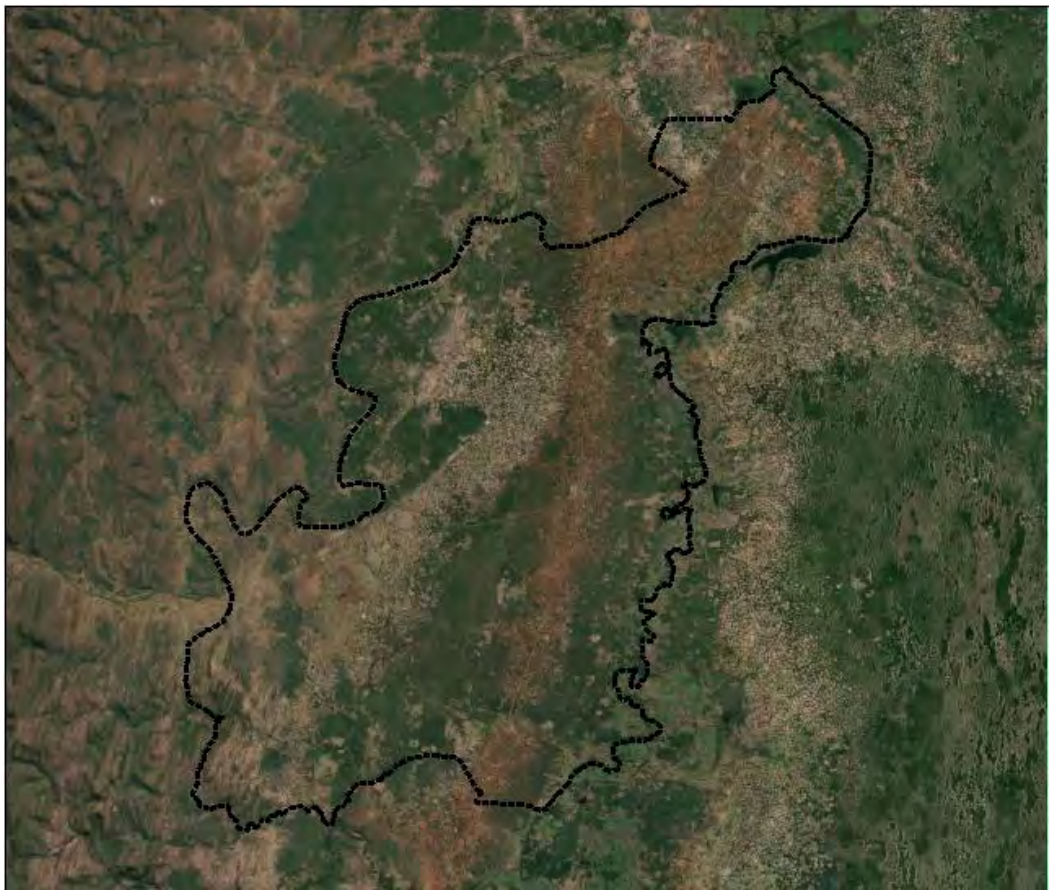
SHEMULA AND MAKHANISI RURAL SUBSIDISED HOUSING DEVELOPMENT LOCATED WITHIN THE JOZINI LOCAL MUNICIPALITY

PRELIMINARY ENVIRONMENTAL ASSESSMENT



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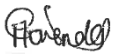
Prisantha Govender Environmental Assessment Practitioner	October 2022	
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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF MAPS

1 INTRODUCTION

1.1 PROJECT BACKGROUND

The Jozini Local Municipality has, through its IDP process, and extensive consultation with respective beneficiary communities residing within the Jozini Local Municipality, identified the need to provide rural subsidised housing in its area of jurisdiction. This process was initiated as a means to address the municipality's predominantly traditional/informal housing profile, and in doing so improve the living conditions and quality of life of its rural communities. The provision and implementation of the rural subsidised housing projects will occur in accordance with the terms of the Rural Housing Subsidy Scheme (as described in Chapter 11 of the National Housing Code).

All rural subsidised housing projects require that an Environmental Assessment be conducted, as part of the initial rural housing application. This document provides an Environmental Assessment of the project area as part of the approval phase of the proposed rural housing project. The report is based on a combination of available desktop data sources. This assessment provides a summarized overview of key socio-economic, infrastructural and environmental aspects that will have to be considered in the implementation of the proposed subsidized housing project. The Jozini Local Municipality appointed Ganwa Consulting as the Implementing Agent for the proposed development. Subsequently, Ganwa Consulting appointed K2M Environmental (Pty) Ltd as the independent Environmental Assessment Practitioner (EAP) to undertake the Environmental Assessment for the proposed development.

The proposed Shemula-Makhanisi Rural Housing Development is located within Wards 12, 13 and 23 of the Jozini Local Municipality and has a total extent of approximately 18179. 28 ha. The entirety of the site consists of rural / traditional dwellings interspersed with thickets and woodland. The project area also contains environmentally sensitive attributes such as rivers, drainage lines, NFEPA Wetlands and CBA: Optimal areas.

While the exact nature of the housing project in terms of the application of the subsidies and the location of individual beneficiaries within the study area has not yet been specified, it is known that the proposed Shemula-Makhanisi Rural Subsidised Housing project will result in the construction of approximately 800 units (400 units per Ward) and will therefore service approximately 800 beneficiaries and their associated families. One VIP will be constructed per top structure. Construction of the top structure and VIP will be within each existing imuzi (development footprint). There will be no construction of roads or pipelines and development will not take place within any watercourses, within 32m of a watercourse, or within CBA: Irreplaceable areas.

According to Chapter 11 of the National Housing Code, rural housing subsidies may be used for any purposes which, in the discretion of the Housing Board, amount to housing purposes. Without limiting the discretion of any particular Housing Board, the following purposes may be regarded as housing purposes:

- The provision of sanitation facilities;
- The provision of roads and stormwater drains within the boundaries of any particular settlement;
- The provision of water;
- The construction or upgrading of dwellings;
- The purchase of building materials in order to enable a beneficiary himself or herself to construct or upgrade a dwelling

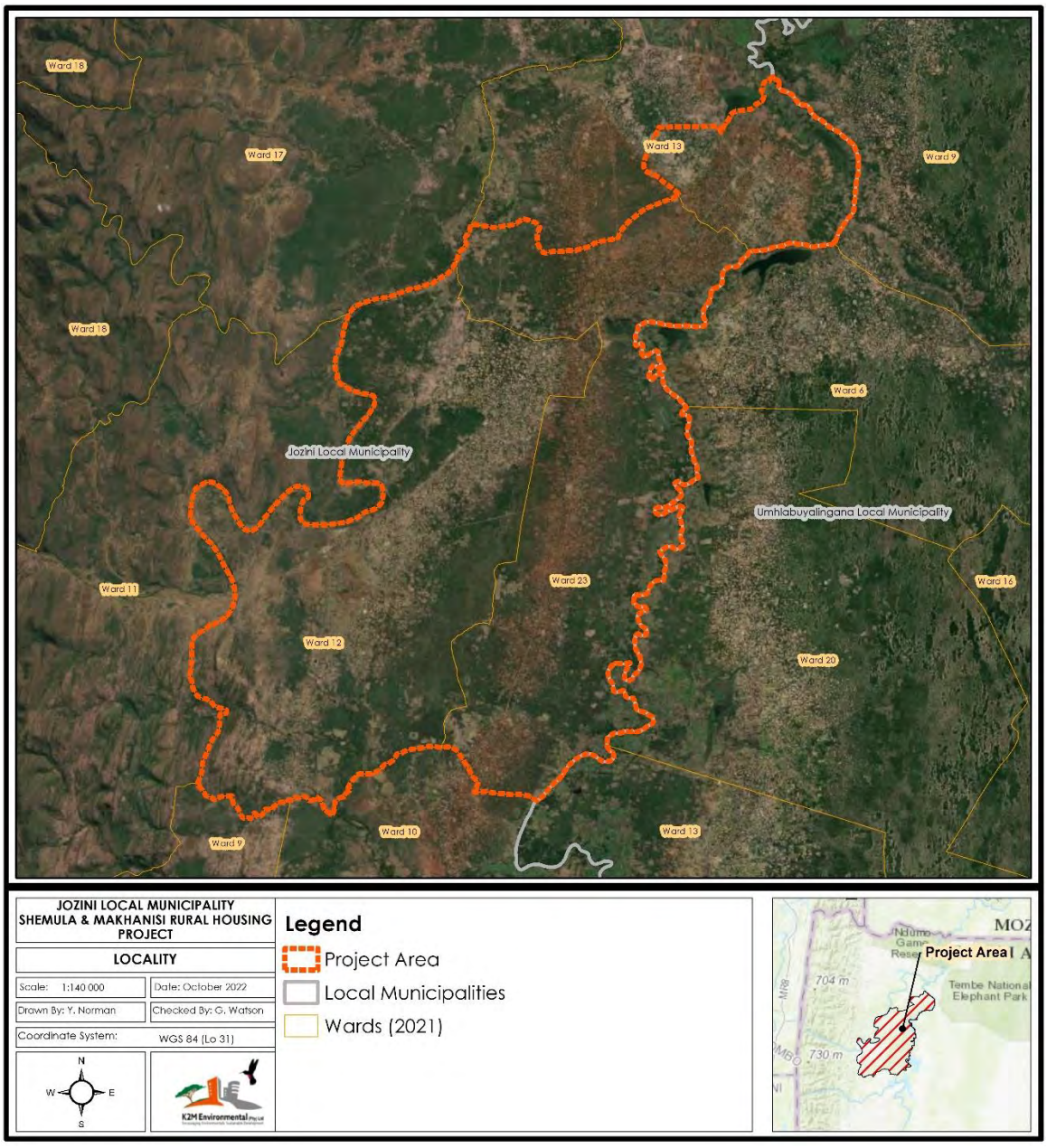
1.2 SITE DESCRIPTION

The project area falls within the jurisdiction of the Jozini Local Municipality, one of the four local municipalities that form part of the uMkhanyakude Municipality. The total population of the project area and local municipality is estimated at 186 496 persons respectively.

The project area is located within Wards 12, 13 and 23 of the Jozini Local Municipality and has a total extent of approximately 18179.28 ha with a population of 20 301 persons. The

entirety of the site consists of rural / traditional dwellings interspersed with thickets and woodland. The project area in relation to the wards is depicted in Map 1.1 below.

Map 1.1: Project Area



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.*" In terms of the Environmental Impact Assessment (EIA) Regulations Listing Notice 1, Listing Notice 2 and Listing Notice 3 of 2014 (as amended), such activities are prohibited until written authorisation is obtained from the Minister or her delegated authority. Activities listed in EIA Regulations Listing Notice 1 and Listing Notice 3 of 2014 (as amended) will require a Basic Assessment to be conducted while activities listed EIA Regulations Listing Notice 2 of 2014 (as amended) will require a thorough EIA process which includes a Scoping Report and an Environmental Impact Assessment Report.

The Department of Economic Development, Tourism and Environmental Affairs (DEDTEA) have in the past on similar projects indicated that it is their opinion that the development and construction of rural subsidised housing projects *does not constitute a listed activity* as identified in terms of Environmental Impact Assessment Regulations. This opinion was based on the fact that the Rural Housing Projects entail the construction of housing units within existing iMuzi's (Brown Field Development). Due to the fact that such projects do not constitute listed activities they therefore did not require environmental authorisation in terms of the National Environmental Management Act) (Act 107 of 1998) (NEMA), and as such no environmental authorisation was required from the Department of Economic Development, Tourism and Environmental Affairs for projects of this nature.

The Department of Human Settlement has requested that cognisance needs to be taken in terms of the establishment of sustainable human settlements. This encourages the densification of settlements to enable for the provision of other supporting infrastructure at a later stage such as water connections to individual stand level as well as improved road and sanitation infrastructure. It is however important to understand that as part of this

project only housing units with a Ventilated Improved Pit Latrine (VIP) will be constructed within existing iMuzi's.

Should any Greenfield development occur as a result to this project, the extent of the cumulative area to be impacted must be limited to less than 1 hectare and should be restricted to degraded areas. Should the cumulative Greenfield Development footprint exceed 1 hectare, then an Environmental Authorisation will need to be applied for.

The purpose of this Environmental Assessment is thus 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 of the housing 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.

This Environmental Assessment is prepared in terms of the Stage 1 application (reservation of beneficiaries) requirement of the Department of Human Settlement. This Report will be submitted to DEDTEA for official comment and to determine the way forward.

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 Environmental Assessment thus provides a summarized overview of some of the key aspects relating to the social, economic, infrastructural, service and biophysical environments, which impact on, and are similarly impacted upon by the Shemula-Makhanisi Rural Housing project area. The summarized overviews of various aspects contained within the 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 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 social, economic, service and infrastructural demographics which impact on and are subsequently impacted upon by the project area and its local population. 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 Socio-Economic Development component of the project area. The social component addresses aspects such as age, gender, education and housing, while the economic component addresses aspects such as monthly household income, employment status, and a profile of the economic sectors within which the employed proportion of the project area population are involved in within the Shemula-Makhanisi Rural Housing project area.

- Section 4 deals with the services and infrastructural component of the project area. The services component therefore addresses residents' access to water, sanitation, electricity, telecommunication infrastructure and waste removal services, while the infrastructural component addresses the road network and stormwater management systems within the project area.

- Section 5 deals with the biophysical characteristics of the project area, and therefore covers aspects such as land use, climate, land cover, topography and drainage, floodline areas, CBAs, Protected areas, corridors, mineral deposits, archaeological, cultural and historical sites, and potential sources of pollution.

- Section 6 provides a brief overview of the current settlement pattern of the Shemula-Makhanisi Rural Housing project area and discusses some of the impacts associated therewith.

- Section 7 provides a summary conclusion of the findings of the Preliminary Environmental Assessment Report and the potential impact of the proposed development on the environment and local population, while also providing some recommendations with which to minimize or negate any negative impacts.

3 SOCIO-ECONOMIC COMPONENT

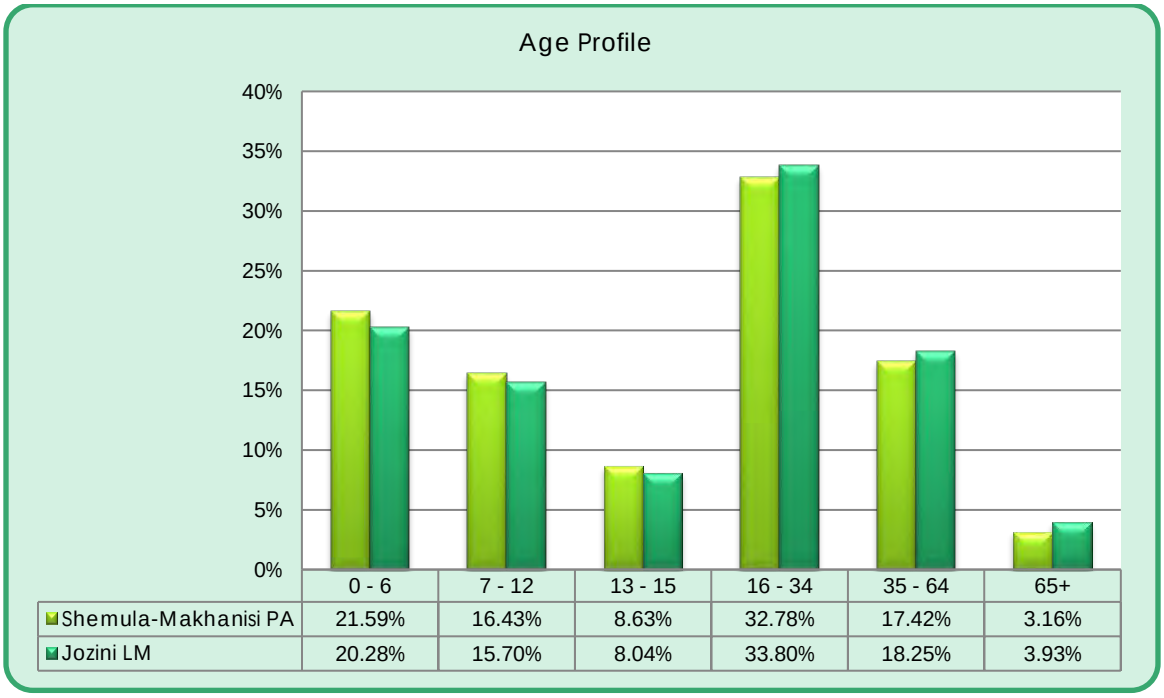
3.1 SOCIAL DEMOGRAPHIC CHARACTERISTICS

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 Shemula-Makhanisi Housing project area falls within the jurisdiction of the Jozini 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 Jozini Local Municipality (LM) are depicted in Figure 3.1 below. As illustrated by graph below, approximately 79.42% of population in the project area is under 35 years of age. Similarly, 77.82% of the population in the Jozini LM is under 35 years of age. Approximately 17.42% of the project area population falls between the ages of 35 and 64 years, while 18.25% of the local municipal population fall under the same age bracket. The project area and Jozini LM have a low proportion of people older than 65 years of age, at 3.16% and 3.93% 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.

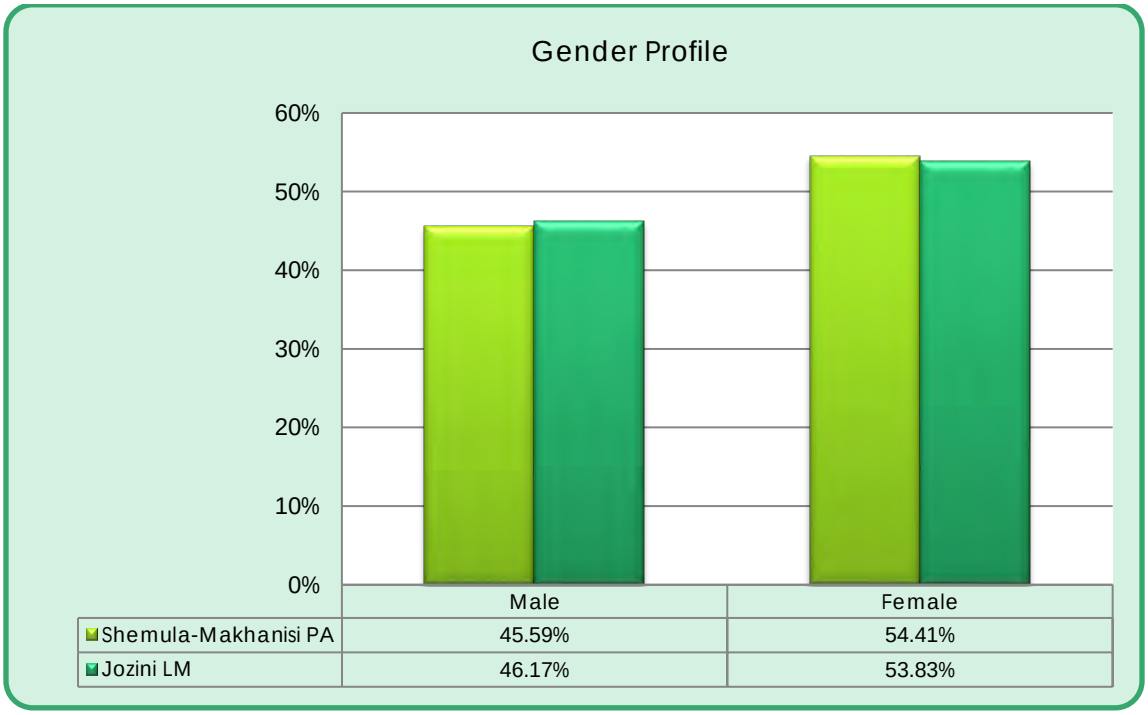
- Provision of adequate social services and amenities: as the young age profile increases the proportion of the population which are not yet economically active which results in a high dependency ratio which places increased pressure on social services, facilities, and amenities. Provision of such services 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 54.41% of the total population of the study area is female and 45.59% are male. Relatively similar trends of a female dominant population are evident for the overall Jozini municipal area with 53.83% of the total population being female and 46.17% being male.

Figure 3.2: Gender Profile



Source: Statistics SA, Census 2011.

3.1.2.1 Implications for the Rural Subsidised Housing Project:

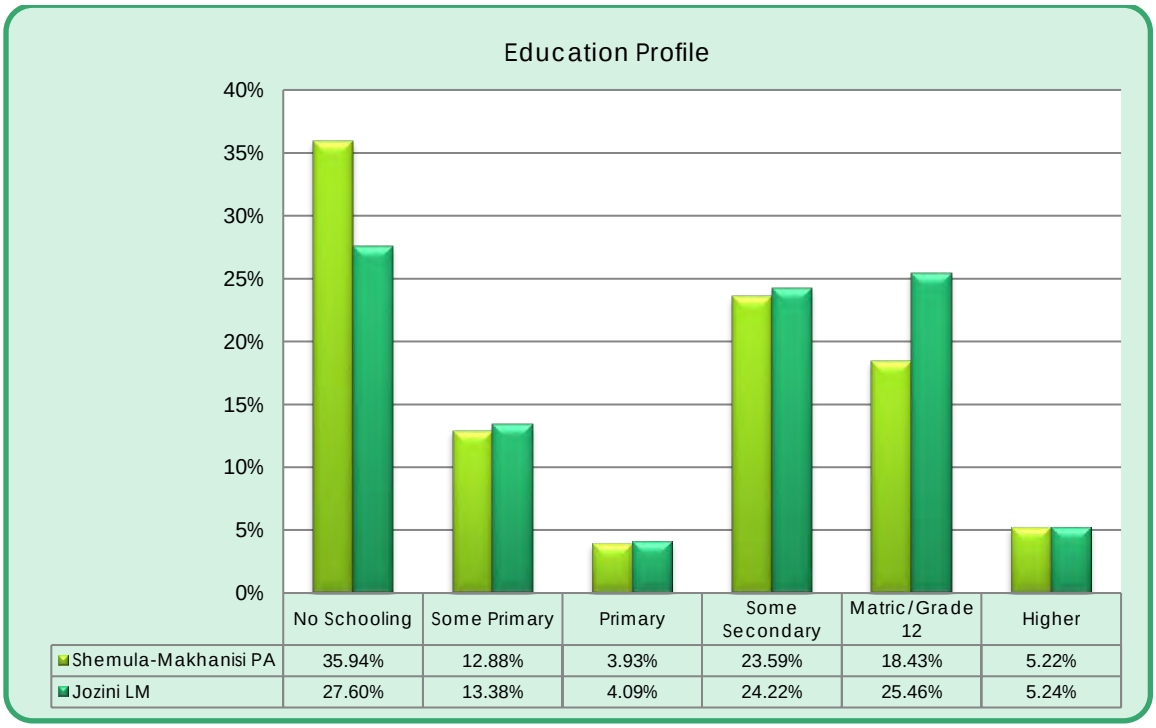
The implication of gender roles within the Shemula-Makhanisi Housing project area need to be given due consideration with regards to the implementation of the envisaged subsidised housing project. Practices of gender equality and empowerment are necessary to ensure that benefits derived from the implementation 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 Jozini 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 as much as 35.94% of the population have indicated that they have not undergone any formal schooling. Only 12.88% of the population indicated to have some primary education

and only 3.93% have completed primary schooling. Only 23.59% of the adult population of the project area indicated to have some secondary education with only 18.43% of the population indicating to have completed Grade 12 and only 5.22% of the total population have undergone some form of post matric/ tertiary education training. The figures of the overall Jozini municipal area indicate a relatively similar low education profile for the municipality with as much as 27.60% of the economically active population having undergone no formal schooling, 13.38% having received some primary level education and only 4.09% having completed primary education. Only 24.22% of the municipal population had received some secondary education and only 25.46% and 5.24% have completed Grade 12 and tertiary education respectively.

Figure 3.3: Levels of Education



	No Schooling	Some Primary	Primary	Some Secondary	Matric/Grade 12	Higher
Shemula-Makhanisi PA	35.94%	12.88%	3.93%	23.59%	18.43%	5.22%
Jozini LM	27.60%	13.38%	4.09%	24.22%	25.46%	5.24%

Source: Statistics SA, Census 2011.

3.1.3.1 Implications for the Rural Subsidised Housing Project:

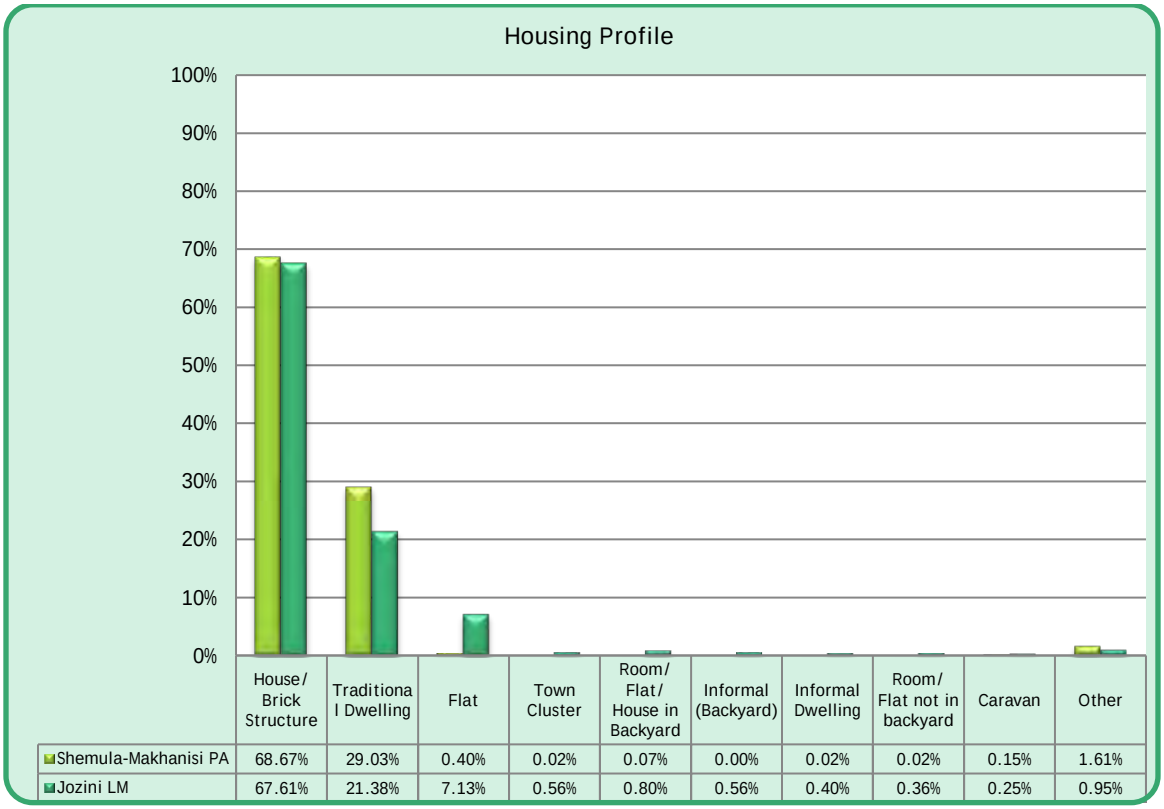
The level of illiteracy within the project area will need to be taken into consideration with regards to the implementation of the proposed project to ensure that that population within the project area who are illiterate are assisted, included and involved in community participation practices, and are 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 Jozini Local Municipality. The most predominant housing type within the study area is "House/ Brick Structure" with the majority (68.67%) of household within the project area residing in structures of this nature; the second most predominant housing type is the "Traditional Dwelling" with 21.38% 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 second most predominant housing type being "traditional dwellings made of traditional material".

Figure 3.4: 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
Shemula-Makhanisi PA	68.67%	29.03%	0.40%	0.02%	0.07%	0.00%	0.02%	0.02%	0.15%	1.61%
Jozini LM	67.61%	21.38%	7.13%	0.56%	0.80%	0.56%	0.40%	0.36%	0.25%	0.95%

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 m^2 (minimum), of which 68.67% of households in the project area; and 67.61% of the households within Jozini 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.

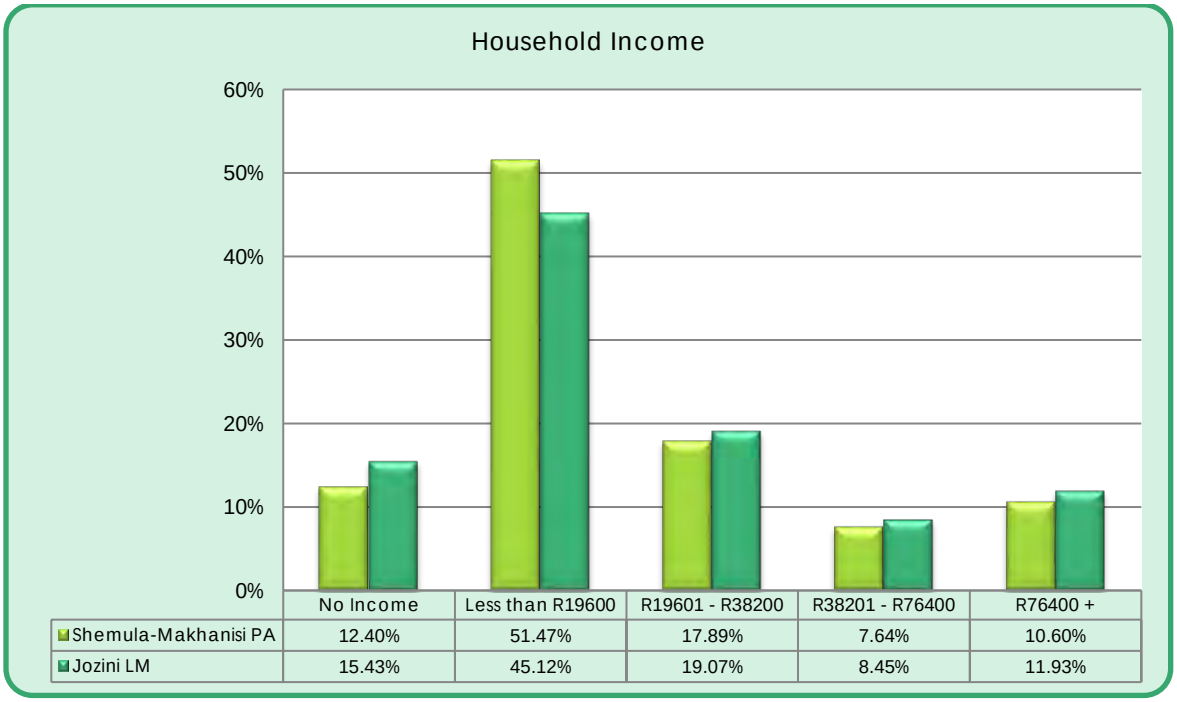
Due to the informal and traditional nature of a considerable number (29.03%) of houses situated within the Shemula-Makhanisi Rural Housing project area, the need for the implementation of a rural subsidized housing project is clearly evident. Such a factor should therefore support and favour the implementation of the proposed project on the Shemula-Makhanisi Rural Housing 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 Shemula-Makhanisi Rural Housing project area and the overall Jozini Local Municipality. As much as 51.47% of the total number of households within the study area indicated a collective monthly household income of R19600 and less, 17.89% fall within the income range of R196001 – R38200, 7.64% earn between R38201 and R76400 while only 10.60% of the total number of households indicating a collective monthly household income of more than R76400. The 2011 Census data also show that 12.40% of the population within the project area have no form of income. Relatively similar monthly household income treads can be seen for the overall Jozini Local Municipality in Figure 3.5 below.

Figure 3.5: Monthly Household Income



	No Income	Less than R19600	R19601 - R38200	R38201 - R76400	R76400 +
Shemula-Makhanisi PA	12.40%	51.47%	17.89%	7.64%	10.60%
Jozini LM	15.43%	45.12%	19.07%	8.45%	11.93%

Source: Statistics SA, Census 2011.

3.2.1.1 Implications for the Rural Subsidised Housing Project:

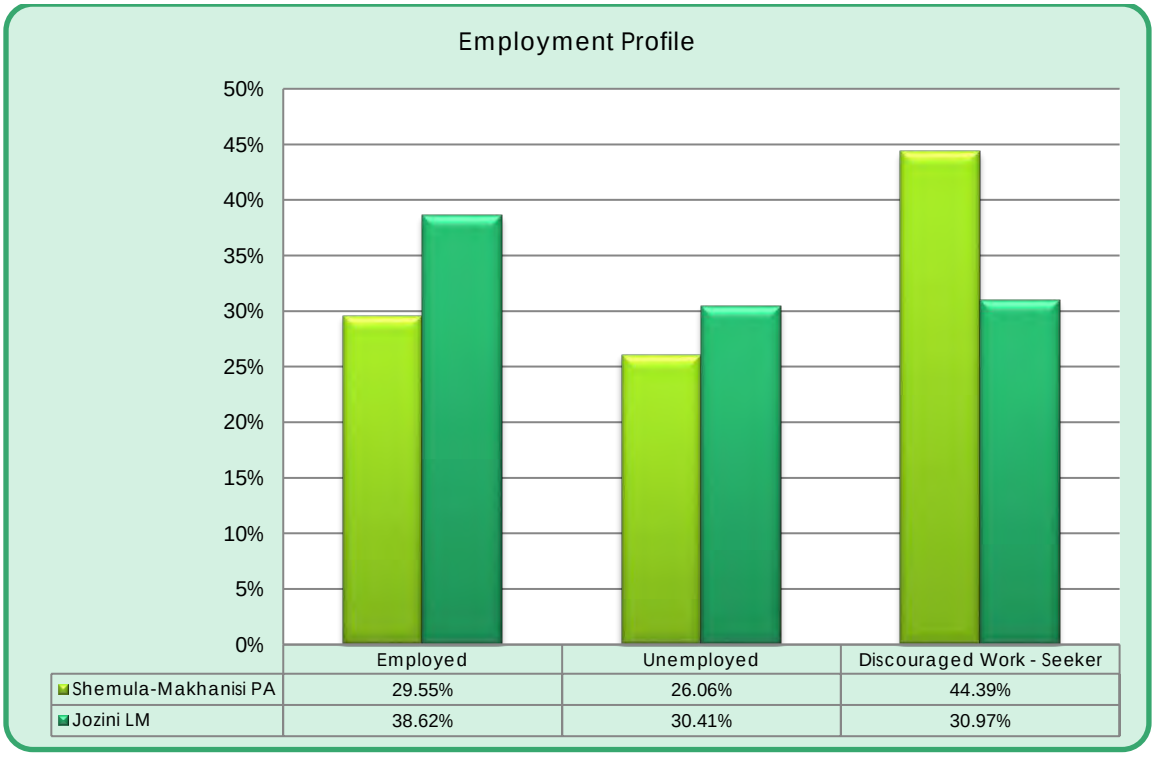
The figures above indicate relatively low affordability levels within the project area and the municipality. The proposed rural housing project will benefit many households with low monthly income and who cannot afford proper housing. The ability of residents to pay for service levels above the minimum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

3.2.2 Employment Profile

Figure 3.6 below illustrates the employment profile of the study area and the overall municipal profile. Around 26.06% of the adult economically active population indicated to be unemployed, according to the narrow definition of unemployment. These figures include persons older that 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 29.55% of the economically active population within the study area indicated that they were employed at the time of the

survey. As much as 44.39% of the economically active population indicated that they were discouraged job seekers. The survey on the overall employment profile of the Jozini Local Municipality indicated relatively similar situation with only 38.62% of the population being employed, 30.41% being unemployed and 30.97% being discouraged job seekers. The very 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

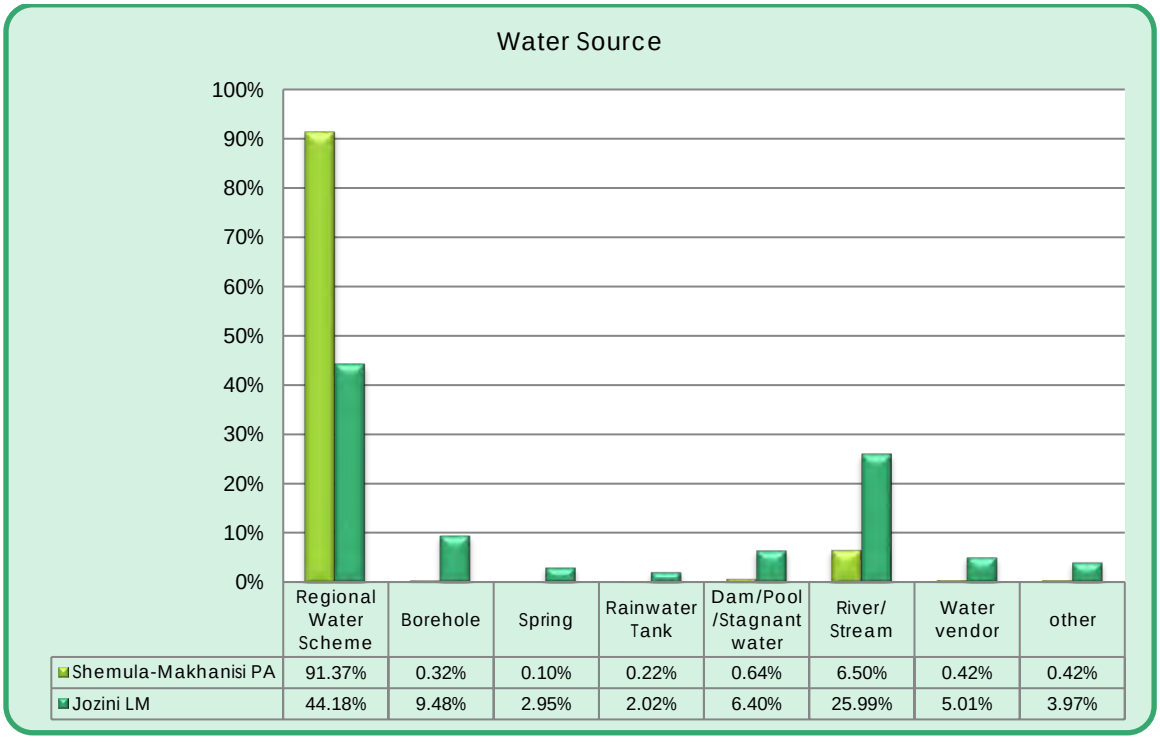
4.1 SERVICES DEMOGRAPHICS

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, the majority of water used by the local community is sourced from the Regional Water Scheme (91.37%). Only 6.50% of water utilized by the local community in the study area is sourced from rivers or streams. Other sources of water are utilized in the study area, but at relatively low levels as depicted in Figure 4.1.

At the municipal level, a similar trend is observed. However, 44.18% of the municipal population sources its water from the Regional Water Scheme and 25.99% source the water from rivers/streams. Only 9.48% of water utilized by the population is sourced from boreholes, with only 6% and 5.01% being sourced from dams/pools and water vendors respectively (Figure 4.1). This suggests a higher dependence on natural water at the municipal level (compared to the study area) and therefore a lack of water infrastructure development in the Jozini Local Municipality as a whole.

Figure 4.1: Water Sources



	Regional Water Scheme	Borehole	Spring	Rainwater Tank	Dam/Pool /Stagnant water	River/ Stream	Water vendor	other
Shemula-Makhanisi PA	91.37%	0.32%	0.10%	0.22%	0.64%	6.50%	0.42%	0.42%
Jozini LM	44.18%	9.48%	2.95%	2.02%	6.40%	25.99%	5.01%	3.97%

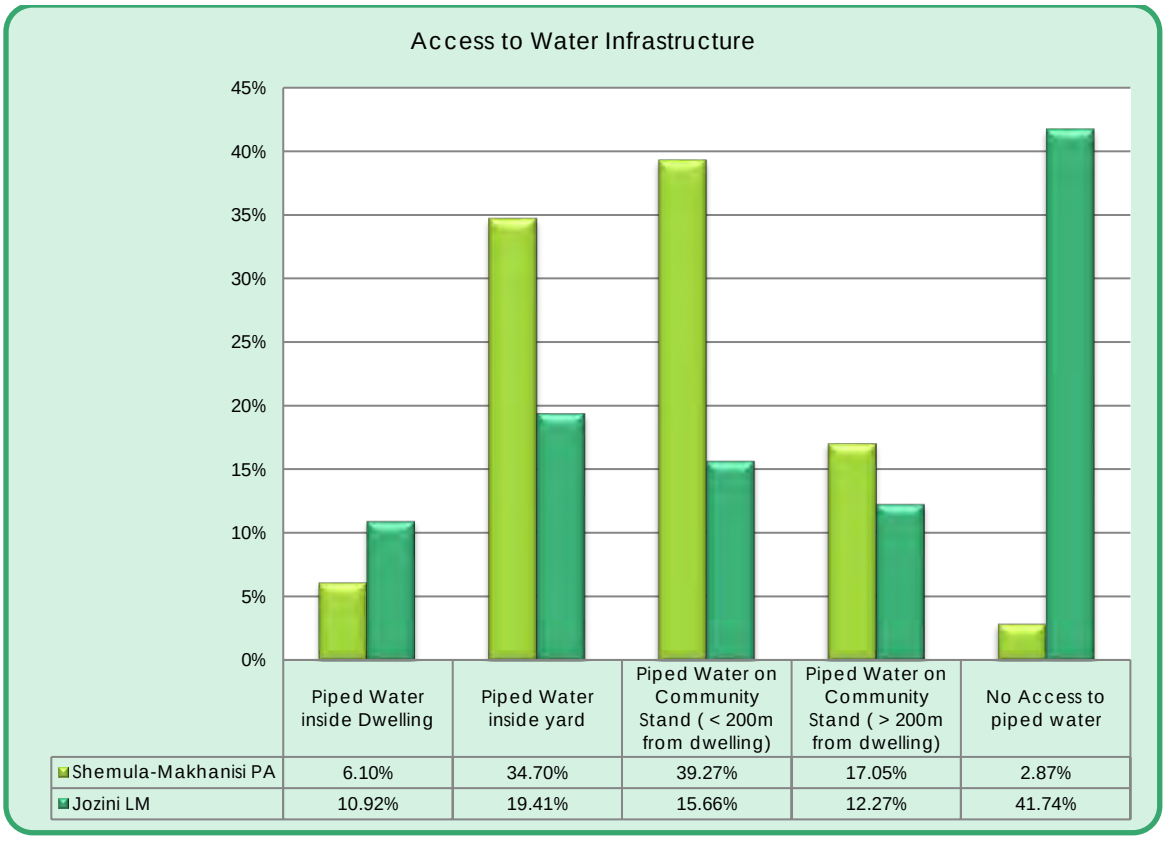
Source: Statistics SA, Census 2011.

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 Jozini Local Municipality. The figure shows relatively limited access to running water in the project area with only 6.10% of the total number of households having access to piped water "inside dwelling" and 34.70% having access to piped water "inside yard". Approximately 39.27% of the households in the project are "access water from a communal stand pipe situated within 200m" from the dwelling while 17.05% "access water from a communal stand pipe situated further than 200m" from the dwelling with only 2.87% of households having no access to piped water. It is quite clear that clean reliable running water was relatively accessible at the time that the survey was conducted within the Shemula-Makhanisi area. However, the area will benefit from further developments to their water infrastructure.

The overall figures for the Jozini Local Municipality, on the other hand, suggest more limited provision of water to households with only 10.92% and 19.41% of households having access to piped water "inside dwelling" and "piped water inside yard" respectively. A further

15.66% of households indicated to source water from a communal tap situated within a distance of 200 meters while 12.27% would source water from a communal tap situated more than 200 meters from the dwelling. Most of the households (41.74%) do not have access to piped water.

Figure 4.2: Access to Water Infrastructure



	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
Shemula-Makhanisi PA	6.10%	34.70%	39.27%	17.05%	2.87%
Jozini LM	10.92%	19.41%	15.66%	12.27%	41.74%

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 only 15.66% of the total Jozini Local municipal population and 39.27% of the Shemula-Makhanisi Rural 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 Shemula-Makhanisi Rural Housing project area, as well as the Jozini 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.

4.1.2 Access to Sanitation Infrastructure

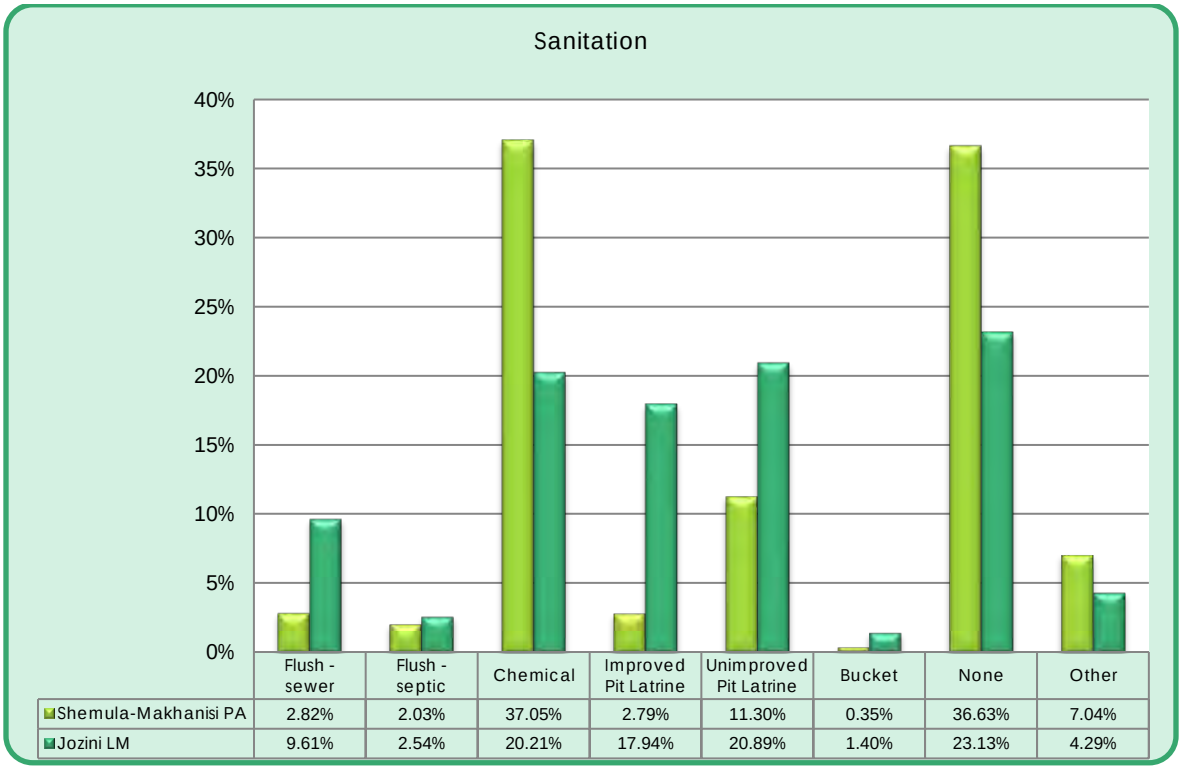
As shown by Figure 4.3 below, as much as 11.30% of the households in the project area make use of "unimproved non ventilated Pit latrine" toilet facilities and only 2.79% use improved "ventilated pit latrine" toilets. As much as 36.63% of the households were recorded as having no access to any sanitation facilities while 37.05% and 0.35% made the use of chemical toilets and bucket toilets respectively. Only 2.82% of households in the project area indicated to use of flush toilets connected to a sewage system and 2.03% connected to a septic tank system. Only 7.04% of household make use of other means of sanitation.

The statistics of the overall Jozini Local Municipality indicate that 20.89% of households making use of "non-ventilated pit toilets" with 17.94% having "ventilated pits toilets. A total of 20.21% of households at municipal level make use of chemical toilets and 1.40% is on the

bucket system. A total of 23.13% percentage of households within the overall municipal area indicated to not have any sanitation facility. While only 9.61% of the total number of households within the Jozini Local Municipality makes use of flush toilets connected of a sewer system while 2.54% use flush toilets connected to a septic tank. The absence of appropriate sanitation infrastructure in the project area is clearly evident from the information depicted in Figure 4.3 below. The comparative figure of households with no access to any sanitation facilities indicate the project area (36.63%) being relatively under-serviced compared to the average municipal figure of 23.13%. The average number of households with flush toilets in Jozini LM is relatively higher than that of the project area and chemical toilets are used more in the project area compared to the overall municipal area. The figures however indicate a relatively 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 Shemula-Makhanisi Rural Housing project area.

The potential impact of the extensive utilization of unimproved pit latrines 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 both the Shemula-Makhanisi Rural Housing project area and the greater Jozini Local Municipality.

Figure 4.3: Access to Sanitation Infrastructure



	Flush - sewer	Flush - septic	Chemical	Improved Pit Latrine	Unimproved Pit Latrine	Bucket	None	Other
Shemula-Makhanisi PA	2.82%	2.03%	37.05%	2.79%	11.30%	0.35%	36.63%	7.04%
Jozini LM	9.61%	2.54%	20.21%	17.94%	20.89%	1.40%	23.13%	4.29%

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 a 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.

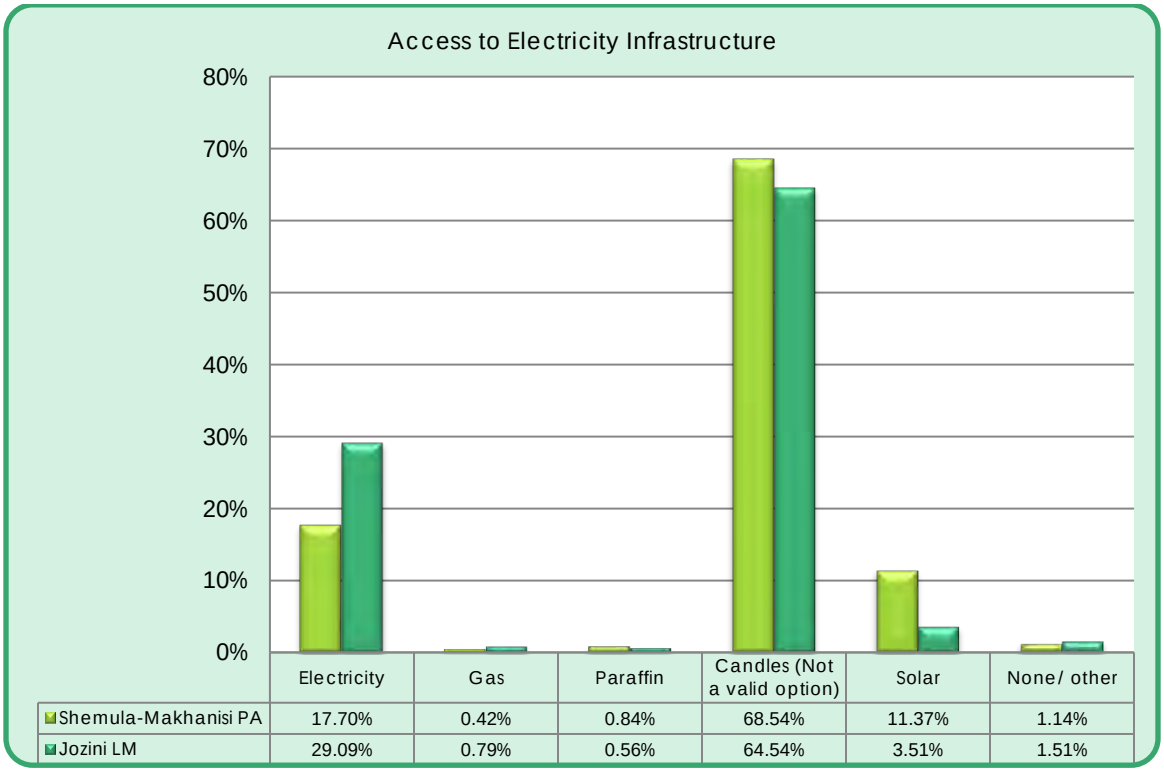
The National legislated (RDP) minimum norms and standards in respect of sanitation service provision in South Africa is considered to be ventilated improved pit toilet (VIP), of which approximately 17.94% of the total households in Jozini Local municipal area and only 2.79% of the Shemula-Makhanisi Rural 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 Shemula-Makhanisi Rural Housing project area, as well as the Jozini 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 Shemula-Makhanisi Rural Housing project area and overall Jozini municipal area. During the time of the survey, the majority of households within the project area (68.54%) indicated that they made use of candles as a source of lighting in the house while only 17.70% used electricity. Solar energy is utilized by 11.37% of households. A further 0.84% and 0.42% made use of paraffin and gas lighting respectively while 1.14% of households use other/no sources of electricity. The trends in "energy for lighting" statistics recorded for the overall municipal area were relatively similar with as much as 64.54% of the households within the overall Jozini municipality indicating to make use of candles for lighting while 29.09% used candles for lighting in 2011. A total of 3.51% of households within the municipal area indicated the use of solar energy as a source of lighting. Furthermore, paraffin (0.56%) and Gas (0.79%) were also recorded as lighting source respectively; with 1.51% 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 relatively lower than the comparative figure for the Local Municipality (Figure 4.4).

Figure 4.4: Access to Electricity Infrastructure



	Electricity	Gas	Paraffin	Candles (Not a valid option)	Solar	None/ other
Shemula-Makhanisi PA	17.70%	0.42%	0.84%	68.54%	11.37%	1.14%
Jozini LM	29.09%	0.79%	0.56%	64.54%	3.51%	1.51%

Source: Statistics SA, Census 2011.

4.1.3.1 Implications for the Rural Housing Project:

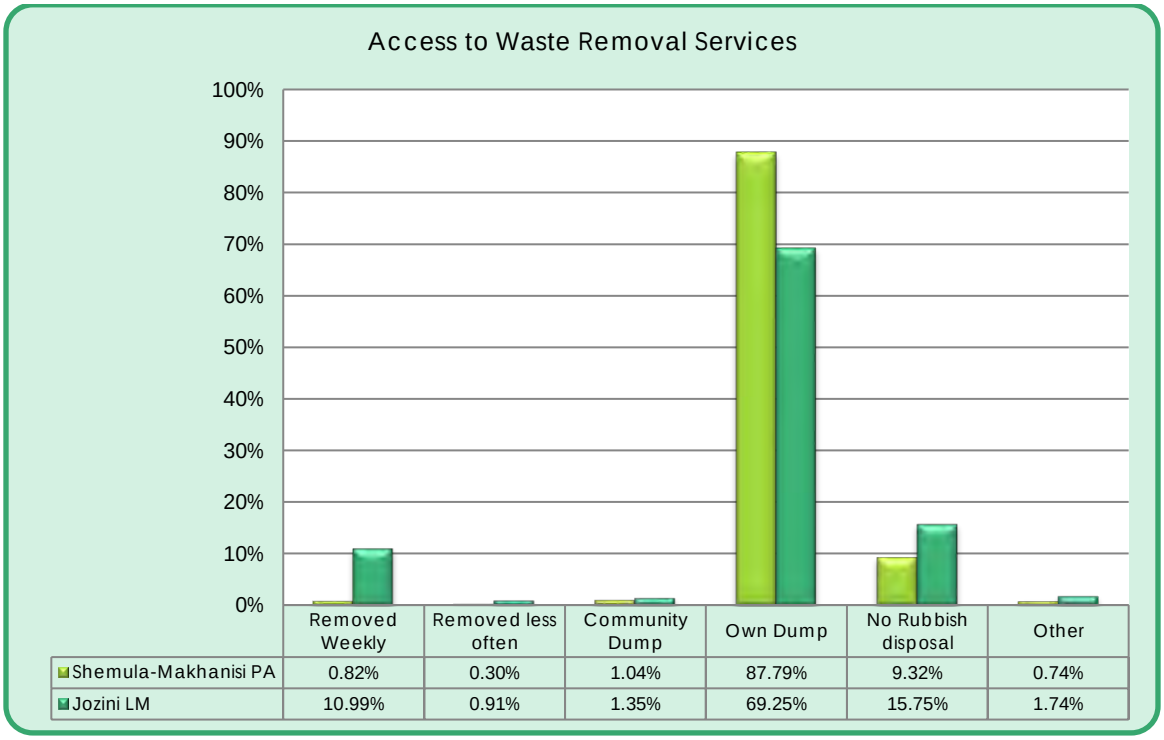
The provision of an internal electrical reticulation network is not viewed as a minimum requirement as far as subsidised housing is concerned, and as such the provision of an internal electrical reticulation network does not form part of the proposed subsidised housing project. The absence of appropriate 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 Shemula-Makhanisi Rural Housing project area and the overall Jozini Local Municipality at the time of the survey is clearly illustrated in the graph. As much as 87.79% 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. A relatively similar percentage (69.25%) of households within the entire Jozini Local Municipality indicated to use the same method of waste disposal. A further 9.32% of households in the project area and 15.75% in the overall municipal area indicated that they had no practised waste disposal method in place. Only 0.82% of households within the project area had its refuse collected by the municipality once a week and 0.30% of households indicated that their refuse was collected by the local municipal authority less often than weekly basis. Only 1.04% of households in the project area made use of a communal dump.

The figures from the graph indicate that 10.99% of the households in Jozini Local Municipality had their refuse collected once a week and 0.91% collected less often than on a weekly basis while 1.35% made use of communal dump sites. Much like in the project area, the majority of households in the Jozini Local Municipality (69.25%) used their own dump (Figure 4.5). From the graph it is evident that the majority of households in the Shemula-Makhanisi Rural Housing project area and the overall Jozini Municipal 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.

Figure 4.5 Access to Waste Removal Services



Source: Statistics SA, Census 2011.

4.1.4.1 Implications for the Subsidised Housing Project:

The Jozini 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 Shemula-Makhanisi Rural 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 Shemula-Makhanisi Rural Subsidised 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 are four Provincial Roads, namely the P435, P522-2, P443 and the P522-1, that run through the project area.

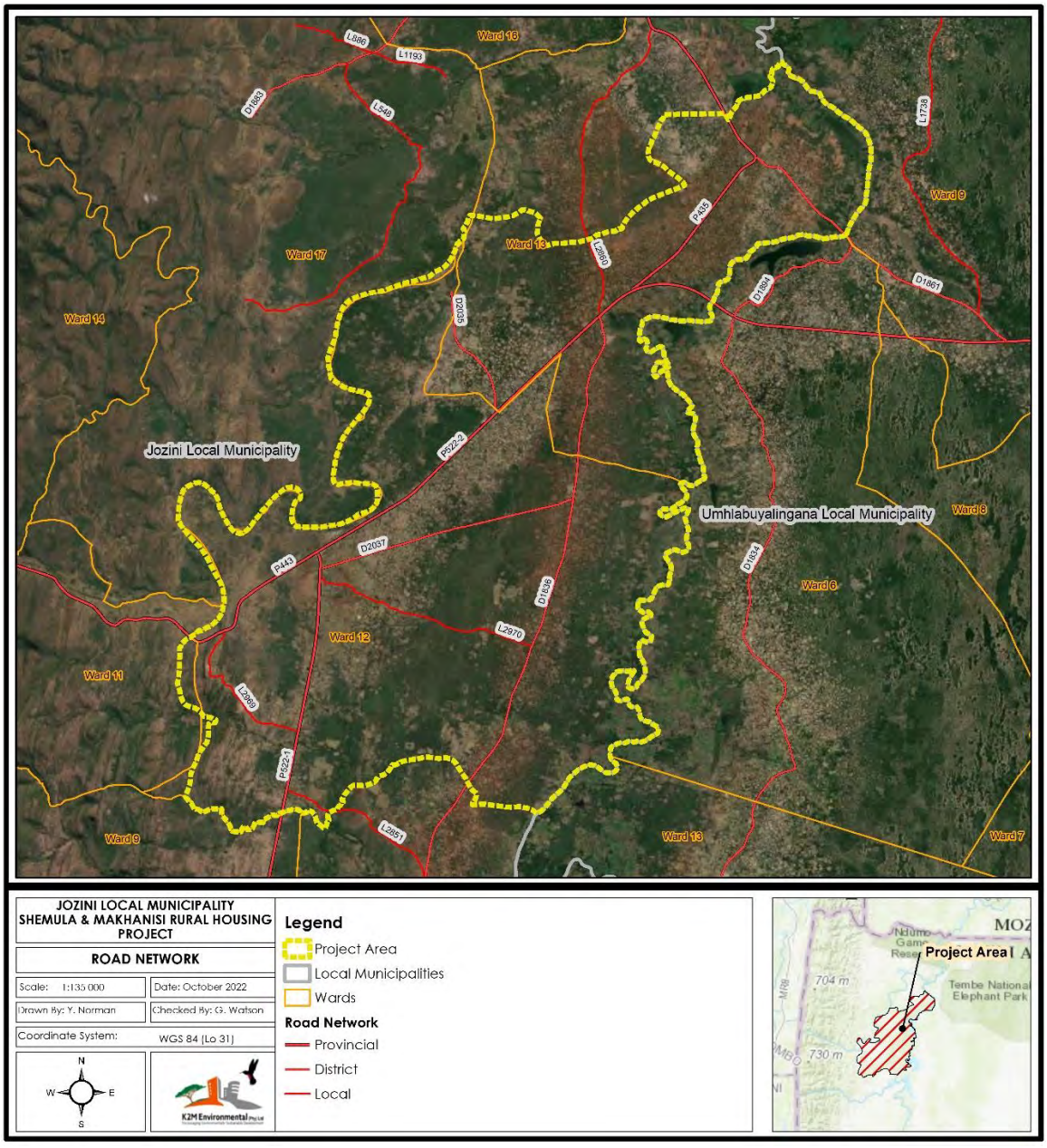
4.2.1.3 District Roads

There are six District Roads that run through the project area. These District Roads are namely the D1861, D1894, D1834, D2035, D2037 and D1836.

4.2.1.4 Local Access Roads

There are five numbered local access roads around the site, namely the L548 (which runs north of the site boundary), the L2969 (which runs in the south-eastern portion of the site), the L2851 (which runs south of the site), the L2970 (which runs in the southern portion of the site) and the L2860 (which runs in the north of the site).

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 erven 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 Shemula-Makhanisi Rural 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 Shemula-Makhanisi Rural 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 negative 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:

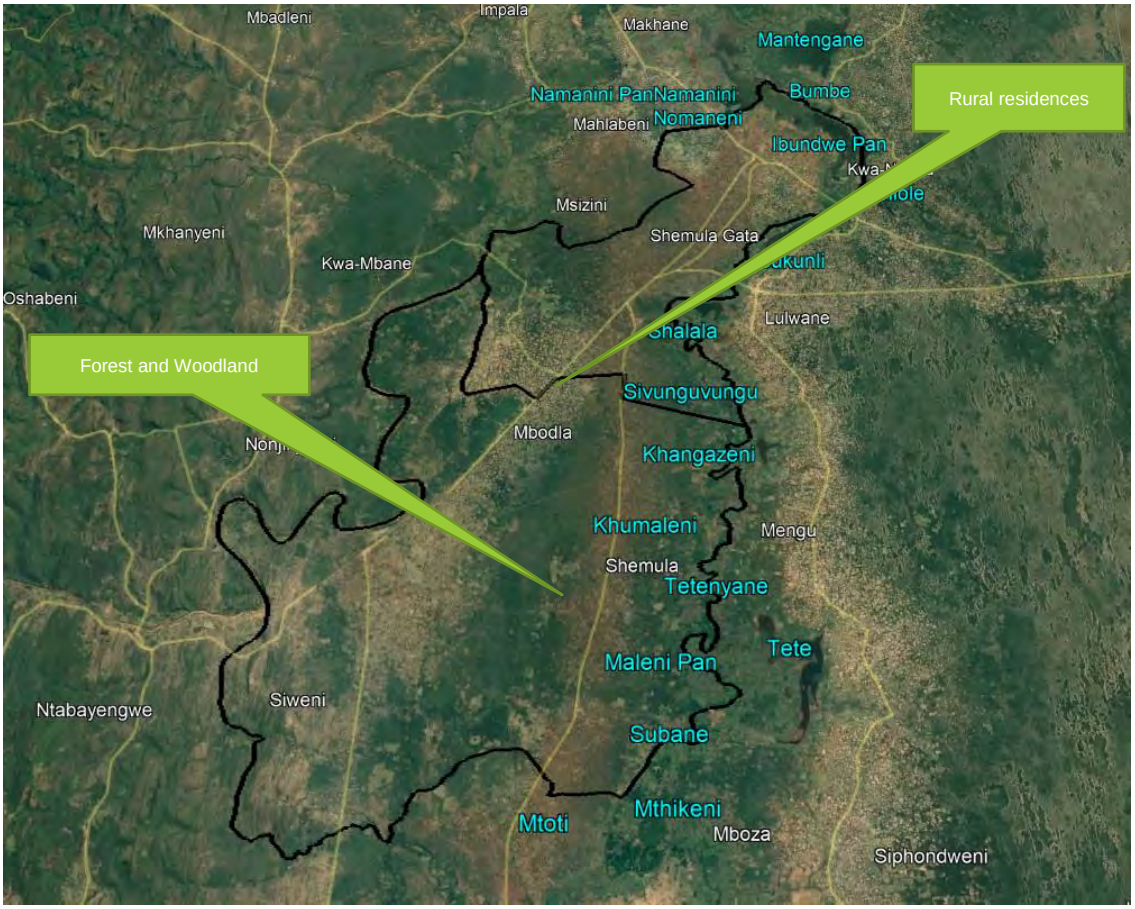
While the National legislated (RDP) minimum norms and standards in respect of stormwater management in South Africa is considered to be "Lined open channels" the logistics and costs involved with the implementation thereof mean that such a minimum norm and standard is not feasible for implementation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

5 BIO-PHYSICAL COMPONENT

5.1 CURRENT LAND USE

The current land use within the project area is rural residential and agricultural. As seen in Figure 5.1 below, the project area consists of rural dwellings and cultivated areas interspersed with dense stands of woodlands and thicket. Two perennial rivers run along the western and eastern boundaries of the site and a network of non-perennial streams runs through the southern, western and eastern portions of the project area. The eastern portion of the project area is also characterised by a network of wetlands running from north to south (labelled in blue).

Figure 5.1: Current Land Use



Source: Google Earth, 2022

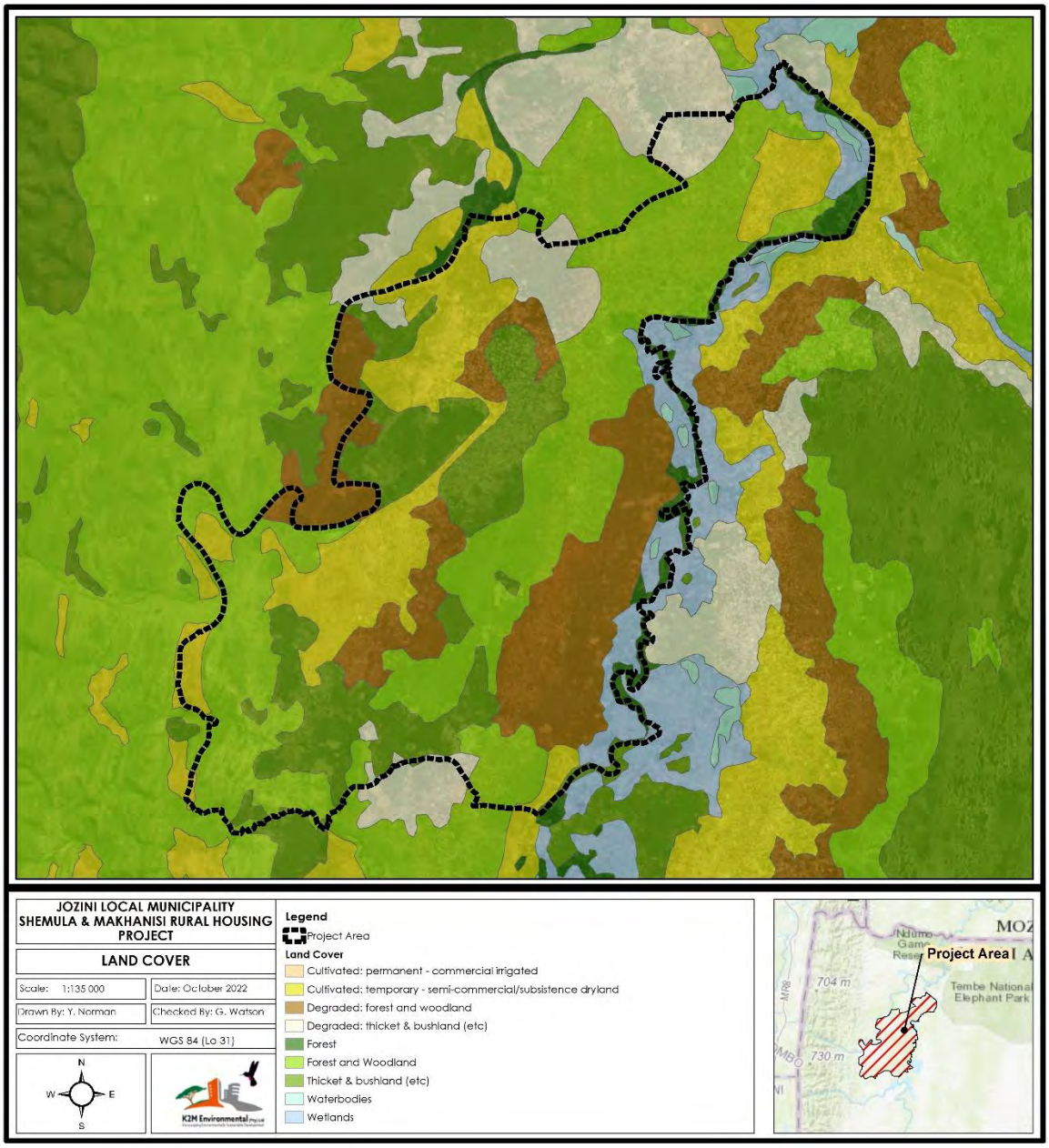
5.2 LAND COVER AND TOPOGRAPHY

The overall land cover within the study area is illustrated in Table 5.1 below and graphically depicted on the Map 5.1 below. The dominant land cover within the project area is "Forest and Woodland", making up 34.3% of the project site.

Table 5.1: Landcover

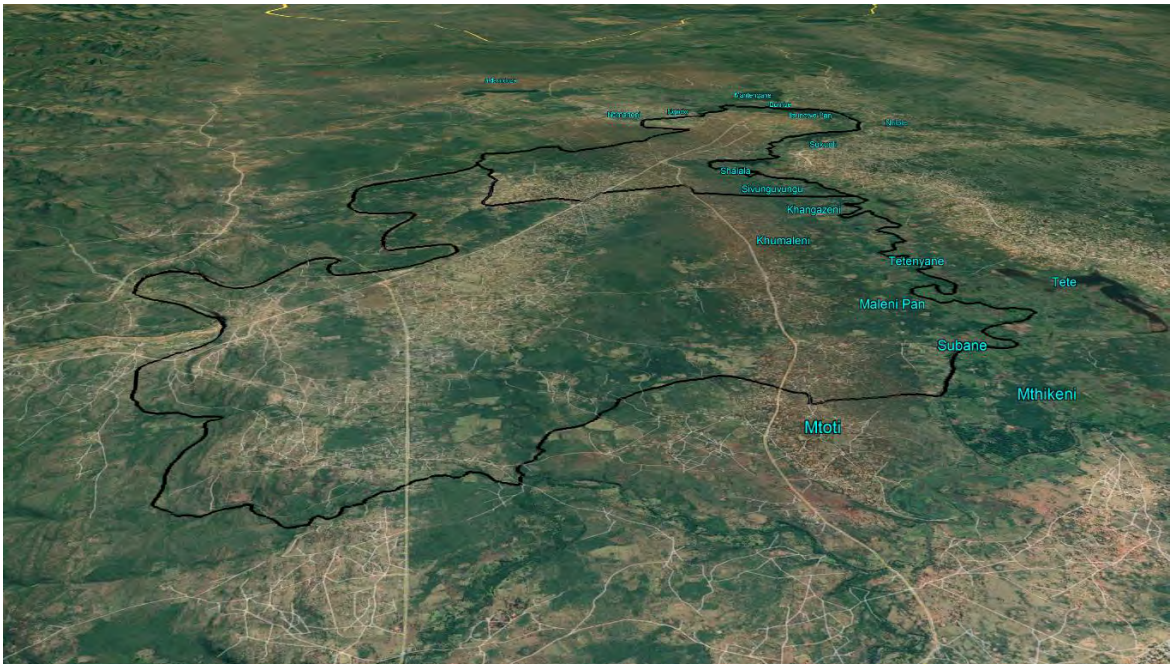
Landcover	Area (Ha)	Percentage (%)
Cultivated: temporary - semi-commercial/subsistence dryland	3021.89	16.6
Degraded: forest and woodland	3248.61	17.9
Degraded: thicket & bushland (etc)	995.65	5.5
Forest	492.34	2.7
Forest and Woodland	6233.72	34.3
Thicket & bushland (etc)	3197.61	17.6
Waterbodies	70.79	0.4
Wetlands	918.64	5.1
Total Area	18179.25	100

Map 5.1: Landcover



The overall topography of the study area is clearly depicted on Figure 5.2 below. The topography of the site is generally flat with gentle undulating slopes.

Figure 5.2: Topography



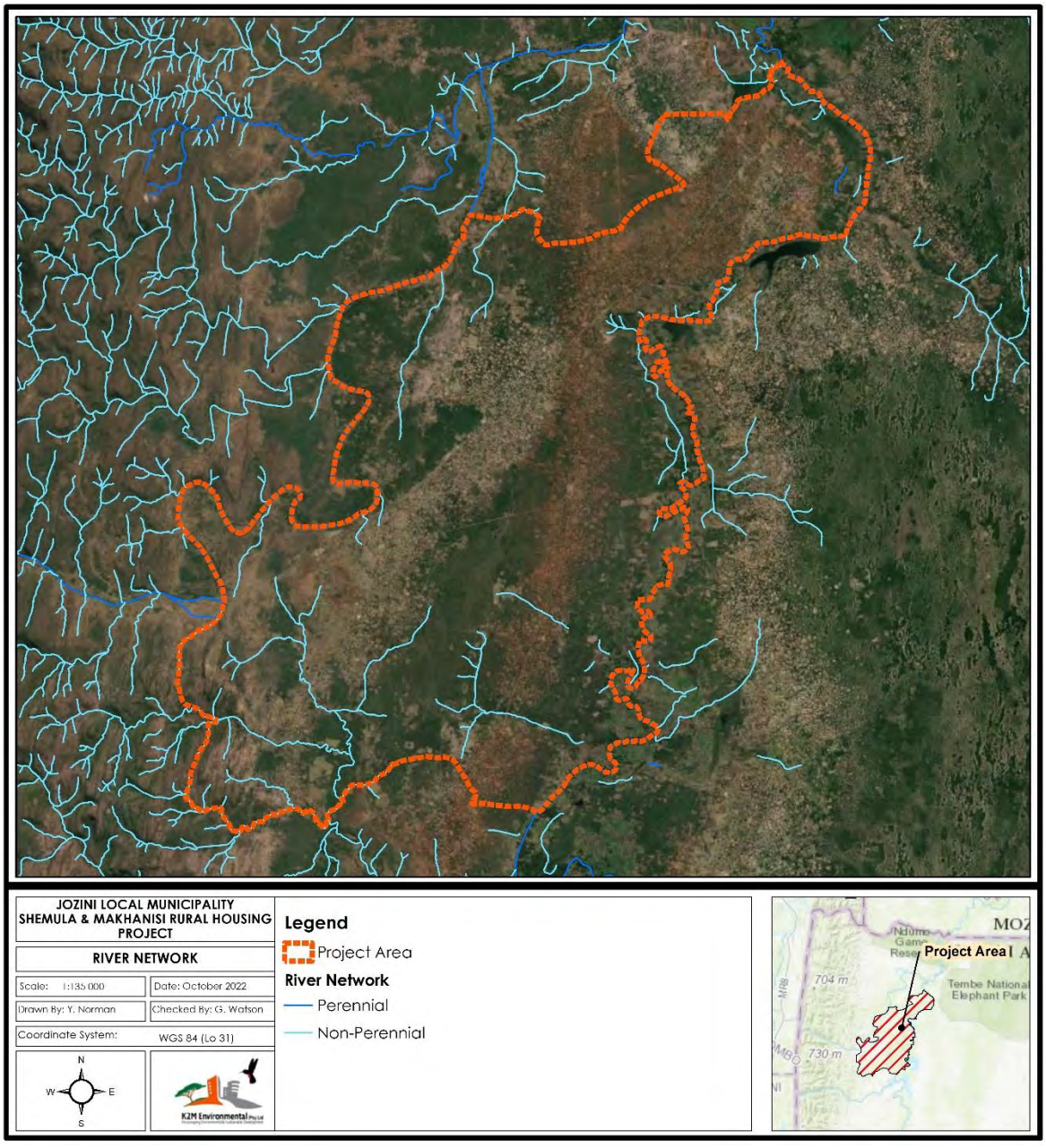
Source: Google Earth 2022

5.3 RIVER NETWORK

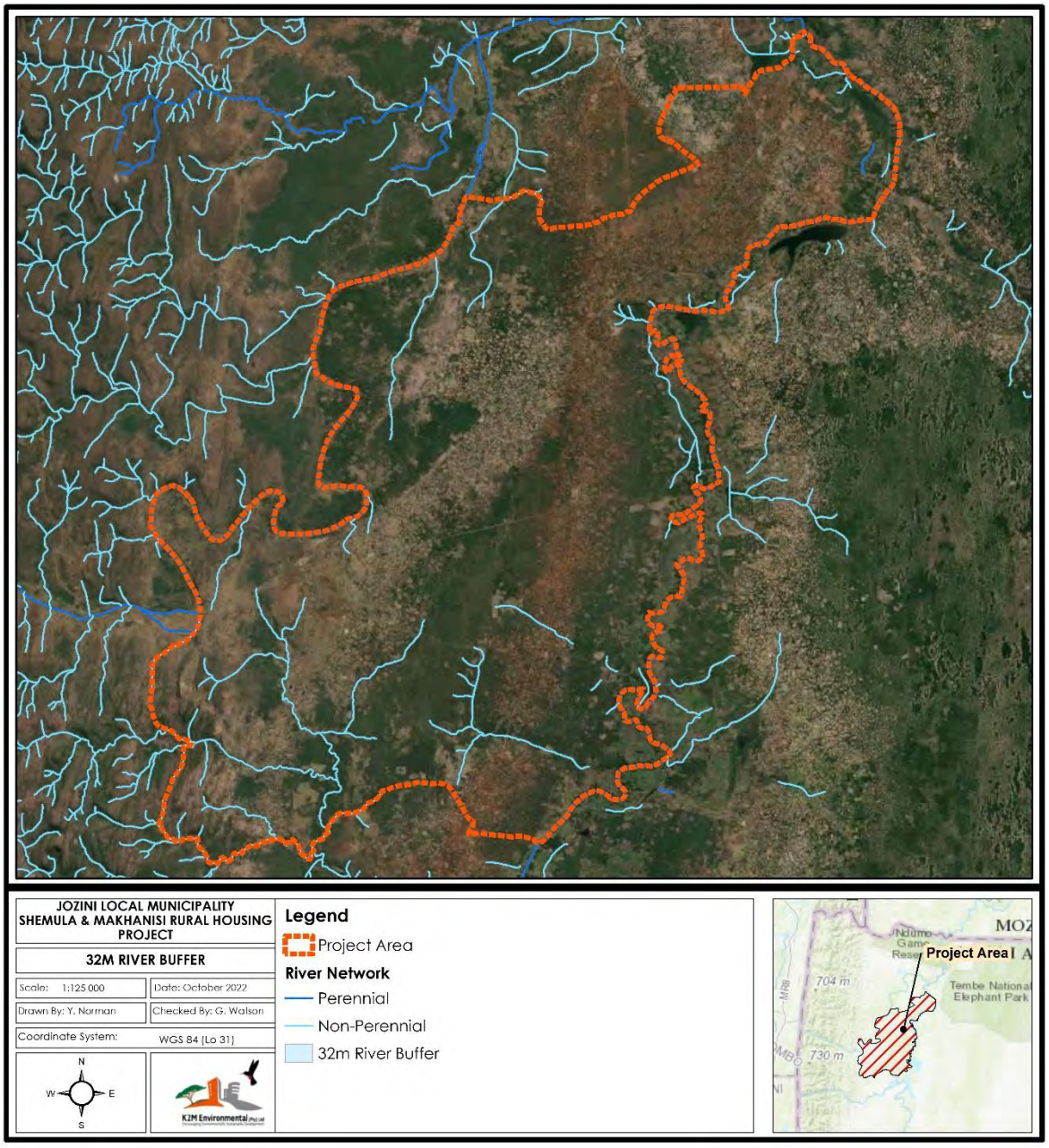
As indicated in Map 5.2, there are two perennial rivers that run along the western and eastern boundaries of the site as well as several non-perennial streams that have been identified within the project area. It should be noted that in terms of the National Water Act, as well as other developmental 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 River Network Buffer



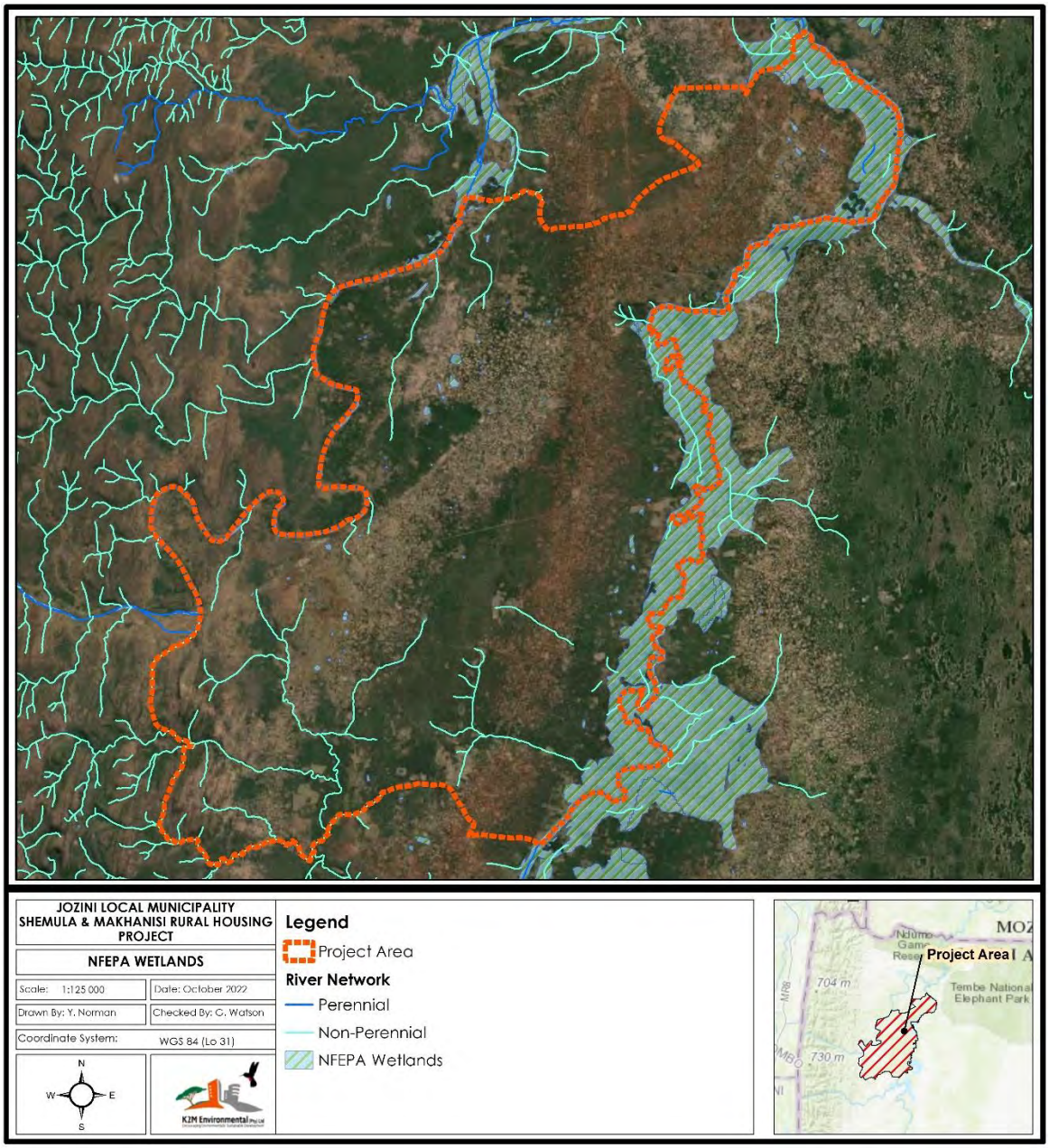
5.4 FRESHWATER ECOSYSTEM PROTECTED AREAS **(FEPA'S)**

Freshwater Ecosystem Protected Areas (FEPA's) according to the Water Research Council 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 illustrated in Map 5.4 below, there is a large NFEPA Wetland that occurs along the north-eastern, eastern and south-eastern boundaries of the project area.

Map 5.4: NFEPA Wetlands



Source: Department of Water and Sanitation

5.5 AGRICUTURAL POTENTIAL

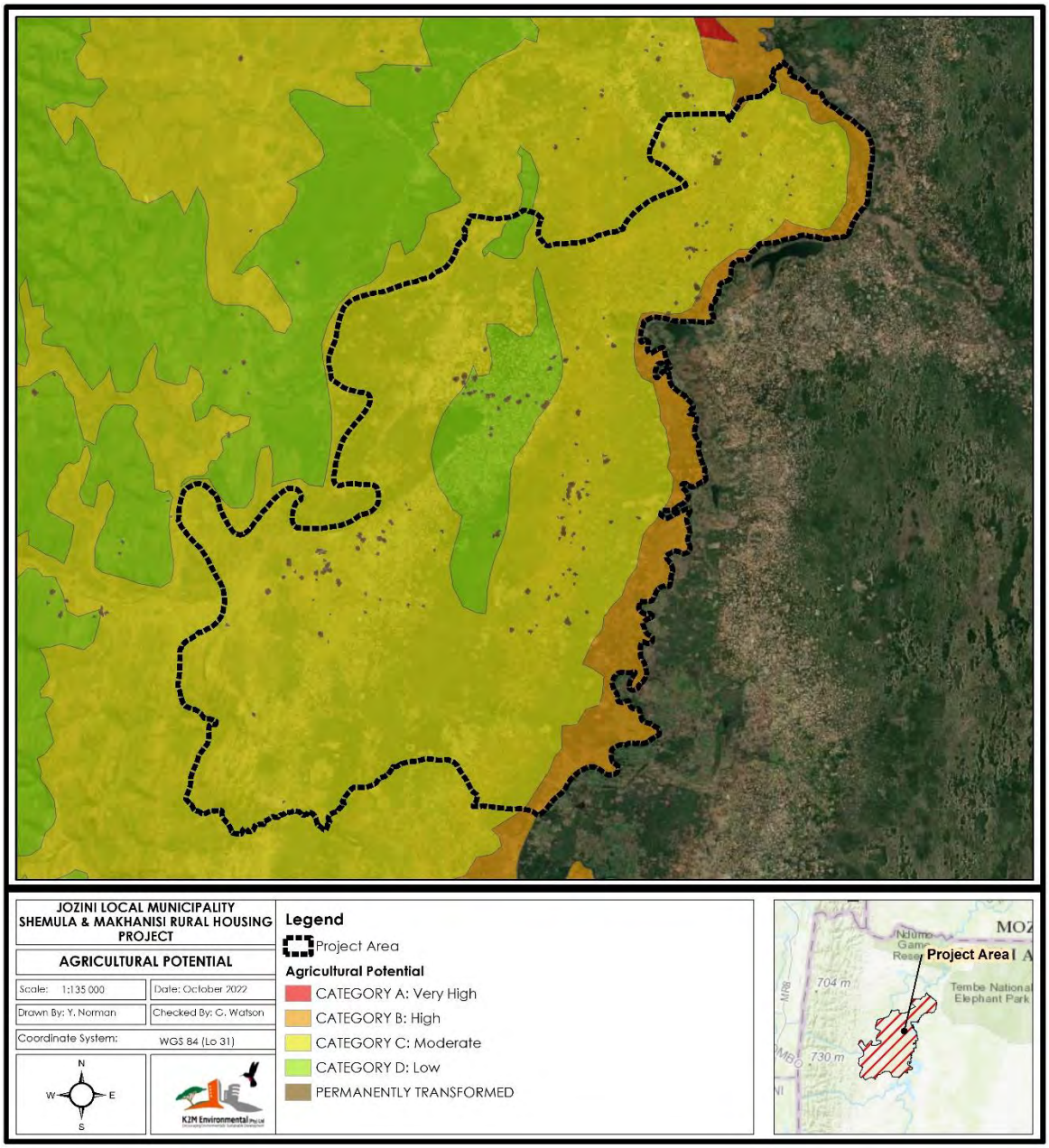
According to the Agricultural Land Potential Categories External Report, agricultural potential refers to the potential of the land to produce sustainably over a long period without degradation to the natural resources base. This includes land under production for cultivation purposes (arable land) and for grazing purposes. Table 5.2 and Map 5.5 illustrate the agricultural potential categories within the site. A description of each category is provided below.

The majority (81.5%) of land within the project area is classified as Category C: Moderate, while 9.7% of the land within the project area is classified as Category B: High. Approximately 8.3% of the lands is classified as Category D: Low and the remainder of the land in the project area (0.26%) is classified as Permanently Transformed. Land with moderate agricultural potential would be required to achieve viable and sustainable food production, although agriculture is the still the majority land use in the rural landscape (Collett and Mitchell, 2013). This Category is more limited in the extent of arable land available for cultivation. These areas are more suitable for extensive grazing, the production of fodder crops in support of livestock production, and, from a natural rangeland grazing perspective, additional feed may be required during winter months to supplement the seasonal grazing provided by existing rangeland (Collett and Mitchell, 2013).

Table 5.2: Agricultural Potential

Agricultural Potential	Area (Ha)	Percentage (%)
Category B: High	1761.82	9.7%
Category C: Moderate	14809.30	81.5%
Category D: Low	1500.00	8.3%
Permanently Transformed	107.89	0.6%
Total	18179.01	100%

Map 5.5: Agricultural Potential

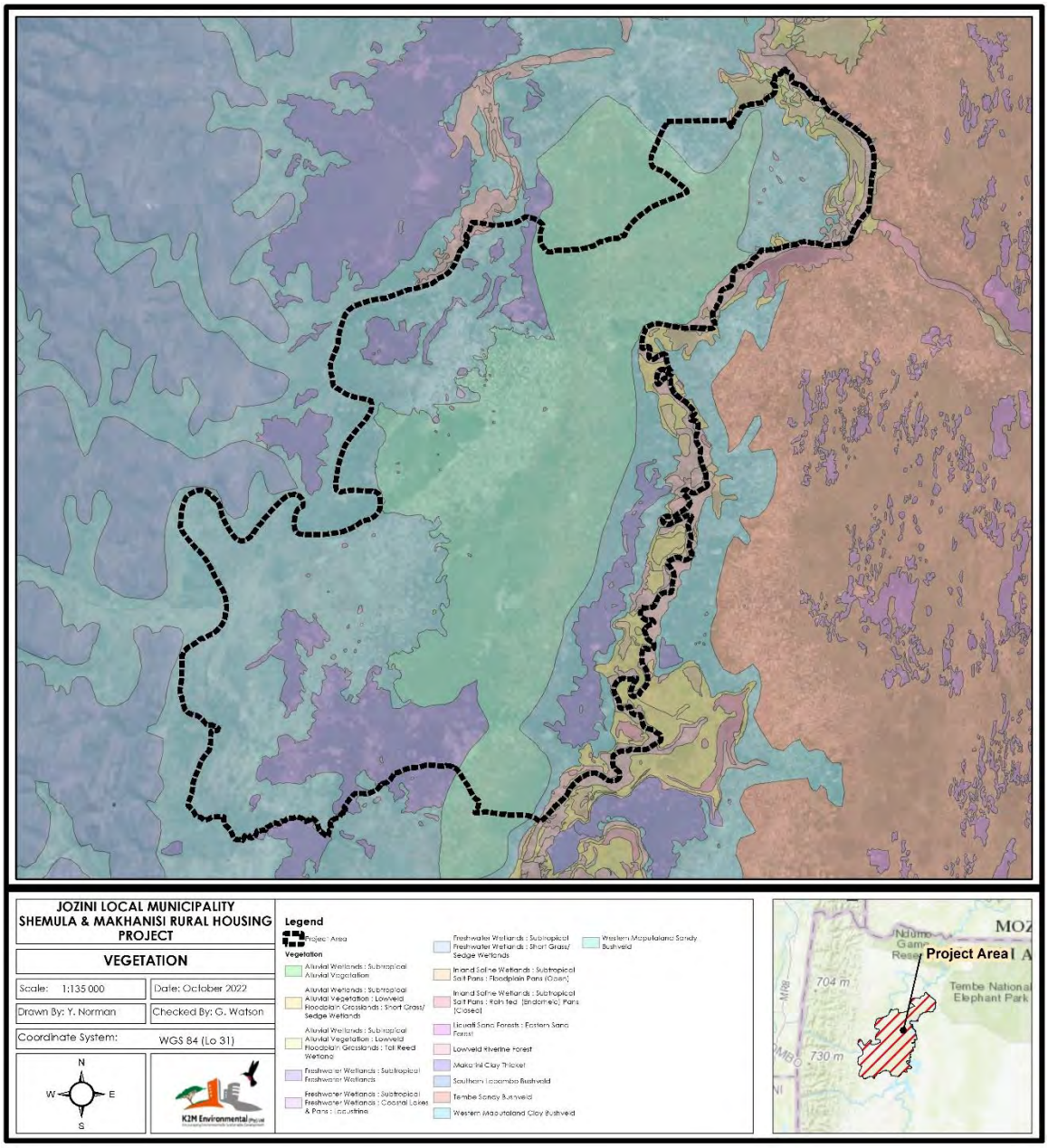


Source: Department of Agriculture and Rural Development

5.6 VEGETATION

As indicated in Map 5.6 and Table 5.3, the project area is characterised mostly by Western Maputaland Clay Bushveld, Western Maputaland Sandy Bushveld and Makatini Clay Bushveld which make up 39.86%, 39.17% and 12.49% of the project area respectively.

Map 5.6: Vegetation



Source: KZN Wildlife

Table 5.3: Vegetation

Vegetation	Area (ha)	Percentage (%)
Alluvial Wetlands: Subtropical Alluvial Vegetation	0.98	0.01
Alluvial Wetlands: Subtropical Alluvial Vegetation: Lowveld Floodplain Grasslands: Short Grass/ Sedge Wetlands	556.62	3.06
Alluvial Wetlands: Subtropical Alluvial Vegetation: Lowveld Floodplain Grasslands: Tall Reed Wetland	32.01	0.18
Freshwater Wetlands: Subtropical Freshwater Wetlands	48.06	0.26
Freshwater Wetlands: Subtropical Freshwater Wetlands: Coastal Lakes & Pans: Lacustrine	1.09	0.01
Freshwater Wetlands: Subtropical Freshwater Wetlands: Short Grass/ Sedge Wetlands	0.81	0.004
Inland Saline Wetlands: Subtropical Salt Pans: Floodplain Pans (Open)	174.62	0.96
Inland Saline Wetlands: Subtropical Salt Pans: Rain fed (Endorheic) Pans (Closed)	31.23	0.17
Lowveld Riverine Forest	695.25	3.82
Makatini Clay Thicket	2271.10	12.49
Tembe Sandy Bushveld	0.55	0.003
Western Maputaland Clay Bushveld	7245.58	39.86
Western Maputaland Sandy Bushveld	7121.35	39.17
Total	18179.25	100

As per the data provided by Mucina and Rutherford (2006), the vegetation units that occur within the Shemula-Makhanisi Rural Housing project area are discussed in further detail below:

5.6.1 Alluvial Wetlands: Subtropical Alluvial Vegetation

Alluvial Wetlands: Subtropical Alluvial Vegetation is an Endangered vegetation type that occurs in Limpopo, Mpumalanga and KwaZulu Natal as well as in eSwatini. Occurring in the Savanna Biome, this vegetation type is characterised by flat alluvial riverine terraces that support a mosaic of macrophytic vegetation, marginal reed belts, flooded grasslands and riverine thickets (Mucina & Rutherford, 2006). Despite much of the surface area having been transformed for cultivation, urban development and road building, this vegetation type is Least Threatened. Large patches of this vegetation type are statutorily conserved in the Kruger and Mapungubwe national parks, Vemre and D'nyala Nature Reserves, Ndumo Game Reserve and the Greater iSimangaliso Wetland Park.

5.6.2 Freshwater Wetlands: Subtropical Freshwater Wetlands

Freshwater Wetlands: Subtropical Freshwater Wetlands occur in the KwaZulu Natal, Mpumalanga, Gauteng, North-West, Limpopo and Eastern Cape Provinces as well as eSwatini. A vegetation type that is a prominent feature in the Albany Thicket, Indian Ocean Coastal Belt and Savanna Biomes, it is characterized by flat topography supporting low beds dominated by reeds, sedges and rushes. This vegetation type is Least Threatened with some 40-50% of the vegetation type being statutorily conserved in protected areas that include the Greater iSimingaliso Wetland Park, Kruger National Park, Ndumo Game Reserve, Tembe Elephant Park.

5.6.3 Inland Saline Wetlands: Subtropical Salt Pans

Consisting of salt pans in the subtropical regions of eastern South Africa, this vegetation type occurs in the Limpopo, Mpumalanga and KwaZulu Natal Provinces and in eSwatini. These pans are often shallow depressions found in old alluvial river terraces surrounded by reed banks and a dense carpet of macrophytic vegetation. The Subtropical Salt Pans vegetation type is Least Threatened with over 40% of the vegetation type being statutorily conserved in protected areas that include the Greater iSimingaliso Wetland Park, Kruger National Park, Ndumo Game Reserve, as well as the private Zoutpan Nature Reserve.

5.6.4 Lowveld Riverine Forest

The Lowveld Riverine Forest occurs in KwaZulu Natal, Mpumalanga and Limpopo Provinces (as well as eSwatini, Mozambique and Zimbabwe) This vegetation type is characterised by tall, dense forests fringing larger rivers and water pans. This vegetation type is Critically Endangered with approximately 50% being statutorily conserved in the Greater Kruger and Mapungubwe National Parks, the Greater iSimangaliso Wetland Park, Ndumo and Mkhuze Game Reserves.

5.6.5 Makatini Clay Thicket

Makatini Clay Thicket is endemic to KwaZulu Natal, occurring in patches within the Maputaland region, primarily east of the Lebombo Mountains. This vegetation type comprises a mixed, but mainly simple-leaved short bushland and thicket with emergent trees up to 10m and a generally dense dominant shrub layer that extends between 1-4m in height. The Makatini Clay Thicket is Least Threatened, with some 40% being statutorily conserved in the Greater iSimingaliso Wetland Park (Mkhuze) and Ndumo Game Reserve.

5.6.6 Tembe Sandy Bushveld

Endemic to KwaZulu Natal, this vegetation type forms part of the Maputaland Lowveld, east of the Pongola/Phongolo River. It is comprised mostly of extensive flat plains characterised by open to closed woodland with a canopy that ranges from 5-10m in height. Tembe Sandy Bushveld is Least Threatened, with some 17% being statutorily conserved mostly in the Tembe Elephant Park.

5.6.7 Western Maputaland Clay Bushveld

As the name suggests, the Western Maputaland Clay Bushveld is endemic to the Maputaland region of KwaZulu Natal, immediately east of the Lebombo Mountains. This vegetation type is comprised of mixed woodlands and wooded grasslands occurring on the crests, upper and midslopes of gently undulating terrain comprising of red sandy clay loam to red clay soils. It is also classified as Vulnerable, with some 42% being statutorily conserved in the Greater iSimangaliso Wetland Park (Mkhuze) and Ndumo Game Reserve.

5.6.8 Western Maputaland Sandy Bushveld

Occurring in isolated patches on the coastal plain of the Maputaland region east of the Lemombo Mountains, Western Maputaland Sandy Bushveld is endemic to KwaZulu Natal. This vegetation type is, like its clay-dominant counterpart, comprised of mixed woodlands

and wooded grasslands. However, the underlying geology of this vegetation type, as indicated by its name, comprises carbonate-rich sandy cordon occurring on the near-coastal environment of the Maputaland region. The Western Maputaland Sandy bushveld is classified as Least Threatened, with some 18% being statutorily conserved in the Greater iSimangaliso Wetland Park (Mkhuze) and Ndumo Game Reserve.

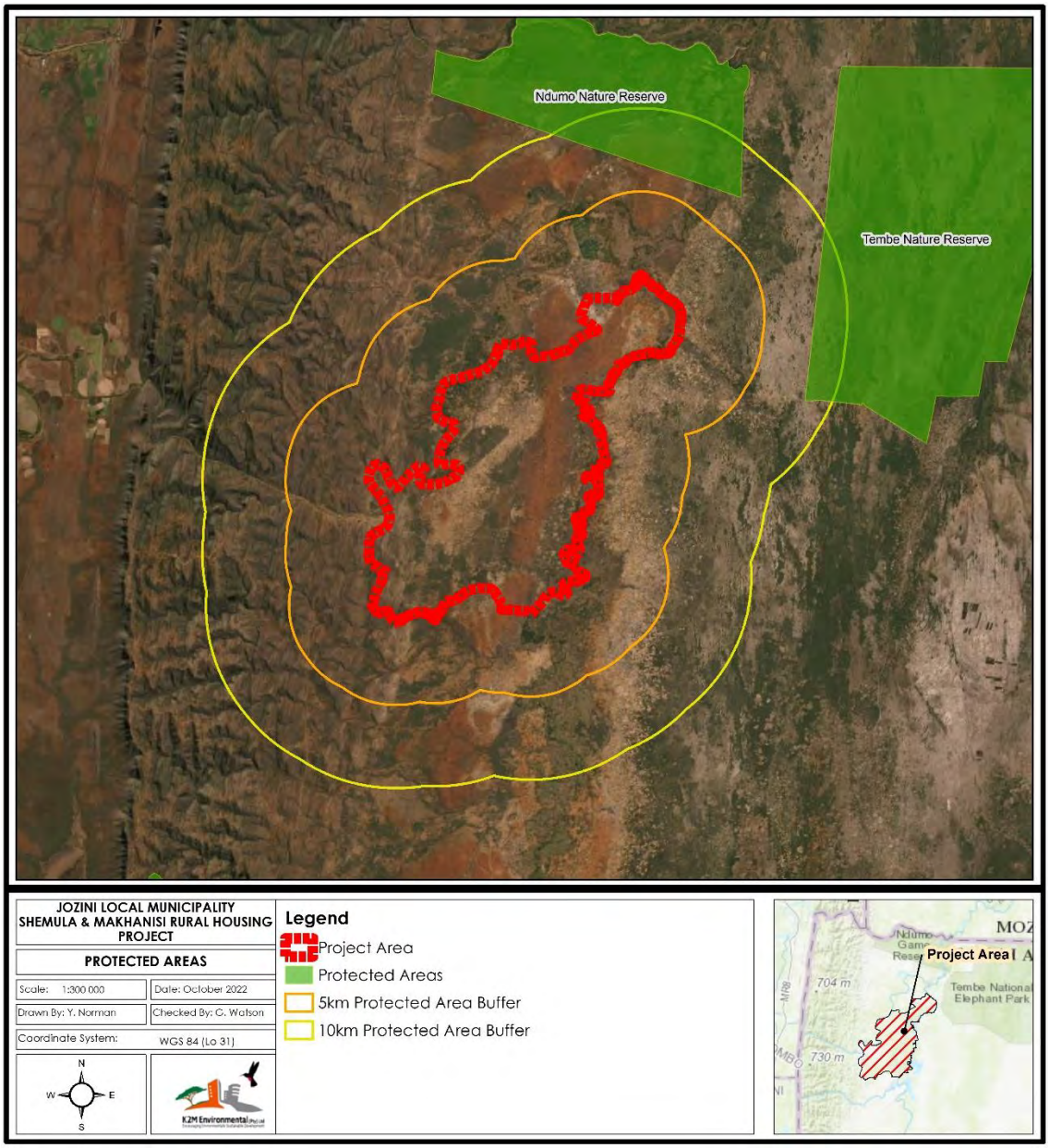
5.7 PROTECTED AREAS

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 illustrated in Map 5.7, there are no protected areas located within the project area. The closest protected areas are the Ndumo Nature Reserve and the Tembe Nature Reserve (commonly referred to as Tembe Elephant Park) which are located approximately 10.5km north and 9.8km northeast of the site respectively.

Map 5.7: Protected Areas



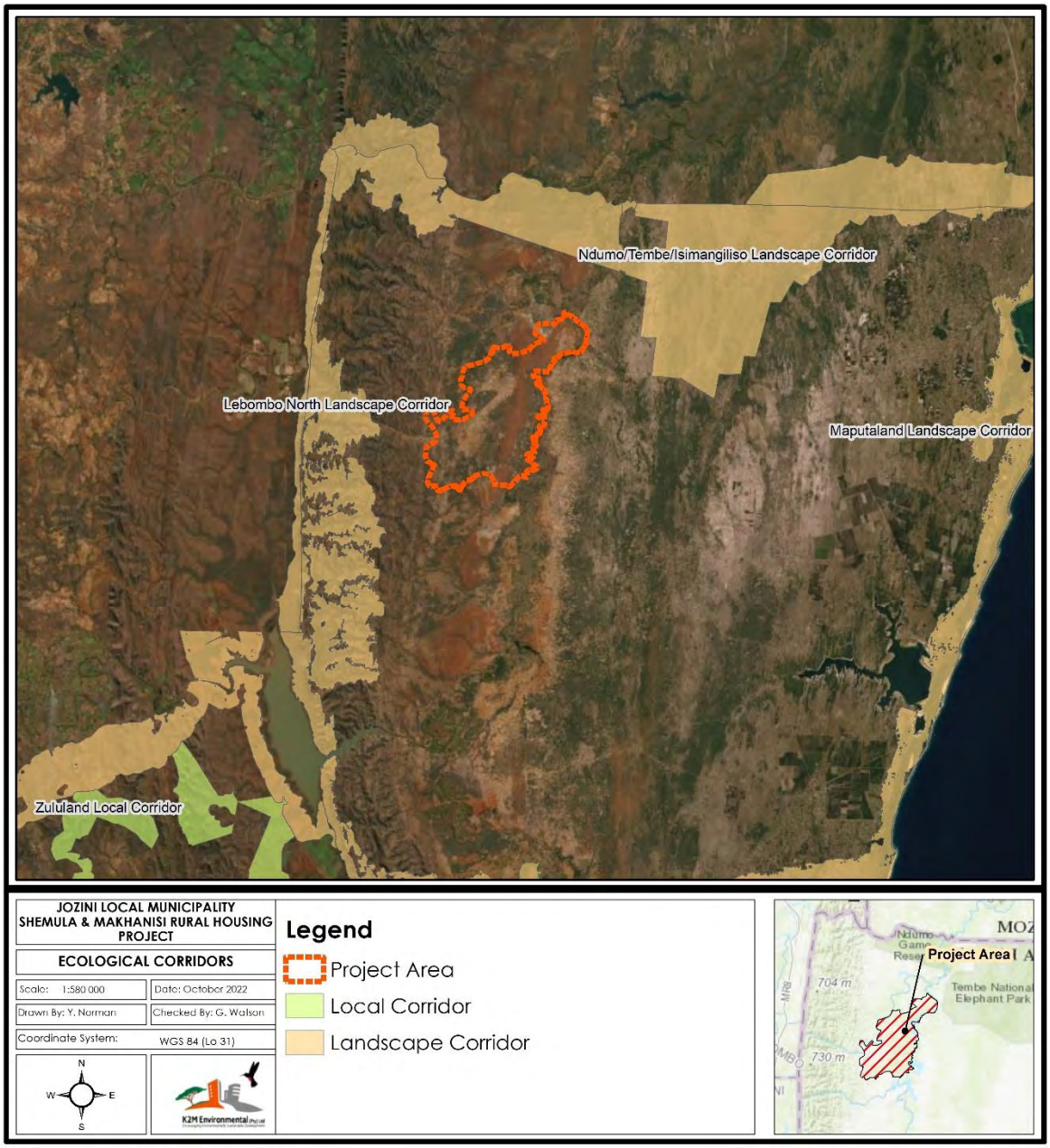
Source: KZN Wildlife, 2019

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, there are no corridors located within the site. The Zululand Local Corridor is located approximately 55 km southwest of the project area. The Maputaland Landscape Corridor is located approximately 50.4 km east of the project area, the Lebombo North Landscape Corridor is located approximately 17.6 km west and the Ndumo/Tembe/Isimangaliso Landscape Corridor is located approximately 8.3 km northeast of the project area.

Map 5.8: Ecological Corridors



Source: KZN Wildlife, 2019

5.9 CRITICAL BIODIVERSITY AREAS

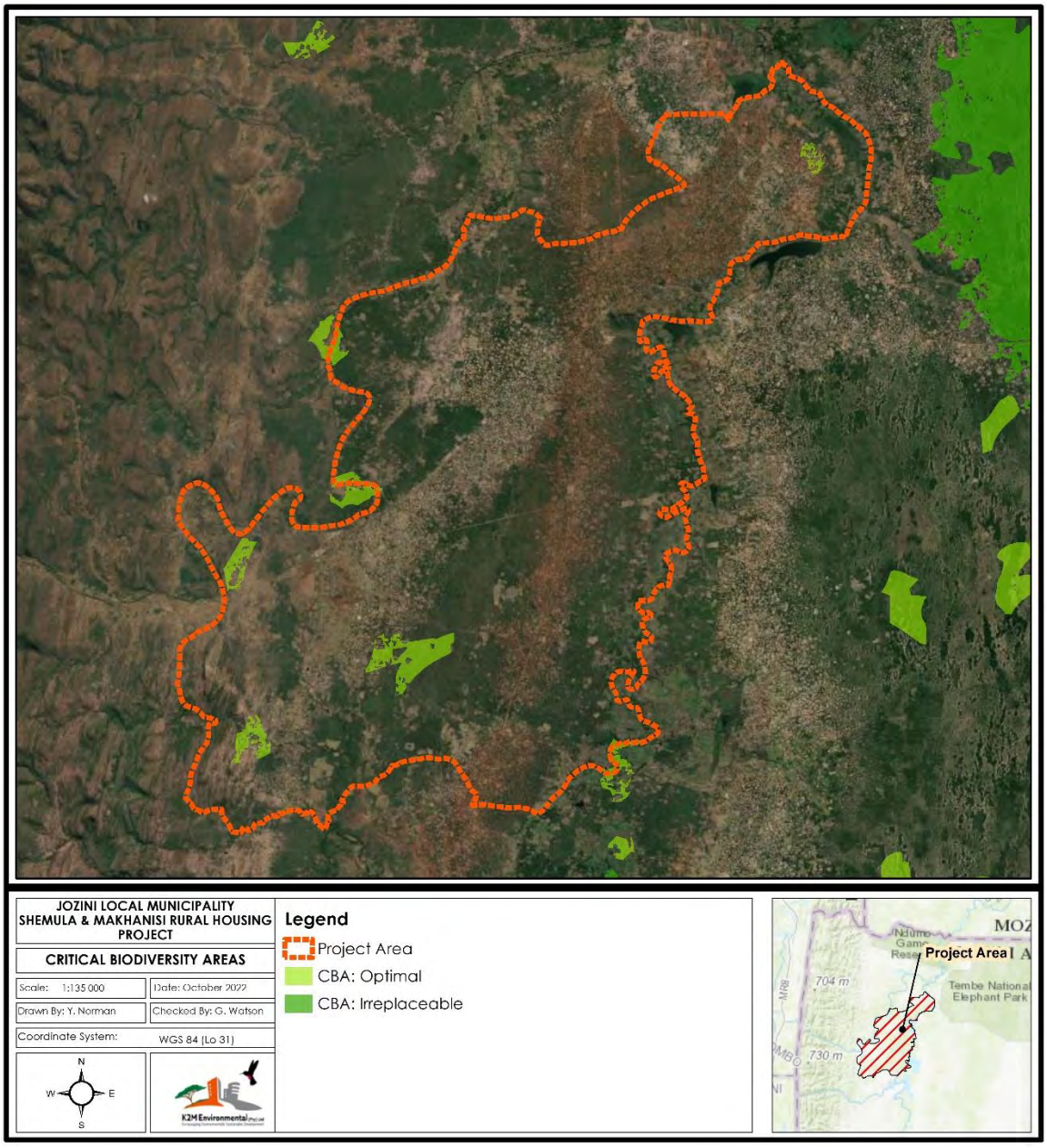
The Critical Biodiversity Areas (CBAs) can be divided into two subcategories, namely Irreplaceable and Optimal. The CBA categories are based on the optimised outputs derived using systematic conservation planning software, with the Planning Units (PU) identified representing the localities for which 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 that 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.

Map 5.9 below depicts that there is a small portion of CBA: Optimal Areas situated within the southern, western and northern parts of the project area. A CBA: Irreplaceable Area is located to the east of the project area.

Map 5.9: Critical Biodiversity Areas



Source: KZN Wildlife, 2019

5.10 MINERAL DEPOSITS

There are no mineral deposits occurring within the boundary of the Shemula-Makhanisi Rural Housing project area.

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 Amafa and Research Institute Act (Act 05 of 2018) requires that the KwaZulu Natal Amafa has to comment on the need for an archaeological assessment for proposed development in accordance with Section 41 of the Act:

- Development area is larger than 5 000m²
- Development is longer than 3 00m
- The development area contains known archaeological sites.

However due to the fact that the proposed project constitutes an in-situ type upgrade, it is not expected that the implementation and operation of the proposed project will result in any new adverse impacts on any archaeological, historical or cultural sites which may be present within the area. It is however recommended that documentation pertaining to the proposed development be submitted to KZN AMAFA for their comment.

6 EXISTING SETTLEMENT PLAN

The project area has a total extent of approximately 18179. 28 ha and falls within Wards 12, 13 and 23 of the Jozini Local Municipality, one of the local municipalities that form part of the uMkhanyakude District Municipality. The total population of the local municipality is estimated at 186 496 persons.

The project area's leadership has the right to allocate residential sites to members of their Traditional Authority within the proclaimed Shemula-Makhanisi Rural Housing area. Each family is then permitted to build their own houses on these allocated sites, which are referred to as "iMuzi's". These iMuzi's comprise of a combination of a number of familial homesteads which are grouped together and constructed in close proximity to one another on the same "communal" patch of land, with patches of cultivated subsistence land which are made use of for subsistence agricultural purposes which are generally located adjacent to and around the homestead areas. Due to the fact that Zulu culture permits men to have more than one wife, this iMuzi settlement pattern is beneficial with regard to polygamous families, where one male may reside in an iMuzi with his various wives and their associated families. When children of the family's reach adulthood, they then generally build their own homesteads within the very same iMuzi. These homesteads also get passed down from one generation to the next.

Followers of traditional Zulu culture generally bury their dead within the iMuzi area. Such a practice results in residents being very reluctant to leave their traditional iMuzi areas to relocate to a new area, as their ancestors and loved ones would be left behind.

While most iMuzi's occurring within the project area had areas of land adjacent to their iMuzi which were cultivated and/or planted to be made use of for subsistence purposes, the land throughout the area is available to all its residents for communal livestock to graze on.

The project area is largely characterized by medium density traditional rural iMuzi settlements which is predominantly located to the east of the site. While homesteads incorporating a mix of round and rectangular structures constructed making use of both

traditional (mud brick, wattle and daub, thatch roof) and more modern (cement grouted concrete blocks and corrugated iron roof) materials and techniques were observed within the project area, the vast majority of the homesteads encountered were of a traditional nature comprising of traditional homesteads constructed making use of traditional materials and traditional techniques.

The spatial distribution of households across the area seems to be determined by a number of influencing factors which will be discussed accordingly below:

- The settlement pattern across the project area to a large extent correlates with the existing Provincial, District network that provide access to the project area.

- A number of perennial and non-perennial river/stream networks traverse the project area, particularly in the southern, western and eastern portions of the site. Aspects such as river networks are an influencing factor with regards to the settlement distribution of the project areas homesteads. Whereas previously the area may not have been adequately catered to with regards to water services and water infrastructure, residents would have traditionally relied predominantly on rivers and streams for their water needs. Historically, residents' dependence on water obtained from rivers and streams located within the area would have been an influencing factor with regards to their households' location. Households would therefore be located within close enough proximity to nearby rivers and streams but predominantly outside of low-lying, flat areas which may have been characterized by periodic flooding.

The spatial distribution of households within the project area is therefore influenced by a number of cultural, historical and natural features. It is important to note however that the spatial distribution of beneficiaries may pose a limiting factor with regards to the implementation of the proposed project. Those households which are located on steep slopes for example may be excluded from the beneficiary list for the project. Furthermore, due to the Zulu culture regarding the burying of one's deceased family members within the iMuzi area may result in households being reluctant to move in order to benefit from the proposed project and such households may also be excluded from the proposed project. Similarly, due to legislative constraints, those households which are located within the stipulated 32m buffer of all river, streams and wetlands will also be omitted from the

Shemula-Makhanisi Rural Subsidised Housing development. The proposed projects "in-situ" type nature therefore implies that the existing settlement plan and spatial distribution of households may have repercussions with regards to the implementation of the proposed project. Such a notion would therefore require greater attention during the implementation phase of development. The "in-situ" type nature of the development is however very beneficial from an environmental perspective, this is due to the fact that the only construction activities associated with the project would occur within already established iMuzi's, and therefore no new/additional areas will be impacted upon as a result of the implementation and operation of the Shemula-Makhanisi Rural Subsidised Housing development.

7 SUMMARY AND RECOMMENDATIONS

As indicated in the Introduction and Background to this report, the exact extent of the housing project in terms of the application of the subsidies for the purposes outlined in the housing code, and the exact spatial location and distribution of beneficiaries within the broader study area are currently not specified. What is however known is that the total number of households in need of housing (including those residing in traditional houses constructed of traditional materials, backyard structures or informal structures) is approximately 31.33%. The purpose of this preliminary assessment is thus to provide a brief overview of the social, economic, biophysical and infrastructural characteristics of the broader area within which this total estimated housing need will have to be addressed.

7.1 SOCIO-ECONOMIC ASPECTS

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

- Approximately 79.42% of the total population of the study 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 large 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 study area is characterized as being female dominated with approximately 54.41% of the project area's total population being represented by females.

- The study area is characterized by fairly low levels of literacy with approximately 35.94% of the population of the study area older than 20 years of age not having received any form of schooling.

- The information depicted in Section 3 indicated that the majority of all households are potentially in need of formalized housing is 31.33%. It was furthermore indicated in Section 4 that there are a number of households that are expected to qualify for housing subsidies in terms of their income profile.

- Affordability levels in the study area are very low with approximately 51.47% of all households earning less than R 19600 per household per month.

- The low affordability levels in the study area are clearly the result of the relatively high unemployment rate which is estimated to be 26.06% in the Shemula-Makhanisi project area, excluding the discouraged work-seekers (44.39%).

7.2 SERVICES ASPECTS

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

- Only 39.27% of households in the study area receive water at levels above the minimum RDP standards according to the 2011 Census information (piped water within a 200 m radius). In addition, the majority of approximately 91.37% of households utilize water provided by the Regional Water Scheme. Only 6.50% of households utilize water directly from Rivers/Streams

- As much as 36.63% of all households in the study area do not have access to any form of sanitation infrastructure, while an additional 11.30% are reliant on unimproved pit latrines.

- As little as 17.70% of the total number of households within the study area has access to electricity for lighting purposes.

7.3 INFRASTRUCTURAL ASPECTS

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

- There are four Provincial Roads, namely the P435, P522-2, P443 and the P522-1, that run through the project area.
- There are six District Roads, the D1861, D1894, D1834, D2035, D2037 and D1836. They all run through the project area.
- There are five numbered local access roads around the site, namely the L548 (which runs north of the site boundary), the L2969 (which runs in the south-eastern portion of the site), the L2851 (which runs south of the site), the L2970 (which runs in the southern portion of the site) and the L2860 (which runs in the north of the site).

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 current land use within the project area is rural residential and agricultural. The project area consists of rural dwellings and cultivated areas interspersed with dense stands of woodlands and thicket.
- The dominant land cover within the project area is ‘‘Forest and Woodland’’.

- There are two perennial rivers and several non-perennial streams that have been identified within the project area.

- A large NFEPA Wetland occurs along the north-eastern, eastern and south-eastern boundaries of the project area.

- The project area is characterised mostly by the Western Maputaland Clay Bushveld, Western Maputaland Sandy Bushveld and Makatini Clay Bushveld vegetation types.

- There are no protected areas located within the project area. The closest protected areas are the Ndumo Nature Reserve and the Tembe Nature Reserve (commonly referred to as Tembe Elephant Park) which are located approximately 10.5km north and 9.8km northeast of the site respectively.

- There are no corridors located within the site. The Zululand Local Corridor is located approximately 55 km southwest of the project area. The Lebombo North Landscape Corridor is located approximately 17.6 km west and the Ndumo/Tembe/Isimangaliso Landscape Corridor is located approximately 8.3 km northeast of the project area.

- There is a small portion of CBA: Optimal Areas situated within the southern, western and northern parts of the project area. A CBA: Irreplaceable Area is located to the east of the project area.

- There are no known archaeological, cultural or historical sites or artefacts located within the Shemula-Makhanisi Rural Housing project area. Due to the "in-situ" type nature of the proposed project, should any sites or artefacts of archeological, cultural or historical significance be located within the project area, it is not expected or anticipated that these will not be impacted upon as a result of the proposed development. The Developer is however aware of his responsibilities with regards to the Amafa Heritage Act. Should there be any Greenfield Development, larger than 5 000m², a Heritage Impact Assessment will be required.

- No detailed quantifiable information is currently available on various forms of pollution in the study area. A number of important observations can however be made in this regard:

    - Elevated levels of air pollution, especially during the winter months, are common in the area due to the extensive use of firewood and fossil fuels for heating and cooking purposes.

    - High levels of environmental pollution are evident resulting from the absence of any form of waste collection and management system within the area.

7.5 EXISTING SETTLEMENT ASPECTS

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

- The project area is characterised mostly by the Western Maputaland Clay Bushveld, Western Maputaland Sandy Bushveld and Makatini Clay Bushveld vegetation types.
- The project area is characterized by medium density scattered rural iMuzi settlement.

- Residents are generally reluctant to move or relocate due to the fact that they bury their dead within their familial iMuzi.

7.6 RECOMMENDATIONS

Based on the existing available desktop overview, it does not appear as if there are any material barriers to the proposed rural housing development from an environmental impact perspective. The specific impacts which can be anticipated and may have to be managed during the implementation phase will only be known once the exact project

extent, location and characteristics have been finalized. Some potential mitigation measures include the following:

- Care must be taken to ensure that there are no significant disturbances (i.e., removal) to surrounding vegetation within the project site during the construction phase of the development.

- Remove all invasive alien vegetation at the project site.

- Soil erosion on site must be prevented during the pre-construction, construction and operational phases.

- Suitable erosion control measures must be implemented in all areas potentially sensitive to erosion such as near water supply points edges of slopes etc.

- Ventilated improved pit toilets must be located away from drainage lines, boreholes and natural springs and at a sufficient distance from the 1: 100-year flood line in watercourses.

- KwaZulu Natal Amafa has to comment on the need for an archaeological assessment for the proposed development in accordance with Section 41 of the KwaZulu Natal Amafa and Research Institute Act (Act No. 05 of 2018).

- A solid waste management plan must be formulated for the areas addressing aspects such as the collection, sorting, recycling and disposal of waste.

- Provision of litter containers in public places to address the litter problem.

- No development is to take place within the 32m buffer of rivers, streams and wetlands.

- No development is to take place on slopes that are steeper than 1:3.

- The following waste management principles should be taken into consideration during construction and operation phases:

- The excavation and use of rubbish pits on site or the burning of waste at the construction camp is forbidden.
- Refuse must be placed in designated skips or bins in the camp area and at construction sites. These should remain within demarcated waste areas and should be covered to prevent refuse from being blown out by wind and attraction of vermin.
- Recycling is to be encouraged by providing separate bins for different types of waste and making sure that staff is aware of their uses.
- Littering in the camp area or on site is forbidden and the site must be cleared of litter at the end of each working day.
- Skips and bins must be emptied regularly (at least two-weekly), removed from the camp site and construction sites and transported to a DEDTEA-registered recycling and waste facility.
- Waste from chemical toilets should be disposed of regularly at a certified waste facility by a registered waste contractor. Care must be taken to avoid contamination of soils and water and pollution of construction sites and adjoining areas.
- Beneficiaries are not to burn any form of waste.
- Waste is to be moved on a weekly or bi-weekly basis.

7.7 LEGISLATIVE REQUIREMENTS

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

Table 7.1: Legislative Requirements

Act [1]	Section [1]	Summary of requirement [1]	Implication for project
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 Affairs and Forestry 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.	If part of the rural housing subsidy will be utilized for the provision of water the necessary permits will have to be obtained from the Department of Water Affairs and Forestry (depending on the existing water service authority and water service provider arrangement in the area)
	S144	A person is prohibited from establishing a township unless the layout plan shows, in a form acceptable to the local authority, the 1/100 year flood level, for the purposes of ensuring that all persons who might be affected have access to information regarding potential flood hazards.	Depending on the exact location of the housing components, a 1/100 year floodline will have to be determined.
Water Services Act (Act 108 of 1997)	S6	Access to water services must be through a nominated water services provider, failing which approval should be obtained from the water services authority.	Applicable if water provision will form part of the subsidy application.
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 rural housing 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. If waste dumps are established for housing developments, a waste disposal license will be required from the Department of Water Affairs and Forestry.	A waste disposal license for a waste dump will be required if a formal waste collection and removal system is implemented as part of housing project. 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 or 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 neighborhood, 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	The existence of graves, archaeological or palaeontological sites will have to be further investigated, once the exact location of the housing project components is known.
	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 palaeontological 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 plans should be eradicated if occurring at the final project location.

Act [1]	Section [1]	Summary of requirement [1]	Implication for project
		weeds and invader plants not within the demarcated areas or biological control reserves must be eradicated and control methods are stipulated	
National Building Regulations and Building Standards Act (Act 103 of 1997) and Regulations R2378	Reg F6 of Part F	The owner of any land on which excavation work is in progress must take 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.
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.

[1] National Department of Housing – Environmental services for Housing developments

8 CONCLUSION

In view of the summary conclusions outlined above, as well as the fact that the project entails the construction of new houses within the boundaries of existing iMuzi's (in-situ upgrading), it is our view that the project will not impact negatively on the environment. The project will in fact provide suitable living conditions to the rural community and contribute to Rural Development.

It should be noted that from past experience on similar projects, Environmental Authorisation was not required. There will be no construction of roads and no development within 32m of any watercourses. It is important to ensure that no listed activities are triggered during construction. Should there be removal of 1ha or more of indigenous vegetation or should activities listed below be triggered, Environmental Authorisation from DEDTEA will then be required for the proposed project. Specific attention needs to be paid to the following activities that could be triggered if contractors are not made aware of it:

Table 8.1: Activities that may be triggered without proper monitoring

Listed Activities	Description of Activity	Potential to be Triggered
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; (c) if no development setback exists, within 32 metres of a watercourse; Where such development occurs – (a) within a watercourse (b) in front of a development setback; or (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse Excluding – (aa) the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour;	Although each imuzi to be constructed will be 42 square metres, the cumulative impact will be larger than 100 square metres hence no development is to take place within 32m of any watercourse.

Listed Activities	Description of Activity	Potential to be Triggered
	(bb) where such development activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies; (cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activities applies; (dd) where such development occurs within an urban area (ee) where such development occurs within existing roads, road reserves or railway line (ff) the development of temporary infrastructure or structures where such infrastructure or structures will be removed within 6 weeks of commencement of development and where indigenous vegetation will be cleared.	
Activity 19 of GN.R. 327	The infilling or depositing of 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; 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; or (c) falls within the ambit of activity 21 in this Notice, in (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.	Temporary access to the southern portions of the project area might be through a stream. Therefore, no crossings of watercourses are permitted. There are to be no sand mining activities that are to take place within the rivers or riverbeds.