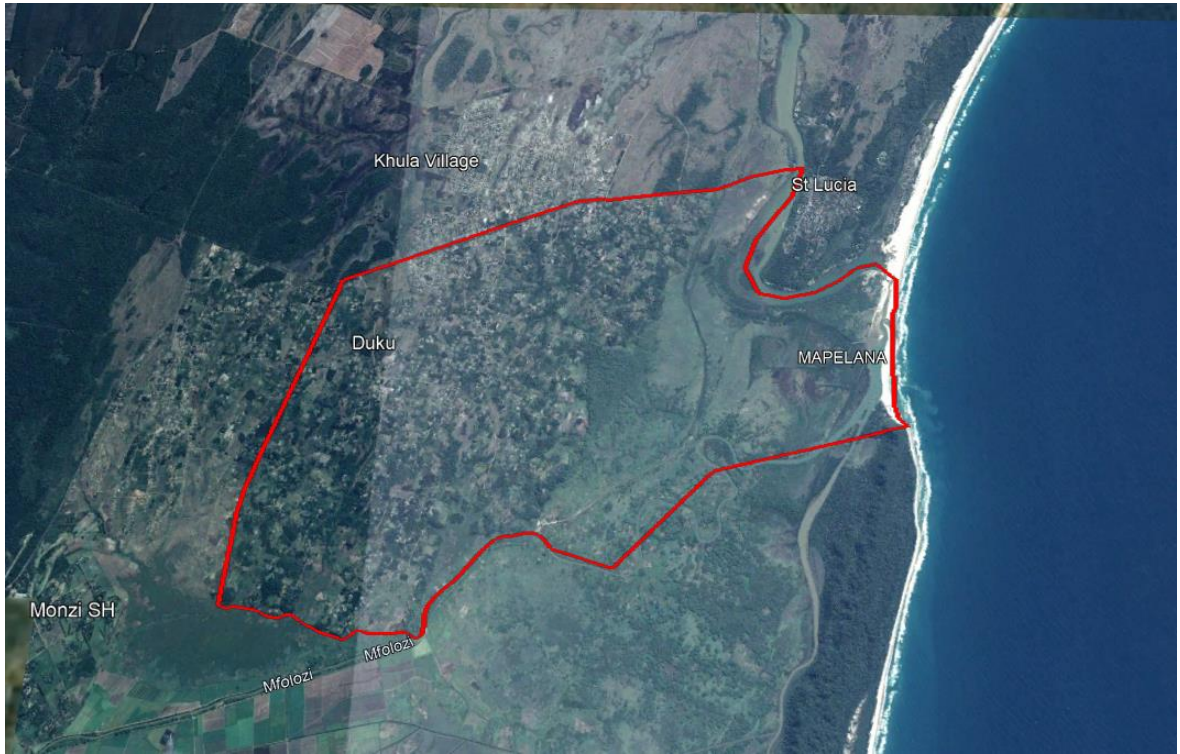
Property Description	21- Digit Surveyor Code	Registered Owner	Farm No.
The land belongs to the government under Elderslie, which is 9KM North of St Lucia.	NOGV00000001486600000	Government	14866
The land belongs to the government under ST Lucia Lands which is 1KM North of St Lucia.	NOGV00000001370200000	Government	13702
To be confirmed.	NOGV00000001745800000	N/A	N/A

1.4 HISTORICAL OVERVIEW OF THE SITE

As illustrated in the series of historical images below, the project area has remained largely unchanged since July 2013.

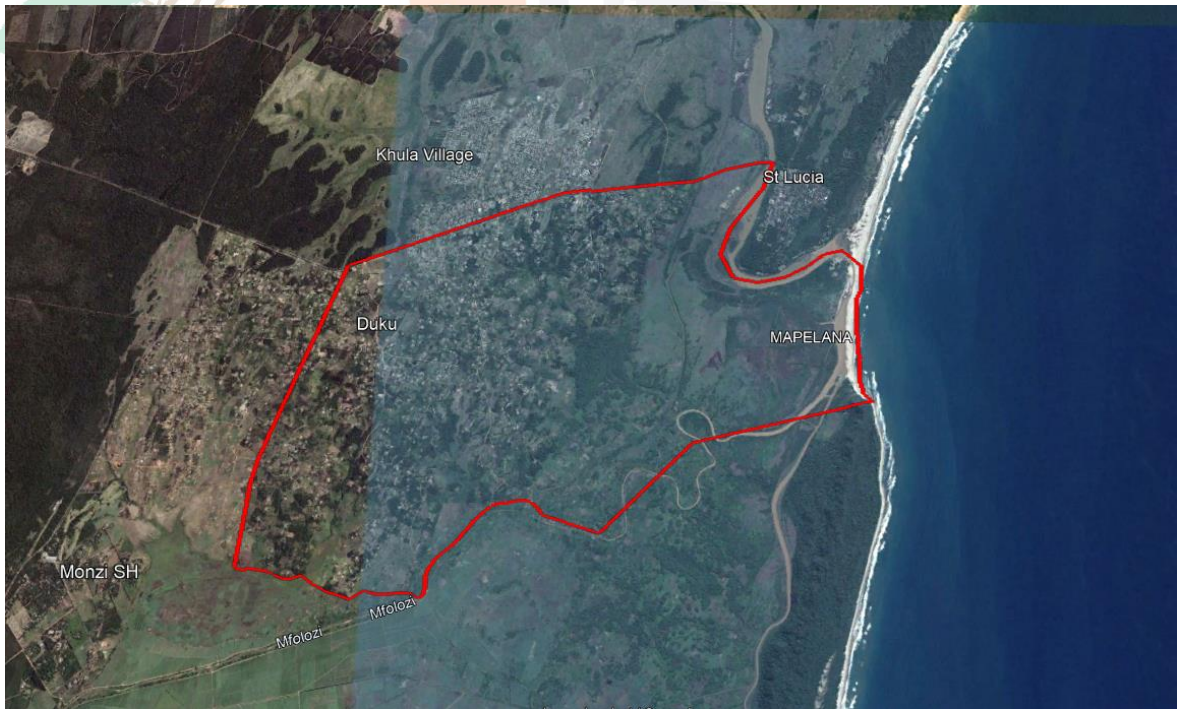


Figure 1.2: Project area in July 2013



Source: Google Earth Imagery, 2023

Figure 1.3: Project area in August 2016



Source: Google Earth Imagery, 2023

Figure 1.4: Project area in May 2019



Source: Google Earth Imagery, 2023

Figure 1.5: Project area in June 2022



Source: Google Earth Imagery, 2023

2 APPROACH AND METHODOLOGY

2.1 APPROACH

2.1.1 Applicable legislation

The National Environmental Management Act (No. 107 of 1998) provides for the control of certain listed activities which “*may have a detrimental effect on the environment*” if not controlled. In terms of the Environmental Impact Assessment (EIA) Regulations Listing Notice 1, Listing Notice 2 and Listing Notice 3 of 2014, such activities are prohibited until written authorisation is obtained from the Minister or her delegated authority. Activities listed in EIA Regulations Listing Notice 1 (No. R983) and Listing Notice 3 (No. R985) of the 4th of December 2014 will require a Basic Assessment to be conducted while activities listed in EIA Regulations Listing Notice 2 (No. R984) will require a full EIA process which includes a Scoping phase and an Environmental Impact Assessment phase. Any proposed development on the site must be screened in light of these regulations and authorisation must be acquired prior to construction, should it be concluded that the development triggers any of the activities listed in the above-mentioned regulations.

The purpose of this Preliminary Environmental Assessment is to identify possible strategic environmental issues at the earliest possible stage in the planning process to:

- ✚ Ensure that environmental issues are addressed in a pro-active manner in the development process.
- ✚ Improve the assessment of strategic environmental impacts that might be caused by the envisaged developments, and
- ✚ Ensure that the concept of sustainability is integrated with developmental decision making.

The overall approach towards this preliminary assessment is therefore based on the concept of sustainable development within the context of the official definition of sustainable development being: “*development that aims for equity within and between generations and adopts an approach where the economic, social and environmental aspects of development are considered in a holistic fashion*”.

2.2 METHODOLOGY

This Preliminary Environmental Assessment provides a summarized overview of some of the key aspects relating to the infrastructural and biophysical environments which impact on and, are similarly impacted upon by the proposed development. The summarized overviews of various aspects contained within the Preliminary Environmental Assessment have been based on a combination of existing available desktop information sources.

Available desktop information sources include information derived from the 2011 South African Census, as well as the Mtubatuba Local Municipality Integrated Development Plan 2021/2022; and various spatial GIS information. These information sources were initially made use of to establish the general status quo conditions of various, service and infrastructural demographics which impact on and are subsequently impacted upon by the project area. As a supplement to the information provided and discussed within the assessment report a number of accompanying thematic maps have also been included within the report, which provide a graphical representation of various biophysical factors at play within the project area.

The report has generally been structured as follows:

- ✚ **Section 3** deals with the **infrastructural component** of the project area. The infrastructural component addresses the road network within the project area.
- ✚ **Section 4** deals with the **biophysical characteristics** of the project area, and therefore covers aspects such as land cover, topography and drainage, floodline areas, vegetation, agricultural potential, critical biodiversity areas, mineral deposits, archaeological, cultural and historical sites, and potential sources of pollution.

- ✚ **Section 5** provides a brief overview of the **preliminary environmental impacts and proposed mitigation measures** for the project area and discusses some of the impacts associated therewith.
- ✚ **Section 6** provides a **summary conclusion** of the findings of the Preliminary Environmental Assessment Report and the potential impact of the proposed development on the environment, while also providing some recommendations with which to minimize or negate any negative impacts.



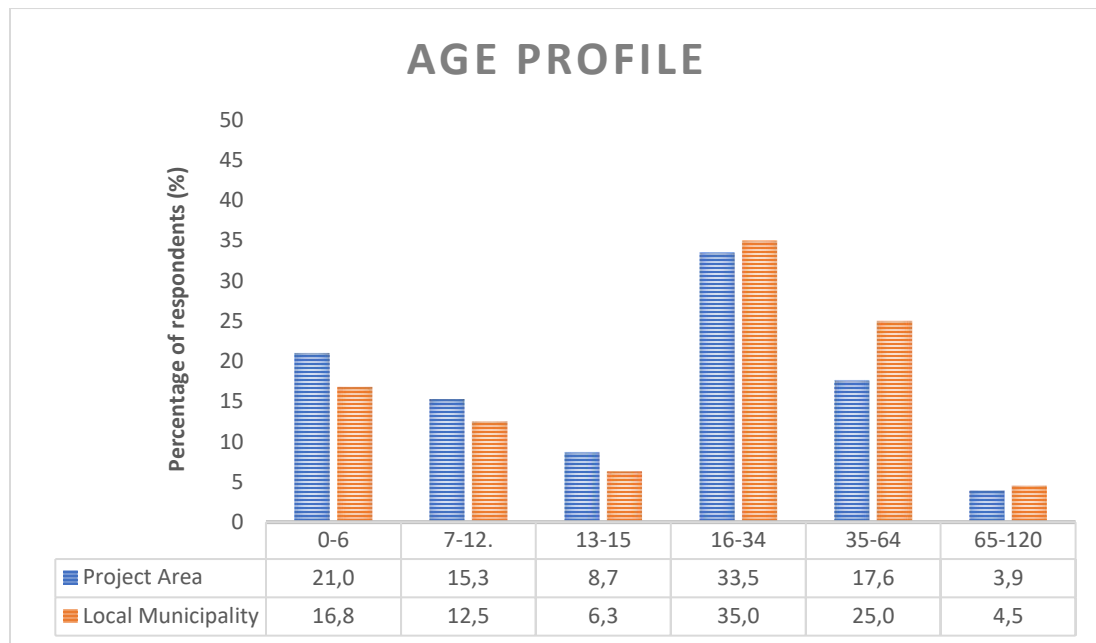
3 SOCIO-ECONOMIC COMPONENT

3.1 SOCIAL DEMOGRAPHIC CHARACTERISTICS

The figures illustrated below were prepared from the Census 2011 and Census 2016 data and present a socio-economic overview of the study area. The Dukuduku Housing project area falls within the jurisdiction of the Mtubatuba Local Municipality. The figures of the project area are therefore presented together with the overall figures of the municipality to yield a comparative socio-economic overview of the study area.

3.1.1 Age Profile

The age profiles of the project area and of the Mtubatuba Local Municipality (LM) are depicted in Figure 3.1 below. As illustrated by graph below, approximately 77.27% of population in the project area is under 35 years of age. Similarly, 76.26% of the population in the Mtubatuba LM is under 35 years of age. Approximately 33.37% of the project area population falls between the ages of 35 and 64 years, while 19.31% of the local municipal population fall under the same age bracket. The project area and Mtubatuba LM have a low proportion of people older than 65 years of age, at 3.92% and 4.44% respectively. The age distribution figures suggest that the population of the study area mostly consists of young individuals who will become the adults in the near future.

Figure 3.1: Age Profile


Source: Statistics SA, Census 2011.

3.1.1.1 Implications for the Rural Subsidised Housing Project:

Age distribution patterns are of utmost importance when planning future developments and allocating subsidies as various subsidised facilities will be better enjoyed by individuals of certain ages now and in the future. Age distribution is also considered when determining the need for other supporting facilities necessary to ensure maximum yield of benefits of any given development, such as the proposed rural housing project. The age distribution structure of the population of the project area has various implications as far as subsidised housing is concerned, which must be considered during the planning (location) and implementation of the project, these include:

- ✚ Provision of sufficient and appropriate education facilities within close proximity to the housing development, and thereby ensuring that scholars do not travel unnecessary distances.
- ✚ Provision of economic and/ or employment opportunities within close proximity of the houses as a number of young people will be entering the economically active

age category over the next five to ten years and will thus be seeking appropriate employment opportunities.

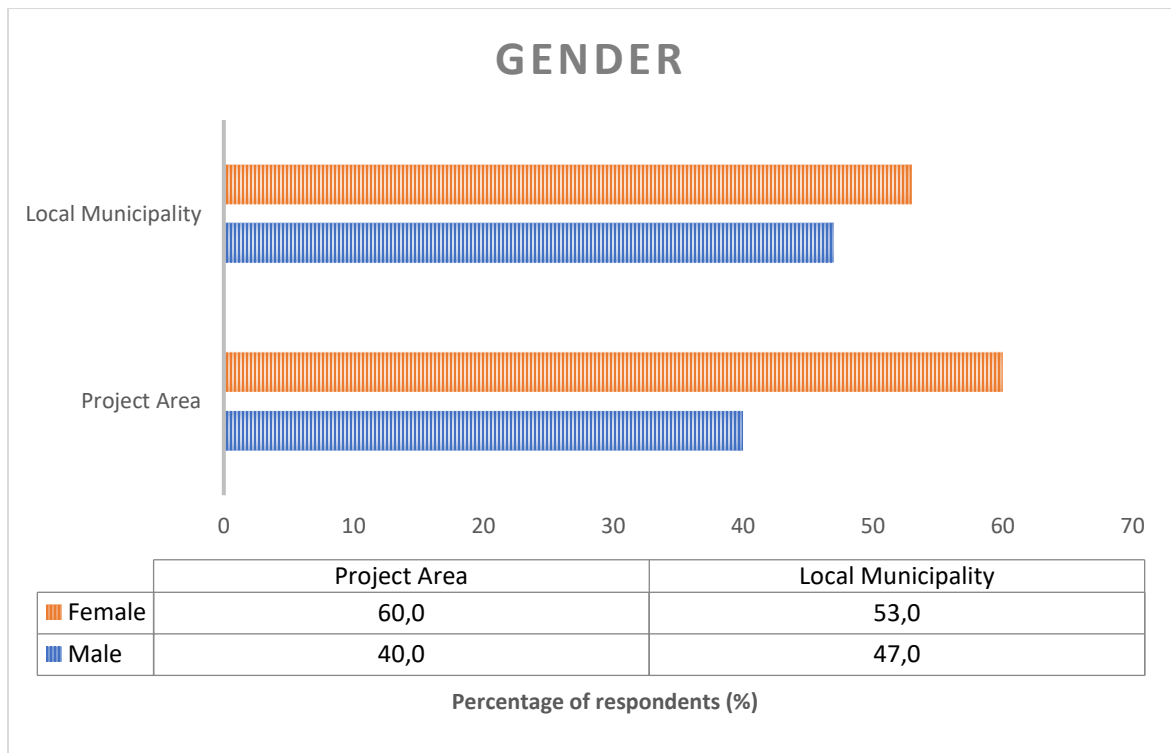
- ✚ Provision of adequate social services and amenities: as the young age profile increases the proportion of the population which are not yet economically active which results in a high dependency ratio which places increased pressure on social services, facilities, and amenities. Provision of such services will not only benefit young individuals but rather the community at large.

The lack of such facilities and services within close proximity to the area will result in the individuals and families relocating to areas where such services are available and therefore leaving the subsidised houses which were meant to improve their quality of life, thereby limiting the success of the proposed housing project.

3.1.2 Gender Profile

Figure 3.2 below illustrates a female dominant population within the study area and the overall municipality. According to the 2011 census information as much as 60% of the total population of the project area is female and 40% is male. Relatively similar trends of a female dominant population are evident for the overall Mtubatuba Municipal area with 53% of the total population being female and 47% being male.

Figure 3.2: Gender Profile



Source: Statistics SA, Census 2011.

3.1.2.1 Implications for the Rural Subsidised Housing Project:

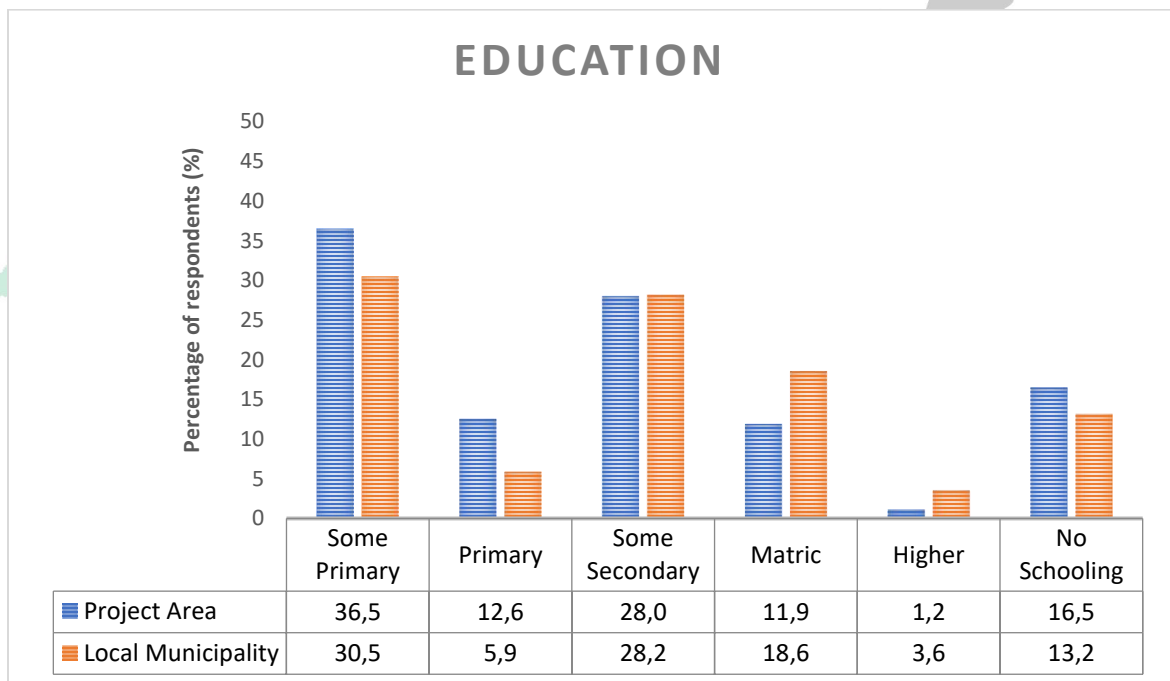
The implication of gender roles within the Dukuduku Housing project area need to be given due consideration with regards to the implementation of the envisaged subsidised housing project. Practices of gender equality and empowerment are necessary to ensure that benefits derived from the implementation of the proposed development are distributed in such a way that is reflective of the population structure as a whole.

3.1.3 Education Profile

The 2011 education profile of the study area and the Mtubatuba Local Municipality is illustrated in Figure 3.3 below. These figures illustrate the education levels of persons over the age of 15 years and therefore falling into the economically active categories of the population. The figures suggest relatively low education and literacy levels within the study area with approximately 16.5% of the population having indicated that they have not

undergone any formal schooling. Approximately 36.5% of the population indicated to have some primary education and only 12.6% have completed primary schooling. Only 28% of the adult population of the project area indicated to have some secondary education with only 11.9% of the population indicating to have completed Grade 12 and only 1.2% of the total population have undergone some form of post matric/ tertiary education training. The figures of the overall Mtubatuba Municipal area indicate a moderate education profile for the municipality with approximately 13.2% of the economically active population having undergone no formal schooling, 30.5% having received some primary level education and only 5.9% having completed primary education. Only 28.2% of the municipal population had received some secondary education and only 18.6% and 3.6% have completed Grade 12 and tertiary education respectively.

Figure 3.3: Levels of Education



Source: Statistics SA, Census 2011.

3.1.3.1 Implications for the Rural Subsidised Housing Project:

The relatively low levels of literacy within the project area will need to be taken into consideration with regards to the implementation of the proposed project to ensure that

that population within the project area who are illiterate are assisted, included and involved in community participation practices, and are not discriminated against as a result. Technical aspects of the proposed housing project may have to be communicated as they need to be clearly understood by the beneficiary communities. Specific provisions will need to be made to include those members of the project area who may be illiterate in the development process, so as to avoid the possibility of exclusion of certain demographics. Facilities with which to cater to adult education could similarly constitute a viable option for future municipal developments of the area. In terms of overall project development and management it is important to ensure that all beneficiaries fully understand and grasp the implications and technical aspects relating to this housing initiative.

3.1.4 Housing Profile

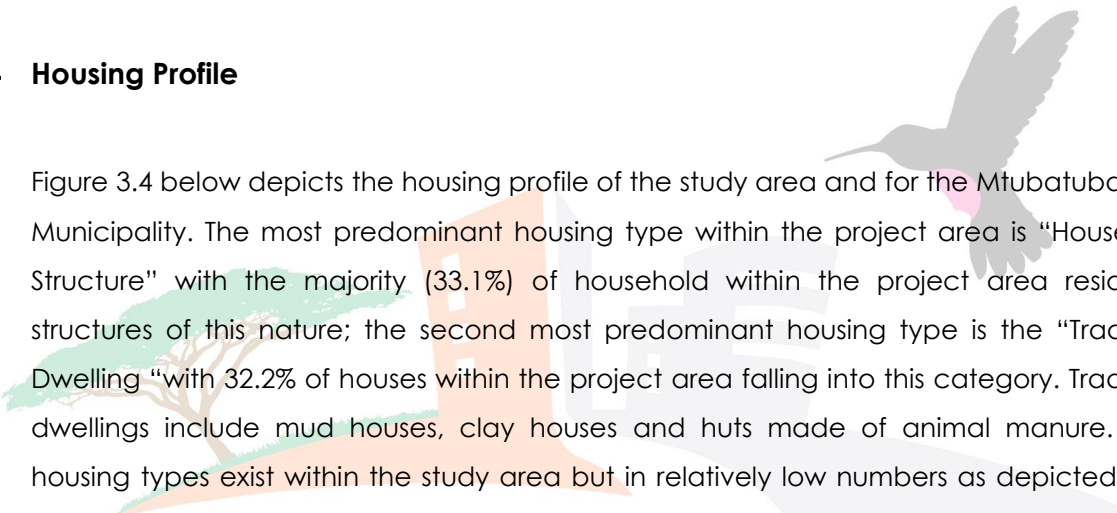
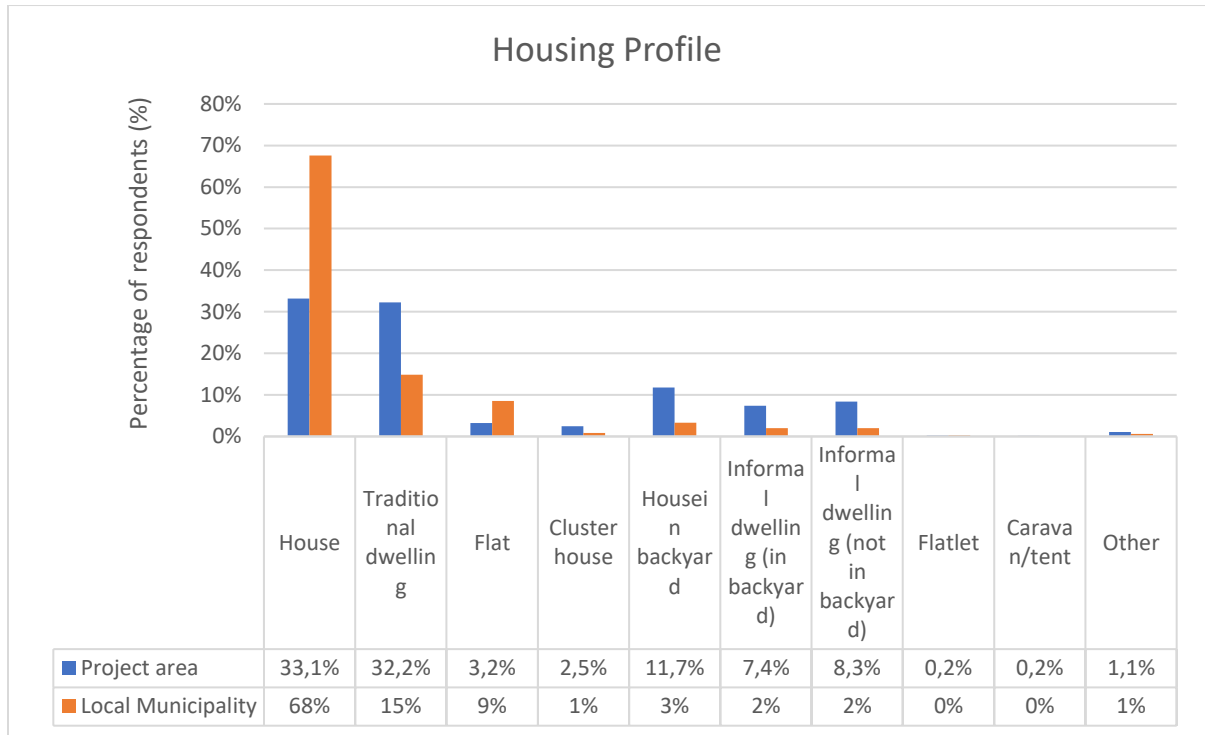


Figure 3.4 below depicts the housing profile of the study area and for the Mtubatuba Local Municipality. The most predominant housing type within the project area is “House/Brick Structure” with the majority (33.1%) of household within the project area residing in structures of this nature; the second most predominant housing type is the “Traditional Dwelling” with 32.2% of houses within the project area falling into this category. Traditional dwellings include mud houses, clay houses and huts made of animal manure. Other housing types exist within the study area but in relatively low numbers as depicted in the graph below. The overall figures for the municipality area depict a relatively similar housing profile with the most predominant and second most predominant housing type being “House/Brick Structure” (68%) and “Traditional Dwelling” (15%) respectively.

Figure 3.4: Housing Profile



Source: Statistics SA, Census 2011.

3.1.4.1 Implications for the Rural Subsidised Housing Project:

According to the Housing Act, 1997, it is pertinent that all citizens and permanent residents of the Republic will, on a progressive basis, have access to:

- ✚ Permanent residential structures with secure tenure, ensuring internal and external privacy and providing adequate protection against the elements.

The National legislated (RDP) minimum norms and standards in respect of housing supply in South Africa is considered to be a brick top structure of 40 m² (minimum), of which 33.1% of households in the project area; and 15% of the households within Mtubatuba Local Municipality; have access to housing services at this level. This national standard has been accepted by the Department of Housing as their minimum norms and standards for the rural housing instrument as far as subsidised housing provision is concerned.

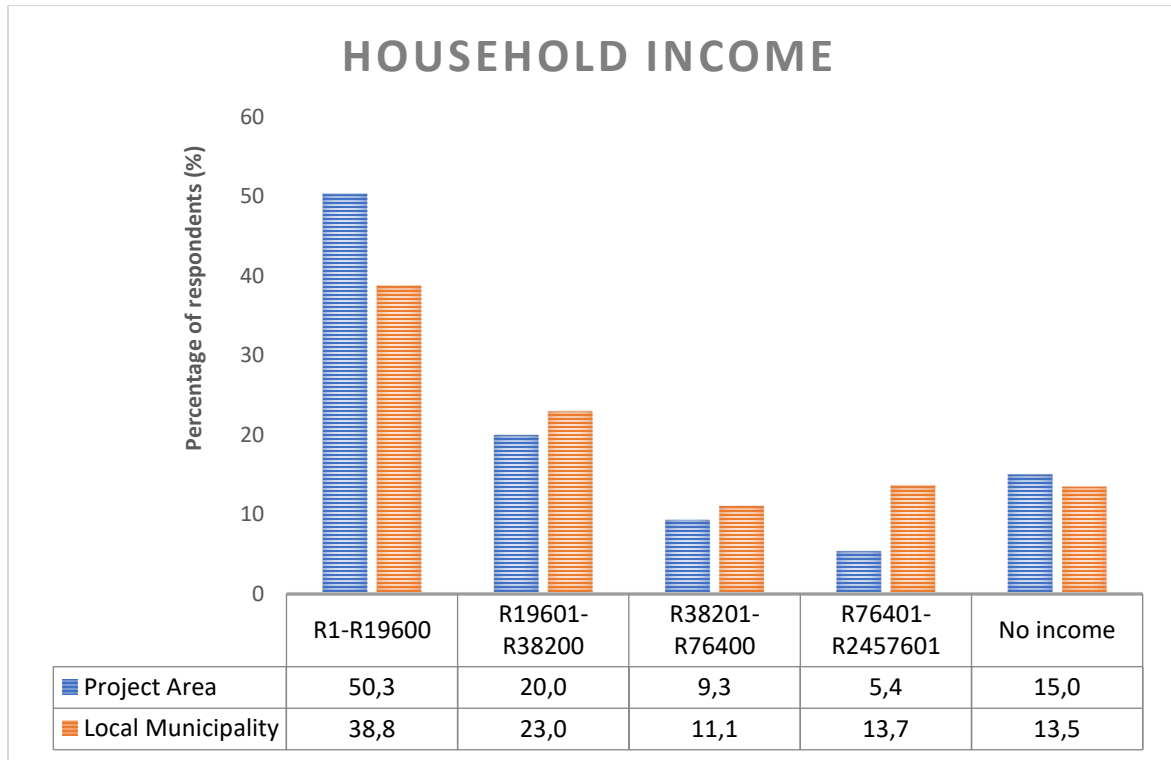
Due to the traditional nature of a considerable number (32.2%) of houses situated within the Dukuduku Housing project area, the need for the implementation of a rural subsidized housing project is clearly evident. Such a factor should therefore support and favour the implementation of the proposed project on the Dukuduku project area.

3.2 ECONOMIC DEMOGRAPHIC CHARACTERISTICS

3.2.1 Household Income and Affordability Profile

Figure 3.5 below illustrates a relatively low household income profile within the Dukuduku Housing project area and the overall Mtubatuba Local Municipality. As much as 50.3% of the total number of households within the study area indicated a collective monthly household income of R19600 and less, 20% fall within the income range of R19601 – R38200, approximately 9.3% earn between R38201 and R76400 while only 5.4% of the total number of households indicating a collective monthly household income of more than R76400. The 2011 Census data also show that 15% of the population within the project area have no form of income. Relatively similar monthly household income trends can be seen for the overall Mtubatuba Local Municipality in **Figure 3.5** below.

Figure 3.5: Monthly Household Income (Project Area)



Source: Statistics SA, Census 2011.

3.2.1.1 Implications for the Rural Subsidised Housing Project:

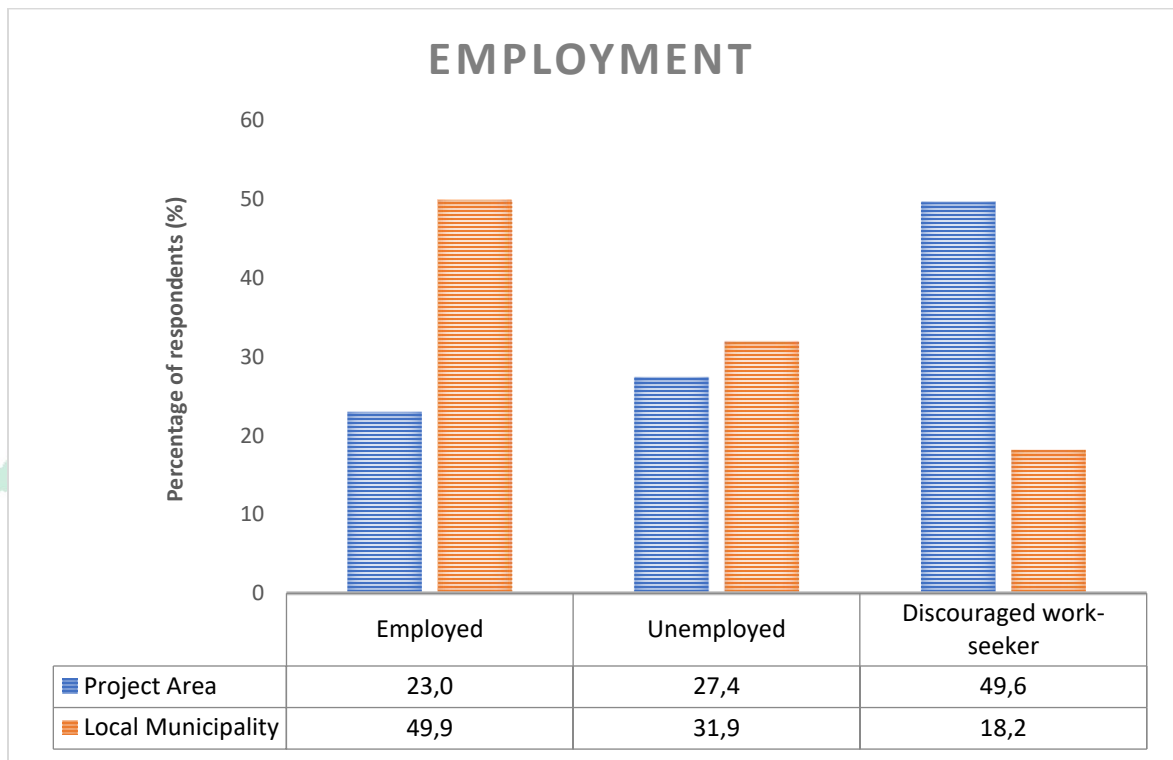
The figures above indicate moderate affordability levels within the project area and the municipality. The proposed rural housing project will benefit many households with low monthly income and who cannot afford proper housing. The ability of residents to pay for service levels above the minimum required standards will also be very limited.

3.2.2 Employment Profile

Figure 3.6 below illustrates the employment profile of the project area and the overall municipal profile. As much as 27.4% of the adult economically active population indicated to be unemployed, according to the narrow definition of unemployment. These figures include persons older than the age of 15 who indicated that they were unemployed at the time of the survey but seeking employment and that they were willing to take up any

employment position should it be presented. Only 23% of the economically active population within the project area indicated that they were employed at the time of the survey. As much as 49.6% of the economically active population indicated that they were discouraged job seekers. The survey on the overall employment profile of the Mtubatuba Local Municipality indicated a relatively more optimistic situation with 49.9% of the population being employed, 31.9% being unemployed and 18.2% being discouraged job seekers. The low affordability levels of the study area population are directly related to the high unemployment rate within the area.

Figure 3.6: Employment Profile



Source: Statistics SA, Census 2011

3.2.2.1 Implications for the Rural Subsidised Housing Project:

The potential role of the envisaged housing project in providing some employment and income generating opportunities during the construction and implementation phases should clearly be a key consideration in the project plan. The development of technical skills relating to construction which could benefit the project beneficiaries after completion

of the housing project should also be considered in the project implementation and management stages.



4 SERVICES AND INFRASTRUCTURE

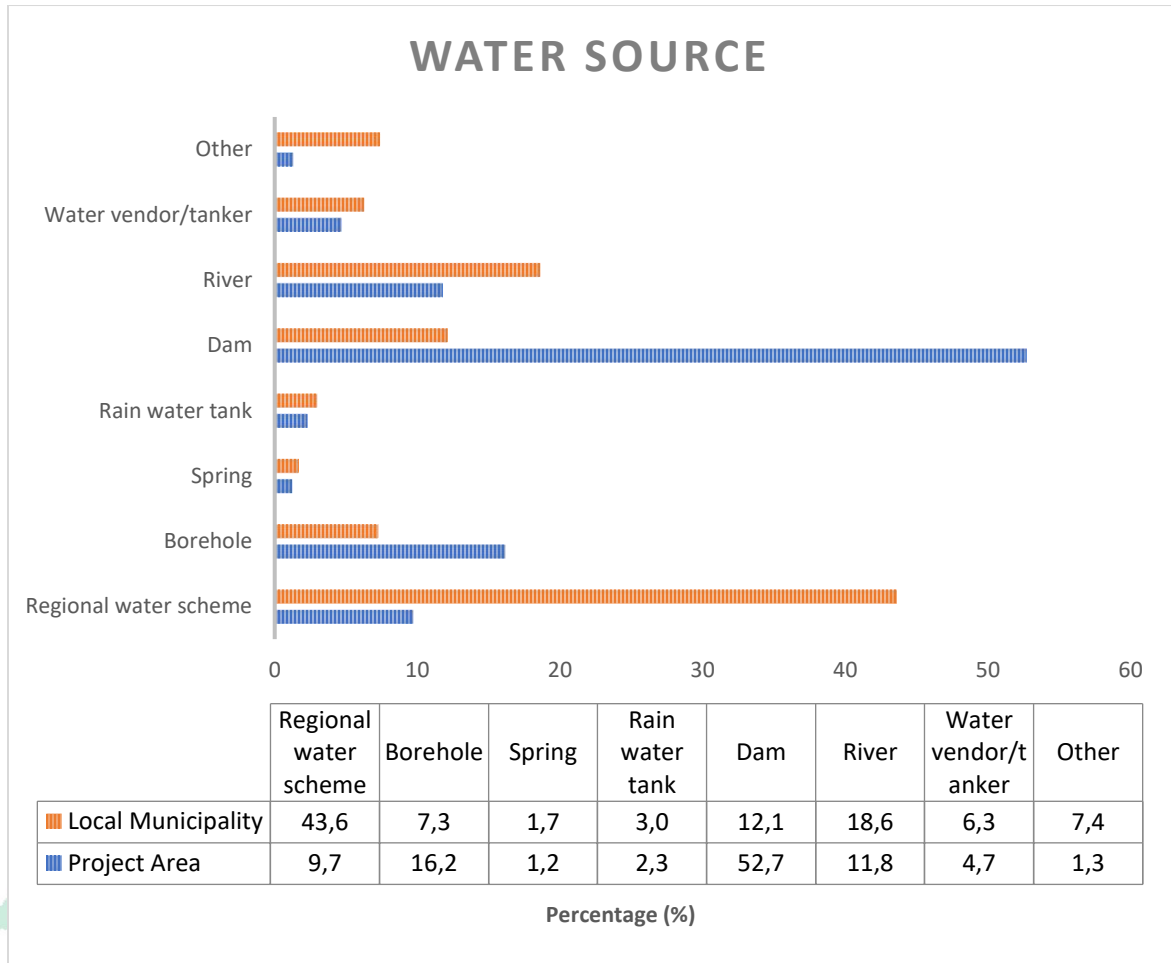
4.1 SERVICES DEMOGRAPHICS

4.1.1 Access to Water Sources and Water Infrastructure

Figure 4.1 below illustrates the different types of water sources accessed by the local communities in the study area and in the municipality. In the study area, a minority of water used by the local community is sourced from the Regional Water Scheme (9.7%) and the majority from dams (52.7%). Only 2.3% of water utilized by the local community in the study area is sourced from rainwater tanks and an equal percentage of water is sourced from a water vendor/tanker. Other sources of water are utilized in the study area, but at low levels as depicted in Figure 4.1.

At the municipal level, a different trend is observed. Approximately 43.6% of the municipal population sources its water from the Regional Water Scheme and 18.6% source the water from rivers. Approximately 6.3% of water utilized by the population is sourced from water vendors/tankers, with only 7.4% and 1.7% being sourced from other water sources and springs respectively (Figure 4.1). This suggests a higher dependence on borehole water at the municipal level (compared to the study area) and therefore a lack of water infrastructure development in the Mtubatuba Local Municipality as a whole.

Figure 4.1: Water Sources

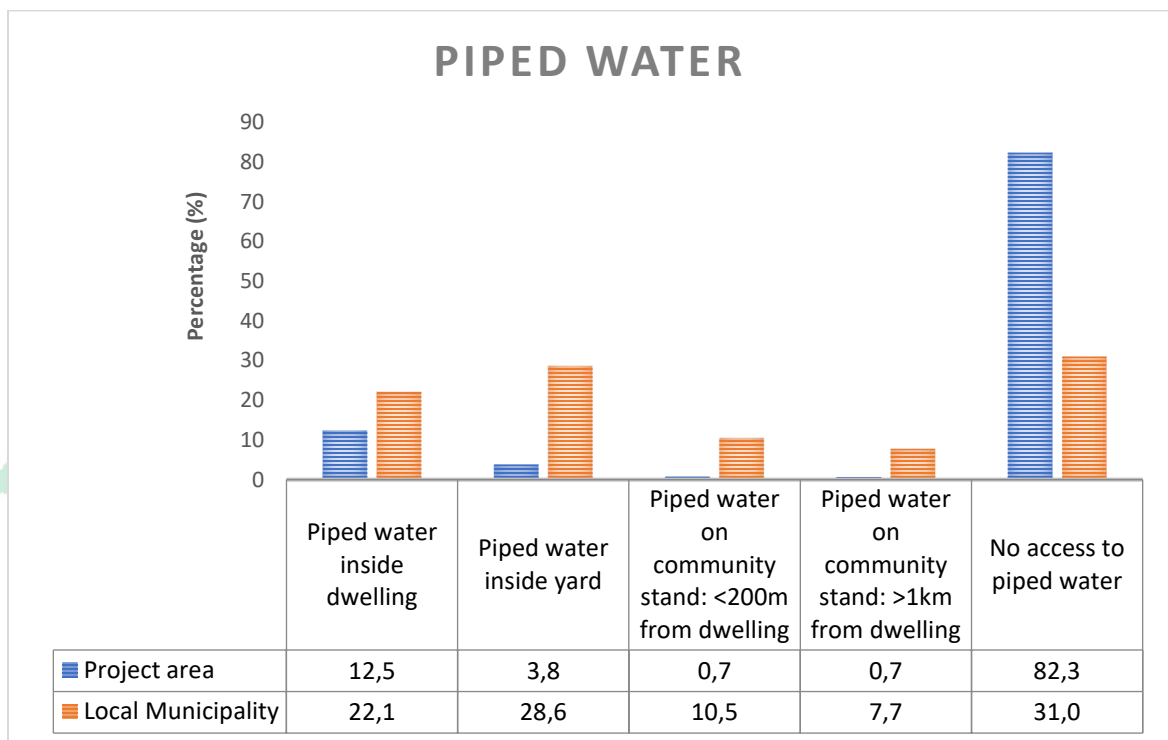


Source: Statistics SA, Census 2011.

Figure 4.2 below illustrates the levels of access to water infrastructure, for drinking and other auxiliary household uses, for communities residing within the project area and the overall Mtubatuba Local Municipality. The figure shows severely limited access to running water in the project area with only 12.5% of the total number of households having access to piped water “inside dwelling” and 3.8% having access to piped water “inside yard”. Approximately 0.7% of the households in the project area “access water from a communal stand pipe situated within 200m” from the dwelling while 0.7% “access water from a communal stand pipe situated further than 200m” from the dwelling with 82.3% of households having no access to piped water. It is quite clear that access to clean reliable running water was severely limited at the time that the survey was conducted within the Dukuduku area. Therefore, the area will benefit from further developments to their water infrastructure.

Mtubatuba Local Municipality households has a significantly higher percentage of households that have access to running water with only 22.1% and 28.6% of households having access to piped water “inside dwelling” and “piped water inside yard” respectively. A further 10.5% of households indicated to source water from a communal tap situated within a distance of 200 meters while 7.7% would source water from a communal tap situated more than 200 meters from the dwelling. Furthermore, only 31% of households do not have access to piped water.

Figure 4.2: Access to Water Infrastructure



Source: Statistics SA, Census 2011.

4.1.1.1 Implications for the Rural Subsidised Housing Project:

The levels of service delivery derived from acceptable national policy frameworks which are relevant for the level of water services indicate the following definitions as being applicable:

- A 'Survival' level of service providing five (5) to eight (8) litres of water per capita per day at 800 – 1500 meters walking distance;

- The RDP level of service providing twenty-five (25) litres of water per capita per day at 200 meters walking distance; and
- A higher level of service providing more than twenty-five (25) litres of water per capita per day and at less than 200 meters walking distance. It even includes a yard or house connection.

The National legislated (RDP) minimum norms and standards in respect of water supply in South Africa are therefore considered to be a maximum 200 m's walking distance between a communal stand pipe and one's residence, of which approximately 10.5% of the total Mtubatuba Local municipal population and 0.7% of the Dukuduku Housing project areas total population have access to water services at this level. This national standard has been accepted by the Department of Housing as their minimum norms and standards for the rural housing instrument as far as subsidised housing provision is concerned. Therefore, due to the fact that the provision of water amounts to housing purposes in terms of the Housing Board/Department of Human Settlements explanation of rural subsidies, the provision of water at the minimum RDP level of service provision at least should constitute a key municipal objective for implementation in Dukuduku Housing project area, as well as the Mtubatuba Local Municipality as a whole. The provision of Housing should therefore not occur in isolation but should be supported by various other necessary infrastructural and service provision projects.

4.1.2 Access to Sanitation Infrastructure

As shown by Figure 4.3 below, the majority of respondents indicated having no means of sanitation (68.2%) while as much as 11% of the population in the project area use flush toilets connected to a sewage system. Only 1% of households use flush toilets connected to a septic tank.

The statistics of the overall Mtubatuba Local Municipality indicated 18.5% of households making use of flush toilets connected to a sewerage system and 27.2% using Pit toilets without ventilation (Unimproved). Approximately 11.5% of households within the Municipality use Pit toilets with ventilation (VIP) toilets connected to a sewerage system and 8.9% of households use chemical toilets. Approximately 18.5% of households have no

means of sanitation. Approximately 12.8% of households use other means of sanitation, 3.3% use flush toilets connected to a septic tank and only 0.8% of households use bucket toilets.

The absence of appropriate sanitation infrastructure in the project area is clearly evident from the information depicted in Figure 4.3 below. This is illustrated by the fact that flush toilets (both sewerage system and septic tank system toilets) are utilized by a very small minority in the project area (12%) compared to the Municipality (20.3%). Similarly, the use of bucket toilets is slightly less prevalent in the project area (0.7%) compared to the Municipality (0.8%). The figures therefore indicate a high need of proper sanitation facilities but the limited access to running water within the area could be a major reason for the lack of sanitation infrastructure in the Dukuduku Housing project area.

The potential impact of the extensive utilization of bucket toilets and other forms of inappropriate sanitation infrastructure, on biophysical aspects such as surface and ground water, as well as the potential health implications is clearly evident from these figures, as is the need for improved access to sanitation infrastructure in the greater Mtubatuba Local Municipality and in particular the Dukuduku Housing project area.

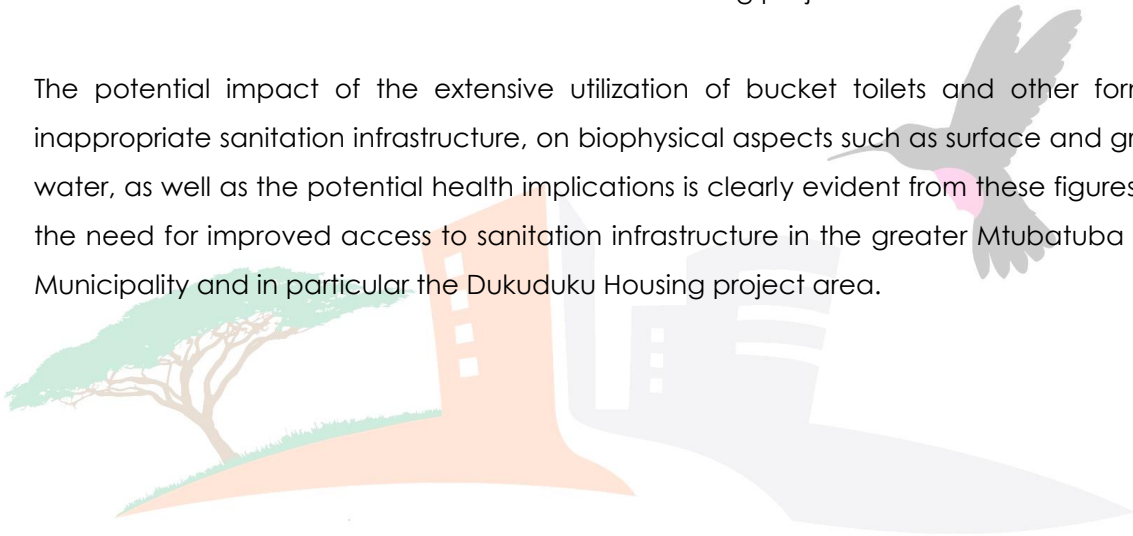
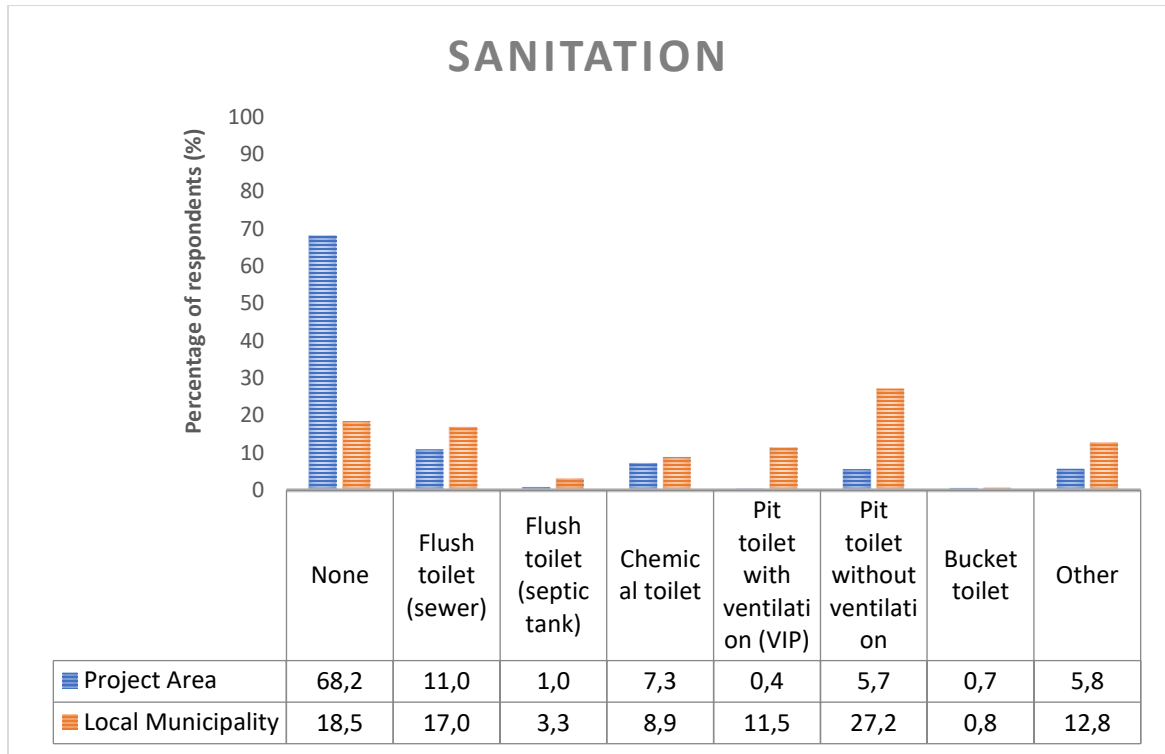


Figure 4.3: Access to Sanitation Infrastructure



Source: Statistics SA, Census 2011.

4.1.2.1 Implications for the Rural Subsidised Housing Project:

The levels of service delivery derived from acceptable national policy frameworks which are relevant for the level of sanitation services indicate the following definitions as being applicable:

- a Ventilated Improved Pit latrine (VIP) level of service;
- the interim level of service providing on-site sanitation that could include amongst others an on-site dry system (single, double pit or organic systems such as the Enviroloo) or an on-site wet system (such as a low flush or a septic tank and french drain); and
- A waterborne level of service providing treatment of raw sewage by means of a Sewage Treatment Works.

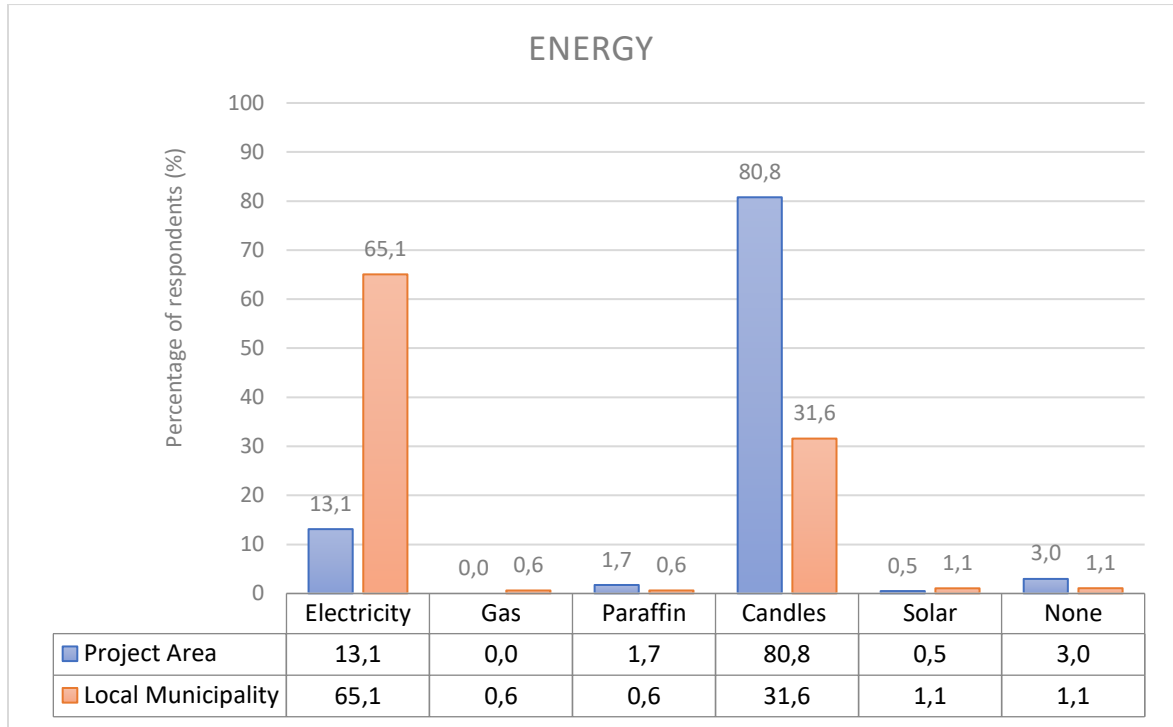
The National legislated (RDP) minimum norms and standards in respect of sanitation service provision in South Africa is considered to be ventilated improved pit toilet (VIP), of which approximately 12% of the total households in Mtubatuba Local Municipal area and

0% of the Dukuduku Housing project areas total population have access to sanitation services at this level. This national standard has been accepted by the Department of Human Settlements as their minimum norms and standards for all rural housing instruments as far as subsidised housing provision is concerned. Therefore, due to the fact that the provision of sanitation amounts to housing purposes in terms of the Housing Board/Department of Human Settlements explanation of rural subsidies, the provision of sanitation at the minimum RDP level of service provision at least should constitute a key municipal objective for implementation in the Dukuduku Housing project area, as well as the Mtubatuba Local Municipality as a whole. The provision of Rural Subsidised Housing should therefore not occur in isolation but should be supported by various other necessary infrastructural and service provision projects.

4.1.3 Access to Electricity Infrastructure

Figure 4.4 below indicates the various energy sources used for lighting purposes by households within the Dukuduku Housing project area and the overall Mtubatuba municipal area. During the time of the survey, the majority of households within the project area (80.8%) indicated that they used candles while 1.7% used paraffin and only 13.1% of households use electricity. Approximately 1.1% of the households indicated the use of solar power and 0% of households use other/no sources of electricity. The trends in "energy for lighting" statistics recorded for the overall municipal area were vastly different with as much as 65.1% of the households within the overall Mtubatuba municipality indicating to use electricity and only 31.6% used candles for lighting in 2011. Only 0.6% of households within the municipal area indicated the use of paraffin as a source of lighting. Furthermore, solar (1.1%) and gas (0.6%) were also recorded as lighting source respectively; with 1.1% of households indicating that they used other or no sources of lighting. The proportion of households with access to electricity in the study area is significantly lower than the comparative figure for the Local Municipality (Figure 4.4).

Figure 4.4: Access to Electricity Infrastructure



Source: Statistics SA, Census 2011.

4.1.3.1 Implications for the Rural Housing Project:

The provision of an internal electrical reticulation network is not viewed as a minimum requirement as far as subsidised housing is concerned, and as such the provision of an internal electrical reticulation network does not form part of the proposed subsidised housing project. The absence of appropriate electricity infrastructure can often result in the extensive utilization of firewood for cooking and heating purposes with the resulting potential negative impact on natural vegetation. Limited access to electricity infrastructure often contributes to the general deforestation of the surrounding area, and increased levels of air pollution arising from the use of firewood for cooking and heating purposes.

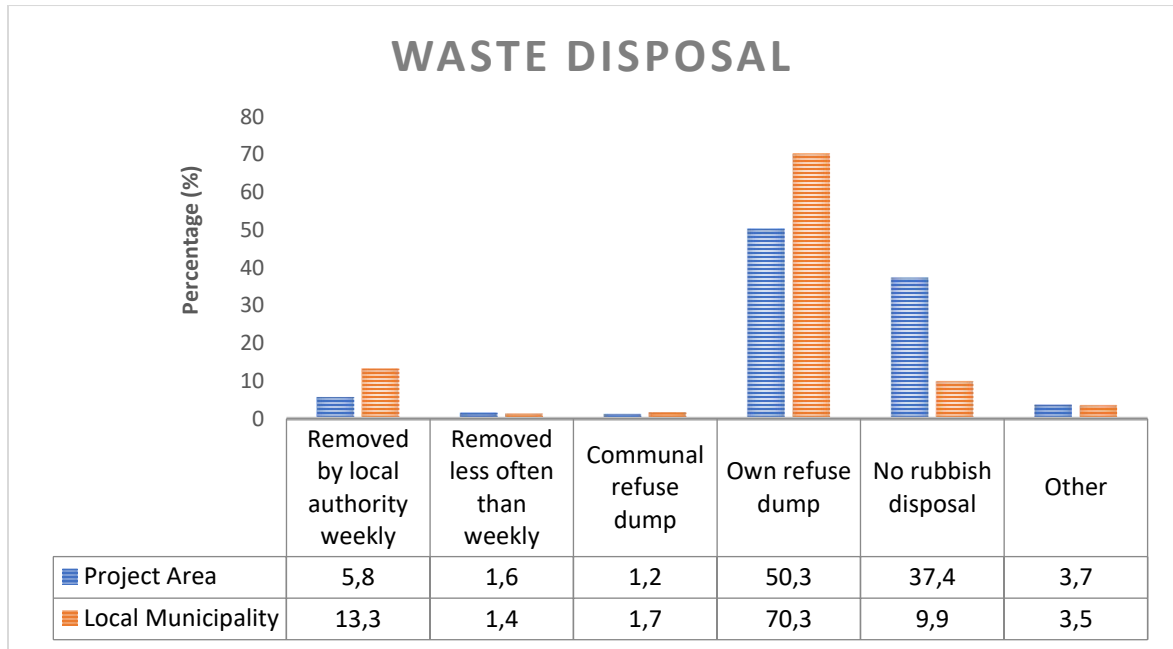
4.1.4 Access to Waste Removal Services

The graph in Figure 4.5 below depicts the various waste management/ removal methods recorded as being used by the various households within the project area and the overall local municipality. The limited availability of any form of formalized refuse removal system in the Dukuduku Housing project area and the overall Mtubatuba Local Municipality at the time of the survey is clearly illustrated in the graph. As much as 50.3% of the total number of households within the project area indicated that they make use of their own refuse dump, be it pit holes in the yard or in close proximity to the house.

Only 5.8% of households within the project area had its refuse collected by the municipality once a week and 1.6% of households indicated that their refuse was collected by the local municipal authority less often than weekly basis. None of households in the project area made use of a communal dump. Approximately 3.7% of households in the project area made use of other waste disposal methods and 37.4% of households did not have access to any form of waste management.

In contrast to the above, the figures from the graph indicate that 13.3% of the households in Mtubatuba Local Municipality had their refuse collected once a week, 1.4% of the households had their waste collected less often than on a weekly basis and 1.7% made use of communal dump sites. Less than half of the households in the Mtubatuba Local Municipality (70.3%) used their own dump (Figure 4.5). Approximately 3.5% of households in the Municipality use other methods of waste disposal and as much as 9.9% of households do not have access to any form of waste disposal. From the graph it is evident that the majority of households in the Dukuduku Housing project area have no access to any form of waste removal or disposal services and dispose of their refuse through means of their own refuse dumps. Although the Mtubatuba Municipal Area provides better access to waste disposal for its residents, a significant proportion of households in the Municipality make use of their own refuse dump (70.3%) (Figure 4.5).

Figure 4.5 Access to Waste Removal Services



Source: Statistics SA, Census 2011.

4.1.4.1 Implications for the Subsidised Housing Project:

The Mtubatuba Local Municipality is the service provider responsible for the provision of a functional waste removal and disposal system within the study area. It must be noted that the absence of waste removal services in the study area can not only impact negatively on the biophysical environment, but also on the aesthetic appearance of the area, and the overall health profile of the resident communities, as well as their livestock as a result of livestock ingesting such waste.

4.2 INFRASTRUCTURE

4.2.1 Roads

This section of the report provides an overview of existing road networks occurring across and providing access to the Dukuduku Housing project area. This overview or the existing road networks is also illustrated in Map 4.1 below. **It must be noted that the scope of the proposed Dukuduku Housing Project does not include any major construction of new roads to the project area, in some instances some individual access roads will be constructed but which will be well below the triggers for environmental authorisation. The accesses will be less than 4-meter-wide, with no construction activity being permitted within a 32m stream, dam, river and wetland.**

4.2.1.1 National Roads

There are no National Roads that have been proclaimed within the project area.

4.2.1.2 Provincial Roads

There is only one Provincial Road, the P237 that runs along the northern border of the project area.

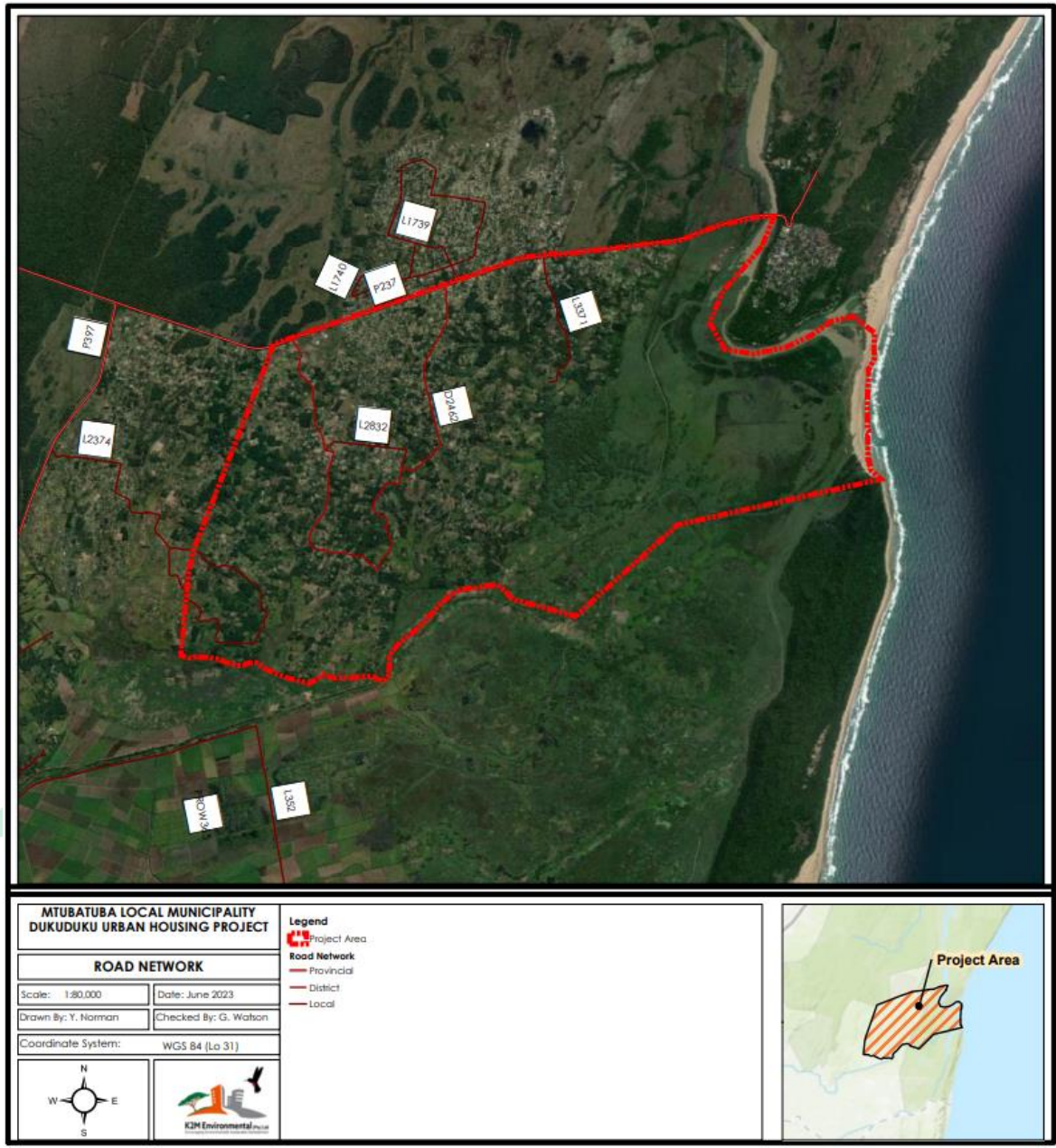
4.2.1.3 District Roads

There is one District Road, namely the D462 that runs through the central portion of the project area.

4.2.1.4 Local Access Roads

There are three numbered local access roads around the site, namely the L2374 which traverses the western portion of the project area, the L2832 which traverses the central portion of the project area and the L3371 which traverses the northern portion of the project area.

Map 4.1: Road Network



Source: Department of Transport

4.2.1.5 Implications for the Rural Subsidised Housing Project:

The National legislated (RDP) minimum norms and standards in respect of roads in South Africa are considered to be “access to all even with graded or gravel paved roads”. This national standard has been accepted by the Department of Human Settlements as their minimum norms and standards for the rural housing instrument as far as road provision is

concerned. It is important to note however that *no new access roads* are planned as part of the Dukuduku Housing Development. Grading processes may be conducted on some existing roads as part of the proposed project in an attempt to improve the current condition of these roads within the Dukuduku Housing project area and will therefore form part of a road maintenance programme, however such a process will not extend to the creation of any new road networks. Furthermore, due to the fact that no new road networks are planned as part of the proposed development, and due to the fact that grading purposes form part of routine road maintenance the surrounding natural environment will not be adversely impacted upon.

It should also be noted that all District Roads will be allocated a 20 m road reserve, to which an additional 10 m building line will be added onto either side, while all Local Access roads will be afforded a minimum 15 m building line within which no construction activities may occur. This therefore ensures that no construction activities associated with the proposed rural housing project will result in any adverse impacts on the existing road network.

4.2.2 Stormwater

Whilst low-income rural subsidised housing developments have huge budgetary constraints on the design and implementation of stormwater management and control systems, it is vitally important to dispose of stormwater as effectively and efficiently as possible. This is because uncontrolled stormwater runoff can cause damage to property and may erode and destabilise fill and cut banks. The objectives of the stormwater management system should be as follows:

- ✚ To adequately dispose of runoff from developed areas without causing soil saturation or erosion. This is particularly important on any sites underlain by erodible soils and on steep slopes;
- ✚ To provide overland flow routes through developments to cater for major storms and thereby minimising any risk of damage to property infrastructure and other immovable assets;

- ✚ Stormwater systems should be designed to function adequately with low maintenance in the long term, and should cater for silting, etc.

4.2.2.1 Implications for the Subsidised Housing Project:

While the National legislated (RDP) minimum norms and standards in respect of stormwater management in South Africa is considered to be “Lined open channels” the logistics and costs involved with the implementation thereof mean that such a minimum norm and standard is not feasible for implementation as part of the Rural Subsidised Housing development.

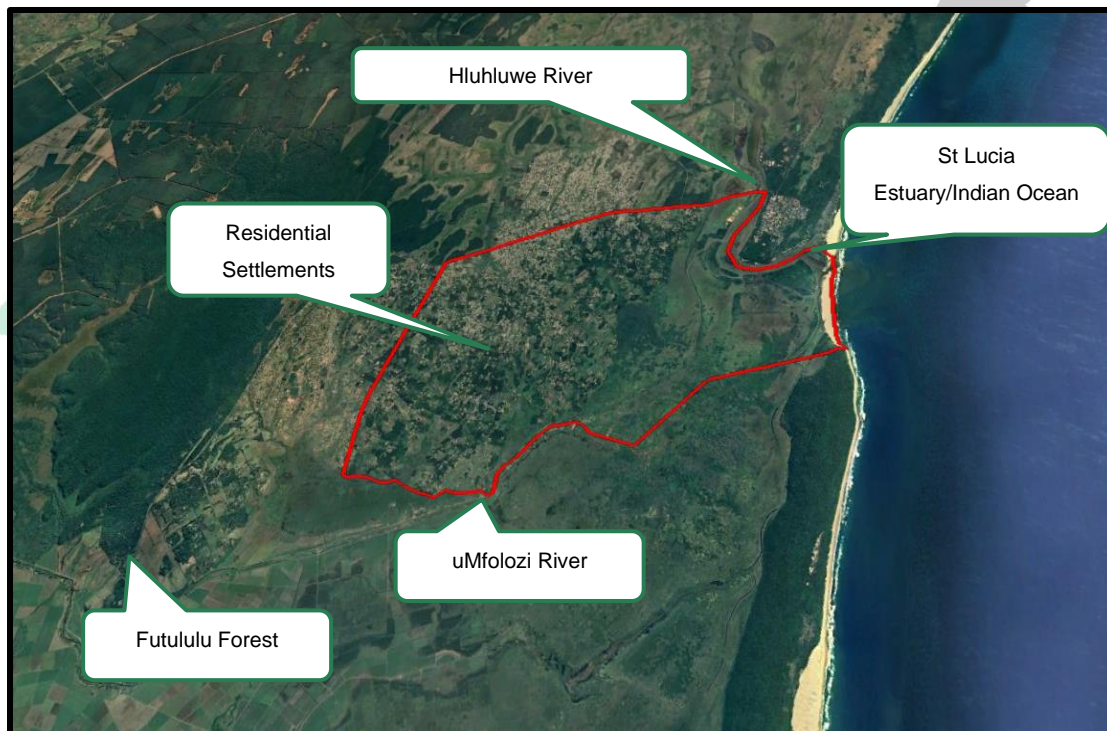


5 BIO-PHYSICAL COMPONENT

5.1 CURRENT LAND USE

As illustrated in the **Figure 4.1** below, the project area is characterized by residential settlements. The surrounding land uses are largely Agricultural and Conservation/Eco-Tourism. The Provincial Road, P237 traverses along the northern border of the project area while the Hluhluwe and uMfolozi Rivers flow along the northern and southern borders of the project area respectively. The project area is bordered by the Indian Ocean to the east.

Figure 5.1: Current Land Use



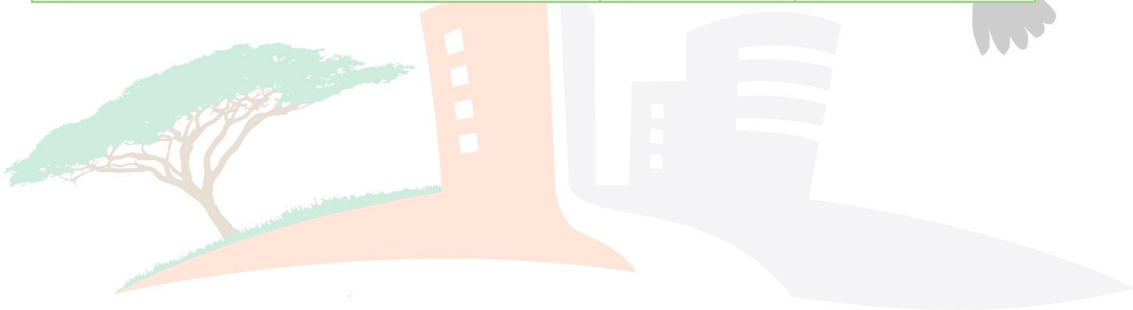
Source: Google Earth Imagery, 2023

5.2 LAND COVER AND TOPOGRAPHY

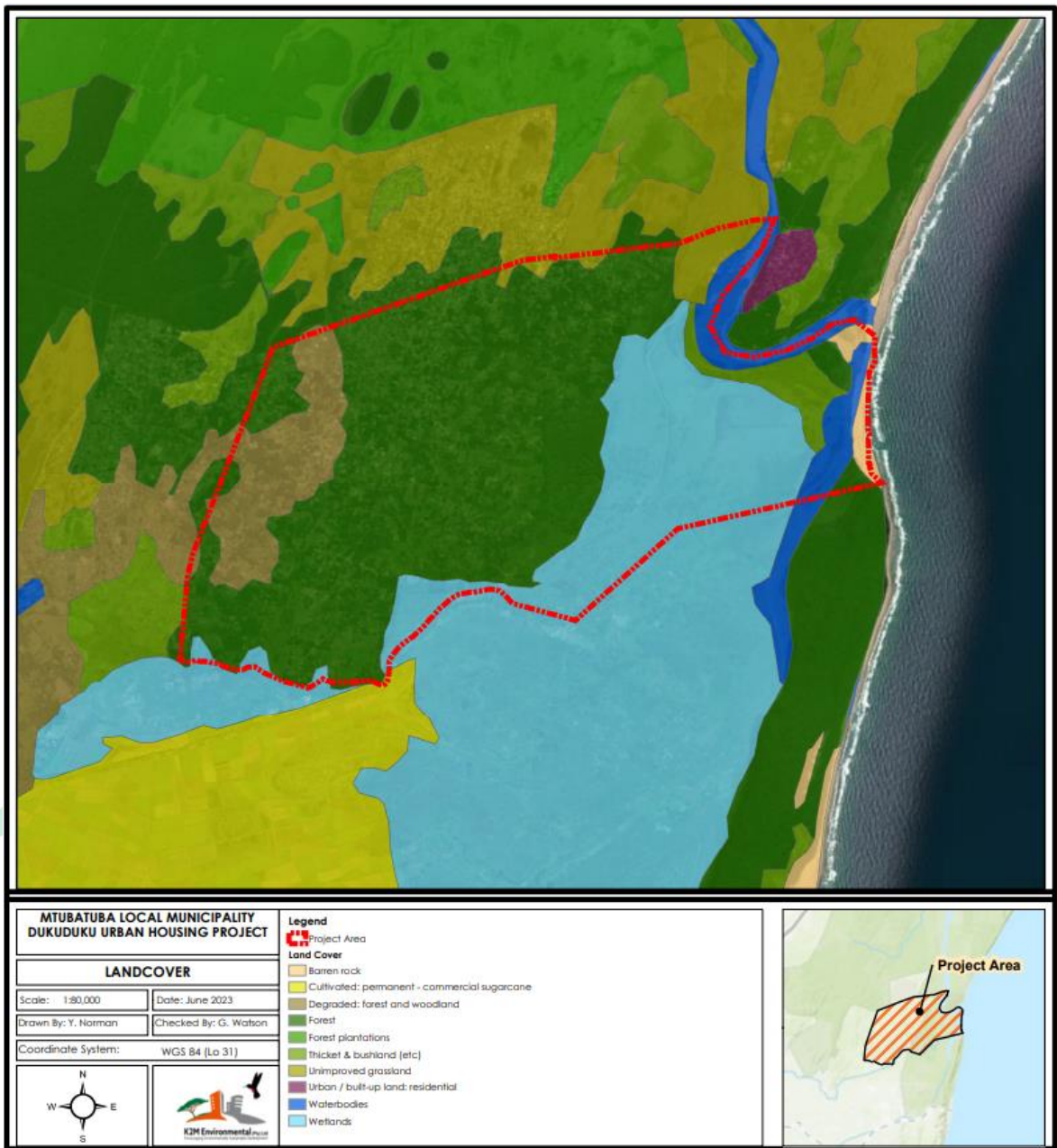
The dominant landcover in the project area is "Forest" (57.61%), followed by 'Wetlands' (22.94%). The remaining landcover categories are displayed in **Table 5.1** and **Map 5.1** below.

Table 5.1: Landcover

Landcover	Size (ha)	Percentage (%)
Barren rock	58,6	1,06
Cultivated;permament-commercial sugarcane	1,85	0,03
Degraded: forest and woodland	486,68	8,75
Forest	3199,66	57,61
Thicket & bushland (etc)	158,10	2,84
Unimproved grassland	137,52	2,48
Waterbodies	245,35	4,42
Wetlands	1274,18	22,94
Total	5561.94	100

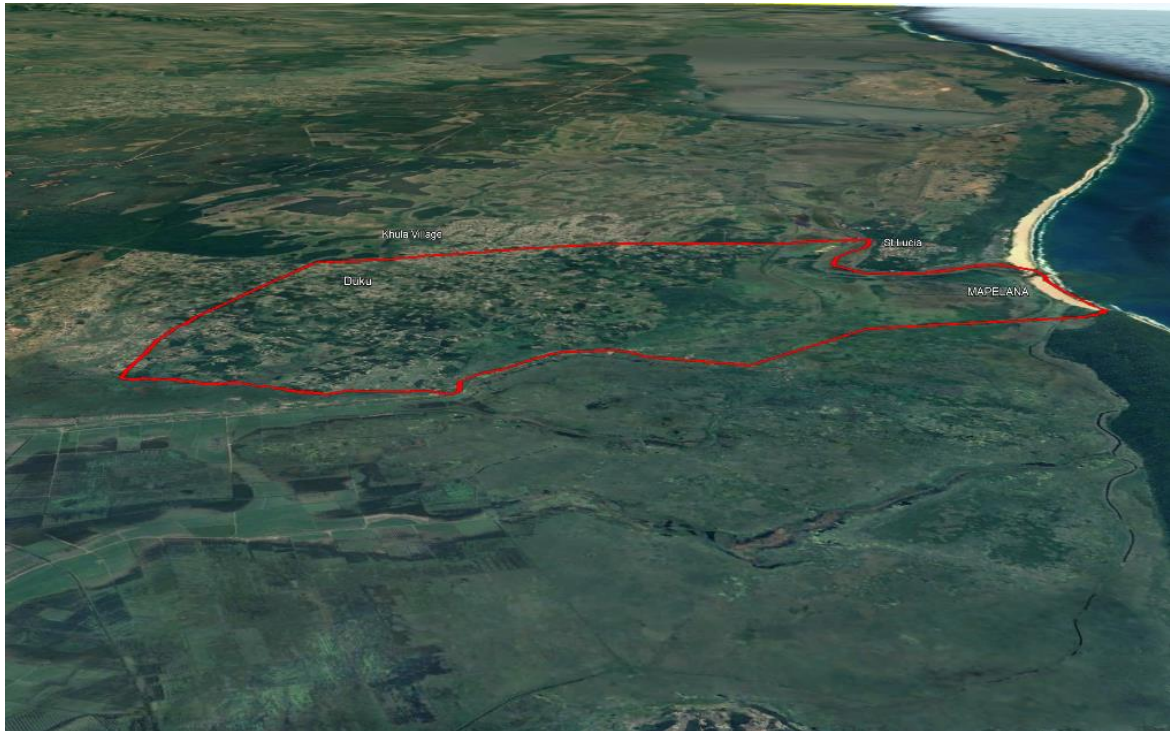


Map 5.1: Land Cover



As depicted in **Figure 5.2** below, the topography in the project area is predominantly flat with gentle undulating slopes.

Figure 5.2: Topography



Source: Google Earth Imagery, 2023

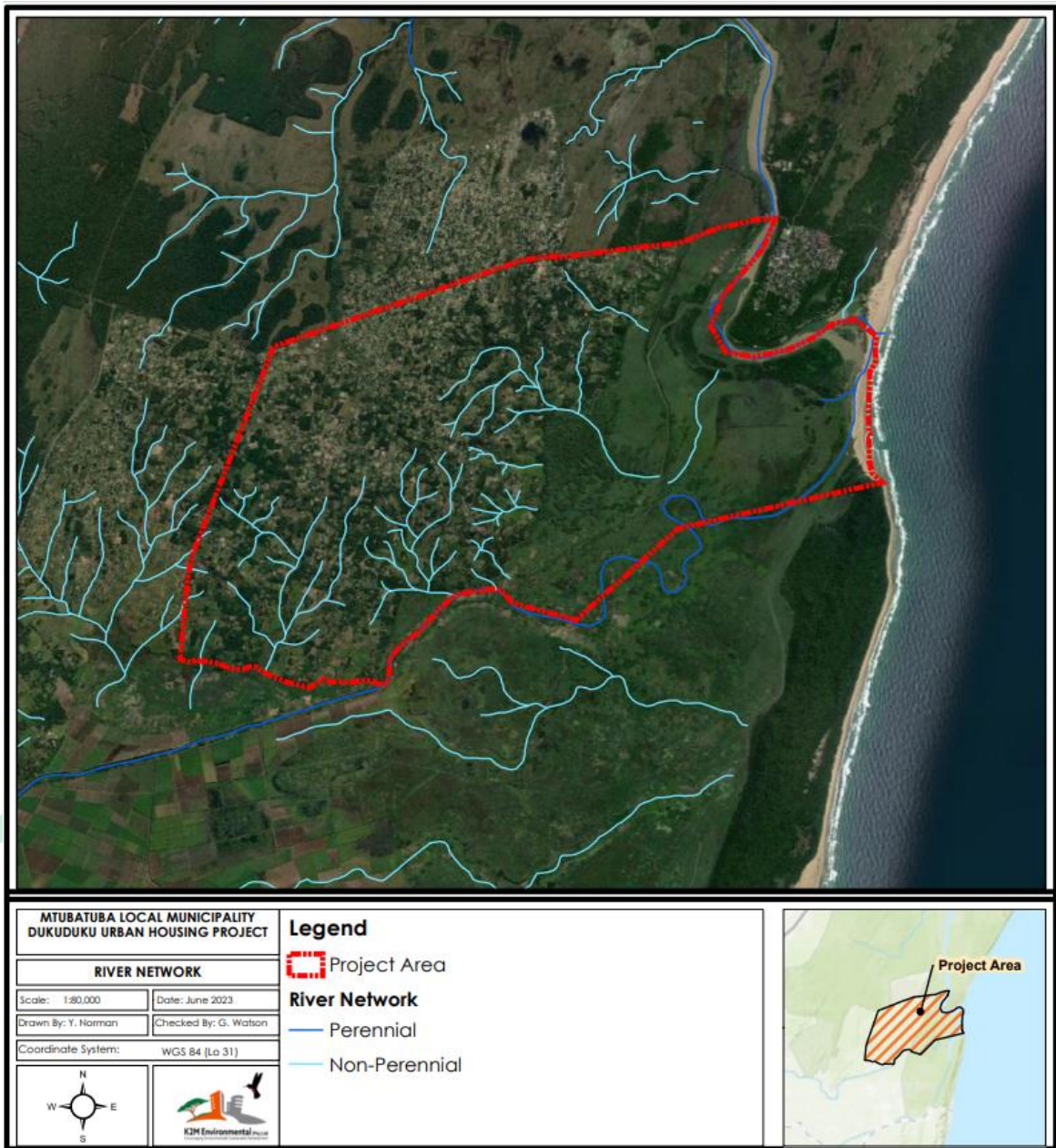
5.3 RIVER NETWORK

As indicated in **Map 5.2**, The project area is traversed by non-perennial streams throughout the area and two perennial rivers, namely the Hluhluwe and Umfolozi Rivers flow along the northern and southern border of the project area respectively. It should be noted that in terms of the National Water Act, as well as other developmental legislation which are applicable, should the project area be subject to a 1:100-year flood line, no development should occur within this area.

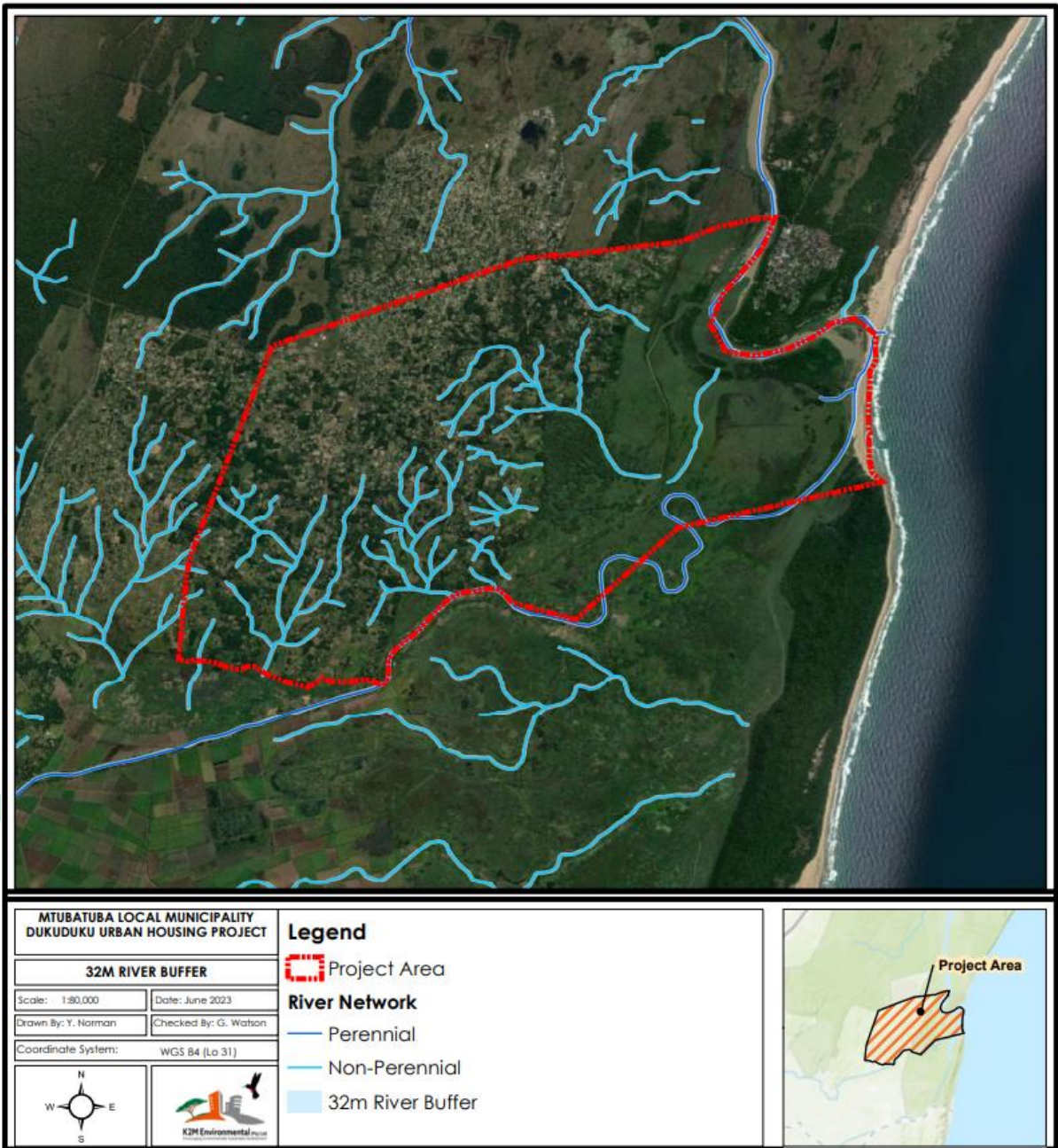
However, in terms of the 2014 EIA Regulations, all new development should be located at least 32m's away from the bank of any river or stream. Should construction take place within 32m from the bank of any river or stream, then an EIA will need to be applied for.

Map 5.3 below illustrates the 32m river network buffer.

Map 5.2: River Network



Map 5.3: 32m Buffer

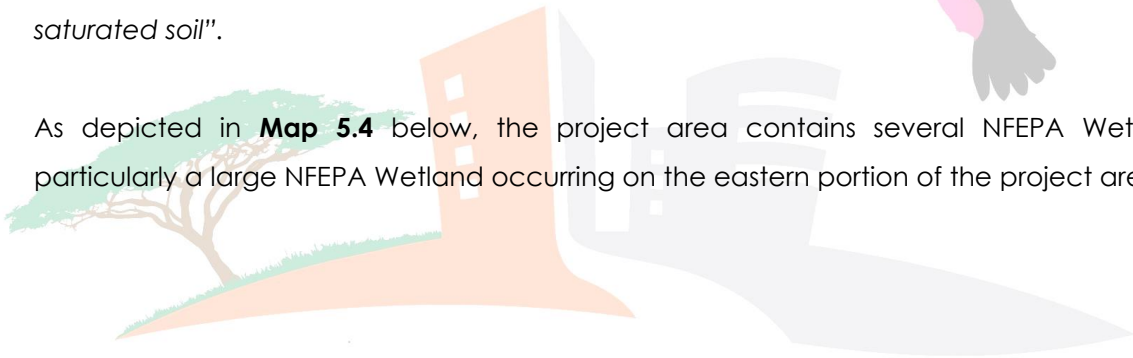


5.4 FRESHWATER ECOSYSTEM PRIORITY AREAS

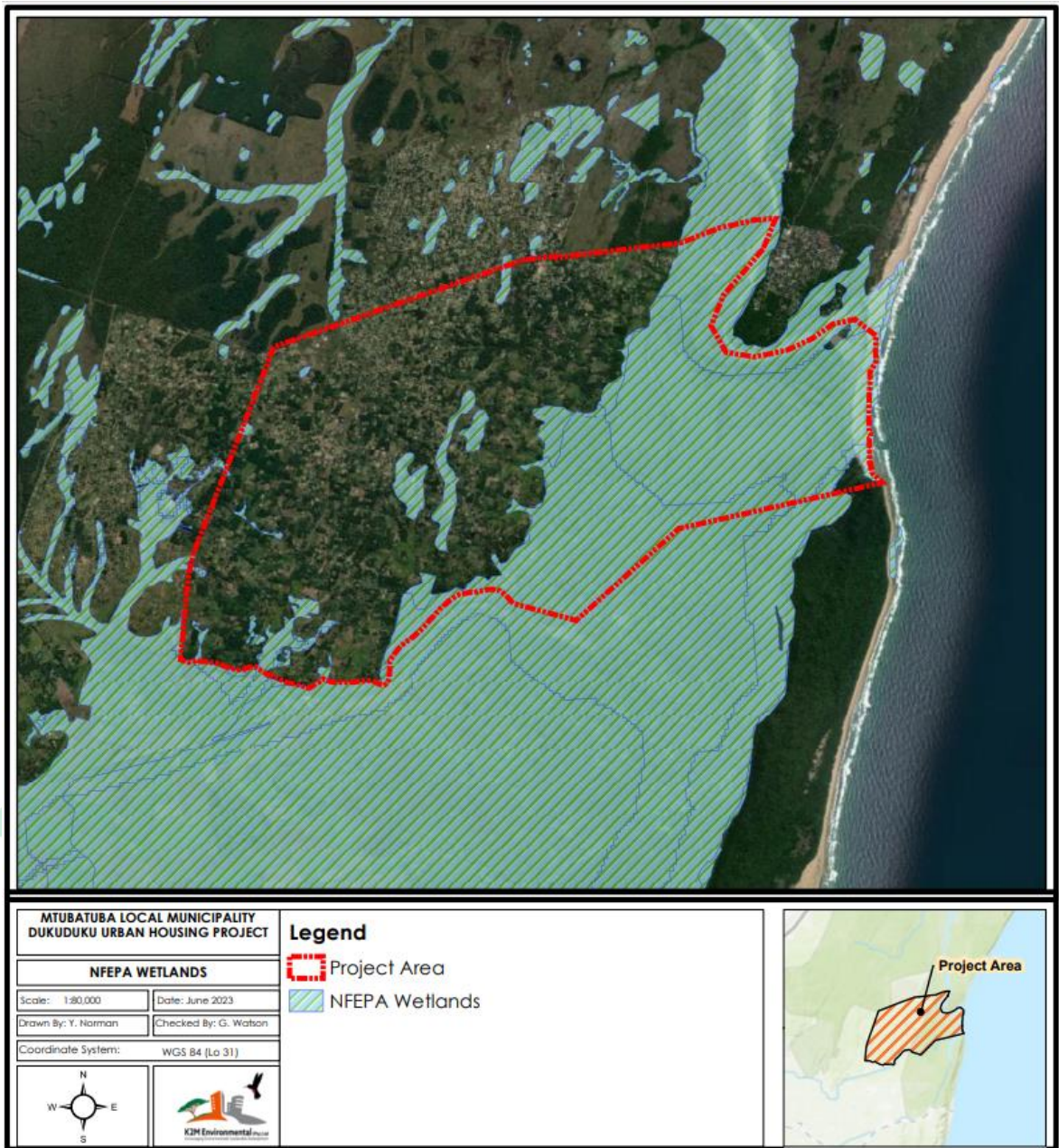
Freshwater Ecosystem Priority Areas (FEPA's) according to the Water Research Commission are strategic spatial priorities for conserving freshwater ecosystems and supporting sustainable use of water resources. Freshwater ecosystems refer to all inland water bodies whether fresh or saline, including rivers, lakes, wetlands, sub-surface waters and estuaries. FEPAs are often tributaries and wetlands that support hard-working large rivers and are an essential part of an equitable and sustainable water resource strategy. FEPAs need to stay in a good condition to manage and conserve freshwater ecosystems, and to protect water resources for human use (Water Research Council).

According to the National Water Act (1998), a wetland is defined as "*Land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land, in normal circumstances, supports or would support vegetation typically adapted to life in saturated soil*".

As depicted in **Map 5.4** below, the project area contains several NFEPA Wetlands, particularly a large NFEPA Wetland occurring on the eastern portion of the project area.



Map 5.4: NFEPA Wetlands



Source: Department of Water and Sanitation

5.5 AGRICULTURAL POTENTIAL

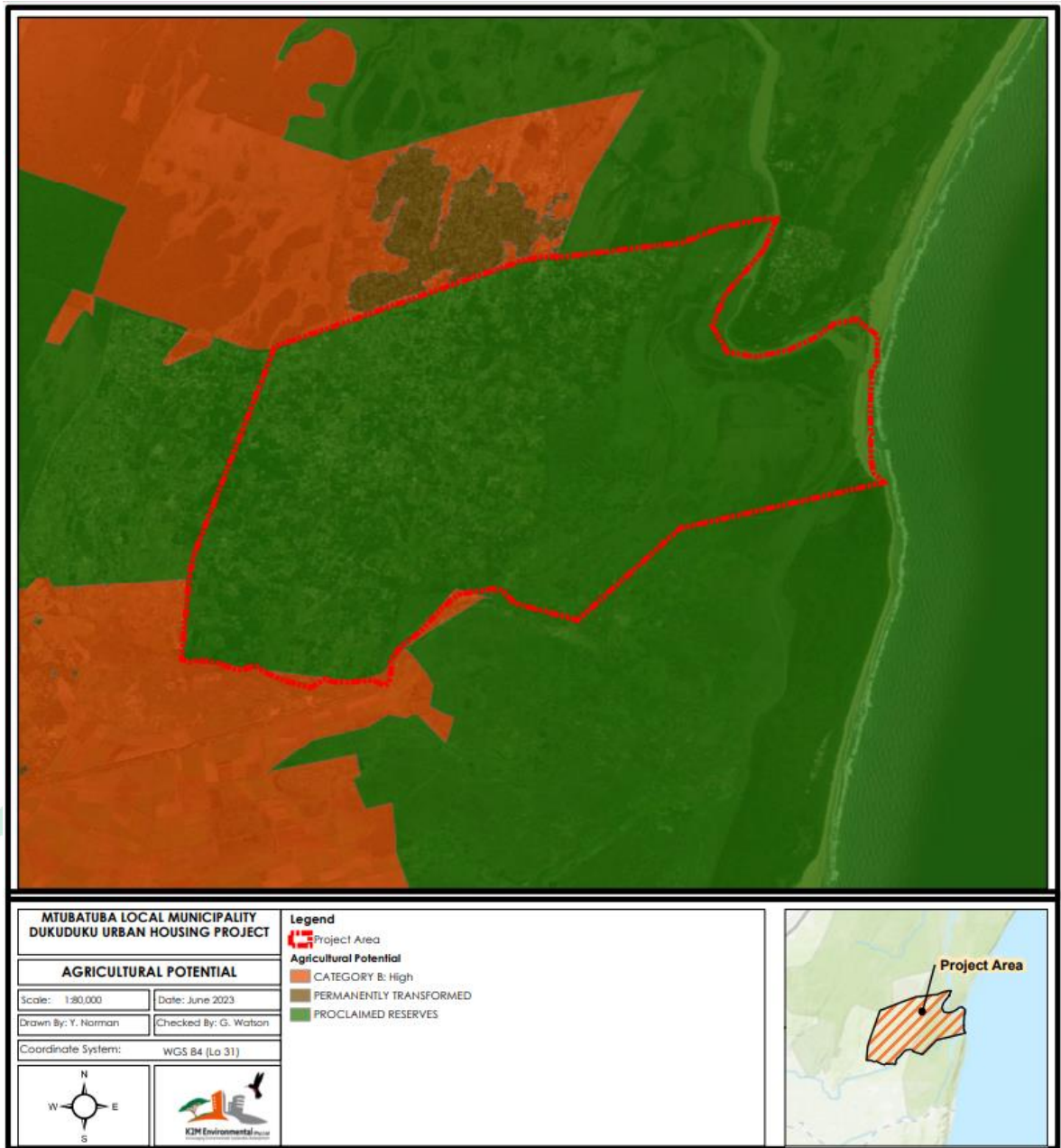
According to the Agricultural Land Potential Categories External Report, agricultural potential refers to the potential of the land to produce sustainably over a long period without degradation to the natural resources base. This includes land under production for cultivation purposes (arable land) and for grazing purposes.

Table 5.2 and **Map 5.5** below depict that 99.39% of the project area is classified as Proclaimed Reserves and 0.61% is classified as Category B: High. Land within the Category of Proclaimed Reserves has been formally proclaimed as either a national or provincial nature reserve under the relevant legislation and is therefore not available for agricultural purposes. However, should this land be removed from such protected status this land, this land would be re-evaluated and assigned to the applicable Category (Collett and Mitchell, 2013). Due to the limited amount of Category B: High Potential land in the province (and in the country), all efforts should be focussed on retaining land within this Category for predominantly agricultural use. (Collett and Mitchell, 2013).

Table 5.2: Agricultural Potential

Category	Size (ha)	Percentage (%)
Category B: High	34,12	0,61
Proclaimed Reserves	5527,82	99,39
Total	5561.94	100

Map 5.5: Agricultural Potential



Source: Department of Agriculture and Rural Development

5.6 VEGETATION

As depicted in **Table 5.3** and **Map 5.6** below, the dominant vegetation types within the project area are the Northern Coastal Forest (56.32%) and Maputaland Coastal Belt (34.48%) vegetation types (Mucina & Rutherford, 2006). Table 1 below depicts the extent to which the remaining vegetation types cover the project area. The vegetation types occurring within the project area are discussed in further detail below:

Table 5.3. Vegetation

Vegetation Type	Size	Percentage (%)
Mangrove Forest	399,36	7,40
Maputaland Coastal Belt	1918,02	34,48
Northern Coastal Forest	3132,21	58,06
Subtropical Dune Thicket	22,05	0,41
Subtropical Seashore Vegetation	53,73	0,99
Swamp Forest	36,57	0,68
Total	5561.94	100

5.6.1 Mangrove Forest

The Mangrove Forest vegetation type occurs in the KwaZulu-Natal and Eastern Cape Provinces in coastal lagoons and estuaries as far south as the Transkei and as far north as the KwaZulu-Natal/Mozambique border (Mucina & Rutherford, 2006). The vegetation type is characterised by species-poor, monospecific, low and dense forests of mangroves (as the name suggests) in tidal zones of coastal lagoons and estuaries. According to Mucina & Rutherford (2006), the Mangrove Forest vegetation type is classified as Critically Endangered, with approximately 72% being statutorily conserved in the Greater iSimangaliso Wetland Park, Richards Bay, Beachwood Mangroves and Umlalazi Nature Reserves. Furthermore, in the uMkhanyakude District Municipality Biodiversity Sector Plan it is classified as Critically Endangered and in the National Gazetted List of Threatened Terrestrial Ecosystems, it is classified as Endangered.

5.6.2 Maputaland Coastal Belt

The Maputaland Coastal Belt occurs in the KwaZulu-Natal Province, stretching from Mtunzini in the south and extending along a 35km strip along the Indian Ocean coast into southern Mozambique in the north (Mucina & Rutherford, 2006). This vegetation type is characterised by flat coastal plains with a wide range of interspersed forests, grasslands and thickets. According to Mucina & Rutherford (2006), the Maputaland Coast Belt vegetation type is classified as Vulnerable with only 15% being statutorily conserved in the Greater iSimangaliso Wetland Park as well as the Sileza, Enseleni and Amathikulu Nature Reserves. However, it is classified as Endangered in both the uMkhanyakude District Municipality Biodiversity Sector Plan as well as the National Gazetted List of Threatened Terrestrial Ecosystems.

5.6.3 Northern Coastal Forest

The Northern Coastal Forest Vegetation type occurs in the KwaZulu-Natal province (and the Eastern Cape Province to a very small extent) along the Indian Ocean seaboard from the Transkei in the south to as far north as southern Tanzania. It is characterised by species-rich tall/medium coastal forests occurring on coastal plains and stabilized coastal dunes. According to Mucina & Rutherford (2006), the Northern Coastal Forest vegetation type is classified as Least Threatened in general but still under threat on coastal dunes in KwaZulu-Natal due to mining. Approximately 68% of this vegetation type is statutorily conserved in protected areas including the Greater iSimangaliso Wetland Park, Dukuduku, Sodwana Bay, Richards Bay, Umlalazi, Umhlanga Lagoon and Mpenjati Nature Reserves.

5.6.4 Subtropical Dune Thicket

The Subtropical Dune Thicket vegetation type occurs in the Eastern Cape and KwaZulu-Natal Provinces as coastal ribbons along the subtropical coast of the Indian Ocean from the Kei Mouth in the south to stretching as far north as the KwaZulu-Natal/Mozambique border. It is characterized by very dense shrubby thickets of spiny shrubs, large-leaved mega-herbs, dwarfed trees, abundant vines and poorly developed undergrowth (due to the shading effect of the closed canopy). According to Mucina & Rutherford (2006), the Subtropical Dune Thicket vegetation type is classified as Least Threatened with approximately 27% being statutorily conserved in several protected areas including the

Greater iSimangaliso Wetland Park, Richards Bay, Amathikulu, Kwelera and Cape Morgan Nature Reserves.

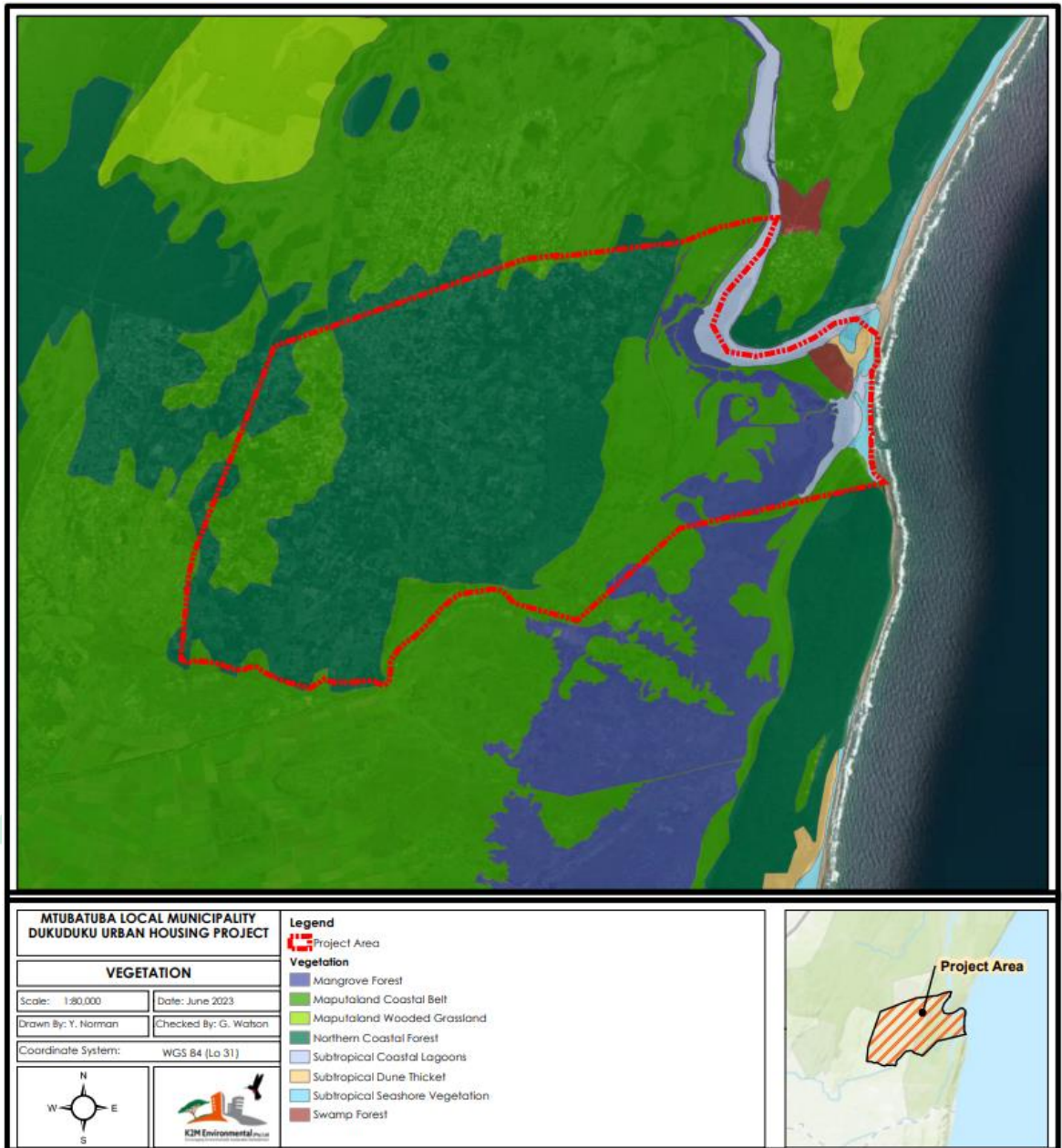
5.6.5 Subtropical Seashore Vegetation

The Subtropical Seashore Vegetation type occurs on the beaches, coastal dunes, dune slacks and coastal cliffs of the sub-tropical coasts of the Indian Ocean from northeast of Kei Mouth in the south to the Mozambique border in the north. It is characterised by open, grassy, herbaceous landscape often dominated by a single pioneer species such as *Scaevola plumieri* (gullfeed). According to Mucina & Rutherford (2006), the Subtropical Seashore Vegetation is classified as Least threatened, with some 30% being statutorily conserved in several coastal protected areas including the Greater iSimangaliso Wetland Park in the north and the Dwesa-Cwebe Nature reserve in the south.

5.6.6 Swamp Forest

According to Mucina & Rutherford (2006), the Swamp Forest vegetation type occurs in the KwaZulu-Natal and Eastern Cape provinces in pockets and narrow ribbons along the Indian Ocean from Maputaland in the north to Pondoland in the south. This vegetation type is characterized by tall forests (12-15m in height) with canopy and shrub layers. According to Mucina & Rutherford (2006), the Swamp Forest vegetation type is classified as Critically Endangered, with some 66% statutorily conserved in the Greater iSimangaliso Wetland Park, Maphelana, Dukuduku, Raphia Palms and Umlalazi Nature Reserves. Furthermore, it is classified as Critically Endangered in the uMkhanyakude District Municipality Biodiversity Sector Plan and in the National Gazetted List of Threatened Terrestrial Ecosystems, it is classified as Vulnerable.

Map 5.6: Vegetation



Source: Mucina & Rutherford, 2006.

5.7 PROTECTED AREAS

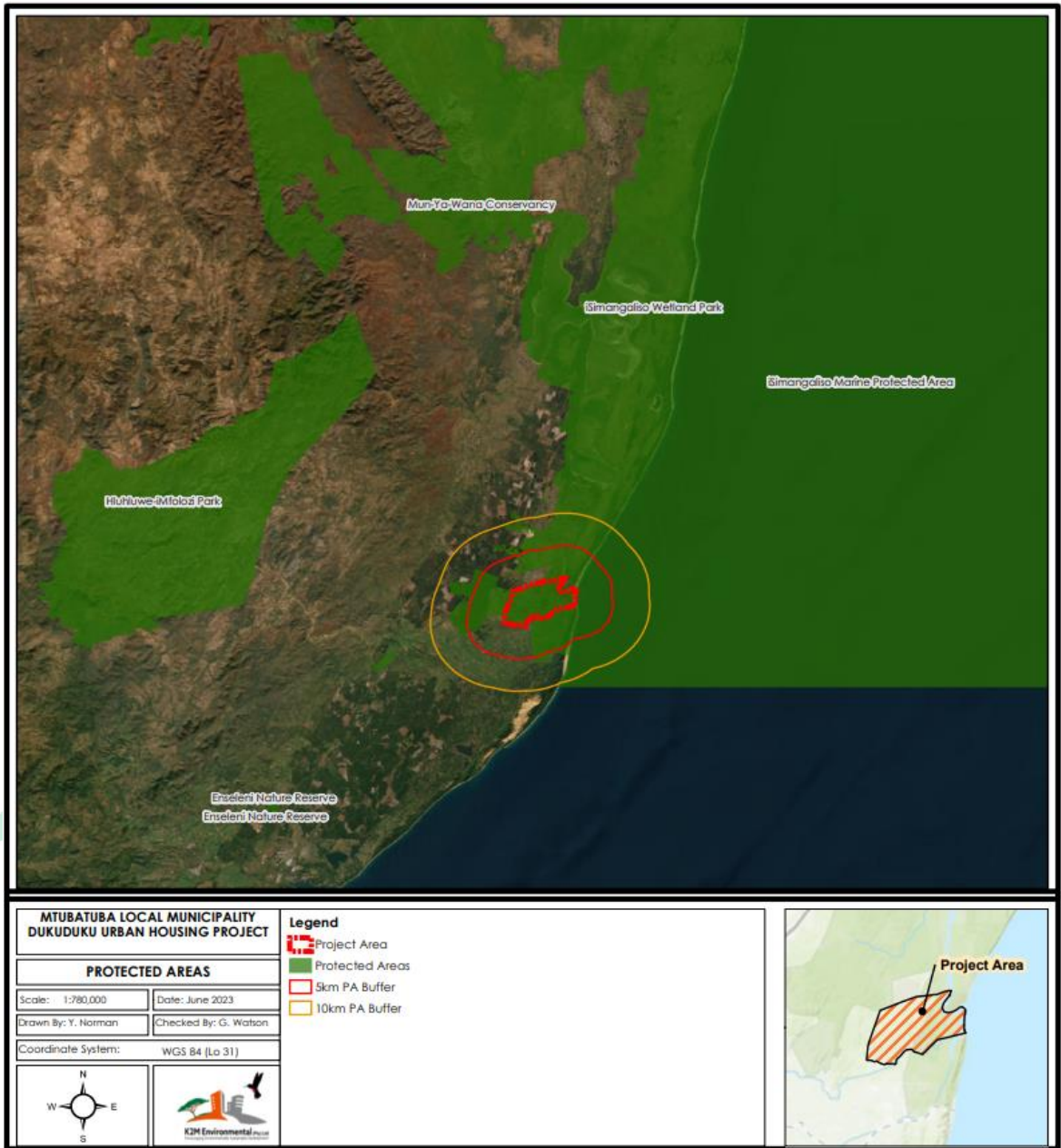
According to the Protected Areas Act (57 of 2003), protected areas are:

- a) special nature reserves, national parks, nature reserves (including wilderness areas) and protected environments;
- b) world heritage sites;
- c) marine protected areas;
- d) specially protected forest areas, forest nature reserves and forest wilderness areas declared in terms of the National Forests Act, 1998 (Act No. 84 of 1998); and
- e) mountain catchment areas declared in terms of the Mountain Catchment Areas Act, 1970 (Act No. 63 of 1970).

As depicted in **Map 5.7** below, the project area falls within the iSimangaliso Wetland Park. The Enseleni Nature Reserve is located approximately 48km south west of the project area while the Hluhluwe-iMfolozi park is located approximately 40.6km west of the project area.



Map 5.7: Protected Areas



Source: KZN Wildlife, 2022

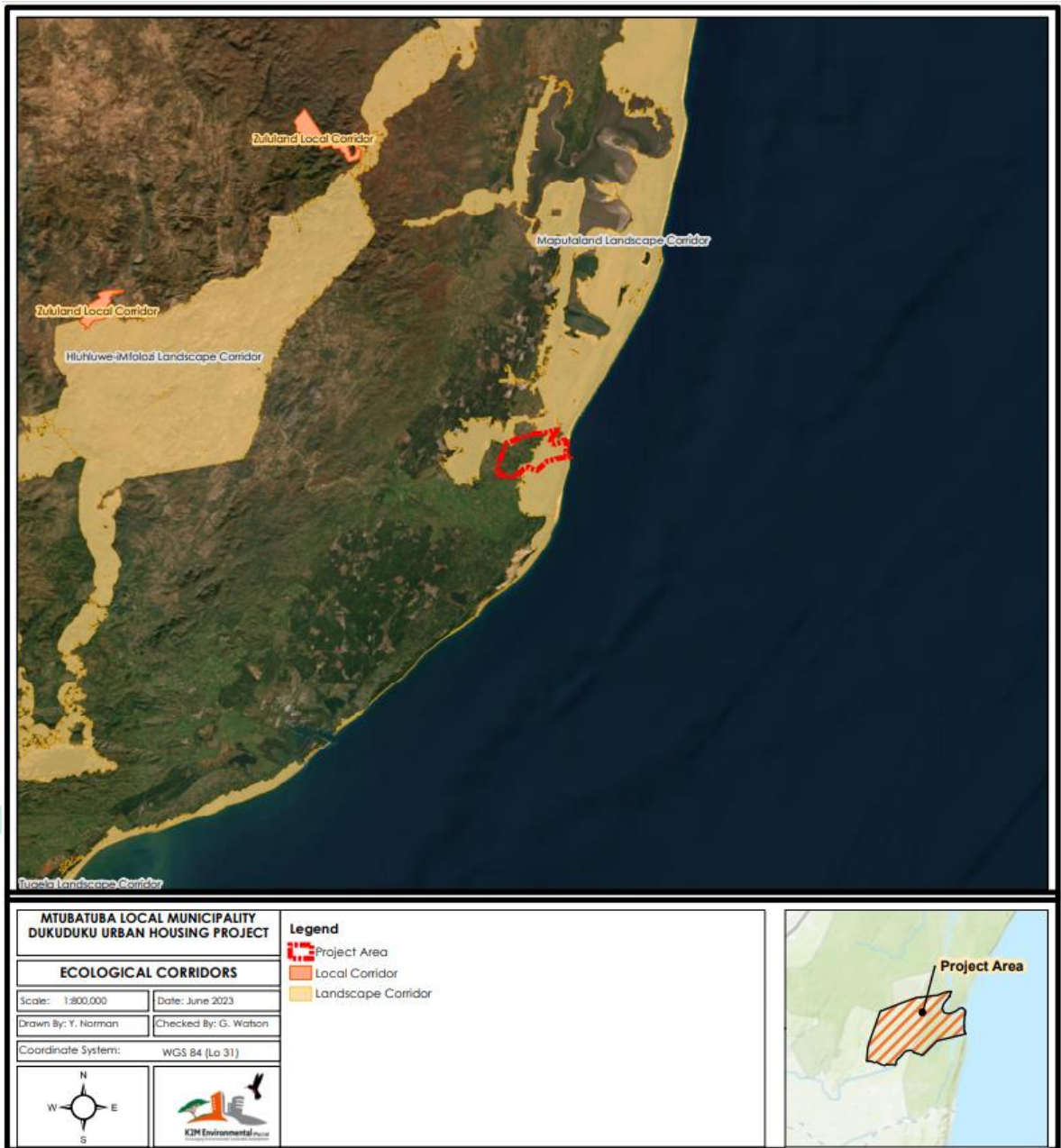
5.8 ECOLOGICAL CORRIDORS

There are two different types of corridors that have been created by Ezemvelo KZN Wildlife, namely, the Landscape Corridors and the Local Corridors. Landscape Corridors are a series of bio- geographic corridors, created to facilitate evolutionary, ecological and climate change processes to create a linked landscape for the conservation of species in a fragmented landscape. Local corridors were developed at a district scale to create fine scale links within the landscape that facilitate ecological processes and ensure persistence of critical biodiversity features.

As depicted in **Map 5.8** below, the eastern portion of the project area falls within the Maputaland Landscape Corridor. The second-closest ecological corridor is the Hluhluwe-iMfolozi Landscape Corridor which is located approximately 40.6km west of the project area.



Map 5.8: Ecological Corridors



Source: KZN Wildlife, 2022

5.9 CRITICAL BIODIVERSITY AREAS

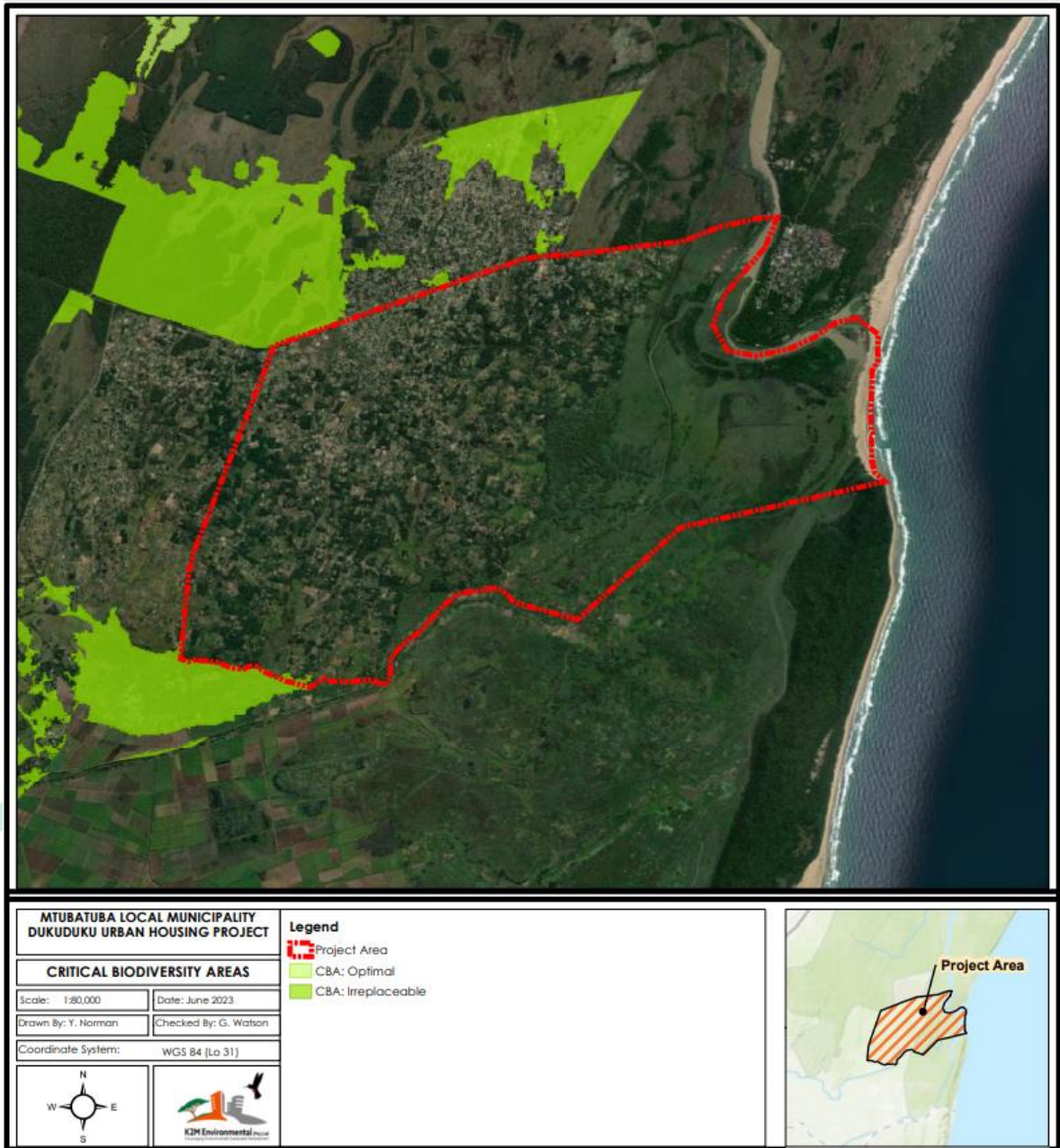
The Critical Biodiversity Areas (CBAs) can be divided into two subcategories, namely Irreplaceable and Optimal. The CBA categories are based on the optimised outputs derived using systematic conservation planning software, with the Planning Units (PU) identified representing the localities for which the conservation targets for one or more of the biodiversity features contained within can be achieved.

The CBA Irreplaceable Areas represent the localities for which the conservation targets of one or more of the biodiversity features can be achieved. These areas are considered critical for meeting biodiversity targets and thresholds, and which are required to ensure the persistence of viable populations of species and the functionality of ecosystems. The CBA: Irreplaceable Areas are identified as having an Irreplaceability value of 1.

The CBA: Optimal Areas are areas which represent the best localities out of a potentially larger selection of available PU's that are optimally located to meet both the conservation target but also the criteria defined by either the Decision Support Layers or the Cost Layer. The CBA Optimal Area has an Irreplaceability score of >0 and < 0.8 .

As illustrated in **Map 5.9** below, CBA: Irreplaceable Areas occur on the northern and south-western border of the project area.

Map 5.9: Critical Biodiversity Areas



Source: KZN Wildlife, 2022

5.10 MINERAL DEPOSITS

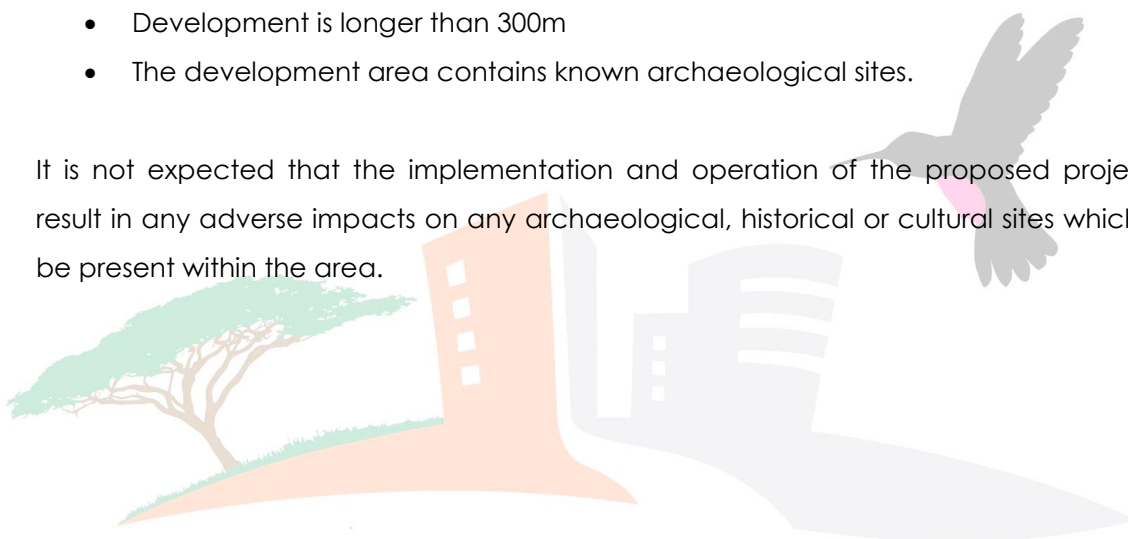
Based on the available information, there are no mineral deposits within the project area and none in close proximity.

5.11 ARCHAEOLOGICAL, HISTORICAL AND CULTURAL SITES

No detailed information is currently available on existing archaeological, historical or cultural sites within the boundaries of the study area. 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 5 000 m²
- Development is longer than 300m
- The development area contains known archaeological sites.

It is not expected that the implementation and operation of the proposed project will result in any adverse impacts on any archaeological, historical or cultural sites which may be present within the area.



6 PRELIMINARY ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

6.1 WETLAND SYSTEM

The removal of the vegetation from the property will increase the surface flow of stormwater dramatically and will result in soil erosion. Therefore, the removal of vegetation and the rehabilitation and re-vegetation of the wetlands will have to be done concurrently as far as possible to reduce erosion of the wetland system of the project area. To determine the impact of the development on the surface water flow, a Stormwater Flow Assessment will have to be conducted as part of the EIA Process. This stormwater assessment/plan should compare the existing surface water flow with the possible water flow once the area has been developed.

The rehabilitation and re-vegetation of the wetland systems are closely linked and the key to the success of any rehabilitation is the deactivation and plugging of the drains within all of the wetland drainage lines. The blocking of drains will improve flooding and increase the wetted perimeter of the current degraded systems. With the increased moisture levels, hydrophilic vegetation will soon re-colonize these systems and improve biodiversity. Initial re-vegetation should focus on restoring a protective ground cover once the vegetation has been removed to prevent erosion. Indigenous turf grasses such as *Stenophrum secundatum* and *Cynodon dactylon* should be used to establish an initial cover. Natural successional processes should drive the shift in vegetation composition from hygrophilous turf grasses to true hydrophilic species once flooding is restored.

Indigenous riparian tree species such as *Ficus sp.*, *Rauvolfia caffra*, *Voacanga thouarsii*, *Syzygium cordatum* should be planted within all the drainage lines to further stabilize the water courses. In the lower wetland portions *Barringtonia racemosa* should be planted. The removal and ongoing control of alien invasive plants is essential across the site. The removal of the vegetation will create an ideal habit for many alien plants and control of these species should be constant during both the construction phase as well as a stipulated function of the Mtubatuba Municipality (managing authority for the open spaces / wetlands) during the operational phase of the development.

The following principles for successful wetland rehabilitation used by the Mondi Wetlands Project can also be useful:

- Remove the cause of the damage, not the symptoms and manage the resource correctly.
- Re-establish the natural water flow patterns within the wetland.
- Do not concentrate water always try and spread it out, this should reduce the possibility of erosion occurring.
- Do not underestimate the force of the water during high flow periods.
- Many wetland soils are highly erodible, be aware of this when designing structures.
- There are two ways of deciding what method of rehabilitation to initiate and that is either stabilising the problem area and maintaining the present condition of the wetland or secondly to try and reclaim the wetland area that has been lost.

Herbaceous plants with their rapidly spreading capabilities and dense near surface root mat, and surface cover, are also extremely effective firstly against scouring of wetlands, and secondly for enhancing the stability of gentle or shallow banks. Herbaceous plants absorb the energy of fast flowing water rather than reflecting it and its strong regenerative powers, makes them ideal for rehabilitating wetland erosion.

For rehabilitation it is important to be deliberate in both the selecting and placing of plants with vigorous rooting growth characteristics that will accelerate natural plant succession and deal directly with the problem on site. Local plant species native to stream banks and wetlands should be used. The best is to look around and see what indigenous species are growing in the area you are about to rehabilitate.

6.2 DRAINAGE AND FLOODLINE

Appropriate stormwater control and management as well as attenuation measures will have to be implemented as part of the development to limit the impact of stormwater runoff especially during the occurrence of heavy rain or storms. It will also be necessary to put the necessary measures in place to eradicate invader plant species and restore the natural indigenous vegetation along drainage and floodlines. No development should be allowed within the 1:100 year flood line.

6.3 ROAD AND STORMWATER RUNOFF

The current road network of the project area will not satisfy the requirements of the proposed development. New roads will have to be constructed to provide access to all the areas of the development. These roads will have to be aligned in such a manner to minimise any negative impacts on the wetland system. The flow rate of the stormwater runoff should be reduced before it reaches the wetland system to reduce the possibility of erosion within the wetland system.

The main factors influencing storm water runoff in the project area will be an increase in the impermeable surface area due to the construction of houses and access roads. An increase in both impermeabilities, which reduce rainwater infiltration into the ground, together with the rapid draining of storm-water from the development sites are likely to result in an increase in storm-water runoff into drainage lines and watercourses. Appropriate storm-water control measures, thus needs to be installed in an environmentally sensitive manner to reduce the flow rate of the stormwater. Insufficient and inappropriate storm-water control measures can result in:

- Increased levels of soil erosion.
- Risk of pollution.
- Detrimental ecological effects in the river catchments downstream of the proposed development site.
- Risk of flooding of dwellings.

Any outlet areas in watercourses that will receive storm-water must be specially protected against degradation and soil erosion. Storm water discharge points into natural watercourses are of particular concern and outlet control structures and water course protection measures that can sustain the magnitude of expected runoff must be installed.

6.4 SOIL EROSION AND EARTHWORKS

The Conservation of Agricultural Resources Act, No. 43 of 1983 (as amended) provides for the control and prevention of soil erosion. Increased runoff during and after rainfall events, especially torrential rainfall events, may result in increased erosion in surrounding areas and water courses feeding into the tributaries and main rivers.

Restoration of excavated areas must be carried out and appropriate erosion control measures must be implemented such as the planting of indigenous grass and other indigenous vegetation found naturally in the area to prevent erosion. The planted vegetation will have to be monitored to ensure continued growth.

During project implementation, the re-vegetation specifications for civil engineering construction projects will have to be adhered to. These specifications provide clear guidelines for:

- Type and source of materials to be used for re-vegetation
- Re-vegetation methods
- Planting guidelines
- Maintenance of re-vegetated areas

6.5 SANITATION AND SOLID WASTE

In terms of the proposed Dukuduku Housing Development four sewer disposal options will be assessed as part of the Bulk Engineering Report, which include:

- Full water borne sewage - discharge to a municipal plant.
- An onsite package plant that falls within the general authorization for the site.
- Septic tank and soakaways
- Ventilated Improved Pit Latrines (VIP System)

The recommended sewage disposal system will be assessed in detail as part of the Environmental Authorization Application. These four alternatives will be compared in terms of its impacts on the environment, implementation cost, etc.

6.6 PHYSICAL AND LANDSCAPE CHARACTERISTICS

The benefits of the proposed housing development through the provision of housing units and the creation of employment opportunities to the community as part of the construction process outweigh the loss of vegetated land. The development will have a net positive impact on the physical and landscape characteristics of the development area if mitigation measures and recommendations are implemented.

The impact on environmental sensitive areas such as the river system should be limited as far as possible. Where these impacts are unavoidable, specific management and mitigation measures will have to be considered during the EIA process as part of the detailed planning and implementation process.

6.7 ECOLOGICAL CHARACTERISTICS

It will be necessary to fully rehabilitate and re-vegetate the project area as well as to remove alien invasive plants on a continual basis during the construction and operational period of the development. The re-introduction of indigenous vegetation into the area as part of the development should be encouraged. Implementing of these measures will help in the rehabilitation and promotion of the natural ecology of the project area and its surroundings.

6.8 ARCHAEOLOGICAL, HISTORICAL AND CULTURAL SIGNIFICANCE

Since the total development footprint will exceed 10 000 m², Amafa will have to comment on the need for an archaeological assessment as part of the EIA process before environmental authorization for the development is considered by the KwaZulu-Natal Department of Economic Development, Tourism and Environmental Affairs

6.9 POLLUTION

All waste generated during the construction and the operational phase of the housing project should be collected and disposed of at the nearest permitted municipal landfill site. The proposed development may generate some additional noise during the construction phase, but this can be managed if contractors abide by stipulated working hours and other mitigation measures that will be specified in the Environmental Management Plan. Additional noise pollution during the operational phase of the development will mainly be associated with increased traffic volumes in this area.

6.10 SOCIAL AND ECONOMIC IMPACTS

The introduction of appropriate mitigation and management measures can result in a number of positive social and economic impacts resulting from the project:

- Provision of proper housing to a large number of destitute households.
- Ecological revival of road-sides, and clearing of alien vegetation areas through the planting and long-term care of suitable indigenous vegetation.
- Employment of people from the local community during the construction phase of the project.
- Sorting of solid waste for recycling at special designated sites and creation and managing of community compost facilities. The compost can be used in community permaculture vegetable gardens.



7 CONCLUSIONS AND RECOMMENDATIONS

The purpose of this preliminary assessment is to provide a brief overview of the biophysical and infrastructural characteristics of the project area.

7.1 SOCIO-ECONOMIC ASPECTS

A number of important aspects and recommendations relating to the socio-economic characteristics of the study area include:

- Approximately 77.27% of the total population of the project area is younger than 35 years of age. This implies two important aspects as far as the development and implementation of the proposed housing project is concerned:
 - Sufficient and appropriate education facilities according to accepted national norms and standards will have to be provided.
 - A number of people will be entering the economically active age category over the next five to ten years and will thus be seeking appropriate employment opportunities.
- The project area is characterized as being female dominated with 60% being represented by females.
- The figure illustrates the education levels of persons over the age of 20 years and therefore falling into the economically active categories of the population in the project area. Approximately 16.5% of the population having no form of schooling. Approximately 36.5% of the population within the study area had undergone some form of primary school education, 12.6% completed primary school, 28% completed some form of secondary school and 11.9% completed matric.
- The most predominant housing type in the project area is the "House/Brick Structure" with 33.1% of houses falling into this category.
- As much as 15% of the total number of households within the study area indicated not to have an income. The figures also show that 50.3% of the total number of households indicated a collective monthly household income of R19600 or less, with 20% falling within the income range of R19600 – R38201 and 9.3% falling between

R38201 and R76400. Approximately 5.4% of the local population indicated a collective monthly income of over R76400.

- Only 23% of the active population indicated to be employed while as much as 27.4% of the economically active population within the study area indicated that they were unemployed with as much as 49.6% of the population indicating that they were discouraged job seekers.

7.2 SERVICES ASPECT

A number of important summary observations regarding the services characteristics of the study area population include:

- The figure shows poor access to running water in the project area with only 12.5% of the total number of households having access to piped water "inside yard" and 0.7% having to walk more than 200m to get water, whilst 0.7% of households have to walk less than 200m to get water.
- Majority of households (68.2%) have no means of sanitation and only 11% use flush toilets connected to a sewage system. Only 1% of households use flush toilets connected to a septic tank.
- As much as 80.8% of the total number of households within the project area has indicated to use candles while only 13.1% of said households have access to electricity for lighting purposes.
- The majority of households within the project area (50.3%) indicated that they make use of their own dump while only 5.8% indicated that their waste was removed weekly. Majority of the households in the local municipality (70.3%) indicated that they make use of their own refuse dump while only 13.3% of the households indicated to have had their refuse removed by the municipality on a weekly basis.

7.3 INFRASTRUCTURAL ASPECTS

The project area is traversed by only one Provincial Road, the P237 that runs along the northern border of the project area. There is also one District Road, which is named D462 that runs through the central portion of the project area. Furthermore, the project area

consists of three numbered local access roads around the site, namely the L2374 which traverses the western portion of the project area, the L2832 which traverses the central portion of the project area and the L3371 which traverses the northern portion of the project area.

7.4 BIO-PHYSICAL ASPECTS

As far as the **biophysical characteristics** of the study area are concerned, the key aspects can be summarized as follows:

- ✚ The project area is characterised by residential settlements (with the surrounding land use being largely Agricultural and Conservation/ Eco-Tourism) and is bordered by the Indian Ocean to the east.
- ✚ The dominant landcover in the project area is "Forest" (57.61%), followed by "Wetlands" (22.94%).
- ✚ The project area is traversed by non-perennial streams throughout the area and two perennial rivers, namely the Hluhluwe and uMfolozi Rivers flow along the northern and southern border of the project area respectively.
- ✚ The project area contains several NFEPA Wetlands, particularly a large NFEPA Wetland occurring on the eastern portion of the project area.
- ✚ With respect to Agricultural Potential, approximately 99.39% of the project area is classified as Proclaimed Reserves and 0.61% is classified as Category B: High. The Land within the Category of Proclaimed Reserves has been formally proclaimed as either a national or provincial nature reserve under the relevant legislation and is therefore not available for agricultural purposes.
- ✚ The vegetation types that can be found within the project area are Mangrove Forest, Maputaland Coastal Belt, Northern Coastal Forest, Subtropical Dune Thicket,

Subtropical Seashore Vegetation and Swamp Forest. The dominant vegetation types within the project area are the Northern Coastal Forest (58,06%) and Maputaland Coastal Belt (32,46%) vegetation types.

- ✚ The project area falls within the iSimangaliso Wetland Park. The Enseleni Nature Reserve is located approximately 48km south west of the project area while the Hluhluwe-iMfolozi park is located approximately 40.6km west of the project area.
- ✚ The eastern portion of the project area falls within the Maputaland Landscape Corridor. The second-closest ecological corridor is the Hluhluwe-iMfolozi Landscape Corridor which is located approximately 40.6km west of the project area.
- ✚ In terms of Critical Biodiversity Areas, CBA: Irreplaceable Areas occur on the northern and south-western border of the project area.

7.5 EXISTING SETTLEMENTS ASPECTS

As far as the settlement characteristics of the study area are concerned, the key aspects can be summarized as follows:

- The topography in the project area is predominantly flat with gentle undulating slopes.
- The overall land is covered by, namely, barren rock, cultivated: permanent-commercial sugarcane, degraded: forest and woodland, forest, thicket & bushland (etc), unimproved grassland, waterbodies and wetlands. The dominant landcover in the project area is "Forest" (57.61%), followed by "Wetlands" (22.94%).

7.6 LEGISLATIVE REQUIREMENTS

Possible considerations from a legislation point of view are briefly summarized in the Table below.

National Water Act (Act 36 of 1998) and regulations	S21, 32, 41	"Water use" in terms of the Act includes "impeding or diverting the flow of water in a watercourse" and "altering the bed, banks, course or characteristics of a watercourse". Department of Water Affairs and Forestry will require water licences for all water uses unless the water use is an "existing lawful water use", or it is a permissible water use in terms of the Schedule 1 of the Act or can be generally authorized. It is advised that the Department of Water and Sanitation be consulted as to their licensing requirements for each development. Licences are not required where water is obtained from the local council or another bulk water supplier.	The necessary permits will have to be obtained from the Department of Water and Sanitation (if applicable).
Water Services Act (Act 108 of 1997)	S7	Water for industrial use must be obtained through a nominated water services provider and no person may dispose of industrial effluent in any manner other than that approved by the water services provider nominated by the water services authority having jurisdiction in the area of question.	It is not anticipated at this stage that any industrial development will form part of the development project.
Environmental Conservation Act (Act 73 of 1989)	S20	Waste must be disposed of at a waste disposal facility licensed in terms of the provisions of the Act. Any hazardous waste such as paints, varnishes, waste oils etc accumulated at the construction sites must be disposed of at hazardous waste sites.	Waste which is may be generated during the construction process, will have to appropriately disposed of.
National Building Regulations and Building Standards Act (Act 103 of 1997) and Regulations	Reg F6 of Part F	No person may on specified days and during specified times generate noise from a construction site which may unreasonably disturb or interfere with the amenity of the neighbourhood, unless authorized to do so by the local authority.	Appropriate specifications will have to be included in the tender documentation
National Heritage Resources Act (Act 25 of 1999)	S34	No person may alter or demolish any structure or part of a structure that is older than 60 years without a permit issued by the relevant provincial heritage resources authority	It is unlikely that the proposed development will impact on any heritage resources of significance.
	S35	No person may, without a permit issued by the responsible heritage resources authority destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or paleontological site.	
	S36	No person may, without a permit issued by the South African Heritage Resources Association or a provincial heritage resources authority, destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by the local authority. "Grave" is widely defined in the Act to include the contents, headstone or other marker of such a place, and any other structure on or associated with such place.	
National Forest Act (Act 84 of 1998)	CH 3 Part 1	There is a prohibition against damaging or cutting protected indigenous trees unless a license has been obtained or an exemption has been published in the Government Gazette.	Indigenous trees will have to be protected, where possible, during the implementation phase of the project
Conservation of Agricultural Resources Act (Act 43 of 1983 and GN R1048)		This regulation requires the control of weeds and invader plants, which occur on any land or inland water surface in SA. Category 1 plants are declared weeds and may only occur in biological control reserves. Category 2 plants are declared invader plants and may only occur in demarcated areas and biological control reserves. Category 3 plants are declared invader plants and may occur in biological control reserves. All weeds and invader plants not within the demarcated areas or biological control reserves must be eradicated and control methods are stipulated	Weeds and invader plans should be eradicated if occurring at the final project location.
National Building Regulations and Building Standards Act	Reg F6 of Part F	The owner of any land on which excavation work is in progress must keep precautions in the working area and on surrounding roads and footways to limit to a reasonable level the amount of dust arising from these areas.	Appropriate stipulations should be included in the tender documentation for construction.

(Act 103 of 1997) and Regulations R2378			
Minerals Act (Act 50 of 1991)	S 5 and 9	No person may prospect or mine for any mineral without the necessary authorization granted to him in accordance with the provisions of the Minerals Act (Act 50 of 1991). Should construction material be excavated from borrow pits, the provision of the Minerals Act, are applicable and the Department of Minerals and Energy needs to be contacted in order to determine their requirements in this regard.	If any borrow pits are to be excavated during the construction process in the implementation phase, the necessary permits will have to be acquired from the Department of Minerals and Energy
Umkhanyakude District Municipality Environmental Management Framework		The District Municipality Environmental Management Framework guidelines need to be considered for the proposed housing development.	Appropriate measures need to be undertaken in protected areas that are endangered and CBAs through the guidelines of the district EMF.
Umkhanyakude District Municipality: Biodiversity Sector Plan		The Umkhanyakude District Municipality: Biodiversity Sector Plan guidelines need to be considered for the proposed housing development.	The key biodiversity management priorities at municipal level planning and protection of CBAs, ESAs and biodiversity corridors need to be considered together with land use change decision making, utilising available biodiversity planning and management tools.

7.7 RECOMMENDATIONS

Based on the existing available desktop overview, it does not appear as if there are any material barriers to the proposed development from an environmental impact perspective. It is recommended that the applicant proceed with caution using best practice to safeguard sensitive areas, if any. Furthermore, in cognisance from the conducted desktop overview, an Environmental Authorisation will be needed for the proposed Dukuduku Housing Development.

The proposed development may trigger the following Listed EIA Activities as indicated in Table 7.1.

Table 7.1: EIA Activities in relation to the proposed development

Activity	Activity Description (in terms of the relevant notice)	Description of Activity (in terms of the 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	Although the project area is traversed by watercourses on the western and eastern

	<p>development occurs –</p> <p>(a) within a watercourse;</p> <p>(c) if no development setback exists, within 32 metres of a watercourse;</p> <p>Where such development occurs –</p> <p>(a) within a watercourse</p> <p>(b) in front of a development setback; or</p> <p>(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse</p> <p>Excluding –</p> <p>(aa) the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour;</p>	<p>borders, there will be no development that will take place within 32 metres of any watercourse. Furthermore, the development entails the upgrade of existing infrastructure. Therefore, this Activity will not be triggered.</p>
<p>Activity 19 of GN. R. 327</p>	<p>The infilling or depositing any material of more than 10 cubic metres into, or the dredging of, excavation, removal of soil, sand shells, shell grit, pebbles or rocks of more than 10 cubic metres from a watercourse;</p> <p>But excluding where such infilling, depositing, dredging, excavation, removal or moving –</p> <p>(a) will occur behind a development setback;</p> <p>(b) is for maintenance purposes undertaken in accordance with a maintenance management plan; or</p> <p>(c) falls within the ambit of activity 21 in this Notice, in</p> <p>(d) occurs within existing ports or harbours that will not increase the development footprint of the port or harbour; or</p> <p>(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.</p>	<p>Although the project area is traversed by watercourses on the western and eastern borders, no sand mining or infilling activities are to take place within the rivers/riverbeds. Therefore, as the proposed project is an in-situ development, this activity will not be triggered.</p>

<p>Activity 24 of GN. R. 327</p>	<p>The development of a road—</p> <p>(i) [a road] for which an environmental authorisation was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Government Notice 545 of 2010; or</p> <p>(ii) [a road] with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres;</p> <p>but excluding a road—</p> <p>(a) [roads] which [are] is identified and included in activity 27 in Listing Notice 2 of 2014;</p> <p>(b) [roads] where the entire road falls within an urban area; or</p> <p>This gazette is also available free online at www.gpwonline.co.za</p> <p>STAATSKOERANT, 7 APRIL 2017 No. 40772 299</p> <p>(c) which is 1 kilometre or shorter.</p>	<p>As the proposed project will entail the upgrade of the existing roads and the construction of new roads within the area, this activity will be triggered.</p>
<p>Activity 27 of GN.R. 327</p>	<p>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 is required for-</p> <p>(i) The undertaking of a linear activity;</p> <p>(ii) Maintenance purposes undertaken in accordance with a maintenance management plan.</p>	<p>Because the project entails Greenfield developments, over 1 hectare of indigenous vegetation will be cleared. Therefore, if the development will clear less than 20 hectares of indigenous vegetation, this activity will be triggered, and therefore, Basic Assessment Report will be required.</p>
<p>Activity 15: of GN.R. 325</p>	<p>The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for—</p> <p>(i) the undertaking of a linear activity; or</p> <p>(ii) maintenance purposes undertaken in accordance with a maintenance management plan.</p>	<p>In the event that the Greenfield development entails the removal of indigenous vegetation of over 20 hectares, this activity will be triggered and therefore a full Scoping and EIA will be required.</p>
<p>Activity 12,</p>	<p>The clearance of an area of 300 square metres or more of indigenous vegetation except where such</p>	<p>The project area contains the Mangrove Forest and</p>

GN.R. 324	<p>clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.</p> <p><u>d. KwaZulu Natal</u></p> <ul style="list-style-type: none"> i. Trans-frontier projected 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 the high water mark of the sea or an estuarine functional zone, whichever distance is the greater, excluding where such removal will occur behind the development setback line or even in urban areas; vii. On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning; viii. A protected area identified in terms of NEMPAA, excluding conservancies; ix. World Heritage Sites x. Sites or areas identified in terms of international convention; xi. Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a 	<p>Maputaland Coastal Belt vegetation types, both of which are classified as Endangered.</p> <p>Furthermore, the project area contains CBA: Irreplaceable Areas along the south western border.</p> <p>The development is within 100 metres inland from the high water mark of the sea and in an estuarine functional zone.</p> <p>The project area is part of the iSimangaliso Wetland Park which is a protected area identified in terms of NEMPAA.</p> <p>This development will entail the clearance of over 300 square metres. Therefore, this activity will be triggered, and Environmental Authorization will be required.</p>
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	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.	
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The proposed development will trigger Activity 27 of Listing Notice 1 (GN.R. 327) and Activity 12 of Listing Notice 3 (GN.R. 324) and may trigger Activity 15 of Listing Notice 2 (GN.R. 325) of the 2014 EIA Regulations (as amended), as the development will entail the clearance of "indigenous vegetation". The concept of indigenous vegetation is therefore noteworthy in this regard.

As defined by the 2014 EIA Regulations, as amended, indigenous vegetation refers to *"vegetation consisting of indigenous plant species occurring naturally in an area, regardless of the level of alien infestation and where the topsoil has not been lawfully disturbed during the preceding ten years"*.

The series of historical images provided under Section 1.4 of this report, clearly indicates that the project area has remain largely unchanged during the preceding ten years. Furthermore, the Dukuduku Housing Project entails a Greenfield development and thus the extent of vegetation clearance is expected to be greater than 1 hectare. It is therefore our opinion that Activity 27 of Listing Notice 1 (GN.R. 327) and Activity 12 of Listing Notice 3 (GN.R. 324) are applicable to the development and therefore Environmental Authorization will be required.