

DRAFT TECHNICAL NOTE
ENVIRONMENT

Central Area and CBD Extension Node Local Area Plan

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This technical note represents the Phase Two Deliverable for the Central Area and CBD Extension Node Local Area Plan.

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Msunduzi Municipality



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1 INTRODUCTION

1.1 DETAILS OF THE STUDY AREA

The study area is approximately 16km² in extent and incorporates the whole of the Msunduzi Central Business District (CBD) and area immediately adjacent (refer to Figure 1). The northern boundary extends around most of Town Hill Hospital and Grey's Hospital, through a portion of Northern Park and includes the residential suburb of Chasedene, as well as the Liberty Midlands Mall. The eastern boundary extends along the N3 and incorporates the suburb of Manor, but excludes the Scottsville Race Course. To the south the boundary incorporates the recreational precinct area of Alexandria Park and the Harry Gwala Stadium, and the suburb of Napierville. To the west the boundary extends towards the suburb of Prestbury terminating just beyond the Rail Yard off Mayors Walk and then generally follows the Dorpspruit Stream towards the Royal Showgrounds. Wards 25, 26, 27, 32 and 33 are impacted by the project and the area falls within the Northern and CBD, Ashburton and Eastern Areas, Area Based Management (ABM) boundaries.

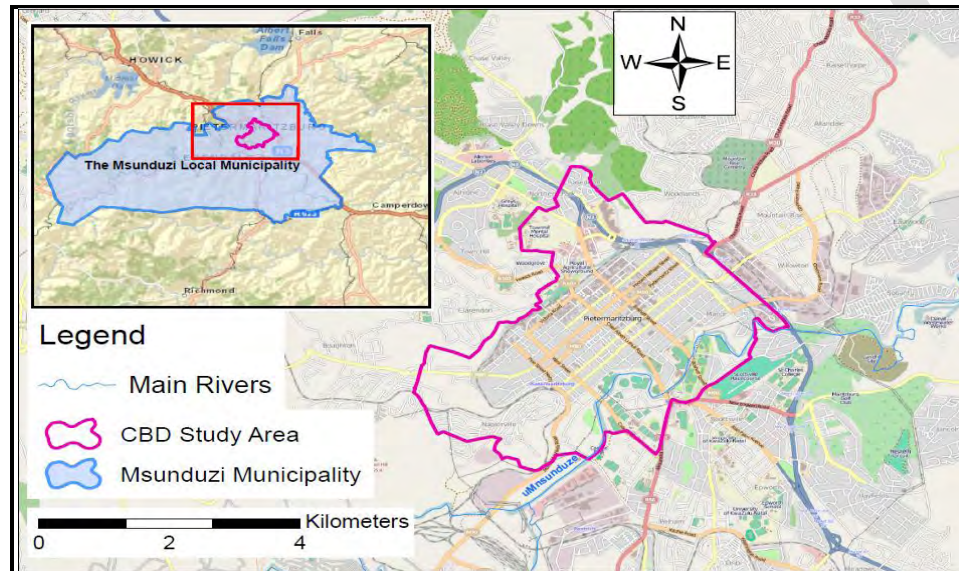


Figure 1: Location of the Central Area and CBD extension node

2 ENVIRONMENTAL STATUS QUO

South Africa and other countries have formulated strategies and legislative tools which are aimed at addressing the decline of non-renewable environmental resources through minimisation of detrimental impacts and better management of environmental resources. In particular, the Constitution Act of South Africa (No 108 of 1996) states that, "Everyone has a right (a) to the environment that is not harmful to their health and well being, and (b) to have the environment protected for the benefit of the current and future generation through reasonable legislative and other measures that (i) prevent pollution and ecological degradation; (ii) promote conservation; and (iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development".

In recognising this responsibility, Msunduzi municipality is preparing a Local Area Plan (LAP) for the Central Business District and areas immediately adjacent (CBD Extension Node) as part of the Spatial Development Framework (SDF) and Integrated Development Plans (IDP) which are aimed at detailing the development and management of the land use within the municipality. To successfully implement the LAP within Msunduzi municipality, it is vital that the current receiving environment is known and understood in order to guide the municipality with their planning of future developments and also minimise the environmental impacts by protecting the sensitive areas and ecological systems located within the municipality.

The sections which follow discuss the current receiving environment of the study area with specific reference to the biophysical environment.

2.1 AIR QUALITY AND CLIMATE

According to the Msunduzi IDP (2013), the climate and local weather within the municipality are strongly influenced by topography (refer to Section 2.2); the higher lying areas in the north and west of the municipality are cooler and receive more rainfall. Pietermaritzburg receives an average of about 695 mm of rain annually, with most rainfall occurring during mid summer. It receives the lowest rainfall (6mm) in June and the highest (112mm) in January (refer to Figure 2). The monthly distribution of average daily maximum temperatures for Pietermaritzburg range from 20.5°C in June to 27°C in February (refer to Figure 3). The region is the coldest

during July when nocturnal temperatures drop to 5.6°C on average (refer to Figure 4) (SA Explore, 2000-2011).

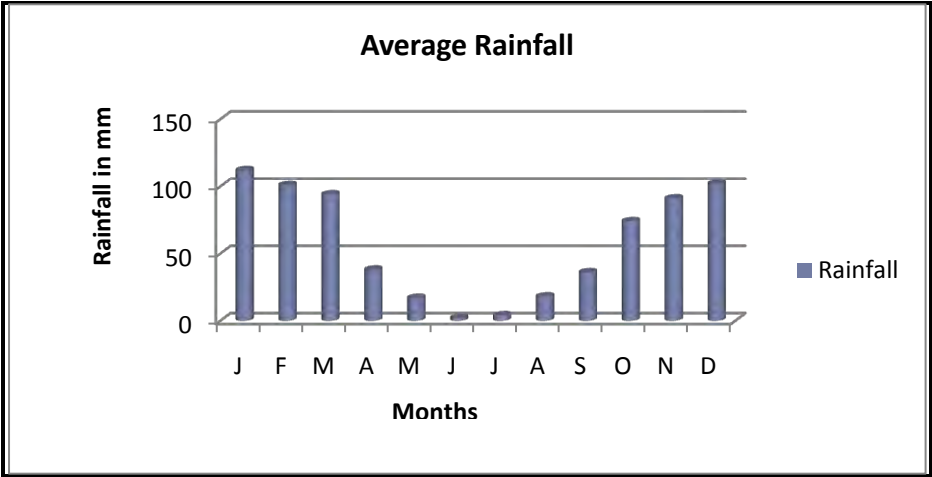


Figure 2: Annual Average Rainfall for Pietermaritzburg, 2000-2011
Source: SA Explore, 2000-2011

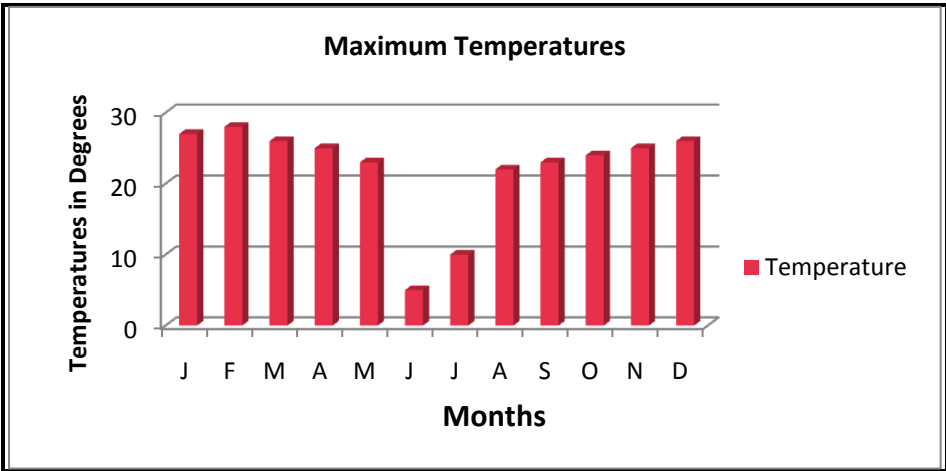


Figure 3: Annual Maximum Temperatures for Pietermaritzburg, 2000-2011
Source: SA Explore, 2000-2011

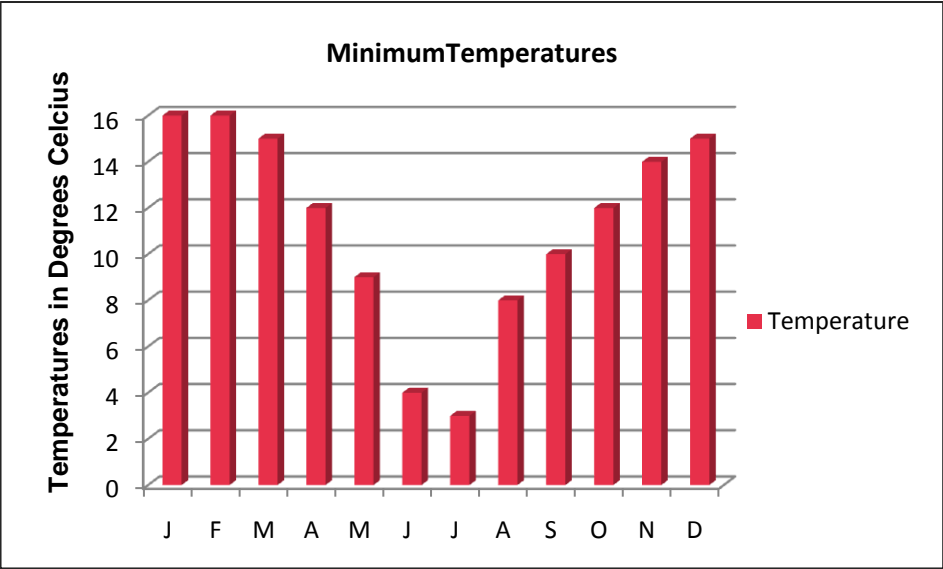


Figure 4: Annual Average Minimum Temperatures for Pietermaritzburg, 2000-2011
Source: SA Explore, 2000-2011

The city of Pietermaritzburg is located in a hollow formed by the valleys of the Msunduzi River and its tributaries. During clear winter nights, Katabatic¹ flow occurs, resulting in the movement of air from upslope areas down to the city. The air flow fills the valley floor with cold, dense air creating inversion that traps pollution within the municipality (Msunduzi IDP, 2013).

¹ Katabatic flow/wind: a wind that carries high density air from a higher elevation down a slope under the force of gravity

The inversion layer mostly occurs where there are major industrial establishments and as a result of a flat land and close proximity to the transport infrastructure such as roads and rail. According to the 2013 IDP, the main sources of air pollution are listed below (Msunduzi IDP, 2013):

- An increase in vehicles volumes and traffic congestion in peak hours in arterial routes and Central Business District;
- Industries operating with old and outdated technologies;
- The use of coal and firewood for heating and cooking by formal and informal settlements; and
- Burning of brushwood and sugarcane.

Air pollution within most part of the municipality is not major problem as the large portion of its location extent (particularly the western areas) emits less pollution compared to the areas located in the north, east and south where there is high amount of pollution emitted (refer to Figure 5). The study area is located within the areas that are very sensitive in terms of air pollution mostly due to the inversion layer described above and the prevalence of sources of pollution.

According the Msunduzi IDP 2011/2012, there is limited monitoring and management of pollutants and this necessitates the development of monitoring stations and equipments which will extent the monitoring to the entire municipal jurisdiction and also facilitate the monitoring of vehicle emissions. Figure 5 shows sensitive areas in respect to air quality for Msunduzi, with the approximate location of CBD and its extension node areas as outlined in black. Most parts of the Central Area and CDB Extension Node are located in very sensitive air pollution areas, and therefore ongoing monitoring and management of pollutants is important.

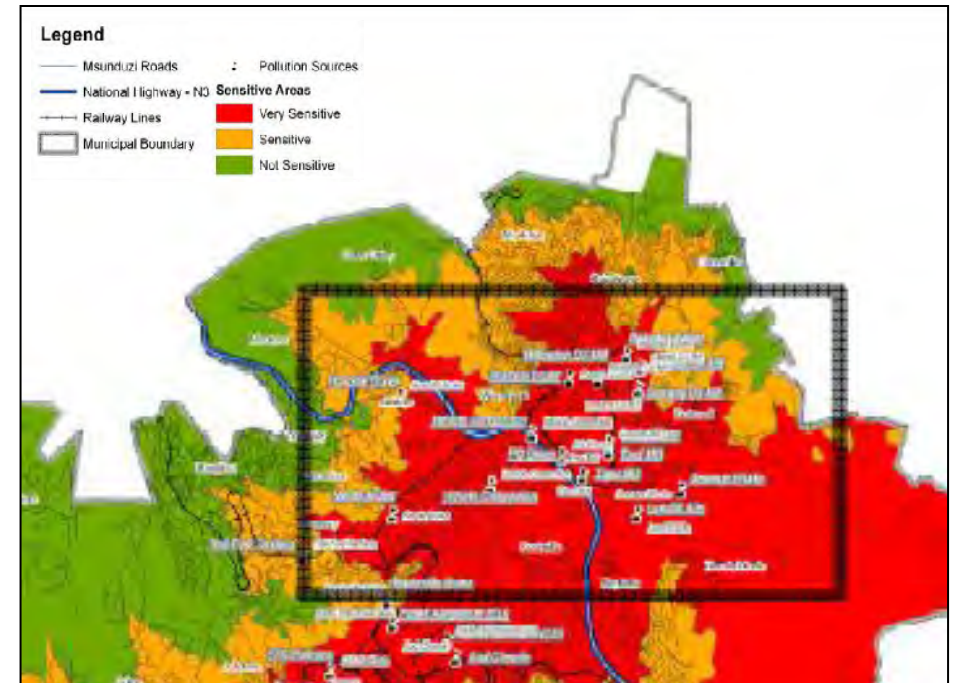


Figure 5: Air Quality Map (approximate study area location outlined in black)

Source: Msunduzi EMF, 2010

2.2 TOPOGRAPHY AND SOILS

2.2.1 TOPOGRAPHY

The escarpment of Msunduzi is 400m above the city to the West and North West. The altitude ranges from 495m to 1795m above sea level and slopes from west to east. The mountains surrounding the city in the north west have created a clear distinction between rural and urban parts of the municipality. Furthermore, this situation has also limited the city from expanding along these directions and thus a number of small urban hubs have been formed outside the city towards the south east where the slope gradient varies between 0.5 to 10% due to undulating hills and flat terrain (Msunduzi IDP, 2013). Figure 6 shows slope percentage for the Central Area and CBD Extension Node (outlined in black). The study area is characterised predominantly by low-lying areas with slope percentages raging between 0 and 6% (1:10 slope). These low-lying areas are associated with the Msunduzi floodplain. There are isolated high-lying areas with slope percentages from 10% upwards in the Extension Node to the west. It is noteworthy that slopes greater than 1:3 (10-18.43% slope) are generally not considered safe for development.

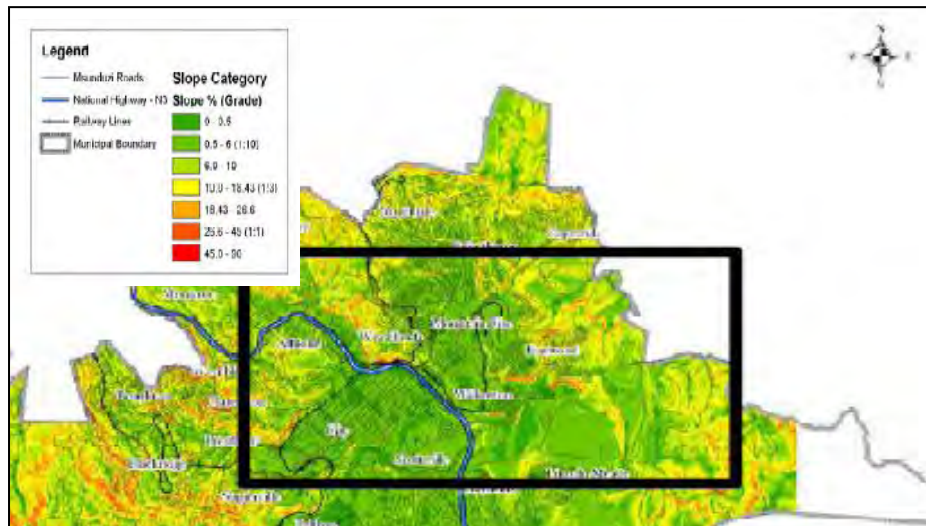


Figure 6: Topographical Map

Source: Msunduzi EMF, 2010

2.2.2 SOILS, LAND COVER AND LAND CAPABILITY

The soils within the municipality vary greatly but most parts have soils with high clay content. The Msunduzi River catchment has shallower soil depths (0.2m and 0.6m) when compared with the Mngeni River catchment (1.2m and 10m) (Msunduzi SDF, 2009).

The KZN Department of Agriculture have used the following characteristics in the Land Capability Classification System: soil depth, texture, drainage, moisture holding capacity, slopes and rockiness (Msunduzi SDF, 2009). The areas with a high agricultural potential occur as a result of the topography, rainfall patterns and geology. Large portions of land with agricultural potential have however been developed for other land uses including housing, commercial and industrial developments (refer to Figure 8).

It should be noted that Figure 7 reflects agricultural potential, and thus the term 'suitable do development' does not consider environmental sensitivity of any kind and should not be taken out of its original context.

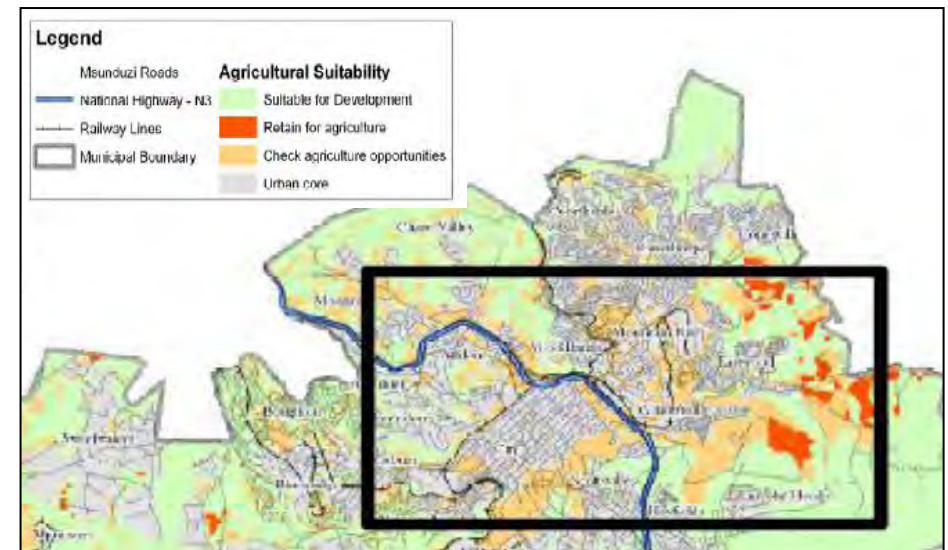


Figure 7: Agricultural Potential (approximate study area location outlined in black)

Source: Msunduzi EMF, 2010

The remaining land which has agricultural potential and in which the study area is located occurs along the Msunduzi River, and can be assessed for agricultural potential. However, these areas do fulfil both a recreation and ecological function and agriculture use would probably be inappropriate (depending on scale, nature of the crop, and impact on ecological and aquatic functioning).

Generally, poor agricultural practices have historically affected the productivity of the land (Msunduzi IDP, 2013).

Figure 8 shows 2008 land cover for the study area, and is a useful indicator of the type of activities (land use) that occur with the CBD and Extension Node. The study area is predominantly categorised as ‘built up dense settlement’ although there are a few areas of dense bush to the south and the Msunduzi which is a strong natural feature.

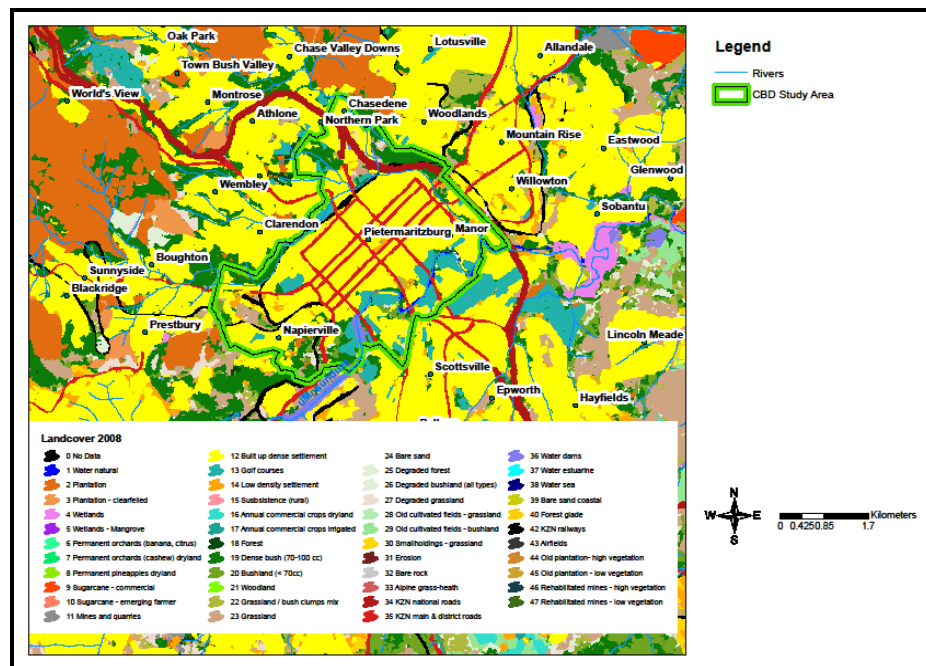


Figure 8: Land cover for the Central Area and Extension Node

Source: KwaZulu-Natal Department of Agriculture and Environmental Affairs, 2008

2.3 BIODIVERSITY

Msunduzi Municipality is rich in biodiversity with many different species consisting of 56 animals, 20 plants, 8 vegetation types and 50 endemics that are of importance (Msunduzi EMF, 2010). There are high numbers of threatened species that occur within the municipality and few which are thought to be extinct. The diversity of habitats and species richness is as a result of topography, geology and other characteristics. However there has been a significant loss of natural habitat due to high levels of transformation; thus leaving a low proportion of untransformed habitats. Approximately 20,186 ha or 31.7% of the municipal area requires conservation (Msunduzi EMF, 2010). Aquatic species which are of high conservation status include fish and frogs (Msunduzi EMF, 2010).

Due to the high intensity of development that has taken place with the Central Area and CBD Extension Node, most of the biodiversity features have been transformed. There are however some features of biodiversity significance that are protected in the recreation and conservation areas to the south in study area.

Initiatives to restore and re-establish green spaces (public open spaces) are much needed in the Central Area. These areas fulfil an important recreation and environmental function within inner cities and contribute to place-making and identity.

The average density of alien plant species within the municipality is depicted by Figure 9. Alien invasive species occur in the outskirts of the study area in the north and south particularly along the Msunduzi River and other smaller watercourses. These alien species are problematic as they consume space of naturally occurring species and negatively impact on the provision of ecosystem goods and services.

There are ongoing efforts within the municipality aimed at eradicating and controlling and further infestation of alien invasive species (Msunduzi SEA Report, 2010).

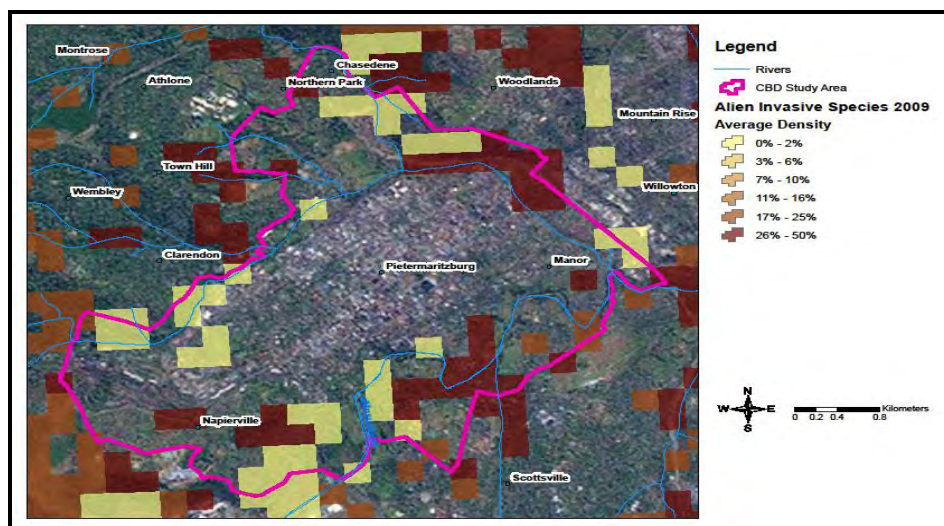


Figure 9: Alien invasive species

Source: Working for Water Alien Invasive Species dataset, 2009

2.3.1 VEGETATION

The Msunduzi Municipality consists of the following vegetation/veld types (refer to Figure 10) (Msunduzi SEA Report, 2010):

- Eastern Mistbelt Forest
- Drakensberg Foothill and Moist Grassland
- Midlands Mistbelt Grassland
- Moist Ngongoni Veld
- Dry Ngongoni Veld
- KwaZulu Natal Hinterland Thornveld
- Eastern Valley Bushveld

The Dry and Moist Ngongoni Veld and KwaZulu Natal Hinterland Thornveld are the main vegetation types occurring within the study area.

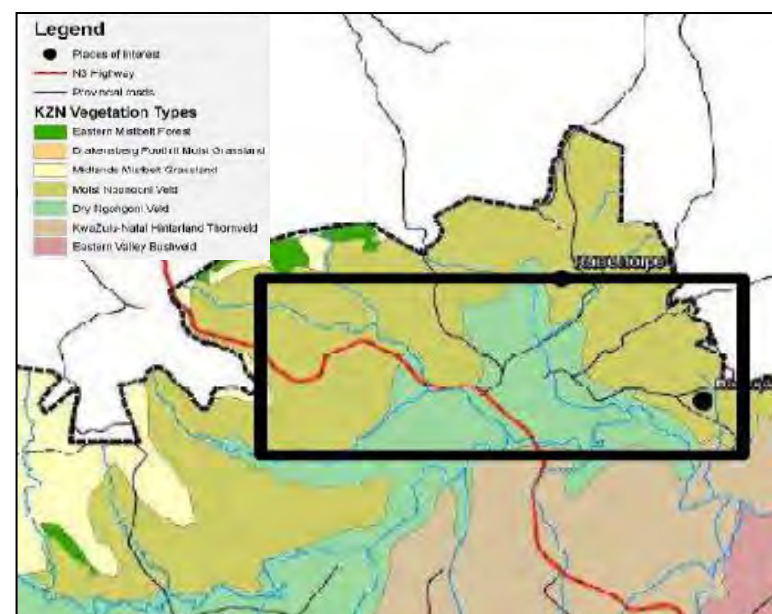


Figure 10: Msunduzi Vegetation Types

Source: Macfarlane & Quayle, 2009

2.3.2 PROTECTED AREAS

Msunduzi municipality has a number of protected areas within its jurisdictional boundary. These are owned and managed by the municipality, Ezemvelo KZN Wildlife or National Government. In addition, there are number of protected areas within Msunduzi (and the study area) that form a valuable part of the municipality's conservation network. These protected areas within the study area are depicted in Figure 11.

The study area in particular has two protected areas namely Alexandra Park and the Pietermaritzburg National Botanical Gardens. These areas serve a variety of functions including recreation, eco-tourism and to some extent conservation of biodiversity.

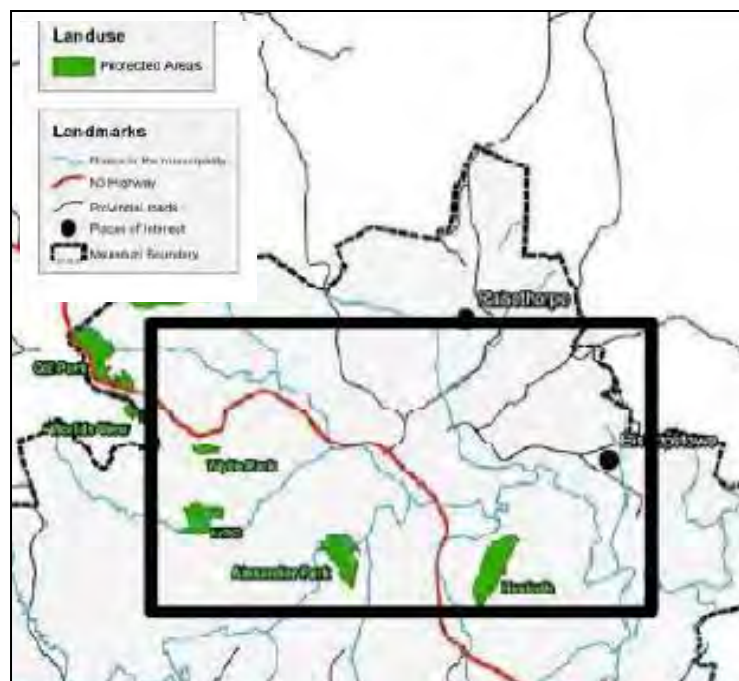


Figure 11: Locations of Protected Areas within Msunduzi Municipality

Source: Macfarlane and Quayle, 2009

Protected areas within Msunduzi are classified into two types, namely type 1 and type 2. Type 1 are those protected areas that are underpinned by strong legislation such the EIA Regulations and effective management; where as Type 2 are those protected areas that are underpinned by weak legislation and limited management. The various protected areas in Msunduzi are described in Table 1 below (Macfarlane and Quayle, 2009) and those located within the study area are Alexandra Park and the Pietermaritzburg National Botanical Gardens.

Table 1: Classification of Protected Areas

Name	Type	Extent (Ha)	Description
Queen Elizabeth Park	1	93.5	This park is managed by Ezemvelo KZN Wildlife with a lease of 99 years, but the land is owned by Msunduzi Municipality. The park was proclaimed under the Provincial ordinance as a park and provides important habitat for a range of important species such as the Natal leaf-folding frog, Black-headed dwarf chameleon and Hilton Daisy. The park also acts as the headquarters for Ezemvelo KZN Wildlife and is used as a recreational area by the general public.
Bisley Valley Nature Reserve	2	358.4	This reserve was proclaimed in terms of the town planning scheme as a Nature Reserve in 1986. The reserve is owned by Msunduzi who are responsible for management of the reserve. The nature reserve was initially proclaimed to preserve and protect biodiversity and to provide recreational opportunities to Pietermaritzburg residents. Important species known from this reserve include the modest millipede, Shaw's earthworm, the javelin flat-backed millipede, and corn crake. There are a number of walking trails, bird hides and a resource centre for day visitors and basic overnight accommodation for 16 visitors.

Name	Type	Extent (Ha)	Description
Ferncliff Nature Reserve	2	147.6	This reserve was proclaimed in terms of the town planning scheme as a Nature Reserve in 1986. The reserve is owned by Msunduzi who are responsible for management of the reserve. The reserve was established largely due to conservation significance of the site, representing one of last remaining remnants of Mistbelt Forest in the Pietermaritzburg area. This forest also represents the type locality for a range of invertebrate species. The nature reserve offers a number of trails, picnic sites and an education resource centre for day visitors. Cannot accommodate overnight visitors.
Worlds View Conservation Area	2	31.7	This conservation area was proclaimed in terms of the town planning scheme as a Conservation Area in 1995. The site encompasses indigenous Mistbelt grasslands between worlds view road and old Howick road. The site was proclaimed largely because of its biological diversity and presence of rare and endangered species such as the Hilton Daisy. Only a portion of this site falls within the demarcated Msunduzi Municipal boundary.
Hesketh Conservation Area	2	92.5	This conservation area has been proclaimed in terms of the town planning scheme as a Conservation Area. The site represents an area of Southern Tall grassveld, located above the Maritzburg Golf Course in the Scottsville area. The site was proclaimed largely

Name	Type	Extent (Ha)	Description
			due to the need to protect areas of this veld type. The site is particularly well known for its ground orchids and other plant species.
Alexandra Park	2	71.4	This park was donated to the Municipality by a resident for the management as a park for urban residents. Protection of this area is written into the title deeds. The park is widely used for recreational use – there are few environmental components of any value.
Wylie Park	2	10.6	This park was also donated to the Municipality by a resident for the management as a park for urban residents. The site is perhaps most important for its horticultural value as an arboretum which is also used for passive recreation.
Pietermaritzburg National Botanical Gardens	2	47.7	The botanical gardens are managed and owned by National government. The area is an important arboretum and used for passive recreation but does have some untransformed land with some biodiversity value.

Source: Macfarlane and Quayle, 2009

2.3.3 AREAS OF HIGH BIODIVERSITY VALUE

Areas of high biodiversity value occurring within the municipality were identified and mapped in the Conservation Plan also referred to as C-Plan to ensure their protection and continuity. The most sensitive areas of the municipality occur in the north westerly direction and the least sensitive in the south easterly direction (refer to Figure 13). Furthermore, areas which pose developmental constrain and where ecological systems need to be conserved and preserved and were identified (Msunduzi EMF, 2010). Figure 12 shows the C-Plan study spatially for the Central Area and CBD Extension Node where sensitive areas are located mostly to the west with few sensitive areas located to the north, east and south on the borders of the study area. The areas in red are categorized as 'totally irreplaceable', meaning that should these areas be lost or degraded, there are no sites within the municipality of equal biodiversity value. These areas are biodiversity hotspots within the study area and of critical importance to the Msunduzi Municipality.

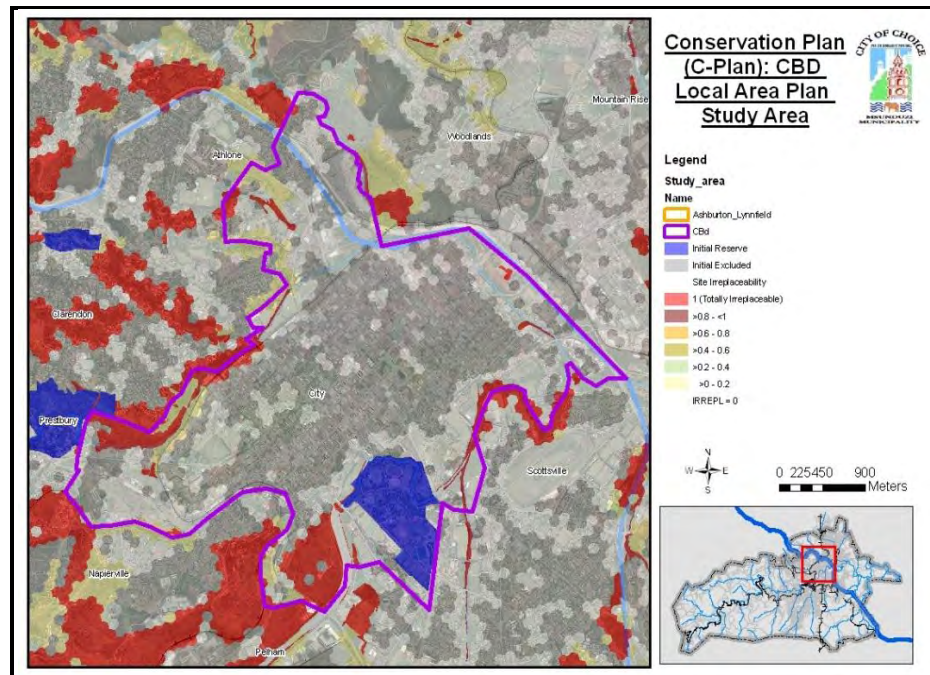


Figure 12: Msunduzi Municipality C-Plan

Source: Msunduzi SDF, 2009

The National Environmental Management: Biodiversity Act (Act No. 10 of 2004) provides for the listing of threatened or protected terrestrial ecosystems in one of four categories: critically endangered, endangered, vulnerable or protected. The purpose of listing threatened ecosystems is primarily to reduce the rate of ecosystem and species extinction, including sites of exceptionally high conservation value by preventing further degradation and loss of structure, function and composition of these threatened ecosystems (SANBI 2011). Figure 13 indicates the presence of threatened ecosystems within the CBD and Extension Node as mostly vulnerable although much of the study area has been transformed.

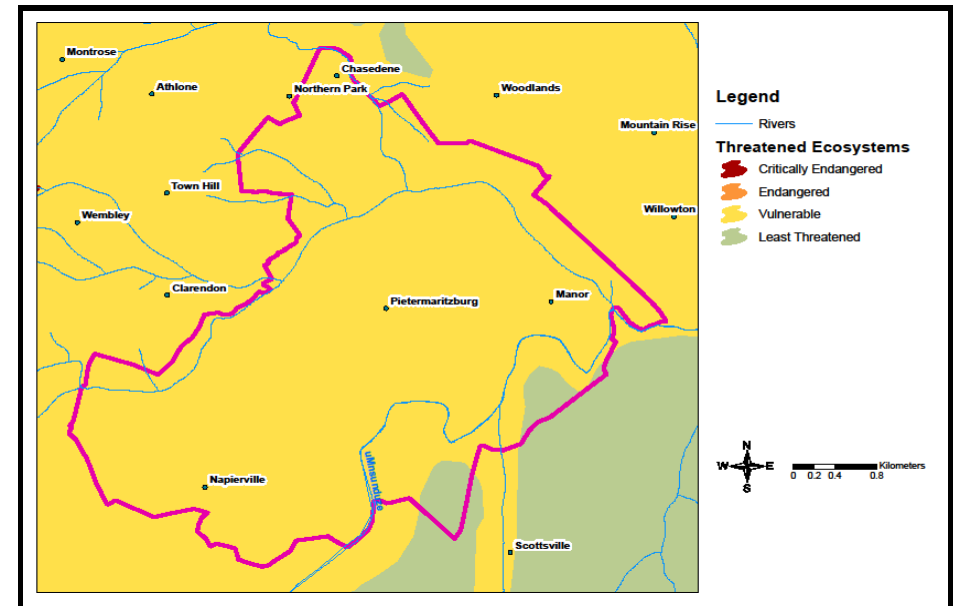


Figure 13: Threatened Ecosystems of the Study Area

Source: SANBI, 2001

If a species is listed as threatened, it must be further classified as critically endangered, endangered or vulnerable. According to SANBI (2001), critically endangered species are any indigenous species facing an extremely high risk of extinction in the wild in the immediate future; endangered species are any indigenous species facing a high risk of extinction in the wild in the near future, although it is not a critically endangered species; while vulnerable species are any indigenous species facing an extremely high risk of extinction in the wild in the medium-term future, although it is not a critically endangered species or an endangered species.

2.4.1 WETLANDS

There are few wetlands within the municipality which are still in a good state (Msunduzi SEA and EMF, 2010). Most of the wetlands have been transformed and degraded due to development activity. Figure 15 depicts wetlands occurring within the study area, which are protected by national legislation (usually a 32m buffer, elevation dependent) that have taken place within the municipality over the years. .

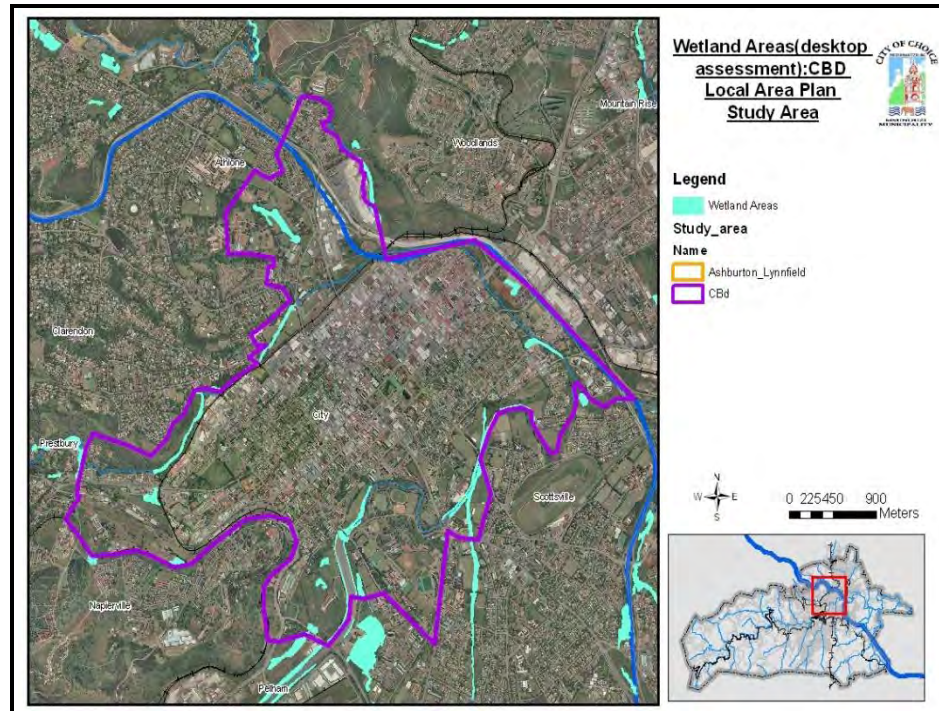


Figure 15: Wetlands Occurring within the Study Area

Source Msunduzi Municipality, 2013

2.4.2 ENVIRONMENTAL RISK

Within Msunduzi, there is an increased risk of downstream flooding due to the rapid increase in settlement density, the destruction, degradation and reduction of wetlands, and misuse of floodplains within the municipality (Msunduzi IDP, 2011/2012). Figure 16 shows potential flood

zones occurring within the study area which are considered to be areas of high environmental risk.

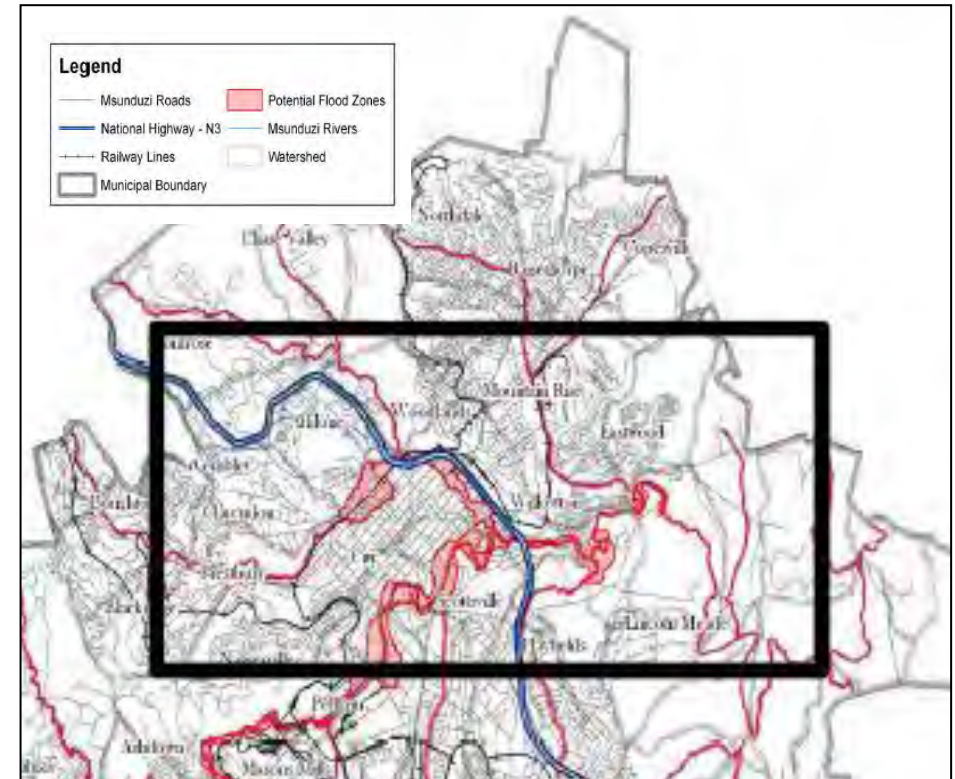


Figure 16: Flood Zones within the Municipality (approximate study area in black)

Source: Msunduzi IDP, 2011/2012

2.5 WASTE MANAGEMENT

The waste management business unit within Msunduzi municipality provides a waste management service in a form of collection, transportation, street cleaning, garden refuse and public awareness (Msunduzi Annual Report 2011/2012). Over the past four consecutive years the municipality has been collecting waste from 89,910 households at least once a week and 19,000 households less than once a week (refer to Table 2). It should be noted that the information obtained for solid waste collection is at a strategic level and it is not clear which areas are serviced by the municipality/ or contracted out on a regular basis. Another anomaly is whether the services are being extended as the population grows and new townships are developed (the figures indicate that the same number of customers have been serviced for four consecutive years).

Table 2: Households Solid Waste Service Delivery

Description	2008/2009	2009/2010	2010/2011	2011/2012
	Actual Number	Actual Number	Actual Number	Actual Number
Solid Waste Removal above minimum level				
Removed at least once a week	89,910	89,910	89,910	89,910
Minimum Service Level and above sub total	89,910	89,910	89,910	89,910
Minimum Service Level and above percentage	62.43%	62.43%	62.43%	62.43%
Solid Waste Removal below minimum level				
Removed less frequently than once a week	19,000	19,000	19,000	19,000
Using communal refuse dump	NA	N/A	N/A	N/A

Description	2008/2009	2009/2010	2010/2011	2011/2012
	Actual Number	Actual Number	Actual Number	Actual Number
Using own refuse dump	N/A	N/A	N/A	N/A
Own Rubbish Disposal	35,090	35,090	35,090	35,090
No Rubbish Disposal	N/A	N/A	N/A	N/A
Below Minimum Service Level sub-total	54,080	54,080	54,080	54,080
Below Minimum Service Level Percentage	37.57%	37.57%	37.57%	37.57%
Total number of households	144,000	144,000	144,000	144,000

2.5.1 LANDFILL SITES

The municipality has one permitted landfill site in the New England landfill that services the disposal needs of the Msunduzi citizens as well as other local municipalities surrounding the municipality (Msunduzi Annual Report 2011/2012). New England disposal site is located in the South Eastern part of the municipality. The infrastructure of the landfill site has been upgraded extensively in order to increase its lifespan. The landfill site receives daily waste which is approximately 700 tons that is spread, compacted and covered. Statistical data of waste categories disposed and processed at the landfill site is maintained for reporting purposes (refer to Table 3). Furthermore, the site is compliant with environmental legislation where there is bi-annual monitoring for gas emissions, ground and surface water contamination (Msunduzi Annual Report 2011/2012).

Table 3: Waste Disposal Service Statistics

Waste Disposal per category	2008/2009 Tons	2009/2010 Tons	2010/2011 Tons	2011/2012 Tons
Builders Rubble	22 740	24 104	25 550	27 594
Bulk Food Waste	15	16	17	19
Garden Refuse	25 164	26 674	28 808	31 688
General Domestic Waste	60 768	64 416	69 567	76 524
Industrial Ash	126	133	144	159
Sawdust	60	63	68	75
Cover Material	50 208	53 220	57 478	63 226
Wood Waste	10	10	11	13
Total	159 091	168 636	181 643	199 298

2.6 CULTURAL AND HERITAGE RESOURCES

The Msunduzi municipality has rich cultural, architectural, historical and archaeological features which as a collective make up the heritage resources of the area (Msunduzi EMF, 2010). There are 646 heritage resource points and 32 heritage zones within the municipal area. The significant numbers of the heritage resources are architectural in the form of buildings that are located within the CBD, surrounding suburbs and the Edendale area. Less significant archaeological features are spread within the entire municipality including the Central Area (refer to Figure 17). The historical and cultural features are presented by churches, temples, cemeteries, open spaces and areas of political significance (SEA, 2010). Maintenance of heritage resources within the municipality has not been consistent (Msunduzi EMF, 2010).

Most notably within the Central Area and CBD Extension Node is the prevalence of heritage resources in the “Zone of Architectural and Cultural significance” particularly in the CBD, as well as the “Zone of Historical significance” in the Alexandra Park area. Any development proposals in the study area would have to adhere to the provisions of the National Heritage Resources Act specifically the following:

Section 34 – Structures older than 60 years:

- In most cases evaluated and handled by Conservation Architects.

Section 35 - Archaeology, palaeontology and meteorites:

- Provides protection for these sites on Provincial and National levels.
- Stipulates State ownership of all archaeological objects, palaeontological material and meteorites.
- Protects archaeological and palaeontological sites and meteorites from unlawful destruction, trade and excavation without permitting.
- Makes provision for mediated action to protect archaeological and palaeontological sites and meteorites being damaged.
- Register private collections of archaeological objects, palaeontological material and meteorites.

Section 35 – Burial grounds and graves:

- Provides protection for graves of conflict, as well as burial grounds containing graves of conflict.
- Graves and burial grounds older than 60 years outside formal cemeteries administered by local authorities.
- The issuing of permits for the exhumation and relocation of such graves and burial grounds.

Section 38 – Heritage Resources Management:

- Subsection (1) stipulates the types of development that require the developer to contact the relevant heritage authority, to determine the need for a Heritage Impact Assessment (HIA).
- Stipulates the minimum information required in such a HIA. These requirements and the minimum requirements for Archaeological Impact Assessments were issued by SAHRA in 2006.

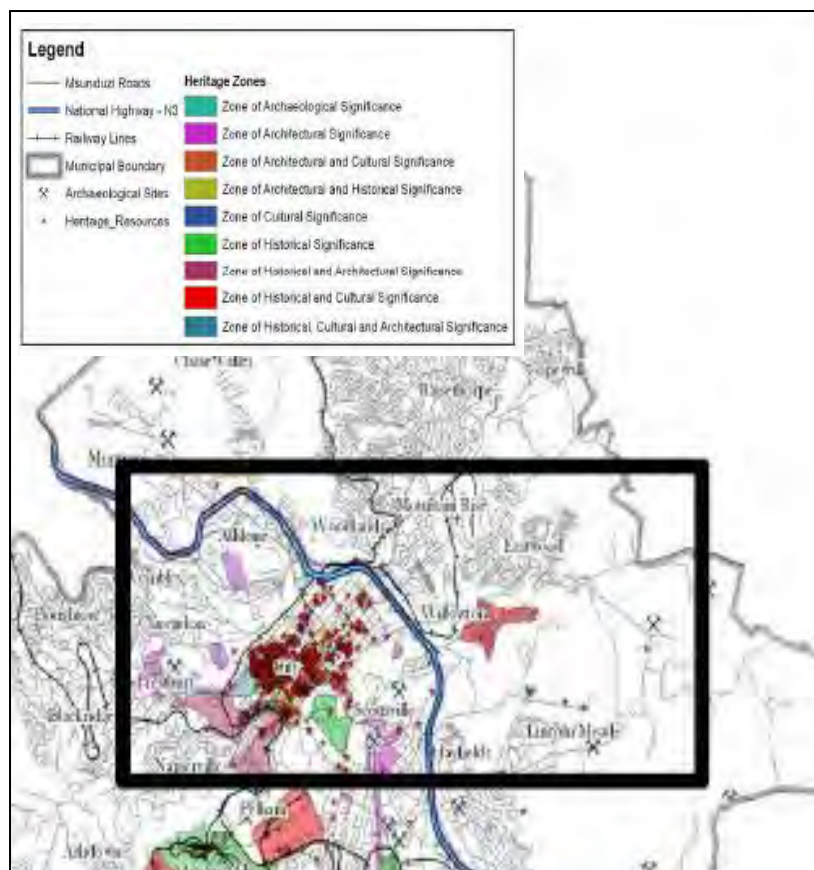


Figure 17: Location of Msunduzi Heritage Resources (approximate location of study area in black)

Source: Msunduzi EMF, 2010

3 APPLICABLE LEGISLATION, BYLAWS AND POLICIES

Table 4 below lists and describes the relevant national laws, bylaws and policies in which the municipality adheres to in fulfilment of its existence and function as a local authority.

Table 4: Applicable Legislation, Policies and Bylaws

APPLICABLE LEGISLATION	DESCRIPTION
National Laws	
Constitution of the Republic of South Africa Act (No 108 of 1996)	<p>Section 24 of the Act emphasis the protection of the environment which must be sustainable for the current and future generation.</p> <p>Section 151 and 152 of the Act relates to the establishment of the municipalities and the functions which they need to fulfil within their respective communities.</p>
National Environmental Management Act (No 107 of 1998)	<p>The main purpose of the act is to protect the environment. Section 24 of the mandates the Minister of Environmental Affairs to identify and authorise activities which will result in the detrimental effect to the environment.</p> <p>Section 28 relates the duty of care towards the environment where developer has a general duty to care for the environment and to institute such measures as may be needed to demonstrate such care.</p>
National Water Act (No 36 of 1998)	<p>Provides Principles that govern the distribution, use and management of water resources in the Republic South Africa. Details the prevention and remedial measures of water pollution.</p> <p>It further lists the permissible water uses and those that require authorisation in a form of Water Use Licence from the Minister of Water Affairs.</p>

APPLICABLE LEGISLATION	DESCRIPTION
National Environmental Management: Biodiversity Act (No 10 of 2004)	Provides management and conservation of South Africa's biodiversity within the framework of the National Environmental Management Act 107 of 1998; the protection of species and ecosystems that warrant national protection and the sustainable use of indigenous biological resources.
National Environmental Management: Air Quality Act (No 39 of 2004)	<p>It provides the control and management of dust, fuel, noise and odour. Section 21 of the Act mandates the Minister of Environmental Affairs to identify the activities which may result in the detrimental effect of the atmosphere and the authorisation which needs to be obtained.</p> <p>The municipalities have been given a mandate to authorise activities that are occurring within their jurisdiction.</p>
National Environmental Management: Waste Act (No 59 of 2008)	<p>Defines the national waste management strategy, norms and standards. It emphasises the role of the provincial organ of the state in the implementation of the waste management.</p> <p>It also relates to the duty of care by developer or manufacturer to avoid generation of waste and if not avoided minimise and manage it accordingly.</p> <p>It further lists the activities which need to be authorised by the Department of Environmental Affairs.</p>
National Heritage Resources Act (No 25 of 1999)	Defines the protection, management and evaluation of heritage resources including structures older than 60 years (Section 34), protection of archaeology, palaeontology and meteorites and provision for mediated action to protect these (Section 35), protection for burial ground and graves (Section 35), and heritage resource management (Heritage Impact Assessments etc) (Section 38).

APPLICABLE LEGISLATION	DESCRIPTION
Local Government: Municipal Systems Act (No 32 of 2000)	<p>Section 23 (1) of the act indicates that a municipality must undertake developmentally orientated planning and Section 24 (1) indicates that planning undertaken by the municipality must be aligned with and complement plans of other municipalities and organs of state.</p> <p>Section 26 of the Act indicates that a core component of an IDP is a SDF which must include the provision of basic guidelines for a land use management system for the municipality.</p>
MUNICIPAL BYLAWS, POLICIES AND FRAMEWORKS	
Water Service By-Laws (No 7 of 2005)	<p>The bylaw relates to the water and sanitation services rendered by the municipality to the residents, commercial and industrial institutions and the tariffs charged for the services.</p> <p>It lists the limits of industrial effluents which may be discharged into the sewage systems and the permits that must be obtained by the industries for the discharge.</p>
Solid Waste By-Laws (No 8 of 2005)	The Bylaws relates to the collection, management and disposal of waste within the municipality jurisdiction and the tariffs charged by the municipality for collection and disposal. It further outlines the conduct which must be adhered to by the public when accessing the landfill sites.
Noise abatement By Law (No 514 of 1984)	The Bylaws details the parameter of ambient noise levels required outdoors and indoors within the municipality. It provides penalties for the exceeding the parameters contained in the By-Laws.
Environmental Management Framework	<p>The purpose the framework is to assist the municipality in making informed decisions in their planning about the development of the city.</p> <p>The objectives the framework are to:</p>

APPLICABLE LEGISLATION	DESCRIPTION
	<ul style="list-style-type: none"> • Identify areas both suitable and unsuitable for development; • Provide information to assist decision making (such as development applications) and thereby streamline the process; • Identify environmentally sensitive areas that require protection so as to ensure ecosystem service • delivery ; • Provide environmental goals and mechanisms to achieve the objectives as stated.
Integrated Development Plan	The plan is aimed at assisting the municipalities to plan for the future developments within their jurisdiction in order to effectively use scarce resources, accelerate service delivery, attract additional funds for development, strengthen democracy, overcome the legacy of apartheid and promote coordination between local, provincial and national government.
Spatial Development Framework	The framework form part of the IDP and represents the spatial expression of the municipality's development. It is also reviewed regularly to account for the changes that constantly occur as the cities develop and expand.

4 CONCLUSION

This technical note has provided an overview of the environmental features occurring within the Central Area and Extension Node within the context of the Msunduzi municipality. It has described the current receiving biophysical environment, its sensitivity and key issues from a biodiversity and environmental risk perspective.

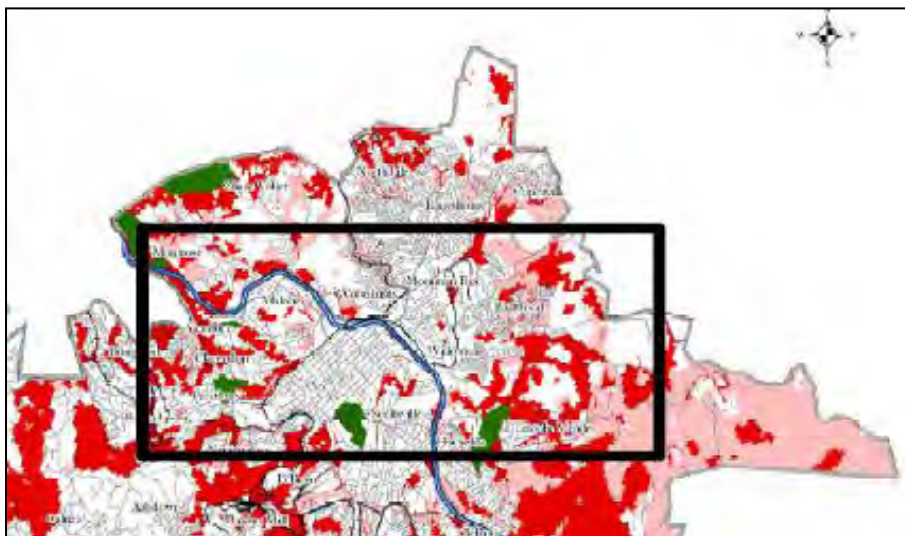


Figure 18 provides a useful summary of the main issues by identifying areas where there are inherent development constraints. The Central Area and Extension Node essentially has no constraints to development due to its transformed nature. However, there are high development constraints along the Msunduzi River and for the protected area of Alexandra Park.

The Central Business District and Central Extension Nodes has limited space for greenfield development due to the densely built up nature of the area. There are however opportunities for brownfield developments that support urban regeneration and renewal.

Furthermore, it is particularly important to retain the existing natural systems in order to provide recreation and leisure function, and ecological goods and services such as flood retention, water purification, reduction of heat islands, and carbon sequestration.

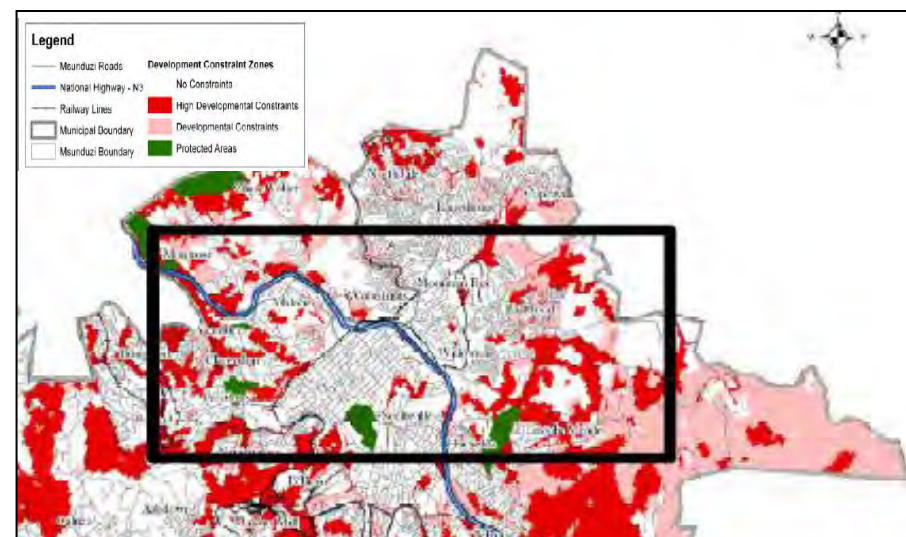


Figure 18: Areas of Developmental Constraints (approximate location of the study area in black)

Source: Msunduzi EMF, 2010

Table 5 highlights key issues noted during the compilation of this technical note.

Table 5: Key issues

Issue	Comment
Air Pollution	The study area is situated in an air quality sensitive area due to the inversion layer and prevalence of sources of pollution. The provisions of the Air Quality Act will need to be adhered, as well as ongoing monitoring and compliance measures, to limit further air quality deterioration.
Soils and Land Capability	The study area has pockets of good soil for potential agricultural activities; however most of these have been significantly transformed and developed for other land uses. Opportunity for agricultural activity will be constrained by limited space and development pressure for other land uses.
Biodiversity	The biodiversity of the study area has mostly been transformed and modified. There are however two areas of limited conservation and biodiversity value,

Issue	Comment
	namely Alexander Park and Pietermaritzburg Botanical Gardens. These areas presents opportunity for the municipality in terms of recreation, eco-tourism and conservation activities, and freely provide ecological goods and services (flood retention, filtering water, carbon sequestration, etc)
Water Resources	The study area is characterised by poor water quality and river ecological health status due to significant modification due to development that has taken place of over the years. The study area is characterised by low-lying areas associated with the Msunduzi river floodplain. As a result, there are certain parts of the study area which are susceptible to flooding which poses a risk to infrastructure, ecological function and human well-being. Any further development will have to adhere to floodlines, set back lines and storm water management principles to minimise the risk of further flooding. The Msunduzi is a strong structuring element in the study area and contributes to place-making as well as provides space for a variety of recreation and leisure activities.
Heritage Resources	Within the Central Area and CBD Extension Node there are a number of heritage resources especially in the “Zone of Architectural and Cultural significance”, as well as the “Zone of Historical significance”. Any development proposals in the study area would have to adhere to the provisions of the National Heritage Resources Act.
Public open spaces	Initiatives to restore and re-establish green spaces (public open spaces) are much needed in the Central Area. These areas fulfil an important recreation and environmental function within inner cities and contribute to place-making and identity.

5 REFERENCES

1. Constitution of the Republic of South Africa Act (No 108 of 1996)
2. Local Government: Municipal Systems Act (No 32 of 2000)
3. Macfarlane, D.M. and Quayle, L., 2009: Msunduzi Municipality Environmental Services Plan – Areas of biophysical importance
4. Msunduzi Final Draft Environmental Management Framework, May 2010
5. Msunduzi Municipality Draft Strategic Environmental Assessment, March 2010
6. Msunduzi Municipality Intergrated Development Plan 2011/2012
7. Msunduzi Municipality Draft Intergrated Development Plan 2013
8. Msunduzi Municipality Annual Report 2011/2012
9. Msunduzi Spatial Development Framework, July 2009
10. National Environmental Management Act (No 107 of 1998)
11. National Water Act (No 36 of 1998)
12. National Environmental Management: Biodiversity Act (No 10 of 2004)
13. National Environmental Management: Air Quality Act (No 39 of 2004)
14. National Environmental Management: Waste Act (No 59 of 2008)
15. Noise abatement By Law (No 514 of 1984)
16. SA Explore, 2000-2011
17. SANBI (2011). Threatened Ecosystems in South Africa. <http://bgis.sanbi.org> (December 2012).
18. Solid Waste By-Laws (No 8 of 2005)
19. UMgungundlovu District Municipality's Draft Integrated Development Plan 2013/2014
20. Water Service By-Laws (No 7 of 2005)