



KwaDukuza Municipality

**Strategic Environmental Assessment
(SEA): Phase 2: Analysis Report**

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SECTION 1: INTRODUCTION

The KwaDukuza Municipality has identified the need for a SEA for the following reasons:

- To assess the environmental implications of the KwaDukuza IDP,
- To determine the ability of the environment to sustain the development currently taking place in the Municipality, and
- To identify the environmental opportunities and constraints within the Municipality.

The purpose of undertaking an SEA is to strengthen and support sustainability planning as an integral part of the IDP process. The SEA will therefore provide the Municipality with a decision support tool to evaluate its outcomes in terms of its environmental implications. The main benefits of SEA are that contributes to achieving sustainable development goals by:

- Proactively informing plans/programs
- Identifying opportunities/constraints which the environment places on development
- Providing guidelines to ensure that development is within acceptable limits
- Integrating across areas, regions/sectors and considering cumulative effects
- Focusing on the maintenance and enhancement of a chosen level of environmental quality

1.1 OBJECTIVE

The purpose of this report is to fulfil the objectives of **Phase 2**. Within Phase 2 an environmental analysis is required to be undertaken by the Municipality. It entails *a focused analysis of the type of problems* faced by the people in the municipal area and includes the *listing and prioritisation* of all development issues. The central objective is to ensure that significant environmental issues are identified during this phase to allow for a strategic focus for future development. Outputs of this phase should be at least a list of major existing environmental problems and threats, and environmental assets. This report aims to meet the following objectives:

- To assess the environmental implications of the KwaDukuza IDP
- To interpret the information contained in the Status Quo Report, with a specific focus on land use change and related impacts
- To identify environmental opportunities and constraints

The objective of the next phase, **Phase 3 Implementation** will be to:

- To provide the municipality with guidelines for the development and assessment of plans and programs to ensure that development is within acceptable limits.
- The mitigation measures will be used as a basis for the compilation of the Environmental Exclusion Map

1.2 METHODOLOGY

The following activities were therefore undertaken in order to meet the above objectives:

- Analysis of the Vision, Strategies and Projects contained within the KwaDukuza IDP
- Analysis of the spatial data using map overlay and multi-criteria analysis techniques to provide a spatial platform for the strategic assessment of biophysical and social factors identified.
- The information gathered as part of the status quo phase was interpreted for the purposes of the SEA, with a specific focus on *land use change* and *related impacts*

SECTION 2: POLICY & LEGISLATIVE OVERVIEW

This section describes the municipality's obligations in terms of legislation and provides an analysis of how well they are meeting these requirements.

2.1 LOCAL GOVERNMENT RESPONSIBILITIES THAT RELATE TO THE ENVIRONMENT

Analysis of the Situation in KwaDukuza Municipality:

Table 2: IDENTIFICATION OF LOCAL LEVEL RESPONSIBILITIES FOR THE ENVIRONMENT

RESPONSIBILITY	MANDATED (Schedule 4b & 5b of Constitution)	TIER OF GOVERNMENT RESPONSIBLE (under Municipal Structures Act)	OTHER RELEVANT LEGISLATION	RELATED PROVINCIAL OR NATIONAL LEGISLATED COMPETENCY (under Schedule 4 and 5 of Constitution)	? FUNCTIONAL RESPONSIBILITY in KWADUKUZA LM	Other
Broad responsibilities (functions)						
Air Pollution - air quality	Yes	A,B	Air Quality Bill	Pollution management & control	ILEMBE DM responsible	Bylaw in place municipality does not have equipment and infrastructure available for performing the function at a basic level
Noise Pollution	Yes	A,B	Bylaws - Noise Control - Chapter 2	Pollution management & control	LM but not performing role Saps And Law Enforcement Agencies	Bylaw in place Insufficient staff, budget & equipment
Refuse Removal, refuse dumps & solid waste disposal	Yes	A,B,C Refuse removal: A,B Domestic waste water & sewage disposal: A,C Solid Waste Disposal: A,C	White Paper on Integrated Pollution & Waste Management Public Health Act Environment Conservation Act	Waste Management	DM & LM, Dolphin Coast Waste Management	Insufficient staff, budget & equipment
Storm water management in built up areas	Yes	A,B				

RESPONSIBILITY	MANDATED (Schedule 4b & 5b of Constitution)	TIER OF GOVERNMENT RESPONSIBLE (under Municipal Structures Act)	OTHER RELEVANT LEGISLATION	RELATED PROVINCIAL OR NATIONAL LEGISLATED COMPETENCY (under Schedule 4 and 5 of Constitution)	? FUNCTIONAL RESPONSIBILITY in KWADUKUZA LM	Other
Water & Sanitation Services	Yes	A,C Including industrial pollution standards & permission?			DM	
Beaches	Yes	A,B	National Acts Eg. Sea Shore Act Marine Living Resources Act		LM & lifeguards	Included in IDP Inadequate staff & finances
Municipal Parks & Recreation	Yes	A,B			LM	Included in IDP Insufficient staff, budget & equipment
Local amenities	Yes	A,B	Protected Areas Act	Nature Conservation	LM Only some urban areas/towns and former TLC areas	Included in IDP Bylaw in place Insufficient staff, budget & equipment
Public Places	Yes	A,B			LM Only some urban areas/towns and former TLC areas	Included in IDP Insufficient staff, budget & equipment
Planning Responsibility						
Incorporation of NEMA principles into all plans	No	All	NEMA			
Municipal Planning	Yes	All		Regional Planning & Development	LM & DM	
Preparation of IDP & associated plans	(Municipal Planning – yes)	All	Local Government Regulations Air Quality Bill Biodiversity Act White Paper on Integrated Pollution & Waste Management Water Services Act Biodiversity Act	Provincial Air Quality Management Plan Provincial Invasive Species Monitoring, Control & Eradication Plan Review of Municipal Integrated General Waste Management Plans; Hazardous waste management plans for province; Provincial environmental & waste management plans		

RESPONSIBILITY	MANDATED (Schedule 4b & 5b of Constitution)	TIER OF GOVERNMENT RESPONSIBLE (under Municipal Structures Act)	OTHER RELEVANT LEGISLATION	RELATED PROVINCIAL OR NATIONAL LEGISLATED COMPETENCY (under Schedule 4 and 5 of Constitution)	? FUNCTIONAL RESPONSIBILITY in KWADUKUZA LM	Other
Compliance with provincial EIPs/EMPS & adherence to EIP/EMP in all planning, policy or programs	No	All	NEMA			
Preparation of management plans for local protected areas	No	All	Protected Areas Act	Review of municipal management plans for protected areas; preparation of management plans for provincial protected areas		
Monitoring/reporting function						
Auditing, monitoring & compliance measures (under model by-laws if created)	N	All	NEMA			
Reporting & provision of information (under model by-laws if created)	N	All	NEMA			
Reporting on Key Performance Indicators from IDPs	N	All				
Collection of data for waste management system	N	?	White Paper on Integrated Pollution & Waste Management			
Air Quality: monitoring of ambient air quality & point/non-point source emissions	(Under Air pollution)	A,B	Air Quality Bill	Provincial – monitoring of ambient air quality; monitoring performance of municipalities (compliance with legislation);n report on implementation of Air Quality Management Plan		
Compliance with provincial EIP	N	All	NEMA	Annual report on implementation of provincial EIP		
State of Environment Report	N	Voluntary at present	None	Provincial & national SoE reports		

2.2 DISCUSSION

This section describes the municipality's obligations in terms of legislation and provides an analysis of who is currently responsible for functions in the municipality, and where the gaps are:

Broad Responsibilities

- *Air pollution (air quality)*. ILEMBE DM responsible. A Bylaw is in place, municipality does not have equipment and infrastructure available for performing the function at a basic level
- In terms of *noise pollution*, LM is responsible, but not performing role. A Bylaw is in place, but there is insufficient staff, budget & equipment. The Saps And Law Enforcement Agencies are assisting.
- *Refuse removal, landfill sites, etc.* DM & LM are responsible. The Dolphin Coast Waste Management is currently performing this whole. There is Insufficient staff, budget & equipment
- *Stormwater Management in built up Areas*. LM is responsible. Experiencing difficulties in keeping up with development.
- *Water and Sanitation Services*: The District Council responsible for water services in the district.
- *Beaches*: LM & lifeguards are responsible. Inadequate staff & finances, Included in IDP.
- *Parks & recreation*: LM is responsible. Insufficient staff, budget & equipment, Included in IDP.
- *Local Amenities and public places*: is a local function. Only in some urban areas/towns and former TLC areas Included in IDP. Bylaw in place but Insufficient staff, budget & equipment

Planning Responsibilities

- Awareness of *NEMA principals* and incorporation into their planning: There has been little evidence of this in existing projects.
- *Municipal Planning*: KwaDukuza and Ilembe Municipality is undertaking this function.
- *IDP & associated plans*: KwaDukuza and Ilembe Municipality is undertaking this function. IDP planning seemed to be sufficiently understood.
- *Compliance with provincial environmental implementation plans*: There has been little evidence of this in existing projects.
- *Preparation of Management Plans for protected areas*: the KwaDukuza has recognised the importance of the Coastal and Marine Protected area at Umvoti River. Management Plans are still to be prepared.

Monitoring/reporting function

- There is no specific Environmental Function or responsibility identified in terms of the Municipality's Organisational structure.
- Developments are often approved with inadequate consideration of environment issues and non-compliance with existing legislation, resulting in inappropriate development, and a general lack of consideration of the environment.
- The municipality is in the process of securing the services of an Environmental Manager.
- Currently communication between the KwaDukuza Municipality and the Ilembe District Municipality is generally poor, although attempts have been made to integrate, e.g. KwaDukuze/Ilembe Coastal Working Group.
- Improved integration and communication between Ilembe and KwaDukuza regarding projects, activities, etc should be encouraged to ensure that development is focussed and aligned with existing and proposed strategies. This would include discussions with eThekweni Municipalities regarding the management of the Tongati River.
- Advice and assistance from Government Departments, local Environment Groups and Organisations (for example WESSA) is recommended to ensure that environmental issues are appropriately considered. DAEA is in the process of setting up a Northern Office that would serve the KwaDukuza Municipality.

- It is advised that an organisational structure setting out which department/organisation (local, provincial and national) is responsible for different aspects relating to the environment. This will enable a clear line of communication and responsibility to be established.
- The focus of environmental management within the Municipality should be on integration, not just within the environmental function, but also within the Municipality and adjacent areas as a whole.
- Multidisciplinary task teams should be encouraged to develop detailed strategies through the IDP to address environmental issues.

2.3 CONCLUSION

There is no specific Environmental Function or responsibility identified in terms of the Municipality's Organisational structure. Developments are often approved with inadequate consideration of environment issues and non-compliance with existing legislation. This has resulted in inappropriate development, increasing pressure on remaining natural resources and infrastructure, and a general lack of consideration of the environment. However the municipality is in the process of securing the services of an Environmental Manager. The prospective positioning of the Environmental Manager could be directly underneath the Municipal Manager and at the same level as the other line functions which would ensure that environmental functions were given the same status as other functions (option 1); could fall within the financial line function, i.e. no projects, plans or programs can be approved prior to approval from the Environmental Manager (option 2), or within the Technical Services Function (option 3) since the Environmental Manager would need to provide input into Planning & Development, Municipal Works and Technical Infrastructure; however conversely the Corporate Services would also require input from the Environmental Manager. At a later stage, the municipality could consider the appointment of a Urban Impact Management Officer, Rural Impact Management Officer, Waste Management Manger Officer and Industrial Impact Management Officer (within the respective line functions but overseen by the Environmental Manager).

Currently communication between the KwaDukuza Municipality and the Ilembe District Municipality is generally poor, although attempts have been made to integrate, e.g. KwaDukuze/Ilembe Coastal Working Group. Improved integration and communication between Ilembe and KwaDukuza regarding projects, activities, etc should be encouraged to ensure that development is focussed and aligned with existing and proposed strategies. This would include discussions with eThekweni Municipalities regarding the management of the Tongati River. Advise and assistance from Government Departments, local Environment Groups and Organisations (for example WESSA) is also recommended to ensure that environmental issues are appropriately considered. DAEA is in the process of setting up a Northern Office that would serve the KwaDukuza Municipality¹. It is advised that an organisational structure setting out which department/organisation (local, provincial and national) is responsible for different aspects relating to the environment. This will enable a clear line of communication and responsibility to be established.

The focus of environmental management within the Municipality should be on integration, not just within the environmental function, but also within the Municipality and adjacent areas as a whole. Multidisciplinary task teams should be encouraged to develop detailed strategies through the IDP to address environmental issues. In this way it is hoped that all dimensions of cross cutting issues will be captured and better understood and managed. Solutions should build on existing structures where possible. The responsibility to drive and develop environmental strategies should be placed with the line functions using input from environmental manager, with the result that the process will be integrative and co-operative rather than top down.

¹ Personal communication with Vanessa Maclou (DAEA)

SECTION 3: ANALYSIS OF THE KWADUKUZA IDP

3.1 THE KWADUKUZA VISION

The vision of the KwaDukuza Municipality as presented in the IDP is:

By 2010 KwaDukuza will, through unity and good governance be an economic powerhouse, delivering services in an affordable and sustainable manner within a safe and healthy environment"

The IDP further identifies that the KwaDukuza mission is based on the following four principles of sustainable development:

- Economic development
- Social development
- Environmental physical development
- Good governance

3.1.1 Analysis and Recommendations

It is proposed that the above principals of sustainable development be expanded further to include the following:

- Economic development as a component of sustainable development refers to a new and fairer approach to economic growth, which promotes access to employment and resources, in a way that is not damaging to the environment.
- Social development relates to meeting people's needs, using appropriate technology in a way that is not damaging to the environment.
- Community empowerment is encouraged by focusing on participation and equity, with particular emphasis on the most vulnerable of society. This is considered necessary for improved planning and development.
- Ecological sustainability is about using resources within their carrying capacity, so that resources can be regenerated for future use, and minimising waste and pollution.
- Good Governance: Environmental management must be integrated, acknowledging that all elements of the environment are linked and interrelated, and it must take into account the effects of decisions on all aspects of the environment and all people in the environment by pursuing the selection of the best practicable environmental option.

A set of Environmental Sustainability Principles has been developed to promote environmental sustainability in the implementation of the municipality's IDP. These are based largely on the environmental management principles in Chapter 1 of the National Environmental Management Act (NEMA) (Act 107 of 1998), but also incorporate the principles of Local Agenda 21 and KwaZulu-Natal's Environmental Implementation Plan (DAEA, 2002). The Environmental Sustainability Principles are outlined in detail in **Table 1 below**, and are divided into the following six themes:

- ❖ Sustainable Development
- ❖ Environmental Justice and Equity
- ❖ Participation, Empowerment and Transparency
- ❖ Co-operative Governance
- ❖ Ecological and Cultural Integrity
- ❖ Environmental Decision-making.

Table 1: ENVIRONMENTAL SUSTAINABILITY PRINCIPLES

THEMES		PRINCIPLES		DESCRIPTION
1	Sustainable Development	1.1	Sustainable Development	Development must be socially, environmentally and economically sustainable.
		1.2	Eradication of poverty	Poverty needs to be eradicated through the satisfaction of basic human needs to ensure truly sustainable development
		1.3	Waste management	Waste must be avoided, or where it cannot be altogether avoided, minimised and re-used or recycled where possible and otherwise disposed of in a responsible manner.
		1.4	Pollution control	Pollution and degradation of the environment must be avoided, or, where they cannot be altogether avoided, minimised and remedied.
2	Environmental Justice and Equity	2.1	Priority of human needs	Environmental management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural and social interest equitably
		2.2	Environmental rights	Negative impacts on the environment and on peoples environmental rights be anticipated and prevented, and where they cannot be altogether prevented, are minimised and remedied.
		2.3	Environment as a public resource and heritage	The environment is held in public trust for the people, the beneficial use of environmental resources must serve the public interest and the environment must be protected as the people's common heritage.
		2.4	Environmental justice	Environmental justice must be pursued so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons.
		2.5	Equitable access	Equitable access to environmental resources, benefits and services to meet basic human needs and ensure human well-being must be pursued and special measures may be taken to ensure access thereto by categories of persons disadvantaged by unfair discrimination.
		2.6	Environmental health and safety	The right of workers to refuse work that is harmful to human health or the environment and to be informed of dangers must be respected and protected.
3	Participation, Empowerment and Transparency	3.1	Participation in environmental governance	The participation of all interested and affected parties in environmental governance must be promoted, and all people must have the opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation, and participation by vulnerable and disadvantaged peoples must be ensured.
		3.2	Contributions to decision-making	Decisions must take into account the interests, needs and values of all interested and affected parties, and this includes recognizing all forms of knowledge, including traditional and ordinary knowledge.
		3.3	Empowerment	Community well being and empowerment must be promoted through environmental education, the raising of environmental awareness, the sharing of knowledge and experience and other appropriate means.
		3.4	Transparency and access to information	Decisions must be taken in an open and transparent manner, and access to information must be provided in accordance with the law.
		3.5	Role of women and youth	The vital role of women and youth in environmental management and development must be recognised and their full participation therein must be promoted.

THEMES		PRINCIPLES		DESCRIPTION
4	Co-operative governance	4.1	Intergovernmental co-ordination	There must be intergovernmental co-ordination and harmonisation of policies, legislation and actions relating to the environment.
		4.2	Conflict resolution	Actual or potential conflicts of interest between organs of state should be resolved through conflict resolution procedures.
		4.3	Global and international responsibilities	Global and international responsibilities relating to the environment must be discharged in the national interest.
5	Ecological and Cultural Integrity	5.1	Biological diversity	The disturbance of the ecosystem and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimised and remedied.
		5.2	Non-renewable resources	The use and exploitation of non-renewable natural resources must be responsible and equitable, and take into account the consequences of the depletion of the resource.
		5.3	Renewable resources	The development, use and exploitation of renewable resources and the ecosystems of which they are part should not exceed the level beyond which their integrity is jeopardised.
		5.4	Sensitive ecosystems	Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, wetlands and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure.
		5.5	Cultural integrity	The disturbance of landscapes and sites that constitute the nation's cultural heritage is avoided, or where it cannot be altogether avoided, is minimised and remedied.
6	Environmental decision-making	6.1	Integration	Environmental management must be integrated, acknowledging that all elements of the environment are linked and interrelated, and it must take into account the effects of decisions on all aspects of the environment and all people in the environment by pursuing the selection of the best practicable environmental option.
		6.2	Life-cycle approach	Responsibility for the environmental health and safety consequences of a policy, programme, project, product, process, service or activity exists throughout its life cycle.
		6.3	Accountability	The costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution; environmental damage or adverse health effects must be paid for by those responsible for harming the environment.
		6.4	Precautionary principle	A risk-averse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions.
		6.5	Consideration of impacts	The social, economic and environmental impacts of activities, including disadvantages and benefits, must be considered, assessed and evaluated, and decisions must be appropriate in the light of such consideration and assessment.

3.2 IDENTIFIED STRATEGIES

The following strategies have been proposed by the municipality in support of the KwaDukuza Vision as detailed in the IDP:

STRATEGY 1: EFFECTIVE INFRASTRUCTURE

GOAL: Ensure access to all residents in KwaDukuza with effective infrastructure through the provision of new and the maintenance of existing infrastructure

STRATEGY 2: INTEGRATED HUMAN SETTLEMENTS

GOAL: To be a leading human settlements provider within the Ilembe District by working towards slum-free environment through the provision of affordable housing to all qualifying and deserving residents.

STRATEGY 3: ECONOMIC DEVELOPMENT AND JOB CREATION

GOAL: To obtain a strong economic growth and job creation ensuring the realization of the Municipal Vision.

STRATEGY 4: INTEGRATED DEVELOPMENT

GOAL: Develop a holistically integrated Municipality, which is aligned to its surrounding Municipalities. To achieve equitable distribution of urban and rural development projects and therefore an equal improvement in access to community and municipal services.

STRATEGY 5: PEOPLE EMPOWERMENT

GOAL: To improve the social well-being of the people of KwaDukuza through sustainable improvements to delivery of municipal services

STRATEGY 6: GOOD GOVERNANCE

GOAL: To demonstrate improved governance levels through the establishment of a prudential financial service delivery strategy and the effective collection of debt and achieved improvements in the invoicing of levy payers

3.2.1 Analysis and Recommendations

The key environmental issues identified have been assessed according to the IDP's strategies. The implementation of the IDP's programs and projects needs to respond to these issues through compliance with the **Table 1 Environmental Sustainability Principles**.

The strategies proposed above encompass the principles of sustainable development expanded upon in **Section 2.1**, however they fail to adequately consider the environmental and cultural resources upon which the municipality depend. It is therefore proposed that the following Strategy be included:

Strategies	Objectives/Goals
Strategy 7: Protection of Environmental and Cultural Resources	
a). Enrichment of Biodiversity attributes	Protection and expansion of all existing sensitive ecosystems.
b). Promotion of ecological linkages	<ul style="list-style-type: none"> Creation of linkages with adjacent municipalities in order to create an overarching series of corridors and linkages of indigenous (open space areas) vegetation that will promote

Strategies	Objectives/Goals
Strategy 7: Protection of Environmental and Cultural Resources	
	movement of species and potentially increase habitat for various species, allowing free movement.
c). The protection of Cultural Resources and Character	<ul style="list-style-type: none"> • Ensure that visual impact is assessed when considering development that could negatively affect the visual amenity of sensitive area or sensitive uses. • Avoid or mitigate the visual impact of development that will result in erosion of natural landscapes particularly those associated with coastal and estuary landscapes • Anticipating and preventing negative impacts on the environment and on peoples environmental rights. • The disturbance of landscapes and sites that constitute the nation's cultural heritage is avoided (cultural in as much as these are the landscape areas that are the landscapes most likely to be enjoyed by the widest cross section of the public).
d). Promotion of cooperative governance and open channels of communication between all relevant stakeholders involved in conservation.	<ul style="list-style-type: none"> • Involve NGO's, SANBI, Ezemvelo KZN Wildlife, AMAFA, consultants involved in EIA processes and a representative of the Municipality.
e). Formation of an environmental planning branch within the Municipalities structure	<ul style="list-style-type: none"> • To ensure that all planning applications are assessed appropriated and follow the correct procedure.

3.3 IDENTIFIED PROJECTS

Refer Attached Schedule, **Appendix A**.

3.3.1 Analysis and Recommendations

The projects identified in terms of the IDP have been considered above.

It is of concern that most of the remaining natural areas of KwaDukuza are to be developed or will be affected by development, as a result of existing New and Proposed Residential Projects planned. Furthermore it seem as if Developers are not advised of the requirement to obtain Environmental Authorisation from various Departments, i.e. DAEA, DWAF, AMAFA, etc.

In light of the key environmental issues identified, the following key environmental projects are recommended. Detailed Terms of Reference are available on request. These should be included in the current IDP review and budgeted for accordingly. It is intended that, where appropriate, these projects should enhance and integrate with the municipality's existing programs, e.g. Spatial Development Framework, The Districts Coastal Management Program, etc.

PROPOSED PROJECTS	SUB-PROJECTS
1. Municipal Environmental Policy & Environmental Management System (EMS)	To develop new policies, institutions and procedures, and to set the basis for ongoing monitoring, review and improvement of environmental performance in line with predetermined sustainable development goals.
2. Education & Awareness Program	Training of Councillors, Sector Leaders, service providers, etc to ensure that sustainability is incorporated within the District at all levels and across functions.
3. Information Gaps & State Of Environment Reporting	Access to timely and reliable information on the environmental will greatly improve the Municipality's ability to deal with environmental challenges GIS database
4. Enhancement of Biodiversity	<ul style="list-style-type: none"> • A Biodiversity Plan and management strategy to inform development proposals

PROPOSED PROJECTS	SUB-PROJECTS
5. Water Resource Management	<ul style="list-style-type: none"> • Floodline Study • Removal of alien invasive vegetation from riparian areas through the Working for Water Programme • Identification of major factors causing pollution of water resources in the LM • Remediation of water pollution issues at source
6. Protection of Wetland Areas	<ul style="list-style-type: none"> • Quantification of wetland degradation / loss in the KLM • Engagement with the sugar cane growing sector to prevent and reverse wetland degradation • Education of sugar cane farmers of the need for wetland conservation • Removal of (sugar cane) planted areas from within wetlands and the establishment of wetland buffer zones which are not cultivated.. • Rehabilitation of wetlands through the Working for Wetlands Programme
7. Coastal Management Plan	<ul style="list-style-type: none"> • Prevention of ribbon development along the coastal zone, and resultant removal of valuable coastal forests and ecological corridors • Zonation of coastal areas to limit certain types of development (e.g. high density residential) and promote other types of development (e.g. light footprint ecotourism development)
8. Tourism & Cultural Sustainability Development Plan	<ul style="list-style-type: none"> • Compile a regional Heritage Resource Management Plan. Since no part of the study area has been searched systematically and all heritage resources are known from chance identification or through construction activities, it is likely that the number of known sites would increase tenfold if the entire area were surveyed systematically. • Environmental sustainability plan • Identify heritage resources, determine significance, formulate management requirements, implement plan
9. Ecotourism Feasibility Study	<ul style="list-style-type: none"> • Ecotourism asset register • Proclamation of conservancies which are sustained by ecotourism activities

SECTION 4: ENVIRONMENTAL ANALYSIS

4.1 OVERALL ANALYSIS

Following on from the Status Quo Report: analysis of issues identified in the SQR.

In assessing the significance of *each* environmental issue the following criteria (including an allocated point system) is used:

Extent This describes whether the impact will be local; extending only as far as the activity, will be limited to the site and its surrounds, will have an impact on the municipality or have an impact on a district wide scale.	District Wide 4	Municipal 3	Surrounds 2	Local 1 and/or Sector (indicate ref)
Duration The lifetime of the impact is measured in terms of its time frame.	Permanent 4	Long-term 3	Medium-term 2	Short-term 1
Intensity This is to establish whether the impact is destructive or benign. Does it destroy the impacted environment, alter its functioning or slightly alter it?	Very High 4	High 3	Moderate 2	Low 1
Probability of occurrence This describes the likelihood of the impacts actually occurring. The impact may occur for any length of time during the life cycle of the activity, and not at any given time.	Definite 4	High-Probable 3	Probable 2	Improbable 1

STRATEGIC ENVIRONMENTAL ASSESSMENT

Theme	Key Resources / Issues	Environmental Analysis	Extent	Duration	Intensity	Probability	Score	Significance High (13-16) Med (9-12) Low (4-8)	Possible Prevention / Mitigation
NATURAL SYSTEM									
<i>Climate / Air Quality</i>	<ul style="list-style-type: none"> Favourable climate The main source of air pollution from industry is located within Stanger. The burning of wood for fuel and the seasonal burning of sugar cane fields and forestry is an important contributor to air pollutants in the rest of the area. The bio climatic profile is suitable for certain types of agricultural production, for example sugar cane and timber production. 	<ul style="list-style-type: none"> Topography plays a major role in modifying rainfall and temperature Air quality is affected by the prevailing meteorological conditions and the local topography. Competing land use for high agricultural land 	2	3	2	3	10	MEDIUM	<ul style="list-style-type: none"> Planning for future industrial development needs to consider meteorological conditions, the cumulative effects of adding emissions and the assimilative capacity of the atmosphere for additional air pollution loading when selecting industry type and siting. With regards to sugar cane burning and forestry burning, management systems should be put into place to minimise the impact to surrounding land uses (i.e. atmospheric conditions under which burning can be permitted/is not permitted, a registry of complaints, etc)
<i>Topography & Geology</i>	<ul style="list-style-type: none"> Good agricultural soil potential Sandwinning often occurs illegally. This has potentially serious implications for the natural environment as the necessary mitigating measures imposed by the permit are not always followed or monitored. Potential for erosion due to land uses 	<ul style="list-style-type: none"> High agricultural potential Soil stability impacts on land uses & infrastructure development. The varied topography increases the aesthetic appeal of the area and provides opportunities for a well-planned open space system. Erosion due to long periods of cultivation and overgrazing, pressure of the land by people and livestock, commercial farming & mismanagement of the land. 	2	3	2	3	10	MEDIUM	<ul style="list-style-type: none"> Planning for development needs to consider topography, geology and soil conditions. Ensure appropriate farming methods

? Theme	? Key Resources / Issues	Environmental Analysis	Extent	Duration	Intensity	Probability	Score	Significance High (13-16) Med (9-12) Low (4-8)	Possible Prevention/ Mitigation
Hydrology - Rivers and Dams - Wetlands - Estuaries	Loss / degradation of wetlands due to sugar cane cultivation	<ul style="list-style-type: none"> Wetlands fulfil a vital role in the correct hydrological functioning of the drainage systems within the study area by retaining water and contributing to perennial flows, by controlling erosion, and by removing silt load and other potential pollutants from the hydrological system. They are a vital component of the water resources system of the catchments which occur in the study area. Cultivation of sugar cane within wetlands causes loss of wetland habitat, thus adversely affecting wetland hydrological and ecological functioning. Wetland soils are lost through erosion and exposure when fields are burnt. The removal of riparian corridors and wetland loss entails that potential ecological corridors are lost. 	3	3	4	4	14	HIGH	<ul style="list-style-type: none"> Education of the sugar cane industry, Subsistence Farmers and Municipal workers Establishment of buffers Removal of planted areas from wetlands Rehabilitation of wetlands through the WFW Program.
	Water pollution	<ul style="list-style-type: none"> Pollution of water resources typically occurs from point sources (e.g. wastewater discharges) or from diffuse sources (e.g. nutrients entering the water resource from a diffuse area). Industrial uses, agricultural activities, and areas of human habitation are expected to be the main source of pollutants in the area. 	2	2	3	3	10	MEDIUM	<ul style="list-style-type: none"> Improvement of agricultural practices to prevent siltation Control / Monitoring of industry discharge standards Maintenance of operational standards at municipal wastewater works Improvement in service delivery to remote rural areas.
	Modification of watercourses by development, especially urban	<ul style="list-style-type: none"> Watercourses are either 	2	4	4	3	13	HIGH	<ul style="list-style-type: none"> Applying the principles of sustainable urban drainage to new

? Theme	? Key Resources / Issues	Environmental Analysis	Extent	Duration	Intensity	Probability	Score	Significance High (13-16) Med (9-12) Low (4-8)	Possible Prevention/ Mitigation
	development	affected through physical modification (e.g. canalisation), or through an altered hydromorphological regime caused by increased runoff from hard surfaces. <ul style="list-style-type: none"> Watercourses in urban areas can also be subject to pollution from runoff containing pollutants such as oil. This typically negatively affects the water quality and the ecological assemblages within the watercourses. Reducing and preventing pollution and degradation of water resources. Sandwinning has a major impact on rivers within the area. Present legislation is not being enforced (e.g. growing of crops in or close to drainage lines and/or river banks). 							development <ul style="list-style-type: none"> Effective stormwater control Use of soft engineering rather than hard engineering Restoration of canalised / modified streams / drainage lines Improved surveillance of practised through existing monitoring structures.
	Reduction in stream flow	<ul style="list-style-type: none"> Reduction in stream flow can be caused by the over-abstraction of surface water (and potentially groundwater, if there is a high base flow component) for purposes such as irrigation. Stream flow reduction is also caused by the invasion of alien invasive plants along watercourses and in wetlands. Stream flow reduction alters the hydromorphology of the river as well as the ecological assemblages of the river. 	2	2	3	2	9	MEDIUM	<ul style="list-style-type: none"> Restoration of wetlands in the upper catchments Control of abstraction for various uses, especially for irrigation. Removal of invasive vegetation within the catchment and along riparian zones

? Theme	? Key Resources / Issues	Environmental Analysis	Extent	Duration	Intensity	Probability	Score	Significance High (13-16) Med (9-12) Low (4-8)	Possible Prevention/ Mitigation
	Invasion of riparian areas by invasive alien vegetation	<ul style="list-style-type: none"> Invasion of riparian areas by invasive alien vegetation causes a loss of biodiversity as naturally-occurring plants are replaced by fewer exotic species, and the fauna which relies on the natural riparian vegetation is adversely affected. This can also cause stream flow reduction problems (see above). 	3	3	4	3	13	HIGH	<ul style="list-style-type: none"> Removal of plants by the WFW programme Establishment of control programmes The control of alien vegetation in South Africa is regulated under R22166 under the Agricultural Resources Act (Act 43 of 1983).
	Impact on Estuaries	<ul style="list-style-type: none"> Siltation as a result of bad land use management threatens integrity of estuaries (results in reduce habitat and alteration of mouth dynamics) Artificial breaching disruptive to ecological process and exacerbate shallowing of the system Water quality issues as a result of sewerage and agriculture Agricultural and industrial impacts on estuary Inappropriate urban development in high energy dynamic zone 	2	4	4	3	13	HIGH	<ul style="list-style-type: none"> Establishment of control and rehabilitation programmes Control of artificial breaching should be incorporated into rehabilitation programs. Control of development adjacent to estuaries.
<i>Coastal & Marine</i>	Formal protection of the coastal zone corridor, where existing natural vegetation exists.	<ul style="list-style-type: none"> Few remaining natural areas Increasing pressures on available land for development and agriculture. 	4	4	4	4	16	HIGH +	<ul style="list-style-type: none"> Restriction of development along the coastal zone in areas where indigenous vegetation still exists. Preservation of primary, secondary or climax dune vegetation Development along the coastal zone needs to be planned and implemented in a sustainable manner. Natural resources should be linked in an environmental corridor , which could be developed into an eco-tourism corridor with facilities to support its development.

Theme	Key Resources / Issues	Environmental Analysis	Extent	Duration	Intensity	Probability	Score	Significance High (13-16) Med (9-12) Low (4-8)	Possible Prevention/ Mitigation
Biodiversity & Protected areas	Development of the Umvoti Estuary and surrounding area into a Marine Protected Area.	<ul style="list-style-type: none"> Wide variety of habitats Important birding area Threatened species Critical for conservation action 	2	4	4	4	14	HIGH +	- No development should be allowed within the proclaimed heritage site and prevent development from abutting onto it through the creation of a buffer zone
Vegetation/Fauna	Formal protection of the Ngoya Forest Fragments and associated grassland areas.	<ul style="list-style-type: none"> Intense pressure from Forestry Injudicious burning and grazing of area, collection of plants for muthi Threatened by Alien Vegetation 	3	4	4	4	15	HIGH +	- Creation of a formal protected area, with the help and funding of EKZN wildlife, SANBI and the creation of a buffer zone around these areas -
	Fragmentation of natural areas and resources	<ul style="list-style-type: none"> Highly transformed Fragments of remaining natural areas/resources are separated by large tracts of transformed land and are therefore unable to support and sustain themselves without intensive management and intervention Increasing pressures on available land for development and agriculture means that less areas of suitable habitat remain available. Improper farming practices, over utilisation of wood species and increase in the occurrence of alien invasive plants all contribute to the loss of natural habitats. The removal of indigenous vegetation leads to a reduction in wildlife habitat and has negative effects on biodiversity. 	3	4	4	4	15	HIGH	- The location of open space systems should incorporate remnant patches of indigenous vegetation and sensitive natural areas. - Open space areas should be large enough to maintain seedbanks necessary to preserve flora and breeding areas to preserve fauna. - Should be interconnected to enable the movement of organisms - Rehabilitation of degraded areas
	Invasion by invasive alien vegetation	<ul style="list-style-type: none"> Alien invading plants (both terrestrial and aquatic) which destroys natural habits. The removal of indigenous vegetation and the disturbance of soils provides opportunities 	3	3	4	3	13	HIGH	- Removal of plants by the WFW programme - Establishment of control programmes - The control of alien vegetation in South Africa is regulated under

? Theme	? Key Resources / Issues	Environmental Analysis	Extent	Duration	Intensity	Probability	Score	Significance High (13-16) Med (9-12) Low (4-8)	Possible Prevention/ Mitigation
		for colonisation and invasion by exotic species. <ul style="list-style-type: none"> The presence of exotic plantations provide the source of alien vegetation that tend to colonise river banks, excluding indigenous vegetation and placing a threat on water resources due to less efficient means of water utilisation as compared to indigenous species. Alien vegetation places a threat to biodiversity within the area as they out compete indigenous species. They decrease the productivity of the veld and lower the grazing and browsing capacity. In addition, the vegetation has been found to have a severe impact on water resources and water availability in South Africa. 							R22166 under the Agricultural Resources Act (Act 43 of 1983).
BUILT SYSTEM/INFRASTRUCTURE									
<i>Water, Sanitation & Water Quality Stormwater Management</i>	Severe water shortage.	<ul style="list-style-type: none"> Major service backlogs in rural areas Current water requirements of existing users cannot be met No water supply exists to the east of the N2 Areas including Blythedale, Princes Grant and Zinkwazi exist on borehole supply Limited spare capacity west of N2 Need to maintain acceptable levels of services in already developed areas 	2	4	4	3	13	HIGH	<ul style="list-style-type: none"> Illembe District: needs to be addressed at strategic level with bulk water suppliers. Extraction of ground water from boreholes, desalination treatment plants, upgrading and installation of new bulk lines Upgrade and rehabilitation of infrastructure to deliver effective service to existing clients Extend services to unserved communities and new developments Introduce management, information technology and customer service

? Theme	? Key Resources / Issues	Environmental Analysis	Extent	Duration	Intensity	Probability	Score	Significance High (13-16) Med (9-12) Low (4-8)	Possible Prevention/ Mitigation
		<ul style="list-style-type: none"> Shortage exacerbated by new development applications Illembe municipality not in a position to provide a bulk service supply for new developments Impacts on environmental resources Poor sanitation and reliance on boreholes leads to ground water contamination, consequently detrimental to human health. 							relationships. - Reduce inefficiencies, waste and water loss
	Poor Sanitation and sewerage disposal	<ul style="list-style-type: none"> No bulk waterborne sewerage Reliance on septic tanks One major treatment works at KwaDukuza Treatment works requires upgrading due to extensive housing developments Poor sanitation and reliance on boreholes leads to ground water contamination, consequently detrimental to human health. 						See above	
	Poorly designed and maintained stormwater management systems which impact on drainage systems	<ul style="list-style-type: none"> Poorly designed and maintained stormwater management systems can cause localised flooding by adding greatly to spate flows. The increased discharge into drainage systems alters the hydromorphological characteristics and adversely affects the ecological assemblages. Water quality can also be adversely affected as more pollutants are transported into the watercourses. Stormwater control in Ballito 	2	4	4	3	13	HIGH	<ul style="list-style-type: none"> - Compliance to legislation - Preparation of Stormwater Management Master Drainage plan - Consideration of land use - Identify 1:100yr flood line (National Water Act, 36 of 1998) - Prevention of pollution - Detention and retaining of stormwater - Detention ponds, overland flow, maintaining pervious surfaces and vegetation cover - Contour planning reduces flow volumes and velocity, and therefore erosion - Use of weirs and Erosion protection

Theme	Key Resources / Issues	Environmental Analysis	Extent	Duration	Intensity	Probability	Score	Significance High (13-16) Med (9-12) Low (4-8)	Possible Prevention/ Mitigation
		problematic – neither proponent nor developer taking responsibility. Responsibility remains with LM who do not have funding <ul style="list-style-type: none"> Increased densities and reduced open space increases runoff Poor farming methods i.e. Decreased biodiversity, overgrazing, pollution by fertilisers, etc, incorrect tillage of soil, non protection of dumpsites Urgent need for Stormwater Management and Control Master Plan 							energy dissipaters wetlands
	Areas more susceptible to flooding	<ul style="list-style-type: none"> Efficient drainage systems results in peak flow occurring more quickly , places pressure on man made drainage systems and natural drainage systems 						See above	See above
	Quality of runoff deteriorate	<ul style="list-style-type: none"> Runoff conveys pollutants such as fertilised, rubbish, septic tank effluent, silt, etc. 						See above	See above
<i>Waste Disposal / Management</i>	Refuse Removal Services Security/Health impact Illegal dumping	<ul style="list-style-type: none"> Waste from Stanger and Ballito currently collected at Dolphin Coast Transfer Station. Refuse removal a problem especially in new townships Security problem and picking from site. Squatter camp near Shakaville garden refuse site. The fence has been stolen and there are stockpiles of tyres and sawdust illegally dumped onsite which are a potential fire hazard 	3	2	3	3	11	MEDIUM	<ul style="list-style-type: none"> Recycling needs to be encouraged within the district. This needs to be done in a controlled manner so that people can be protected from injury. The benefits of recycling include jointly employment, and sustainable waste management. Funding for the establishment of a regional /local waste disposal site needs to be identified. There is a shortage of capacity within the district with regards to sourcing funding
<i>Pollution</i>	Pollution of drainage systems through lack of access to formal	<ul style="list-style-type: none"> Lack of access to formal services can lead to the use of 	2	4	4	3	13	HIGH	<ul style="list-style-type: none"> See Recommendation under Water, Sanitation & Water Quality,

Theme	Key Resources / Issues	Environmental Analysis	Extent	Duration	Intensity	Probability	Score	Significance High (13-16) Med (9-12) Low (4-8)	Possible Prevention/ Mitigation
	services	water resources to meet human needs, such as washing, ablutions etc. These activities tend to pollute the water resources.							Stormwater Management
Energy/ Resource use	Alternative sources Inadequate bulk supply Visual impact	<ul style="list-style-type: none"> Predominant source is electricity Existing bulk supply is limited. Eskom Stanger substation insufficient to support current development along the coast and requires additional capacity. Most routes are underground – limits visual impact but some routes overhead e.g.. Prince Grant and Blythedale village. Street lights required to fight crime. Electricity a concern for communities serviced by SECOM and not the municipality 	3	2	3	3	11	MEDIUM	
Recreational, Cultural & Visual Amenity	Loss of natural coastal landscapes	<ul style="list-style-type: none"> These landscapes are important for recreation and tourism. They also attract development particularly for high income residential estates. Over development is likely to result in loss of the natural character of these areas. In addition to loss of landscape quality this is likely to have implications for recreation, tourism and investment. 	1	4	4 ²	4	13	HIGH	- Control development density, height and location
			Natural coastal and estuary landscapes			Probable to definite for entire coastline			

² Current; Very high in southern section, moderate in middle section and low in northern section of coastline

Theme	Key Resources / Issues	Environmental Analysis	Extent	Duration	Intensity	Probability	Score	Significance High (13-16) Med (9-12) Low (4-8)	Possible Prevention/ Mitigation
	Loss of access to natural coastal areas	<ul style="list-style-type: none"> In addition to access to physical resources, the loss of access for the general public will mean that only the privileged will be able to enjoy these areas. 	1 ³	4 permanent	4 ⁴	4 ⁵	13	HIGH	- Ensure public access to all natural coastal areas
	Integration of open space in development	<ul style="list-style-type: none"> In addition to issues relating to recreation and ecological linkages the visual implications of poor integration of open space include; Developments appear dense when viewed from the outside. The outlook for residents / workers is generally hard which affects quality of life and well being of the population. 	1 New settlement areas	4 permanent	3 High	4 ⁶	12	MEDIUM	<ul style="list-style-type: none"> Proposed development should incorporate indigenous vegetation and open space areas. Open space areas should be large enough to maintain seedbanks necessary to preserve flora and breeding areas to preserve fauna. Should be interconnected to adjacent areas to enable the movement of organisms Rehabilitation of degraded areas
	Protection of Cultural and Heritage Resources	<ul style="list-style-type: none"> Area rich in cultural resources Lack of information regarding key cultural resources Land claims unresolved 	4	2	2	3	10	MEDIUM	<ul style="list-style-type: none"> Development within the area needs to be planned and implemented in a sustainable manner. Cultural resources to be linked with environmental resources in a corridor that could be developed into an tourism corridor with facilities to support its development
<i>Transport & Accessibility</i>	Transport & Accessibility	<ul style="list-style-type: none"> Half of population do not have access to any form of transportation Maintenance of roads Regravelling or roads on regular basis especially in summer season 	3	2	2	3	10	MEDIUM	- Structuring of future development should focus on locating activities in areas of accessibility
<i>Cemeteries/ crematoria</i>	Lack of space in graveyards critical Uncontrolled Burials	<ul style="list-style-type: none"> Lack of space for graveyards within the Municipality. 	3	3	3	2	11	MEDIUM	<ul style="list-style-type: none"> Identification of future sites Traditional authorities to manage

³ Natural coastal and estuary landscapes

⁴ Current; V High in southern section of coastline

⁵ Moderate for extensive sections of coastline

⁶ Definite to high probability of trend continuing in future settlement.

Theme	Key Resources / Issues	Environmental Analysis	Extent	Duration	Intensity	Probability	Score	Significance High (13-16) Med (9-12) Low (4-8)	Possible Prevention/ Mitigation
	Siting of graves	<ul style="list-style-type: none"> Uncontrolled burials are a problem in the rural areas. Incorrectly sited graveyards and informal burials have the potential to impact on human health. 							burials in tribal areas - Education on use of crematoria and/or recycling of graves investigated - Correct procedures to be following when siting graveyards
GOVERNANCE									
Broad responsibilities	Responsibility for environment unclear Capacity a problem	<ul style="list-style-type: none"> Responsibilities not clearly defined. Need for environmental training and awareness Development projects often approved without adequate environmental assessment 	4	3	3	3	13	HIGH	- Need for greater involvement from DAEA - Municipal officers to be educated on responsibility and who to refer applications to. - Roles and responsibilities to be clearly defined - Appointment of Municipal Environmental Officer
Planning	Limited Environment Planning Adhoc development Alignment Issues	<ul style="list-style-type: none"> Adhoc development Improved integration and communication between Ilembe and KwaDukuza is required. Alignment between KwaDukuza, Ilembe and eThekweni Municipalities regarding the management of the Tongati River 	4	4	3	3	14	HIGH	- SDF and Conservation Priority Map to be developed – will aid decision making - Plan for open space system - Improved communication and structures between municipalities, departments and organisations
Monitoring/enforcement	Limited resources available to ensure environmental compliance and enforce legislation.	<ul style="list-style-type: none"> Responsibilities not clearly defined. Need for training. 	3	4	4	4	15	HIGH	- Employment and utilization of competent officers to monitor development and enforce legislation - Existing structures should be maintained and built upon. - WESSA has offered to assist in training and promoting environmental awareness.

4.2 ANALYSIS ACCORDING TO LANDSCAPE CHARACTER

REF.	CHARACTER DESCRIPTION	OBSERVATIONS	THREATS
Coast Natural	Undeveloped coastal landscapes.	These areas are likely to hold the highest attraction and be most memorable to the majority of local people and visitors. It is possible to further divide this into areas where coastal dune forest and where sugar cane cultivation dominates the landscape. These areas are likely to be under increasing pressure from development.	Development particularly high income residential development. Change in agricultural practices particularly towards forestry Loss of indigenous forest Urbanisation.
Coast Urban	Developed coastal landscapes	Development on the coast is generally comprised of dense formal settlement. These landscapes are highly transformed.	Densification of existing development areas. Illegal in-filling to create additional building areas. Extension of building and gardens into coastal dune. Illegal beach access through dune areas Pollution particularly from sewage treatment plants Loss of indigenous vegetation and greater introduction of alien invasive species
Estuary Natural	Undeveloped estuary landscapes.	These areas are likely to hold the highest attraction and be most memorable to the majority of local people and visitors. It is possible to further divide this category into areas where natural vegetation and where sugar cane cultivation dominates the landscape. These areas are likely to be under increasing pressure from development.	Development particularly high income residential development. Pollution. Change in agricultural practices Extending the planting of crops to lagoon edges Illegal dumping of building rubble waste and rubbish Loss of indigenous vegetation
Estuary Urban	Developed estuary landscapes.	Development of estuary landscapes is generally comprised of dense formal settlement. These landscapes are highly transformed.	Illegal in-filling. Extension of garden vegetation to banks of estuaries. Pollution particularly from sewage treatment plants Densification of existing development including double / multi-storey buildings. Loss of indigenous vegetation including forest, marginal and wetland species. Greater introduction of alien invasive species
River Corridor, Agriculture	River corridor landscapes dominated by sugar cane cultivation	Sea and estuary views are possible from the lower sections of river valleys. Long views along valleys are possible. The character may be reinforced through rehabilitation of riverine vegetation. These corridors could have future importance for recreation and sustainable transport linkages between hinterland and coast.	Loss of riverine and wetland vegetation through cultivation of river bank and wetland areas. Development blocking views
River Corridor, Dense Rural Settlement	River corridor landscapes dominated by dense rural settlement.	The density of rural settlement draws attention away from the river and riverine vegetation. Degradation of the river bank areas and riverine vegetation is also typical.	Densification of development reducing the influence of landform on the overall character Illegal dumping of waste
River Corridor, Rural Settlement	River corridor landscapes with a traditional settlement.	Traditional settlement is generally not sufficiently dense to dominate the river corridor characteristic as is the case with dense rural settlement areas.	Loss of riverine and wetland vegetation through cultivation of river bank and wetland areas. Increase in alien invasive species.
Rural Settlement	Traditional settlement on gently undulating land with little or no other distinguishing characteristic.	This landscape type is relatively flat. Only short views are generally possible. Vegetation is relatively natural but is degraded.	Densification of areas / nodes bringing additional pressure on the land for small scale agriculture.

REF.	CHARACTER DESCRIPTION	OBSERVATIONS	THREATS
Rural Settlement Steep Land	Traditional settlement on steep land	This landscape type is relatively rugged. Long views are possible particularly over lower land to the east. Vegetation is relatively natural but is degraded.	Over grazing of steep slopes creating slope erosion and degradation of grasslands
Urban	Built formal landscapes	The built elements of the landscape dominate all other characteristics. This landscape type might be further divided using building height / density criteria.	Densification of development further reducing areas of open space and the softening influence of garden vegetation / street trees on the built environment
Dense Rural Settlement	Rural settlement that is so dense that it dominates other characteristics	It is possible that this character area might be combined with the River Corridor, Dense Rural Settlement category	Densification of development reducing the influence of rural characteristics. Illegal dumping of waste
Intensive Agriculture	Relatively flat / undulating areas of sugar cane cultivation with little other distinguishing characteristic.	These areas probably hold the least level of interest and are the least memorable within the study area. They do however provide marked contrast with urban areas which helps to highlight identity.	Loss of indigenous vegetation including forest patches on slopes and wetland vegetation along drainage lines

4.3 ANALYSIS ACCORDING TO SECTOR

Assessment: Agriculture	Subsistence (A) Commercial (B)	
? Theme	? What is the condition/state	? Pressures /analysis
NATURAL SYSTEM		
<i>Climate / Air Quality</i>	<ul style="list-style-type: none"> The bio climatic profile is suitable for certain types of agricultural production, for example sugar cane and timber production The burning of wood for fuel and the seasonal burning of sugar cane fields and forestry is an important contributor to air pollutants in the rest of the area. 	<ul style="list-style-type: none"> Air quality is affected by the prevailing meteorological conditions and the local topography. Competing land use for high agricultural land
<i>Topography & Geology</i>	<ul style="list-style-type: none"> Good agricultural soil potential In the KwaDukuza, and in particular in areas further to the west, erosion is very prevalent. Sandwinning often occurs illegally. This has potentially serious implications for the natural environment as the necessary mitigating measures imposed by the permit are not always followed or monitored. 	<ul style="list-style-type: none"> High potential for erosion Erosion due to long periods of cultivation and overgrazing, pressure of the land by people and livestock, commercial farming & mismanagement of the land. Erosion is mainly caused by the poor management of land under sugar cane production, especially when cultivation of crops occurs on terrain that is too steep for the sustainable cultivation of crops. This practice appears to occur widely and is responsible for a huge silt input into the rivers in the area. It is likely that the aquatic ecology of the rivers in the area has been severely impacted by this factor.
<i>Hydrology</i> - Rivers and Dams - Wetlands - Estuaries	<ul style="list-style-type: none"> The overall state of water resources in areas where agricultural activities occur is thought to be poor. The agricultural sector in the KLM has various impacts on the water resources in the LM, including flow reduction, siltation and other pollution, destruction of wetlands. In the rural parts of the LM, it is likely that wetlands and riparian areas are used as a source of natural products, e.g. grass for thatching and medicinal plants. Wetlands provide a source of water for livestock, and provide good grazing for 	<ul style="list-style-type: none"> Drainage and cultivation of wetlands Wetland loss can be primarily attributed to monoculture, i.e. sugar cane planting within the wetlands and associated draining of wetlands. The maximisation of the use of any available arable land of suitable gradient for sugar cane production irrespective of the associated environmental impacts appears to be the main economic dynamic behind wetland degradation within the sugar cane sector. In most wetlands planted with sugar cane, drains are visible. A central drain and

Assessment: Agriculture	Subsistence (A) Commercial (B)	
? Theme	? What is the condition/state	? Pressures /analysis
	<p>livestock in the drier winter months, when protein levels in the surrounding dryland grassland decrease.</p> <ul style="list-style-type: none"> In the KwaDukuza area, burning is closely related to sugar cane cultivation. Sugar cane fields are typically burnt throughout most of the year, with most burning occurring between April and November. Thus burning would most likely be occurring in the drier winter months when the potential for desiccation of wetland soils is highest. It was noted from the site visit that a number of local farmers are attempting to reclaim the riparian zones by planting indigenous vegetation within the boundaries of these areas. A good example of this was Ashton Farm, where substantial riparian corridors exist between the sugar cane fields and will play an integral role in landscape connectivity, providing movement corridors for small mammals, birds and insects, particularly Lepidoptera 	<p>secondary drains feeding into it create a 'herring bone' pattern of drainage in the wetland. Even in areas where cultivation may have ceased, drains are still effective in desiccating the wetland and thus causing the degradation of wetland habitat.</p> <ul style="list-style-type: none"> Poor burning practices contribute to wetland degradation. The frequency of burning and the time of year at which a wetland is burnt are crucial factors in determining whether burning regimes are sustainable. If wetlands are subject to burning on too frequent a basis, or if the time and nature of the burn are incorrect (a light fire as opposed to a intensive fire), a long-term reduction in wetland cover and alteration in species composition are likely to occur. Wetland vegetation is unlikely to have allowed enough time to recover if burning is too frequent. If burning occurs at the incorrect time of the year (e.g. early in the dry season), the vegetation cover which binds wetland soils is likely to be lost, leaving the underlying soil vulnerable to erosion by water or by aeolian deflation (wind erosion). This has the effect of reducing the organic content of the soil, leading to general wetland degradation. The associated erosion is likely to cause degradation or loss of wetland habitat. Wetlands covered by sugar cane cultivation are likely to be burnt and left exposed for a certain period, and the burn is likely to be a heavy burn. As there is no wetland vegetation protecting the soils, wetlands in burnt areas would be exposed to water and aeolian erosion, causing further loss of wetland soils Head cut/donga erosion Where livestock grazing and associated movement of livestock (especially cattle) through wetlands occurs, this can be a threat to wetlands as it often results in overgrazing / trampling of vegetation and associated erosion, which may result in wetland habitat destruction Many catchments upstream of wetlands in the area are characterised by poor land management and thus severe soil erosion The main pressures relate to planting of crops within wetlands, removal of riparian vegetation for cultivation, pollution of watercourses through siltation, nitrification etc. and reduction of stream flow due to abstraction or the planting of commercial forests. The demand to have as much land used for sugar cane cultivation as possible (i.e. with respect to cultivating sugar cane within wetlands and right up to the boundaries of rivers) is likely to be adversely affect sustainable development in that land owners may be reluctant to rehabilitate riverine / wetland areas

Assessment: Agriculture	Subsistence (A) Commercial (B)	
? Theme	? What is the condition/state	? Pressures /analysis
Coastal & Marine	<ul style="list-style-type: none"> • (B) Coastal corridor, becoming highly segregated • The coastal waters support a wide variety of fish and shellfish that are targeted by recreational and commercial fishers. • Much of the coast has been modified due to land clearing for sugar-cane and timber cultivation. As a result very little natural vegetation remains, and what does remain is often situated on privately owned land. 	<ul style="list-style-type: none"> • Increasing pressures on available land for development and agriculture. • Recreational harvesting of inshore resources is extensive due to the areas proximity to Durban and the accessibility of beaches, however there is little subsistence use.
Biodiversity & Protected areas	<ul style="list-style-type: none"> • (A) Umvoti Estuary (Natural Heritage Site). • Biodiversity as a whole has suffered immensely as a result of the highly transformed nature of the majority of the Municipality to agriculture and the ever increasing requirement for housing across all sectors and the associated infrastructural requirements (roads, waste water treatment plants, industry, etc). • The Addington Conservancy from the site visit appears to be of limited conservation value due to the Sugar Mill that is situated within its boundaries. • In addition, the entire area, with the exception of the narrow strips of riparian vegetation is wholly planted to sugar cane and alien invasive plants appear to be having a major impact on the remaining natural vegetation. • Tree bird species, which are rare migrants have however been recorded at the Sappi Stanger Maturation ponds. 	<ul style="list-style-type: none"> • Creation of a depauperate ecosystem through over utilization by local communities, through, fishing, collection of firewood, <i>muthi</i> collection and encroachment of subsistence farming.
Vegetation/Fauna	<p>(A),(B) Ngoya Forest Fragments currently becoming degraded.</p> <p>(A) The Ngoya Forest and Grassland face intense pressure from the forestry industry, who would like to plant exotic tree species on this land in order to produce pulp.</p> <p>(B) In addition, alien invasive vegetation poses a threat to these three areas as they are small, with injudicious burning & utilisation of the grasslands by livestock and the forests as a source of muthi threatening the existence of these rare and complex ecosystems.</p> <p>(B) In the north eastern sector of the KwaDukuza Local Municipality, Eastern Valley Bushveld occurs. This area is small and relatively transformed through human settlement and indiscriminate livestock grazing and fire utilization.</p> <ul style="list-style-type: none"> • Existing small isolated fragments of forest and grassland are in danger of being lost from the system, as their small size makes them prone to encroachment by alien vegetation. • The utilisation of certain species for muthi and firewood, and regular burning events associated with sugarcane harvesting has the potential to impact substantially on the 	<ul style="list-style-type: none"> • Existing small isolated fragments of forest and grassland are in danger of being lost from the system, as their small size makes them prone to encroachment by alien vegetation. • The utilisation of certain species for muthi and firewood, and regular burning events associated with sugarcane harvesting has the potential to impact substantially on the remaining natural vegetation. • Pressure from livestock grazing • More awareness of the receiving environment and the environmental education of the lay person will improve development from a sustainability perspective • Improved guidelines for development • Animal species are under immense pressure from hunting, snaring and habitat loss due to land transformation and human settlement. • The corridors in the case of sugarcane may vary, but the principle remains clear that open space linkages are essential for faunal movement.

Assessment: Agriculture	Subsistence (A) Commercial (B)	
? Theme	? What is the condition/state	? Pressures /analysis
	remaining natural vegetation. <ul style="list-style-type: none"> Animal species are under immense pressure from hunting, snaring and habitat loss due to land transformation and human settlement. The corridors in the case of sugarcane may vary, but the principle remains clear that open space linkages are essential for faunal movement. 	
BUILT SYSTEM/INFRASTRUCTURE		
<i>Water, Sanitation & Water Quality</i>	<ul style="list-style-type: none"> Severe water shortage. Poor Sanitation and sewerage disposal In certain parts of the municipality where water services have not yet been developed, wetlands and associated drainage systems may be important in providing water supply for rural communities. Where they occur, hillslope seepages and associated springs may provide an important source of water for human consumption, and valley bottom wetlands are likely to provide an important source of water for domestic uses In the KwaDukuza area no major dams currently exist. However there are some smaller impoundments which exist along certain of the rivers and streams in the study area. Impoundments include structures such as dams and weirs constructed across water courses. 	<ul style="list-style-type: none"> Over-abstraction of water from rivers can adversely affect both the hydro-ecology and morphology of the water body. According to the design of the impounding structure, impoundments have a varying degree of impact on the flow regime of the river / water course across which they are constructed. Impoundments alter the flow regime of the downstream river by acting as a physical barrier, constraining the flow of water. Weirs may have a lesser impact, as most of the normal flow would be bypassed below the structure (except in low flow conditions), but some impacts may still be initiated.
<i>Stormwater Management</i>	<ul style="list-style-type: none"> Poorly designed and maintained stormwater management systems which impact on drainage systems 	<ul style="list-style-type: none"> Poor farming methods i.e. Decreased biodiversity, overgrazing, pollution by fertilisers, etc, incorrect tillage of soil, non protection of dumpsites
<i>Waste Disposal / Management</i>	<ul style="list-style-type: none"> KwaDukuza has a Garden Refuse facility at Shakaville that disposes 720 tons of waste monthly. The Dolphin Coast Waster Management operate a transfer station at Dolphin Coast that handles all of the waste from Stanger and Ballito. Security/Health impact Illegal dumping 	<ul style="list-style-type: none"> The Garden Refuse facility is experiencing problems with security and access control, that has resulted in problems with squatters, incorrect /illegal disposal of waste, etc. The issue of refuse removal has been raised by the Councillors.
<i>Pollution</i>	<ul style="list-style-type: none"> In the KwaDukuza local municipality Point source pollution is likely to mainly emanate from the urban areas in the municipality, such as Stanger and Shakaskraal, as well as from factories and industrial plants in the area. Point source and diffuse pollution are the most significant causes of adverse water quality problems in rivers. Point source pollution is pollution that enters a river a particular point – e.g. a sewage discharge, and diffuse pollution is pollution that enters a water course from a wide, non-specific area. It is unknown to what degree sewage treatment plants and associated discharges affect water quality in the rivers into which the discharge occurs. The impact of septic tanks (found in rural parts of the study area) on water quality in the rivers and streams of the area is also not known. Diffuse pollution in the study area is likely 	<ul style="list-style-type: none"> Point source pollution is typically associated with discharges from urban and industrial landuses, whilst diffuse pollution is often associated with landuses which cover a wider area, such as agriculture. Depending on the material discharged / entering the river, different water quality parameters are affected. General pollution of rivers in the LM may have an impact on the recreational use of those water bodies by posing a risk to human health. This may be especially true for recreational use of estuaries Direct pollution of the wetland – Pollution, mainly related to agricultural activities may cause a reduction in the diversity of plant and animal species, or excessive plant growth in the case of nutrient input. Poor agricultural practices, both within and 'upstream' of the municipality contribute to pollution of water resources.

Assessment: Agriculture	Subsistence (A) Commercial (B)	
? Theme	? What is the condition/state	? Pressures /analysis
	<p>to originate mainly from agricultural activities. The potential for diffuse pollutants entering the river systems areas of agricultural activity (primarily sugar cane plantations) is made even more likely by the close proximity of much of the planted land in the study area to river corridors, and in some cases even within drainage lines and wetlands. Fertilisers used in the cultivated land are likely to have an impact on a number of water quality parameters in the rivers. Fertilisers which are used in cultivated lands tend to cause unacceptable levels of nitrates and sulphates in the receiving water course, and have an adverse impact on the pH balance of the river by making the water more acidic. Pesticides used in cultivated lands can also contribute to water quality problems.</p> <ul style="list-style-type: none"> The presence of livestock mainly in areas where subsistence farming is practiced can also create bacteriological problems in rivers, for example, an increase in the level of cryptosporidium (a protozoan associated with the disease cryptosporidiosis in humans) may be recorded where livestock exist in close proximity to water courses. The level of pollution in the rivers of the study area is generally unknown 	<ul style="list-style-type: none"> Poverty, and a lack of resources (in the case of subsistence farming) may be an important social factor contributing to the pollution of water resources.
<i>Energy/ Resource use</i>	<ul style="list-style-type: none"> Predominant source is electricity Existing bulk supply is limited. Most routes are underground – limits visual impact but some routes overhead e.g.. Prince Grant and Blythedale village. 	<ul style="list-style-type: none"> Eskom Stanger substation insufficient to support current development along the coast and requires additional capacity. Street lights required to fight crime. Electricity a concern for communities serviced by SECOM and not the municipality
<i>Recreational, Cultural & Visual Amenity</i>	<ul style="list-style-type: none"> Area rich in cultural resources Lack of information regarding key cultural resources Land claims unresolved 	<ul style="list-style-type: none"> Over development is likely to result in loss of the natural character of these areas. In addition this is likely to have implications for recreation, tourism and investment.
<i>Transport & Accessibility</i>	<ul style="list-style-type: none"> Poor condition of roads due to poor standard of stormwater management and lack of maintenance Re-gravelling or roads on regular basis especially in summer season 	<ul style="list-style-type: none"> Roads can significantly alter the hydrological dynamics of a wetland by 'damming' water upstream of the road, and by channelling flows. This may lead to scouring and associated donga erosion and sedimentation of downstream components Structuring of future development should focus on locating activities in areas of accessibility
<i>Cemeteries/crematoria</i>	<ul style="list-style-type: none"> (A) Burial sites for family members next to the homesteads are considered common in rural areas, particularly in the tribal areas with predominantly Black communities. Also most of the graves in traditional cemeteries are marked with personal items. Where these are eventually removed or become dislodged from the graves it may become increasingly difficult to identify the graves of family members 	<ul style="list-style-type: none"> Uncontrolled burials are a problem in the rural areas. Some of the problems associated with siting of cemeteries include steep terrain, location near watercourses or on the banks of large rivers. Incorrectly sited graveyards and informal burials have the potential to impact on human health. Identification of future sites Traditional authorities to manage burials in tribal areas Education on use of crematoria and/or recycling of graves investigated Correct procedures to be following when siting graveyards

Assessment: Agriculture	Subsistence (A) Commercial (B)	
? Theme	? What is the condition/state	? Pressures /analysis
GOVERNANCE	Refer Strategic Environmental Assessment Table	
Environmental Opportunities	Environmental Constraints	Development Scenarios
Establishment of ecological corridors along drainage lines	Development (including cultivation) is not permitted to impact upon, or occur with a water resource.	The 'greening' of the sugar sector through the implementation of the Sustainable Sugar Initiative Guidelines
Opportunity to promote conservation & coastal based tourism, such as, kite surfing, deep sea fishing, etc.	All agriculture should be restricted to existing areas of utilisation.	
Coastal Zone is predominantly agriculture with the opportunity to be rehabilitated into areas of coastal grassland and coastal forest.	Increasing pressure on sugar cane (main employer) from other land uses	

Assessment: Residential	Low Income (A) Medium – High Income (including Gated Communities (B)	
? Theme	? What is the condition/state	? Pressures /analysis
NATURAL SYSTEM		
<i>Climate / Air Quality</i>	<ul style="list-style-type: none"> • KwaDukuza is characterized by mild winter temperatures and warm to hot temperatures in the summer months • The burning of wood for fuel and the seasonal burning of sugar cane fields and forestry is an important contributor to air pollutants in the rest of the area. 	<ul style="list-style-type: none"> • Air quality is affected by the prevailing meteorological conditions and the local topography. • Competing land use for high agricultural land
<i>Topography & Geology</i>	<ul style="list-style-type: none"> • The topography and landscape of the KwaDukuza municipality is characterised by undulating hills in the majority of the area, i.e. the coastal strip, with a more broken and steep topography on the western boundaries. • Sandwinning often occurs illegally. This has potentially serious implications for the natural environment as the necessary mitigating measures imposed by the permit are not always followed or monitored. • Potential for erosion due to land uses 	<ul style="list-style-type: none"> • Topography influence the type and cost of development, controls the direction and rate of water runoff, influences weather and climate, and affects flora and fauna. • High costs relating to grading and site improvements associated with steeper sites • Extensive vegetation clearing and levelling can impact on topography and on the functioning of a natural watercourse
<i>Hydrology</i> - Rivers and Dams - Wetlands - Estuaries	<ul style="list-style-type: none"> • The overall state of water resources in areas where residential development occurs is thought to be poor. • The current trend of rapid (and densification) of development along the coastal strip is not sustainable in the context of water resources. • Urban development has been responsible for loss and degradation of water resources, especially within the coastal zone where most of the urban development has occurred. • Where surface water resources have been lost / degraded due to urban expansion, this can be related to rapid population growth in a region close to the Durban 	<ul style="list-style-type: none"> • The main pressures relate to the modification of watercourses in areas where residential development has occurred. • Residential development may previously have occurred within wetland areas. • The nature of urban development often causes modification of the physical structure of drainage lines. • Extensive vegetation clearing and levelling can impact on topography and on the functioning of a natural watercourse • The creation of 'water front developments' can impact on aquatic life, water temperature, stream velocity, sediment load and water quality

Assessment: Residential	Low Income (A) Medium – High Income (including Gated Communities (B)	
? Theme	? What is the condition/state	? Pressures /analysis
	metropolis, and due to the growth of the area as a prime holiday / tourism destination.	
<i>Coastal & Marine</i>	<ul style="list-style-type: none"> • (B) Uncontrolled and unformed development impacting on the remaining natural ecosystems • Expansion of residential and other development including uncontrolled influx of tourists contribute to the current degradation of the KwaDukuza coastline and loss of sense of space. • Areas such as Salt Rock and Ballito are already highly developed and strong conservation initiatives are required. • Off shore ecological assets include wrecks such as the Fame and Octopus that have apparent fish attracting devise, and ecological as well as historical interest for the area. There are a number of licensed launch sites along the coast that allow for diving and whale/dolphin watching 	<ul style="list-style-type: none"> • These are the landscapes that a large portion of the population is likely to find attractive& memorable. • The proposed new airport at La Mercy, may increase the number of visitors further. • Areas in demand for development particularly from the high-income residential market. They are also in demand for recreation and provide an important asset for potential tourism development. • The demand for housing along the coast is likely to entail that in the future the majority of the coastal belt of the municipality is developed. The level / intensity of development is likely to affect sustainability; the higher the density the less environmentally sustainable these developments are likely to be as less land is likely to be left open as natural areas or for ecological linkages. • Urban sprawl and ribbon development. Urbanisation is increasingly prevalent along the coastal strip of the KwaDukuza Municipality, especially in the southern areas around Balito. • Historical urban development and more recent urban holiday home and residential development are likely to have destroyed or severely degraded wetland systems in the smaller coastal catchments. • Off shore ecological assets should be considered when planning developments and/or land based pollutant sites that may impact on them directly and indirectly.
Biodiversity & Protected areas	Protected under the Protected Areas Act Current patterns of development are not environmentally sustainable.	<ul style="list-style-type: none"> • Development Pressure (Residential) • Biodiversity as a whole has suffered immensely as a result of the highly transformed nature of the majority of the Municipality to agriculture and the ever increasing requirement for housing across all sectors and the associated infrastructural requirements (roads, waste water treatment plants, industry, etc).
Vegetation/Fauna	<ul style="list-style-type: none"> • (B) Relatively large units (patches) of coastal forest exist, in particular, for example, areas around Zinkwazi and Blythedale. • (B) In the north eastern sector of the KwaDukuza Local Municipality, Eastern Valley Bushveld occurs. This area is small and relatively transformed through human settlement and indiscriminate livestock grazing and fire utilization. • These remnant patches are being transformed with the onset of demand for coastal residential development. • These patches remain as they are more difficult to develop than the associated coastal grasslands and thus far have been spared from development. 	<ul style="list-style-type: none"> • Pressure from high density housing • Pressure from rural residential development • Extensive vegetation clearing and levelling can impact on topography and on the functioning of a natural watercourse • Existing small isolated fragments of forest and grassland are in danger of being lost from the system, as their small size makes them prone to encroachment by alien vegetation. • The utilisation of certain species for muthi and firewood, and regular burning events associated with sugarcane harvesting has the potential to impact substantially on the remaining natural vegetation. • Animal species are under immense

Assessment: Residential	Low Income (A) Medium – High Income (including Gated Communities (B)	
? Theme	? What is the condition/state	? Pressures /analysis
		pressure from hunting, snaring and habitat loss due to land transformation and human settlement.
BUILT SYSTEM/INFRASTRUCTURE		
<i>Water, Sanitation & Water Quality</i>	<ul style="list-style-type: none"> • Poor water supply infrastructure exists in some areas of the coastal belt, and thus increasing development means increasing pressure on groundwater resources. In large parts of the coastal belt there is no bulk water supply, thus groundwater has to be used as a source of water. Over-abstraction of coastal aquifers can lead to saline intrusion, although it is not known to what degree saline intrusion is an issue in the area. • A lack of basic services, including water supply and sanitation, is a major issue in terms of service delivery in the LM. • Accordingly a significant percentage of the population does not have access to formal services, and thus have to rely on other methods to obtain water and for sanitation. • This has a resulting impact on water resources, as they are polluted by use for sanitation and washing etc. • The problems are worsened in that water accessed from natural water resources is often polluted • In certain parts of the municipality, wetlands and associated drainage systems may be important in providing water supply for rural communities. Where they occur, hillslope seepages and associated springs may provide an important source of water for human consumption, and valley bottom wetlands are likely to provide an important source of water for domestic uses 	<ul style="list-style-type: none"> • High density residential development without adequate services is a major threat to both human health and ecosystem function • Pollution of groundwater resources may increase the risk of those communities that rely on groundwater as their sole source of water supply. • Poor maintenance of services, e.g. leaking sewers can contribute to runoff pollution • Over-abstraction of water from rivers can adversely affect both the hydro-ecology and morphology of the water body.
<i>Stormwater Management</i>	<ul style="list-style-type: none"> • (B) Rapid urban development along the coast has not been accompanied by effective stormwater control and planning. This has adverse knock-on effects on the drainage systems within these areas, as these are modified by the increased discharge of stormwater and other urban runoff into them. • Poor stormwater management and a lack of implementation of sustainable urban drainage systems are likely to have contributed to the degradation of drainage systems in urban areas within the municipality. The entry of pollutants and litter into the drainage systems as well as the radical altering of flows during rainfall events due to reduced infiltration capacity are expected to be the primary impacts. • (A) Contaminated stormwater runoff from informal settlements threaten water quality • Historical urban development and more recent urban holiday home and residential development are likely to have severely impacted drainage systems in the smaller 	<ul style="list-style-type: none"> • The development of erven results in an increase in stormwater runoff due to the increase in hardened impervious surfaces. As density increase so does surface runoff • Increasing development densities impact on stormwater runoff into the natural environment and results in increased quantities and concentrations of flow with concomitant increase in pollution. This often impacts on downstream properties. • Increased impermeability is directly related to increased runoff and to increased pollution loading of stormwater • Poor construction & maintenance of sewers and manholes result in stormwater infiltrating the system, resulting in an overload to the system with resultant overflow of sewerage effluent into the surrounding area, and potential flooding of waste water treatment works by excessive inflow. • Urbanisation is increasingly prevalent along the coastal strip of the KwaDukuza Municipality, especially in the southern areas around Ballito.

Assessment: Residential	Low Income (A) Medium – High Income (including Gated Communities (B)	
? Theme	? What is the condition/state	? Pressures /analysis
	coastal catchments. However urban development is also prevalent further inland, especially in the Stanger area.	<ul style="list-style-type: none"> Roads can significantly alter the hydrological dynamics of a wetland by 'damming' water upstream of the road, and by channelling flows. This may lead to scouring and associated donga erosion and sedimentation of downstream components
<i>Waste Disposal / Management</i>	<ul style="list-style-type: none"> KwaDukuza has a Garden Refuse facility at Shakaville that disposes 720 tons of waste monthly. The Dolphin Coast Waster Management operate a transfer station at Dolphin Coast that handles all of the waste from Stanger and Ballito. 	<ul style="list-style-type: none"> The Garden Refuse facility is experiencing problems with security and access control, that has resulted in problems with squatters, incorrect disposal of waste, etc. The issue of refuse removal has been raised by the Councillors, especially within the new townships.
<i>Pollution</i>	<ul style="list-style-type: none"> Pollution of watercourses through infiltration of urban pollutants as well as litter and increased stormwater discharge are the main problems. 	<ul style="list-style-type: none"> General pollution of rivers in the LM may have an impact on the recreational use of those water bodies by posing a risk to human health. This may be especially true for recreational use of estuaries Direct pollution of the wetland –related to urban-related activities (e.g. sewage treatment) may cause a reduction in the diversity of plant and animal species, or excessive plant growth in the case of nutrient input. Poverty, and a lack of resources may be an important social factor contributing to the pollution of water resources.
<i>Energy/ Resource use</i>	See Section under Agricultural Assessment	
<i>Recreational, Cultural & Visual Amenity</i>	<ul style="list-style-type: none"> Blockage of access to coastal landscapes and resources through secured coastal development 	<ul style="list-style-type: none"> Rapid development with no formal plans may lead to a loss of cultural resources, if inadequate investigation is carried out. Ribbon coastal development is likely to further reduce access to coastal resources and landscapes. Pressure for development will place increasing pressure on Cultural resources
<i>Transport & Accessibility</i>	See Section under Agricultural Assessment	
<i>Cemeteries/crematoria</i>	<ul style="list-style-type: none"> (A) Burial sites for family members next to the homesteads are considered common in rural areas, particularly in the tribal areas with predominantly Black communities. Also most of the graves in traditional cemeteries are marked with personal items. Where these are eventually removed or become dislodged from the graves it may become increasingly difficult to identify the graves of family members 	<ul style="list-style-type: none"> Uncontrolled burials are a problem in the rural areas. Some of the problems associated with siting of cemeteries include steep terrain, location near watercourses or on the banks of large rivers. Incorrectly sited graveyards and informal burials have the potential to impact on human health.
GOVERNANCE	Refer Strategic Environmental Assessment	
<i>Environmental Opportunities</i>	<i>Environmental Constraints</i>	<i>Development Scenarios</i>
The design of future residential developments to include natural open areas, ecological linkages and sufficient buffers around water resources.	Development is not permitted to impact upon, or occur within a water resource. Majority of population has a low income, and the environment is not considered high on their agenda	Boom in property development along coastal corridor La Mercy airport will place increasing pressure on resources within the area and demand for housing Young population signifies need for more housing, education and health services The design of more environmentally friendly residential developments

Assessment: Industrial	Light (A) Heavy (B)	
? Theme	? What is the condition/state	? Pressures /analysis
NATURAL SYSTEM		
<i>Climate / Air Quality</i>	<ul style="list-style-type: none"> • KwaDukuza is characterized by mild winter temperatures and warm to hot temperatures in the summer months • The main source of air pollution from industry is located within Stanger. 	<ul style="list-style-type: none"> • Air quality is affected by the prevailing meteorological conditions and the local topography.
<i>Topography & Geology</i>	See section under Residential Assessment	
<i>Hydrology Rivers and Dams Wetlands Estuaries</i>	<ul style="list-style-type: none"> • The overall state of water resources in areas where industrial development occurs is thought to be poor. 	<ul style="list-style-type: none"> • The main pressures relate pollution of watercourses through discharge of pollutants into local watercourses. • Increased stormwater discharge and runoff due to hard surfaces • Industrial development may previously have occurred within wetland areas.
<i>Coastal & Marine</i>	<ul style="list-style-type: none"> • Off shore ecological assets include wrecks such as the Fame and Octopus that have apparent fish attracting device, and ecological as well as historical interest for the area. There are a number of licensed launch sites along the coast that allow for diving and whale/dolphin watching 	<ul style="list-style-type: none"> • Environmental factors influence the number of launches allowed per day. • It is likely that the number of launch sites required will increase due to increased pressure on the coastline from tourism and residential development. • Off shore ecological assets should be considered when planning developments and/or land based pollutant sites that may impact on them directly and indirectly. • Need to make KwaDukuza Local Municipality and sustainable entity, in terms of generating income and making the Municipality self-sustainable
Biodiversity & Protected areas	<ul style="list-style-type: none"> • Few protected areas, poor representation of conserved vegetation types in protected areas • The Addington Conservancy from the site visit appears to be of limited conservation value due to the Sugar Mill that is situated within its boundaries. • There are however three bird species, which are rare migrants have been recorded at the Sappi Stanger Maturation ponds. 	<ul style="list-style-type: none"> • Biodiversity as a whole has suffered immensely as a result of the highly transformed nature of the majority of the Municipality to agriculture and the ever increasing requirement for housing across all sectors and the associated infrastructural requirements (roads, waste water treatment plants, industry, etc). • Need to make KwaDukuza Local Municipality and sustainable entity, in terms of generating income and making the Municipality self-sustainable • Rare bird species due to their limited appearance in bird species assemblages across South Africa, will add to the tourism value of the Kwadukuza Local Municipality, in terms of attracting 'twitchers' to the area in order to get a rare sighting of these birds.
Vegetation/Fauna	High levels of transformation of associated riverine vegetation and pollution of rivers from industrial activities.	<ul style="list-style-type: none"> • Need to make KwaDukuza Local Municipality and sustainable entity, in terms of generating income and making the Municipality self-sustainable
BUILT SYSTEM/INFRASTRUCTURE		
<i>Water, Sanitation & Water Quality</i>	<ul style="list-style-type: none"> • Severe water shortage. • Poor Sanitation and sewerage disposal • In the KwaDukuza area no major dams currently exist. However there are some smaller impoundments which exist along certain of the rivers and streams in the study area. Impoundments include structures such as dams and weirs 	<ul style="list-style-type: none"> • Over-abstraction of water from rivers can adversely affect both the hydro-ecology and morphology of the water body. • According to the design of the impounding structure, impoundments have a varying degree of impact on the flow regime of the river / water course across which they are constructed. Impoundments alter the flow

Assessment: Industrial	Light (A) Heavy (B)	
? Theme	? What is the condition/state	? Pressures /analysis
	constructed across water courses.	regime of the downstream river by acting as a physical barrier, constraining the flow of water. Weirs may have a lesser impact, as most of the normal flow would be bypassed below the structure (except in low flow conditions), but some impacts may still be initiated. <ul style="list-style-type: none"> • Pollution of groundwater resources may increase the risk of those communities that rely on groundwater as their sole source of water supply
<i>Stormwater Management</i>	<ul style="list-style-type: none"> • Poor stormwater management and a lack of implementation of sustainable urban drainage systems are likely to have contributed to the degradation of drainage systems in urban areas within the municipality. The entry of pollutants and litter into the drainage systems as well as the radical altering of flows during rainfall events due to reduced infiltration capacity are expected to be the primary impacts. 	<ul style="list-style-type: none"> • The development of erven results in an increase in stormwater runoff due to the increase in hardened impervious surfaces. As density increase so does surface runoff • Increasing development densities impact on stormwater runoff into the natural environment and results in increased quantities and concentrations of flow with concomitant increase in pollution. This often impacts on downstream properties. • Increased impermeability is directly related to increased runoff and to increased pollution loading of stormwater • Poor construction & maintenance of sewers and manholes result in stormwater infiltrating the system, resulting in an overload to the system with resultant overflow of sewerage effluent into the surrounding area, and potential flooding of waste water treatment works by excessive inflow.
<i>Waste Disposal / Management</i>	See Section under Agricultural assessment	
<i>Pollution</i>	<ul style="list-style-type: none"> • Pollution of watercourses through infiltration of urban pollutants as well as litter and increased stormwater discharge are the main problems. • Refer Section under Agricultural Assessment 	<ul style="list-style-type: none"> • Point source pollution is typically associated with discharges from urban and industrial land uses, whilst diffuse pollution is often associated with land uses which cover a wider area, such as agriculture. Depending on the material discharged / entering the river, different water quality parameters are affected. • General pollution of rivers in the LM may have an impact on the recreational use of those water bodies by posing a risk to human health. This may be especially true for recreational use of estuaries • Direct pollution of the wetland may cause a reduction in the diversity of plant and animal species, or excessive plant growth in the case of nutrient input.
<i>Energy/ Resource use</i>	See Section under Agricultural assessment	
<i>Recreational, Cultural & Visual Amenity</i>	See Section under Agricultural assessment	
<i>Transport & Accessibility</i>	See Section under Agricultural assessment	
<i>Cemeteries/crematoria</i>	n/a	
GOVERNANCE	Refer Strategic Environmental Assessment Table	

Assessment: Industrial	Light (A) Heavy (B)	
? Theme	? What is the condition/state	? Pressures /analysis
Environmental Opportunities	Environmental Constraints	Development Scenarios
The use of technology (e.g. water recycling) to reduce discharges to local watercourses and reduce the need to abstract water. The design of future industrial developments to include natural open areas, ecological linkages and sufficient buffers around water resources.	Development is not permitted to impact upon, or occur with a water resource.	The relocation of the Durban International Airport to the La Mercy site – the King Shaka platform; The possible future development of the King Shaka International Airport could contribute substantially to the revitalisation of the economy in the southern areas of the corridor The development of the Dube Trade Port (Industrial Development Zone) which is closely linked to the King Shaka International Airport; The development of an East Coast Global Logistics Centre and; Further afield, the Richards Bay IDZ and Lebombo SDI linked to the Greater St. Lucia Wetlands Heritage Site.

Assessment: Tourism	Conservation (A) Heritage/Cultural (B) Resort (C) Coastal (D)	
? Theme	? What is the condition/state	? Pressures /analysis
NATURAL SYSTEM		
<i>Climate / Air Quality</i>	<ul style="list-style-type: none"> KwaDukuza's climate together with its beach make it an attractive tourist destination. 	<ul style="list-style-type: none"> Air quality is affected by the prevailing meteorological conditions and the local topography.
<i>Topography & Geology</i>	<ul style="list-style-type: none"> The topography and landscape of the KwaDukuza municipality is characterised by undulating hills in the majority of the area, i.e. the coastal strip, with a more broken and steep topography on the western boundaries. 	<ul style="list-style-type: none"> The varied topography increases the aesthetic appeal of the area and provides opportunities for a well-planned open space system. Topography influences the type and cost of development, controls the direction and rate of water runoff, influences weather and climate, and affects flora and fauna. Inappropriate development will impact on views within the area. High costs relating to grading and site improvements associated with steeper sites Extensive vegetation clearing and levelling can impact on topography and on the functioning of a natural watercourse
<i>Hydrology Rivers and Dams Wetlands Estuaries</i>	<ul style="list-style-type: none"> See Section under Residential assessment 	<ul style="list-style-type: none"> The Umvoti Estuary, Zinkwazi Estuary, Nonoti River and the Tugela River are the four main water bodies that need protection against development, habitat alteration and pollution. Apart from estuarine areas (which are utilised for recreational activities such as boating, birding etc), it is not thought that there is much recreational use of water resources in the LM.
<i>Coastal & Marine</i>	<ul style="list-style-type: none"> The beaches are considered to be the primary tourist attraction for the region. Extensive use is made of this asset by South Africans The demand for sandy beaches and the pressure to provide space, adjacent to bathing beaches and other amenities, both for recreational activities and parking is 	<ul style="list-style-type: none"> Demand for prime tourism development land in coastal areas Competing tourism/residential use Expansion of residential and other development including uncontrolled influx of tourists contribute to the current degradation of the KwaDukuza coastline and loss of sense of space.

Assessment: Tourism	Conservation (A) Heritage/Cultural (B) Resort (C) Coastal (D)	
? Theme	? What is the condition/state	? Pressures /analysis
	growing. • Highly transformed, partly by tourism related infrastructure • Areas such as Salt Rock and Ballito are already highly developed and strong conservation initiatives are required. • Off shore ecological assets include wrecks such as the Fame and Octopus that have apparent fish attracting devise, and ecological as well as historical interest for the area. There are a number of licensed launch sites along the coast that allow for diving and whale/dolphin watching	• Densification diminishes attraction to area • In spite of the transformed nature of the coast, it is likely to continue to attract large numbers of holidaymakers. The proposed new airport at La Mercy, may increase the number of visitors further • Continued tourism development in these areas with loss of this natural resource, and potential unsustainability of the tourism industry • Development of hotels and residential requirements for holiday makers • Historical urban development and more recent urban holiday home and residential development are likely to have destroyed or severely degraded wetland systems in the smaller coastal catchments. • Off shore ecological assets should be considered when planning developments and/or land based pollutant sites that may impact on them directly and indirectly.
Biodiversity & Protected areas	• Currently under-utilised • Few protected areas, poor representation of conserved vegetation types in protected areas, few ecotourism facilities within natural areas	• Developers want to develop the area • Transformation of remaining natural areas and loss of ecotourism opportunities • The lack of biodiversity in the area impacts on the services that the environment provides to the LM
Vegetation/Fauna	• Currently under-utilised • High levels of transformation of associated riverine vegetation and pollution of rivers from agricultural and industrial activities which is a potential new development area for light footprint ecotourism developments.	• Rural agriculture and development • Continued transformation of coastal vegetation
BUILT SYSTEM/INFRASTRUCTURE		
<i>Water, Sanitation & Water Quality</i>	See Section under Residential assessment Limiting/potentially limiting factor to tourism industry growth	• Inadequate and poorly sited infrastructure impacts on biodiversity • Infrastructure inadequate to meet demand; existing infrastructure not adequately maintained; Poorly sited infrastructure impacts on environment. • Over-abstraction of water from rivers can adversely affect both the hydro-ecology and morphology of the water body.
<i>Stormwater Management</i>	See Section under Residential assessment	
<i>Waste Disposal / Management</i>	See Section under Residential assessment	
<i>Pollution</i>	See Section under Residential assessment	• General pollution of rivers in the LM may have an impact on the recreational use of those water bodies by posing a risk to human health. This may be especially true for recreational use of estuaries • Direct pollution of the wetland – Pollution, mainly related to agricultural activities and some urban-related activities (e.g. sewage treatment) may cause a reduction in the diversity of plant and animal species, or excessive plant growth in the case of nutrient input.
<i>Energy/ Resource use</i>	See Section under Residential assessment Limiting/potentially limiting factor to tourism industry growth	

Assessment: Tourism	Conservation (A) Heritage/Cultural (B) Resort (C) Coastal (D)	
? Theme	? What is the condition/state	? Pressures /analysis
<i>Recreational, Cultural & Visual Amenity</i>	<ul style="list-style-type: none"> The KwaDukuza area is viewed as a nationally and internationally important tourism destination. The growth of the tourism industry can be attributed to urban expansion in the area as well as the diversity of tourism activities. The high levels of transformation, especially in the Ballito area, as well as the easy access to the coastal belt are inextricably linked. It is likely that many cultural resources have been lost through past development EIAs have not been undertaken for all coastal development Where EIAs have been undertaken for coastal development, visual implications have not been considered. Visual issues are generally not considered in decision making. 	<ul style="list-style-type: none"> The area is subject to increasing development pressure. Unsustainable – require heritage plan Potential un-sustainability of tourism development, which is largely founded on the beach and associated natural features. The problems of the lack of capacity of bulk infrastructure
<i>Transport & Accessibility</i>	See Section under Residential assessment	
<i>Cemeteries/crematoria</i>	n/a	
GOVERNANCE	Refer Strategic Environmental Assessment Table	
<i>Environmental Opportunities</i>	<i>Environmental Constraints</i>	<i>Development Scenarios</i>
<i>Development of ecotourism opportunities in conservation areas with community involvement</i>	<i>Few natural areas remaining in the municipality</i>	<i>Establishment of new conservation areas which are economically sustainable through ecotourism/cultural tourism facilities</i>
<i>Development of heritage tourism inland</i>		<i>Expansion and upgrading of existing heritage and cultural tourism facilities</i>

4.3.1 Summary Of Key Issues According To Sector

The following table provides a summary of the top priorities per sector.

Name	Description	Top Priorities	
		Rank	Issue
Agriculture	Subsistence	1	Poor agricultural practices
		2	Soil erosion issues
		3	Loss of biodiversity
	Commercial (timber / cane)	1	Loss of wetlands / riparian areas
		2	Soil erosion issues
		3	Competition for land use
Residential	High income (gated)	1	Modification of watercourses through factors such as poor stormwater management and increased runoff from hard surfaces, sandwinning.
		2	Competition for land use
		3	Maintenance of infrastructure
	Low income	1	Lack of infrastructure
		2	Poor living & health conditions
		3	Low income
Industrial	heavy	1	Potential for air pollution
		2	Potential for water pollution
		3	Poor siting

Name	Description	Top Priorities	
		Rank	Issue
	Light	1	Siting of developments
		2	Proximity to adjacent land uses/natural resources
Conservation	Conservation	1	Ngoya Forest, lack of formal protection
		2	Coastal Zone areas still supporting natural ecosystems
		3	Umvoti Estuary, proposed development within the area surrounding it
Tourism	Conservation	1	Establishment of conservation areas with ecotourism potential
		2	Development of ecotourism activities within existing conservation areas
	Heritage/ Cultural	1	Upgrading of heritage tourism facilities to be more user friendly and accessible
		2	More detailed and more accurate signage
		3	Development of community based tourism opportunities
	Resort	1	Encouragement for all resorts to adopt some sort of Environmental Management System (EMS)
	Coastal	1	Encouragement for all coastal tourism facilities to adopt some sort of Environmental Management System (EMS)
		2	Strict limitation of coastal tourism development outside of the urban boundary

4.3.2 Summary Of The Main Causes Of Environmental Change

- ❖ Extensive monoculture (sugar and forestry)
 - o Land degradation
 - o Loss of biodiversity
 - o Loss of coastal lowland forests
 - o Pollution & nuisance as well as increased risk of soil erosion due to cane burning
 - o Fertilizers and associated pollution of water resources
 - o Encroachment into drainage areas and wetlands; resultant loss / degradation of wetland / riparian habitat
 - o Loss of valuable agricultural land to residential development
 - o Threats to habitats by exotic forests
 - o Reduction in water runoff to catchments
 - o Impact on catchment areas, i.e. siltation of estuaries
 - o Loss of ecotourism opportunities

- ❖ Land Degradation / poor agricultural practices
 - o Burning of veld for grazing
 - o Overgrazing
 - o Soil erosion, sheet, gully and land slides
 - o Siltation
 - o Deforestation
 - o Invader species
 - o Communal tenure
 - o Collection of firewood
 - o Loss of sense of place
 - o Over densification of residential development
 - o Poorly planned developments in environmentally sensitive areas

- ❖ Built up Areas and Dense settlements
 - o Land fill sites
 - o Waste disposal
 - o Degradation of drainage systems due to altered run-off and pollution
 - o Poor maintenance of infrastructure
 - o Air pollution
 - o Water pollution
 - o Loss of open space areas

- o Lack of open space planning
 - o Poorly planned developments in environmentally sensitive areas
 - o Demand for sea views
 - o Migration of people from rural areas
 - o Lack of environmental awareness and education
 - o Densification of existing development areas.
 - o Illegal in-filling to create additional building areas.
 - o Extension of building and gardens into coastal dune.
 - o Illegal beach access through dune areas
 - o Pollution particularly from sewage treatment plants
 - o Loss of indigenous vegetation and greater introduction of alien invasive species
- ❖ Rural settlements
- o Degradation due to lack of basic services and infrastructure
 - o Degradation of drainage systems due to altered run-off and pollution
 - o Water pollution
 - o Waste disposal
 - o Increased poverty and vulnerability
 - o Health: Diseases such as Malaria, Cholera and HIV/AIDS
 - o Cultural Traditions: Traditional burials and possible effects on ground water
 - o Socio-political issues regarding basic needs and different perceptions about environment and conservation
 - o Lack of environmental awareness and education
 - o Migration of people from rural areas
 - o Densification of areas / nodes bringing additional pressure on the land for small scale agriculture.
 - o Over grazing of steep slopes creating slope erosion and degradation of grasslands
 - o Densification of development reducing the influence of rural characteristics.
 - o Illegal dumping of waste
- ❖ Industry
- o Air pollution
 - o Effluent discharge into rivers
 - o Water requirements
 - o Expansion
- ❖ Institutional
- o Lack of environmentally based capacity
 - o Environmental processes and procedures not well defined within Municipality
 - o Lack of inter-sector and inter-government level integration.
 - o Lack of strategic environmental management, implementation and monitoring
 - o Lack of understanding of visual implications of development
 - o Financial Constraints
- ❖ General
- o Health: Diseases such as Malaria, Cholera and HIV/AIDS
 - o Cultural Traditions: Traditional burials and possible effects on ground water
 - o Socio-political issues regarding basic needs and different perceptions about environment and conservation
 - o Lack of environmental awareness and education
 - o Lack of understanding of strategic environmental impacts and the importance of natural areas

4.4 ENVIRONMENTAL SUSTAINABILITY FRAMEWORK

Defining the desired state of the environment

Taking into account the key resources of the area and issues identified, it is important to define objectives for their sustainability and indicators by which to measure their sustainability. The resulting Sustainability Framework will provide the starting point for implementing sustainable practices into the ethos of the Municipality, and can be used to measure existing and future development proposals against.

Sustainability Framework				
Theme	Key Resources / Issues	What are Objectives for Sustainability	Sustainability Indicators ⁷	Responsibility/ Legislation
NATURAL SYSTEM				
<i>Climate / Air Quality</i>	<ul style="list-style-type: none"> Favourable climate The bio climatic profile is suitable for certain types of agricultural production, for example sugar cane and timber production. <p>Issues</p> <ul style="list-style-type: none"> Contribution to air pollution By sugar cane burning By industries 	<ul style="list-style-type: none"> Pollution and degradation of the environment must be avoided, or, where they cannot be altogether avoided, minimised and remedied. Air quality to conform with standards 	<p>Is there an adopted Air Quality Management Plan?</p> <p>% of licensed industries with did not comply with license conditions</p> <p>% of these for which there was an enforcement response by the authority</p>	<p>Ilembe DM responsible, DEAT, Industry</p> <p>The Atmospheric Pollution Act Environmental Conservation Act, Road Traffic Act and the Occupational Health and Safety Act are the current Central Government sets of legislation governing air quality. The Atmospheric Pollution Prevention Act has been repealed with the Air Quality Act, but this has not been enacted by the Minister. The Atmospheric Pollution Act provides the ambient air quality standards and also the guidelines for Schedule Processes.</p>
<i>Topography & Geology</i>	<ul style="list-style-type: none"> Good agricultural soil potential The varied topography increases the aesthetic appeal of the area and provides opportunities for a well-planned <p>Issues</p> <ul style="list-style-type: none"> Potential for erosion due to land uses Illegal sandwinning. This has potentially serious implications for the natural environment as the necessary mitigating measures imposed by the permit are not always followed or monitored. 	<ul style="list-style-type: none"> Safeguard soil quality and quantity and reduce contamination 	<ul style="list-style-type: none"> Land cover typologies Agricultural land classification Area of contaminated land 	<p>Ilembe District Municipality, KwaDukuza Local Municipality, DWAF, DAEA, DME, Farmers, Sand winners.</p> <p>Conservation of Agricultural Resources Act Guidelines for agricultural production Mineral & Petroleum Resources Development Act of 2002 (Act 28 of 2002) Mining guidelines</p>

⁷ PALMER DEVELOPMENT GROUP (2004). DEAT: Development of a Core Set of Environmental Performance Indicators for Local Level Reporting and in terms of Schedule 4b & 5b of the Constitution.

Sustainability Framework				
Theme	Key Resources / Issues	What are Objectives for Sustainability	Sustainability Indicators ⁷	Responsibility/ Legislation
<p><i>Hydrology</i></p> <ul style="list-style-type: none"> - Rivers and Dams - Wetlands - Estuaries 	<ul style="list-style-type: none"> All of the drainage systems & wetlands of KwaDukuza are considered to have important ecological value due to their inherent high levels of biodiversity and species composition which differs from surrounding upland habitats. Water underpins local development by ensuring perennial flow of water for uses such as abstraction for public water supply and irrigation. They provide natural products in the case of wetlands, and also provide natural areas which can be utilised for recreational activities and tourism, as well as biodiversity persistence. There are different wetland hydrogeomorphic wetland types within the municipality (valley bottom, floodplain and hillslope seepage), each of which plays a slightly different but important ecological function. <p>Issue</p> <ul style="list-style-type: none"> Loss / degradation of wetlands due to sugar cane cultivation Water Pollution Modification of watercourses by development, especially urban development Reduction in stream flow Invasion of riparian areas by invasive alien vegetation 	<ul style="list-style-type: none"> No new development or any change in land use must occur within the boundaries, or within a reasonable buffer zone of a water resource, including wetlands and drainage lines. Water quality standards set by DWAF must be conformed to. A water resources strategy which prevents over-abstraction must be implemented Quantification of wetland areas loss within the KLM All existing cultivation within wetlands must be phased out and a suitable buffer zone established. The principles of the sustainable sugar initiative should be followed and promoted with the sugar cane sector 	<ul style="list-style-type: none"> Compliance with water quality guidelines and discharge conditions, and associated enforcement compliance with abstraction licence conditions, and associated enforcement % of wetland area lost area of wetland / riparian habitat being rehabilitated 	<p>The Department of Water Affairs and Forestry is broadly responsible</p> <p>The relevant legislation is the National Water Act. The Act provides for the protection and sustainable use of all Water Resources, and seeks to prevent water pollution.</p> <p>Development should in no way disturb damage or alter the characteristics of water resources. In the case of river this includes the riparian zones associated with them.</p> <p>'Protection' in relation to a water resource entails:</p> <ul style="list-style-type: none"> Maintenance of the quality of the quality of the water resource to the extent that the water use may be used in a sustainable way; Prevention of degradation of the water resource The rehabilitation of the water resource <p>In addition the Conservation of Agricultural Resources Act applies to certain aspects of erosion control and water resource protection in the context of the agricultural sector.</p>
<p><i>Coastal & Marine</i></p>	<ul style="list-style-type: none"> The KwaDukuza coastline comprises of sandy beaches interspersed with rocky headlands The beaches are considered to be the primary tourist attraction for the region Coastal corridor where natural coastal forest and grasslands occur, in particular around areas, for example, Zinkwazi and Blythedale. <p>Issues</p> <ul style="list-style-type: none"> Lack of protection and monitoring of urban sprawl, ribbon development within the coastal 	<ul style="list-style-type: none"> Promote and maintain a largely natural outlook. Promote sensitive development Promote the preservation of primary, secondary or climax dune vegetation Take a holistic view of development within certain areas that are deemed sensitive 	<ul style="list-style-type: none"> % of beaches with blue flag status % of conservation to development No. dwellings within the Admiralty Reserve location, density and scale of development 	<p>Ilembe District Municipality, KwaDukuza Local Municipality, DWAF, DAEA.</p> <p>National Environmental Management Act, Act No. 107 of 1998, KwaZulu-Natal Nature Conservation Management Amendment Act, Act No. 5 of 1999, National Water Act, Act No. 36 of 1998, Conservation of Agricultural Resources Act, Act No. 43 of 1983</p>

Sustainability Framework				
? Theme	? Key Resources / Issues	? What are Objectives for Sustainability	? Sustainability Indicators⁷	? Responsibility/ Legislation
	<p>zone</p> <ul style="list-style-type: none"> Over-exploitation of living marine resources is inadequately controlled Highly sensitive environment in terms of Stone and Iron Age archaeological sites 			National Environmental, Management: Biodiversity Act, Act No. 10 of 2004.
Biodiversity & Protected areas	<ul style="list-style-type: none"> The Ngoya Forest Mosaic, Umvoti Estuary, Zinkwazi Estuary and the coastal forest corridor are considered to be areas of conservation significance. <p>Issues</p> <ul style="list-style-type: none"> Highly transformed Fragments of remaining natural areas/resources are separated by large tracts of transformed land Policing and protection of proclaimed protected areas & the addition of identified areas, such as, Ngoya Forest Fragments into formally protected areas Intense pressure from Forestry Injudicious burning and grazing of area, collection of plants for <i>muthi</i> Threatened by Alien Vegetation 	<ul style="list-style-type: none"> Addition of protected areas, Ngoya Forest, and appropriate rehabilitation. Education of local communities around the value of these unique environments Promote the development of nurseries for the propagation of <i>muthi</i> plants to prevent removal from natural environment. 	<p>Area (hectares) and % of municipal area under 'local protected area' status</p> <p>% of land of 'conservation importance' in the municipal area under protected area status</p> <p>% of local protected areas with a current/adopted management plan and authorised budget</p> <p>Area (hectares) of sensitive, vulnerable, highly dynamic and stressed ecosystems in the municipal area (by ecosystem type) P*</p> <p>% of each of the above which is degraded or transformed on an annual basis P*</p>	<p>Ilembe District Municipality, Kwadukuza Local Municipality, DWAF, SANBI, EKZN Wildlife.</p> <p>Protected Areas Act, Act No. 57 of 2003.</p> <p>KwaZulu-Natal Nature Conservation Management Amendment Act, Act No. 5 of 1999,</p> <p>National Environmental Management Act, Act No. 107 of 1998.</p>
Vegetation/Fauna	<ul style="list-style-type: none"> Ngoya Forest Fragments should be protected and a suitable buffer area created around these areas. These areas are critical to the conservation goals of the Province and cannot be sacrificed, having an irreplaceability value of 1(C-Plan,2006). Remnant patches of riparian vegetation exist along the larger rivers, namely the Nonoti, Mdlotane, iMbozamo, Umvoti and Umhlali. There are limited examples of coastal grassland within the Municipality and along the entire North Coast, that are home to some rare and endemic species and therefore are a priority for conservation. 	<ul style="list-style-type: none"> Review and develop a formal strategy towards development proposals Initiate a master plan for the control of alien vegetation 	<p>Area (hectares) of municipal land currently planted with indigenous and endemic species</p> <p>Area (hectares) of municipal land currently invaded by alien species</p> <p>% of municipal land currently invaded by alien species</p> <p>Area of IAS cleared from municipal land (this reporting year)</p> <p>% of municipal land currently invaded by alien species which has been cleared (this reporting year)</p>	<p>KwaDukuza Local Municipality and the relevant authorities, such as DAEA and DWAF</p> <p>KwaDukuza Local Municipality and the relevant authorities, such as DAEA and DWAF</p> <p>KwaDukuza Local Municipality and the relevant authorities, such as DAEA and DWAF,</p> <p>Conservation of Agricultural Resources Act, Act No. 43 of 1983.</p>

Sustainability Framework				
? Theme	? Key Resources / Issues	? What are Objectives for Sustainability	? Sustainability Indicators⁷	? Responsibility/ Legislation
	Issues <ul style="list-style-type: none"> Lack of protection of natural ecosystems Remaining natural areas are narrow & traditionally encountered in areas that are inaccessible or difficult to farm. Due to their small size and isolated nature, they require constant human intervention & management to ensure survival. Threatened by development and alien invasive vegetation. 	<ul style="list-style-type: none"> Education of the local communities as to the potential threats posed by alien vegetation in terms of erosion, loss of grazing lands, water usage, etc 	Is there an adopted Invasive Species Monitoring, Control and Eradication Plan that is integrated and aligned to the IDP?	KwaDukuza Local Municipality
BUILT SYSTEM/INFRASTRUCTURE				
<i>Structures and buildings</i>	<ul style="list-style-type: none"> Shakan sites have great potential for development as local and foreign visitor attractions. Stone Age and Iron Age coastal archaeological sites, including shell middens Historic structures and buildings Ancestral graves 	Protection of culturally significant structures and buildings, especially those older than 60 years	Provided by Amafa aKwaZulu-Natali in terms of the KZN Heritage Act 1997 and international guidelines for preservation of the built environment	Provided by Amafa aKwaZulu-Natali in terms of the KZN Heritage Act 1997 and international guidelines for preservation of the built environment
<i>Water, Sanitation & Water Quality</i>	<ul style="list-style-type: none"> There is a huge disparity in provision of services and major service backlogs experienced. Water infrastructure is a top priority in KwaDukuza Local Municipality with only half of the population having access to water. Various bulk water options are being considered including desalination treatment plants. Issues <ul style="list-style-type: none"> There is severe water shortage in the area, which is exacerbated by new development applications. Umgeni water, KwaDukuza and Illembe cannot meet the current water requirements of existing users. The water shortage needs to be addressed at a strategic level. Lack of maintenance of existing infrastructure. Reliance on ground water can lead to health impacts amongst the more vulnerable sections of the population, where ground water has become polluted through poor land use and/or burials near water courses 	Encourage efficiencies in resource use and waste reduction in the municipality.	% households with access to potable water within 200m of dwelling (or on site) % of households with at least a basic level of service as determined by the WSA service levels policy	Umgeni water, KwaDukuza and Illembe The Water Services Act
<i>Stormwater Management</i>	<ul style="list-style-type: none"> Stormwater is managed on a daily basis by the 	Development of a Stormwater	% of storm water drains that are maintained annually	DM & LM

Sustainability Framework				
Theme	Key Resources / Issues	What are Objectives for Sustainability	Sustainability Indicators ⁷	Responsibility/ Legislation
	municipality. Issues <ul style="list-style-type: none"> The biggest problem faced by the department has to do with the current extensive housing development project taking place along the coast especially in Ballito. The Municipality are finding it increasingly difficult to provide funding to develop all the necessary storm water structures in the area There is an urgent need for a Stormwater Management and Control Master Plan to be drawn in agreement between Municipality and the housing developers in the area 	Management and Control Master Plan to ensure appropriate stormwater management. Improve the quality of stormwater runoff. Appropriate maintenance and upgrading of infrastructure Recovery and reuse of stormwater.	No. dwellings within the 50 year flood line	
<i>Waste Disposal / Management</i>	<ul style="list-style-type: none"> Waste from Stanger and Ballito currently collected at Dolphin Coast Transfer Station. Issues <ul style="list-style-type: none"> Insufficient staff, budget & equipment Refuse removal a problem especially in new townships Security problem and picking from site. Squatter camp near Shakaville garden refuse site. Lack of security Illegal dumping 	Encourage efficiencies in resource use and waste reduction in the municipality, through education, recycling, reuse, waste recovering, and responsible disposal.	Number of incidents of illegal dumping % of these incidents for which enforcement action was taken, and or Amount (tonnes) of illegal dumping cleared by the local authority % municipal landfill sites licensed according to the terms of the Environmental Conservation Act Available landfill lifespan	DM & LM, Dolphin Coast Waste Management White Paper on Integrated Pollution & Waste Management Public Health Act Environment Conservation Act
<i>Recreational, Cultural & Visual Amenity</i>	<ul style="list-style-type: none"> The Umvoti Estuary (Heritage Site), plays a pivotal role in tourism to the area and all residential development within this area should not be promoted. This area should be enhanced for tourism through the creation of a series of locally guided tours and the creation of an environmental sensitive tourism operation to allow for the exploration of the area. Key tourism assets are: beach, rivers, coastal vegetation, cultural attractions (mainly Zulu) The area is recognised by birding authorities as a birding hotspot, the avifaunal biodiversity is thus considered a tourism asset, as well as an environmental asset. 	Deliver and provide access to facilities and services to support those living in, visiting and working within the municipality. Enhance the quality of existing public and private facilities	Area (hectares) of municipal parks, recreation areas or other open spaces within the municipal area with conservation value % of this area infilled by development on an annual basis Area (hectares) of municipal parks, recreation areas and other open space per capital within the municipal area % of municipal budget allocated to the provision of and maintenance of municipal parks	LM Only some urban areas/towns and former TLC areas Protected Areas Act
	<ul style="list-style-type: none"> Areas of historical, archaeological and cultural 			

Sustainability Framework				
? Theme	? Key Resources / Issues	? What are Objectives for Sustainability	? Sustainability Indicators⁷	? Responsibility/ Legislation
	<p>value are shown on Map 1: Conservation Resources.</p> <ul style="list-style-type: none"> • General visual qualities throughout the Municipal Area • Large rural areas – whilst not important in terms of their visual quality, they do provide a break and contrast for developed areas. They also provide opportunity for integrating open space into development as the urban edge expands. This is fundamental in developing identity and sense of place for built areas. <p>Issues</p> <ul style="list-style-type: none"> • Insufficient staff, budget & equipment • Tourism underpins local development in that it forces development pressures in limited areas, mainly the coastal areas • The definition between rural and urban areas is in danger of being lost as developments extend into rural areas. • The density and orientation of some development is such that it does not take advantage of the rural setting or incorporate open space. • General visual qualities are often linked to other sectors such as ecology. Visual implications of planning and enforcement decisions should be considered. 	<p>Protection of heritage resources and incorporation into management plans of individual developments as well as those of the municipality</p>	<p>and recreation areas</p> <p>Provided by Amafa aKwaZulu Natali in terms of the KZN Heritage Act 1997 and international guidelines for preservation of the built environment</p>	<p>Provided by Amafa aKwaZulu Natali in terms of the KZN Heritage Act 1997 and international guidelines for preservation of the built environment</p>
<i>Noise Pollution</i>	<ul style="list-style-type: none"> • No information was available regarding possible noise pollution. • More site-specific research and analysis is required to assess pollution in the KwaDukuza area. • Insufficient staff, budget & equipment 	<p>Encourage efficiencies in resource use and waste reduction</p> <p>Facilitate an improvement (decline) in levels of noise pollution effecting commercial and private residents.</p>	<p>Number of noise pollution related complaints received by the local authority</p> <p>% of these complaints for which there was enforcement action</p>	<p>LM but not performing role SAPS and Law Enforcement Agencies</p> <p>Bylaws - Noise Control - Chapter 2</p>
GOVERNANCE				
Broad responsibilities	<ul style="list-style-type: none"> • Responsibilities not clearly defined. • Need for environmental training and awareness • Development projects often approved without adequate environmental assessment 	See above	See above	See above
Planning	<ul style="list-style-type: none"> • Adhoc development 	Incorporation of NEMA	For each of the following, is	LM & DM

Sustainability Framework				
? Theme	? Key Resources / Issues	? What are Objectives for Sustainability	? Sustainability Indicators⁷	? Responsibility/ Legislation
	<ul style="list-style-type: none"> Improved integration and communication between Ilembe and KwaDukuza is required. Alignment between KwaDukuza, Ilembe and eThekweni Municipalities regarding the management of the Tongati River 	principles into all plans Municipal Planning Preparation of IDP & associated plans Compliance with provincial EIPs/EMPS & adherence to EIP/EMP in all planning, policy or programs Preparation of management plans for local protected areas	there a current, adopted plan that is integrated and aligned to the IDP?: Air Quality Plan, Integrated Waste Management Plan; Oil Spill Contingency Plan; Water Services Development Plan; Plan to provide access to basic water services; Invasive Species monitoring, control and eradication plan heritage resources management plan	NEMA
Monitoring/enforcement	<ul style="list-style-type: none"> Limited resources available to ensure environmental compliance and enforce legislation. Responsibilities not clearly defined. Need for training. 	Auditing, monitoring & compliance measures (under model by-laws if created) Reporting & provision of information (under model by-laws if created) Reporting on Key Performance Indicators from IDPs Collection of data for waste management system Air Quality: monitoring of ambient air quality & point/non-point source emissions Compliance with provincial EIP	Has the municipality audited its plans, policies and programmes for adherence to NEMA principles?	

SECTION 5: CONCLUSION/ RECOMMENDATIONS

As part of Phase 2, an environmental analysis of the Municipality has been undertaken. This has involved a *focused analysis of the type of problems* faced by the people in the area and the *listing and prioritisation* of environmental issues facing the KwaDukuza Municipality.

The outputs of Phase 2 of the project allow for a strategic focus for future development. The aim of the next phase is to provide the municipality with guidelines for the development and assessment of plans and programs to ensure that development is within acceptable limits, and to prepare an Conservation Priority Map that will assist them in ensuring that development is sustainable.

SECTION 6: REFERENCES

CSIR Building and Construction Technology. 2000: Guidelines for Human Settlement Planning and Design, Compiled under the Patronage of Department of Housing, CTP Book Printers, Cape Town.

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DEAT, 2002: National Framework document - Strengthening Sustainability in the Integrated Development Planning Process.

Enact International, 2003: A Guideline for Environmental Decision-Making by Municipalities in Kwazulu-Natal Prepared for: The Provincial Planning and Development Commission, KwaZulu-Natal

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APPENDIX A: IDENTIFIED PROJECTS

PROGRAMMES	PROJECTS
STRATEGY 1: EFFECTIVE INFRASTRUCTURE – GOAL: Ensure access to all residents in Kwadukuza with effective infrastructure through the provision of new and the maintenance of existing infrastructure	
1.1 Operating Expenditure	1.1.1 Operating Expenditure
1.2 Preparation of Sector Plans	1.2.1 Integrated waste management plan
	1.2.2 Water services & sanitation plan
	1.2.3 Electricity plan
	1.2.4 Municipal infrastructure plan
	1.2.5 Transport & roads
	1.2.6 Cemetery & crematoria
	1.2.7 It strategy & implementation
1.3 Electrical Administration	1.3.1 Quality of Service & Supply
1.4 Lighting	1.4.1 Street lighting
1.5 Low Voltage Network	1.5.1 Upgrade LT Mains
1.6 Medium Voltage Network	1.6.1 Upgrade MV Network
	1.6.2 Upgrade MV Substations
	1.6.3 Pole Replacements
	1.6.4 33/11kv Bulk Services (DBSA)
1.7 Electricity Service Connections	1.7.1 Electrification Projects (DME)
	1.7.2 Electrification Projects (ESKOM)
	1.7.3 Private Township Projects
1.8 Civil Works Administration	1.8.1 Quality of Service & Supply
1.9 Municipal Buildings	1.9.1 Civic Buildings & Community Halls
	1.9.2 Beach Amenities
	1.9.3 Bus Bays & Taxi Ranks
1.10 Roads & Stormwater Infrastructure	1.10.1 Roads Infrastructure
	1.10.2 Stormwater Infrastructure
	1.10.3 Bulk Services: Housing Projects
	1.10.4 Road Kerbings & Sidewalks
	1.10.5 General
1.11 Vehicle Service Centre	1.11.1 Mechanical Workshop
1.12 Fleet Services	1.12.1 Vehicle Replacements
STRATEGY 2: INTEGRATED HUMAN SETTLEMENTS –GOAL: To be a leading human settlements provider within the Ilembe District by working towards slum-free environment through the provision of affordable housing to all qualifying and deserving residents	
2.1 Operating Expenditure	2.1.1 Operating Expenditure
2.2 Preparation of Sector Plans	2.2.1 Land Reform Plan
	2.2.2 Human Settlements Plan (Housing)
2.43 Capacity Building within the Integrated Human Settlement Programme	2.3.1 As per sector plan
2.4 Integrated Planning for Human Settlements	2.4.1 Ethafeni 900 units (MIG,DOH)
	2.4.2 Aldinville 1250 units (MIG,DOH)
	2.4.3 Siyembezi Ext Phase Two 1000 units (MIG,DOH)
	2.4.4 Shakashead Phase 2 (DOH)
	2.4.5 Mgidimbe Land Release & Project Management
	2.4.6 Driefontein
	2.4.7 Chris Hani 1000 units (MIG)
	2.4.8 Steve Biko priority 1 & 2

	2.4.9 Njekane Priority Two & Five
	2.4.10 Mnyundwini 1000 units (DLA,DOH)
	2.4.11 Sakhamkhanya
	2.4.12 Albert Luthuli Housing Project
	2.4.13 Groutville Priority 2 & 5 Land Reform, Valuations & Facilitation
	2.4.14 Nyathikazi Land valuation ,Housing Development and Packaging
	2.4.15 HIV AIDS Housing Program
	2.4.16 Rocky Park Glenhills Human Habitat
	2.4.17 Capacity Building
	2.4.18 Family Units -Old Age Home
	2.4.19 Ext 36 (300 units) MIG,DOH)
	2.4.20 Dube Station 910 units (MIG, DOH)
	2.4.21 Mgigimbe Land Acquisition 200 units (MIG ,DOH)
	2.4.22 Mbozamo Ext 500 units (DOH)
	2.4.23 Ntshawini Lloyd 2000 units(DOH)
	2.4.24 Khalafukwe Phase 4 700 units (DOH)
	2.4.25 Dube Toll Plaza 700 units (MIG,DOH)
	2.4.26 Dube Village 910 units (MIG,DOH)
	2.4.27 Mbozamo Ext 500 units (MIG)
	2.4.28 Njekane 1000 units (MIG,DOH)
	2.4.29 Groutville Priority 1
	2.4.30 Shayamoya Phase 1 1200 units (DOH)
	2.4.31 Shayamoya Phase 2 820 units (DOH)
	2.4.32 Etete Phase Four
	2.4.33 Consolidation Subsidies (DOH)
	2.4.34 Institutional Subsidies (DOH)
	2.4.35 Project Linked Subsidies (DOH)
	2.4.36 Peoples Housing Process Subsidies (DOH)
	2.4.37 Rural Subsidies (DOH)
	2.4.38 New/Conditional Approval Projects (DOH)
	2.4.39 New Peoples Housing Subsidies (DOH)
	2.4.40 New Rural Subsidies (DOH)
	2.4.41 Rural Housing
	2.4.42 Projects as per sector plan
2.5 Slum Clearance & Squatter Control	2.5.1 To be determined
2.6 Rapid Land Release	2.6.1 To be determined
2.7 Land Reform	2.7.1 Mgigimbe
	2.7.2 Steve Biko P1 & P2
	2.7.3 Groutville Priority 2 & 5
	2.7.4 Driefontein
	2.7.5 Nyathikazi
	2.7.6 HIV/AIDS Housing Programme
	2.7.7 HIV/AIDS Policy
	2.7.8 Habitat for Humanity/ Rocky Park Glenhills
	2.7.9 Shakashead Phase 2
	2.7.10 Capacity Building
	2.7.11 Family Units – Old Age

	2.7.12 Land Banking
STRATEGY 3: ECONOMIC DEVELOPMENT AND JOB CREATION – GOAL: To obtain a strong economic growth and job creation ensuring the realization of the Municipal Vision.	
3.1 Operating Expenditure	3.1.1 Operating Expenditure
3.2 Preparation of Sector Plans	3.2.1 Local Economic Development Plan
	3.2.2 Tourism Plan
	3.2.3 Integrated Poverty Alleviation Plan
	3.2.4 Agriculture Plan
3.3 Urban and rural planning management	3.3.1 Total EDP and IDP Urban Control
	3.3.2 Total IDP Planning Building Control
3.4 Local Economic Development	3.4.1 Business Retention Expansion (TIK,DEAT)
	3.4.2 SMME Development Strategy (DBSA)
	3.4.3 Groutville Market (DEAT)
	3.4.4 Informal Trading Provisions
	3.4.5 Total Museum
	3.4.6 Business Development Projects
	3.4.7 Projects as per sector plan
3.5 Tourism Development	3.5.1 King Shaka Tourism Route
	3.5.2 Chief Luthuli Legacy Project (DAC,DPW)
	3.5.3 Walter Sisulu Market- Redevelopment
	3.5.4 Feasibility on Homestays
	3.5.5 Projects as per sector plan
3.6 Poverty Alleviation	3.6.1 Community Based Agriculture
	3.6.2 Sakhankhanya Agriculture projects
	3.6.3 Garden/Sportsfield
	3.6.4 Coastcare Phase IV
3.7 Agricultural Development	3.7.1 Community Based Agriculture (DOH,DOA)
	3.7.2 Sakhankhanya Agricultural Projects (DOA)
	3.7.3 Amadumbe Project (DOA)
	3.7.4 Garden and Sportsfield Development- Youth Program
	3.7.5 Projects as per sector plan
STRATEGY 4: INTEGRATED DEVELOPMENT – GOAL: Develop a holistically integrated Municipality, which is aligned to its surrounding Municipalities. To achieve equitable distribution of urban and rural development projects and therefore an equal improvement in access to community and municipal services.	
4.1 Operating Expenditure	4.1.1 Operating Expenditure
4.2 Preparation of Sector Plans	4.2.1 Spatial Development Framework
	4.2.2 Land Use Management System
	4.2.3 Integrated Environmental Management Plan
	4.2.4 Geographical Information Systems
4.3 Integrated Development Planning	4.3.1 Integrated Development Plan
STRATEGY 5: PEOPLE EMPOWERMENT – GOAL: To improve the social well-being of the people of Kwadukuza through sustainable improvements to delivery of municipal services	
5.1 Operating Expenditure	5.1.1 Operating Expenditure
5.2 Preparation of Sector Plans	5.2.1 Human Settlements Plan
	5.2.2 Disaster Management Plan
	5.2.3 Health Plan
	5.2.4 Education Plan
	5.2.5 HIV/AIDS
5.3 Integrated Community Safety Plans	5.3.1 Community Based Crime Prevention Strategy

	5.3.2 Kwadukuza Community Safety Strategic Plan for a Safe Environment
5.4 Cleaning and Greening of Kwadukuza	5.4.1 As per sector plan
5.5 Sports & Recreation	5.5.1 Upgrading of Sports Facilities
	5.5.2 KwaDukuza Volleyball Courts (NLDLT Fund)
	5.5.3 KwaDukuza Tennis Courts (NLDLT Fund)
	5.5.4 Shakaville Socce Ground (NLDLT Fund)
	5.5.5 Glenhills Sports Ground (NLDLT Fund)
	5.5.6 Main Recreation Soccer Ground (NLDLT Fund)
	5.5.7 Gledow Soccer Ground (NLDLT Fund)
	5.5.8 Shakaville Tennis and Volleyball Courts (NLDLT Fund)
	5.5.9 Sakhuxolo Sports Centre (NLDLT Fund)
	5.5.10 Damal Soccer Ground (NLDLT Fund)
	5.5.11 Nkobongo Soccer Ground (NLDLT Fund)
	5.5.12 Townsend Park -Tennis Courts (NLDLT Fund)
	5.5.13 Driefontein (NLDLT Fund)
	5.5.14 Shakashead (Sawmill) (NLDLT Fund)
	5.5.15 Velani Township (NLDLT Fund)
	5.5.16 Groutville Ward 9 (NLDLT Fund)
	5.5.17 Groutville Ward 10 (NLDLT Fund)
	5.5.18 Parks & Gardens
5.6 Learning and Leisure	5.6.1 Library Service
	5.6.2 New Library
	5.6.3 Fencing and Security Gates
	5.6.4 Upgrade of Museum
5.7 Access to PHC	5.7.1 Total Health Services - Administration
	5.7.2 Health Service - Clinics - Other
	5.7.3 Shakaskraal
	5.7.4 Damal Clinic
	5.7.5 Damal Clinic
	5.7.6 Glenhills
	5.7.7 NANDI Clinic
	5.7.8 KwaDukuza Clinic
5.8 Community Safety	5.8.1 Total Marine Safety
	5.8.2 Total Testing grounds
	5.8.3 Total Fire and Ermegency
	5.8.4 Total Fire and Rescue Fleet Services
	5.8.5 Total Motor Licensing
	5.8.6 Total Policing
	5.8.7 Admin
5.9 HIV/AIDS	5.9.1 Treatment & Care for People Living With HIV/AIDS
	5.9.2 Care for Orphans
	5.9.3 Organisational Arrangements
STRATEGY 6: GOOD GOVERNANCE – GOAL: To demonstrate improved governance levels through the establishment of a prudential financial service delivery strategy and the effective collection of debt and achieved improvements in the invoicing of levy payers	
6.1 Operating Expenditure	6.1.1 Operating Expenditure
6.2 Preparation of Sector Plans	6.2.1 Performance Management System
	6.2.2 Financial Plan

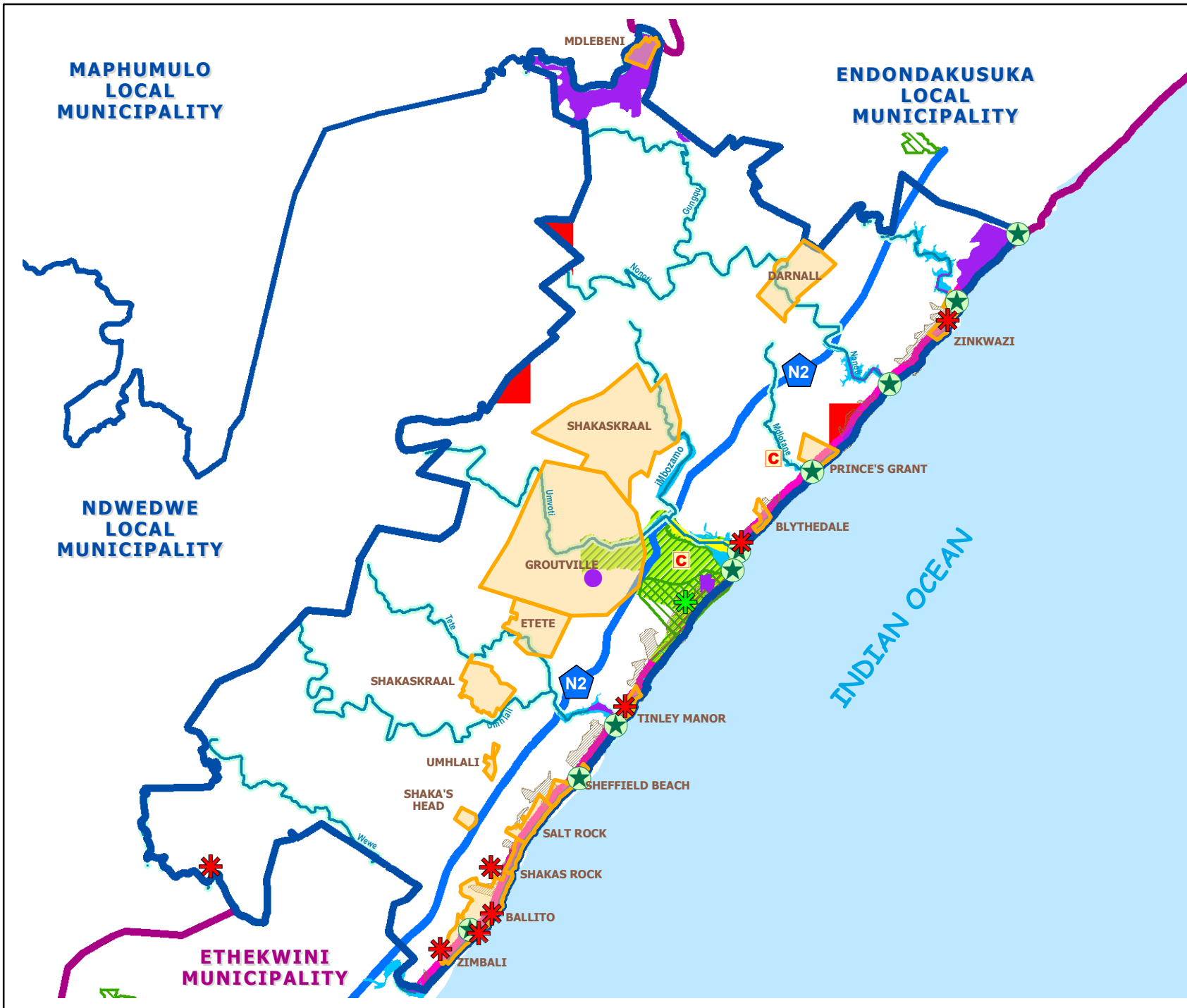
6.3 Financial Management	6.3.1 To be determined
6.4 Management & Admin Services	6.4.1 To be determined
6.5 Public Relations	6.5.1 To be determined
6.6 Special Projects	6.6.1 To be determined
6.7 Performance Management Programme	6.7.1 To be determined
6.8 Corporate Services	6.8.1 Human Resources
	6.8.2 Administration
	6.8.3 Corporate Communications
	6.8.4 Data Processing
	6.8.5 Town Treasurer

APPENDIX B: MAPS

Map 1: Conservation Resources.

Map 2: Strategic Impacts / Key Intervention Areas

**KWADUKUZA
LOCAL MUNICIPALITY**
STRATEGIC
ENVIRONMENTAL
ASSESSMENT
CONSERVATION
RESOURCES



Legend

- District Municipalities
- Local Municipalities
- Towns/Settlements
- National Route (N2)

Conservation Resources

- Rivers
- Wetlands
- Conservation Areas
- Estuaries
- Green Wedge
- Key Vegetation Resources
- High Quality/Threatened Landscapes
- Irreplaceable Sites (Index >0.6)
- Admiralty Reserve
- Conservancies
- Natural Heritage Site
- Cultural Heritage Clusters
- Significant Ecological Assets

SOURCE:
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KwaDukuza Local Municipality, 2006
SANBI, 2004
Ezemvelo KZN Wildlife, 2006
ENPAT (DEAT), 2001

