FETAKGOMO-TUBATSE LOCAL MUNICIPALITY

FETAKGOMO-TUBATSE LOCAL MUNICIPALITY INTEGRATED WASTE MANAGEMENT PLAN (IWMP)

FINAL DRAFT INTEGRATED WASTE MANAGEMENT REPORT

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Fetakgomo – Tubatse Local Municipality

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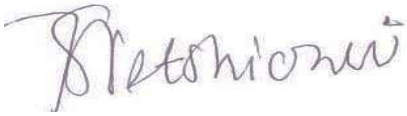

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ACCRONYMS

DEA	: Department of Environmental Affairs
FTLM	: Fetakgomo – Tubatse Local Municipality
GHG	: Green House Gases
IDP	: Integrated Development Plan
IWMP	: Integrated Waste Management Plan
LEDET	: Limpopo Department of Economic Development, Environment and Tourism
SAWIC	: South African Waste Information Centre
SDM	: Sekhukhune District Municipality
SOER	: State of Environment Report
BPEO	; Best Practicable Environmental Option
MCDA	: Multi Criteria Decision Analysis
FBRR	: Free Basic Refuse Removal
ECA	: Environmental Conservation Act
TC	: Total Concentrations
LC	: Leachable Concentrations
NDWC	: National Domestic Waste Collections Standards
CBO	: Community Based Organisations

PPP : Public Private Partnership

DEFINITION OF KEY TERMS

General Waste	**"general waste"** means waste that does not pose an immediate hazard or threat to health or to the environment, and includes - *(a)* domestic waste; *(b)* building and demolition waste; *(c)* business waste; and *(d)* inert waste; (Waste Act, 2008)
Hazardous Waste	**"hazardous waste"** means any waste that contains organic or inorganic elements of compounds that may, owing to the inherent physical, chemical or toxicological characteristics of that waste, have a detrimental impact on health and the environment; (Waste Act, 2008)
Landfill site / Waste Disposal Facility	**"waste disposal facility"** means any site or premise used for the accumulation of waste with the purpose of disposing of that waste at that site or on that premise; (Waste Act, 2008)
Polluter Pays Principle	**"Polluter pays principle"** means those responsible for environmental damage must pay the remediation costs, both to the environment and to human health, and the costs of preventive measures to reduce or prevent further pollution and environmental damage.

Recycle (External)	**"recycle"** means a process where waste is reclaimed for further use, which process involves the separation of waste from a waste stream for further use and the processing of that separated material as a product or raw material; (Waste Act, 2008)
Re-use	**"re-use"** means to utilize articles from the waste stream again for a similar or different purpose without changing the form or properties of the articles; (Waste Act, 2008)
Waste	**"waste"** means any substance, whether or not that substance can be reduced, re-used, recycled and recovered - *(a)* that is surplus, unwanted, rejected, discarded, abandoned or disposed of; *(b)* which the generator has no further use of for the purposes of production; *(c)* that must be treated or disposed of; or *(d)* that is identified as a waste by the Minister by notice in the *Gazette* and includes waste generated by the mining, medical or other sector, but (i) a by-product is not considered waste: and (ii) any portion of waste, once re-used, recycled and recovered, ceases to be waste; (Waste Act, 2008)
Waste Indicator	"**waste indicator**" allows for consistent reporting of specific activities related to a topic of concern (DEAT, 2002)

Waste Minimisation Programme	**"waste minimisation programme"** means a programme that is intended to promote the reduced generation and disposal of waste; (Waste Act, 2008)
Waste Minimisation Plan	**"waste minimisation plan"** means a systematic strategy plan intended to promote the reduced generation and disposal of waste; this will include the re-use, recycle, treatment and reduced disposal of waste
Waste Stream	**"Waste Stream"** means the total flow of waste falling under a particular waste category from activity areas, businesses units, and operations that is recovered, recycled, reused, or disposed of in landfills e.g. domestic waste, hydrocarbon waste, etc.

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INTRODUCTION AND METHODOLOGY

1 INTRODUCTION

Kimopax Pty Ltd was appointed by Municipal Infrastructure Support Agent (MISA) to assist in the compilation of an Integrated Waste Management Plan (IWMP) for Fetakgomo-Tubatse Local Municipality (FTLM). The Local Municipality recognizes that an Integrated Waste Management Plan is a very important instrument with very precise and significant implications on the goal of promoting sustainable development and service delivery with regards to waste management within the Municipality, and one that will inform the Integrated Development Plan (IDP) and other strategic Plans for the local Municipality. This document will be the municipality's first generation IWMP. Before there was a merger between Fetakgomo Local Municipality and Greater Tubatse Local Municipality, Greater Tubatse Local Municipality had commissioned the compilation of their first IWMP in 2015, however the process was abandoned midway due to the pending merger that was proposed and subsequently successful. This IWMP Plan will address all areas of waste management – from waste prevention and minimisation (waste avoidance), to its collection, storage, transport, treatment, recovery and final disposal. It will not only address the practicalities of waste management, but also the issues of public education and changing concepts, as these are vital to a successful management system.

1.1 Project Background

In terms of the Constitution of South Africa Act 108 of 1996 environment and waste management are areas of shared responsibility between provincial and the local government. In terms of Chapter 7 of the Constitution, provincial government is required to support local government with respect to matters listed in Schedule 5 of

the Constitution, which includes waste management[1]. The promulgation of the National Environmental Management: Waste Act 59 of 2008 requires integrated waste management planning at both provincial and local level. South Africa's first National Waste Management Strategy (NWMS), published in 1998, highlighted the need for integrated waste management at the local level as a high priority.

South African Constitution Schedule 5-Functional Areas of Exclusive Provincial Legislative Competence. The following local government matters to the extent set out for provinces in section 155(6)(a) and (7): Refuse removal, refuse dumps and solid waste disposal

Section 11 (4) of the National Environmental Management: Waste Act requires that municipalities submit IWMP's to the MEC for endorsement and to include the approved IWMP in its Integrated Development Plan (IDP) as contemplated in Chapter 5 of the Municipal Systems Act. A municipal IWMP must comply with the aspects outlined in section 12 of the National Environmental Management: Waste Act (Act 59 of 2008), which includes consultative processes and public participation that must be followed during and before the finalization of the IWMP, as prescribed in section 29 of the Municipal Systems Act.

1.2 IWMP Objectives

The objectives of the IWMP will be to:

- Facilitate the implementation of the provisions of the NEM: Waste Act;
- Promote sustainable waste management practices within the Local Municipality;

[1] South Africa Constitution 1996.

- Provide guidance and support to the municipality and industries with respect to the integrated waste management planning;
- Minimize adverse social and environmental impacts of waste management operations, particularly on poor and vulnerable communities and improve their quality of life;
- Provide implementable and cost effective short, medium and long-term goals to address waste management issues within the Local Municipality;
- Ensure alignment with relevant provincial and municipal strategies, policies, guidelines and action plans

1.3 PROJECT METHODOLOGY

The methodology for the IWMP is based on the guideline for the development of IWMPs which was developed by the National Department of Environmental Affairs.

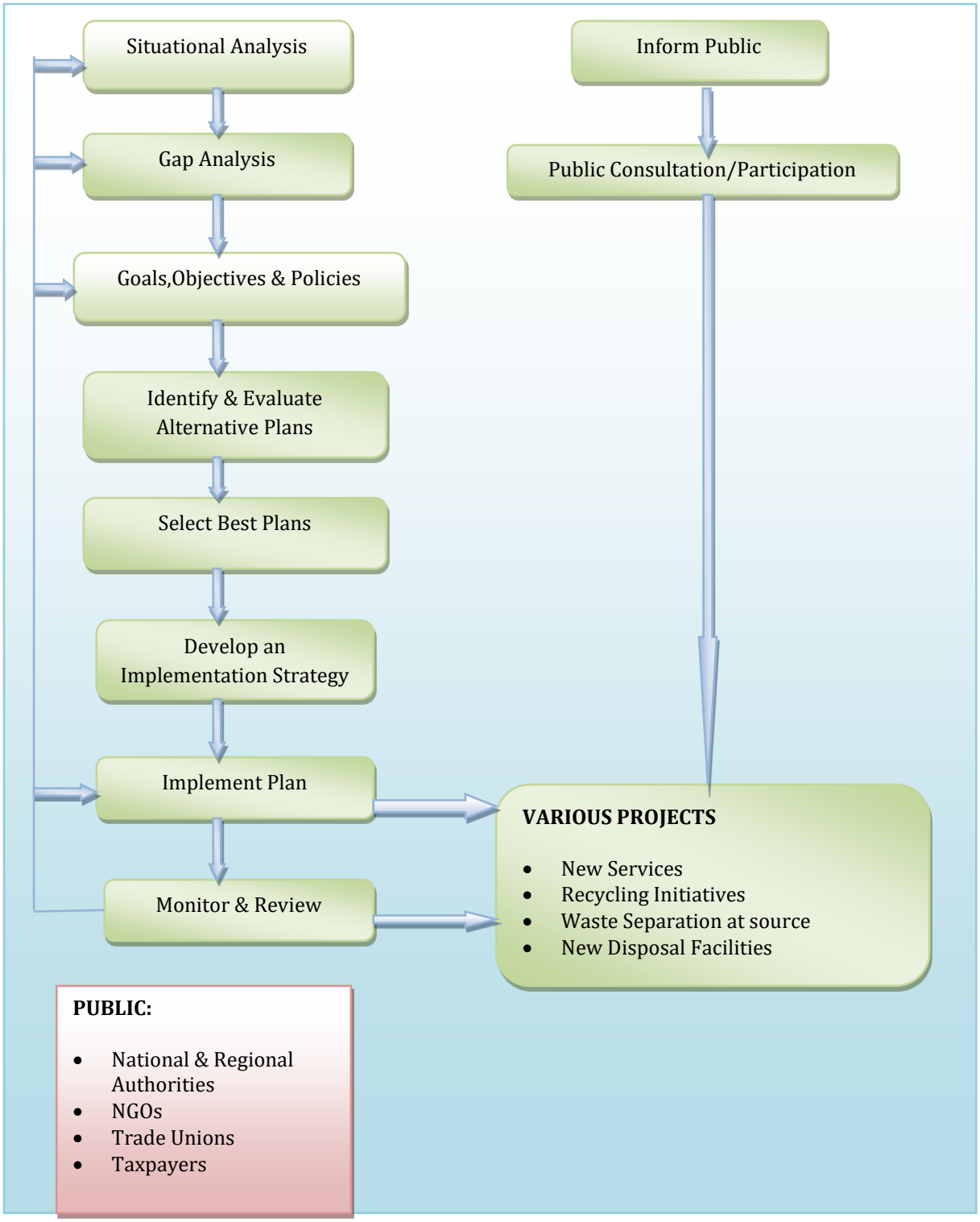


Figure 1: IWMP Process

(a) Establish the existing status (Status Quo) with regard to waste management in the local municipality

(b) Determine management objectives and needs with regard to waste management through obtaining and integrating input from key stakeholders

(c) Determine any gaps, backlogs, shortfalls, risks or impacts between the existing status and the desired end state that is relevant to waste management practices and systems.

(d) Identify and evaluate waste management alternatives and options that could be taken to address these identified gaps, backlogs, shortfalls, risks and impacts that will achieve the management objectives. This evaluation is conducted against a pre-determined set of evaluation criteria and includes as assessment from the perspective of Multi Criteria Decision Analysis (MCDA), which includes, but is more than just a Cost- Benefit Analysis (CBA), in order to determine and select the (BPEO).

(e) Summarise the actions for implementation of the BPEO for waste management into a draft IWMP. Such an IWMP should be specific and concise, and should clearly indicate actions, responsibilities and timeframes.

(f) Discuss the draft IWMP with key stakeholders to determine acceptability and implementability.

(g) Finalise the draft IWMP, which would contain a framework for an implementation schedule, performance evaluation and monitoring measures, and timeframes for review

1.4 Situation Analysis

The main aim of this phase of the project was to quantify and qualify all aspects related to the existing waste management services and practices. It included the current status with regards to the delivery of waste services, number of residents in that municipality, demographic profile and socio-economic composition. This

information was then used as a point of departure for determining future needs, establishment of priorities, optimisation and budget requirements. The major tasks that was carried out during the status quo analysis was Review; Information Analysis; Assessment and Report Generation. The specifics of these four tasks included the following aspects:

- Review of: -
  - ✓ All relevant existing municipal, provincial and national documentation relating to waste management including any existing IWMP's for the Local Municipality;
  - ✓ All applicable national and provincial legislative arrangements, as well as the situation with regard to Municipal Waste Management Bylaws, their effectiveness and current levels of implementation, and determining any international arrangements or agreements that may be applicable.
  - ✓ All available information on the current population demographics of the local municipality, growth estimates and development patterns, densities and the population's socio-economic categories and income levels; and
- Investigation and Research through literature review and individual interviews into all aspects relating to waste management in the local municipality including:
  - ✓ All aspects of waste collection and street cleansing, including collection methods, vehicle routing, transport conditions, record keeping, complaints, etc;
  - ✓ Current status of equipment and machinery;
  - ✓ Current status of personnel, including level of skills and training needs;
  - ✓ Waste generation rates, patterns and trends, including a summary of domestic, industrial and business producers, volumes of general waste, primary waste storage systems (bins, bags etc), levels of service, etc;

- ✓ Current status of waste management awareness and control, including implementation of waste related bylaws, aspects relating to littering, waste prevention and minimisation, buy-back and recycling centres, health concerns, and enforcement capabilities, and;
- ✓ Capture data collected during review of documentation and investigation and research into intelligent and interactive database.

- Analysis and Assessment of: -
  - ✓ Available and collected information to determine statistics with regard to current and projected demographics and waste generation patterns in the municipality, the types and amounts of general waste generated, the composition thereof, and projected future waste generation trends;
  - ✓ The services that are currently provided, or that are available, for the collection, minimisation, re-use, recycling and recovery, treatment and disposal of waste, and technical and operational aspects there-of;
  - ✓ The existing waste management systems and practices, defining distinctive waste management patterns, and evaluating waste minimisation and cleaner production initiatives, as well as waste management education and awareness;
  - ✓ The current waste management services in terms of organisational structure and institutional arrangements, quality of service, legislative and regulatory issues, social and environmental impacts, including impacts from contaminated land, and public acceptance;

Generation of Situation Analysis Report that addresses: -

- Applicable legislative requirements and regulatory status quo;
- Demographics and socio-economic status quo;

- Waste quantities and characteristics;
- Existing waste management systems and practices;
- Technical and operational issues;
- Waste information issues; and
- Waste education and awareness.

The results of the situational analysis will therefore be documented in a comprehensive Status Quo Report that clearly describes the current status of waste management in the Local Municipality, and that will be used during the needs assessment.

1.5 Needs Assessment and Gap Analysis

1.5.1 Needs Assessment

To identify needs regarding the IWMP's and Set Waste Management Objectives for the Plan, extensive public participation will be conducted. It is envisaged that at least two public meetings will need to be held in the Burgersfort region and the other in the Apel region. Key identified stakeholders will be invited to attend the meeting.

During the meeting, needs are to be determined and management objectives agreed upon for the following waste management aspects:

- Applicable legislative requirements and regulatory status quo;
- Demographics and socio-economic status quo;
- Waste quantities and characteristics;
- Existing waste management systems and practices;
- Technical and operational issues;
- Waste information issues; and

- Waste education and awareness.

Following the finalisation of the meeting, a Needs Assessment Report will be prepared.

1.5.2 Gap Analysis

Once the expectations, needs, and objectives of key stakeholders with regard to the management of waste have been determined, the gaps between the current Status Quo and the Desired End State (or Needs) can be established. An analysis of these gaps is therefore conducted on the following aspects:

- Applicable legislative requirements and regulatory status quo;
- Demographics and socio-economic status quo;
- Waste quantities and characteristics;
- Existing waste management systems and practices;
- Technical and operational issues;
- Waste information issues; and
- Waste education and awareness.

The outcome of the Gap Analysis will therefore identify the shortcomings and gaps between existing waste management systems and practices, and the needs, expectations and objectives of stakeholders, which will be summarised in a Gap Analysis Report.

1.6 Development and Evaluation of Alternative Scenarios

Based on the Status Quo Assessment, the Objectives and Needs expressed by stakeholders, as well as the Gap Analysis that identified shortfalls between the existing status and the desired outcomes, management options to address these gaps can be identified and/or developed and evaluated.

1.7 Implementation Instruments

The partnerships, legislative instruments, economic instruments and a financial plan appropriate for the IWMP will be established in consultation with stakeholders.

1.7.1 Partnerships

The development of partnerships as a mechanism for providing the services and facilities required for IWMP will be considered. The categories of partnerships that will be considered include:

- Public partnerships
- Public Private Partnership (PPP)
- NGO/Community Based Organizations (CBO's)

1.8 Implementation Plan

A municipality in conjunction with the appointed consultant will develop an implementation plan which will detail how targets set in the goals will be attained as well as what resources will be required to attain the targets in the next five years. In this instance the implementation plan will be developed in a manner that summarises the entire IWMP planning process in order to demonstrate how each of the steps fit into each other.

1.9 Draft and Final IWMP

During this phase the IWMP for the Local Municipality is drafted, discussed with stakeholders, and following the consideration of comments received, finalised as a final Draft IWMP for submission to the municipality.

1.10 Approval Process

Chapter 3, Section 11 4a (ii) of the Waste Act states that each municipality must include the approved IWMP in its Integrated Development Plan (IDP) as contemplated in Chapter 5 of the Municipal System Act for approval by council. This is to ensure that the approved IWMP is included in the municipal IDP, the goals and

targets contained in the IWMP are prioritised and that council will implement the IWMP.

1.11 Public Participation Approach

Under the Waste Act, Chapter 3, Section 11 (7b) states that, "a municipality must, before finalising its IWMP, follow a consultative process contemplated in section 29 of the Municipal Systems Act, either as a separate process or as part of the consultative process relating to its IDP contemplated in that section.

Apart from the Municipal Systems Act; the Waste Act requires the development of an IWMP to follow a public participation and consultation process (Section 72 and 73). Awareness programs should be developed in order to keep stakeholders abreast on issues pertaining to the development and implementation of the IWMP. Engagement with stakeholders will be done in various platforms such as:

- Ward committee meetings
- Waste management forum meetings
- Workshops with interested and affected parties (could include youth environmental group, taxi associations, religious groups etc)

The issues raised during the stakeholder participation process should be captured and dealt with under the implementation plan and stakeholders should be informed of progress made with regards to attaining the goals in the five years of implementing the IWMP.

1.11.1 Development of I&AP Database

A database of interested and affected parties (I&APs) involved in waste management in the Local Municipality will be compiled. A database including all the chiefs, community leaders, and interested parties will be developed in categories of those to ensure that information is communicated strategically at all levels. A complete list of key stakeholders and I&APs will be drawn up in consultation with the local municipality.

1.11.2 Advert and BID

An advert will be placed in local newspaper to be agreed upon with the local municipality. This will be to announce the project and its objectives and invite Interested Affected parties to register. Background information Documents (BID) of the project will be made available to all interested and Affected Parties (I&APs). Newsletters to inform the public will be distributed to each community to inform them of the project.

1.11.3 Public Meeting

Based on the structural power sharing within the councillors and chiefs, will ensure that proper communication structures are in place to ensure proper flow of information. A number of meetings will be held in the area. These meetings will have the following function:

- Obtain additional data on producers, transportations, disposers etc. of waste;
- Identification of existing processes and alternative technologies for waste management:
- Education of the public with regards waste management: and
- Prioritization of any issues at identified above.

Meetings will be held in strategic places that will cover large numbers of communities. Community leaders will be made to take leadership in communication with the community since they know their people.

CHAPTER 2

BACKGROUND INFORMATION & LEGISLATIVE FRAMEWORK

2 DEFINING THE GEOGRAPHICAL AREA

2.1 Description of the Study Area

The Lim 476 Municipality was established and officially proclaimed in the Section 12 Notice Limpopo Provincial Gazette no. 2735, its short title: "Notice in terms of s12 of the Local Government: Municipal Structures Act, 1998 (Act 117 of 1998): Disestablishment of Existing Municipalities and Establishment of New Municipalities", dated 22nd July 2016 issued by the Member of the Executive Council (MEC) for local government in Limpopo Province. The municipality was formed as a sequel to an amalgamation between the former Fetakgomo Local Municipality and the former Greater Tubatse Local Municipality, which municipalities were established after the 2000 Local Government Elections as an outflow of the municipal demarcation board. The amalgamation was given a force of law in the aftermath of the 2016 Local Government Elections, which municipal elections were held on the 03rd August 2016. Both the former FTM and former GTLM were classified as categories B municipalities due to their spatial and economic characteristics. It is a Category B municipality. Its municipal boundaries have been determined in the Demarcation Notice published in Gazette no. 2629 dated 11th November 2015. The MDB (Municipal Demarcation Board) Circular 8/2015: Redetermination of Municipal Boundaries in terms of Section 21 of Local Government: Municipal Demarcation Act, 1998, has redetermined the municipal boundaries of Lim 476 by amalgamating the former municipal areas of FTM (Lim 474) and GTM (Lim 475) into the boundaries of the new municipal area.The Lim 476 government municipality is located north of N4 highway, Middleburg, Belfast and Mbombela; and east of the N1 highway; Groblersdal and Polokwane.

Category B Municipality or alternatively known as Amalgamated Urban - Rural Municipalities, are Municipalities with a full range of municipal powers and functions. These Municipal boundaries are extended to incorporate smaller neighboring towns and rural hinterlands.

The municipal area of jurisdiction covers approximately **4550.001105 square kilometres or 45500.1105 ha** in size. The area is known as the Middleveld as it is

located between the Highveld and lowveld regions. It is located within the Sekhukhune District Municipality (SDM) of the Limpopo Province. The municipality has a total of **39 wards** as illustrated in Table 1 making it the **third** (03) largest municipality in the Limpopo Province in terms of wards after Polokwane with 45 wards and Thulamela with 41 wards. The municipality comprises approximately **297** villages. The municipality is largely dominated by **rural** landscape with only **06** (six) proclaimed **townships**. Like most rural municipalities in the Republic of South Africa, Lim 476 is characterised by weak economic base, inadequate infrastructure, major service backlogs, dispersed human settlements and high poverty levels[2].

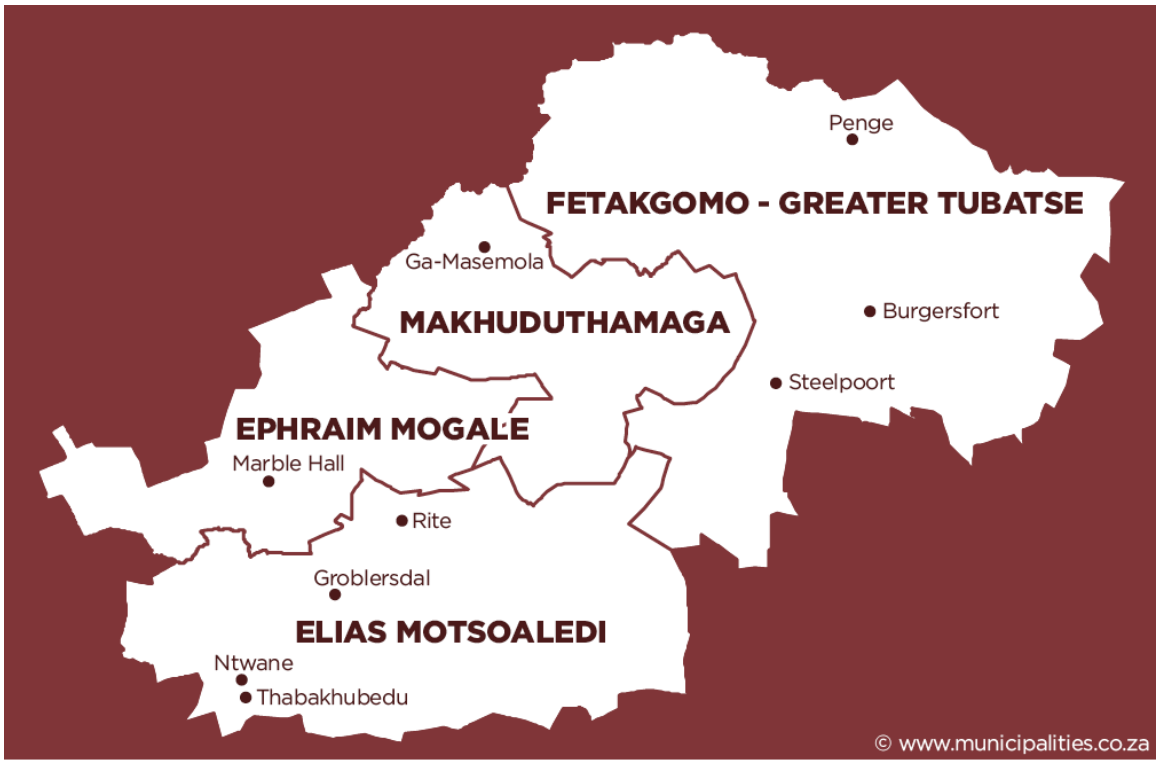


Figure 2: Locality Map

[2] Final Consolidated IDP 2016/17 – 2018/20121 for Fetakgomo Greater

Table 1: Wards for Fetakgomo-Tubatse Local Mnicipality

WARD NUMBER	VILLAGES
1	Makopung, Makgelane, Mapareng, Manawaneng, Mokotung, Ohrigstad, Maepa
2	Stocking, Tukakgomo, Palaneng, Bottom Village
3	Sentlane, Tshewereng, Mashabela A, Maebeng, Makua, Matsi, Mabotagale,Makola, Matshi, Rite, Mashabela, Maroteng, Sekateng
4	Riba Cross
5	Madiseng
6	Ga-Phasha, Ga-Mampuru, Motale
7	Mooihoek, Lenareng,
8	Mantsakane, Melao, Modimolle, Magabaneng, Boshoek, Lehabeng, Diphale, Ga-Makwa, Winnaarshoek, Lekgwareng,
9	Modubeng, Ga-Phala, Malokela, Kgopaneng, Sehunyana, Shakung, Thokwane, Lwaleng
10	Ga-Makopa, Ditwaile, Serafa, Magakala, Maakgake, Itabaleng, Mashabela, Ga-Mongatane, Tedintetjane, Mtsaneng, Senthle
11	Ga-Mahlakwane, Ga-Mapea, Ga-Makubane, Ga-Maroga, Ga-Ragopola, Driekop
12	Mahlageng, Ga-Mpuru, Maandagshoek,Mamphahlane, Mohlake, Genokakop,Hwashi, Matimatjatji, Sehlaku,
13	Praktiseer
14	Wismaar, Motloulela, Legwareng, Moshira, Sokodibeng, Marobajin,Moroke
15	Maropaneng, Ditobeleng, Makgemeng, Ga-Kgoete, Masete, Ga-Mashishi,Shakung

16	Mamogolo, Maretiwane,Penge,Segorong,Ga-Malepe, Segorong, Makubu, Ga-Moraba A, Ga-Motshana
17	Ga-Manyaka, Ga-Selala, Ga-Mphethi, Ga-Mapea B, Ga-Mashukwane
18	Thabaneng, Manoke, Apiesdoring, Burgersfort
19	Ga-Riba, Khulwane, Polaseng A, Maglopi, Madetameng,
20	Hopekraals, Pologong, Sofaya, Naledi, Santeng, Bothashoek, Riverside, Dithabaneng
21	Ga-Podile, Sekopung, Ga-Makofane, Maphoko, Motlolo
22	Taung, Matokomane, Marota, Ga-Motodi
23	Mafarafara, Maahlase, Kgotlopong, Motlailane, Morethuse, Alverton, Lekgwabeng, Marota
24	Maakubu, Magwareng, Molawi, Kgautswana, Rietfontein, Masakeng, Kgwedi, Lebalelo, Paeng
25	Ga-Mashampthane, Mariseleng
26	Malaeneng, Ga-Moraba B, Tswenyane, Banareng, Leboeng, Phiring, Marakalala
27	Dithamaga Trust, Mahlagari,Tsakane, Ga-Malekana, Madidimola, Madibeng
28	Ga-Masha
29	Maphopha, Ga-Maepa, Rantho, Mmaphoko
30	Morulaneng, Mokobola, Mabotsha, Shushumela
31	Makgemeng, Mangabane, Steelpoort,Annex A, Trustine
32	Shubushubu, Rostok, Mahlabeng, Modihule, Lekgwareng A, Tsimeng, Sentlhane, Tswereng, Ledingwe, Ramallane, Ga-Motene, Malaeneng, Lekgwareng, Selape, Ga-Mampa, Mashegeng, Lesetse, Nyakela, Seokodibeng, Tsidintsing, Legwareng

33	Ga-Selepe, Manotwang, Mosotsi, Pashaskraal, Skutlong, Sealane, Phashaskraal
34	Mphaaneng, Zeekoegat, Bogalatladi, Mohlahlaneng, Masikwe, Sefeteng B, Malomanye, Maropeng, Malepeng, Mogabane, Monametsi, Braamfontein
35	Malogeng, Forong, Pelangwe, Ga-Maisela,Makgonyane, Moshate A, Matsha, Mapodi, Kamapolaneng, Ga-Nkoana, Mahlabaphooko, Tau-Nchabeleng, Masweneng
36	Mooiplaas, Mooiklip, Strydkraal, Seteneng, Mashung, Debeila,
37	Strydkraal, Thabanaseso, Matlala, Lepellane, Mashabela B, Thobehlane, Mashabela C, Mphanama,
38	Marathameng, Mawete, Ga-Seroka, Matlou, Lehlokong, Manoge, Sefateng A, Masehleng, Stopong, Letolong, Mabatho, Phahlamanoge, Mashilabela, Phetseng, Shenyane, Lekgwareng B, Lehlabile, Ga-Mmela, Ga-Radingwana
39	Riverside, Moshate B, Morwaswe, Masharu, Mokhulwana, Lekazang, Matsimela, Maisela, Magakala, Magotwaneng

2.2 Proposed Township Development

Township development will influence the ability and capacity of the local municipality to provide waste management services to new developments. There should be coordination between physical planning and waste management section. Waste management department should be a given an opportunity to comment on new applications for rezoning and township establishment.

The municipality has appointed a service provider for the formalization of Dresden, Apel Extension 1 and Apiesdoring. Formalization is the first stage in the process of township establishment and a valuation roll will be created for the areas.

2.3 Topography

The northern part of the FTLM is mountainous, thereby presenting engineering challenges as far as the development and provision of infrastructure is concerned. The southern part of the FTLM is high-lying and has a more moderate topography. The management of the koppies, valleys and the mountain ranges in the area is critical to ensure environmental sustainability. The FTLM area is highly mountainous hence development occurs mostly in valleys. Settlements sizes are small and scattered due to extensive broken terrain. In fact the ridges and the mountains form linear dividers between the settlements. "In certain areas the topography is very steep creating impossible mountainous terrain which is barely inhabited. The ridges further divide the municipal areas creating pockets of homogenous composition, which determine growth and development potential" (GSDM:Central Tubatse-Driekop, Praktiseer and Burgersfort: Trends Report and Detail Development Plans). The terrain dictates that larger settlement development occurs mainly in flat, low lying areas in-between the mountain ranges. Generally, the roads run at the bottom of the basin/ valleys. It is therefore not surprising that the major roads, i.e. R555, R37 and R36 and Jane Furse to Lydenburg road for most part run parallel to rivers. The position of cross-link roads is dictated by topography that is flatter to allow the road to pass through at reasonable flat grades. Where these roads pass through wide basin, particularly in former Lebowa homeland motley of settlements have grown around these major roads. In other words, there is clustering of series of settlements for almost the entire length of the road, e.g. Mecklenburg-Driekop (R37), Mapareng -Tswenyane (R36) and Mampuru to Eerste Geluk (parallel to R555). In former 'white areas' the spatial development is contrasting as it tends to be more nodular therefore not continuous. For example, there is approximately 20 km of vacant of intervening land between Steelpoort and Burgersfort and about 50 km between Burgersfort and Ohrigstad

along R555. This land need to be managed properly for the expansion or growth of Burgersfort, Steelpoort and Ohrigstad towns. Even the scattered rural villages have located within more developable basin almost parallel to mountain range. The central spine road (normally the bus and a taxi route) usually runs along the flatter alignment in the basin.

2.4 Rivers

There are three main rivers in the FTLM, namely the Spekboom, Steelpoort and the Olifants, which is the largest. The existence and topography of these water sources present an opportunity to create water storage facilities. The construction of De hoop dam in the Steelpoort River which was finalized in 2011 had major benefits for agriculture, as well as for general development in the region. There is a need to carefully assess the water needs of the area, taking into consideration the development of the mining industry, which in itself need large quantities of water. Given the present water needs in the municipal area, an increase in storage facilities or the expansion of the existing storage facilities needs to be investigated.

Due to the lack of waterborne sewerage infrastructure in many of the villages, one of the major challenges is the pollution occurring in these rivers. These rivers are a major source of drinking water for the communities who do not have access to piped water. These rivers are also used for irrigation purposes for agricultural activities within the municipal area.

2.5 Climate

There have been a few recent studies that have highlighted the important role that climate, for instance, plays in Sekhukhune livelihoods and stresses (Ziervogel et al, 2006; DoA, 2006). More specifically, rainfall patterns in the municipality and SDM in general are highly variable – a situation that tends to disrupt a wide range of socio-

economic activities in the area such as rain-fed crop production, often with very little warning. The Sekhukhune area has in fact been significantly affected by both El Niño and La Niña events in some past years, which has affected the amounts of rainfall received in the area (Ziervogel et al, 2006). El Niño tends to be associated with below average rainfall, whilst La Niña often incurs above average rainfall. The recent drought in the municipality and the District generally is partially a result of these phenomena. As part of environmental challenges, rainfall patterns in the District are highly variable, thereby disrupting agricultural production and causing related socio-economic stresses. Because of its climatic profile, the District is currently susceptible to both the El Niño and La Niña phenomena. Variations in climate exacerbate the water shortage problem (net water deficit) which is already a key developmental constraint in the area. The weather condition for the municipality is characterised by sub-tropical by nature and conducive to agricultural production. The summer tend to be extremely hot and humid with temperatures often exceeding 35 degrees Celsius between the months of October and march, while the winters tend to be warm during the day and cool to cold at night and in the early mornings.

2.6 Geology

The municipality is situated on the eastern side of the Bushveld Igneous Complex and the Transvaal geological system and is therefore underlain by both sedimentary and volcanic rock formations. Owing to the geological composition, the area is characterized by steep rising mountains, which are linked by undulating river valleys. There are no major geological impediments to development in the FTLM area. Erosion and land degradation has been identified as a challenge in the

area, which if not managed, will also impact on future agricultural activities in the area.

Minerals are found in abundance in the Bushveld Igneous Complex, which has seen the establishment of several mines in the area. The most fertile soils in the region are to be found in the lower lying areas of Burgersfort and Steelpoort, which are deep, well-drained and characteristic of deep sandy/loamy soils of exceptional quality. These soils are suitable for most agricultural purposes.

2.7 Waste Management and Climate Change

Waste generation does not result in positive impacts on climate. Waste treatment and disposal can have both positive and negative climate impacts. Therefore, an increasingly key focus of waste management activities is to reduce GHG emissions. GHG emissions and savings (credits) are attributable to various stages of a waste management system. Figure 3 shows a simplified schematic of a municipal waste management system with the predominant climate impact sources. The general suite of activities – collection, separation, treatment, transfer, and disposal – applies to all waste types with varying levels of sophistication, with the possible exception of agricultural waste. In many rural areas, agricultural waste is dealt with in-situ, through uncontrolled burning, burial, or simple land dumping. Evidently, not all sources of emissions are indicated in the diagram: there are further environmental burdens associated with manufacture of waste receptacles, vehicles, and treatment facilities, as well as the transfer of residual waste materials from intermediate stations and treatment facilities to landfill.

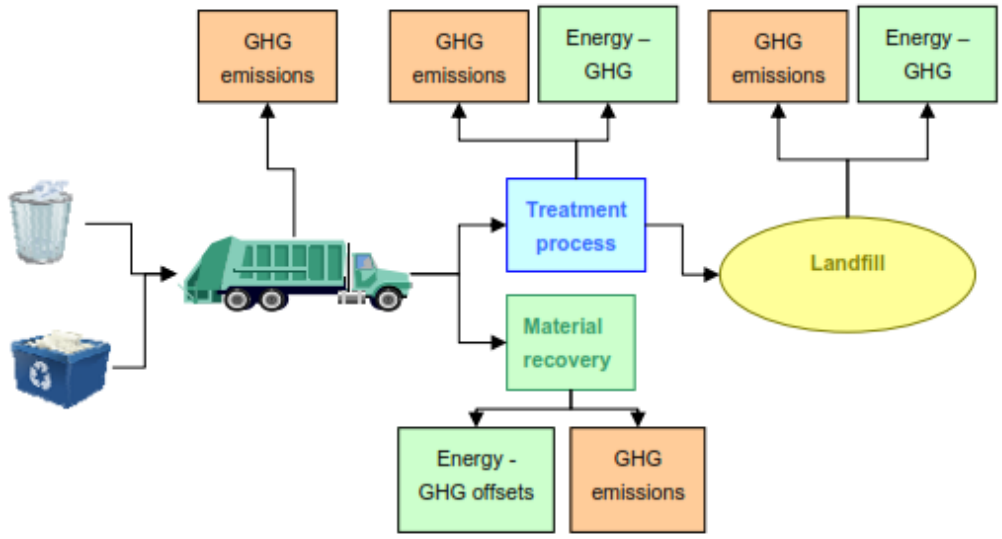


Figure 3: Simplified schematic of waste management system and GHG emissions in urban waste management.

2.7.1 Sources of GHG

Methane emissions from landfill are generally considered to represent the major source of climate impact in the waste sector (this impact is quantified in later sections). It is worth noting that, if a broader view of waste management were taken, which included materials management, landfill methane would no longer be the largest source of GHG in the sector. Waste contains organic material, such as food, paper, wood, and garden trimmings. Once waste is deposited in a landfill, microbes begin to consume the carbon in organic material, which causes decomposition. Under the anaerobic conditions prevalent in landfills, the microbial communities contain methane-producing bacteria. As the microbes gradually decompose organic matter over time, methane (approximately 50%), carbon dioxide (approximately 50%), and other trace amounts of gaseous compounds (< 1%) are generated and form landfill gas. In controlled landfills, the process of burying waste and regularly covering deposits with a low permeability material creates an internal environment that favours methane-producing bacteria.

As with any ecological system, optimum conditions of temperature, moisture, and nutrient source (i.e. organic waste) result in greater biochemical activity and hence greater generation of landfill gas. The gradual decay of the carbon stock in a landfill generates emissions even after waste disposal has ceased. This is because the chemical and biochemical reactions take time to progress and only a small amount of the carbon contained in waste is emitted in the year this waste is disposed. Most is emitted gradually over a period of years.

2.8 Legislative Framework

2.8.1 The South African National Constitution Act 108 Of 1996

The South African Constitution (Act 108 of 1996) is the supreme law of the land. All law, including environmental waste management planning must comply with the Constitution. The Constitution states that the people of South Africa have the right to an environment that is not detrimental to human health and imposes a duty on the state to promulgate legislation and to implement policies to ensure that this right is upheld. All departments of state or administration in the national, provincial or local levels of government have similar obligations. The principles of co governance are also set out in the Constitution and the roles and responsibilities of the three levels of government are defined.

According to the Constitution, responsibility for waste management functions is to be devolved to the lowest possible level of government. Local government therefore is assigned the responsibility for refuse removal, refuse dumps and solid waste disposal. Provincial government has the exclusive responsibility to ensure that local government carries out these functions effectively.

2.8.2 National Environmental Management Act 107 of 1998

The National Environmental Management Act (NEMA) provides for co-operative governance by establishing principles and procedures for decision-makers on matters affecting the environment. An important function of the Act is to serve as an enabling Act for the promulgation of legislation to effectively address integrated environmental management. Some of the fundamental principles established in the Act are -Accountability; Affordability; Cradle to Grave Management; Equity; Integration; Open Information; Polluter Pays; Waste Avoidance and Minimisation; Co-operative Governance; Sustainable Development; and Environmental Protection and Justice.

Section 24 and 44 of NEMA makes provision for the promulgation of regulations that identify activities that would require environmental authorisation prior to commencing. The most recent edition of these listed activities has been published under **Listing Notice 1,2,3: List of activities and competent authorities identified in terms of sections 24(2) and 24 D, Government Notice 38282, 4th December 2014.** It must be noted that in terms of Waste Management activities, these listing notices are supplemented by the relevant latest published **List of Waste Management Activities that has or is likely to have a detrimental effect on the environment.**

The environmental assessment regulations which aims to regulate the procedure relating to the submission, processing and consideration of, and decision on applications for environmental authorisations where published in 2006. The latest edition of these regulations was published in **Government Notice 38282, 4th December 2014: National Environmental Management Act (107/1998): Environmental Impact Assessment Regulations, 2014.**

2.8.3 Environmental Conservation Act 73 of 1989

Although significant sections of the Environment Conservation Act (ECA) have been repealed, by NEMA and acts promulgated in terms of NEMA, particularly those dealing with waste management and environmental impact assessment relation to

Waste Management this Act it is still an important piece of legislation as a reference guide of where we come from and where we are going as far as waste management is concerned in South Africa.

Part IV of the act introduced Control of Environmental Pollution. Waste Disposal Sites were formerly controlled through Section 20 of the Act by the issuing of Permits. This was repealed by the promulgation of the Waste Act, Act 59 of 2008. In terms of the Section 19 of Part IV of the Act, it is an offence to litter on any place to which the public has access and the person or authority in charge of the area must provide containers for the discarding of litter. In addition, every authority in control of any place must remove the litter within a reasonable time. Provision is made for the appointment of inspectors to investigate compliance with the Act. In terms of Section 24A of the Environment Conservation Act, a competent authority may make regulations with regards to the control of the littering. Environment Impact Assessment Regulations, regarding activities defined under Part V Section 21 (1) of the Environment Conservation Act, have been promulgated in Government Notice R1183 of 5 September 1997, and superseded Government Notice No R.982 of 4 December 2014 by the Environmental Impact Assessment Regulations, 2014. The promulgation of NEMA has resulted in this act being repelled.

2.8.4 National Environmental Management: Waste Act 59 of 2008

The National Environmental Management: Waste Act (No 59 of 2008) asserts the roles of both national and provincial government in waste management. National governments competence to legislate is established in line with section 44 of the Constitution on the grounds of the need to maintain essential national standards, establish uniform norms and standards, and to promote and give effect to the right to an environment that is not harmful to health and well-being. The Act establishes a national framework for waste planning, regulation and management with roles for all spheres of government, specifically:

i) National government is tasked with establishing a national waste management strategy, including norms, standards and targets. National norms and standards

may cover all aspects of the waste value chain, from planning to service delivery. Of particular importance from an intergovernmental perspective are the powers of national government with respect to norms and standards for:

- The regionalization of waste management services;
- Tariffs for waste services provided by municipalities, including providing for tariffs to be imposed to provide for waste management infrastructure or facilities and ensuring that funds obtained from the provision of waste services are used for the delivery of these services.

ii) Provincial governments are tasked with the implementation of the national waste management strategy and national norms and standards, and may set additional, complementary provincial norms and standards. The Waste Act notes that these norms and standards —must amongst other things facilitate and advance regionalization of waste management services.

iii) Local governments are required to ensure the universal and sustainable delivery of services, subject to national and provincial regulation. In particular, they are required to maintain separate financial statements, including a balance sheet of the services provided.

Chapter 2: Part 2 requires the Minister to set national norms and standards for the classification of waste – refer to Waste Classification and Management Regulations, Government Notice 36784, 23 August 2013; planning and provision of waste management services – refer to National Domestic Waste Collection Standards, Government Notice 33935, 21 January 2011, and storage, treatment and disposal of waste, including the planning and operation of waste treatment and waste disposal facilities.

Section 9 states that the municipality must exercise its executive authority to provide waste management services in a manner that complies with the national and provincial norms and standards drawn up by the Minister.

In ***Chapter 3*** of the Act, it states that an Integrated Waste Management Plan (IWMP) must be drawn up and also underlines the contents on the IWMP. Certain waste management measures have been outlined in Chapter 4 of the Act.

Chapter 4 is fragmented into different parts, each focusing on a certain waste management measure:

- Part 1 stipulates that the Minister must declare a certain waste to be a priority given that the associated waste poses a threat to the environment.
- Part 2 designates the duties for all holders of waste to try to minimise the quantity of waste generated and should adopt recycling initiatives.
- Part 3 focuses on the measures that can be implemented in order to promote the recycling and reuse of waste.
- Part 5 outlines and defines the duties of the waste holder as well as the waste collection service provider in order to achieve efficient and effective waste storage, collection and transportation.
- Part 6 deals with the measures that need to be taken in terms of treatment, processing and disposal of waste.
- Part 7 gives the Minister and the provincial MEC the authority to require the preparation of Industry Waste Management Plans.
- Part 8 focuses on Contaminated Land. It must be noted that by proclamation of the Minister in the Gazette, this section came into effect on 2 May 2014. On the same date the "National Norms and Standards for the Remediation of Contaminated Land and Soil Quality" were promulgated (see 1.1.4.7).

Chapter 5 designates the Minister as the licensing authority with respect to all waste management activities that involve obligations or other contractual agreements.

2.8.4.1 National Environmental Management: Waste Act, 2008(Act No.59 of 2008: National Domestic Waste Collection Standards, Government Notice 33935, 21 January 2011

This notice aims to standardize waste service delivery to ensure that this service be available to all while complying with current health and safety legislations as well as

minimally changing those waste collection processes that function effectively and efficiently. The standards which are defined in this document are based on the principles outlined in ***Section 2***. The National Domestic Waste Collections Standards (NDWCS) also specifies that recyclables which are not collected at households should be deposited at drop-off centres which must be easily accessible to households. These drop-off centres must promote recycling, ensure user friendliness and also collection must be done at regular intervals so that it does not cause a nuisance.

The standards and regulations aimed for ensuring health and safety of Waste Collection Personnel are addressed in ***Section 7*** of this document. The NDWCS defines that there should be mechanisms in place to ensure that there be transparent communication between different stakeholders.

Section 8 of this document stipulates that the service provider must create awareness amongst households about waste collection services offered, source separation, composting and the consequences of illegal dumping. This notice also outlines the role of the Waste Management Officer regarding waste awareness and the handling of complaints are prescribed.

2.8.4.2 National Environmental Management: Waste Act, 2008(Act No.59 of 2008: National Waste Information Regulations, Government Notice 35583, 13 August 2012

This notice illustrates the regulations for the collections of data and information to fulfil the objectives of the national waste information system set out in section 61 of the Waste Act. These regulations apply uniformly to all persons conducting an activity listed in Annexure 1 of this notice. A person who conducts an activity in a province that has established waste information system in terms of Section 62 of the Waste Act and collects the minimum information required by the regulations must submit the information to a provincial waste information system, or the South African Waste Information System.

2.8.4.3 National Environmental Management: Waste Act, 2008 (Act No.59 of 2008: Waste Classification and Management Regulations, Government Notice 36784, 23 August 2013

This purpose of this Regulation is to regulate the classification and management of waste in manner which supports and implements the provisions of the Waste Act; to establish a mechanism and procedure for the listing of waste management activities that do not require a Waste Management License; to prescribe requirements for the disposal of waste to a landfill; to prescribe general duties of waste generators, transporters and managers.

2.8.4.4 National Environmental Management: Waste Act, 2008(Act No.59 of 2008: National Norms and Standards for the Assessment of Waste for Landfill Disposal, Government Notice 36784, 23 August 2013

The purpose of the Norms and Standards is to prescribe the requirements for the assessment of waste prior to disposal to landfill in terms of Section 8(1) a of the Waste Classification and Management Regulations.

The notice underlines the Standard Assessment Methodology to access waste for the purpose of disposal to landfills which require the following:

- Identification of chemical substances present in waste
- Sampling and analysis to determine the total concentrations (TC) and leachable concentrations (LC) of the elements and chemical substances that have been identified in the waste and that are specified in Section 6 of this Notice.

Within 3 years of the date of commencement of the Regulations, all analysis of the TC and LC must be conducted by labs accredited by SANAS. The TC and LC limits must be compared to the threshold limits specified in section 6 of this notice. Based on the TC and LC limits the specific type of waste for disposal to landfill must be determined in terms of Section 7.

2.8.5 National Waste Management Strategy, Government Notice 35306, 4 May 2012

The National Waste Management Strategy (NWMS) is a legislative requirement of the Waste Act. The purpose of the NWMS is to give effect in achieving the objectives outlined in the Waste Act. Organs of state and affected persons are obliged to give effect to the NWMS. This document outlines the challenges that South Africa currently experiences with regards to waste management and states that waste management should move away from being uncoordinated to be managed and implemented in a more integrated, holistic manner.

NWMS is built around a framework of eight goals which, as per the strategy, needs to be achieved by 2016. These eight goals are illustrated below:

- *Goal 1: Promote waste minimisation, reuse, recycling and recovery of waste*
- *Goal 2: Ensure the effective and efficient delivery of waste services*
- *Goal 3: Grow the contribution of the waste sector to the green economy*
- *Goal 4: Ensure that people are aware of the impact of waste on their health, well-being and the environment*
- *Goal 5: Achieve integrated waste management planning*
- *Goal 6: Ensure sound budgeting and financial management for waste services*
- *Goal 7: Provide measures to remediate contaminated land*
- *Goal 8: Establish effective compliance with and enforcement of the Waste Act*

Chapter 4 of the NWMS deals with the mechanisms necessary to implement this strategy. This chapter also outlines the roles of different tiers of government as well as private and public sector in the implementation of the NWMS.

The NWMS overall aim is to reduce the generation and environmental impacts associated with poor waste management. It presents a plan on how to achieve the desired goals outlined in the document which will ultimately promote a cleaner, healthier environment within South Africa.

2.8.6 National Environmental Management: Air Quality Act 39 of 2004

This act aims to protect the environment by providing reasonable measures for the protection and enhancement of the quality of air as well as for the prevention of air pollution and ecological degradation. Chapter 2 of the act stipulates the establishment of a national framework to achieve the objects of the act. This national framework will contain aspects of ambient air quality standards as well as national norms and standards on air quality management. This act also outlines the contents of air quality management plans and the procedure to be followed for the application of atmospheric emission license.

Section 21(1) as of this act stipulates that the Minister must publish a list of activities that will have significant detrimental effects on the environment. This list was published in the following document:

List of Activities Which Result in Atmospheric Emissions Which Have or May Have A Significant Detrimental Effect On The Environment, Including Health, Social Conditions, Economic Conditions, Ecological Conditions Or Cultural Heritage (GNR 248, March 2010).

This document contains the emission standards for cement production using alternative fuels and/or resources (AFR). This is an important aspect in terms of waste management because thermal waste treatment can be implemented during cement production. This involves the use of waste as an AFR in the cement production process.

2.8.7 National Policy for the Provision of Basic Refuse Removal Services to Indigent Households, Government Notice 34385, 22 June 2011

The National Policy on Free Basic Refuse Removal (FBRR) aims to address the need for free basic refuse removal among impoverished households. Many municipalities experience many challenges with respect to delivering an effective and sustainable waste service to all households. Some of the problems currently experienced by municipalities in terms of waste management are insufficient budget allocation, lack of equipment, skilled staff and poor access to service areas. There are 3 objectives of

the National Policy on FBRR. The first, being to establish a framework for the development, identification and management of indigent households that can be enrolled for the FBRR service within the municipality. The second is to set broad principles, resulting in the adoption of bylaws for the implementation and enforcement of tariff policies that will support the FBRR service within the concerned municipalities. The last of these principals is to educate and raise awareness within municipalities regarding proper handling of domestic waste for FBRR as well as for the need to minimise waste and promote recycling.

2.8.8 White Paper on Integrated Pollution and Waste Management for South Africa of 2000

The White Paper on Integrated Pollution and Waste Management for South Africa serves to inform the public of the government's objectives towards integrated pollution and waste management as well as how the government intends to achieve these objectives. This document also intends to inform government agencies and State organs of these objectives, and their roles in achieving them. It also illustrates the shift from the way waste management was dealt with previously, mainly tackling post-consumer waste, towards a newer more holistic approach of waste management. This document also encourages the amalgamation of all existing legislations pertaining to waste management and pollution into a single piece of legislation dealing with all waste and pollution matters.

2.8.9 White Paper on Environmental Management Notice 749 of 1998

The White Paper on Environmental Management was published in 1998. This policy sets out government's objectives in relation to environmental management, how it intends to achieve its objectives, and to guide government agencies and organs of state in developing strategies to meet their objectives. The policy document is an overarching policy framework that refers to all government institutions and to all activities that impact on the environment.

The policy states that government will allocate functions to the institutions and spheres of government that can most effectively achieve the objectives of sustainable development and integrated environmental management. This would include the allocation if certain functions to the municipal sphere of government. Where appropriate, provincial and local government are to develop their own legislation and implementation strategies to address their specific needs and conditions within the framework of the policy.

2.8.10 Hazardous Substances Act 15 of 1973 (24 February 2000 – to date)

This legislation aims to address substances that are deemed hazardous, in order to regulate and prohibit the importation, manufacture, sale, use, operation, application, modification, disposal or dumping of such substances. In terms of waste management, Section 29 of the Hazardous Substances Act stipulates that the Minister has the designated authority to authorise, regulate or prohibit the dumping of hazardous substances. Industries that generate hazardous waste must produce an industrial waste management plan.

2.8.11 National Water Act 36 of 1998

The National Water Act contains a number of provisions that impact on waste management, including the disposing of waste in a manner, which detrimentally impacts on a water resource and the discharge of waste into a water resource. The Act allows the Minister to make regulations for: Prescribing waste standards, which specify the quantity, quality and temperature of waste that may be discharged or deposited into or allowed to enter a water resource. Prescribe the outcome or effect, which must be achieved through management practices for the treatment of waste before it is discharged or deposited into or allowed to enter a water resource. Requiring that waste discharged or deposited into or allowed to enter a water resource be monitored and analyzed according to prescribed mechanisms.

2.8.12 The Development Facilitation Act 67 of 1995

The Development Facilitation Act 67 of 1995 sets out a planning and land development system, which ensures that national, provincial, and local government

policies are implemented. Section 28 describes the requirements for Land Development Objectives, which must be developed by each local authority. One of the objectives of Land Development Objectives is to create a new system of planning that encourages sustained utilisation of the environment, particularly with regard to the environmental consequences of developments. Municipalities are encouraged to co-operate in order to develop the capacity of each municipality to exercise its powers and duties and manage its affairs.

2.8.13 Municipal Systems Act No. 32 of 2000

The Municipal Systems Act describes the core principles, mechanisms, and processes that are necessary to enable municipalities to move progressively towards the social and economic upliftment of communities and ensure access to services that are affordable to all. Its focus is primarily on the internal systems and administration of the municipality. The Act enables the process of decentralisation of functions through assigning powers of general competence to local Government. Municipal by-laws are regulated to achieve harmony with national and provincial legislation. As service authorities, municipalities remain responsible for the effective delivery of services and must provide an appropriate policy and regulatory framework. This can be achieved through the most appropriate service provider, ranging from internal departmental delivery to corporatisation and joint ventures to private sector delivery options. Performance management systems are to be developed to measure and evaluate performance in priority areas, which are to be reported annually to citizens and other spheres of government. The process to be followed in planning, drafting and adopting the Integrated Development Plan is set out.

CHAPTER 3

WASTE MANAGEMENT STATUS QUO

3 FETAKGOMO-TUBATSE LOCAL MUNICIPALITY WASTE STATUS QUO

Information for the compilation of this status quo study was collected from site visits, interviews with key personnel as well as various electronic and hard copy documents.

3.1 Demographic Description of Fetakgomo-Tubatse Local Municipality

3.1.1 Base Population

According to the 2011 STATSA information; the total population of Fetakgomo - Tubatse municipality combined is approximately **429470** with **106 050** households; these statistics makes Fetakgomo-Tubatse Local Municipality a municipality with highest population in the District. In 2016 a Community Survey was done, and the results show that the population increased to 490 381 as illustrated in Figure 4 and Table 2. As per the current community survey 2016 the average growth rate for the local municipality was at **0.0215%** which put the municipality as the highest in the District.

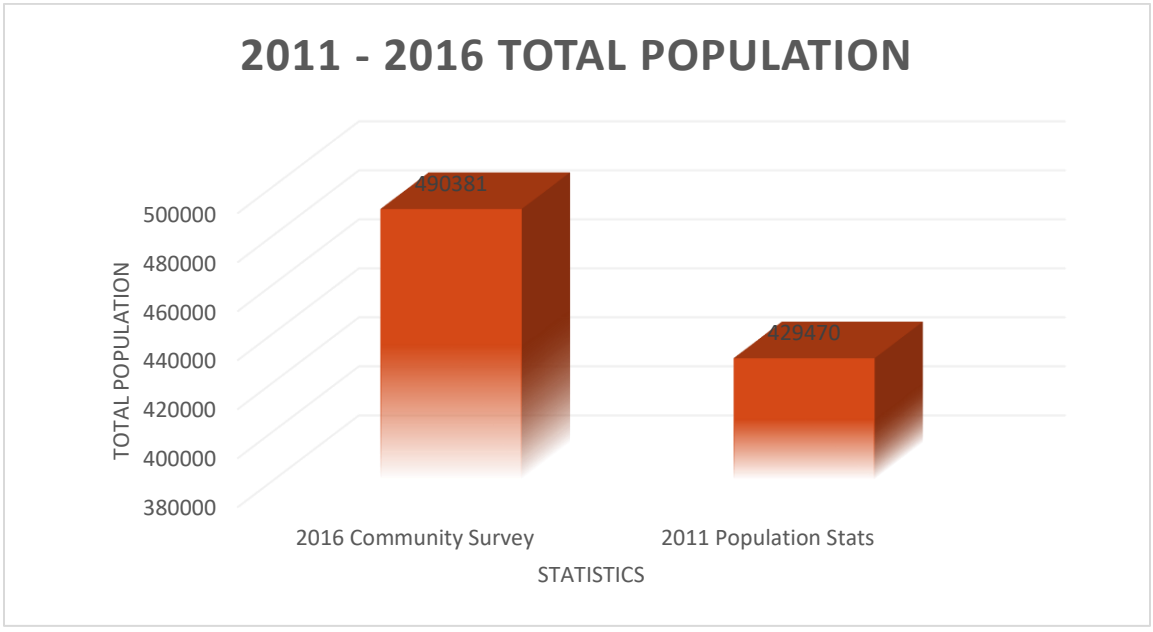


Figure 4: 2011 and 2016 Population Statistics

Table 2: Total Population by Gender

2011 STATISTICS				2016 COMMUNITY SURVEY			
	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	AV. GROWTH RATE
Fetakgomo-Tubatse Local Municipality	202 656	226 814	**429 470**	238 458	251923	**490381**	**0.0215%**

Table 3 indicate the total number of Households for Fetakgomo-Tubatse Municipality in 2011 as 106050 and 125454 in 2016; which makes the municipality the biggest municipality in the District. The municipality has shown a growth of **4%** growth of households in 2016; this might be due to the mining activities taking place in the area.

Table 3:Total number of households[3]

2011 STATISTICS			2016 COMMUNITY SURVEY	
	TOTAL HOUSEHOLDS	AVERAGE SIZE OF HOUSEHOLDS	TOTAL HOUSEHOLDS	AVERAGE SIZE OF HOUSEHOLDS
Fetakgomo-Tubatse Local Municipality	106 050	**4.05**	125 454	**4.0**

3.1.2 Population and Waste Projections for Fetakgomo-Tubatse Municipality

The 5year population projection was calculated using the exponential growth projection equation method:

$$Popn_{proj} = Popn_{last}\ (1+Growth.Rate)^{(Proj.Year)}$$

[3] Fetakgomo-Burgersfort Consolidated IDP 2016

Population projection for the next five years:

$Popn_{2021}$ = 490 381 $(1+0.0215)^5$

=490 381$(1.0215)^5$

=545 413

Population projection for **2021** is estimated to be at **545 413.**

3.1.3 Population Distribution by Age and Sex

The base population, according to the 2011 census much of the population in Burgersfort is children/infants between the ages of 0-4 which made up 13.2% of the total population and Fetakgomo 13.1% comprise of the same age group followed by 11.3% between the ages of 15-19 years as indicated in Figure 5 and Figure 6 respectively. Age and sex distribution will influence the type of strategies that the municipality will come up with to address waste management challenges in the affected communities.

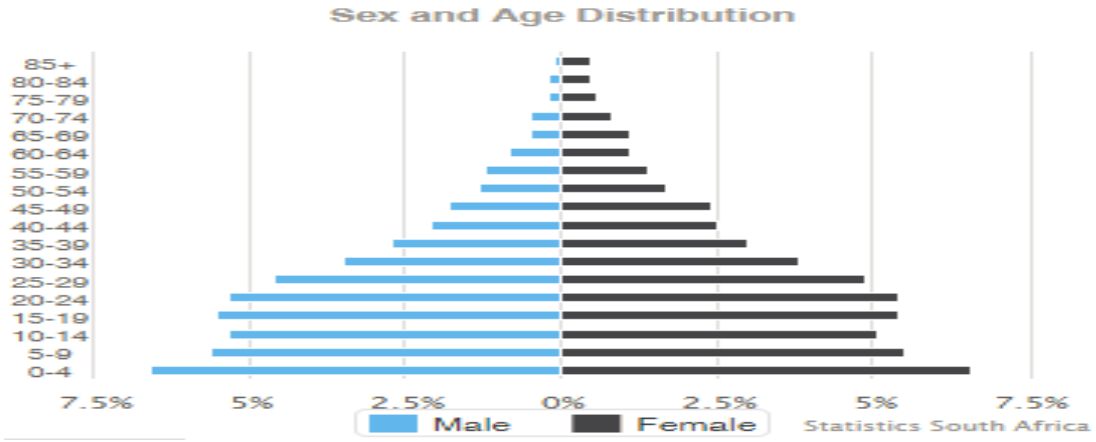


Figure 5: Sex and Age Distribution for Burgersfort[4]

[4] Statistics South Africa, 2011 Census

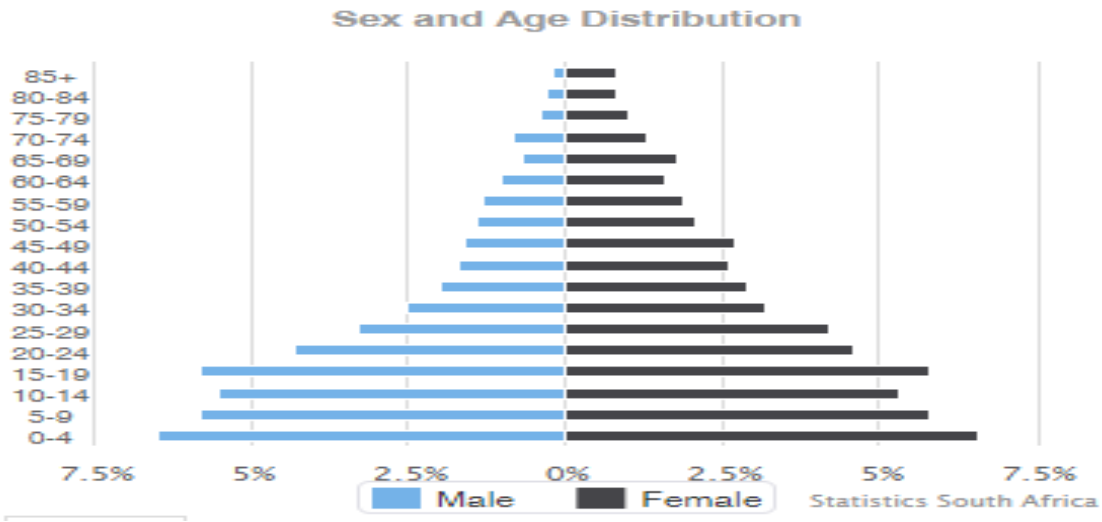


Figure 6: Sex and Age Distribution for Fetakgomo

3.1.4 Income Levels by Household

The majority of the households earn between R9 601 – R19 600 which makes up 41.6% of the households in the municipality as indicated in Figure 7.

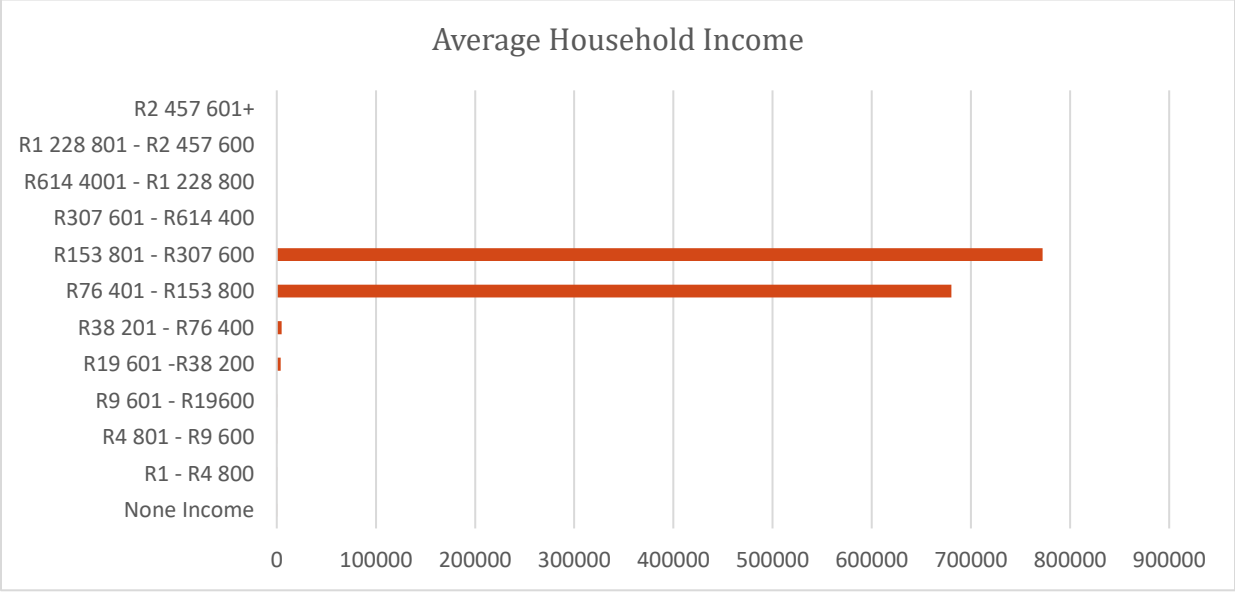


Figure 7: Average Household Income[5]

[5] Statistics South Africa; 2011 Census

3.2 Municipality Waste Removal

Waste management services are currently rendered in 5 areas in the Burgersfort region as shown in Table 5. Dumping and burning of waste is the more common way of disposing waste. There is generally a problem of illegal dumping in areas like: Praktiseer; Tukakakgomo; along the R37 road and the R555 road. Old heavy machinery tyres and used diapers are generally a problem when it comes to illegal dumping within the municipality. The rate of improvement in refuse removal has also been very slow, starting off a low base of only 4 707 in 2007/08 of the households having their refuse removed by municipality weekly, the situation only improved to 4 729 of the households receiving the service by 2012 as illustrated in Table 5.

The current study estimates that **40053** (**95%**) households in the Apel region have no formal refuse removal service and thus need this service[6]. They tend to use dongas, forests, open spaces and own created refuse dump. The widespread inadequacy of formal refuse removal service in the municipal area poses a health hazard to the rural communities - it is particularly a problem for businesses. Also noteworthy is that there is formal waste collection, which covers 4 wards as indicated in Figure 8. Out of the 11 wards in Apel 7 wards are not serviced by the municipality. The main challenge for not providing waste removal to the unserviced wards is the reluctance by residents to pay the service fee. The collection in the 4 wards started in 2009 as a pilot project which started as food for waste and the programme was phased out in 2010.

[6] Fetakgomo-Tubatse Consolidated IDP 2016

Table 4: Wards Currently Serviced by the Municipality in the Apel Region.

Ward Number	Village Name
3	Mohlaletse
35	Nkoana, Apel
36	Nchabeleng, Parts of Apel and Koana
39	Parts of Nchabeleng and Mohlaletsi

In the Burgersfort area waste collection by the local municipality is done in only five towns namely:

- Ohrigstad
- Praktiseer
- Steelport
- Burgersfort
- Ga-mapodile

Table 5: Areas Receiving Refuse Removal Services in the Burgersfort Area

Area	2010	2011	2012
Ohrigstad	190	197	197
Praktiseer	2332	2395	2398
Steelport	230	273	281
Burgersfort	1458	1723	1731
Ga-mapodile	691	755	761

3.2.1 Mine Waste

Mines within the municipality have subcontracted private companies to collect their general waste. Waste that is disposed at the Burgersfort landfill site is only general waste and is estimated at 484 tonnes per month.

3.2.2 Health Care Risk Waste

There is a total of 37 government health institutions within the local municipality. General waste is collected by the local municipality and health care risk waste is collected by Buhle Waste Management company which is subcontracted by the Department of Health to collect waste in Sekhukhune District Municipality. Apart from collecting waste from government medical institutions Buhle is also collecting from 70 private surgeries in the district municipality with 13 of those private health facilities located in FTLM. In 2016 a total of 8 5528.1tonnes of health care risk waste was collected from government medical institutions in the local municipality.

The local municipality provides services for general waste collection to 14 health institutions in the Apel region to the following health institutions:

- Poulos Masha clinic
- Nkoana clinic
- Mankotsane
- Phasha clinic
- Selepe clinic
- Motsepe clinic
- Manotoane clinic
- Nchabeleng health care centre
- Mohlaletse clinic
- Ikageng clinic
- Mphanama clinic
- Phamananoge clinic
- Nchabeleng clinic
- Seroka clinic

In the Burgersfort region the municipality collects general waste from the following health institutions:

- Praktiseer clinic

- Burgersfort clinic
- Mapodile clinic

Other health institutions dispose their general waste at the Burgersfort landfill site and these:

- Dilokong Hospital
- Meckleburg Hospital

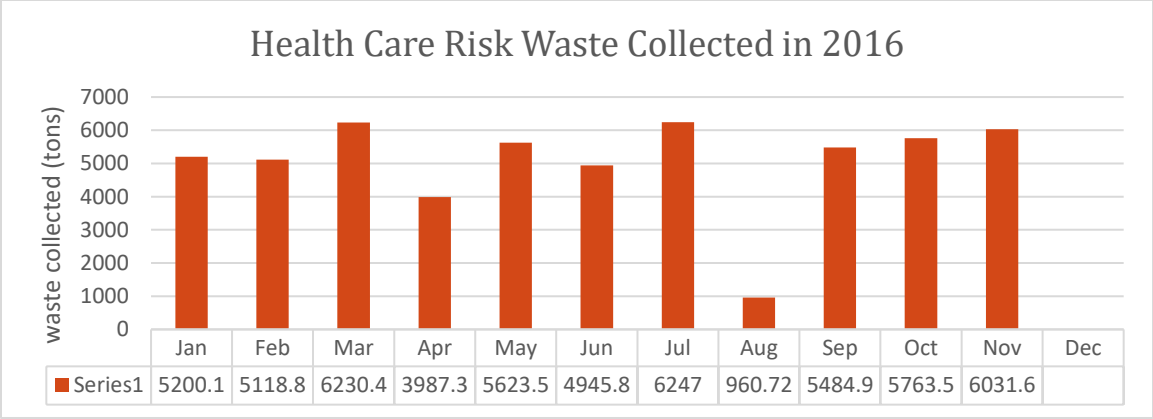


Figure 8: Health Care Risk waste collected in 2016

In 2017 a total of 55 593.4 tonnes was collected from from government medical institutions as illustrated in Figure 9:

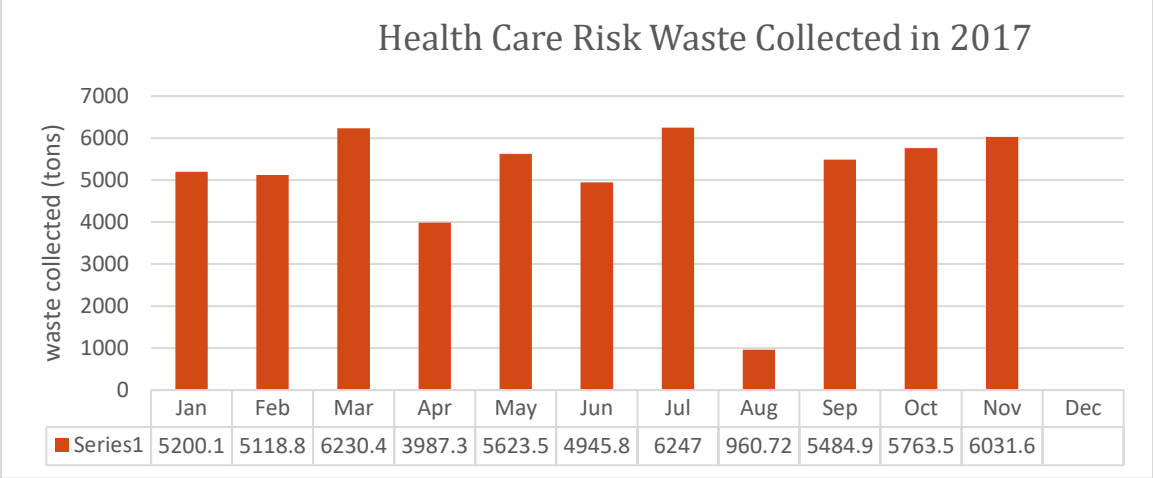


Figure 9: Health care risk waste collected in 2017

Other Private surgeries have entered into a Private Public Partnership with hospitals where they leave their waste for Buhle to come and collect for disposal at Holfontein Hazardous Waste Landfill Site in Gauteng.

3.2.3 Institutional Waste

The municipality is comprised of 225 primary schools, 133 secondary schools and 8 private schools[7]. From a total of 366 educational facilities, the municipality provides waste collection from 12 educational institutions namely:

- St. Thomas College
- Laerskool Burgersfort
- Calvin College
- Mogale wa Bogale Technical School
- Highlands College
- Koboti Primary School
- Bogwasha Primary School
- Itirele Primary School
- Leolo Secondary School

[7] Fetakgomo-Tubatse Consolidated IDP 2016

- Laerskool Steelport
- Shupyane Primary School
- Kgahlanong Secondary School

Schools were waste is not collected have resorted to trenching and burning of their waste.

3.2.4 E-Waste

Electronic waste is defined as discarded, surplus, obsolete, broken electrical or electronic devices. The risk of e-waste lies in potential exposure to toxic metals for example chromium, lead, lithium and mercury; halogenated compounds such as PCBs, radio-active substance and particulates from toner cartridges. Improper disposal of e-waste cause pollution problems because electronic equipment contains toxic contaminants that can cause water and air pollution and are of concern if disposed of at landfills.

Mapoma Holdings is currently working within the local municipality collecting e-waste from households, business offices and schools. The collected waste is then sold to Desco and Computer Recycling Company who are based in Johannesburg. The challenge the individual is experiencing is lack of transportation to collect the e-waste. Some of the e-waste is disposed at the landfill sites

3.2.5 Hazardous Waste

According to the National Environmental Management: Waste Act (Act 58 of 2008), hazardous waste is defined as any waste that contains organic or inorganic elements or compounds that may, owing to the inherent physical, chemical or toxicological characteristics of that waste have a detrimental impact on health and the environment. Examples of hazardous waste include: used oil, fluorescent tubes, grease, ferrous metal slag etc. Oil Separation Solutions based in Burgersfort collects hazardous waste from mines and industries within the local municipality for recycling. They mostly collect used oil, fluorescent tubes, grease etc. and collected waste is transported to Johannesburg. Quantities of used oil vary on a monthly basis

but in a month, they collect an average 10 000litres per month and other hazardous waste collected average 30tonnes per month. Ferrous metal slag collected is listed in the table 6 below:

Table 6: Quantities of ferrous metal slag collected between 2012-2016

	2012	2013	2014	2015	2016
Waste Type	**TONNAGE/ YEAR**	**TONNAGE/ YEAR**	**TONNAGE/ YEAR**	**TONNAGE/ YEAR**	**TONNAGE/ YEAR**
Ferrous Metal Slag	351260	375091	470973	340400	229623

3.2.6 Used Tyres

The Integrated Industry Waste Tyre Management Plan, formulated by REDISA, came into effect on the 23 July 2012 and aligns with the legislated Waste Tyre Regulations of 2009 under the National Environmental Management: Waste Act (2008). The plan although drafted by REDISA is the property of DEA and is administrated by REDISA. The Integrated Industry Waste Tyre Management Plan is the first of many integrated industry waste management plans that are being commissioned by the Department of Environmental Affairs (DEA). The plan works by charging a fee to manufacturers and importers of tyres at R2.30 + VAT per kilogram of tyre. From the 1st October 2012 all manufacturers and importers of tyres declare tyres imported and manufactured by weight every month to REDISA and pay the levy. There is currently no company or individuals within the municipality that are currently collecting tyres for recycling.

Figure 10: Used tyres piled at Trentyre in Steelpoort.

3.2.6.1 Uses of Tyres

Cement Manufacturing

Old tires can be used as an alternative fuel in the manufacturing of Portland cement, a key ingredient in concrete. Whole tires are commonly introduced into cement kilns, by rolling them into the upper end of a preheater kiln, or by dropping them through a slot midway along a long wet kiln. In either case, the high gas temperatures (1000–1200 °C) cause almost instantaneous, complete and smokeless combustion of the tire. Alternatively, tires are chopped into 5–10 mm chips, in which form they can be injected into a precalciner combustion chamber

Pyrolysis

The pyrolysis method for recycling used tires is a technique which heats whole or shredded tires in a reactor vessel containing an oxygen-free atmosphere. In the reactor the rubber is softened after which the rubber polymers break down into smaller molecules. These smaller molecules eventually vaporize and exit from the reactor. These vapors can be burned directly to produce power or condensed into an

oily type liquid, generally used as a fuel. Some molecules are too small to condense. They remain as a gas which can be burned as fuel. The minerals that were part of the tire, about 40% by weight, are removed as solid ashes. When performed properly, the *tire pyrolysis* process is a clean operation and produces little emissions or waste, however, concerns about air pollution due to incomplete combustion as is the case with tire fires have been documented.

3.2.7 Municipality Waste Receptacles

In Apel region the community used to be given black refuse bags, but the programme ceased in 2016 and this resulted in the mushrooming of illegal dumping sites. The Fetakgomo office bought more than 1500, 80litre black bins that are supposed to be distributed to the community (Picture 1). Municipality provide few receptacles at public facilities within their capacity in the form of skips and street beans.

Picture 1: Bin Storage Area at a Municipality Facility

3.2.8 Waste Collection Vehicles (Municipality Fleet)

The municipality currently has 4 vehicles in their fleet. Of the four (4) vehicles three (3) service Apel region and one (1) skip loader which was bought in December service the Burgersfort region as illustrated in Table 7. The fleet comprise of:

- Nissan UD 85 DGZ 520L (Compactor)
- Nissan UD 80 CCG 661 (Compactor)

- Tata CRY 896L (Skip Loader)

Collection in Burgersfort, Orighstad, Steelport, Ga-mapodile and Praktiseer is done by a private contractor through a Service Level Agreement

Table 7: List of Waste Vehicle Fleet for the Local Municipality

	DGZ 580 L (Compactor)	CCG 661 L (Compactor)	CRY 896 L (Skip loader)
MADE	NISSAN	NISSAN	TATA
MODEL	UD 85	UD80	1518C Ex-2
YEAR	2015/06	2009/06	2013/03
KMs	25466	113527	24513
CURRENT STATE	In operation	Normally experiences breakdowns	In operation

3.3 Current and Previous Waste Disposal Quantities and Characteristics

Determination of current and previous waste disposal rates was based on the figures obtained from the South African Waste Information Centre (SAWIC) website from 2012 to 2016. Figure 10 show the amount of waste that was disposed at the landfill sites.

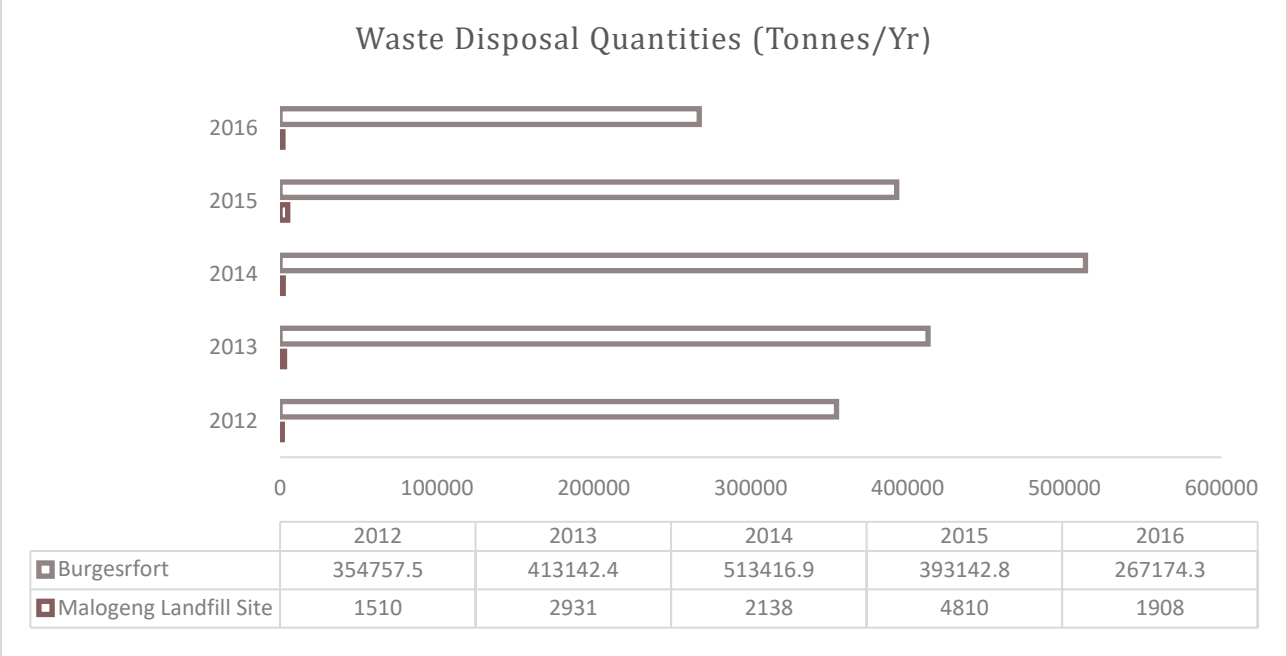


Figure 11: Waste Disposal Quantities (Tonnes/Yr)[8]

Waste disposed comprised of municipality waste, commercial, industrial, construction, demolition, food waste, garden waste and ferrous metal slag, with total quantities indicated in Table 8 and Table 9.

Table 8: Total Waste Disposed at the Landfill Sites Between 2012 - 2016 (tons/year)[9]

	2012	2013	2014	2015	2016
Malogeng landfill site	1510	2931	2138	4810	1908
Burgersfort landfill site	354757,5	413142,4	513416,9	393142,8	267174,3
Total	**356267,5**	**416073,4**	**515554,9**	**397952,8**	**269082,3**

Definition of Municipal Waste:
All types of solid waste generated by households and commercial establishments, and collected usually by local government bodies

[8] SAWIC website downloaded in November 2016

[9] SAWIC

Table 9: Quantities of Waste Disposal by Type

	2012	2013	2014	2015	2016
WASTE TYPE	**TONNAGE /YEAR**	**TONNAGE/ YEAR**	**TONNAGE/ YEAR**	**TONNAGE/ YEAR**	**TONNAGE/ YEAR**
Commercial and Industrial Waste	Data not Available	681,4	327,7	21,8	8
Construction and Demolition Waste	1272,5	12359,5	25243,9	36870,3	23655,2
Municipal Waste	3587	27463,5	18425,8	20076,9	15050,6
Food Waste	21	184	55,2	45,8	20
Garden Waste	127	294	529,6	538	717,5
Ferrous Metal Slag (Hazardous)	351260	375091	470973	340400	229623
TOTAL	**356267,5**	**415392**	**515227,5**	**397931**	**269066,3**

3.4 Future Waste Generation Quantities

Waste generation growth estimates should take the economic growth, population growth rate, socio-economic profiles of the population, industrial growth and urban sprawl. They should also take into consideration waste minimization measures and recycling interventions over the planning horizon.

The reason it is important to establish waste quantities and composition in FTLM is that this significantly impacts on the sizing of infrastructure and the strategies recommended in managing waste.

The 2006 State of the Environment Report (SOER) indicated that South Africa generated 42million m3 of solid waste per year. The Guidelines for the Development of Integrated Waste Management Plans (DEA, no date), explains that this equates to 0.7kg per person per day. Average generation rates for South Africa have been further detailed per income category as follows:

- Low income: 0.41kg/per person/day (149.65kg/person/year)
- Middle income: 0.74kg/per person/day (270.1kg/person/year)
- High income: 1.29kg/per person/day (470.85kg/person/year)

The following assumptions were made during the estimation of waste generation using socio-economic data:

- Socio-economic data is taken from the current IDP, Census 2011 and Community Survey 2016.
- Annual population growth rates were calculated and assigned to the local municipality using the socio-economic data.
- The planning period for this IWMP is a five-year planning period (2017 – 2022) which coincides with the Integrated Development Plan (IDP) for the local municipality.
- Predictions were done for the period: 2011 up to and including 2021.

Table 10: Population and Waste Projections for 2021

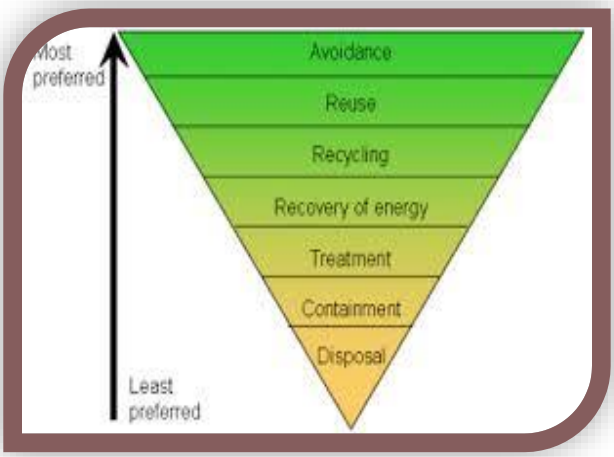
Income Level	2011	2001	Projected Population for 2021[10]	Waste Projections in 5yrs until 2021 (tons)
No income	45 253	64 233	31 880	4 770.8
R1 – R400	22 187	26 218	18 774	2 809.5
R401 – R800	2 419	1 905	3 072	459.7
R801 – R1 600	12 087	13 699	10 665	1 596.0
R1 601 – R3 200	1 678	1 685	1 670	249.9
R3 201 – R6 400	2 281	761	6 837	1 023.1
R6 401 – R12 800	1 810	1 864	1 757	262.9
R12 801 – R25 600	1 034	588	1 818	272.1
R25 601 – R51 200	157	167	148	22.1
R51 201 – R102 400	25	0	625	168.8
R102 401 R204 800	28	0	784	211.8
R204 801 - more	27	0	729	196.9

[10] $(1+GROWTH.RATE) = (POP_{LAST}/POP_{FIRST})^{1/(LAST.YEAR-FIRST.YEAR)}$

3.5 Waste Avoidance

A hierarchical control approach to waste management is encouraged. Waste should preferably be managed in the following order of preference:

- **Avoidance**: using goods in a manner that minimises their waste components;
- **Reduction**: reduction of the quantity and toxicity of waste generated during construction;
- **Re-use**: removing an article from a waste stream for use in a similar or different purpose without changing its form or properties;



- **Recycling**: separating articles from a waste stream and processing them as products or raw materials;
- **Recovery**: reclaiming components or materials, or using the waste as a fuel;
- **Treatment**: processing of waste by changing its form or properties to reduce toxicity and quantity; and
- **Disposal**: burial, deposit, discharge, abandoning or release of waste by the entity creating the waste or a waste contractor.

3.5.1 Existing Waste Avoidance in the Municipality

Waste avoidance has been promoted through public awareness campaigns throughout the communities and schools. Youth jobs in waste used to run the campaigns, unfortunately their contract ended in 2016. In addition, projects which focus on recycling have been implemented to promote recycling at the source as well as recycling at the various businesses distributed throughout the municipality. These efforts have been carried out on a continuous basis and must be undertaken accordingly in the future.

Successful waste avoidance will result in further lowering of the demand on the municipality waste management infrastructure and the functions of collection, recovery and disposal will be done more efficiently.

3.5.2 Recovery for Recycling

Most of the recycling is currently done at the landfill sites and the material is sold to a third party who in turn sell the material in Johannesburg. Recycling is done as cooperatives and income generated is shared equally with individuals receiving approximately R2000 per month[11]. These cooperatives are Fetakgomo Tubatse Waste Management Cooperative which operates at Malogeng Landfill Site and Manong Recycling Cooperative. The Burgersfort Waste Management Company which has been operating since 1996, it also does waste sorting at the Burgersfort landfill site. Individual and companies collect recyclables in the streets and shopping centres. Apart from reclamation at the landfill site there are notable examples of companies doing recycling or collecting recyclables at source and these include:

- Shoprite which started its own recycling in 2017,
- Marumo Green Projects which collects recyclables at Thaba Moshate Casino and the Steelpoort shopping mall; and
- Burgersfort Waste Management Company which collects recyclables from Tubatse Crossing.

[11] Interview with a recycler at the Malogeng Landfill Site in December 2017

The municipality initiated a programme of training waste recyclers and has created a database of waste recyclers in the municipality. Apart from training, the municipality has also sourced bailing machines which are currently used at the Burgersfort Landfill Site. Plans are underway to provide Malogeng Landfill Site with a bailing machine, but the progress is hampered by the low capacity of electricity supply to the site. The municipality with the assistance of Limpopo Department of Economic development, Environment and Tourism (LEDET) launched the Fetakgomo Tubatse Recycling Forum which comprise of 99-member individuals and companies and out of the 99 members in the database 18 were trained by the local municipality and only three (3) companies are registered with the Department of Environmental Affairs and five (5) applications are awaiting approval from the Department of Environmental Affairs. The municipality allocates a training budget on annual basis to cater for training of recyclers within the municipality jurisdiction.

"Recycling of waste refers to the separation at source of recyclable materials from the general waste stream and the reuse of these materials. The objectives of recycling are to save resources as well as reduce the environmental impact of waste by reducing the amount of waste disposed at landfills."

3.5.2.1 Recycled Materials

A total of 871.4 tonnes of recyclable material was recycled at the Burgersfort landfill site between January and October of 2017.

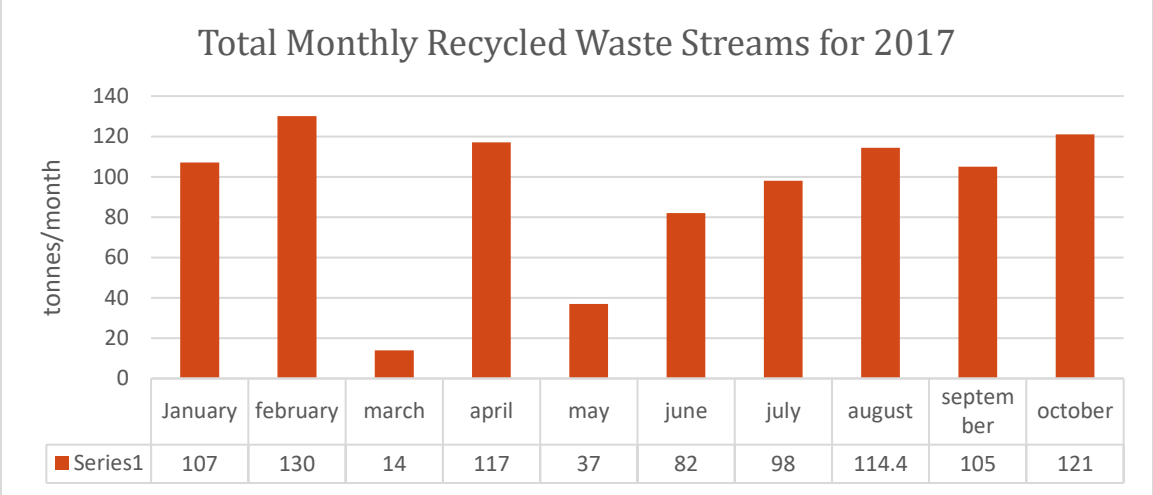


Figure 12: Monthly recyclable waste streams at the Burgersfort landfill site

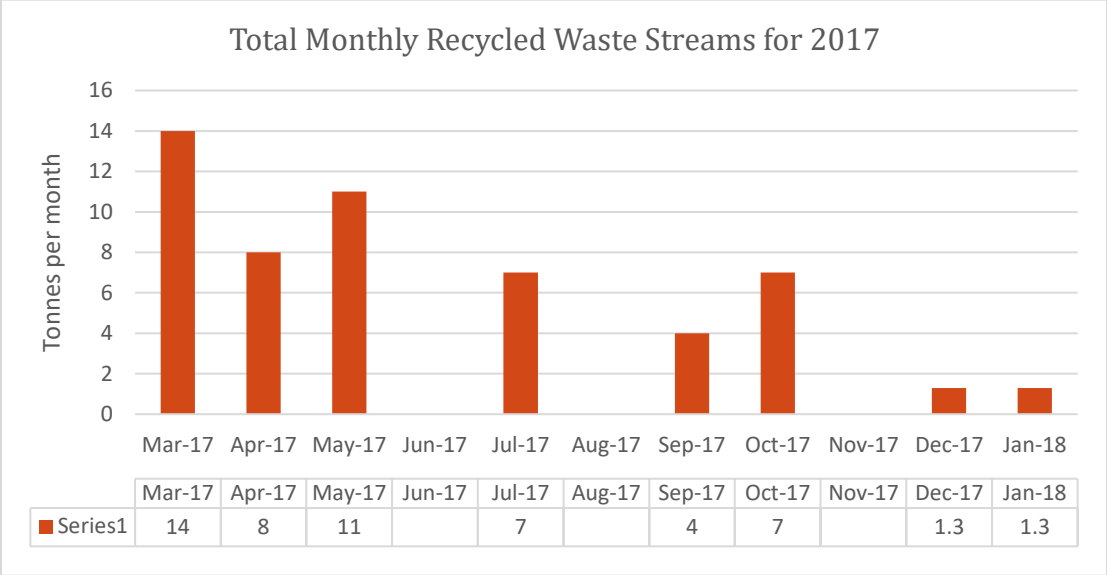


Figure 13: Monthly recyclable waste streams at the Malogeng landfill site

The recyclable material at the landfill site comprise of the following:

- Cardboard K4
- White Paper
- Light density paper
- Glass bottles
- UB cans

- PET
- HDPE
- Polydrop
- Conveyor
- Boesman hoses

The quantities recycled per waste stream at the Burgersfort landfill site is illustrated in Figure 12 below:

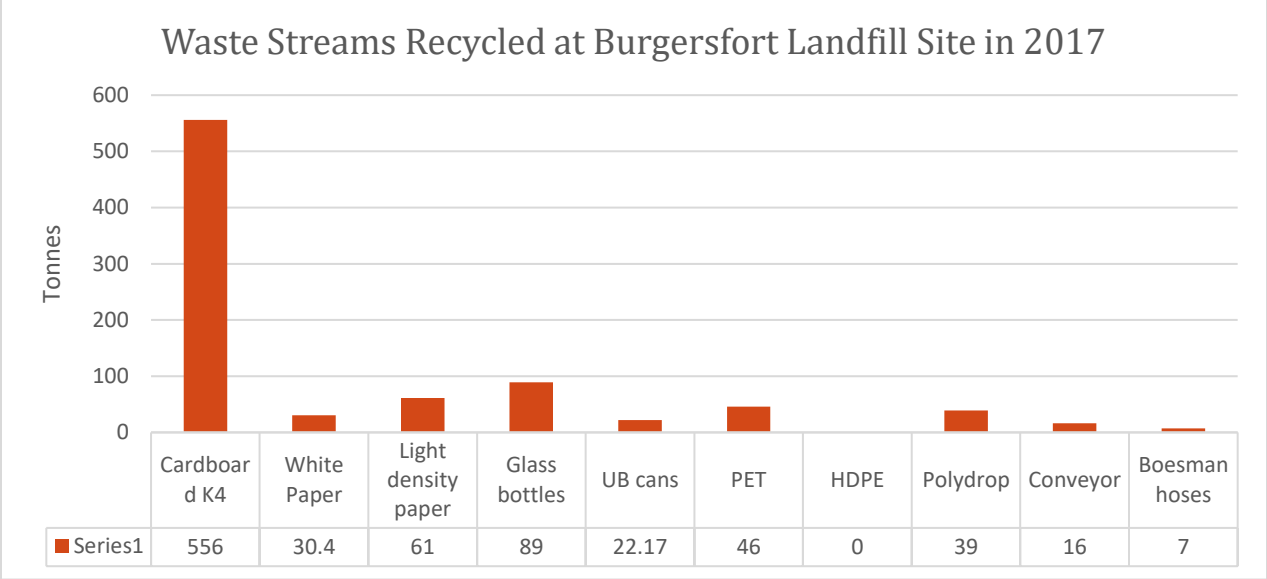


Figure 14: Recycled waste stream at the Burgersfort landfill site

3.5.2.2 Small and Rural Communities

Small and rural communities find recycling difficult to carryout successfully due to a range of logistical problems and a lack of skills and initiatives. Recyclers and businesses participating in these communities tend to not be sustainable, which results in stockpiles of unused recyclables that impact negatively on the aesthetics of their area of operation. The cost of transporting recyclables to the major centres is often exorbitant in so much that transportation costs exceed the value of the material transported and making it commercially unviable.

It is equally important to bring politicians and councillors on board who have the authority to initiate waste management projects and who can approve the allocation of resources to such projects. It will also be seen if at the recommendation point of the IWMP if possible and practical, a dedicated waste minimization official should be part of the plan going forward to promote recycling, although smaller municipalities often cannot afford a dedicated official but with the growth of Burgersfort, it may be an appointment worth their while.

One of the major observations made in the previous draft IWMP compiled in 2016 as well as various smaller municipalities was the degree of recycling which varies significantly from 1 to 13% of the waste disposed of to landfills. This is because Burgersfort like many other small authorities have it difficult in identifying or quantifying the waste being disposed of at their landfill sites since they do not have the necessary equipment (weigh bridges) or trained staff. This becomes the backbone of the Waste Information System which makes it important to understand the waste streams that need prioritisation in terms of recycling and minimisation[12]

[12] Burgersfort Local Municipality Draft IWMP 2016

Picture 2: Shed at the Malogeng Landfill Site Where Recycling Takes Place

Scrap metal is collected mostly in Burgersfort and two major recyclers of the scrap are PSM and Nieuwco. Figures collected from SAWIC show that in 2015

recycling of metals and metal compounds was 2 342.7 tonnes and 2014 it was 3 549.3 tonnes[13].

Picture 3: Recycling Activities at Burgersfort Landfill Site

3.6 Waste Separation

The introduction of waste separation initiatives at source requires that consideration be given to the following;

- Implementation of education and awareness programmes

[13] SAWIC

- Introduction of tariff reduction incentives to consumers who separate waste at source
- Development of by-laws, which allow the municipality to implement waste separation at source.

Business institutions such as Thaba Moshati are practising separation at source with the assistance of Marumo Green Projects who collects food waste for composting. Restaurants are also using external service providers for collection of used oil for cooking. Waste separation at household still needs to be implemented.

3.7 Current Waste Minimisation Strategies, Systems and Practices

The global trend of incorporating environmental aspects within business and industrial activities is becoming more prominent as time progresses. This is attributed to the limitations of natural resources and proven consequences of poor environmental management. Currently there are many businesses and industries that implement environmental management systems, such as ISO 14000, which promote waste prevention and minimisation.

Many international and local companies utilise materials that are easily recyclable, this is very evident in the fast food sector. Businesses that utilise duplex and eco printing aid waste minimisation. There are certain brands, mainly those associated with household detergents, that produce refills which reduces waste generation volumes because customers can purchase the same product but now has a much smaller packaging volume.

Awareness Campaigns

Every quarter the municipality is supposed to undertake eight waste and environmental awareness campaigns, (four (4) in the Apel region and four (4) in the Burgersfort region). In the 2017/208 financial Apel has already conducted 2 awareness campaigns targeting schools and the other one held in Mohlaletsi targeting communities. There are also regional cleaning campaigns undertaken by the municipality where the Mayor and Ward Councillors are expected to take part,

however attendance by political officer bearers is very poor. There is a total of nine (9) awareness and clean up campaigns planned for Burgersfort Region in the 3rd quarter of 2017/2018 financial year. These campaigns will be targeting the following communities:

- Burgersfort taxi rank (Mayoral awareness and clean-up campaign)
- Corner Alverton and Praktiseer (recycling, clean up and removal of illegal dumps)
- Mapodile (recycling and clean up)
- Dresden at the bridge (recycling, clean up and removal of illegal dumps)
- Praktiseer, alongside the road to Mabocha (recycling, clean up and removal of illegal dumps)
- Malekana around steelbridge (recycling and clean-up)
- Ohrigstad (recycling and clean-up)
- Burgersfort, Aloe Ridge (Portfolio Councillors' recycling and clean-up)
- Corner R37 and Bothashoek (recycling and clean-up)

In the same quarter (3rd quarter) of 2017/2018 financial year Apel Region has 6 planned awareness and clean-up campaigns targeting the following wards:

- Ward 36: Strytkraal
- Ward 37: Mphanama
- Ward 38: Radingwana, Mela and Mohlala
- Ward 34: Atok
- Ward 14: Moroke

The SDM has also conducted seven (7) clean-up campaigns during the 2016/2017 financial year targeting schools and villages. In the 2017/2018 financial year one (1) cleaning campaign was held at Hlakana School and eight (8) awareness campaigns on safe disposal of diapers were held at the following clinics:

- Phasha clinic
- Mohlaletse clinic
- Nkoana clinic
- Burgersfort clinic

- Poulos Masha clinic
- Madiseng mobile clinic station
- Dilokong Gateway clinic
- Mecklenburg Hospital

Apart from awareness campaigns the municipality has also initiated an environmental forum for mines where they also discuss issues related to environmental and waste management.

Table 11: Waste Minimization / Public Awareness Programmes

PROGRAMME	DESCRIPTION	OBJECTIVES
Environmental Forums	A forum that comprises of mining companies which discusses waste and environmental management issues.	To achieve a greater degree of co-ordination and effectiveness on various issues relating to the environment.

3.8 Waste Disposal Sites

3.8.1 Landfill Sites

The municipality currently has two landfill sites which are managed by Afrika Youth Consortium:

- Malogeng Landfill Site in Apel; and
- Burgersfort Landfill Site in Burgersfort.

3.8.1.1 Malogeng Landfill Site

The site is located in the north-west corner of the Apel south of the Olifant River and the Strydpoortberge. The access road to the site is off the existing gravel road between Malogeng and Zeekoeigat on route to the R37 main road. The site covers an area of approximately 10ha. They are currently two boreholes on site, one has dried up and the other one is used for ablution facilities. Water quality testing is done annually, it started in 2016. Quarterly audits have not been since 2016 due to budget

constraints, the first audit after 2016 will be done in the 3rd quarter of 2017/2018 financial year.

GPS Coordinates	Eastings: 29.80360⁰ Southings: 24.26846⁰	**AREA COVERED**	10ha	**REMAINING LIFESPAN**	10 yrs
SURROUNDING LANDUSES	The site is surrounded by scattered rural communities				
WASTE TYPE HANDLED	General	**WASTE COMPACTION?**		Yes	
SECURITY/ ACCESS CONTROL?	Site is fenced, and access is controlled				
WEIGHBRIDGE	There is a weighbridge which is currently operational 			**FIRE FIGHTING EQUIPMENT**	Yes
RECYCLING ACTIVITIES	Yes				

	
CURRENT CONSTRAINTS OF SITE	**Operational Constraints.** The site is managed by a main contractor and the municipality is experiencing the following challenges on the operation of the site: • Waste compactor and a water bowser used for dust monitoring currently not working. • Personnel (Landfill site manager and supervisor) based on site do not possess necessary qualifications to manage and supervise the site. • Monthly reports compiled by the main contractor do not reflect the true activities happening on site and the figures of waste disposed is not a true reflection of what is currently being disposed of at the site.
LICENSE STATUS	Site is Licensed

3.8.1.2 Burgersfort Landfill Site

The Burgersfort landfill site is located om part of portion 10 of the farm Mooifontein 313KT. The site was licensed on April 15, 1998 and commissioned for operation in 2000. The facility receives approximately 600 tonnages of waste on a monthly basis. The municipality has requested tenders for closure of the site because it has reached

its lifespan. The municipality has identified another site within its jurisdiction. Land for the development has already been found in Appiesdoring on the road to Penge ± 10km from Burgersfort town. Process is currently underway for decommissioning.

GPS Coordinates	E: 24°41'07" S: 30°20'17"	**AREA COVERED**	Ha	**REMAINING LIFESPAN**	0 yrs
SURROUNDING LANDUSES	The site is close to the CBD.				
WASTE TYPE HANDLED	General	**WASTE COMPACTION?**		Yes	
SECURITY/ ACCESS CONTROL?	Site is fenced, and access is controlled				
WEIGHBRIDGE	There is no weighbridge at the site			**FIRE FIGHTING EQUIPMENT**	Yes
RECYCLING ACTIVITIES	Yes 				

	 
CURRENT CONSTRAINTS OF SITE	• Landfill site has reached its lifespan • Personnel (Landfill site manager and supervisor) based on site do not possess necessary qualifications to manage and supervise the site • Municipality has not filled a vacancy for a full-time landfill site supervisor
LICENSE STATUS	Site is Licensed

3.8.2 Transfer Stations

A transfer station is a building or processing site for the temporary deposition of waste. Transfer stations are often used as places where local waste collection vehicles will deposit their waste cargo prior to loading into larger vehicles.

Advantages include:

- Minimise illegal waste dumping.
- Can serve as a controlled place for sorting and processing the waste. Particularly in many low-income communities where a thriving informal economy exits in recycling of waste, these waste transfer stations can minimise health hazards and may limit the amount of waste picking that is done in the streets, which will reduce the amount of waste that is scattered around communal bins and waste accumulation points.
- Reduce maintenance cost of collection vehicles. These vehicles stay on well paved roads and are not travelling on rough roads, particularly in landfill sites.
- Improved waste dumping efficiency at final disposal site, reducing the number of vehicles at the disposal site

The municipality does not have any transfer station. The municipality has identified six areas where they can commission a transfer station. These areas were grouped into clusters and they include:

- Dilokong cluster;
- Moroke cluster;
- Penge cluster;
- Leboeng cluster;
- Ngwaabe cluste; and
- Mphanama cluster.

3.9 Illegal Dumping Hotspots

A survey was done on the 30th and 31st of October and the 1st of November 2017 and a total of ten (10) illegal dumping hotspot sites were identified. Most of the hotspots

(seven (7)) identified in Burgersfort and surrounding areas are within areas where the municipality does not provide waste collection services, reasons being:

- Unwillingness by community members to pay refuse removal tariffs
- Some residential areas are not formalised making it difficult for the municipality to charge waste removal tariffs because of the absence of valuation rolls for such communities.

In Apel region the illegal dumping started mushrooming when the supply of black plastic bags was ceased in 2016. Illegal dumping has been exacerbated by informal hawkers and also ignorance by the local communities. The biggest illegal dumping is currently happening at an open borrow pit in Praktiseer along the road that goes to Penge.

To curb illegal dumping the municipality is conducting clean-up campaigns targeting illegal dumping hotspots and waste management awareness campaigns to change attitudes of the local communities. Apart from clean-up campaigns EPWP beneficiaries are assisting the municipality with street cleaning.

Picture 4: Illegal dumping at an open borrow pit in Praktiseer along the road that goes to Penge (S.24°33'29" and E. 30°18'46")

Figure 15: Location of Hotspot 4 (Open borrow pit) in Praktiseer along the road that goes to Penge

Hotspot 2 & 3 illustrated in Figure 9 is a few metres from offices of Department of Public Works. There is currently construction of houses taking place.

Figure 16: Hotspot 2 & 3 close to Department of Public Works Offices in Bothashoek

Picture 5: Hotspots 2&3 (S.24°34'24" and E. 30°19'24"; S.24°34'24" and E. 30°19'30")

Figure 17: Illegal dumping hotspots 5&6

Illegal dumping hotspot 1 (Figure 16) is located along the R37 opposite the industrial area after the Steelport river.

Figure 18: Illegal dumping hotspot 1 (S.24o39'12" and E. 30o17'16").

Another illegal dumping hotspot is located at Burgersfort Extension 10 informal settlement (Figure 17) which just on the edge of the Central Business District (CBD).

Figure 19: Burgersfort Extension 10 informal settlement

Three (3) hotspots were identified in Apel and its surroundings (Figure 18 & 19). These hotspots were identified in the following areas:

- Mohlaletsi;
- Mashung/Ga-Mankopane; and
- Mashung/Ga-Nkoana

Figure 20: Illegal dumping hotspot in Apel (S. 24°28'46"and E. 29°52'25")

Figure 21: Hotspots 2 & 3 in Apel (S. 24°25'41"and E. 29°48'05"; S. 24°25'45"and E. 29°47'24"

3.9.1 General Effects of Illegal Dumping

Thousands and thousands of tons of illegal waste are dumped each year around the country. It is a problem that affects people all over South Africa. Aside from the fact that illegal dumping is usually a felony in all municipalities, it has consequences that affect everyone. Even if the dumper is not caught, there are consequences for the illegal dumping. Illegal dumping affects:

- Environment
- Public Health
- Community as illustrated by the picture below.

4 Steelburger / Lydenburg News NEWS Friday December 1, 2017

Public sick and tired of rotten waste next to road

Gilbert Motseo and Melvin Seroka

BURGERSFORT - Residents of Praktiseer alleged that hawkers are polluting the township.

Resident Paul Malepe said they trade next to Tubatse Police Station and the local taxi rank and often throw cow skulls and rotten vegetables next to the road.

"Community members residing next to the road suffer from the unpleasant smell.

"The hawkers dump rotten stuff next to the small bridge situated between the traffic lights and Ga-Motodi intersection.

"Most of the polluters sell pap and offal or tripe, as well beef heads," said Malepe.

Steelburger/Lydenburg News spoke to several hawkers who denied polluting the area. Environmental specialist Collen Mojela said they will ensure the area stays clean. "We will engage with various stakeholders and community members to clean the area. We will also ask the Fetakgomo Greater Tubatse Municipality to erect a no-dumping sign next to the bridge." Community members pleaded with the hawkers to refrain from throwing waste next to the road and under the bridge.

The rotten waste dumped in Praktiseer.

Picture 6: Article from Steelburger/Lydenburg news on illegal dumping

3.9.1.1 Environment

Sometimes illegal waste has hazardous substances such used oil and chemicals that could cause damage to the soil, the air, and the surrounding groundwater. Polluted water can be carried to water sources that is used for drinking. Improper disposal of materials can pollute natural habitats and cause death to life in a wide area. Trash such as plastic bags can be consumed by animals, which can cause their death.

3.9.1.2 Public Health

There stockpiles of broken glass (stockpiled by recyclers) in areas along routes such as R555 and R37 which can cause human injuries like cuts which could possibility lead to infections. Illegal trash dumping can be an ideal breeding area for misquotes that can cause life threatening diseases. In addition, other animals could cycle through the material which could cause other diseases and illnesses. Fires can become more frequent in such areas, because illegal dumping areas can cause combustion, or arson is common at these type of dumping sites. Lastly, waste dumping could leak into water sources that people drink from.

3.9.1.3 Community

The more obvious effects of illegal dumping is that it looks ugly. This ugliness affects the value of homes around the community, and possibly the overall moral of the people. Waste dumping can cause surrounding property damage. Illegal dumping costs money. It cost money to clean up and to fix the surrounding damages. A lot of time, businesses can even lose money from surrounding dump sites because they lose business. Lastly, it cost the dumper's money. It cost him money because he pays taxes and his taxes go to clean up the dumping instead of something else. Municipalities pay millions of rands to clean up dump sites, which has an overall effect on the person dumping

3.10 Municipality Waste Management By-Laws

The municipality is currently using two (2) by-laws which were for the two (2) different municipalities (Fetakgomo and Greater Tubatse) before the merged in 2016. The new by-laws for the consolidated municipality have been compiled and are awaiting public participation prior to being gazetted. The by-laws cover the following areas:

- Waste Removal
- Domestic Waste
- Waste Containers

- Garden Waste
- Bulky or Industrial Waste
- Builder's Waste
- Recycling

3.11 Economics and Financing of Waste Management

Financial data pertaining to waste management was sourced from the local municipality in November 2016 and clarified at a meeting which was held on the 22nd of February 2018 with the municipality finance personnel. The municipality charges residents a certain amount of money for refuse removal based on the value of the property and business communities are charged based on the size of business property per square metre. Due to the unavailability of a weighbridge at the Burgersfort landfill site, waste disposed at the site is charged on estimation based on the site of waste delivery vehicles. This is an area where the municipality is supposed to generate income due to the number of daily users of the landfill site.

On average the municipality bill residents and business communities an average of R1millon per month but collection ranges from R200 000 to R400 000 per month as illustrated in Table 12 for example for the month of January 2018, the municipality billed 4 232 households and businesses a total of R1 062 099.87 and R422 432.83 was collected. In the current financial year of 2017/2018, the total billed for the landfill site is R175 475,08 and the collected income amounted to R145 537,47.

3.12 Income Generated from Waste Management Services for 2017

The municipality generated a total of R 3 714 819.07 from waste management services from January 2017 to September 2017 as illustrated in Table 12 below.

Table 12: Revenue collected from waste management services from January - September 2017

MONTH	RECEIPTS
January	R276 648,20
February	R477 522,87
March	R420 086,77
April	R415 340,52
May	R406 615,25
June	R491 957,63
July	R491 957,63
August	R383 668,65
September	R351 021,55
TOTAL	**R3 714 819,07**

3.12.1 Operational Costs in Waste Management

General expenses such contracted professional services, salaries and wages as illustrated in Figure 19 account for more than half of the budget.

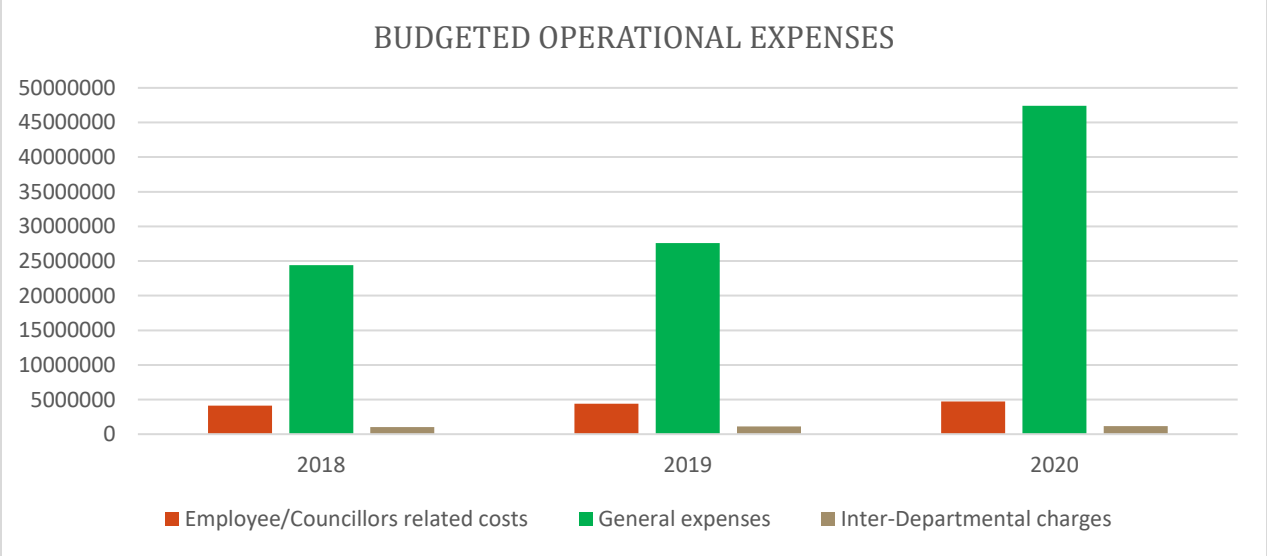


Figure 22: Waste Management operational expenses

Figure 14 clearly illustrates that majority of the operational expenses relating to waste management is due to salaries/wages and the utilisation of contractors.

Table 13: Summary of Budgeted Income and Expenditure for Waste Management from 2018 – 2020[14]

SUMMARY	2018	2019	2020
Total Operating Income*	13 879 031.80	14 850 564.03	15 890 103.51
Interested Earned*	90 736.00	97 087.52	103 883.65
Total Operating Expenses*	32 137 220.00	35 887 826.00	56 292 474.00
Income Foregone	2 400 000.00	2 568 000.00	2 747 760.00
Surplus*			
Deficit*	20 567 452.20	23 508 174.45	43 049 246.84

** Amount in Rands*

Operational income is found to be less than operational expenses, resulting in operational deficit for waste management (Table 13). Aspects such as increasing labour costs, increase contractor utilisation has and will continue to result in the waste management expenses increasing over a period of time.

3.12.2 Capital Budget

The capital budget for budgeted for 2018 is R22 000 000 as illustrated in Table 14 below.

[14](Total Income + Interest Earned) – (Income foregone + Operating Income)

Table 14: Capital budgets until 2020

Activity	Budget year 2018	Budget year 2019	Budget year 2020
Purchase of Refuse Removal Fleet	1 500 000	2 000 000	-
Purchase of Landfill Site	15 000 000	-	-
Rehabilitation and Closure of Burgersfort Landfill Site	1 500 000	2 000 000	3 000 000
Development of Malogeng Landfill Site	2 000 000	3 000 000	1 500 000
Development of Transfer Station	2 000 000	2 000 000	2 000 000
TOTALS	**22 000 000**	**9 000 000**	**6 500 00**

3.13 Organisational Structure

The municipality has its own structure/department that deals with waste and environmental management and the current organogram is illustrated in Figure 21 and an ideal organogram with all vacancies filled is illustrated in Figure 22. The Departmental Manager reports to the Director of Community Services. The department has 10 vacancies that need to be filled comprising of:

- 1 x landfill site supervisor;
- 2 x compact operators;
- 1 x landfill clerk; and
- 2 x general workers.
- 1x Snr Environmental Officer
- 2 x environmental officers
- 1 x office administrator (Apel Region)

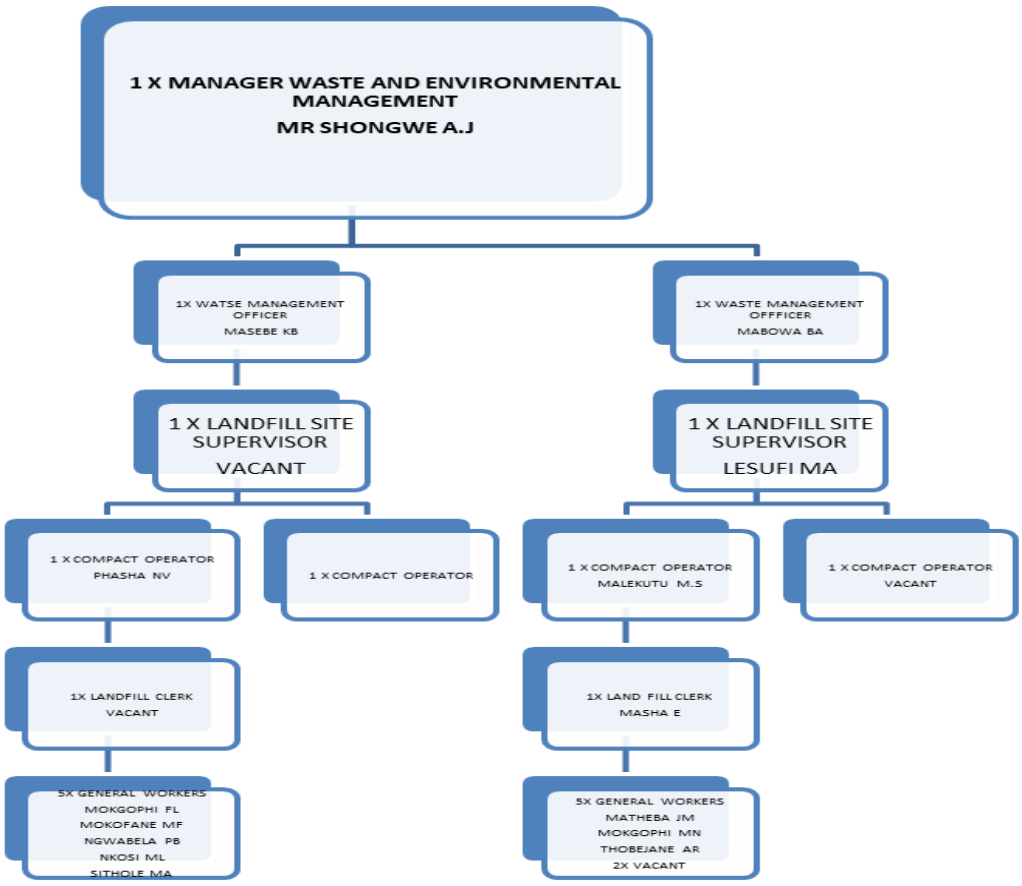


Figure 23: Approved waste management organizational structure

Apart from the staff members mentioned in Figure 20, there are approximately 90 EPWP workers who assist the local municipality with street cleaning.

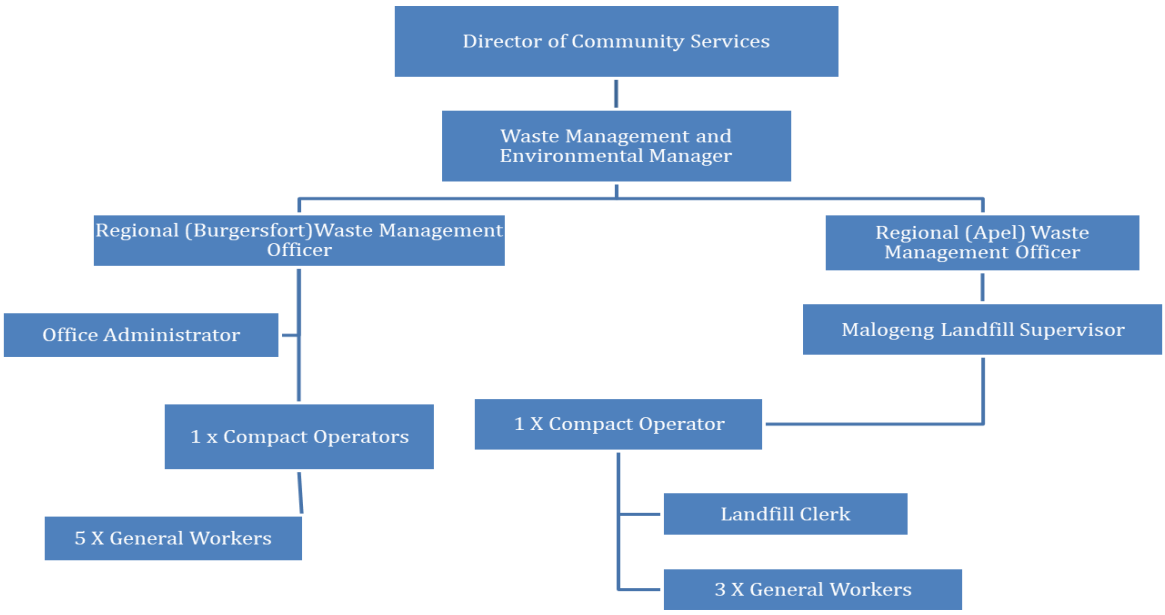


Figure 24: Current organizational structure

3.14 Summary of Waste Management Challenges Facing the Municipality

Like any other rural municipality in South Africa, Fetakgomo – Tubatse Municipality is not immune to waste management challenges currently facing other municipalities. Below is a summary of the challenges facing the local municipality:

- Illegal dumping
- Absence of buy back centers for recyclers
- The municipality currently does not have any transfer station
- The current fleet owned by the municipality is not enough to service the jurisdiction of the municipality
- Lack of enforcement of waste management by-laws which is allowing illegal dumping without prosecution or fine
- The environmental and waste management department is currently under-staffed
- Reluctance by community members to contribute/pay for waste management services
- Lack of prioritizing waste management activities within the local municipality

CHAPTER 4

NEEDS AND GAP ANALYSIS

4 NEEDS PRIORITISATION AND THE IDENTIFICATION OF GAPS

This section was compiled with information derived from:

- The review of the Status Quo Assessment report
- Interviews and meetings with different key personnel in the municipality
- Interviews with different organisations within the municipality that deal with waste management notably Fetakgomo – Tubatse Recycling Forum and representatives from Oil Waste Solutions.

The gaps and needs analysis have been summarized into the following headings:

- Legislation and regulatory issues
- Financial, institutional and organisational needs
- Waste collection and municipal service delivery issues
- Waste minimization and recycling initiatives
- Waste treatment and disposal issues
- Public awareness and education
- Waste information management

Table 15: The gap and needs analysis

ITEM	ISSUES IDENTIFIED	IDENTIFIED GAPS AND NEEDS	RECOMMENDATIONS
1	**LEGISLATION AND REGULATORY ISSUES**		
1.1	Waste Management By-Laws	• The municipality is currently working on by-laws which belonged to the former Fetakgomo Local Municipality and Greater Tubatse Local Municipality. Since the merger in 2016 they have drafted by-laws which are yet to be gazetted	The municipality needs to gazette the by-laws. The by-laws should focus on the following areas: • The establishment of the localized waste information system as stipulated in the Waste Act. The collected information from the recyclers, permitted landfill or generators of waste must be fed into the national database.
1.2	Waste Act	• The municipality currently does not have waste management standards as per section 9.3 of the Waste Act	The local municipality must adopt the district/provincial or national norms and standards for the following waste activities: • For solid waste that is disposed at the municipality landfill sites.

			• For the separation and storage of waste management
		• There is no existing IWMP for the local municipality	• The municipal council will need to adopt this IWMP and ensure that it is incorporated into the IDP. • In terms of Section 13.3 of the Waste Act the municipality will need to report on an annual basis to the Department of Environment on implementation progress of the IWMP
		• There is no provision by the municipality of waste recycling containers for recyclable waste	• Public areas such as taxi ranks and institutions such as schools and health facilities should have recycling stations.
2	**WASTE COLLECTION AND MUNICIPAL SERVICE DELIVERY ISSUES**		
2.1	Optimization of Waste Routes	• Current waste collection routes are not optimized for efficient vehicle and crew utilization.	A proper optimization should be completed to make sure that optimum routes are used to increase utilization of resources
2.2	Household Waste Collection	• Not all households are receiving waste collection services. One of the major reason is that some of	• There should be coordination between the Waste and Environmental Management Department and other

		townships are not formalized hence the municipality can allocate municipality rates to the households for services rendered	municipality departments to ensure that there is proper future waste management planning for proposed township formalizations within the local municipality. • Municipality must consider the introduction and implementation of FBRR systems
2.3	Illegal Waste Disposal Sites	• These illegal dumpsites were identified in areas where there are no formal waste collection services and also in areas where the municipality render waste collection services.	• Municipality should provide skip bins at strategic places in these areas to curb illegal dumping. • Stringent fines should be introduced for illegal dumping, and municipal police must assist with the enforcement of the waste management by-laws. • There is a need to provide street bins (steel poles and ash bins)
3	**WASTE MINIMIZATION AND RECYCLING INITIATIVES**		

3.1	Waste Minimization, Recycling and Re-use	• Separation at source is limited to a few business institutions. This is limiting the potential amount of waste that can diverted away from being disposed at the landfill sites	• Separation at source needs to be introduced to the entire local municipality to encourage recycling and maximum diversion of recyclable waste from the municipal landfill sites. • Drop off centers should be established at strategic locations within the municipality jurisdictions. • Municipality has developed a draft MOU for waste recyclers (Intention is to approach waste generators to absorb recyclers at their facilities)
		• There is no recycling policy for municipality staff nor the municipality as a whole	• FTLM must consider the implementation of a policy to govern recycling, waste minimization and re-use activities
		• There are no facilities from where most recyclers can operate from.	• The municipality must consider establishing buy back centers/recycling centers from which the recyclers can operate from and where the community can drop off their recyclables. These

			facilities will assist recyclers who struggle to secure transport collect and transfer their recyclable materials
		• The municipality lacks legal instruments to facilitate and enforce waste minimization and recycling initiatives	• FTLM by-laws must cover this gap
4	**WASTE TREATMENT AND DISPOSAL ISSUES**		
4.1	Malogeng Landfill Site	• Inconsistence in external annual audits. The recent one was completed end of March. Prior to March the first one was done in 2016.	• Compliance with waste license should be adhered to. Annual landfill audits should be done.
		• Not enough boreholes for water quality monitoring (Two (2) boreholes were drilled, only one is operational the other one is dry)	• A geohydrology study should be done to determine groundwater flow and additional positions for borehole drilling. • A tender has been advertised for the drilling of boreholes.
		• Monthly reports compiled by the appointed contractor do not reflect	• A competent contractor with competent personnel should be appointed to manage the landfill site

		the actual quantities disposed at the site.	
		• There is no stormwater management plan	• It is a minimum requirement to prevent clean run-off to come into contact with contaminated water and vice versa. External storm water channels must be constructed around the landfill to divert all upstream clean run-off around the site.
4.2	Burgesrfort Landfill	• There is no weighbridge at the site	• The site has already reached its life span. Weighbridge must be prioritized for the new site.
		• Monthly reports compiled by the appointed contractor do not reflect the actual quantities disposed at the site.	• A competent contractor with competent personnel should be appointed to manage the landfill site
		• No external annual landfill audits done	• Compliance with waste license should be adhered to. External and internal annual landfill audits must be conducted

		• Landfill site has reached its capacity	• A new site was identified but not operational.
4.3	Transfer Stations	• There are currently no transfer stations, but six clusters were identified for the establishment of the transfer stations.	• FTLM must prioritize the construction of transfer stations in the six clusters identified by the local municipality.
4.4	Illegal Dumping	• Illegal dumping is a major problem in various areas within the local municipality	The local municipality should apply the following general provisions in areas where illegal dumping is rife: • Providing waste collection services in areas previously not serviced • Public awareness on 3Rs (Reduce, Reuse Recycle) should be intensified at schools, shopping centers and pension pay out points. • Identifying known hotspots and policing those areas • Erecting signage in areas where frequent dumping occurs.
5	**PUBLIC AWARENESS AND EDUCATION**		

5.1	Educational Awareness, Schemes and Campaigns	• Although the local municipality, district municipality and LEDET already have a number of initiatives to increase public awareness of waste management related issues.	• A more coordinated approach and increased cooperation is required especially on issues relating to recycling, e-waste, medical wastes and household hazardous wastes. • A platform (e.g. a telephone hotline or interactive internet-based resources etc.) is needed for the public to report waste management issues and access information (e.g. non-collection of waste and instances of illegal dumping)
		• Municipality	• Develop, implement and promote inter-municipal waste information seminars and workshops • Municipality must ensure that the public and private sectors understand their roles and cooperate and participate in the campaigns.

		• General Public	• There should be a high level of commitment from municipality senior management and politicians to ensure successful awareness campaigns.
6	**FINANCIAL, INSTITUTIONAL AND ORGANISATIONAL NEEDS**		
6.1	Waste Management Personnel	• The municipality waste and environmental management section is under-staffed putting a strain on the current staff. There are 10 vacancies that need to be filled, these include: 1 x landfill site supervisor; 2 x compact operators; 1 x landfill clerk; and 2 x general workers. 1x Snr Environmental Officer 2 x environmental officers 1 x office administrator (Apel Region)	• For the smooth operation of the waste and environmental management department, the municipality must prioritize the filling in of the vacant positions in the department.

6.2	Waste Budget	• Insufficient funds for waste related activities	• Municipality must consider looking at external funding from other organizations and institutions. • Waste management is a crucial part of service delivery; hence the municipality must prioritize waste management budget the same they prioritize other service delivery budgets such as water and sanitation. • The municipality must consider looking at ways of funding some of its activities by engaging in Private Partnerships in waste recycling.
	Revenue from Waste Management Activities	• The amount that is billed on monthly basis averages R1milion and collection averages less than R500 000 monthly (Table 12).	• There should be a change in the historical mindset around paying for waste management services. This could be done by intensive waste management education programmes.
	Revenue from Landfill Sites	• Revenue collected from the Burgersfort landfill site is not a true	• Weighbridge should be prioritized on the new identified site.

		reflection of the actual waste disposed at the site because there is no weighbridge	
6.3	Integrated Planning	• There are no formal communication structures between departments dealing with waste management and planning in the local municipality.	• Development planning in the local municipality must take into consideration waste service provision and their early engagement and communication between planners and those involved in waste management is needed. • All departments and organisations directly involved with different aspects of waste management service delivery should have a formalized communication structure. Such kind of communication should not only be reserved for operational matters but must also include planning stages. This will ensure meaningful integration.

6.4	Compliance and Enforcement	• Currently compliance and enforcement of waste management issues falls under the waste and environmental management department. This presents the following challenges: 1. These officials do not have the capacity to apprehend culprits and issue them with fines. 2. As it is the waste and environmental management department is under-staffed making it difficult to carry out inspections.	• The municipality police should be active in monitoring and enforcing municipality by-laws and other pieces of legislation. This is some specialized function and personnel tasked with undertaking these functions should be given appropriate training to ensure and increased prosecution rate of waste management contraventions. • A Compliance and Enforcement section must be formed under the Waste and Environmental Management department. This section will comprise of Environmental Management Inspectors (EMI) who will be responsible for compliance monitoring and enforcement of all environmental matters in terms of Chapter 7 of NEMA, including waste management matters. These EMIs will

			work together with municipal police to ensure perpetrators are prosecuted.
7	**WASTE INFORMATION MANAGEMENT**		
7.1	Waste data capture and management	• There is no accurate information relating to waste generation rates in the local municipality. Existing information is based on disposal data which is mostly estimates.	• The municipality must undertake a survey to determine the actual waste generation rates within its jurisdiction. This will help in future planning and decision-making.
		• There is no operational Waste Information Systems within the local municipality. This normally results in: 1. Inconsistencies in data, analysis and reporting. 2. Compromised planning and execution of programmes.	• The municipality must develop and implement a centralized waste information system that will standardize waste data capture. This will help to improve the accuracy of data and standardize the source of data used in reports and plans. • For this system to be successful, weighbridges must be fully operational, and data accurately captured and reported.

CHAPTER 5

THE DESIRED END STATE

5 DESIRED END STATE

The desired end state entails identifying priorities and goals that a municipality wishes to attain with regards to waste management. Using the information collected on the historical and present waste management situation, strategic goals for the IWMP should be developed. These should aim to address the gaps and the needs of the community and more importantly should respond to the Waste Act requirements. A program on how these will be attained is developed as an implementation plan. The strategic goals must be set based on the relevant waste legislation, regulations and policies and should be guided by the waste management hierarchy principles. Further, it should also include the setting of specific, achievable targets for waste management such as collection, recycling, recovery and disposal. The setting of goals, objectives and targets must also take into consideration the municipal response to the goals and targets set in the National Waste Management Strategy.

The National Waste Management Strategy provides a set of goals that municipalities must achieve over a period of five years to give effect to the Waste Act. It contains an action plan with targets to be achieved by 2016. It is important that there should be a target date if the municipal strategic goals and targets are to be attained within five (5) years from the date the IWMP has been approved by council. Table 16 below illustrates how strategic goals can be divided into goals requiring immediate attention or short, medium or long-term goals.

Table 16: Terms for strategic goals[15]

TERMS FOR STRATEGIC GOALS	DURATION
Immediate	1 year
Short-term	2-3 years
Medium-term	3-5 years
Long-term	5-10 years

Long term goals relate to targets that extend beyond the 5-year period of implementing an IWMP.

5.1 Goals and Objectives

This section of the IWMP focuses on the objectives, targets and policies which the FTLM should agree to, and strives to commit to. Based on the Gaps and Needs identified, summarised below are the Strategic Goals and Objectives, as well as targets that the local municipality would have to achieve in each sector. The review of this IWMP should be done against the agreed objectives and targets. The overarching waste management objectives for the FTLM include the following:

- Goal 1: Promote waste minimisation, reuse, recycling and recovery of waste
- Goal 2: Ensure the effective and efficient delivery of waste services
- Goal 3: Grow the contribution of the waste sector to the green economy
- Goal 4: Ensure that people are aware of the impact of waste on their health, well-being and the environment
- Goal 5: Achieve integrated waste management planning
- Goal 6: Ensure sound budgeting and financial management for waste services
- Goal 7: Provide measures to remediate contaminated land
- Goal 8: Establish effective compliance with and enforcement of the Waste Act

[15] Guideline for the development of IWMPs

Definitions of key headings that will be used in the tables are as follows:

- **Goal:** Refers to the final result that needs to be achieved by the local municipality
- **Objective:** Detailed outline of the specific objective to be met to achieve the goal
- **Target:** Timeframe for completion of the objective (years). Usually given as the time for completion from acceptance of the IWMP by the municipal council.
- **Progress:** What has been done to date
- **Activities:** Specific tasks that will be undertaken to meet the mentioned objectives.

Table 17: Promote waste minimisation, reuse, recycling and recovery of waste

GOAL 1: PROMOTE WASTE MINIMISATION, REUSE, RECYCLING AND RECOVERY OF WASTE (Refer to Table 15 Item 3)				
OBJECTIVES	**TARGETS**	**ACTIVITIES**	**TIMEFRAME**	**PROGRESS**
Reduction of Waste Disposal to Landfill by systematically increasing recycling and re-use	10% per annum increase in amount of recyclable materials being recovered through FTLM and private sector initiatives. To be reviewed after 5 years.	• Engage with private recycling companies to form an information sharing Recycling Forum in order to quantify recycling rates	Short-term	• Municipality is currently working with the Recycling Forum and mines within its jurisdiction.
	Use the multi-bag separation at source system	• Pilot the system in a suitable area	Immediate	
		• Roll out in phases to other collection areas serviced by the municipality.	Short-term	
	Ensure commercial centres and major businesses recycle.	• Through engagement with Recycling Forum identify and target commercial centres and major businesses that can be served by either private recyclers or FTLM	Short-term	• The municipality working with the Recycling forum are currently engaged in the exercise.
Municipality to make waste recycling more convenient for all sectors	Establish transfer stations and drop off centres	• Municipality to build transfer stations in strategic areas and introduce drop off centres at these locations	Medium-term	• Municipality has identified six clusters to establish six transfer stations.
	Introduce Buy Back centres	• Investigate the feasibility of introducing Buy Back Centres in areas of high recyclable waste generation, taking into account other initiatives to increase recycling.	Medium-term	
	Extend recycling and source separation programs to major shopping centres, taxi ranks, parks and sporting facilities	• Categorized Recycle bins to be placed prominently at all areas where crowds gather.	Medium-term	

Table 18: Effective and efficient delivery of waste services

GOAL 2: ENSURE THE EFFECTIVE AND EFFICIENT DELIVERY OF WASTE SERVICES (Refer to Table 15 Item 2)				
OBJECTIVES	**TARGETS**	**ACTIVITIES**	**TIMEFRAME**	**PROGRESS**
Route and vehicle use optimisation of existing waste collection services	To provide an effective and efficient waste collection service to existing serviced areas.	Purchase/develop waste collection route optimisation software.	Immediate	
		Pilot one area for route optimisation	Short-term	
Household waste collection	To provide waste collection services to 60% of the municipality community in the next 5 years	• Municipality must consider the introduction and implementation of FBRR systems	Short-term	Waste collection is currently covering 4 wards in the Apel region and 5 towns in the Burgersfort region
		• Develop an effective, efficient, sustainable and affordable waste collection strategy that services the entire	Immediate	
		• Municipality must do a feasibility study on leasing waste collection vehicles	Short-term	
Manage illegal dumping	Develop and enforce a penalty system for illegal dumping activities	Use GPS and GIS to map and quantify illegal dumping to identify areas of frequent illegal dumping for targeted approach to apprehend/educate transgressors and landowners	Immediate	
		Prosecute transgressors and/or bill landowner for clean up	Immediate	
		Remove waste and clean area	Immediate	The local and district municipality 4 conduct clean up campaigns per annum

Table 19: Waste treatment and disposal

GOAL 3: WASTE TREATMENT AND DISPOSAL				
OBJECTIVES	**TARGETS**	**ACTIVITIES**	**TIMEFRAME**	**PROGRESS**
Ensure safe disposal of general waste	Decommissioning of Burgersfort landfill site	• Procurement for Contractor to undertake the decommissioning process	Short-term	• Tender went out for the appointment of a consultant to undertake the decommissioning process
	Malogeng Landfill Site	• Erect new signage at the site	Short-term	Done
		• Drilling of additional boreholes for monitoring	Medium-term	A tender was advertised by the local municipality for the drilling of boreholes at the landfill site.
		• Installation of 3 phased electrical system	Medium-term	
		• Leachate and stormwater management plan	Long-term	
	Identification of a new site for a landfill to service Burgersfort region	• Appointment of an engineering contractor to license and construct the new landfill site	Short-term	• Municipality has finalised project specifications for the tender
Reduction of waste disposed to landfill (in conjunction with increased recycling) by implementing advanced waste treatment facilities	Establish composting facilities (Goal #3)	• Investigate the feasibility and suitable business model for the chipping, transport and composting of garden and green wastes and also investigate suitable locations for the establishment of one or more Composting Facilities.	Long-term	• Marumo Waste Management is currently running a composting facility.

	Establish a Waste to Energy Facility – Thermal Process (Goal #3)	• Investigate the feasibility and suitable business model for the collection, transport and thermal treatment of residual wastes to produce electricity.	Long-term	
		•		

Table 20: Public awareness and education

GOAL 4: ENSURE THAT PEOPLE ARE AWARE OF THE IMPACT OF WASTE ON THEIR HEALTH, WELL-BEING AND THE ENVIRONMENT (Refer to Table 15 Item 5)				
OBJECTIVES	**TARGETS**	**ACTIVITIES**	**TIMEFRAME**	**PROGRESS**
Publicise and education on recycling and waste management	Develop and implement a communication and public awareness programme	• Develop education and awareness strategies and training material to increase awareness of public	Short-term	
		• Develop a school's competition programme to encourage school's involvement in waste management issues	Short-term	
	Develop a municipality recycling/waste management education page on the internet	• Use website to publicise ongoing waste management initiatives e.g. educational information from all feasibility studies for composting, thermal treatment	Short-term	
Increase public awareness about the issue of Illegal dumping	To reduce illegal dumping	• Organise and publicise clean-up programs, particularly in areas that experience a high incidence of illegal dumping.	Short-term	
		• A platform (e.g. a telephone hotline or interactive internet-based resources etc.) is needed for the public to report waste management issues and access information (e.g. non-collection of waste and instances of illegal dumping)	Short-term	

Table 21: Integrated waste management planning

GOAL 5: INTEGRATED WASTE MANAGEMENT PLANNING (Refer to Table 15 Item 6.3)				
OBJECTIVES	**TARGETS**	**ACTIVITIES**	**TIMEFRAME**	**PROGRESS**
Integrated Planning	Inter-departmental coordination	• All departments and organisations directly involved with different aspects of waste management service delivery should have a formalized communication structure. Such kind of communication should not only be reserved for operational matters but must also include planning stages. This will ensure meaningful integration.	Short-term	

Table 22: Financial, institutional and organisational structure

GOAL 6: ENSURE SOUND BUDGETING AND FINANCIAL MANAGEMENT FOR WASTE SERVICES (Refer to Table 15 Item 6)				
OBJECTIVES	**TARGETS**	**ACTIVITIES**	**TIMEFRAME**	**PROGRESS**
Ensure correct staffing levels are maintained	Fill vacant key waste management posts	• Prioritise the filling of vacant posts • Determine vacant post qualification and experience requirements • Recruit and appoint required key staff	Short-term	
Ensure ongoing development of FTLM staff	Increase effectiveness and efficiency of FTLM staff	• Identify suitable training opportunities for all levels of FTLM staff	Short-term	• Ongoing
		• Develop a training schedule to ensure staff receive ongoing training relevant to their work	Short-term	
Financing appropriate to delivering an efficient and effective waste management service	Adequate budget to continue with waste management service delivery and achieve the goals and objectives of this IWMP	• Review and implement tariffs for waste collection and disposal	Medium-term	
		• Conduct full cost accounting for waste services	Immediate	
		• Look to external funding from other organisations/institutions	Immediate	
		• Continually review and implement tariffs for waste collection and disposal	Long-term	

Table 23: Waste information management system

GOAL 7: WASTE INFORMATION MANAGEMENT				
OBJECTIVES	**TARGETS**	**ACTIVITIES**	**TIMEFRAME**	**PROGRESS**
To develop an information system to capture relevant data for current operation and future planning, in order to optimise waste management and budgeting	To have a fully operational Waste Information Management System in place, including any domestic, commercial and industrial database, finances and up-to-date information. Such a system can be used for current operations as well as future planning purposes	Complete and implement a fully functional Waste Information Management System. A system that is updated regularly (monthly) and in line with SAWIC	Short-term	
Establish a monitoring and information system that tracks waste generation, collection, reuse, recycling, reprocessing and disposal in terms of waste flow and facilitate the movement of waste				

Table 24: Establish effective compliance with enforcement of the Waste Act.

GOAL 8: ESTABLISH EFFECTIVE COMPLIANCE WITH AND ENFORCEMENT OF THE WASTE ACT (Refer to Table 15 Item 1)				
OBJECTIVES	**TARGETS**	**ACTIVITIES**	**TIMEFRAME**	**PROGRESS**
New waste management by-laws	Promulgation and Enforcement of new Waste Management By-Laws.	• Publish new Waste Management By-Laws	Immediate	• Currently in waiting public comments.
		• Ensure adequate trained and experienced staff and resources are allocated to effectively implement and enforce Waste Management By-Laws.	Short-term	
		• Monitoring of effectiveness of by-laws.	Short-term	
To have an IWMP for the local municipality	Municipal council to adopt the IWMP	• IWMP to be presented to municipal council when it is finalised	Immediate	• IWMP compilation is currently in progress
To comply with section 9.3 of the Waste Act	Municipality should develop its own waste management standards for the management of waste.	• Municipality to adopt the district or provincial or national norms and standards waste disposed at landfill sites and for separation and storage of waste.	Short-term	

CHAPTER 6

ALTERNATIVES AND SCENARIOS

6 IDENTIFICATION AND EVALUATION OF ALTERNATIVES AND SCENARIOS

The local municipality must undertake to identify the different alternatives that can be employed to achieve the desired end state and different approached should be indicated to achieve the targets. The municipality should indicate the best possible way of attaining the goals by weighing the costs associated with the alternatives versus the benefits of each. It is very crucial that the municipality look at all the requirements and must decide on its available professional capacity and financial resources.

6.1 Achieving Proper Waste Management in the Local Municipality

For the local municipality to attain a proper waste management within its jurisdiction, the following should be considered:

6.1.1 Collection Services

Main aspects of collection services include:

- Waste receptacles
- The frequency of waste collection

6.1.1.1 Waste Receptacles

There are a number of waste receptacles that can be used such as 85 litre bins, 240 litre trolley bins, skip containers, etc. The receptacle will be dependent on the volume of waste generated at the collection point, the type of waste, the type of collection vehicle and the cost of the service to the community. In densely populated areas such as larger cities, the 240 litre wheelie-bin system is fairly common. This is due to the fact that there is generally more waste in these areas requiring larger waste receptacles. These wheelie-bins are emptied mechanically into the collection vehicle. There is however a cost implication since these containers are fairly expensive and costs must somehow be recovered, usually directly influencing the cost of the service. It is however a once off capital cost which might be weighed against the continuously monthly cost of bin liners.

The most commonly used system is the black bag system. Usually a bin liner (black bag) is placed in an 85 litre container (dustbin) and used for disposal purposes. The bag is then removed from the bin and placed on the sidewalk for collection. Bags can be picked up by hand and dropped into the collection vehicle.

In more rural areas almost, any type of receptacle is used, depending on how formal the collection system is. In some rural or less affluent areas skip containers are placed at strategic points. The community may then responsible to bring their waste and dispose of it in the skip containers from where it is collected. The level of co-operation from the community usually determines the success of such a system.

For commercial collection, i.e. restaurants, shops, etc., a vast number of receptacles is used. In most instances the type of receptacles is determined by the type and volume of waste disposed of as well as the type of service rendered. In smaller towns the municipality usually renders the service and they provide the receptacles. In larger towns there are sometimes private contractors collecting waste from commercial collection points. To summarise, the type of receptacle will be dependent on what the community can afford, the volumes of waste generated, the type of waste and the special needs of the community.

6.1.1.2 Waste Collection Frequency

The collection frequency is dependent on the volumes of waste generated, the availability of the equipment and the level of service. The norm is that domestic collection is done once a week in most areas. Commercial collection is dependent on the volumes generated and the types of waste. A restaurant, for instance, will have their waste removed up to four times a week should the volumes require it. This is due to the fact that most of their waste is food residue that can cause an odour and pest problem within a day or two.

6.1.2 Equipment for Waste Management

The type of equipment is usually determined by the cost of the service to the residents, the condition of the collection roads (surface, alignment, etc.), the distance to the landfill and the number of collection points serviced per day.

6.1.2.1 Equipment Cost

There is a wide range of collection equipment that can be utilised for collection equipment. This can range from a tractor and trailer system (+/- R 360 000) up to a top of the range REL (+/- R 1 100 000). It is vital that the right equipment is utilised for the right conditions and type of service required.

6.1.2.2 Conditions of Roads Collection

The road condition that the collection vehicle has to drive plays a major factor 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 trailer would be more suitable in the rural application as opposed to a state of the art 20 m^3 REL, which is not built to drive on poorly maintained roads. The maintenance cost would be above normal for an REL to drive these roads on a daily basis due to wear and tear on components. A tractor and trailer, which is a much more robust type of system, will be better suited to such conditions. In an urban environment a tractor and trailer will be less suited as the landfill is usually far from the collection areas and will take too long to drive to the landfill and back.

6.1.2.3 Distance to the Landfill

Distance to the landfill plays an important role. For instance, if the landfill is 20 km from the collection area, a tractor and trailer will spend most of the time driving from the collection area to the landfill and back. A general rule is that a tractor and trailer combination should not drive further than 7 km from the collection area to the landfill. For distances above 7 km, alternative types of vehicles should be considered.

There is a collection system using 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 and back.

Another possible application will be in a regional context where the vehicle collects waste in a certain area, leaves the container at a designated point and moves on to the next area. The container will then be collected by a "Roll-on Roll-off" truck for disposal at the landfill.

6.1.2.4 Number of Collection Points

The number of collection points becomes critical in an urban area where a 20 m^3 REL collects up to 1 200 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 and back. Aspects such as compaction also play an important role. A 20 m^3 REL can collect up to 60 m^3 of waste at a time because of a one to three (1:3) compaction ratio, while a tractor/trailer combination can collect only 5 m^3 to 10 m^3 at a time before it has to offload. The tractor/trailer therefore has to make a lot more trips to the landfill than a 20 m^3 REL. The REL therefore has more time for the collection and service of more points. It must also be noted that the "runners", collecting and loading the collection vehicle, are idling while the vehicle is on the road to the dumpsite and back.

6.1.2.5 Equipment for Landfill sites

On the larger landfills a landfill compactor, loader, water container and tipper will be found to ensure effective operating conditions. For smaller landfills a TLB will handle waste effectively enough and on communal landfills where the 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 the waste generated.

Compaction is usually an important factor since this allows for more waste to be disposed of at a landfill thereby prolonging the life of the landfill. 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 30-ton landfill compactor, capable of handling over 500 tons of waste per day, on a landfill only receiving 10 tons per day. Such a machine cost in the

region of R 2 600 000 and operating cost is in the region of R 180.00/hour without the cost of the operator or maintenance costs.

CHAPTER 7

IMPLEMENTATION PLAN OF THE IWMP

7 IWMP IMPLEMENTATION PLAN

This section presents a plan by which the FTLM aims to meet the goals defined in the previous section. The plan consists of a number of initiatives which, if appropriately executed, should move the FTLM towards realising these goals. An implementation programme with alternatives consideration is presented in the table below. It is however acknowledged that the FTLM faces numerous challenges in the implementation of these projects including financial, human resource and logistic limitations. It is therefore expected that the implementation programme may be modified during the next 5-year period as resource allocation changes.

For the Plan to be successfully implemented, thorough planning would be required by all responsible stakeholders. Aspects of the planning include legislation and policy compliance, proper financial planning, public participation, monitoring and meeting of targets identified in this IWMP.

It is recommended that an IWMP Review Committee be established at the local municipality level to monitor and review progress in the implementation of the IWMP. The committee members should include parties that are directly and indirectly involved in the implementation of projects, to ensure integrity of the review process. It is important to note that when implementing the IWMP, compliance with current waste management legislation is maintained. This applies to new projects such as establishment of drop-off centres and recycling buy-back centres where Environmental Impact Assessments will be required. Application for permissions takes varying periods of time and should be factored into the project planning. Budget estimates presented are indicative only, using a cost base date of **March 2018**. The Waste and Environmental Manager together with Finance Department must undertake more detailed budget estimates for each task based on prepared Terms of Reference for the required task and included in annual budgeting.

GOAL 1: PROMOTE WASTE MINIMISATION, REUSE, RECYCLING AND RECOVERY OF WASTE								
OBJECTIVES	**TARGETS**	**ALTERNATIVE ACTION 1**	**ALTERNATIVE ACTION 2**	**ALTERNATIVE ACTION 3**	**START DATE**	**COMPLETION DATE**	**RESPONSIBILITY**	**BUDGET**
Reduction of Waste Disposal to Landfill by systematically increasing recycling and re-use	10% per annum increase in amount of recyclable materials being recovered through FTLM and private sector initiatives. To be reviewed after 5 years.	Engage with private recycling companies to form an information sharing Recycling Forum in order to quantify recycling rates	None	None	Process has already started	Ongoing	Head: Community Services	R300 000/Annum
	Use the multi-bag separation at source system	Pilot the system in two wards	Can do a pilot system in the Tubatse region	None	4 July 2018	23 January 2019	Head: Community Services	R800 000 (Alternative Action 1) R 1 500 000 (Alternative Action 2)
		Roll out in phases to other collection areas serviced by the municipality.	Can be rolled out in the entire municipality	None	01 July 2019	01 July 2020	Head: Community Services	R1 000 000 (Alternative Action 1) R 2 500 000 (Alternative Action 2)
	Ensure commercial centres and major businesses recycle.	Through engagement with Recycling Forum identify and target commercial centres and major businesses that can be served by either private recyclers or FTLM	None	None	25 February 2019	Ongoing	Head: Community Services	-

Municipality to make waste recycling more convenient for all sectors	Establish transfer stations and drop off centres	Municipality to build transfer stations in strategic areas and introduce drop off centres at these locations	Start with the construction of 3 stations in Mphanama, Penge and Ngwaabe	None	Process of appointing consultant has already started	30 September 2018	Head: Technical Services Head: Community Services	R10 000 000 has already been set aside for Alternative Action 2.
	Introduce Buy Back centres	Investigate the feasibility of introducing Buy Back Centres in areas of high recyclable waste generation, taking into account other initiatives to increase recycling.	None	None	11 January 2021	25 June 20121	Head: Community Services	R300 000
	Extend recycling and source separation programs to major shopping centres, taxi ranks, parks and stadiums	Categorized Recycle bins to be placed prominently at all areas where crowds gather.	None	None	5 November 2018	18 March 2019	Head: Community Services	R600 000

GOAL 2: ENSURE THE EFFECTIVE AND EFFICIENT DELIVERY OF WASTE SERVICES								
OBJECTIVES	**TARGETS**	**ALTERNATIVE ACTION 1**	**ALTERNATIVE ACTION 2**	**ALTERNATIVE ACTION 3**	**START DATE**	**COMPLETION DATE**	**RESPONSIBILITY**	**BUDGET**
Route and vehicle use optimisation of existing waste collection services	To provide an effective and efficient waste collection service to existing serviced areas.	Purchase/develop waste collection route optimisation software.	None	None	11 March 2019	24 June 2019	Head: Information Technology Head: Community Services	R250 000
		Pilot one area for route optimisation	None	None	08 July 2019	13 March 2020	Head: Information Technology Head: Community Services	To be determined after the route optimization task is completed
Household waste collection	To provide waste collection services to 60% of the municipality community in the next 5 years	• Municipality must consider the introduction and implementation of FBRR systems	None	None	15 April 2019	26 September 2019	Head: Finance Head: Community Services	To be determined during the feasibility
		• Develop an effective, efficient, sustainable and affordable waste collection strategy that services the entire municipality	None	None	15 October 2019	01 February 2020	Head: Community Services	R150 000
		• Buy additional 3 skip loader trucks	None	None	30 January 2019	30 May 2019	Head: Finance Head: Community Services	R2.5 million
		• Municipality must do a feasibility study on leasing of waste collection vehicles	None	None	18 May 2020	10 September 2020	Head: Finance Head: Community Services	R300 000

Manage illegal dumping	Develop and enforce a penalty system for illegal dumping activities	Use GPS and GIS to map and quantify illegal dumping to identify areas of frequent illegal dumping for targeted approach to apprehend/educate transgressors and landowners	None	None	20 November 2019	30 May 2020	Head: Town Planning Head: Community Services	R250 000
		Prosecute transgressors and/or bill landowner for clean up	None	None	Dates to be determined by the gazetting of Waste Management By-laws	Ongoing	Head: Community Services	-
		Remove waste and clean area	None	None	02 July 2018	Ongoing	Head: Community Services	-

GOAL 3: WASTE TREATMENT AND DISPOSAL								
OBJECTIVES	**TARGETS**	**ALTERNATIVE ACTION 1**	**ALTERNATIVE ACTION 2**	**ALTERNATIVE ACTION 3**	**START DATE**	**COMPLETION DATE**	**RESPONSIBILITY**	**BUDGET**
Ensure safe disposal of general waste	Decommissioning of Burgersfort landfill site	• Procurement for Contractor to undertake the decommissioning process	None	None	Process has already started	June 2021	Head: Technical Services Head: Community Services	R27 000 000 already budgeted until 2021
	Malogeng Landfill Site	• Drilling of additional boreholes for monitoring	None	None	12 August 2021	16 November 2021	Head: Technical Services Head: Community Services	R450 000
		• Installation of 3 phased electrical system	None	None	01 November 2021	25 March 2022	Head: Technical Services Head: Community Services	R750 000
		• Leachate and stormwater management plan	None	None	27 July 2018	30 October 2018	Head: Technical Services Head: Community Services	R250 000
	Identification of a new site for a landfill to service Burgersfort region	• Appointment of an engineering contractor to license and construct the new landfill site	None	None	Process has already started	June 2020	Head: Technical Services Head: Community Services	R6 000 000 already allocated 2018/2019

Reduction of waste disposed to landfill (in conjunction with increased recycling) by implementing advanced waste treatment facilities	Establish composting facilities (Goal #3)	• Investigate the feasibility and suitable business model for the chipping, transport and composting of garden and green wastes and also investigate suitable locations for the establishment of one or more Composting Facilities.	None	None	25 January 2021	22 April 2021	Head: Community Services	R350 000
	Establish a Waste to Energy Facility – Thermal Process (Goal #3)	• Investigate the feasibility and suitable business model for the collection, transport and thermal treatment of residual wastes to produce electricity.	None	None	01 June 2021	25 November 2021	Head: Community Services	R450 000

GOAL 4: ENSURE THAT PEOPLE ARE AWARE OF THE IMPACT OF WASTE ON THEIR HEALTH, WELL-BEING AND THE ENVIRONMENT								
OBJECTIVES	**TARGETS**	**ALTERNATIVE ACTION 1**	**ALTERNATIVE ACTION 2**	**ALTERNATIVE ACTION 3**	**START DATE**	**COMPLETION DATE**	**RESPONSIBILITY**	**BUDGET**
Publicise and education on recycling and waste management	Develop and implement a communication and public awareness programme	• Develop education and awareness strategies and training material to increase awareness of public	None	None	18 June 2018	21 September 2018	Head: Community Services	R300 000
		• Develop a school's competition programme to encourage school's involvement in waste management issues	None	None	13 August 2018	15 November 2018	Head: Community Services	R250 000
	Develop a municipality recycling/waste management education page on the internet	• Use website to publicise ongoing waste management initiatives e.g. educational information from all feasibility studies for composting, thermal treatment	None	None	15 July 2018	Ongoing	Head: Information Technology Head: Community Services	Can be done inhouse
Increase public awareness about the issue of Illegal dumping	To reduce illegal dumping	• Organise and publicise clean-up programs, particularly in areas that experience a high incidence of illegal dumping.	None	None	15 October 2018	05 May 2019	Head: Community Services	R300 000
		• A platform (e.g. a telephone hotline or interactive internet-based resources etc.) is needed for the public to report waste management issues and access information (e.g. non-collection of waste and instances of illegal dumping)	None	None	28 November 2018	Ongoing	Head: Information Technology Head: Community Services	Can be done inhouse
To comply with the Occupational Health and Safety Act	To provide all employees in the Waste and Environmental Department with	• Buy overalls, safety boots, hard hats and reflections	None	None	27 August 2018	08 October 2018	Head: Community Services	R100 000

	Personal Protective Equipment							

GOAL 5: INTEGRATED WASTE MANAGEMENT PLANNING (Refer to Table 15 Item 6.3)								
OBJECTIVES	**TARGETS**	**ALTERNATIVE ACTION 1**	**ALTERNATIVE ACTION 2**	**ALTERNATIVE ACTION 3**	**START DATE**	**COMPLETION DATE**	**RESPONSIBILITY**	**BUDGET**
Integrated Planning	Inter-departmental coordination	• All departments and organisations directly involved with different aspects of waste management service delivery should have a formalized communication structure. Such kind of communication should not only be reserved for operational matters but must also include planning stages. This will ensure meaningful integration.	None	None	26 October 2018	Ongoing	All Heads of Departments	-

GOAL 6: ENSURE SOUND BUDGETING AND FINANCIAL MANAGEMENT FOR WASTE SERVICES								
OBJECTIVES	**TARGETS**	**ALTERNATIVE ACTION 1**	**ALTERNATIVE ACTION 2**	**ALTERNATIVE ACTION 3**	**START DATE**	**COMPLETION DATE**	**RESPONSIBILITY**	**BUDGET**
Ensure correct staffing levels are maintained	Fill vacant key waste management posts	• Prioritise the filling of vacant posts • Determine vacant post qualification and experience requirements • Recruit and appoint required key staff	None	None	30 July 2018	29 June 2019	Head: Human Resources Head: Community Services	To be in line with municipality remuneration policy
Ensure ongoing development of FTLM staff	Increase effectiveness and efficiency of FTLM staff	• Identify suitable training opportunities for all levels of FTLM staff	None	None	20 May 2019	30 June 2020	Head: Human Resources Head: Community Services	R200 000
		• Develop a training schedule to ensure staff receive ongoing training relevant to their work	None	None	01 July 2018	30 August 2018	Head: Human Resources Head: Community Services	-
Financing appropriate to delivering an efficient and effective waste management service	Adequate budget to continue with waste management service delivery and achieve the goals and objectives of this IWMP	• Review and implement tariffs for waste collection and disposal	None	None	30 July 2018	Annually	Head: Finance Head: Community Services	-
		• Conduct full cost accounting for waste services	None	None	14 March 2022	4 July 2022	Head: Finance Head: Community Services	R350 000
		• Look to external funding from other organisations/institutions	None	None	30 July 2018	Ongoing	Head: Finance Head: Community Services	

GOAL 7: WASTE INFORMATION MANAGEMENT								
OBJECTIVES	**TARGETS**	**ALTERNATIVE ACTION 1**	**ALTERNATIVE ACTION 2**	**ALTERNATIVE ACTION 3**	**START DATE**	**COMPLETION DATE**	**RESPONSIBILITY**	**BUDGET**
To develop an information system to capture relevant data for current operation and future planning, in order to optimise waste management and budgeting Establish a monitoring and information system that tracks waste generation, collection, reuse, recycling, reprocessing and disposal in terms of waste flow and facilitate the movement of waste	To have a fully operational Waste Information Management System in place, including any domestic, commercial and industrial database, finances and up-to-date information. Such a system can be used for current operations as well as future planning purposes	Complete and implement a fully functional Waste Information Management System. A system that is updated regularly (monthly)	None	None	16 May 2022	17 November 2022	Head: Information Technology Head: Community Services	R1 000 000

GOAL 8: ESTABLISH EFFECTIVE COMPLIANCE WITH AND ENFORCEMENT OF THE WASTE ACT								
OBJECTIVES	**TARGETS**	**ALTERNATIVE ACTION 1**	**ALTERNATIVE ACTION 2**	**ALTERNATIVE ACTION 3**	**START DATE**	**COMPLETION DATE**	**RESPONSIBILITY**	**BUDGET**
New waste management by-laws	Promulgation and Enforcement of new Waste Management By-Laws.	• Publish new Waste Management By-Laws	None	None	31 January 2019	23 May 2019	Head: Community Services	R200 000
		• Ensure adequate trained and experienced staff and resources are allocated to effectively implement and enforce Waste Management By-Laws.	None	None	Refer to Goal 6	Refer to Goal 6	Refer to Goal 6	Budget dealt with in Goal 6
		• Monitoring of effectiveness of by-laws.	None	None	30 June 2022	01 December 2022	Head: Community Services	R300 000
To have an IWMP for the local municipality	Municipal council to adopt the IWMP	• IWMP to be presented to municipal council when it is finalised	None	None	30 June 2018		Head: Community Services	
To comply with section 9.3 of the Waste Act	Municipality should develop its own waste management standards for the management of waste.	• Municipality to adopt the district or provincial or national norms and standards waste disposed at landfill sites and for separation and storage of waste.	None	None	15 May 2021	20 August 2021		R450 000

CHAPTER 8

IMPLEMENTATION INSTRUMENTS

8 IMPLEMENTATION INSTRUMENTS OF THE IWMP

8.1 Partnerships

The costs and needs of a sustainable waste management system are huge and hence require input and participation from its varied stakeholders. It is thus important for municipalities to form partnerships with different stakeholders to try and sustain and promote good waste management practices for all their community members. There are a wide range of partnerships that can be formed. A few examples are given below:

a. **Public-public Partnerships:** This is a partnership between two public sector institutions or organisations where neither partner seeks profit from the partnership. A typical example of such a partnership could be in cases of operating regional waste facilities. All concerned municipalities would come together in the joint development of such a facility and share the costs.
b. **Public-private partnerships**: This is normally a partnership between a public-sector institution/organisation and a private company or party. The private company or party takes the financial risks for the project including capital costs, designing and building the facility as well as the operational costs. The land typically belongs to the public entity with the fixed asserts sponsored by the private entity but ultimately becoming state property.
c. **Public-community partnerships:** This partnership includes members of the community receiving the service forming part of the partnership with the public entity giving the service. A typical example in waste management is when community-based contractors are involved in recycling programmes by among other collecting the recyclables which have been separated at source.

8.2 Policy and Legal Instruments

A critical component to the implementation of the IWMP is the supporting legal framework. This framework needs to support and guide the implementation of the objectives of the IWMP. The municipality should introduce an Integrated Waste

Management Policy. This provides an excellent chance to ensure that both the plan and policy are aligned and support the implementation of the desired objectives. In addition to the policy, a municipality needs by-laws which will give the plan a binding legal standing. This will also allow for punitive measures in cases of non-compliance. The FTLM bylaws are currently being revised. The revision of these bylaws should be aligned with the IWMP in order to ensure relevance and effectiveness. Provincial policies and regulations also have relevance together with the national prescripts.

8.3 Economic Instruments

Financing of waste management services is dependent on accurate costing of the required services. The full cost of waste service provision is seldom understood by both municipal officials as well as the general public. This results in waste management services often being under budgeted and/or communities' reluctance to pay the rightful cost of the service. Tariffs have the potential to fully cover the costs of providing the services, but the charges are often set below actual costs. Currently the FTLM tariffs are set based on the stand size of households which provides opportunities for cross subsidization between different areas but disregards the actual costs of providing that service. Below are some of the interventions that can be implemented.

- Undertake on a full cost accounting exercise for waste management services to include aspects of collection, transportation, landfill, street cleansing, fee collection, debt payment and depreciation.
- Implementing recycling programmes will reduce the disposal costs and generate revenue for the municipality. The cost accounting exercise referred to above could include the costs of these recycling programmes against their gains in terms of real monetary returns as well as cost savings relating to increased landfill life span through saved air space.
- Increasing the service charges to correlate with the actual costs maybe a challenge to low income groups, given the current backlog specifically to those areas. The

concept of Pay-as-you-throw may then be a better approach, where the service charge is proportional to the waste produced per household.

The implementation of this IWMP can necessitate both capital and operational costs which can be funded through potential avenues listed in the table below.

Table 25: Funding Options

CAPITAL FUNDING	OPERATIONAL FUNDING
Own funding	Tariffs
Municipal Infrastructure Grant (MIG)	Rates
Consolidated Municipal Infrastructure Programme (CMIP)	Equitable share
Municipal Systems Improvement Programme (MSIP)	Donor funding
Extended Public Works Programme (EPWP)	
Donor funding	
Financial Institutions (e.g. DBSA)	
Public-private partnerships	
Provincial and National government allocations	

CHAPTER 9

MONITORING AND REVIEW

9 MONITORING AND REVIEW PROGRAM

Monitoring of the implementation program (outlined in Chapter 7) is essential as it allows the responsible authority to ensure that the proposed plan is implemented within designated timeframes.

9.1 Reporting

Section 13(3) of the Waste Act requires that annual performance reports prepared in terms of Section 46 of the Municipal Systems Act must contain information on the implementation of this IWMP. Pertinent information should include:

- The extent to which the plan has been implemented during the period;
- The waste management initiatives that have been undertaken during the reporting period;
- The delivery of waste management services and measures taken to secure the efficient delivery of waste management services, if applicable;
- The level of compliance with the plan and any applicable waste management standards;
- The measures taken to secure compliance with waste management standards;
- The waste management monitoring activities;
- The actual budget expended on implementing the plan;
- The measures that have been taken to make any necessary amendments to the plan;
- Any other requirements as may be prescribed by the minister.

9.2 Monitoring

The Annual Performance Report should comprise the following:

a. **Strategic Issues**: Performance and progress on meeting short, medium and long-term Goals and Objectives;
b. **Financial Issues**: Reporting on budget forecasting, obtaining sufficient budgets and budgeting constraints with respect to both existing waste management operations and implementation of this IWMP;
c. **IWMP Amendments:** Amendments to the IWMP necessitated by the outcomes of feasibility studies, financial constraints etc.
d. **Communication:** Keeping FTLM Councillors, key stakeholders and the residents of FTLM informed on progress against the IWMP.

9.3 Revision of the IWMP

The IWMP should be viewed as a living document and it is recommended that the Targets and Objectives be reviewed and updated annually based on both progress and constraints encountered, as part of the preparation of the Annual Performance Report. As this IWMP forms part of the Integrated Development Plan required in terms of Chapter 5 of the Municipal Systems Act, this IWMP must be comprehensively reviewed after 5 years, thus the next comprehensive revision of the IWMP should occur in 2023. The comprehensive review will update the status quo, evaluate overall progress against the Goals and Objectives in this IWMP, review gaps and needs and reformulate Goals and Objectives as required to continue to improve waste management services in the FTLM area.

10 REFERENCES

- DEA, 2009, Guidelines for the Development of Integrated Waste Management Plans, National Department of Environmental Affairs
- DEAT, Undated, A Policy on Pollution Prevention, Waste Minimization, Impact Management and Remediation, White Paper - Integrated Pollution and Waste Management for South Africa.
- Final Consolidated IDP for FTLM 2016
- National Waste Management Strategy, 2011
- SAWIC Website
- Sekhukhune District Municipality IWMP 2017
- Stats SA Census Data, 1996-2011
- Stats SA Community Survey, 2016

APPENDIX 1: PUBLIC PARTICIPATION PROCESS

APPENDIX 2: LIST OF HEALTH FACILITIES

APPENDIX 3: HEALTH CARE RISK WASTE COLLECTED FROM THE DISTRICT MUNICIPALITY

APPENDIX 4: WASTE PERMIT FOR MALOGENG

APPENDIX 5: LIST OF REGISTERED FETAKGOMO – TUBATSE LOCAL RECYCLING FORUM