INTEGRATED WASTE MANAGEMENT PLAN (IWMP)

2025- 2029

AbaQulusi Local Municipality

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

DEFINITIONS

Domestic waste (General waste) is a waste generated by single or multifamily residential dwellings and solid waste of non-hazardous nature generated by wholesale, retail, institutional or service establishment, such as office buildings, stores, markets, restaurants, theatres, hotels, warehouses, industrial operations and manufacturing processes.

Hazardous waste is any waste which by reason of chemical reactivity or toxic, explosive, corrosive or other characteristics causes danger or is likely to cause danger to human health or the environment, whether alone or in combination with other wastes. Hazardous waste is categorized in four hazard ratings with 1 being the most hazardous and 4 being the least hazardous.

Medical waste is any waste generated by hospitals, clinics, nursing homes, doctor's offices, medical laboratories, research facilities and veterinarians, which is infectious or potentially infectious.

Solid Waste Management facility is any facility used for the transportation, processing or disposal of solid waste, and includes transfer stations, recycling facilities, composting facilities, waste incinerators, and sanitary landfills.

Transfer Station is a facility that receives solid waste from collection vehicles and reloads that waste into larger vehicles for transfer to a disposal or processing facility.

Incineration is the controlled combustion of solid waste employing closed combustion chambers, controlled combustion air, temperature monitoring and control to insure complete combustion of organic matter with a minimum of undesirable air emissions and wastewater discharges.

Controlled landfill is a solid waste management facility used for the disposal of non-hazardous domestic waste and non-infectious medical waste, which employs compaction of wastes, covering of waste with soil cover material, and the management of leachate and gaseous materials produced by the organic decomposition of the landfilled waste, all in such a manner as not to harm human health and minimize negative impacts to the environment.

Landfill Classification is a system under the DWAF Minimum Requirements for classifying landfill according to the type and size (TPD) of the landfill, and its potential for significant leachate generation.

Communal Landfill is the smallest landfill classification with a capacity of less than 25 tonnes per day.

Leachate is the liquid by product of organic decomposition of landfilled waste or any liquid which comes in contact with solid waste in a sanitary landfill.

Landfill gas is the gaseous by product of organic decomposition of landfilled waste. Landfill gas contains significant concentrations of methane gas which is explosive at concentrations exceeding 5 percent.

Recycling is the sorting, processing, and transportation of solid waste materials, products or containers for the purpose of remanufacture or reuse.

Sorting is the authorised separation of solid waste materials for the purpose of recycling or disposal, either at the source of generation or at a solid waste management facility.

Scavenging is the unauthorised separation of solid waste for recyclable materials and food for human consumption.

Surface water is all waters in or coming from a water source which is found on the surface of the ground, excluding water under the surface of the ground and sea water.

Perimeter drains are open ditches surrounding the landfill installed to prevent surface water from entering the landfill.

Groundwater is all waters flowing or existing under the ground surface.

Aquifer is a water bearing formation capable of supplying a sufficient yield for a community based potable water source.

Daily cover is a daily application and compaction of approximately 15 centimetres of soil intended to control blowing litter, odours, flies, rats and fires, intended for an exposure of less than one week.

Intermediate cover is an application and compaction of cover having the same functions as daily cover but applied at a thickness of 30 centimetres, intended to be exposed for a period of one week to one year.

Final Cover is an application and compaction of soil on the landfill after it has reached its designed elevation. The final cover soil shall be relatively impermeable and have a thickness of approximately 50 centimetres.

Vectors are birds, insects, and rodents capable of carrying disease causing bacteria, viruses or fungi from one host to another.

Page

ACRONYMS

DFFE	Department of Forestry, Fisheries and the Environment
DALRRD	Department of Agriculture, Land Reform and Rural Development
DHSWS Sanitation	Department of Human Settlements, Water and
DMRE	Department of Mineral Resources and Energy
COGTA	Department of Cooperative Governance and Traditional Affairs
EIA	Environ mental Impact Asses ment
EMI	Environ mental Management Inspectorats
EMPR	Environmental Management Programme
EPR	Extended Producer Responsibility
IDP	Integrated Development Plan
IndWMP	Industry Waste Management Plan
IWMP	Integrated Waste Management Plan
MDB	Municipal Demarcation Board
MEC	Member of Executive Council
NEAS	National Environmental Authorisation System
NEMA	National Environmental Management Act
NGO	Non-governmental organisations
NWMS	National Waste Management Strategy
ALM	AbaQulusi Local Municipality
ZDM	Zululand District Municipality
PPP	Public Private Partnership
RTS	Refuse Transfer Station
SABS	South African Bureau of Standards
SANAS	South African National Accreditation System
SANS	South African National Standards
SARS	South African Revenue Service
SAWIS	South African Waste Information System
SMME	Small, Medium and Micro Enterprise
WIS	Waste Information System
WMO	Waste Management Officer
WSDP	Water Services Development Plan

Page

ABAQULUSI LOCAL MUNICIPALITY

1. INTRODUCTION

Through the history of human civilization, some societies at the peak of their development have collapsed due to inadequate management of their accumulating waste burden and the resultant proliferation of disease, environmental degradation and ultimate impact on their ability to produce and reproduce effectively.

The development or review of the IWMP is a legal requirement as per National Environmental Management Waste Act, 2008 (Act No 59 of 2008) as amended. The municipality is obliged to compile the IWMP and include it in the respective Integrated Development Plans (IDPs). Then, the municipality has developed its own IWMP in house using IWMP web portal.

The compilation of Integrated Waste Management Plan requires that a set of prescribed steps be undertaken. The completion of each step in the prescribed process will influence actions taken at, and completion of, each subsequent step in the process. The IWMP consists of the following major stages of the environmental planning process:

- ✓ Analysis of the current situation and legal framework;
- ✓ Gap analysis and needs assessment;
- ✓ Development of goals, objectives, targets and policies;
- ✓ Development of projects and programmes to reach the set objectives;
- ✓ Implementation of projects and programmes;
- ✓ Monitoring and evaluation; and
- ✓ Review of the IWMP after 5 years.

The compilation of this document was done in line with the National Waste Management Strategy 2020, however 2012 NWMS goals are also considered which are the legislative requirements of the National Environmental Management: Waste Act, 2008 (Act No 59 of 2008, here after referred to as the "Waste Act". The Act requires that the Waste Management Strategy be reviewed at least every five years, and the focus of this strategy is therefore on the strategy's waste management measures and actions that need to be taken within the next five years.

1.1 The Integrated Waste Management Plan

The intent of Integrated Waste Management Planning as adopted by the Cabinet is that of a waste management hierarchy focuses on waste prevention, minimization, recover, re-use, treatment and finally, disposal as the last resort.

All human activities give rise to residual materials which are not immediately used where they arise. These residuals may be recycled, reclaimed or re-used; else they constitute waste which will ultimately be released into the environment. The biosphere has the capacity to transform many wastes over time, either into harmless products or nutrients which can be used again. However, the natural assimilation capacity of the environment can easily be exceeded if waste, particularly from human activity, is not controlled.

The main goal of IWMP is to optimize waste management by maximizing efficiency, and minimize associated health and environmental impacts and financial costs, thereby improving the quality of life of all South Africans and the world as a whole.

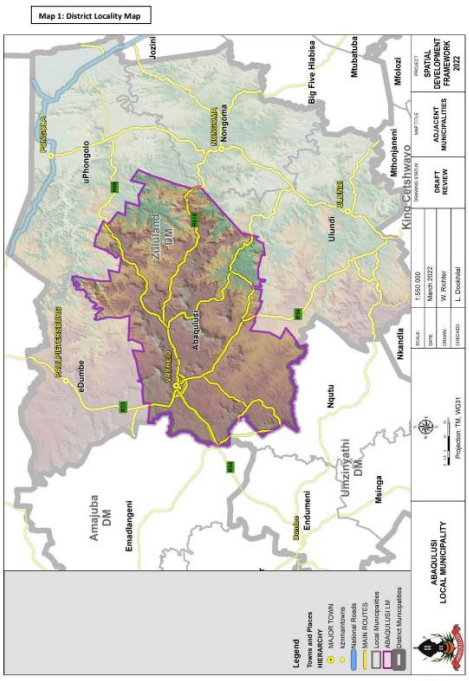
The main objectives of this IWMP are to:

- Improve waste management within the Municipality;
- Evaluate the current waste management system and highlight positive as well as deficiencies in respect of waste management within the Municipality;
- Establish a waste management system aimed at pollution prevention and minimization at source;
- Manage the impact of pollution and waste on the receiving environment;
- Manage waste in a holistic and integrated manner.

2.1 The Description of the Municipality

The AbaQulusi Local Municipality is located in the Northern part of KwaZulu-Natal Province and forms part of the Zululand District Municipality. It is named after the AbaQulusi, a Zulu clan whose descendants live in the vicinities of Vryheid, Utrecht, eDumbe and eNgoje. Abaqulusi Municipality comprises of many settlements, both rural and urban, with Vryheid being its main urban settlement/town. Other areas of interest that fall within the boundaries of Abaqulusi also include Louwsburg, eMondlo, Hlobane, Coronation and Bhekuzulu. The municipality is split into 23 Wards and its geographical cover is estimated at 4185km^2 in extent making it one of the spatially largest municipalities in the province.

ABAQULUSI LOCAL MUNICIPALITY



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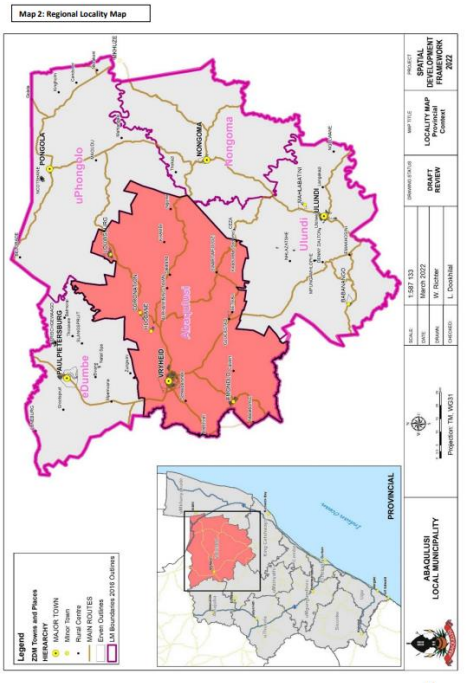

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occupied by a population of approximately 247 263 people, according to the Census 2022. The population of Abaqulusi has been growing steadily since 2011, from 214 714 to 247 263 people, recording and increase of 32 549 people over a 11-year period. At present, Abaqulusi Municipality constitutes approximately 26% of the Zululand District Municipality making it the largest populated local municipality compared to the other local municipalities within the district. The 4 other local municipalities that make up the Zululand Family include eDumbe, uPhongolo, Nongoma and Ulundi. The municipality is also characterised as the main hub for the district and is also very strategically positioned, sharing its border with all 4 local municipalities within the district, as well as with Amajuba and uMzinyathi District families. The Locality Maps below spatially depicts the Abaqulusi Municipality's location within the Zululand District Municipality and the KwaZulu-Natal Province.

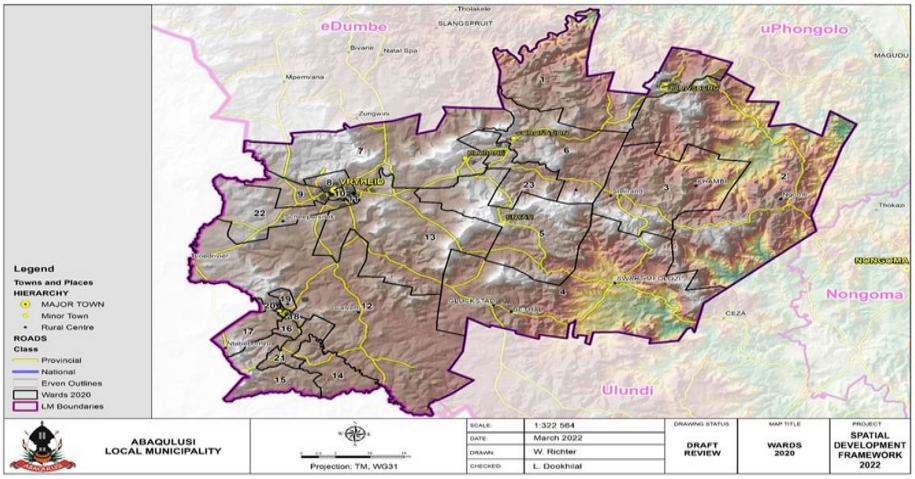


Figure 2.1: Map illustrating the study area of AbaQulusi Local Municipality

ABAQULUSI LOCAL MUNICIPALITY

The 2022 Stats SA estimates the population in the Municipality is 247 263 with 50 633 households. An annual growth rate of 1.44% is predicted for AbaQulusi area.

The 2022 Stats SA confirmed the AbaQulusi population estimate as 247 263.

Table 2.1: AbaQulusi municipal population size

	CENSUS 2011	**CENSUS 2022**
Population	214 714	247 263
Growth Rate	1%	1,4 %
% of Growth	10.5%	15.5%

Source: Stats SA 2022

2.2 Methodology

The following method was followed to obtain the compilation of this document:

(a) All relevant records and documents of the Waste Management were obtained from Department of Community Services and Environmental Services for the purposes of this IWMP development.

(b) All areas in the Municipality were visited to obtain first-hand knowledge of the existing status of the waste management service rendered.

(c) The current landfill site status quo was also used to obtain information.

(d) Industries were contacted.

(e) Healthcare Risk Waste facilities were contacted

(f) Recyclers and PROs were also contacted.

It must be stated that some of the information, especially for the demographic profile, is based on the 2022 Census data. The weigh bridge is currently not functional however the Municipality is using volume density estimates. The Municipality is registered on SAWIS and currently reporting. The diverted waste is reported by recyclers in SAWIS on behalf of the Municipality, Mpilenhle Trading Company.

2.3 Legislative Framework

The Constitution of South Africa, 1996 (Act No 108 of 1996) provides foundation for environmental regulation and policy in South Africa. The right to environmental protection and to live in an environment that is not harmful to health or well-being is set out in the Bill of Rights.

The White Paper on Environmental Management established the concept of the Waste Management Hierarchy in South African environmental policy and the concept was subsequently given legal expression in the National Environmental Management: Waste Act, 2008 (Act No 59 of 2008) as amended. The Waste Management hierarchy is a systematic and hierarchical approach to integrated waste management, addressing in turn waste avoidance, reduction, reuse, recycling, recovery and safe disposal of waste as the last resort.

Figure 2.2: Waste Management Hierarchy

Due to the significance of municipal waste services, the Waste Act needs to read in conjunction with the body of legislation regulating local government, including the Municipal Finance Management Act, 2003, and the Municipal Systems Act, 2000, which create the overall framework for planning, budgeting, service delivery and reporting at local level. For example, section 94(e) (ii) of the Municipal System Act allows the Minister to make regulations or issue guidelines for incentives and penalties to encourage the recycling of waste. In terms of section 74(1)(h) of the Municipal Systems Act, a municipal council must adopt and implement a policy on the levying of fees for municipal services provided by the municipality itself or by way of service delivery agreements.

The policy encourages the economical, efficient and effective use of resources, the recycling of waste and other appropriate environmental objectives. The Municipality may also develop its own by-laws to provide for a municipal waste removal system in the municipal area.

NEMA also introduced a number of additional guiding principles into South African environmental legislation, including the life-cycle approach to waste management, producer responsibility, the precautionary principle and the polluter pays principle. NEMA also places a duty of care on any person who causes significant pollution or degradation of the environment where it cannot reasonably be avoided. The Waste Act echoes the duty of care provision by obliging the holders of waste to take reasonable measures to implement the waste hierarchy while protecting the environment and public health.

The following is a list of sectorial legislation relevant to the Waste Act:

Title of legislation	**Relevance to Waste Act**
The National Environmental Management: Waste Act, 2008 (Act. 59 of 2008) (NEMWA)	Regulates the management of waste in South Africa in order to protect health and environment
The National Waste Information Regulations of 2012, published on 13 August 2012 and published under Section 69(1)(y), (aa) and (ee) of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008). The National Waste Information Regulations, 2012 ref are: Gazette No. 35583.	Regulate the collection of data and information to fulfil the objectives of the national information system as set out in section 61 of the act.
Norms and Standards for the Assessment of Waste for Landfill and the Norms and Standards for the Disposal of Waste to Landfill promulgated under the National Environmental Management: Waste Act, 2008 (NEM: WA) (effective 23 August 2013):	Norms and Standards determine the requirements for the disposal of waste to landfill as contemplated in reguations8(1) and (c) of Regulations.

Health Act, 2003	Regulates environmental health inspections, and allows Minister medical waste and health nuisances.
Minerals and Petroleum Resources Development Act, 2002	Regulates mining residue deposits and stockpiles.
Municipal Systems Act, 2002	Establishes main planning, performance management, service delivery, monitoring and
	Reporting systems for local government, including waste services.
Explosives Act, 2003	Regulates disposal of explosives.
Hazardous Substances	Impacts on disposal of nuclear waste.
National Water Act, 1998	Protection, management and control of water resources, includes municipal obligation to prevent contamination from inadequate waste management.
Occupational Health and Safety Act, 1993	Protects health and safety of workers, including against hazards to health and safety.
National Environmental Management Act, 1998	Framework environmental legislation. Regulation deals with environmental impact assessments.

Constitution of South Africa, 1996	Establish right based approach to environmental law, regulates division of legislative and executive powers between the spheres of government.
DWS Minimum Requirements for Landfill, 2nd Edition, 1998	Provides applicable waste management standards and / or specifications that must be met, as well as providing a point of departure against which environmentally acceptable waste disposal practices can be assessed.
The Polokwane Waste Summit Declaration	Reduce waste generation and disposal by 50% and 25% respectively by 2012 and develop a plan for zero waste by 2022.
Municipal Structures Act, 1998	Transformation of local government into a more financially sustainable and performance orientated sphere of government.

3. SITUATION ANALYSIS

3.1 Background

AbaQulusi Local Municipality is a local municipality in Zululand in the KwaZulu Natal province of South Africa. Its total surface area is 4 185 km² and 63% of the population live in rural areas, most of which live in scattered

homesteads in tribal areas. Homesteads are of mixed nature, including both modern dwellings and traditional thatched huts. The remainder of the population lives as tenants on farms or towns, dormitory townships and shacks in the settlements around towns

Vryheid is Zululand's main commercial, industrial and business centre, with a reasonably well-developed physical, social and institutional infrastructure. It is located at the intersection of major transport routes (R34 and R69) that traverse the region.

The main nodal points of the AbaQulusi Municipal area are:

- Vryheid with its central business district and surrounding residential area, together with its former black township Bhekuzulu;
- Louwsburg, an independent settlement area some 67km northeast of Vryheid;
- Hlobane and Coronation, which have become ghost towns due to decline of the coal mining, and other similar settlements 25km to the east of Vryheid;
- eMondlo and surrounding tribal area of Hlahlindlela southwest of Vryheid;
- Khambi Tribal Area and surrounding settlements in the southeastern part of the Municipal area;
- Glückstadt and surrounding settlements in the eastern part of the Municipal area;
- Boschhoek and surrounding settlements in the central part of the Municipal area; and
- A number of rural settlement areas around Brakfontein between eMondlo and Vryheid in the western part of the Municipal area.

3.2 Demographic Profile

3.2.1 District Context

An in-depth analysis of the demographic trends has been undertaken within the district and regional context in order to provide a sound foundation to the Local Economic Development strategy. The population within the Zululand District Municipality has been estimated to have grown at a rate of 1.55 % per annum between 2011 and 2022 according to the 2022 census.

Table 3.1 The total population of the ZDM is 942 794 according to 2022 census. It increased by 1.55 % per annum from 803 575 in 2011. However, this growth was spread unevenly among the five local municipalities within Zululand District, uPhongolo Municipality having the highest growth rate at 2,0% and Abaqulusi at 1,4% growth rate being the lowest in the ZDM.

Table 3.1: POPULATION DISTRIBUTION

MUNICIPALITY	POPULATION 2011	POPULATION 2022	POPULATION GROWTH (% P.A.) 2016-2022
Abaqulusi LM	214 714	247 263	1, 4%

Source: 2022 Census

Population distribution by local municipality reveals a high population concentration in the Abaqulusi Municipality with 247 263 people (26% of the ZDM population).

Table 3.2: AbaQulusi Population Projection

YEAR	2011	2022
Population Projection	214 714	247 263

STATS SA 2022

3.2.2 Gender Differentiation

The gender composition within AbaQulusi Municipal area indicates a slight imbalance between males and females. The Census 2022 revealed that approximately 48% (116 369) of the population within AbaQulusi comprises of females while 52% (130 894) comprises of males. Nevertheless, this confirms with the national trends that a higher proportion of women are found in the rural areas than men. This in many instances, especially amongst the African communities is attributed by the fact that men are generally attracted to places such as the bigger cities (e.g. Durban, etc.) that present the employment opportunities sometimes regardless of the nature of work involved.

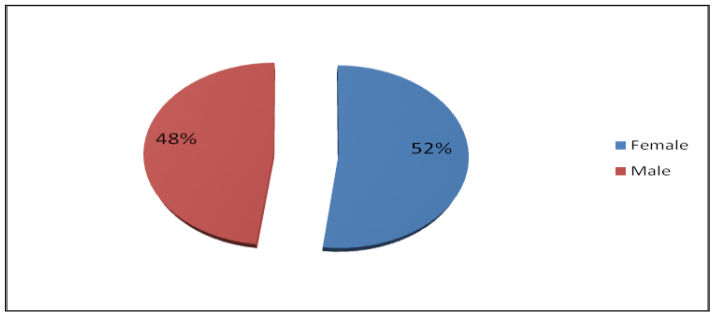


Figure 3.1: Gender differentiation, Source: Census 2022

3.2.3 Age Composition

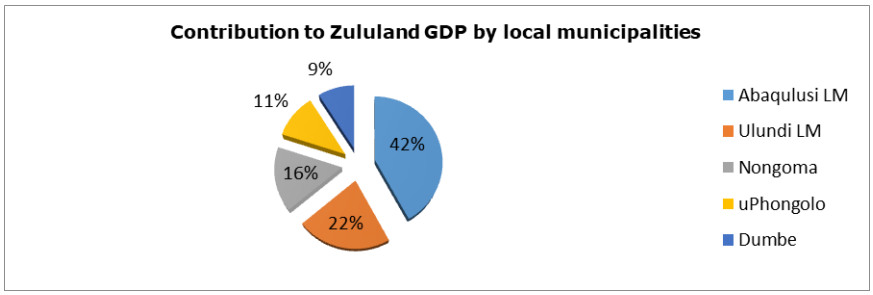
The age composition or structure determines the kinds of economic activities within the locality. Different age groups have different economic needs and different spending patterns. According to Census 2022, this is how Abaqulusi Municipal area age composition is:

- Population under 15 years is 32%
- Population which is 15 to 64 years is 63,3%
- Population over 65 years is 5,7%

This represents a significantly higher percentage of the young population than for Municipality and South Africa.

3.3 Size and Structure of the Local Economy

The collapse of coal mining industry over the last three decades has had a serious impact in the economy of AbaQulusi Local Municipality area. The rate of unemployment has increased since the collapse of the mining sector. The AbaQulusi Municipal Economic structure is dominated by tertiary services which include government services, community services, transportation and trade. The important primary economic sector is agriculture. The secondary manufacturing sectors are not well developed and contribute to a lesser extent to the economic structure of the AbaQulusi Local Municipality.



SOURCE: STATS SA 2022

Figure 3.2: Local Municipality contribution to the Zululand District

The sub-region, within which AbaQulusi lies, has developed a peripheral economy in the provincial context, mainly because of its distance from the main greater markets and corridors such as the N2 to Durban and Richards Bay and N3 to Pietermaritzburg and Gauteng. AbaQulusi does, however, have a secondary corridor of national significance. The coal line corridor, which runs from Richards Bay, through Ulundi, Vryheid and Paul

Pietersburg and on to the mining areas of Mpumalanga, is an important route in the national rail and road network.

4. WASTE MANAGEMENT PRACTICES WITHIN THE ABAQULUSI LOCAL MUNICIPALITY

4.1 Waste Generation Areas

Table 4.1 reflects the annual estimate tonnage of waste currently ending up in the Vryheid landfill site. The major waste generators include the industrial and domestic areas. The major industrial waste generators are located in the industrial area of Vryheid. Domestic waste is mainly generated in the residential areas of Vryheid, Bhekuzulu, eMondlo, coronation/Hlobane and Louwsburg. As indicated in Table 4.2, more than half of the total population (63%) are not rendered with waste service as a results they practice their waste management through burning. Only 36% of households have an average basic level of service. The Municipality uses black refuse bags, skip bins and wheely bins to store waste at the point of collection and thereafter waste is transported to the landfill site. In Vryheid waste is collected on a weekly basis from the households, daily in industries CBD and malls. Refuse is collected daily in other towns. There are 3814 indigents households where waste is collected once a week.

Other areas, such as Vaalbank and Gluckstad contribute a fairly small amount of waste. The major waste generation areas generate approximately 66 040 tonnes of waste annually. Table 4.3 shows the estimate percentage of waste quantities that are disposed of at the Vryheid landfill site. Note that the actual quantities can only be obtained when using a weigh bridge. The figures are used to provide the reader with the picture of the major waste generators in the Municipal area.

Table 4.1: Characterisation of waste stream disposed of at Vryheid Landfill Site

Type of waste	Estimate tonnage of waste per annum
Plastic HDPE	4 %
PET (Plastic bottles)	16 %
Film plastic	5 %
Organic waste (food waste)	10 %
Cardboard	16 %
Aluminium Cans	0,9 %
Polystyrene	5,3 %
Office paper	1,7 %
Glass	10 %
Food waste	5 %
Garden waste	10 %
Contaminated waste	16 %
Textile	13 %
Absorbent hygiene products	30 %
Metal cans	7 %
Firearm waste	0,1 %
Mixed waste	52 %
TOTAL	69214,51

Source: DFFE Watse Characterisation 02 July 2024

Figure 4.1: DFFE Waste Characterisation 02 July 2024

Table 4.2: Refuse removal within AbaQulusi Local Municipality (tonnes/annum)

ACCESS TO WASTE REMOVAL	2011 CENSUS	2016 Community Survey
Number to Refuse Service	43 299	51 910
Removed by local authority / private company at least once a week	17985 (42%)	20 001 (38.5%)
…less than often	434 (1%)	2 021 (3.9%)
Communal refuse dump	511 (1%)	889 (1.7%)
Own refuse	20764 (48%)	21 774 (41.9%)
Access to Refuse Removal	92%	86%
No rubbish disposal	2728 (6%)	5 355 (10.3%)
Other	878 (2%)	1 870 (3.6%)

Source: STATS SA 2022

Table 4.3: Estimate percentage of waste volume disposed of at Vryheid Landfill Site

Type of waste	Estimate tonnage of waste per annum
Plastic HDPE	4 %
PET (Plastic bottles)	16 %
Film plastic	5 %
Organic waste (food waste)	10 %
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Source: DFFE Waste Characterisation 02 July 2024

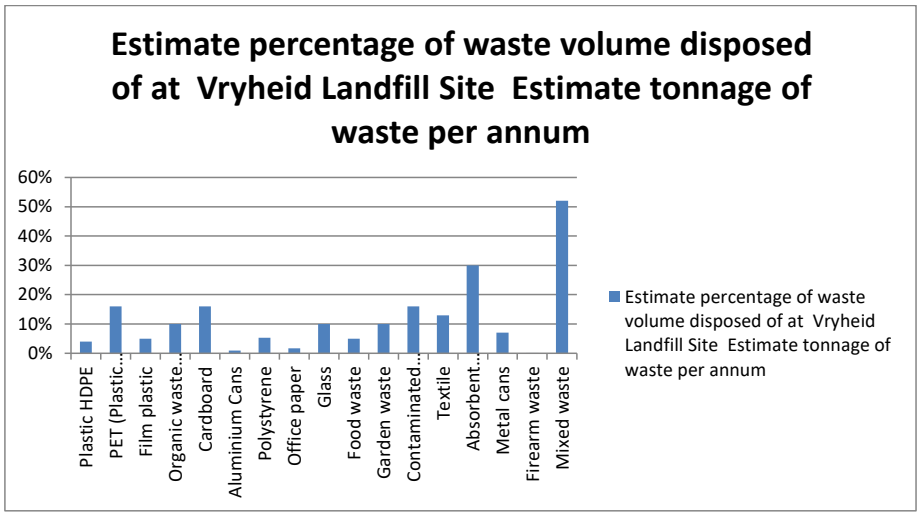

Figure 4.2 Estimate percentage of waste volume disposed of at Vryheid Landfill Site

4.2 Projection of Waste Generation

Waste generation growth estimates should not take only the economic growth, population growth rate, socio-economic profiles of the population, industrial growth and urban sprawl into consideration, but should also take into account waste minimization measures and recycling interventions over the planning period.

4.2.2 Waste Stream Analysis

The Municipality is currently disposing of approximately 89 891 tonnes per annum. It must be noted, however, that this is an average figure which is calculated from the trucks that enters the site.

a) Medical and Hazardous Waste

The municipality is currently not involved in the collection, transportation, treatment or disposal of any medical and hazardous waste generated within the municipal area. Medical waste comprises of anatomical, infectious and pharmaceutical waste. It includes sharps, ampules, soiled dressings,

syringes, needles, etc. The anatomical waste is collected by Compass Waste Services (CWS). They store this waste in their cold storage facility and thereafter dispose it of in either the Roodepoort or Bloemfontein Incinerator. The infectious waste is also collected by pass Uvikela and Eco cycle Services into their facilities where it is autoclaved to sterilise it, shredded and thereafter disposed of into the Dundee landfill site.

Site visits to the current waste disposal facilities and subsequent interviews with the officials of the AbaQulusi Local Municipality show that the majority of medical practitioners, clinics and hospitals do separate their medical waste from their general waste.

The majority of companies in the town of Vryheid neither have their own IWMPs nor records of amounts of waste generated by their business operations, especially hazardous waste. Lack of such information makes it difficult to quantify the amount of this waste stream.

AbaQulusi landfill site currently does not have spotters to identify and separate hazardous and toxic waste coming into the landfill sites. Thus, it is highly possible that other hazardous material is disposed of in this landfill site, such as aerosol cans, batteries, paint, household chemicals, etc. No information was provided for other hazardous and toxic waste generators, such as hair and beauty salons.

b) Garden waste

There are currently no containers meant for collection of garden waste in AbaQulusi Local Municipality. Most households put garden waste in black plastic bags meant for domestic waste and put this on the pavement for collection by municipality. Larger garden waste, such as trees also find their way to the landfill sites. The majority of the people are not composting as they do not know what to compost and how to compost waste. It is thus

important that the AbaQulusi Local Municipality initiates an education and awareness programme aimed at improving composting within the Municipality. The following products, along with other biodegradable products can be composted:

- ✓ Grass/lawn;
- ✓ Kitchen waste i.e. fruit and vegetables, tea bags, egg shells;
- ✓ Leaves;
- ✓ Weeds and other garden waste; and
- ✓Woodchips and sawdust, etc.

c) Building rubble

Building rubble is cause for concern for the AbaQulusi Local Municipality. It does not only find its way into the Vryheid Landfill site, but it significantly reduces the airspace of the already near capacity facility. Each time there is a demolition of building, the households or business hire a bulk mass container for collecting building rubble from the Municipality. The Municipality dispose of the debris and all the rubble in the landfill site.

Waste minimization practices need to be put placed in order to reduce the bulk of building rubble that is eventually landfilled.

d) Abattoir waste

The local abattoir" industry poses serious environmental threats if their current waste management practices go unchecked. The problems resulting from abattoirs range from, amongst others, excessive usage of water, malodours, waste discharges into watercourses and contamination of underground water. Above all, some of untreated abattoir waste as well as condemned animal bodies eventually find their way into the landfill site.

The most widely used route for disposal of abattoir waste is municipal sewers. Discharge cost due to high organic strength of untreated abattoir waste is relatively high. Abattoirs normally also have difficulty in meeting municipal By-Laws for fats, oils, greases and suspended solids. A degree of on-site pre-treatment is therefore preferable; however, to minimize waste volumes, water conservation and optimum water housekeeping are essential.

In addition to good abattoir housekeeping, abattoir waste management should be implemented commencing with low cost, low technology practices and thereafter progressing to more sophisticated technologies. Some of the best management pre-treatment practices are discussed in

4.2.3 Current Waste Minimization and Recycling Initiatives

Chapter 4, Part 3, Section 17 of the Waste Act provides for the reduction, re-use, recycling and recovery of waste products. One of the major reasons for the increasing amount of the disposed waste at the landfill sites is the current lack of waste minimization initiatives or incentives to promote waste minimization and separation in industrial and residential areas.

Part 5, Section 23 (2) of the Waste Act further states that "*Every municipality must, subject to this Act, and as far as is reasonably possible, provide containers or receptacles for the collection of recyclable waste that are accessible to the public."* There are currently no recyclable waste containers provided by the AbaQulusi Local Municipality within its jurisdiction.

Recycling in Vryheid landfill site is done by informal recyclers. Material recycled on site includes cardboard boxes, scrap metal, tyres and plastic bottles. There are no recycling activities at eMondlo and Louwsburg.

4.2.4 Waste Treatment

The AbaQulusi Local Municipality currently does not have any medical and hazardous waste treatment facilities within its jurisdiction.

4.2.5 Waste Disposal Facilities

The AbaQulusi Local Municipality is serviced by one landfill site, namely Vryheid landfill site. The closure process for eMondlo landfill site has already been finalised. Illegal dumping is generally a problem in all areas. In the landfill site waste is measured and there is a weigh bridge which is not functional. All domestic and industrial waste is disposed of in the landfill site. There is intervention on the existing Abaqulusi landfill site from MISA including DFFE and EDTEA to ensure compliance and maximum performance.

a) Abaqulusi Landfill Site

The site is currently permitted and has been receiving waste for more than ten years. This landfill site has enough capacity for approximately five years and therefore requires an operational license should the municipality intend to continue use of the facility. The efficient management of this site could extend the lifespan of the site even further as there is currently informal sorting or recycling taking place on site. The site is ideally located as a landfill site as it has good access roads and it is centrally located within the municipality. The landfill has permit whether for closure or continued operation in terms of the relevant legislation. These would include fencing of the landfill, enforcement of access control and control of waste types, daily compaction, daily cover and shaping of the landfill to facilitate drainage and litter, odour and dust control, EIA process and permitting in order to comply with the legislative requirements.

Figure 4.3 Abaqulusi Landfill Site

4.3 Evaluation of the Current Systems

After having discussed the current waste management systems, the focus will now be on the evaluation of the existing waste management facilities, waste collection infrastructure and personnel. This evaluation will be in accordance with a SWOT analysis. The SWOT analysis will look at the strengths, weaknesses, and threats facing the current waste management system in the AbaQulusi Municipal area.

Table 4.7: SWOT Analysis for Abaqulusi Landfill Sites

Table 4.7.1: Landfill site

ASPECT	STRENGTH	WEAKNESS	OPPORTUNITY	THREATS
SERVICE	Inadequate waste management systems, but there is room for improvement.	Sorting and recycling occurring at a minimal scale.	High potential for sorting and recycling.	Loss of economic benefit to disadvantaged communities.

EQUIPMENT	One compactor machinery, water tank truck, tipper truck and excavator	Lack cover material	Buy compactor machinery/Dozer	Escalating cost of maintenance
LANDFILL	Good access roads and centrally located within the municipality. Has enough capacity for approximately ten years.	Inefficient waste management systems. Licensed and has been receiving waste for more than ten years.	Operational license has been obtained and efficient waste management systems be put in place to extend the lifespan of the site.	Cost of environmental impact assessment and the Environmental Authorisation.
PERSONNEL	There are two personal employees	The job at hand just heavy for these two officials	Appoint Landfill site officer and Waste Officer to ensure that hazardous waste does not find its way into the landfill and ensure compliance.	Hazardous waste may end up in the general waste disposal site.

Table 4.8: Distance from various towns within AbaQulusi Local Municipality in relation to the town of Vryheid

TOWNS	DISTANCE TO LANDFILL (VRYHEID)
EMondlo	27km
Louwsburg	67km
Hlobane	25km
Vaalbank	14km
Coronation	25km

5. GAP ANALYSIS AND NEEDS ASSESSMENT

5.1 Gap analysis

- One of the keys aims of an Integrated Waste Management Planning is to bring conformity, consistency and compliance to legal requirements used to govern waste management. The compilation of the AbaQulusi IWMP began with the collection of baseline information, which informed the drafting of the Status Quo or Situation Analysis Report. The AbaQulusi IWMP is in accordance with the recently promulgated Waste Act.

The gap and need analysis are informed by the information gathered in the Status Quo Report, through interviews, public participation site visits and questionnaires. It is also based on the Waste Management Hierarchy which is embedded as the primary objectives of the Waste Act.

Table 5.1: Gap and Needs Analysis for AbaQulusi Local Municipality

STRATEGIC ISSUES	GAPS	NEEDS
Institutional / Organisational	❖ There is general shortage of skilled staff in waste management. More staff needs to be appointed on waste management services. ❖ Lack of clearly defined roles and responsibilities. ❖ Insufficient capacity in terms of man power.	❖ More skilled and trained personnel must be recruited and an accredited service provider must be appointed to provide training to operational staff. ❖ Recruit staff in accordance with waste hierarchy. ❖ Advertise and fill all vacant posts.

	❖Lack of waste management By-Laws.	❖Appoint a service provider to assist in developing By-Laws. Training of officials on enforcement and compliance of By-Laws must be undertaken**.**
Integrated Waste Management Planning	❖General lack of waste management compliance because of the absence IWMP.	❖Source resources (human and financial) to ensure the successful implementation of IWMP.

Waste Management Information	❖ Lack of waste information on the current status of the equipment used for the service of waste collection. ❖ Lack of waste information recording systems. ❖ Lack of information management and dissemination systems. ❖Lack of reporting requirements.	❖ Collect information regarding general waste management including generation, collection disposal and operation of landfill sites. ❖ Develop a Municipal Waste Information System and provide necessary training to operating staff. ❖ Collect information on environmental impacts and resources in general. ❖Monthly meetings to report on waste management.

Waste Collection Services	❖ Illegal dumping ❖ Lack of access for collection services to some households especially in rural areas ❖ Inflexibility of current collection systems to collect separated waste for recycling	❖ Regulate and monitor waste production through use of by-laws ❖ Include collection services for households in rural areas ❖ Provide resources like waste bins and skips to kick start separation at source.
Waste Minimization and Recycling	❖ Lack of waste minimization strategy.	❖ Develop a waste minimization strategy to ensure waste reduction in generation areas.

	❖ Poor coordination of recycling activities. ❖ Industries" lack of IWMP. It is a statutory requirement to do so.	❖ Establish a WIS with a database of major waste generators. ❖ Establish a database of all recycling initiatives and facilitate engagement between business and recycling groups. ❖ All industries need to draft their own IWMPs. By-Laws can assist in this regard.

Commented [SD1]: Industry waste management plans

ABAQULUSI LOCAL MUNICIPALITY

Waste Disposal Facilities	❖ Incorrect location of landfill site. Buffer zone is less than the required minimum of 500m. ❖ Lack of fencing and poor access control. ❖ No waste screens resulting in waste debris scattered in and around the landfill site.	❖ Build landfill sites in appropriate areas and keep to buffer zone requirement ❖ Landfill sites should be fenced off to prevent scavenging. ❖ Erect waste screens to prevent waste debris flying around.
	❖ Co-disposal of waste like garden waste with domestic waste, construction and demolition waste (rubble). ❖ Poor design of landfill sites.	❖ Different types of waste should be separated and disposed of appropriately. ❖ Design landfill sites as per EDTEA Minimum Requirements.

Education, Capacity Building and Awareness	❖ Lack of comprehensive understanding of waste management issues.	❖ Conduct refresher courses on staff involved in waste management issues.

5.2 Priority Projects

Situation analysis provides a detailed description of the current situation of waste management within AbaQulusi Local Municipality. It provides a baseline in understanding what the current challenges facing the AbaQulusi Municipality are, what the existing gaps are, what the „desired state" for waste management should be, and the requirements or needs in order to achieve this "desired state". The *Status Quo* Report discussed in the previous section has revealed serious environmental management challenges faced by the AbaQulusi Municipality. However, it is important to outline urgent interventions within the Municipality, which have implications for the overall management of waste within its jurisdiction. The following programmes/projects have *inter alia* been identified as priority projects to be included in the IDP, and implemented within the next five years (detailed planning and project descriptions is provided.

- Development of Integrated Waste Management Planning;
- Development of waste collection infrastructure;
- Development of waste disposal infrastructure;
- Waste minimization and recycling;
- Institutional and organizational review;
- Development of a Waste Information System;
- Publish and enforce Environmental Management By-Laws;

- Environmental education and awareness;
- Review of the current tariff structure.

5.3 Needs Assessment

5.3.1 Waste Collection, Transportation and Disposal needs

Population and economic growth are the major drivers of increased waste generation through increased production, consumption and intensified construction. An increase in population and household numbers as well as expansion of serviceable areas within the Municipality will require efficient planning of collection, transportation and disposal of waste generated by the growing population. In addition, waste recycling strategy identifying awareness programmes and campaigns must be developed.

5.3.2 Institutional and Organizational Needs

An analysis of the AbaQulusi Local Municipality's Waste Management Unit reveals that there is insufficient capacity in terms of man power and there are still vacancies that need to be filled. Most of the staff involved with waste management lack skills and their roles are not clearly defined. This insufficient capacity leads to a lack of staff commitment due to existing staff being over worked (See Annexure A: The current waste management organogram). The Municipality should consider establishing units, such as waste recycling unit, waste research unit and compliance and enforcement unit.

The AbaQulusi Municipality does have waste management By-Laws, that needs to be gazetted and up doted by the council.s is a cause for concern as By-Laws regulate waste management activities within the Municipality. A service provider must be appointed to assist in drafting and fine-tuning the existing By-Laws and providing training of officials on enforcement and compliance. The public must also be made aware of the By-Laws.

5.3.3 Need for Recycling Initiatives

The *Status Quo* Report has shown that the recycling initiatives in the AbaQulusi Local Municipality are very small and not supported at all. Chapter 4, domestic waste constitutes the largest volume of waste generated and disposed of. This is where recycling and composting initiatives should be targeted, as well as packaging industries. The municipality must also assist in promoting recycling initiatives and the establishment of recycling companies.

5.4 Financial Requirements

The implementation of the IWMP would require sufficient funds for the recruitment and training of staff, procurement of equipment and applications for licenses. The implementation of the IWMP should be done in a phased manner, taking into cognizance the AbaQulusi Local Municipality's priorities at the time.

6.POLICY, GOALS AND OBJECTIVES

6.1 Proposed Waste Management Policy

Population and economic growth within the jurisdiction of the AbaQulusi Local Municipality has resulted in net growth in the volume of waste generated. Current trends indicate a marked increase in waste generation. This trend necessitates that the Municipality develop interventions with the objective of minimizing waste and thus reducing the potential of experiencing environmental and health problems. If this is not considered as a matter of urgency, it has the potential to negatively affect the municipality area as a tourist destination. To this end, the AbaQulusi Local Municipality has as its overall waste management policy objective, "to significantly reduce the amount of waste that finally gets disposed of in the landfill by raising community awareness and empower them economically with waste management interventions that will enable them to live in sustainable human settlements".

6.2 Goals and Objectives

It is important to structure goals and objectives in accordance with the National Waste Management Strategy. The main goal of IWM planning is to optimize waste management by maximizing efficiency, and minimizing associated health and environmental impacts, financial costs; thereby improving the quality of life of all South Africans. The intention is to move away from the „cradle to grave" approach to a fully integrated waste management approach based on the waste management hierarchy.

The goals and objectives of the AbaQulusi Local Municipality are informed by the Situation Analysis, Gap Analysis and Needs Assessment, which were dealt with in the previous chapters.

The process related goals and objectives of the NWMS are summarised in the table below.

Table 6.1: Process related Goals and Objectives of the NWMS

GOAL	OBJECTIVE
Securing ecologically sustainable development while promoting justifiable economic and social development	• To ensure the protection of the environment through effective waste management measures • To protect the health and wellbeing of people by providing an affordable waste collection service • Grow the contribution of waste sector to GDP • Increase number of jobs within waste services, recycling and recovery sectors • Promotes SMMEs in waste sector
Avoiding and minimizing the generation of waste	• Ensure the design and manufacture of products that avoid or minimize waste generation • Discourage waste generation through cost reflective and based tariffs • Increase consumer awareness of waste minimization issues

Reducing, re-using and recovering waste	• Increase reuse and recycling rates of products • Reduce the percentage (%) of recycling material to landfill • Ensure separation at the source in all metropolitan and local municipalities • Encourage the establishments of Material Recovery Facilities (MRFs) • Encourage waste to energy options • Support the diversion of high calorific waste from landfill recovery options
Promoting and ensuring the effective delivery of waste services	• Facilitate the provision of at least a basic level of waste service to all • Ensure an effective and efficient solid waste management • Implement free basic refuse policy for indigent households • Promote the regionalisation of waste management services
Treating and safely disposing of waste as last resort	• Stabilise quantity of waste disposal to landfill then reduce this volume • Improve landfill management to comply with legislation • Increase thermal treatment and conversion of waste to energy • Ensure diversion of certain waste tyres from landfill

Remediating land where contamination presents a significant risk of harm to health or environment	• Quantify the extent of contaminated land • Implement contaminated land measures in the Waste Act. • Remediate priority areas of contaminated land. • Clarify extent of state liability for contaminated land.
Achieving integrated wate management planning	• Reliable information of waste flows and accurate national waste balance • Establish and implement an effective system of performance based IWMPs at all levels of governments. • INDWMPs approved for key industrial sectors
Sound budgeting and financial management for waste services	• Sound financial planning for waste services. • Full cost accounting for waste services. • Cost reflective volumetric tariffs implemented. • Waste services sustainably financed.
Adequate staffing and capacity for waste management	• WMOs appointed at all levels of government. • Additional technical capacity developed to deal with norms and standards, industry regulation and remediation. • EMI capacity expanded to deal with Waste Act. • Private sector capacity mobilized to support waste service delivery and community-based collection models.

Effective compliance and enforcement of waste regulations	• Conduct systematic monitoring of compliance with regulations and permit conditions. • Create a culture of compliance with Waste Act regulations. • Establish a hotline to report non-compliance. • Successful prosecution of waste offenders.
Effective monitoring and reporting on performance with waste functions	• Implement systematic monitoring of key performance indicators by each sphere of government. • Reporting on key performance indicators in line with the Waste Act. • Conduct regular evaluation of performance with waste functions and IWMPs.
Ensure that people are aware of the impact of waste on their health, wellbeing and the environment	• Develop national and local awareness campaigns on the social importance of waste management. • Promote waste minimization and recycling through education system. • Establish an equivalent to the "Blue Drop" award for waste management by municipalities.

Source: DEA National Waste Management Strategy, March 2010

The goals and objectives were developed subsequent to the analysis of the status quo and evaluation of gaps and needs. These goals and objectives will therefore be incorporated into the local waste management strategy to form the core of the Integrated Waste Management planning for the AbaQulusi Local Municipality.

Tables 6.2.1 to 6.2.7 show the goals and objectives that will be incorporated into the IWMP:

ABAQULUSI LOCAL MUNICIPALITY

Table 6.2

Table 6.2 Proposed Goals and Objectives for AbaQulusi Local Municipality IWMP

Table 6.2.1: Integrated Waste Management Planning

Goal	Achieving integrated waste management planning.
Objective	✓ Maximize efficiency; minimize associated health and environmental impacts and financial costs, thereby improving the quality of life. ✓ Reliable information on waste flows. ✓ Establish and implement an effective system of performance based IWMP. ✓ Industries to be encouraged to prepare IWMPs through By-Laws, especially for key industrial sectors.
Target	➢ Implement the IWMP by July 2025 ➢ Industry to prepare their WMPs by June 2027.

2: Waste Information Management

Goal	To have accurate waste information data available and an effective waste information management system.
Objective	✓ To develop an information system to capture relevant data for current operation and future planning, in order to optimize waste management and budgeting. ✓ Establish a monitoring and information system to track waste generation, collection, re-use, recycling and disposal in terms of waste flow and facilitate waste exchange. ✓ Assist in delivery of information on waste services. ✓ Enforce the retrieval of information from the private sector. This will make medical and hazardous waste information available.
Target	➢To have a fully operational Waste Information System (WIS) in place, including extensive industry database and up-to-date waste management information by June 2027

ABAQULUSI LOCAL MUNICIPALITY

Table 6.2

3: Waste Collection Services

Goal	To provide an appropriate, affordable and sustainable waste collection service to all people within the AbaQulusi Local Municipality and ensure that they live in a healthy and clean environment free of illegal dumping.
Objective	✓ To extend access to quality and sustainable waste services to all areas, including tribal households. ✓ Initiate and implement appropriate waste collection services to informal settlements, and high-density low income and informal trading areas. This should happen at all times during the day to create awareness about waste management issues within the community and thereby empower communities to take responsibility for cleanliness of their surrounding environment. ✓ To minimize illegal dumping and littering through sustained clean-up programs, education and by-law enforcement. ✓ Ensure that all private waste collection and transportation companies are registered on the municipal WIS.

Target	➢ 75% of all households to receive a regular waste collection service by June 2027. ➢ Illegal dumping to be phased out by June

	2029. ➢The National Policy for the Provision of Basic Refuse Removal Services to Indigent Households to be aligned with the existing Indigent Policy of AbaQulusi Municipality by June 2029.

Table 6.2.4: Waste Minimisation and Recycling

Goal	To implement sustainable recycling within AbaQulusi giving due consideration to social, environmental and economic factors.
Objective	✓ Encourage, educate and promote separation at source, waste minimization and recycling. ✓ Promote cleaner production. ✓ Reduce waste quantities disposed of at landfill sites. ✓ Ensure that waste minimization and recycling procedures and practices are adopted by all sectors of society. ✓ Create sustainable employment through local entrepreneur development in waste recycling partnerships.
Target	➢A target of 50% reduction of general waste streams disposed of to landfill by June 2029.

Table 6.2.5: Waste Disposal

Goal	Ensure sufficient long term waste disposal capacity that is environmentally and publicly acceptable; also ensure that all landfills are progressively rehabilitated in such a manner so as to minimize the negative impacts on the environment and nearby communities.
Objective	✓ To ensure at least 20 years or more of licensed airspace to serve the current and projected waste disposal needs of the Municipality. ✓ Upgrades the operating landfill sites to meet DWAF"s Minimum Requirements, and ensure that all waste disposal sites are registered. ✓ Develop a plan for the progressive rehabilitation of current and future landfill sites to the approval of the regulatory authority.
Target	➢ Develop and commission a new landfill site to receive all the waste generated by the Municipality by 2018. ➢ Commission an environmental impact assessment for the regional landfill site by 2011. ➢ Closure and rehabilitation of all illegal dump sites by 2029.

Table 6.2.6: Organisational and Institutional Review

Goal	Successful implementation and review of the waste management plan from an organizational and institutional perspective with all targets set up by IWMP being realized.
Objective	✓ Establish an organizational structure in line with all waste management planning requirements and activities. ✓ Implement appropriate mechanisms for monitoring and enforcement of waste management by-laws. ✓ Ensure that enforcement efforts are efficient, well-coordinated and effective. ✓ Ensure that activities of relevant municipal staff and departments are well coordinated and aligned. ✓ Ensure that there is sufficient capacity and capability in the municipality for planning, contract management, monitoring and enforcement. ✓ Review and incorporate additional by-laws required for the implementation of the integrated waste management plan.
Target	➢ Employ required staff in order to up capacity. ➢ Establish effective monitoring and enforce waste by-laws by June 2027.

Table 6.2.7: Waste Management Education, Capacity Building and Awareness

Goal	Ensure that the community of AbaQulusi Local Municipality is informed and made aware of waste management issues in general and of the integrated waste management system and that municipal staff involved with waste management and related issues is competent to implement the plan successfully.
Objective	✓ Develop and implement a communication and public awareness program. ✓ To build capacity and raise the skill profile of the municipal staff. ✓ Ensure that the public and the private sector understand their specific roles and cooperate and participate in the waste management issues. ✓ Change the historical mind-set around illegal dumping and littering.
Target	➢80% of the AbaQulusi Local Municipality must be exposed to information and made aware of waste management and waste management planning issues by June 2027.

7. INVESTIGATION OF ALTERNATIVES

Having identified the Goals and Objectives in Chapter 5, these will now be evaluated by developing alternative solutions to meet them. From

the various alternative solutions developed, feasible scenarios are compiled taking into consideration various aspects of the waste management cycle. These scenarios will then be evaluated to ensure that most suitable scenario is selected for implementation. The following information is provided to assist the reader to better understand the conditions and terminology often used in waste management.

7.1 The Collection Services

Collection services entail the use of fleet, waste receptacles, condition of collection roads, and number of collection points per day and the frequency of collection. All these aspects must be considered in order to determine the most cost-effective waste collection option.

7.1.1 Waste Receptacles

There are a number of waste receptacles that can be used, such as 85l bins, 210l trolley bins, skip containers, etc. The receptacle will be dependent on the volume of waste generated at a collection point, the type of waste, the type of collection vehicle and the cost of service to the community. For commercial collection, for example restaurants, shops, etc., a vast number of receptacles can be used. In smaller towns, such Louwsburg the municipality can render a service by putting the receptacles at shops, schools and households for collection by tractor and trailer. However, in larger towns collection of waste can be done by private contractors. Generators of industrial waste usually dispose of their waste themselves, or use a private contractor. The waste receptacle commonly used for industrial waste is skip containers. Domestic waste receptacles should be placed on the pavement on the day of collection. This allows for easy access to the receptacle and saves on actual collection time.

Table 7.1: Waste skip receptacle prices as in 2025.

WASTE SKIPS	SIZE	ESTIMATED PRICE
	5.5m³	**R 24 320.00**
	6m³	**R 25 000.00**
	8m³	**R 30 600.00**
	11m³	**R 10 500.00**

7.1.2 Collection Fleet

The type of waste collection fleet is usually determined by the cost of service to the residents, the condition of the collection roads (surface, terrain, etc.), the distance to the landfill site and the number of collection points serviced per day. There is a wide range of collection equipment that can be utilized for collection fleet. This can range from a tractor and a trailer system, which may roughly cost R 500 000, up to top of the range REL with the estimated cost of R 2 500 000. It is important that the right equipment is utilized for the right conditions and the type of service required.

The road condition that the collection vehicle has to drive plays a major role when deciding on a particular collection vehicle. If one has to compare a rural road full of potholes to a road in a city suburb, a tractor and a trailer would be the more suitable in the rural application as opposed to a state of art 20m³ REL, which is not built to drive on poorly maintained roads. The maintenance cost would be above normal for a REL to drive these roads on a daily basis due to wear and tear on the

parts. A tractor and a trailer, which is a much more robust type of system, will be better suited to such conditions. In an urban environment a tractor and a trailer will be less suited as the landfill is far from the collection areas and will take too long for a round trip.

7.1.3 Distance to the Regional Landfill Site

As discussed above, distance to the landfill site plays an important role when dealing with waste collection service. For example, if the landfill site is situated 27km from the collection area (eMondlo – Vryheid), a tractor and a trailer will spend most of the time driving from the collection area to the landfill site and back. As a general rule, a tractor and a trailer combination should not drive further than 7km from the collection area to the landfill site. For distances above 7km, alternative types of vehicles should be considered.

Another form of waste collection that can be considered is the use of a mobile compactor with a demountable container. This can be used in various applications. Once the container is full, it is demounted and left for a Roll-on-Roll-off truck to collect. The collection vehicle therefore does not waste any time driving to the landfill site and back.

7.1.4 The Number of Collection Points

The number of collection points becomes critical in the urban area where a 20m³ compactor collection truck collects up to 1 500 service points per day. A collection vehicle's sole purpose should be to collect waste and not spend time driving from the collection area to the landfill site and back. For example, a 20m³ compactor collection truck can collect up to 60m³ of waste at a time because of a one to three (1:3) compaction ratio, while a tractor and a trailer combination can collect only 7m³ to 12m³ at a time before it has to offload. The tractor and

trailer combination therefore has to make many more trips to the landfill site than a 20m³ compactor collection truck. The compactor collection truck therefore has more time for the collection and service of more points. It must also be noted that the staff collecting and loading the collection vehicle are idling while the vehicle is on the road to the landfill site and back.

7.1.5 Landfill Equipment

On a large-scale landfill site (Vryheid) a landfill compactor, a loader, water container and a tipper will be needed to ensure effective operating conditions. For smaller landfill sites a multi-purpose vehicle will handle waste effectively enough and on communal landfill sites where a trench system is used a machine is only required part-time. The type of equipment will depend on the type of operation (trench, cell, etc.) and the volume of waste generated. Compaction is an important factor since this allows for more waste to be disposed of at a landfill thereby prolonging the life-span of a landfill site. Economics, however, play an important role since the volume of waste has to justify the type of equipment. It is of no use using a 30tonne landfill compactor, capable of handling over 500 tonnes of waste per day, on landfill only receiving 10 tonnes per day. Such a machine cost in the region of R 3 000 000 and operating cost is in the region of R 200.00/hour without the cost of the operator or maintenance cost.

From the above discussion, it is quite evident that the choice of equipment is very important to ensure that the correct equipment is used for the correct application.

7.2 Site Selection Criteria for Refuse Transfer Station (RTS)

In order to identify suitable sites for the location of the transfer station in AbaQulusi Local Municipality a number of siting criteria should be used. Site suitability depends on a number of technical, environmental,

economic, social and political criteria and a balance needs to be achieved among the multiple criteria that might have competing objectives. The following criteria for the initial screening are generally technical, environmental and economic. It can be expected that the Scoping Process will identify additional social and political criteria to be addressed.

7.2.1 Factors to be considered when identifying a site for Refuse Transfer Station

i) General location

It is desirable that a transfer station be located near the centroid of the population to be served, and near a major haul route to the destination landfill to maximize waste collection efficiency.

ii) Land-use

The site should conform to zoning requirements, building heights and setbacks. Appropriate land use designation would include municipal and industrial.

iii) Access to major transportation routes

The transfer station should have direct and convenient access to truck routes, major arterials, and freeways. Provision for intermodal transportation facilities should be made which will require access to rail. It is preferable to avoid routing traffic through residential areas in order to minimise noise and congestion problems and ensure the safety of the community.

iv) Traffic compatibility

Use of the transfer station is likely to involve an expansion of local traffic, including heavy vehicles such as bulk haulage trucks. Congestion may also occur at peak periods the siting of the transfer station should not cause interference with existing road traffic.

v) Prevailing winds

Prevailing winds are a consideration due to the possibility of odours, however enclosing the transfer station and providing odour control devices can mitigate against the impact of odours.

vi) Site size requirements

The area required for a transfer stations varies significantly, depending on the volume of waste to be transferred, rates at which waste will be delivered, the functions to be carried out at the site, and the types of customers the facility is intended to serve. Locating a site of sufficient size is critical to operating efficiencies and minimizing impacts on the surrounding community. There should be sufficiently space for onsite roadways, queuing, and parking. Allowance would also be made for a buffer zone around the station. Provision will also be made for recycling and public education.

vii) Cost of land

The cost of purchasing land for a transfer station can be significant and impact on its viability. The preferred option would be to use municipal land.

viii) Site services

Consideration should be given to the availability of utilities, including water, sewer, and electricity. Transfer stations generally require electricity to operate equipment such as compactors, lighting, water for

facility cleaning, restrooms, and drinking; and sanitary sewer systems for wastewater and leachate disposal. The proximity of services can have a strong impact on capital and operating costs.

ix) Topography

Transfer stations often are multilevel buildings that need to have vehicle access at several levels. Completely flat sites need ramps or bridges constructed to allow vehicle access to upper levels. Sites with moderately sloping terrain can use topography to their advantage, allowing access to the upper levels from the higher parts of the natural terrain and access to lower levels from the lower parts. Sites with steep slopes might require extra costs associated with earthmoving and retaining walls.

x) Visual impact

The transfer station should preferably be oriented so that transfer operations and vehicle and traffic are not readily visible to the surrounding development. To mitigate impact on the surrounding community, a transfer station should be located in an area that provides separation from sensitive adjoining land uses such as residences. Buffers can be provided and can be natural or constructed and can take many forms, including open spaces, fences, sound walls, trees, berms, and landscaping. In addition, the building should be aesthetically pleasing and complementary to surrounding development.

7.3 ALTERNATIVE WASTE TREATMENT TECHNOLOGIES

Over the past few years various alternative waste disposal technologies have been developed, all with one common disadvantage (high capital cost). The following is a list of alternative technologies to landfilling.

Treatment Type	Advantage	Disadvantage

Biological Treatment: Composting	Low capital cost Environmentally friendly Good product	Extensive land required Long period for composting Odours if not well managed Contains heavy metals
Waste to Fertiliser	Small area required Organic fertilizer Good earning potential	High capital costs Need investigation of markets Sorting of waste required
Thermal treatment	Reduces waste stream Controlled handling of waste Can be used to generate energy	High capital cost Not in line with national policy of recycling and re-use Air pollution control required
Steam treatment	Enables recycling By product can be used as a renewable energy source	High capital cost Extraction of recyclables require resources Technology must be imported Requires investigation into sustainability

From the various alternative solutions developed, a number of feasible scenarios, which are in line with the strategic goals and objectives identified during the gaps and needs analysis of the Status Quo, will then be compiled. The following strategic goals are regarded as the key priority areas (major gaps and needs) from which the implementation

plan revolves. These goals will further be broken down into projects with their own specific description, objectives, time-frames, anticipated cost and expected deliverables in the next chapter. For now, the focus will be on measures to be considered under the alternatives investigated as well as the recommendations for each scenario.

7.4 RECOMMENDATIONS WITH REGARD TO THE ALTERNATIVES

Table 7.2: Goals, objectives and recommendations

GOALS	OBJECTIVES	RECOMMENDATIONS
Disposal infrastructure development	• Establish RTS at eMondlo and Louwsburg. • Purchase and place appropriate waste receptacles at the two RTS. • Ensure that the RTS are permitted and comply with legislative requirements • Establish a regional landfill site. • Erect fencing around all landfill sites to control access and avoid litter flying all over the place. • Purchase a 30tonne landfill	• Obtain a landfill site license as per NEMWA requirements. • 30tonne landfill compactor is ideal for a regional landfill site. • Loader, tipper and water container are needed for the effective operation of a landfill site.

	compactor. • Purchase a front-end loader and a tipper for operation at regional landfill site. • Purchase a water container.	
Waste collection infrastructure	• Purchase 4 X 6m³ skip containers for eMondlo RTS. • Purchase 4 X 6m³ skip containers for Louwsburg RTS. • Provide households with waste bags. • 1 X 19m³ or 20m³ REL truck for waste collection from Louwsburg, Coronation and eMondlo townships to Vryheid at least once a week. • Purchase of three (3) tractors and trailers for waste collection at Louwsburg, Coronation and eMondlo. • Purchase of 3 mobile compactor trucks for Vryheid and its suburbs. • Purchase of 20m³ REL for loading waste from Vryheid area to the regional landfill site.	• From the previous discussion regarding investigation of alternatives, it is evident that a tractor will be more suited to operate in rural areas where the surface of the road is often slippery or with potholes. • The REL trucks can be conveniently used in urban areas where road surfaces are relatively smooth. The REL truck is also good for travelling long distances from waste collection points to landfill site.

Institutional	Appoint personnel in	The delivery of an
capacity and huma resources	accordance with the integrated waste management planning. • Train staff whether inhouse or seek a service provider. • Expose staff to the requirements of National Waste Management Strategy and National Environmental Management Waste Act. • Appoint the Waste Management Officer to coordinate all the waste management issues within the AbaQulusi Municipality. • Appoint „spotters“ to look for hazardous waste within the general landfill site. • Promulgate By-Laws for waste management.	effective refuse removal service and efficient waste management within the AbaQulusi Municipality depends on the ability of the staff to perform their specific functions. • It is therefore non-negotiable that staff be trained to perform their specific duties. • Appointment of WMO is a legislative requirement in terms the Waste Act. • Institute continuous monitoring and evaluation programme. • Appoint a service provider to draft By-Laws and to train staff.

Dissemination of information / Communication	Introduce the Cleanest Town Competition. The competition focuses on how municipalities manage their environment and how they deal with their waste management obligations. The CTC further aims to integrate responsible environmental management principles into the developmental programmes	This initiative encourages the successful implementation of waste minimization programmes, such as recycling, composting and waste separation amidst many challenges, such as the lack of financial resources and poor infrastructure experienced by many municipalities. It also

	of municipalities, leading to clean, sustainable human settlements. • The competition contributes towards a sustainable future, creating public awareness on waste management issues by encouraging communities to clean up their residential areas and working towards improving the marketability of their towns as tourist destinations. • Introduce Waste Management in Education in order to educate and change the mindset of primary school leaners through the training of their educators, with respect to waste and sustainable development. This provides municipality with an opportunity to engage with schools to address the waste management challenges experienced in their areas. • Teachers must be trained to introduce integrated waste management to leaners from the foundation phase until the start of the senior phase.	assesses management practices within the municipality. • The programme aims to increase environmental awareness of leaners by highlighting waste management problems experienced in the school and the surrounding environment, as well as to develop the culture of responsible waste management practices at schools and in the broader community. A one day or two half days can be essential to ensure and maintain the enthusiasm of educators and the sustainability and success of the programme.

	• Introduce 2Wise2Waste	• The cleaning contractors

	programme to reduce the environmental impact from the operations of the AbaQulusi Local Municipality. The chief aim of the this programme is to create awareness amongst the employees of AbaQulusi Municipality on energy efficiency, water conservation, waste minimization and recycling with the aim of effecting behavioural change and implementing interventions. • Build a general community awareness. • Develop and maintain a Waste Information System.	must be incorporated into the project to enhance the success of this recycling initiative. These contractors must also undergo training in waste minimization. Information on how to be environmentally friendly at work and at home should be communicated to staff on a regular basis. • Develop and disseminate brochures and flyers on environmentally friendly practices. • Appoint officials to capture all waste information available. • Establish weigh bridges at RTS and regional landfill site. • Liaise with industries and health-care facilities to obtain quantities of waste generated by such facilities.

		Appoint „spotters“ to pick up medical and hazardous waste that end up in the General Landfill site.
Waste minimizatic and recycling initiatives	• Establish sheds at Vryheid, Louwsburg and eMondlo RTS for recycling initiatives. • Create opportunities to start recycling by facilitating processes between industry and communities. • Stimulate the market for products made from recycled material. Launch a "Buy Recycled" marketing campaign to promote this initiative.	Engage with industry role players and the general public to seek solutions to problem areas in the sector.
Management of illegal activities	Develop a penalty system for illegal activities.	• Appoint a WMO to work closely with the Environmental Management Inspectors. • Develop and amend the by-laws. • Provide waste skips at hotspots throughout the AbaQulusi Municipality

ABAQULUSI LOCAL MUNICIPALITY

The fundamental purpose of the AbaQulusi Local Municipality embarking on Integrated Waste Management Planning process is to give effect to the goals and objectives of the National Environmental Management Waste Act. Apart from merely attempting to achieve legal compliance with the Act, this IWMP is also aimed at improving waste management practices within the AbaQulusi Local Municipality, beyond a „compliance achievement" based approach, towards an environmental, economic and social best practice approach to managing waste within AbaQulusi over the next five-year planning period.

This implementation plan, following the systematic undertaking of the following steps, is geared at improving waste management standards within the AbaQulusi Local Municipality to the level that is not only legally compliant, but that gives greater overall effect to the goals and objectives of the National Environmental Management Waste Act:

- Identification of major gaps in the current waste management practices;
- Determination of needs in term of achieving an improved waste management standard;
- Setting of goals, policies and objectives that are aimed at addressing the afore-mentioned gaps and needs;
- Evaluation of alternative waste management methods and options available to the AbaQulusi Municipality to achieve improved waste management standard within its jurisdiction;
- Development of an implementation plan for the five-year planning period that outlines the following key components for the successful implementation of identified priority projects stemming from the alternatives analysis:
  - Project description;

- ✓ Project objectives;
- ✓ Time-frame for implementation;
- ✓ Anticipated cost of project;
- ✓ Expected project deliverables;
- ✓ Responsible role-players;
- ✓ Possible funding mechanisms;
- ✓ Possible interested and affected parties.

Table 8.1 Implementation plan (Summary of an IWMP planning process)

										(EQP)	Finance (HR+EQP)
All waste going to waste disposal facilities	**Goal 1**: Promote recycling and recovery of waste	Establish mechanisms for promoting separation at source	**X**					Establish a pilot project for separation at source	2 additional personnel (remuneration)	Waste receptacles	R500 000
		Roll out separation at source to 70% of households		**X**				Roll out separation at source through a public private partnership (PPP)	2 additional personnel (remuneration)	Waste receptacles, 2 collection and transportation vehicles	R2 000 000
		100% households are participating in separation at source				**X**			2 additional personnel (remuneration)	Waste receptacles, 1 collection and transportation vehicle	R3 500 000
		Develop a composting strategy to divert garden waste from waste disposal facilities	**X**					Develop a composting strategy	1 project manager from the municipality to oversee the feasibility study and the strategy development process		R200 000
		Establish a compost plant		**X**				Establish a compost plant to divert garden waste, to be operated by a service provider	1 project manager from the municipality to manage the contractor	Procure equipment needed to run a fully compliant compost plant such as forklifts, grinding buckets, wood chippers, etc.)	R3 000 000
Some of the households are not receiving waste management services	**Goal 2**: Ensure the effective and efficient delivery of waste services	Develop a strategy for the collection of waste services	**X**					Labour intensive collection model/ approach	1 additional personnel (project manager) (remuneration)		R500 000
		Increase the roll out of waste collection services to 30% of households (including indigents)		**X**				Labour intensive collection model/ approach	2 additional personnel to manage the contractors	Establish a transfer station/ MRF facility, procure waste receptacles/bins	R3 000 000
		Increase the roll out of waste collection services to 70% of households (including indigents)					**X**	Labour intensive collection model/ approach	Additional personnel to manage the contractors	Procure waste receptacles/bins	R3 000 000
There is no waste management by-law in place	**Goal 3**: Develop legislative tools to enforce the Waste Act and other applicable legislation	Develop a strategy for the collection of waste services		**X**				Develop a waste management by-law	Personnel (project manager and waste officials)	Computer and stationery	R200 000
		Review waste management by-law					**X**	Review by-law/s	Personnel (project manager and waste officials)	Computer and stationery	R250 000
The budget is not ring fenced and there are no proper mechanism for cost recovery for the services rendered	**Goal 4**: Sound budgeting and financing of waste management services	Conduct full cost accounting for waste services	**X**					Conduct a full cost accounting exercise internally and ensure the proper budgeting of waste service and services rendered	Personnel (remuneration)	Computer and stationery	R80 000
		Set and implement tariffs for waste collection and disposal		**X**				Implement tariffs for waste collection and disposal Procure a service provider to	Personnel (will be implemented by existing staff)	Computer and stationery	R200 000

							develop the tariff model			
		Review and implement revised tariffs for waste collection and disposal				X		Personnel (will be implemented by existing staff)	Computer and stationery	R100 000
The municipality is operating an unlicensed waste disposal facility and the waste disposal facility is not managed in an environmentally sound manner	**Goal 5**: Ensure the safe and proper disposal of waste	Apply for a waste licence in order to have a licenced waste disposal facility	X				Close unlicensed waste disposal facilities and apply for a licence to	Personnel (Project manager)		R500 000
		Establish a new waste disposal facility		X			Establish a new waste disposal facility	Personnel (waste disposal facility operators, weigh-bridge operator etc.)	Equipment to run a fully compliant waste disposal facility i.e. trucks, weigh-bridge etc.	R15 000 000
		Train the waste disposal facility manager/operators in order that the disposal facility can be run in accordance with the licence conditions			X		Conduct training for waste disposal facility manager/ weigh-bridge operators	Service provider	Training material	R100 000
The municipality does not have education and awareness programme or strategy in place	**Goal 6**: Education and awareness	Recruit environmental/ waste education personnel	X				Appoint education personnel	Personnel (3 additional staff members)		R2 000 000
		Develop an education and awareness strategy		X			Develop an education and awareness strategy, internally	Personnel (existing staff members)	Develop material to conduct education, awareness and advocacy	R100 000
		Develop a schools competition programme to encourage school's involvement on waste management issues i.e. recycling		X			Roll out the education and awareness campaigns i.e. schools competition	Personnel (existing staff members)	(Posters, pamphlets, and media, etc)	R500 000
There is no law enforcement	**Goal 7**: Compliance and enforcement	Appoint officials to enforce by-laws		X			Roll out enforcement and monitoring of by-laws	6 additional personnel		R3 000 000
		Enforce by-laws			X	X	X	Enforce by-laws	Personnel (remuneration)	Vehicles Laptops Cell phones	R500 000

9. INSTRUMENTS FOR IMPLEMENTATION OF IWMP

The development of the IWMP for AbaQulusi includes the need to develop a financing and revenue plan for the section dealing with waste management issues. In order to do so, it is necessary to recap the current financial position of the waste management division of the Municipality. Certain other issues and unique characteristics which contextualize solid waste management need to be highlighted. In doing so, it is necessary to take cognizance of the following:

- The existing cost structure, considering direct and indirect cost, is not adequately ring-fenced and as a result of that, certain costs are "given" to the waste management division or expensed to the service division on a "cost allocation" basis.
- Solid waste is in the most cases an undesired service item, unlike water and electricity; and the issue of "not in my back yards" is one that need to be managed with due care.
- Solid waste, unlike water and electricity, which flow from municipality to the consumer, is generated by the customer and flows toward the Municipality.
- A solid waste service, unlike water and electricity, cannot be cut-off should a customer elect not to pay for any reason.
- The "monopoly rights" inherent in the waste management service are less than that of water and electricity.
- Mismanagement of solid waste can lead to serious health and environmental risks.
- Certain sub-services in solid waste management operate in competition with the private sector.
- The policing of illegal dumping is currently poorly executed.
- Education and awareness campaign regarding environmental health contribute to improvement of consumer understanding.
- Private operators are not licensed, which leads to limited control over their modus operandi.
- Knowledge of waste generated, transported and disposed of is still incomplete.

9.1 Policy Principles and Instruments

The following policy principles and instrument should be noted when considering the economics and financing of waste management;

- The local regulatory landscape should be developed in such a manner that it complies with the policy principles specified in Waste Act and NWMS, e.g. accountability, equity, full cost accounting, good governance, integrated and open information, participation and the polluter pays principle.
- The waste management function of AbaQulusi Local Municipality should be financially and operationally ring-fenced and the process should start for the creation of an independent business unit which is responsible for the waste management service of AbaQulusi Local Municipality and which is fully accountable and responsible for all aspects of the rendering of the solid waste management services.
- The sub-service (removal of dead animals) within the solid waste management function should also be ring-fenced in order to understand the exact cost and income of such sub-service. Such information will enhance decision-making.
- Unit costs should be calculated for all waste management activities.
- By-laws should provide for the "polluter pays" principle, waste information system and permitting of private sector waste operators.

It is of importance that the AbaQulusi Local Municipality take control of the development of the by-law as far as it relates to waste management matters.

9.1.1 Funding Sources

In order to provide solid waste services in a financially sustainable manner, the Municipality should have a sound revenue base for both operational costs and the repayment of capital funding. Solid waste management services are relatively capital intensive and capital is required for replacement programs, new facilities and expansion. Should

the Municipality's financial position be of such a nature that it cannot provide the necessary capital commitments, alternative service delivery mechanisms for the solid waste management service as a whole will have to be investigated. All the major funding sources available to the Municipality should therefore be identified.

9.1.2 Sources of Capital Finance

It may not be possible for the Municipality to bear all the costs of providing a comprehensive solid waste infrastructure to all un-served or underserved users. It may only be able to make a limited contribution and the rest will have to be raised from other sources. It is therefore important to assess the extent to which loan funding will be required, since the cost of servicing loans affects the tariffs (and general rates) that should be set to raise recurrent expenditure. The following are possible sources which can be utilized by the Municipality:

- Municipal Infrastructure Grant (MIG).
- Consolidated Municipal Infrastructure Program (CMIP).
- Municipal Systems Improvement Program (MSIP).
- Extended Public Works Program (EPWP).
- National Poverty Relief Programs (NPRP).
- Private commercial loans from developmental financial intermediaries, DBSA, commercial and merchant banks.
- Own sources.

The Municipality may also consider using and/or financial leases to fund certain capital assets that were previously funded by internal or external loans. Certain income streams can be ring-fenced and allocated to a specific capital item which allows for very innovative funding mechanisms and funding structures.

9.1.3 Sources of Operating Finance

The type of solid infrastructure provided, the associated levels of service, technology used, waste recycling and minimization and disposal methodology all have a significant impact on operating costs of solid waste management service. The primary sources of revenue for operating expenditure are:

a) Tariffs

Solid waste services are provided to individual households and businesses and therefore it is appropriate and possible to establish tariffs for these services which are payable by each customer served. The individual households should be charged as part of the general rates account and not as a tariff. This is a cost-effective way of charging for the individual household and should be maintained as far as possible. However, the issue of hidden inefficiencies may result from this practice. The issue of hidden efficiencies can be overcome by proper financial and operational ring-fencing of solid waste service. The table below illustrates waste removal tariffs for 2025\2026.

ABAQULUSI LOCAL MUNICIPALITY

Table 9.1: Waste removal tariffs

Waste removal tariffs	
Description	Tariff

ABAQULUSI LOCAL MUNICIPALITY

REMOVAL OF RUBBISH AND REFUSE	
All inclusive of VAT	
Residentials	
Dwellings, households, flats, and non-rate able properties by bin linear or container.	
Per normal removal per month (Vryheid & Bhekuzulu)	
Stands 0 – 800sq.m	R 169.52
Stands above 800sq.m	R 169.52
Businesses	
Trades, businesses and industrials, per month	
Daily removals	
Small businesses	R 385.00
Medium businesses	R1,097.25
Large businesses	R4,123.56
Malls & centres	
Weekly removals for large businesses	R4,744.57
Daily removals	R822.94
Rent for bulk container per month	
Removal of rubbish not specified anywhere	R1,269.30
Illegal dumping	R3677.97
Putting out refuse on wrong days	R1,838.99

Incorrect dumping on site	R3,677.97
Rent and removal during special occasions (excluding religious gatherings) of refuse containers not exceeding three days.	
Fees to paid in advanced	
Standard refuse containers	
Hire per container	
Removal per container	R683.18
Bulks mass container	R162.07
Hire per container	R819.86
Removal per container	R2,322.87
Removal and burials of Carcasses:	
Donkeys, mules, horses and cattle, each small type animals. Each	R193.36
Removal of bulky garden refusal, per load	R52.45
The total cost of a standard type of container	R552.56
Landfill (weighing of waste)	
Mixed refuse per 250kg	R66.00
Builders' rubble and excavated material per 250kg	R21.00

ABAQULUSI LOCAL MUNICIPALITY

Bulk food waste and condemned per 250kg	R179.00
Gardner refuse per 250kg	R21.00
Sawdust and wood per 250kg	R66.00
Special disposal per 250kg	R178.00

b) Rates

Solid waste services include public services such as street cleaning. This service also has a "public good" component in the sense that the cleanliness of each individual stand affects the overall environmental health quality of the region. In this regard it may be appropriate to finance solid waste services through rates which are typically used to finance the public good.

c) Equitable share

The equitable share subsidy from national government is meant for the provision of basic municipal services to the poor. A solid waste collection service is regarded as a basic municipal service.

d) Donations

Donations from environmentally conscious bodies can be applied for the funding of waste education. This is a useful source of income and can relieve the municipality from a further operational expenditure. The municipality should explore these sources extensively since resources can be pooled in order to expand public awareness regarding environmental management issues.

9.1.4 Institutional Arrangements

The functions of refuse collection and public waste management services, such as street cleaning have been allocated to municipalities. A variety of role-players are involved in solid waste service provision and the Municipality must establish a clear institutional map in terms of who is responsible for what in the solid waste management system. The

municipality, as the responsible authority on institutional arrangements for solid waste provision, has to decide on service delivery mechanism. The decision whether to use an internal waste service or external service rests with the municipality.

The municipality is empowered under the Municipal Systems Act, to provide municipal solid waste services by an external mechanism by entering into a service delivery agreement with an outside organization. This outside organization can be another public sector body, a private sector firm or a community-based organization. If the decision is to involve external service providers (fully or in part), the municipality will need to set up monitoring and regulatory mechanisms to regulate the performance of the service providers.

The use of small contractors for refuse collection and street cleaning at a fixed fee in the urban areas of the municipality should be thoroughly investigated. Service delivery agreements can be entered into with small single community-based contractors. This mechanism may be effective in reducing capital and operational expenditure and may contribute significantly to economic development.

Generally, private waste operators and small contractors relieve the municipality of substantial amounts of capital expenditure on vehicles and other infrastructure, and are in many cases more cost effective than the municipality. The municipality must therefore explore the use of small contractors where it is beneficial and may compete with the private sector for business waste collection where the service can be rendered at a "profit". The real "profitability" of the business waste collection service can only be determined when the Waste Management Component of the municipality is properly ring-fenced financially and operationally, and an Activity Based Cost exercise has been undertaken.

It is important that private sector waste collection companies be subject to securing permits for collection, that the by-law provides for such

permitting and that the necessary measures are put in place to issue and monitor these permits.

9.1.5 Measures for Reduction of Other Costs Waste and Capital Requirements

The removal of illegally dumped refuse is a costly exercise and more money should be spent on waste and environmental education and policing, since the saving generated by the reduction of illegal dumping may exceed the cost of such educational and policing efforts. Fees earned from fines should be applied towards waste and environmental education. This can be seen as a Public-Public Partnership between various internal departments. The community, through NGOs should also get involved in waste and environmental education initiatives. This can be seen as NGO, Public Partnership.

Waste recycling, minimization and reduction should be further explored. These functions are particularly suited for Public-Private Partnerships. The reduction in the waste stream will reduce operational and capital expenditure. The opportunity cost principle should be implemented since it may not be beneficial in the short term to implement these endeavours but it may have significant benefits in the long term. The AbaQulusi Local Municipality should consider subsidizing these measures in the short-term to medium-term to get them off the ground in order to secure the associated long-term benefits.

10. ENVIRONMENTAL COMPLIANCE AND PUBLIC PARTICIPATION

The IWMP is an overall plan which addresses waste management in the region. All aspects of this plan need to be conveyed to interested and affected parties, as well as the general public. The environmental compliance is addressed by the environmental impact assessment (EIA) processes which have to be followed. Public cognizance is addressed by public awareness campaigns, information releases, and public and stakeholder participation.

10.1 Waste Management License Application Process/EIA Process

Government Notice 718 (GN 718) is a list of waste management activities that have or are likely to have detrimental effect on the environment. These activities require a Waste Management Licence (WML) in accordance with Section 20 (b) of National Environmental Management Waste Act, 2008, in order for them to be undertaken.

10.1.1 Facilities requiring Waste Management License Application/EIA

Various waste management facilities require WML and the following infrastructure is typically subject to compliance with the above Regulations, as directly relevant to solid waste management in the AbaQulusi Local Municipality:

- Proposed waste transfer stations;
- Proposed garden refuse landfill (composting-

  No WML required if there is no processing);

10.1.2 The Waste Management License/EIA Process

Waste management infrastructure required for the disposal of waste is subject to the process followed in the EIA Regulations. This process is as follows:

- Waste management license application form/Application for authorization to undertake an activity;
- Consultation with the relevant authority;
- Submission of basic assessment/scoping report;
- Submission of EIA report;
- Review of basic assessment/scoping/EIA by authorities;
- Consideration of the application by the relevant authority;
- Approval/rejection of application;
- ➢Appeal.

10.2 Public Participation

Prior to the implementation of the IWMP, appropriate mechanisms, processes and procedures should be put in place to enable communities, residents and stakeholders in the Municipality to participate in local affairs, also issues related to waste management. Provincial departments, landowners and the public must be involved in the EIA processes.

Planning and development of waste management facilities such as landfills and refuse transfer stations, are all subject to public participation requirements from the Department of Water and Environmental Affairs and other national and provincial departments. The Municipal Systems Act, 2000 (Act No 32 of 2000) contains extensive

requirements relating to public participation, specifically the right of the public to contribute to the decision-making process.

10.3 Consultation with Authorities

The following authorities may need to be consulted when planning, developing and implementing elements of the IWMP:

- **National**

  Department of Forestry, Fisheries and the Environment

- **Provincial**

Department of Transport;

Department of Health;

Department of Finance;

Department of Agriculture, Environmental Affairs and Rural Development; Department of Traditional Affairs and Local Government.

- Local

Adjacent municipalities.

11. MONITORING AND REVIEW

A monitoring plan for the implementation of the IWMP must be developed and this will be an ongoing activity that will serve to measure the degree of success with which the planning process is accomplished. Monitoring focuses on short-term objectives and ensures that timeous corrective action is taken to ensure that the IWMP is implemented

successfully. The monitoring system should be based upon a series of Key Performance Indicators (KPIs), which must be developed for each program and the overall performance will be measured against these KPIs.

11.1 Monitoring

The objectives of monitoring at local municipality level are to:

- Ensure that the implementation is according to plan and within the program;
- Ensure that the objectives are being met and that adjustments are made when necessary;
- Identify needs and problems related to the IWMP that should be addressed at all three levels of government;
- Fulfil monitoring requirements and information needs of the public.

Management systems are performance outcome based and this requires that KPIs be developed and that the Waste Management Division of the municipality formulate its own KPIs and performance targets which relate to approved IWMP.

(a) The KPIs should adhere to the following principles:

- Measurability – indicators are readily calculable from information that can easily be generated and at a reasonable cost, given the financial and administrative capacity of the municipality;
- Simplicity – measure one dimension of performance (quantity, quality, efficiency, effectiveness and impact) and avoid combining too much into one indicator;

- Precision – measure only those dimensions that the municipality intends to gauge;
- Relevance – measure only those dimensions that enable the municipality to measure progress in terms of its objectives;
- Adequacy – measure, quality, quantity, efficiency, effectiveness, and impact; and separate indicators are set for each priority and objective, in terms of the latter parameters;
- Objectivity – state clearly and without ambiguity what is to be measured.

An important consideration in choosing suitable indicators is whether data is available for its measurement in the municipal area. The municipality has to be clear about what data it currently collects and what data it will have the capacity to collect in the near future. The production, obtaining and recording of accurate waste data is an important element of the monitoring process and a basis for planning future management arrangements.

The development of the IWMP was based on a set circumstance that prevailed when the planning commenced, and certain assumptions were made at the time. These could change with a passage of time. Thus, it is advisable to verify such assumptions by monitoring them as they apply to the IWMP, and to adjust and refine the parameters, KPIs and performance targets to ensure that the IWMP remains valid and applicable.

11.1.1 Monitoring of IWMP according to Goals and Objectives Identified

a) Monitoring Reports

The AbaQulusi Local Municipality has the responsibility for the compilation of a report on the implementation of their general waste

IWMP on an annual basis. This report will be submitted to the provincial Department of Agriculture and Environmental Affairs, KwaZulu Natal. The provincial authorities are required to compile a report on the implementation of local authority IWMPs, IWMPs from industries that manage and dispose of their own waste, and hazardous waste IWMPs on an annual basis and to submit these reports to the National Department of Environmental Affairs for consideration.

i) Integrated Waste Management Planning

Deliverable: Annual reports on the waste reporting (waste inventory) of waste streams

The IWMP needs to be updated and this should be based upon the most accurate available data. A need remains for ongoing data collection to improve and measure the operation of the waste management system.

The NWMS identified the development and implementation of a WIS as one of its priorities. The objective of this system is to qualify and quantify key issues, needs and problems such as illegal dumping, waste quantities and types, recycling quantities, generation rates, waste destinations, etc. the continuous updating and utilization of this information is imperative to any refinement and adjustment of the IWMP over a long-term, and for budgeting and costing purposes.

ii) Waste Information Management

Deliverable: Annual reports on implementation of WIS

iii) Waste Collection Services

Deliverable: Annual reports on implementation of collection & transportation services

iv) Waste Minimisation & Recycling

Deliverable: Annual reports on waste recycling programmes and projects, information exchange between stakeholders.

v) Waste Disposal

Deliverable: Registration and licensing of waste disposal facilities, auditing of general waste disposal facilities by provincial authorities.

vi) Organisational, Institutional & Regulatory

Deliverable: Training manual for staff audited annually.

vii) Waste Management Education, Capacity Building & Awareness

Deliverable: Annual reports on awareness programmes.

b) Review

A critical evaluation and review of the monitoring reports will provide information of assessing the achievement of the IWMP"s goals and strategic objectives. This process will ensure the reappraisal of the IWMP and assess the appropriateness of policies, goals and strategic objectives, and whether they need to be amended and adjusted.

The objective of reviewing the IWMP and its implementation is to ensure its continued suitability, adequacy and effectiveness. The review should be documented and formal submission should be made to Municipal Council and the relevant KZN authorities. It should also be made available to the public.

The review should include issues such as performance levels related to the implementation of the IWMP, improvements from baseline conditions / indicators, and the Public's perceptions and opinions regarding waste management in general and its associated services.

12. RECOMMENDATIONS AND CONCLUSION

The implementation plan is the end result of the Integrated Waste Management Plan development process and it outlines the sequential rollout of identified priority projects over the five-year planning period determined for this IWMP. The implementation plan is intended to provide a practical methodology for the successful implementation of the identified priority projects. The identified priority projects deemed necessary to improve the standard of waste management practices within the AbaQulusi Municipality have been staggered over a five-year period due to anticipated budgetary constraints that limit the possible implementation thereof over a shorter time-frame.

It is important to mention the most significant factors that have the potential to negatively influence the successful implementation of the

Integrated Waste Management Plan. These factors are *inter alia* as follows:

- Lack of available budget/capital for the implementation of specific projects;
- Unclear or ambiguous delegation of roles and responsibilities in the implementation plan;
- Lack of availability of capable resources/personnel to implement the plan

The above-mentioned constraints have been taken into account when compiling the implementation plan of this IWMP. The priority projects identified in the implementation plan are aimed at elevating the AbaQulusi Local Municipality to a level whereby they can achieve compliance with the waste-related legislative requirements and guideline documents. The intention of the implementation plan is not, therefore, to burden the
AbaQulusi Municipality with administrative tasks and unrealistic expectations, but rather to promote a culture of skills development and capacity building within the Municipality.

The goals and objectives for the IWMP have been set for the AbaQulusi Local Municipality at every tier of the waste management hierarchy. It is our honest belief that the targets and objectives set for this IWMP are achievable and would like to stress the importance and necessary commitment that needs to be shown by the AbaQulusi Municipality in sourcing outside finance for the implementation of priority projects.

The establishment of a Waste Information System (WIS) should be the starting point for AbaQulusi Local Municipality. The aim of WIS will be to provide all the necessary detailed information pertaining to waste management, i.e. license status of disposal facilities, volumes disposed

of, condition of the landfills/transfer stations, number and type of equipment, date of purchase, operating and maintenance costs, replacement date, type of service, number of personnel involved, etc. Decisions concerning new equipment or services can then be made based on accurate information provided by the WIS.

Some of the information in this document can serve as the basis for the future development of such a WIS. This is regarded to be of fundamental importance to the AbaQulusi Local Municipality. This IWMP should be reevaluated and expanded to a detailed operational plan, once suitable information is available from the system so as to ensure that future planning is done correctly, i.e.

- Service levels should be workshopped with the community to obtain their views and inputs on the proposed upgrading of their services and cost implications involved;
- Community awareness campaigns should be implemented to educate the communities on responsible waste management;
- The municipality should promote recycling and / or waste minimization. The informal salvaging operations at the Vryheid landfill site should be formalized to ensure that the reclaimers cooperate with the landfill supervisors.
- The Municipality should consider calling all existing recyclers within AbaQulusi Local Municipality, such as Umnotho Wezibi Recyclers, who contributed with valuable information during the compilation of this document, with a view to formulate partnership during implementation of the priority projects.

The above recommendations should ensure that the short-term waste management requirements in the municipal areas are met. Once the Waste Information System is implemented, this plan should be re-evaluated and adjusted. Long-term planning can then be practiced in a more responsible manner. This will ensure that sound waste

management is practiced within the AbaQulusi Local Municipality over a long term.

REFERENCES

1. AbaQulusi Local Municipality Draft IDP 2008 – 2009
2. DEA: National Waste Management Strategy, 2010
3. DEA: National Environmental Management Act, 2008 (Act No 57 of 2008)
4. DEA: National Waste Management Strategies and Action Plans for South Africa, Series Documents (1999)
5. DEA: White Paper on integrated Pollution and Waste Management for South Africa, (May 2000)
6. DEA: Working with Waste – Guideline on Recycling of Solid Waste
7. DEA: Working with Waste – Guideline on Waste Collection in High Density and Unser viced Areas
8. DWS: Minimum Requirements for the Handling, classification and Disposal of Hazardous Waste, Second Edition (1998)
9. DWS: Minimum Requirements for waste disposal by landfill, Second Edition (1998)
10. Minimum Requirements for the Monitoring of Water Quality at Waste Management Facilities, Second Edition (1998)
11. Statistics South Africa, 2022

ABAQULUSI LOCAL MUNICIPALITY

GENERAL COMMENTS

1. Please fix the table of content, figures and tables