

Review of the Integrated Waste Management Plan Emfuleni Local Municipality:

Integrated Waste Management Plan Report

DRAFT DUE FOR COUNCIL APPROVAL

September 2019

COMPILED BY:

iX engineers (Pty) Ltd
Eastwood Office Park, Protea House
270 Lynnwood Service Rd
Lynnwood Ridge, Pretoria, 0081
P O Box 22, Menlyn, 0063
Tel: +27 (0) 12 745 2000
Fax: +27 (0) 12 745 2001
Contact Person: G le Roux

COMPILED FOR:

Emfuleni Local Municipality
Cnr Klasie Havenga & Beyers Naude
Boulevard
Vanderbijlpark, 1911
Tel No: +27 (0)16 986 8442/71
Facsimile: +27 (0)86 555 6019
Contact Person: Bernice Somo

Table of Contents

1.	INTRODUCTION.....	1
2.	LEGISLATIVE REQUIREMENTS.....	1
3.	METHODOLOGY.....	9
3.1	Situation analysis.....	9
3.1.1	Approach.....	9
3.2	Background	10
3.3	Locality.....	10
3.4	Study Area	12
3.5	Demographics	12
3.5.1	Population.....	12
3.5.2	Unemployment	14
3.5.3	Employment.....	14
3.5.4	Education	15
3.6	Waste Characterisation	15
3.6.1	Waste Generation.....	16
3.6.2	Future Waste Generation Rates and Quantities	17
3.6.3	Industrial and Mining Waste	19
3.6.4	Health Care Risk Waste	19
3.7	Recycling, treatment and disposal.....	19
3.7.1	Recycling	19
3.7.2	Garden Refuse.....	19
3.7.3	Treatment and Disposal	20
3.7.4	Waste disposal sites	20
3.7.5	Transfer Stations.....	30
3.8	Status of waste collection services.....	36
3.8.1	Service Area and Refuse Collection	36
3.8.2	Service and Receptacles provided.....	37
3.8.3	Frequency of street cleansing	38
3.8.4	Collection Needs	38
3.8.5	Equipment.....	38
3.9	Financing for Waste Management.....	44
3.9.1	Current Tariff Structure for Waste Collection	44
3.9.2	Budgeted Financials Performance for Waste Management	47
3.10	Organisational and institutional matters	48
3.11	Legal matters	49
3.11.1	Legal Compliance.....	49
3.11.2	Municipal By-Law Pertaining to Waste	49
3.11.3	Illegal Dumping.....	51
3.12	New and future developments	52
4.	REVIEW OF THE PREVIOUS IWMP	52
5.	GAPS AND NEEDS ANALYSIS.....	53

6.	PERFORMANCE OF THE MUNICIPALITY	55
7.	DESIRED END STATE	55
7.1	Safe and proper disposal of waste	56
7.2	Effective and efficient delivery of waste service	57
7.3	Effective and efficient delivery of waste service	58
7.4	Waste minimisation	59
7.5	Compliance with legislative requirements	60
7.6	Waste information system	60
7.7	Education and awareness	61
8.	STAKEHOLDER PARTICIPATION	62
9.	GOALS AND TARGETS	63
9.1	Waste Disposal Infrastructure	63
9.1.1	Target 1: Ensure that all the landfill sites in the Municipality are licensed and comply with legislative requirements	63
9.1.2	Target 2: Maintain infrastructure on the various landfill sites	63
9.1.3	Legal requirements/framework	68
9.1.4	Resources and finances	68
9.1.5	The implications should there be lack of action on the strategic goal 1	68
9.2	Waste Collection	68
9.2.1	Target 1: Maintain current service delivery to all areas within the Municipality and extend service delivery to all indigent populations where possible	68
9.2.2	Target 2: Effectively plan to extend service delivery to any new developments within the Municipality	69
9.2.3	Target 3: Conduct a transportation study to identify and optimise collection routes and number of service points	69
9.2.4	Target 4: Establish receptacle requirements within the Municipality and supply the receptacles to residents in order to optimise collection efforts	70
9.2.5	Legal requirements/framework	72
9.2.6	Resources and finances	72
9.2.7	The implications should there be lack of action on the strategic goal 2	73
9.3	Resource Extension	74
9.3.1	Target 1: Effective structure and extension of human resources.	74
9.3.2	Target 2: Increase/approval of budget for Waste Collection and Waste Disposal for service delivery.	74
9.3.3	Target 3: Effective financial management for waste management	78
9.3.4	Target 4: Implement improved tariff model	79
9.3.5	Target 5: Decrease non – payment of tariffs	80
9.3.6	Legal requirements/framework	80
9.3.7	Resources and finances	80
9.3.8	The implications should there be lack of action on the strategic goal 3	81
9.4	Waste Minimisation	81
9.4.1	Target 1: Formalise and encourage recycling activities	81
9.4.2	Target 2: Encourage waste minimisation	81
9.4.3	Legal requirements/framework	81

9.4.4 Resources and finances	81
9.4.5 The implications should there be lack of action on the strategic goal 5	82
9.5 Management of Illegal Activities.....	82
9.5.1 Target 1: Develop an Illegal Dumping Management Strategy	82
9.5.2 Target 2: Improve removal of illegally dumped waste	83
9.5.3 Legal requirements/framework.....	83
9.5.4 Resources and finances	83
9.5.5 The implications should there be lack of action on the strategic goal 5	83
9.6 Waste Information System	84
9.6.1 Target 1: Develop and maintain a waste information system	84
9.6.2 Target 2: Contribute to Inter Municipal Waste Information Workshops.....	84
9.6.3 Legal requirements/framework.....	84
9.6.4 Resources and finances	84
9.6.5 The implications should there be lack of action on the strategic goal 6	85
9.7 Education and Awareness	85
9.7.1 Target 1: Build community awareness	85
10. FUNDING/RESOURCES AND FINANCES.....	89
11. RECOMMENDATIONS.....	90
12. IMPLEMENTATION PLAN	95
13. SUMMARY.....	112
13.1 Waste Disposal Infrastructure	112
13.2 Waste Collection	113
13.3 Resource Extension.....	114
13.4 Waste Minimisation.....	114
13.5 Management of Illegal Activities.....	115
13.6 Waste Information System	115
13.7 Education and Awareness	115

List of Figures

Figure 1: Locality of the Municipality.....	11
Figure 2: Population Distribution by racial groups (Source: Stats SA, 2011 and 2016).....	13
Figure 3: Population by gender	13
Figure 4: Emfuleni Local Municipality education level in 2011	15
Figure 5: Waste characterisation for the Emfuleni Local Municipality.....	16

List of Tables

Table 1: Emfuleni Local Municipality between 2001 and 2011	12
Table 2: Disability.....	14
Table 3: Employment status between 2001 and 2016	14
Table 4: Current waste generation figures	17
Table 5: Future Waste Generation Rates and Quantities.....	18
Table 6: Future Waste Generation Rates and Quantities (with waste recycling targets incorporated).....	18
Table 7: The status of the Palm Springs Landfill.....	21
Table 8: The status of the Boitshepi Landfill Disposal Site.....	24
Table 9: The status of the Waldrift Landfill Disposal Site.....	27
Table 10: The status of the Zuurfontein Landfill site	29
Table 11: Waste receptacle	38
Table 12: Street cleaning services in Emfuleni Local Municipality	38
Table 13: Waste vehicles used in the Municipality (Vanderbijlpark)	39
Table 13: Waste vehicles used in the Municipality (Duncanville).....	40
Table 15: Waste vehicles used in the Municipality (Sebokeng).....	40
Table 16: Refuse Waste Charges.....	44
Table 17: Collection and Transportation Tariffs	45
Table 18: Disposal fees at Landfill sites	46
Table 19: Budget/Expenditure	47
Table 20: Human Resource Capacity required	48
Table 21: Review of previous IWMP	52
Table 22: Desired End State for Safe and Proper Disposal of Waste	56
Table 23: Desired End State for Waste Collection.....	57
Table 24: Desired End State for Resource Extension	58
Table 25: Desired End State for Waste Minimisation	59
Table 26: Desired End State for Management of Illegal Activities	60
Table 27: Desired End State for Waste Information System	61
Table 28: Desired End State for Education and Awareness	62
Table 29: Capital Cost Estimate for Establishment of MRF / Waste Sorting Facility.....	65
Table 30: Potential Recycling Revenue Income.....	66
Table 31: Operating Cost Estimate for MRF / Waste Sorting / Buy back centre per annum.....	66
Table 32: Human Resource Capacity required	73
Table 33: Financial Projection for Future Disposal Operations	75
Table 34: Estimated Skip Costs.....	83

Annexures

Annexures

- Appendix 1: Landfill Licenses (Waldrift, Zuurfontein, Palm Springs, Boitshepe)
- Appendix 2: Personnel Organogram
- Appendix 3: Emfuleni Local Municipality: Solid Waste Management By-Laws
- Appendix 4: Tear sheets - Public Participation Notice
- Appendix 5: Roshnee Transfer Station Upgrade Cost Estimate
- Appendix 6: Sonland Transfer Station Upgrade Cost Estimate
- Appendix 7: Springbok MRF and Transfer Station Establishment - Cost Estimate
- Appendix 8: Comments Report: Public Participation

List of Abbreviations

DEA	Department of Environmental Affairs
DWAF	Department of Water Affairs and Forestry
HCRW	Health Care Risk Waste
IDP	Integrated Development Plan
IWM	Integrated Waste Management
IWMP	Integrated Waste Management Plan
GDARD	Gauteng Department of Agriculture and Rural Development
NEMA	National Environmental Management Act, Act No. 107 of 1998
NEMWA	National Environmental Management Waste Act, Act No. 59 of 2008.
NWMS	National Waste Management Strategy

GLOSSARY OF TERMS

Building and demolition waste means waste, excluding hazardous waste, produced during the construction, alteration, repair or demolition of any structure, and includes rubble, earth, rock and wood displaced during that construction, alteration, repair or demolition;

Business waste means waste that emanates from premises that are used wholly or mainly for commercial, retail, wholesale, entertainment or government administration purposes;

A landfill working Cell refers to the volume of waste generally placed during one working day and covered on all horizontal surfaces by cover soil;

Communal Waste Disposal Site is the smallest waste disposal site classification with a capacity of less than 25 tonnes per day;

Composting is the controlled aerobic biological decomposition of organic matter, such as food scraps and plant matter, into humus, a soil-like material. Aerobic is the decomposition process in the presence of oxygen;

Constitution means the Constitution of the Republic of South Africa, 1996;

Container as referred to in this document means a disposable or re-usable vessel in which waste is placed for the purposes of storing, accumulating, handling, transporting, treating or disposing of that waste, and includes bins, bin-liners and skips;

Decommissioning in relation to waste treatment, waste transfer or waste disposal facilities, means the planning for and management and remediation of the closure of a facility that is in operation or that no longer operates;

Department as referred to in this document means the Department of Environmental Affairs;

Disposal as referred to in this document means the burial, deposit, discharge, abandoning, dumping, placing or release of any waste into, or onto, any land;

Disposal Site Airspace or capacity is the total volume of space on a waste disposal site to be filled with waste and cover material;

Domestic waste means waste, excluding hazardous waste, that emanates from premises that are used wholly or mainly for residential, educational, health care, sport or recreation purposes;

Environment as referred to in this document means the surroundings within which humans exist and that are made up of -

- (i) the land, water and atmosphere of the earth;
- (ii) micro-organisms, plant and animal life;
- (iii) any part or combination of (i) and (ii) and the interrelationships among and between them; and
- (iv) the physical, chemical, aesthetic and cultural properties and conditions

of the foregoing that influence human health and wellbeing;

Extended producer responsibility measures mean measures that extend a person's financial or physical responsibility for a product to the post-consumer stage of the product, and includes -

- (a) waste minimisation programmes;
- (b) financial arrangements for any fund that has been established to promote the reduction, re-use, recycling and recovery of waste;
- (c) awareness programmes to inform the public of the impacts of waste emanating from the product on health and the environment; and

(d) any other measures to reduce the potential impact of the product on health and the environment;

Garden Refuse means waste generated as a result of normal domestic gardening activities, including grass cuttings, leaves, plants, flowers and other similar small and light organic matter, but shall not include tree branches with a diameter thicker than 40 millimetres at any point of its length, domestic waste, bulky waste, construction and demolition waste or any waste generated as a result of commercial garden service activities; General Waste Collection Standards

Gazette, when used in relation to-

- (a) the Minister, means the *Government Gazette*; and
- (b) the MEC, means the *Provincial Gazette* of the province concerned;

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;

Hazardous waste means 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;

Incineration means any method, technique or process to convert waste to flue gases and residues by means of oxidation;

Industry includes commercial activities, commercial agricultural activities, mining activities and the operation of power stations;

Inert waste means waste that—

- a) does not undergo any significant physical, chemical or biological transformation after disposal;
- b) does not burn, react physically or chemically biodegrade or otherwise adversely affect any other matter or environment with which it may come into contact; and
- c) does not impact negatively on the environment, because of its pollutant content and because the toxicity of its leachate is insignificant;

Integrated Waste Management Plan¹ is a plan which has been compiled to provide the most cost-effective and technically and environmentally acceptable solutions to the total waste management in the municipality. It addresses the situation analysis and offer solutions to ensure responsible waste management. As such it addresses waste generation, waste minimisation and re-use, collection of all waste, disposal infrastructure (disposal facility requirements) and disposal according to environmentally sound practises and within the requirements of relevant legislation and regulations. A plan prepared in terms of Section 12 of the National Environmental Management: Waste Act (Act 59 of 2008);

Licensing authority means an authority referred to in section 43 and that is responsible for implementing the licensing system provided for in Chapter 5;

Health Care Risk Waste means waste capable of producing any disease and includes but is not limited to the following:

¹ ibid

- (a) laboratory waste;
- (b) pathological waste;
- (c) isolation waste;
- (d) genotoxic waste;
- (e) infectious liquids and infectious waste
- (f) sharps waste;
- (g) chemical waste; and
- (h) pharmaceutical waste;

MEC means the Member of the Executive Council of a province who is responsible for waste management in the province;

Minimisation when used in relation to waste, means the avoidance of the amount and toxicity of waste that is generated and, in the event where waste is generated, the reduction of the amount and toxicity of waste that is disposed of;

Minister as referred to in this document means the Minister of Environmental Affairs;

Municipality means a municipality established in terms of the Local Government: Municipal Structures Act, 1998 (Act No. 117 of 1998);

Municipal Systems Act means the Local Government: Municipal Systems Act, 2000 (Act No. 32 of 2000);

National Environmental Management Act means the National Environmental Management Act, 1998 (Act No. 107 of 1998);

Operating Plan consists of drawings, descriptions and other documents regarding the operation of the waste disposal site, placement of waste, building daily cells and lifts, leach ate management, waste disposal gas management and all other functions related to the operation of the waste disposal site;

Operator is the person or organisation responsible for the operation of the waste disposal site. The operator may be the owner, another public agency or private contractor;

Owner is the person or organisation that owns the property and/or facilities that constitute the waste disposal site;

Pollution has the meaning assigned to it in section 1 of the National Environmental Management Act;

Reclamation is the unauthorised separation of solid waste for recyclable materials and food for human consumption;

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;

Re-use means to utilise articles from the waste stream again for a similar or different purpose without changing the form or properties of the articles;

Site Feasibility is the initial step in the DEA permitting/licensing process that establishes the basic site features and general feasibility for a fully permitted/licensed waste disposal site;

Solid Waste is waste of a solid nature generated by a person, business or industry;

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

Storage means the accumulation of waste in a manner that does not constitute treatment or disposal of that waste;

The Bureau means the Waste Management Bureau established by section 34A;

Treatment means any method, technique or process that is designed to-

- (a) change the physical, biological or chemical character or composition of a waste; or
- (b) remove, separate, concentrate or recover a hazardous or toxic component of a waste; or
- (c) destroy or reduce the toxicity of a waste,

in order to minimise the impact of the waste on the environment prior to further use or disposal;

Waste means—

(a) any substance, material or object, that is unwanted, rejected, abandoned, discarded or disposed of, or that is intended or required to be discarded or disposed of, by the holder of that substance, material or object, whether or not such substance, material or object can be re-used, recycled or recovered and includes all wastes as defined in Schedule 3 to this Act; or

(b) any other substance, material or object that is not included in Schedule 3 that may be defined as a waste by the Minister by notice in the Gazette,

but any waste or portion of waste, referred to in paragraphs (a) and (b), ceases to be a waste-

(i) once an application for its re-use, recycling or recovery has been approved or, after such approval, once it is, or has been re-used, recycled or recovered;

(ii) where approval is not required, once a waste is, or has been re-used, recycled or recovered;

(iii) where the Minister has, in terms of section 74, exempted any waste or a portion of waste generated by a particular process from the definition of waste; or

(iv) where the Minister has, in the prescribed manner, excluded any waste stream or a portion of a waste stream from the definition of waste;

Waste Disposal Classification is a system (historically used before the promulgation of the Waste Classification and Management Regulations, 2013 to classify waste) under the DWAF Minimum Requirements for classifying waste disposal sites according to the type, size of waste stream and its potential for significant leachate generation;

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 management activity means any activity listed in Schedule 1 or published by notice in the Gazette under section 19, and includes—

- a) the importation and exportation of waste;
- b) the generation of waste, including the undertaking of any activity or process that is likely to result in the generation of waste;
- c) the accumulation and storage of waste;
- d) the collection and handling of waste;
- e) the reduction, re-use, recycling and recovery of waste;
- f) the trading in waste;
- g) the transportation of waste;

- h) the transfer of waste;
- i) the treatment of waste; and
- j) the disposal of waste;

Waste Management facility is a place, infrastructure, structure or containment of any kind, wherein, upon or at, a waste management activity takes place and includes a waste transfer station, container yard, landfill site, incinerators, lagoons, recycling and composting facilities;

Waste management licence means a licence issued in terms of Section 49;

Waste management officer means a waste management officer designated in terms of Section 10;

Waste management services means waste collection, treatment, recycling and disposal services;

Waste minimisation programme means a programme that is intended to promote the reduced generation and disposal of waste;

Waste transfer facility means a facility that is used to accumulate and temporarily store waste before it is transported to a recycling, treatment or waste disposal facility;

Waste treatment facility means any site that is used to accumulate waste for the purpose of storage, recovery, treatment, reprocessing, recycling or sorting of that waste.

EXECUTIVE SUMMARY

The EMP acquired the services of IX Engineers Consultants to review the ELM 2014 IWMP for all the milestones to be achieved. The final draft will be submitted to Council as well as the MEC for GDARD for approval. The milestones for this project are as follows:

1. Project Initiation
2. Mapping
3. Determination of Status Quo
4. Alternatives, Evaluation and Development of solutions
5. Compilation of the IWMP

At the end the approved IWMP will be included in the IDP as a sector plan for implementation. The IWMP will further guide any waste management policy in the municipality.

The reviewed Integrated Waste Management Plan (IWMP) has the following abridged contents:

1. Status Quo

The significance of garden greens in the waste stream (with 25% garden and putrescible waste) forms the bigger portion of the waste generated in the ELM. The paper (22%) comes second and metal being the least of the waste streams (2.4%). The most dominant stream is the garden and putrescible waste.

It is the responsibility of the municipality to prioritise the packaging stream (paper, plastic and glass). There is a potential for significant job creation from this material. Based on the above waste characterisation, it is evident that a large percentage of waste can be diverted from landfilling.

Boitshepi landfill site receives an average disposal rate of 10,292 tons per month was regarded as the current disposal rate. The site has a remaining life of 3.31 years. Waldrift landfill site receives an average of 2000 tons/month is disposed of at the site. The current lifespan of this facility is about 7 years. Palm Springs landfill site receives an average of 2,500 tons per month. The current lifespan of this facility is 15 years.

The above statistics show that if the current population and waste generation trend grows by 0.63% in the next 10 years, by 2030 the municipality will produce a total of 318 782 tons per annum of waste for which they will have to make provision for in terms of waste disposal site airspace, transport, and personnel.

The Municipality has jurisdiction over 6 (six) transfer stations viz the Springbok, Roshnee, Arcon Park, Sonland Park, Vaaloewer and Sebokeng transfer stations. All transfer stations can only be used for the disposal of garden refuse and builders' rubble (according to the Waste Management by-laws).

A total of 188,774 out of 220,135 households in Emfuleni form the urban edge for kerbside weekly collection. The remainder of the households represents the informal settlements that are serviced through the removal of illegal dumping sites. Currently, the Municipality is faced with challenges in household refuse collection as a result of vehicle and personnel shortages needed for waste collection. This has resulted in a backlog in household waste collection where in some areas waste removal has been interrupted.

2. Alternatives for waste management

Seven focus areas have been identified for the compilation of the IWMP for the Local Municipality. Based on the Gaps and Needs identified in the previous section, a Desired End State has been identified for each of the seven focus areas.

It is important to align the Desired End State in accordance with the National Waste Management Strategy. The official hierarchy adopted in the Government waste management hierarchy, in order of preference, is as follows:

- i. Waste avoidance
- ii. Waste minimisation
- iii. Waste re-use
- iv. Waste recycling
- v. Waste treatment
- vi. Waste disposal

It is important that there should be a target date by which these municipal strategic priorities are to be attained within the five years from the date the IWMP has been approved

3. The seven (7) implementation strategies for the Integrated Waste Management Plan (IWMP):

3.1. Safe and proper disposal of waste

This section relates to the development, upgrading and legal compliance of the waste disposal infrastructure. This includes the identification of new infrastructure required, the licensing of existing unlicensed facilities, upgrading of the current infrastructure as well as the improvement of waste management practices.

3.2. Effective and efficient delivery of waste service

The shortcomings in the available waste collection infrastructure have been identified. This will involve possible waste receptacles, new developments, repair and use of infrastructure (weighbridge), unserved areas and route planning.

3.3. Effective and efficient delivery of waste service

This area involves the identification of shortcomings in the personnel, financial and equipment resources and development of strategies to ensure that the requirements are satisfied. The existing financial resources are analysed and new structures and strategies are developed.

3.4. Waste minimisation

This section involves the identification of specific waste minimisation strategies. This can include separation and collection at source, privatisation of reclamation activities and development of collection points throughout the area.

3.5. Compliance with legislative requirements

This relates especially to illegal dumping activities within the municipal area. This involves identification of possible illegal dumping hot spots, development of clean up and anti-dumping campaigns, possible revision of by-laws as well as revision of collection strategies.

3.6. Waste information system

This section covers the need for effective record keeping and development of a Waste

Information System (WIS) as well as the sharing of available information and the co-operation of the various stakeholders within the Municipality.

3.7. Education and awareness

This section addresses the need for education and awareness campaigns to be launched with regards to proper waste management. This can take place on a community and on a more strategic level between stakeholders.

This section has presented the abridged version of the reviewed IWMP for the ELM which covers the waste hierarchy approach to waste management.

1. INTRODUCTION

The development of an Integrated Waste Management Plan (IWMP) is a requirement for certain organs of state in terms of Section 11 of the National Environmental Management: Waste Act, 2008 (Act. 59 of 2008) (NEMWA) for government to properly plan and manage waste. The compilation of this IWMP will be done in line with the “Guideline for the Development of Integrated Waste Management Plans (IWMP’s) (DEA, 2012) and in accordance with Section 12 of NEMWA.

The Emfuleni Local Municipality (hereinafter refer to as “the Municipality”) appointed iX Engineers to assist with the review of IWMP for the Municipality.

The process followed in order to compile the IWMP consisted of two phases, the first consisting of a “Situation Analysis” and the determination of the “Desired End State” for waste management within the Municipal Jurisdiction, the second phase consisting of identifying, evaluating and selecting alternative methods/approaches for achieving the desired end state.

This report, the IWMP, is a concise report including the information collated in the two phases mentioned above and provides the Municipality with a plan on how to manage and improve the waste management service within the municipal area. The Municipality will be responsible for the implementation of the IWMP and the evaluating and reviewing of the plan to ensure that the respective objectives are being met.

2. LEGISLATIVE REQUIREMENTS

THE SOUTH AFRICAN CONSTITUTION, 1996 (ACT 108 OF 1996)

Section 24 of the Bill of rights of the Constitution of South Africa clearly states that everyone has the right to:

- (a) An environment that is not harmful to their health or well-being; and
- (b) Should have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that:
 - (i) prevent pollution and ecological degradation;
 - (ii) Promote conservation; and
 - (iii) Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

The Constitution places an emphasis on the need to have the environment protected for the benefit of present and future generations through reasonable legislative and other measures i.e. IWMP. It is within this provision that IWMP’s must strive or come up with measures to uphold the rights of all citizens within the jurisdiction of the Municipality and should enhance and promote environmental protection from any form of degradation as enshrined by the South African Constitution.

THE NATIONAL ENVIRONMENTAL MANAGEMENT: WASTE ACT: (ACT NO. 59 OF 2008)

Chapter 3, section 11 of the Waste Act requires that certain organs of state must develop Integrated Waste Management Plans (IWMPs). Section 12 of the Waste Act outlines what the contents of integrated waste management plans should be, whilst section 13 stipulates the reporting mechanisms on the implementation of IWMP’s.

In terms of section 11 (4) (a) (ii) of the Waste Act, municipalities must incorporate the approved IWMP in their IDP's as called for by chapter 5 of Municipal Systems Act, 2000 (Act 32 of 2000) (hereinafter referred to as the "MSA"). The MSA Chapter 5, sections 23-37 deals with the process of developing Integrated Development Plans. Section 36 of the MSA states that, a Municipality must give effect to its IDP and conduct its affairs in a manner which is consistent with its IDP. This means that the development and implementation of the IWMP must be aligned with the IDP.

Some aspects of waste are managed by different pieces of legislation such as the National Water Act, (Act 36 of 1998); Hazardous Substances Act, (Act 15 of 1973); Advertising on Roads and Ribbon Development Act (Act 21 of 1940); and the National Health Act, 2003 (Act 61 of 2003).

Other applicable policies and standards including municipal by-laws are listed below which should be considered when developing an IWMP:

REGULATIONS IN TERMS OF THE WASTE ACT:

On 13 August 2012, the Minister of Water and Environmental Affairs, Ms Edna Molewa published under section 69(1)(y), (aa) and (ee) of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) (Waste Act) the National Waste Information Regulations, 2012 in Gazette No. 35583 for implementation on 1 January 2013.

Any person who conducts activities which are listed in Annexure 1 of the Regulations needs to register on the South African Waste Information System at www.sawic.org.za. The purpose of the national waste information regulations, 2012 is to regulate the collection of data and information to fulfil the objectives of the South African Waste Information System (SAWIS) as set out in section 61 of the Waste Act. The Municipality should therefore comply with these regulations and follow the procedure and criteria to register on SAWIS (as required in Section 4 of the Regulations) and submit a quarterly report containing the information as prescribed in Annexure 2 of the Regulations, within 30 days of the end of a reporting period (as required in Section 7 of the Regulations).

Waste Classification and Management Regulations promulgated under the National Environmental Management: Waste Act, 2008 (NEM:WA) (effective 23 August 2013): The Waste Classification and Management Regulations (WCMR) (developed in terms of section 69 of NEM:WA) will ultimately enable the improved and more efficient classification and management of waste. All wastes that were classified in terms of the "Minimum Requirements for the Handling, Classification and Disposal of Hazardous Waste in terms of the Department of Water Affairs" (2nd Edition, 1998; Department of Water Affairs and Forestry) or alternative classifications that were approved prior to the WCMR taking effect, must be re-classified and assessed within three years from the commencement of these Regulations;

Norms and Standards for the Assessment of Waste for Landfill and the Norms and Standards for the Disposal of Waste to Landfill promulgated under the National Environmental Management: Waste Act, 2008 (NEM:WA) (effective 23 August 2013): The Norms and Standards for the Assessment of Waste for Landfill Disposal and the Norms and Standards for Disposal of Waste to Landfill were also published for immediate implementation. The purpose of the Norms and Standards for the Assessment of Waste for Landfill Disposal are to outline the requirements for the assessment of waste prior to the disposal to landfill and to advice on the total concentration and the leachable concentration threshold limits. The Norms and Standards for Disposal of Waste to Landfill seek to determine the requirements for the disposal of waste to landfill. They stipulate the containment barriers for the different landfill types and list the barrier requirements that must be included in an application for waste management licence for a landfill site or cell;

NATIONAL ENVIRONMENTAL MANAGEMENT: WASTE AMENDMENT ACT 26 OF 2014

The definition of waste was amended in the abovementioned Amendment Act as follows:

“waste” means-

- (a) any substance, material or object, that is unwanted, rejected, abandoned, discarded or disposed of, or that is intended or required to be discarded or disposed of, by the holder of that substance, material or object, whether or not such substance, material or object can be re-used, recycled or recovered and includes all wastes as defined in Schedule 3 to this Act; or
- (b) any other substance, material or object that is not included in Schedule 3 that may be defined as a waste by the Minister by notice in the Gazette,

but any waste or portion of waste, referred to in paragraphs (a) and (b), ceases to be a waste-

- (i) once an application for its re-use, recycling or recovery has been approved or, after such approval, once it is, or has been re-used, recycled or recovered;
where approval is not required, once a waste is, or has been re-used, recycled or recovered;
- (ii) where the Minister has, in terms of section 74, exempted any waste or a portion of waste generated by a particular process from the definition of waste; or
- (iii) where the Minister has, in the prescribed manner, excluded any waste stream or a portion of a waste stream from the definition of waste.

The above implies that residue deposits and residue stockpiles falls under the definition of Waste under NEMWA and activities which involves these waste streams needs to be licensed under NEMWA accordingly. The NEMWA licensing procedure will apply to these activities but the Minister of Mineral Resources is the licensing authority where a waste management activity involves residue deposits and residue stockpiles on a prospecting, mining, exploration or production area;

The Waste Management Listed Activities were also amended as part of the abovementioned Act as follows:

Important Definitions	
Importance of definitions	Definitions determine the scope of application of the NEMWA and its subsequent Regulations.
Facility	<i>“a place, infrastructure, structure or containment of any kind including associated structures or infrastructure, wherein, upon or at, a waste management activity takes place and includes a waste transfer facility, a waste storage facility, container yard, waste disposal facility, incinerators, lagoons, recycling, co-processing or composting facilities”</i>
Lagoon	<i>“the containment of waste in excavations and includes evaporation dams, earth cells, sewage treatment facilities and sludge farms”</i>
Temporary storage	<i>“a once off storage of waste for a period not exceeding 90 days”</i>
Category A Activities	
Regulation 3	A person who wishes to commence, undertake or conduct a waste management activity listed under this Category, <u>must conduct a basic assessment process set out in the EIA Regulations made under Section 24(5) of NEMA as part of a waste management licence application</u> contemplated in Section 45 read with Section 20(b) of the NEMWA.

Important Definitions	
Category A activities	<p>Storage of waste</p> <p>(1) The storage of general waste in lagoons. (Note: storage of general waste other than in lagoons – refer to Category C [i.e. no licence])</p> <p>Recycling or recovery of waste</p> <p>(3) The recycling of general waste at a facility that has an operational area in excess of 500m², excluding recycling that takes place as an integral part of an internal manufacturing process within the same premises.</p> <p>(4) The <u>recycling of hazardous waste in excess of 500kg but less than 1 ton per day calculated as a monthly average</u>, excluding recycling that takes place as an integral part of an internal manufacturing process within the same premises.</p> <p>(5) <u>The recovery of waste including the refining, utilisation, or co-processing of waste</u> in excess of 10 tons but less than 100 tons of general waste per day or <u>in excess of 500kg but less than 1 ton of hazardous waste per day</u>, excluding recovery that takes place as an integral part of an internal manufacturing process within the same premises.</p> <p>Treatment of waste</p> <p>(6) The treatment of general waste using any form of treatment at a facility that has the capacity to process in excess of 10 tons but less than 100 tons.</p> <p>(7) <u>The treatment of hazardous waste using any form of treatment at a facility that has the capacity to process in excess of 500kg but less than 1 ton per day excluding the treatment of effluent, wastewater or sewage.</u></p> <p>Disposal of waste</p> <p>(9) The disposal of inert waste to land in excess of 25 tons but not exceeding 25 000 tons, excluding the disposal of such waste for the purposes of levelling and building which has been authorised by or under other legislation.</p> <p>(10) The disposal of general waste to land covering an area of more than 50m² but less than 200m² and with a total capacity not exceeding 25 000 tons.</p> <p>(11) The disposal of domestic waste generated on premises in areas not serviced by the municipal service where the waste disposed exceeds 500kg per month.</p> <p>Construction, expansion or decommissioning of facilities and associated structures and infrastructure</p> <p>(12) The construction of a facility for a waste management activity listed in Category A of this Schedule (not in isolation to associated waste management activity).</p> <p>(13) The expansion of a waste management activity listed in Category A or B of this Schedule which does not trigger an additional waste management activity in terms of this Schedule.</p> <p>(14) The decommissioning of a facility for a waste management activity listed in Category A or B of this Schedule.</p>
Category B Activities	
Regulation 4	<p>A person who wishes to commence, undertake or conduct a waste management activity listed under this Category, <u>must conduct a scoping and environmental impact reporting process set out in the EIA Regulations made under Section 24(5) of NEMA as part of a waste management licence application</u> contemplated in Section 45 read with Section 20(b) of the NEMWA.</p>
Category B activities	<p>Storage of hazardous waste</p>

Important Definitions	
	<p>(1) The storage of hazardous waste in lagoons excluding storage of effluent, wastewater or sewage. (Note: storage of hazardous waste other than in lagoons – refer to Category C [i.e. no licence])</p> <p>Reuse, recycling or recovery of waste</p> <p>(2) The <u>reuse or recycling of hazardous waste in excess of 1 ton per day</u>, excluding reuse or recycling that takes place as an integral part of an internal manufacturing process within the same premises.</p> <p>(3) The recovery of waste including the refining, utilisation, or co-processing of the waste at a facility that processes in excess of 100 tons of general waste per day or in excess of 1 ton of hazardous waste per day, excluding recovery that takes place as an integral part of an internal manufacturing process within the same premises.</p> <p>Treatment of waste</p> <p>(4) The <u>treatment of hazardous waste in excess of 1 ton per day calculated as a monthly average; using any form of treatment</u> excluding the treatment of effluent, wastewater or sewage.</p> <p>(5) The treatment of hazardous waste in lagoons, excluding the treatment of effluent, wastewater or sewage.</p> <p>(6) The treatment of general waste in excess of 100 tons per day calculated as a monthly average, using any form of treatment.</p> <p>Disposal of waste on land</p> <p>(7) The <u>disposal of any quantity of hazardous waste to land</u>. (Note: definition of residue deposits and residue stockpiles as well as distinction between disposal and storage)</p> <p>(8) The disposal of general waste to land covering an area in excess of 200m² and with a total capacity exceeding 25 000 tons.</p> <p>(9) The disposal of inert waste to land in excess of 25 000 tons, excluding the disposal of such waste for the purposes of levelling and building which has been authorised by or under other legislation.</p> <p>Construction of facilities and associated structures and infrastructure</p> <p>(10) The construction of a facility for a waste management activity listed in Category B of this Schedule (not in isolation to associated waste management activity).</p>
Category C Activities	
Regulation 5	<p>A person who wishes to commence, undertake or conduct a waste management activity listed under this Category, must comply with the relevant requirements or standards determined by the Minister listed below-</p> <p>(a) Norms and Standards for Storage of Waste, 2013; or</p> <p>(b) Standards for Extraction, Flaring or Recovery of Landfill Gas, 2013; or</p> <p>(c) Standards for Scrapping or Recovery of Motor Vehicles, 2013.</p>
Category C activities	<p>Storage of waste</p> <p>(1) The storage of general waste at a facility that has the capacity to store in excess of 100m³ of general waste at any one time, excluding the storage of waste in lagoons or temporary storage of such waste.</p> <p>(2) The <u>storage of hazardous waste at a facility that has the capacity to store in excess of 80m³ of hazardous waste at any one time</u>, excluding the storage of hazardous waste in lagoons or temporary storage of such waste.</p> <p>(3) The storage of waste tyres in a storage area exceeding 500m².</p>

Important Definitions	
	<p>Recycling or recovery of waste</p> <p>(2) The sorting, shredding, grinding, crushing, screening or bailing of general waste at a facility that has an operational area in excess of 1000m².</p> <p>(4) The scrapping or recovery of motor vehicles at a facility that has an operational area in excess of 500m².</p> <p>(5) The extraction, recovery or flaring of landfill gas.</p>
Transitional provisions	<ul style="list-style-type: none"> A person who lawfully conducts a waste management activity listed in this Schedule on the date of the coming into effect of this Notice may continue with the waste management activity until such time that the Minister by notice in a Gazette calls upon such a person to apply for a waste management licence. <p>An application for a waste management activity which was listed under the previous Waste Management Activities List Notice which is no longer listed in terms of this Schedule and a decision on such an application is still pending on the date of coming into effect of this Notice, such an application will be considered withdrawn.</p> <p>If a situation arises where waste management activities, listed under the previous Waste Management Activities List Notice, are listed differently under the current list of waste management activities, and a decision on such an application is still pending, such an application will still be processed by the licensing authority in accordance with this Notice, except if it is an application for a waste management activity A 3(11) or waste management activity B 4(7) listed under the previous Waste Management Activity List Notice (i.e. the treatment of effluent, wastewater or sewage).</p> <ul style="list-style-type: none"> A person who submitted an application for a waste management licence for a waste management activity which is no longer listed in Category A or B but listed in Category C of this Schedule on the date of coming into effect of this Notice, must consider such an application for that activity withdrawn, and must comply with the requirements or standards for that waste management activity. A person who lawfully conducted a waste management activity that is no longer listed in Category A or B, but listed in Category C of this Schedule, on the date of coming into effect of this Notice, may continue with the waste management activity for the duration stipulated in the permit or waste management licence until the expiry date of the permit or waste management licence where after such a person must comply with requirements or standards for that waste management activity. An application submitted for a waste management activity A 3(11) or waste management activity B 4(7) listed under the previous Waste Management Activity List Notice (i.e. the treatment of effluent, wastewater or sewage) and is still pending on the date of coming into effect of this Notice, such an application will be considered by the relevant licensing authority and will be assessed and decided upon under the previous Waste Management Activities List Notice up to the construction phase of that facility. A person who obtained a waste management licence for waste management activity A 3(11) or waste management activity B 4(7) listed under the previous Waste Management Activity List Notice (i.e. the treatment of effluent, wastewater or sewage) prior to the coming into effect of this Notice, must comply with the waste management licence conditions up to the completion

Important Definitions	
	<p>of the construction phase and thereafter must comply with any applicable authorisation or legislation.</p> <ul style="list-style-type: none"> • A person who submitted an application for a waste management licence for activity A 3(11) or B 4(7) listed under the previous Waste Management Activity List Notice (i.e. the treatment of effluent, wastewater or sewage) and such an application falls outside the revised thresholds for these activities under the NEMA Listing Notices, wherein a decision is still pending on the date of coming into effect of this Notice, must consider such an application withdrawn.

Waste Pricing Strategy: Firstly, Government is developing a Waste Pricing Strategy which the CSIR has been commissioned to undertake. This draws from international research and practice and presents a range of fiscal options with which the government is now empowered to “catalyse the waste economy”.

These could include fees, incentives, taxes, levies, deposit schemes and the like, which would generate significant revenue. The aim is to increase the value of waste as a resource and to generate a flow of revenue into the treasury that can be pooled and redirected through a new departmental Waste Bureau to deserving projects and programmes that stimulate the waste and recycling economy, divert waste from landfill and create jobs at the same time.

Despite pleas to ring-fence the incoming revenue through fiscal measures, the Department of Environment Affairs is bound by stipulations that any funds arising from taxes must go through Treasury, as it maintains it has the power and is best suited to administer them. Other fiscal means to accumulate funds such as levies, deposit schemes etc. are not however required to go through Treasury.

Private and public sector entities seeking to apply for funds collected must first draw up business plans outlining inter alia how much they want, how they will stimulate the recycling economy and how many jobs will be created in the process.

New Waste Bureau: The new Waste Bureau is being set to be operational by April 2015 which will manage the application process and present funding plans to Treasury which will have final say over who gets what.

Other provisions and possibilities have the recycling and waste management industry, especially the packaging sector worried. The various plastic, paper, metal, glass recycling organisations, funded by their producer companies, have grown in effectiveness to be partly responsible for South Africa ranking high amongst other countries in seeing that their respective materials are recovered and re-used.

EPR looming large: Extended Producer Responsibility (“EPR”), a concept widely accepted by the producers, is looming large in the new government plans as a stick to pressure them to increase recycling diversion from landfill, with the carrot of providing possible funding (on its terms) with which to do so.

The concern is that the government might cause, inadvertently or otherwise, the demise of these long-standing organisations who are directly or indirectly enabling the employment of some 100 000 people, many of them at the lowest and neediest levels of the society.

Waste Management Council: Also in the DEA’s plan is a new Waste Management Council seen as a public-private cross-sector stakeholder body to advise and guide the direction of the waste recycling industry into a brighter, less wasteful and more prosperous future.

It is hoped that it will be sufficiently representative to include experienced industry stakeholders who have a deep understanding of how the recycling business works in practice.

THE NATIONAL WASTE MANAGEMENT STRATEGY (NWMS)

Gazetted by DEA in 2012, aims at giving effect to the objects of the Waste Act. Municipalities are required to align their IWMP's to the NWMS targets where possible in order to contribute to the attainment of the goals and targets set in the NWMS.

NATIONAL DOMESTIC WASTE COLLECTION STANDARDS, JANUARY 2011

The main purpose of these standards is to redress past imbalances in the provision of waste collection services, whereby it has become imperative that acceptable, affordable and sustainable waste collection services be rendered to all South Africans.

The provision of waste collection services will improve the quality of life of citizens and will ensure that citizens live in a clean and more acceptable environment. The lack of waste collection services or poor-quality waste collection services can result in a number of environmental and human health problems and therefore proper planning is crucial.

NATIONAL POLICY FOR THE PROVISION OF BASIC REFUSE REMOVAL SERVICES TO INDIGENT HOUSEHOLDS

This policy provides for the provision of basic refuse removal for Indigent households. The policy defines basic refuse removal service level as the most appropriate level of waste removal service that should be provided, and this is based on site specific circumstances. Such a basic level of service be it in an urban or rural set-up, is attained when a Municipality provides or facilitates waste removal. The policy further outlines the appropriate levels of service for different settlement densities, frequency of collection and provision of waste receptacles amongst others.

NATIONAL ENVIRONMENT MANAGEMENT ACT, (ACT 107 OF 1998) NEMA

NEMA is the mother of all environmental management Acts in South Africa. The purpose of NEMA is to uphold the provisions of section 24 of the Bill of rights (The Constitution of the Republic of South Africa). It aims to promote and uphold the rights of South African citizens to live in an environment that is not harmful to its health or well-being.

It places sustainable development at the centre of every development process that has the potential to have an impact on social, economic and environment whereby it requires the integration of social, economic and environmental factors in the planning, implementation and evaluation of decisions to ensure that development serves present and future generations.

MUNICIPAL SYSTEMS ACT, 2000 (ACT 32 OF 2000)

In terms of Section 25 of the MSA each municipal council must, within a prescribed period after the start of its elected term, adopt a single, inclusive and strategic plan (IDP) for the development of the Municipality. In relation to waste management, the IDP is required to include sectorial environmental plans which would be an IWMP for waste management. In their IDP's municipalities are required to ensure proper resource allocation to achieve the targets set in the respective plans.

NATIONAL HEALTH ACT, 2003 (ACT 61 OF 2003)

The National Health Act 61 of 2003 provides a framework for a structured uniform health system within the Republic, taking into account the obligations imposed by the Constitution and other laws on the national, provincial and local governments with regard to health services; and to provide for matters connected therewith.

Section 32 of the Health Act (Act 61 of 2003) requires provincial Health MECs to assign environmental health functions to district and metropolitan municipalities. The definition of these functions in the Health Act includes environmental pollution control, waste management and water quality monitoring.

As a schedule B function in terms of the Constitution, municipalities are expected to continue to fund and provide the expanded definition of municipal health services (RSA 1996). The assignment and delegation of additional environmental health and management functions has led to recognition in the Health Act of the responsibility of the Provincial sphere to contribute towards meeting the additional financial burden. Many district municipalities are having difficulty in restructuring and implementing the new district-level arrangements envisaged by the Health Act for the financing and management of environmental health functions. Section 34 of the Health Act makes provision for transitional arrangements (RSA 2003) in which local municipalities are required to continue providing the services they provided before the Act, and until such time as a Service Level Agreement (SLA) is in place. In a number of districts, the EHS devolution process has not yet been finalised. District Municipalities cannot raise income from property rates and do not receive equitable share finance for their given environmental health function. It follows then that the Provincial Department of Health is required, through an SLA to assess and make available the resources needed to perform the required environmental health functions. Local municipalities who previously provided environmental health services are expected to continue to provide the finances for these posts which are required to be transferred to the District Level. Additional posts to address newly assigned and delegated functions need to be funded in terms of Section 32 of the Health Act through an SLA which a) describes the services; b) determines the resources that must be made available by the province and those by the municipality and c) sets performance and monitoring standards.

The National Health Act does not address the disposal of health care risk waste as such.

Draft regulations for the control of environmental conditions constituting a danger to health or a nuisance were published in GNR21 of 14 January 2000. In terms of the proposed regulations, registration is required for: concerns that to carry out a scheduled trade, including waste incineration, waste (including HCRW) disposal sites and waste collecting, sorting, treating or processing sites.

3. METHODOLOGY

3.1 Situation analysis

3.1.1 Approach

The following methodology was followed for the situation analysis investigation:

- (i) All relevant records of the Waste Management Section of the Municipality were obtained for the purposes of the study.
- (ii) The 2014 Emfuleni Local Municipality Integrated Waste Management Plan was studied to gather useful information and for the review.
- (iii) All the waste disposal facilities and equipment were visited and inspected on 12 and 19 July 2019 to obtain first-hand knowledge of the existing status of the waste management services rendered.
- (iv) Copies of the waste disposal site licenses for the various waste disposal facilities were obtained from the Municipality.

- (v) Financial information on waste management within the Municipality was obtained from the “Service Delivery Budget Implementation Plan, 2018/2019 as well as from the Manager: Environmental Management and Planning.
- (vi) Much of the demographical information was obtained from the IDP (2018/2019)
- (vii) Other waste management service delivery information was obtained from a questionnaire completed by the Manager: Environmental Management and Planning.

3.2 Background

Emfuleni Local Municipality is one of three municipalities within the Sedibeng District Municipality in Gauteng. The other local municipalities include Midvaal and Lesedi. The Municipality is a Category B Municipality (GT421), in accordance with information obtained from the demarcation board website (www.demarcation.org.za).

The municipal area encompasses a geographical area of 987.45 km² (Emfuleni LM IDP 2018/2019), which implies that the Municipality accounts for 23% of the total district surface area. The primary towns in the Municipality is Vanderbijlpark and Vereeniging.

According to the 2018/19 IDP, the total population of the Municipality is 733 444 (obtained from the 2016 Community Survey). The population growth is 0.37% (as per <https://municipalities.co.za/demographic/1060/emfuleni-local-municipality>).

The Municipality is divided into forty-five Municipal Wards which is outlined in the 2011 Municipal and Ward Boundaries map (www.demarcation.org.za).

3.3 Locality

Emfuleni is the western-most municipality within Sedibeng located at the extreme south of Gauteng on the banks of the Vaal River. Emfuleni borders the Metsimaholo and Ngwathe Local Municipalities in the Free State to the south, Midvaal Local Municipality to the east, the City of Johannesburg metropolitan area to the north and Westonaria, Merafong and Tlokwe Local Municipalities to the west. Refer to Figure 1 for a locality map of the Municipality.

The location of the Municipality is shown on the following Figure 1



3.4 Study Area

The following towns and areas formed part of this study:

- Vanderbijlpark; and
- Vereeniging

The following are township areas that are also included in the municipal area:

- Evaton;
- Sebokeng;
- Sharpeville;
- Boipatong;
- Bophelong; and
- Tshepiso

There are ten other small suburban settlements within six kilometres of the above towns; they are Bonanne, Steel Park, Duncanville, Unitas Park, Arcon Park, Sonlandpark, Waldrift, Rust-ter-vaal, Roshnee and Debonairpark (Emfuleni LM IDP 20018/19).

3.5 Demographics

The following demographic information was obtained from the IDP 2018/19. Demographics can be defined as the most recent statistical characteristics of a population in a given area at a specified time. The most commonly examined demographics include gender, race, age, economic and social status/profile, number of households and their distribution, poverty levels, education and employment status.

According to the IDP 2018/19, the Municipality has shown a steady increase in the number of households that receive a refuse removal service from the local authority. The number of households that do not receive a refuse removal service can in this case also be attributed to farms and informal settlements in rural areas that are remotely located and which are not easily accessible to the Municipality to render a waste removal service due to a lack of resources and inaccessible roads. Waste is collected once a week to a total of 189,242 out of 220,617 households in ELM areas. The remainder of the households represents the informal settlements that are serviced through the removal of illegal dumps. The municipality collection is on average, being maintained on 85% and above on weekly curbside collection to all formal households.

3.5.1 Population

According to the 2018/19 IDP and community survey 2016, the population of Emfuleni Local Municipality between 2001 and 2011 has increased by 9.6% (Table 1). Between 2011 and 2016 the population has increased by 1.6%. The community survey (2016) depicts that Emfuleni Local Municipality Population is 733 444.

Table 1: Emfuleni Local Municipality between 2001 and 2011

Emfuleni Local Municipality		
2001	2011	2016
658 422	721 663	733 444

(Source: IDP 2018/19 and Community Survey 2016)

a. Population by racial groups

The average population growth rate per annum since 2016 is 0.63% (Stats SA, 2016). Figures 2 to 4 below illustrate the gender distribution, household distribution and population groups, respectively.

Below is a distribution of population Emfuleni Local Municipality by racial groups. The African population has increased from 616 095 in 2011 to 625 778 in 2016 which translate into 1.6% growth and remains the highest followed by Whites making an increase from 86 948 in 2011 to 90 996 in 2016 and this translate into 4.6% increase. The Coloured population growth has increased by 11.3% from 8 356 in 2011 to 9 303 in 2016. Indians/Asian is the lowest but it shows a slight increase from 7 078 in 2011 to 7 367 in 2016, which translate into 4% growth.

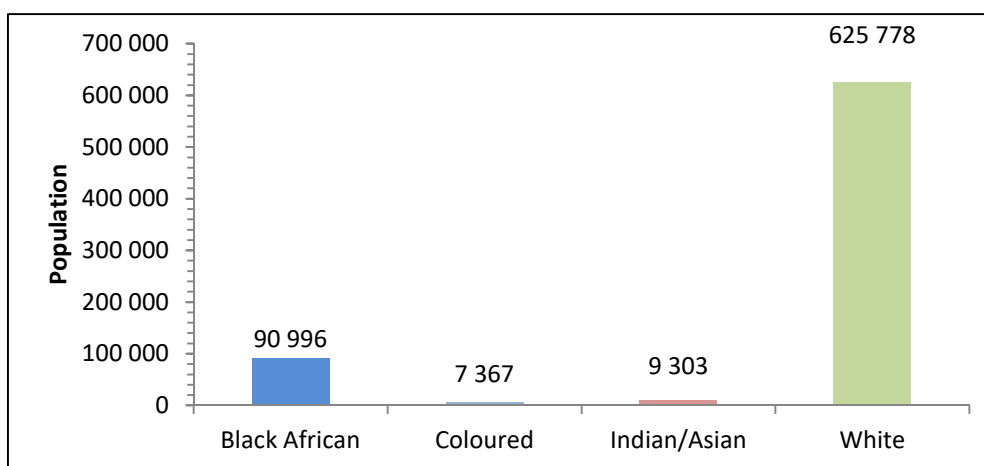


Figure 2: Population Distribution by racial groups (Source: Stats SA, 2011 and 2016)

b. Population by gender

The above gender distribution graph gives a comparative view of the gender distribution. This shows that the dominant age group in both male and female in Emfuleni area is between the ages of 20 to 29 years. There are more females 128 567 (50.5%) than males 126 422 (49.5%) in the municipality.

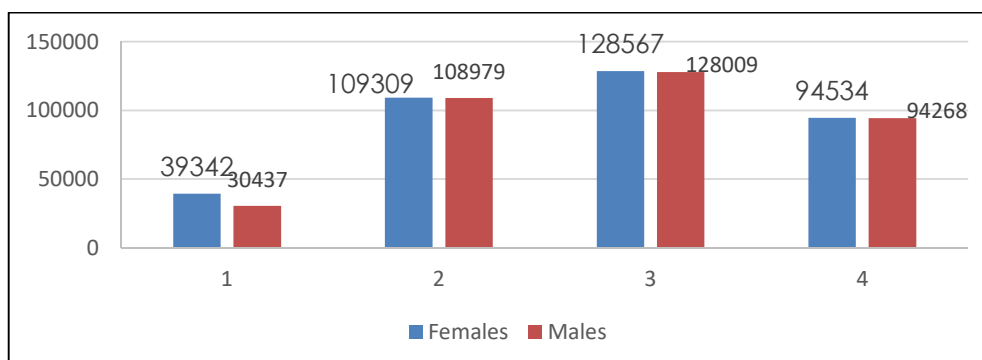


Figure 3: Population by gender

c. Disability Population

Table 2 below shows that 90 699 population has seeing difficulty, and this excludes people using glasses followed by self-care difficulty at 23 442 and the disability with the lowest population is communication difficulty estimated at 11 943.

Table 2: Disability

Type of disability Number	Type of disability Number
Wheelchair	14 397
Walking stick or frame	18 843
Hearing aid	18 657
Communication difficulty	11 943
Hearing difficulty	23 724
Seeing difficulty	90 699
Self-Care difficulty	23 442
Total	201 705

(Source: IDP 2018/19, Referenced from Stats SA, 2011)

3.5.2 Unemployment

The Unemployment rate at the municipality is 60%. The Total number of employees is 2708, whereby the Main employers are Government departments, Municipality, Acellor Mittal, Cape Gate and Trade (Emfuleni Local Municipality IDP).

In 2001 households with No Income was estimated at 48 000 and in 2011 the number decreased to 38 000. The highest income was between R19 201 to R38 400. Less than 1000 of the households have income of 2 457 601 and more.

3.5.3 Employment

Table 3 depicts that the number of Employed people has greatly increased from 93 537 in 2001 to 202 543 in 2011. At the same time the number of unemployed people also increased from 63 160 in 2001 to 107 555 in 2011.

Table 3: Employment status between 2001 and 2016

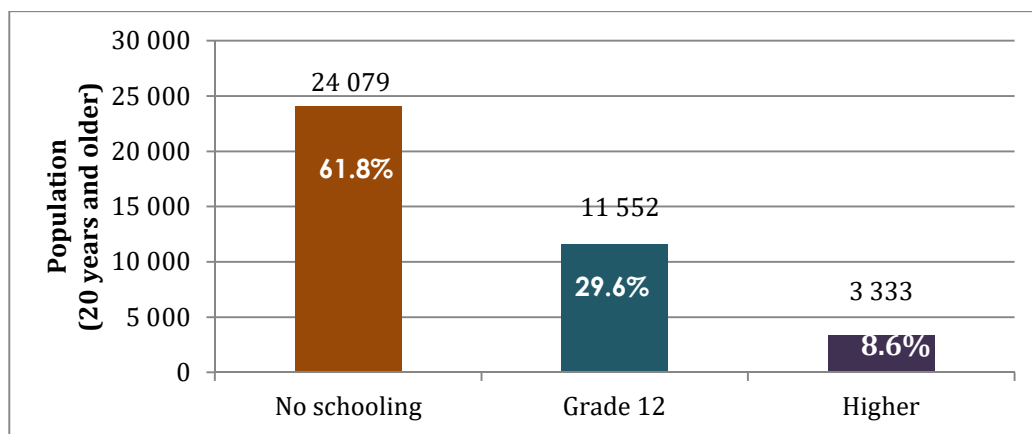
EMPLOYMENT STATUS	YEAR	
	2001	2011
Employment	93 537	202 543
Unemployment	63 160	107 555

(Source: IDP 2018/19, Referenced from Stats SA, 2011)

The municipality has a relatively high unemployment rate. This will have an effect on waste generation as well as waste disposal as a service delivery. A higher unemployment rate relates to less revenue generated by the municipality therefore the municipality will have less resources available for an effective waste collection service. It often increases the number of informal recyclers at the waste disposal site.

3.5.4 Education

Education levels are directly linked to employment and income levels as well as the community's awareness of good waste disposal practices. The education levels for the municipality are low, 61.8% of people attending school are at Pre-Grade 12 level, and very few people attend post matric studies.



3.6 Waste Characterisation

A Waste Characterisation study was recently conducted by GIZ, a German company and the findings from the studies are still valid and appropriate. Thus, the study was not repeated.

The following main waste streams were focused on, namely:

1. Builder's rubble
2. Garden waste and putrescible waste
3. Metal
4. Glass
5. Paper
6. Plastic
7. Other

The waste types were categorised into seven classes which were used to determine the total characterisation of waste.

Figure 6 represents the Waste characterisation for the Emfuleni Local Municipality.

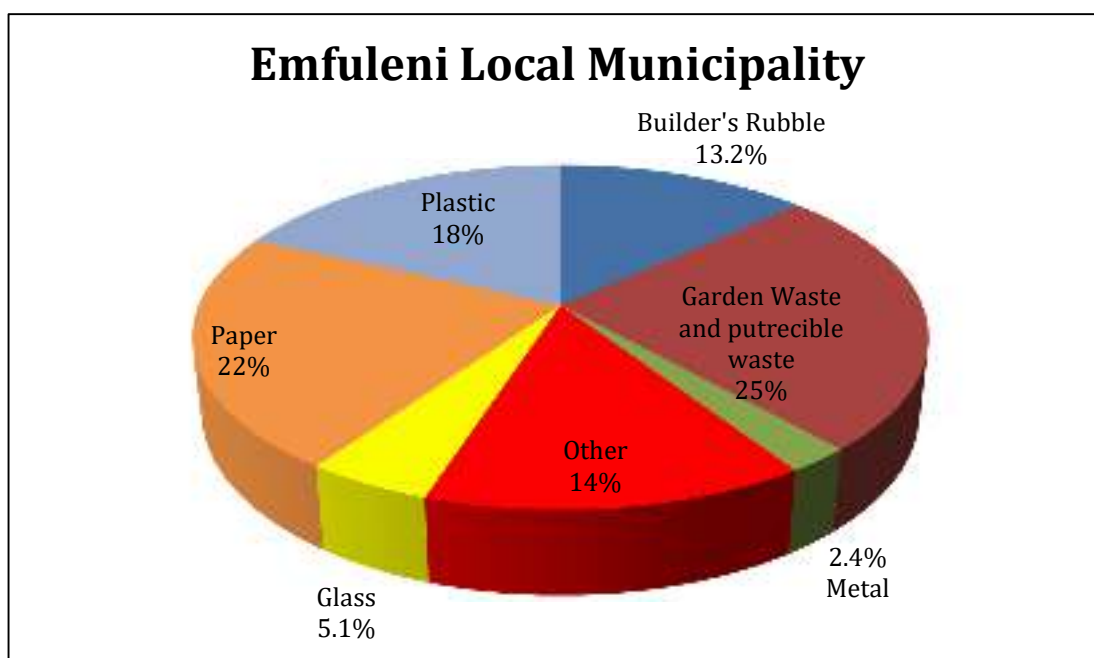


Figure 5: Waste characterisation for the Emfuleni Local Municipality

The insert highlights the significance of garden greens in the waste stream (with 25% garden and putrescible waste), as well as the paper (22%) and metal being the least of the waste streams (2.4%). The most dominant stream is the garden and putrescible waste. It is the responsibility of the municipality to prioritise the packaging stream (paper, plastic and glass), as they also need so see the potential for significant job creation from this material. From the above waste characterisation study, it is evident that a large percentage of waste can be diverted from landfilling. (Please refer to Section 11 and Section 12 of the report with regards to targets set for recycling/waste minimisation).

3.6.1 Waste Generation

All the landfills have weighbridges to record incoming waste volumes to be disposed of. The Palm Springs landfill does have a weighbridge but is not operational, due to electricity connection which needs to be installed. The other weighbridges at Boitshepe and Waldrift were malfunctioning at times and therefore the average monthly disposal volumes were taken when it was indeed functioning, to calculate annual waste generation tonnages.

Boitshepe: An average of 10,000 tons per month were disposed of from January 2017 to June 2017 and comparing the data with the period July 2016 to December 2016 of 10,585 tons per month, shows a slight decrease. Therefore, an average disposal rate of 10,292 tons per month was regarded as the current disposal rate.

Waldrift: The weighbridge data shows that an average of 2000 tons/month is disposed of at the Waldrift landfill site.

Palm Springs: According to the estimated waste quantities received at the Palm Springs landfill, it amounts to between 2000 tons/month and 3000 tons per month. An average of 2,500 tons per month was taken as the current disposal figure.

Table 4: Current waste generation figures

Disposal Sites	Current Waste Generation Figure (tons per annum)
Boitshepe/Proposed Yakani	123504
Waldrift	24000
Palm Springs	30000
Total	177504

3.6.2 Future Waste Generation Rates and Quantities

With the assumption that the future population growth rates and growth estimates remained constant for the next 10 years and the per capita waste generation rates also remained constant then results would be as follows:

Table 5: Future Waste Generation Rates and Quantities

Disposal Sites	Current Waste Generation Figure (tons per annum)	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Boitshepe /Proposed Yakani	123504	131284.8	139161.8	147511.5	156362.2	165744.0	175688.6	186229.9	197403.7	209247.9	221802.8
Waldrift	24000	25512.0	27042.7	28665.3	30385.2	32208.3	34140.8	36189.3	38360.6	40662.3	43102.0
Palm Springs	30000	31890.0	33803.4	35831.6	37981.5	40260.4	42676.0	45236.6	47950.8	50827.8	53877.5
Total	177504	188687	200008	212008	224729	238213	252505	267656	283715	300738	318782

Note: Future Waste generation was calculated by increasing the waste generation figures according to population growth.

Table 6: Future Waste Generation Rates and Quantities (with waste recycling targets incorporated)

Disposal Sites	Current Waste Generation Figure (tons per annum)	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Boitshepe/ Proposed Yakani	123504	32821.2	10437.1	3872.2	1518.7	643.9	293.5	146.2	77.5	41.1	21.8
Waldrift	24000	6378.0	2028.2	752.5	295.1	125.1	57.0	28.4	15.1	8.0	4.2
Palm Springs	30000	7972.5	2535.3	940.6	368.9	156.4	71.3	35.5	18.8	10.0	5.3
Total	177504	47172	15001	5565	2183	925	422	210	111	59	31

In Table 5 above, no recycling figures have been taken into consideration since no record keeping for waste recycled is being held.

The above results show that if the current population and waste generation trend grows by 0.63% in the next 10 years, by 2030 the municipality will produce a total of 318 782 tons per annum of waste for which they will have to make provision for in terms of waste disposal site airspace, transport, and personnel.

Note: The above figure does not take into account any possible recycling, reduction or reuse initiative the Municipality is likely to put into place in the near future which could reduce the final disposal tonnages to landfill.

Table 6 above gives an indication of the waste generation figures, taking recycling targets recommended in this report, into consideration.

3.6.3 Industrial and Mining Waste

The Municipality is collecting general waste from other industries that are registered with the Municipality and is being disposed of at the Boitshepi landfill site i.e. Cape Gate and Arcelor Mittal. Hazardous waste of major industries is being disposed of at a private owned landfill site viz the Vlakfontein Hazardous site.

3.6.4 Health Care Risk Waste

The municipality does not collect medical waste. The Department of Health and Environmental Health is responsible for collection of the Medical and Health Care risk waste.

The Municipal area 18 fixed clinics, 5 of these clinics are structurally adequate to render a comprehensive PHC core service package. The remaining 13 clinics have structural constraints which prevents comprehensive PHC service delivery or one stop shop as advocated by National Health Norms and Standards.

Overcrowding, long queues and compromised infection control becomes a reality in these facilities, due to the challenges alluded to above. The department has prioritized upgrading of health facilities to address the structural constraints in health facilities.

No medical waste is allowed for disposal at the Emfuleni General Landfill sites.

3.7 Recycling, treatment and disposal

3.7.1 Recycling

There are currently Municipal driven waste minimisation activities taking place in the Municipality. Recycling initiatives involve community engagement that are supported by the municipality. The areas that participate in the recycling strategies are cooperatives such as Majakathata, Mojaka, Palm Springs, Evaton west. Other Municipality strategies are currently in the process of being implemented and put in place. At the various landfill sites, informal reclamation activities are evident.

3.7.2 Garden Refuse

Large volumes of garden refuse were observed at the various transfer stations. The exact volume of garden refuse and builder's rubble generated are not known since no record-keeping and sorting of different types of waste takes place at the waste disposal sites/ transfer stations. Garden waste is placed in black bags and removed with general waste from the collection areas. It is then taken to the nearest landfill site and some to the various transfer stations. For larger branches of trees, the consumers are charged a limited fee (per skip) for special collection by the municipality.

3.7.3 Treatment and Disposal

Municipalities should keep record of waste disposal facilities under their area of jurisdiction and should indicate the status of these waste disposal facilities (i.e. whether they are licensed or unlicensed) including treatment facilities for hazardous waste (even if they are owned and operated by the private sector). Municipalities are required to ensure that waste is properly managed and disposed of according to waste license conditions. It is also important that municipalities must establish the size of their waste disposal facilities; the anticipated lifespan and/or available airspace, types and quantities of waste disposed, and should take note of whether these are operated in a sound and environmentally acceptable manner.

JG Afrika is assisting to roll out a programme to assist local municipalities inter alia Emfuleni LM to develop comprehensive plans to mitigate the release of greenhouse gases (GHG) from landfill sites. Key components of the business plans will include self-sustaining job creation opportunities at various skill levels and the Project will make time for learnership and training for officials.

This follows the firm's management of the pilot phase of this award-winning project that saw the first six selected municipalities formulate strategies to divert organic waste from their landfill sites. The project aims to identify areas for strategic intervention that advance the objectives of both the National Climate Change Response Policy and the National Waste Management Strategy. Each individual project focused on emission reduction, including methane with its greater global-warming potential than carbon dioxide.

The project is part of the South African Department of Environmental Affairs' (DEA) Near-Term Priority Waste Management Flagship programme. It is being funded by the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB), and is being implemented by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) in partnership with the DEA.

3.7.4 Waste disposal sites

The Municipality has jurisdiction over three operational disposal sites viz the Boitshepe, Waldrift and Palm Springs disposal sites. The Zuurfontein landfill has been closed in August 2005 and received a closure permit from the Department of Environmental Affairs and Tourism on 1 April 2008. The operation of the three operating landfill sites are currently being outsourced under contract to WJ Makume, a waste contractor company.

All the landfill sites are licensed. The landfill sites are experiencing operational problems in varying degrees, but mainly as a result of financial constraints. The operational sites are covered on a daily basis and wind-blown litter, vectors, fires, dust and odours are common concerns.

I. Palm Springs Landfill site

The **Palm Springs** landfill is operated by a contractor (WJ Makume) and managed by the Emfuleni Local Municipality. The landfill is situated at Latitude 26°29'30.86" S; Longitude 27°49'90" E. This site is permitted in terms of the National Environmental Management: Waste Act and classified as a **G:M:B** type (medium landfill site with insignificant leachate potential) (**Class B landfill site** under the 2013 Waste Classification and Management Regulations) and caters for the disposal needs of Evaton, Orange Farm and surrounding areas. The current lifespan of this facility is 15 years. Plans are underway for an expansion to extend the lifespan of this site to 50 years.

This landfill is not operated as per license conditions. Waste is as far as possible regularly compacted and covered with a contracted bulldozer present on site. There is no appropriate notice board at the main entrance of the landfill site displaying all the necessary information in relation to

the license holder, Emfuleni Local Municipality. There are no traffic signage for safe vehicular movement into and out of the site. The site has a concrete palisade fence for security and access control. An interruption in the fence is evident and is currently being used as a temporary entrance to the site.

This site is supposed to only accept waste types that it has been intended for. No proper records are kept on site due to non-functioning of facilities (a weighbridge, etc.). Ablution facilities are not available for the operators and waste recyclers. Recycling activities at this site are not regulated.

The status of the **Palm Springs Landfill** site is summarised below and depicted visually in the subsequent photo gallery.

Table 7: The status of the Palm Springs Landfill

Position of site:	The site is located in Palm Springs, Evaton, next to the intersection of R551 and Golden Highway. (Geographical co-ordinates: 26°29'30.86" S; 27°49'90" E).
Permit:	Yes
Year issued:	2008/11/04
Classification of site:	G:M:B (Class B)
Type of Operation (end – tip, trench, cell):	Cell method
Estimated size of site:	Approximately 4ha.
Estimated remaining life of site:	Approximately 30 years (plans in place to expand and extend life span of site to 50 years.
Separation of fresh and contaminated water:	No
Groundwater monitoring:	No boreholes available for monitoring. Boreholes from the vicinity were monitored.
Volumes per day, week or month:	No proper records exist for volumes of waste deposited; however, an estimated 200 tons/day of waste is deposited daily on site.
Is cover material available?	Yes
Is the drainage sufficient?	In good condition
Is there access control?	Yes
Is the site fenced?	Yes
Does the site have a sufficient buffer zone?	Yes, but radius unknown.
Type of equipment utilised on site:	A hired bulldozer, front End Loader (FEL), Tipper truck and Water truck.
Operating hours:	07:00 to 17:00 Monday to Saturday and 7 to 15:00 on Sunday

Site facilities, i.e. ablutions, guard house:	The site has infrastructure (however not operational) such as: <ul style="list-style-type: none"> • Guard house • Store room • Security house • Toilets
Estimating cost for closure:	No estimate exist to this effect
Savings plan for closure:	No savings plan in place for closure of this site



Palm Springs Landfill Site Entrance



Guard house and Palisade fence in order



Landfill Compactor at Waste Disposal Site



Recycling taking place at Working Site



Weightbridge within Palm Spring Landfill Site



Fleet Vehicles used at Palm Springs Landfill Site

II.Boitshepi Landfill Disposal Site

The Boitshepi landfill is owned by the Emfuleni Local Municipality but operated and managed by a contractor, WJ Makume. Boitshepi landfill site is situated near Boipatong at Latitude 26°40'01.28" S, Longitude 27°51'31.01" E. The site is permitted under the National Environmental Management: Waste Act and classified as G:L:B⁺ (general large landfill site with the potential to produce significant leachate) (**Class B landfill site** under the 2013 Waste Classification and Management Regulations) and caters for the disposal need of Vanderbijlpark, Boipatong, Tshepiso, Sharpville and surrounding areas.

Tipper truck and FEL were performing their day to day site maintenance at the site. The weighbridge scale was not functioning well, thus control of records of waste disposed is not taking place. This site only accepts waste types that it has been intended for. Monthly meetings are held with the waste recyclers. There was burning of waste taking place at the site.

Access control measures are in place and enforced appropriately. The weighbridge is malfunctioning from time to time and therefore record-keeping is not accurate. The software should also be updated to ensure accurate billing for customers.

An operation and maintenance plan is available on site and adhered to. Working areas of the site are shaped to a 1:3(h) slope. The equipment used on the site is adequate for the purpose of managing the site.

Condition 3.3.8 (i) of the license (Gaut 002/08-09/N0152 issued on 25 July 2011 stipulated that the landfill should not be operated after 8 years i.e. 25 July 2019. The Boitshepe disposal site existing license is currently under review with a Section 24G Environmental Impact Report being completed and submitted to GDARD to make a decision whether the site can continue with operation or whether an application for closure should be submitted.

The air space available as on June 2018 (ref: Hill and Associates Site Extent and Airspace report, dated June 2018 for Boitshepe landfill), indicated that the site has a remaining life of 3.31 years, as this was based on a volume calculation available in accordance with an end shape proposed for the landfill. This calculation took note of side slopes which need to be adhered to for closure.

The license indicates that the site should not be operated after 25 July 2019 to avoid further encroachment of operations on the wetland. It can be stated that the site has been operated away from the wetland. No height restriction has been provided in the license issued, although a height has been incorporated into the end shape model for the site.

It is recommended that the ELM should apply for closure and that the site should be closed and properly rehabilitated in terms of the license conditions (part of the issued license for closure once issued by the competent authority). Any remedial action as a result of the impact of the site on the environment, especially the ground water and adjacent wetland, should be undertaken as part of the closure and rehabilitation.

Table 8: The status of the Boitshepi Landfill Disposal Site

Position of site:	This site is located near Boipatong. (Geographical co-ordinates: 26°40'01.28" S; 27°51'31.01" E).
Permit:	Yes
Year issued:	2011/07/25
Classification of site:	G:L:B⁺ (Class B)
Type of Operation (end – tip, trench, cell):	Cell method
Estimated size of site:	Approximately 45 ha
Estimated remaining life of site:	
Separation of fresh and contaminated water:	Adequate drainage
Groundwater monitoring:	Yes
Volumes per day, week or month:	10 000-12 000 tons/day (estimated)
Is cover material available?	Yes
Is the drainage sufficient?	No
Is there access control?	Yes
Is the site fenced?	Yes
Does the site have a sufficient buffer zone?	Yes, 50m buffer zone
Type of equipment utilised on site:	Land compactor, bulldozer, weighbridge, tractor to carry skips, and water cart for dust control.
Operating hours:	7:00 – 6 Weekdays, 07:00 – 5 Saturdays and 7:00 – 15:00 Sundays and public holidays
Site facilities, i.e. ablutions, guard house:	This site has ablution facilities, offices, weighbridge and a control room.
Estimating cost for closure:	None
Savings plan for closure:	None



Boitshepi Landfill Site Entrance



Plant Equipment at Boitshepi Landfill Site



Parts of collapsed concrete palisade fence, causing vulnerable security/access control



Reclaiming activities and burning of waste at Boitshepi Waste Disposal Site



Vandalised Ablution Facilities at Boitshepi Landfill Site



Guardhouse and Weighbridge at Boitshepi Landfill Site

III. Waldrift Landfill site

The Waldrift Landfill is owned by Emfuleni Local Municipality and operated by WJ Makube. The landfill is located near Meyerton and Vereeniging and is situated at Latitude 26°36'02" S; Longitude 27°57'57" E. This site is permitted under the National Environmental Management: Waste Act and classified as a G:M:B⁻ type (general medium size landfill site with no significant leachate potential) (**Class B landfill site** under the 2013 Waste Classification and Management Regulations) and caters for the disposal needs of Meyerton, Vereeniging and surrounding areas. The current lifespan of this facility is about 7 years.

Phase 2 of the site is closed and rehabilitated. There is a compost area where waste is disposed of during rainy seasons. The reason for this is that waste trucks cannot go up the working cell when it is muddy.

There are 2 retention dams at the site, of which 1 is burned.

The notice board at the main entrance displays all the necessary information with regard to the landfill site. Access control measures are in place and enforced appropriately as there are permanent security guards on site. An operation and maintenance plan is available on site and adhered to. Working areas of the site are shaped to a 1:3(h) slope. The equipment used on the site is adequate for the purpose of managing the site. The weighbridge is malfunctioning and record-keeping is therefore not accurate. The software should also be updated to ensure accurate billing for customers. This site only accepts waste types that it has been intended for.

The Waldrift disposal site existing license is currently under review with a Section 24G Environmental Impact Report being completed and submitted to GDARD to make a decision whether the site can continue with operation or whether an application for closure should be submitted.

Table 9: The status of the Waldrift Landfill Disposal Site

Position of site:	The site is located near Meyerton and Vereeniging. (Geographical co-ordinates: 26°36'02" S; 27°57'57" E)
Permit:	Yes
Year issued:	2011/09/29
Classification of site:	G:M:B (Class B)
Type of Operation (end – tip, trench, cell):	Cell method
Estimated size of site:	25ha.
Estimated remaining life of site:	
Separation of fresh and contaminated water:	Yes
Groundwater monitoring:	Yes
Volumes per day, week or month:	2000 tonnes per day
Is cover material available?	Yes
Is the drainage sufficient?	
Is there access control?	Yes, with permanent security guards on site.
Is the site fenced?	Parts of the concrete palisade fence have collapsed.
Does the site have a sufficient buffer zone?	Yes, uncertain of the size.
Type of equipment utilised on site:	Land compactor, IDT dumper, LB machine, excavator, bulldozer, weighbridge, tractor to carry skips, and water cart for dust control.
Operating hours:	7:00 – 6 Weekdays, 07:00 – 5 Saturdays and 7:00 – 15:00 Sundays and public holidays
Site facilities, i.e. ablutions, guard house:	The site has ablution facilities, a weighbridge and a control room.
Estimating cost for closure:	Not available
Savings plan for closure:	Not available



Waldrift Landfill Site Entrance



Pallisade Fencing in order



Retention Dam burnt at Waldrift Landfill Site



Retention Dam not properly maintained



FEL steel wheel compactor performing day to day site activities



Phase 2 of Waldrift landfill site closed and rehabilitated

IV. Zuurfontein Landfill Site

The Zuurfontein Landfill is located near Meyerton and Vereeniging and is situated at Latitude 26°36'02" S; Longitude 27°57'57" E. The site is permitted under the National Environmental Management: Waste Act and classified as G:M:B- type (general medium sized landfill site with insignificant leachate potential). No sign board for emergency numbers is available on site. Some section of the eastern side of the fence is stolen and should be repaired. There is no security at the entrance. This landfill site has been closed and decommissioned. No methane gas monitoring is being conducted.

Table 10: The status of the Zuurfontein Landfill site

Position of site	The site is located near Meyerton and Vereeniging. (Geographical co-ordinates: 26°36'02" S; 27°57'57" E).
Permit	Yes
Year issued	2008/04/01
Classification of site	G:M:B (Class B)
Type of operation	Closed
Estimated size of site	12.0911ha
Estimated remaining life of site	Data unavailable
Separation from fresh and contaminated water	Yes
Groundwater monitoring	Yes
Volumes per day, week or month	None as the site is closed
Is cover material available?	All vegetated.
Is the drainage sufficient?	Yes, in good condition
Is there access control?	Gate available but no security.
Is the site fenced?	Yes, some parts of eastern side of landfill collapsed.
Does the site have sufficient buffer zone?	Yes
Type of equipment utilised on site	N/A
Operation hours	N/A
Site facilities, i.e. ablution, guard house	No facilities at this site
Estimating cost for closure	N/A
Saving plan for closure	N/A

Zuurfontein Landfill Site



Zuurfontein Landfill Site Entrance



Methane Gas Equipment



Parts of the concrete palisade fence have collapsed and need to be repaired



Zuurfontein Site fully vegetated

V. Proposed Yakani Landfill Site

Emfuleni Municipality is proposing to develop a new Waste Management Facility, including a Class B landfill site together with a composting area, a recycling area and the use of a mobile crusher for construction and demolition waste on Portion 178 of the farm Vlakfontein 546 IQ, between Vereeniging and Sebokeng.

The site will accommodate waste from residential areas of Vereeniging and Vanderbijlpark and more specific, greater Sebokeng Zone 13, 10, 12, Eaton Side, small farms, Debonair Park, Rustervaal and Roshnee. Once the Palm Springs landfill reaches capacity, waste from Sebokeng North and the Evaton region will also be re-routed for disposal at the proposed landfill site. Currently the proposed landfill will be a replacement for the Boitshepe landfill which is due for closure soon.

3.7.5 Transfer Stations

The Municipality has jurisdiction over and 5 (five) transfer stations viz the Springbok, Roshnee, Arcon Park, Sonland Park, Vaaloewer and Sebokeng transfer stations. The Sebokeng transfer station is constructed, but currently not yet operational while the Springbok transfer station is

vandalised and not in use. All transfer stations can only be used for the disposal of garden refuse and builders' rubble (according to the Waste Management by-laws).

I. Sebokeng transfer station

The transfer station has an access gate with security guard and a guard house. The gate is not functional and needs to be repaired to control access to the site. It is fairly new, and no waste has been brought into the site yet. It is intended that only building rubble and garden waste will be allowed at the transfer station. It has been observed that illegal dumping is currently taking place outside the boundaries, adjacent to the site.

Sebokeng Transfer Station



Sebokeng Transfer Station Site Entrance



Sebokeng Transfer Station not operational yet



Illegal waste disposal near Sebokeng Transfer Station



Vandalised Entrance Gate

II. Sonland Park Transfer Station

Fencing is not adequate at the site as the concrete palisade fence is broken, resulting in various access control problems. Having a single access control gate can help to effectively control and record the waste coming into the transfer station. Burning of waste is also occurring at the site, which is not allowed. There are no skip bins on site, waste is placed directly on the ground. It is clear that the transfer station is treated as a landfill site. This aspect should be addressed and rectified since waste may not be disposed of on land. There are 2 caretakers at the site, who are responsible for instructing people where to dump (spotters), and 1 security guard.

Sonland Park Transfer Station



Sonland Park Transfer Station Entrance



Various types of waste at Sonland Park Transfer Station



Various types of waste at Sonland Park Transfer Station



Fire activities at transfer station

III. Roshnee Transfer Station

The transfer station is in a good condition except for the lack of skip bins for the storage of the waste. Part of the palisade fence is broken, which enables intruders to access the transfer station. This should be addressed and repaired. There is one security guard and 1 caretaker present at the site.

Roshnee Transfer Station



Rosnee Transfer Station Entrance



Guard House at Rosnee Transfer Station



No skip bins provided for waste



Rosnee transfer Station in acceptable condition

III. Arkon Park Transfer Station

The site is in a good condition. Skip bins are available with adequate fencing around the premises. Skip bins were full on the day of the inspection, and the transfer station was closed. This was due to the shortage/ unavailability of municipal waste trucks to collect the waste. The transfer station has 1 security guard and 1 caretaker at the site.

Arkon Park Transfer Station



Arkon Park Transfer Station Entrance



Entrance at Arkon Park Transfer Station



Skip bins used at Arkon Park Transfer Station



Arkon Park transfer station well fenced

IV. Springbok Transfer Station

The site is purely used as a dumping area. The transfer station is completely vandalised and should be demolished. The site should be cleared.

There are squatter camps built on the site. It was observed that large amounts of waste (truck size) from private companies also dispose of their waste at this transfer station. The fencing is vandalised, and the guard house also is also not in good condition.

As mentioned above, the transfer station should be demolished, and the site should be cleared. The feasibility of establishing a Material Recycling Facility (MRF) on the property should rather be investigated.

Springbok Transfer Station



Vandalised guard house at Springbok Transfer Station



Palisade fencing vandalised at Springbok Transfer Station



Various kinds of waste streams accepted at the Springbok Transfer Station



Camps built at Transfer Station



Waste brought to the transfer station by large truck from private company



Camps built at Transfer Station

V. Vaaloewer Transfer Station

This transfer station is also utilised by the Porcupine Ridge Eco estate. There are no skip bins, waste is disposed of on the paved demarcated area. It is recommended that skip containers should be provided for the disposal of waste (filled black bags). Reclaimers can then sort the waste and put the recyclables into one skip and non-recyclables into another skip. The non-recyclable waste can then be collected by the municipality and transferred to the closest landfill for disposal and the recyclable waste can be collected and sold off to recycling companies or sold off by the recyclers themselves for income generation.

Vaaloewer Transfer Station



No skips at Vaaloewer Transfer Station



Waste disposed off on ground at mini dump



Recycling activities taking place at transfer station

VI. Proposed recycling buy-back centre

Safripol, a polymer producer and marketer company has started with the process of kicking-off a cooperative project for the establishment of a recycling buy back centre in CE6 area in Vanderbijlpark, with Petco and ELM. No further information is available during the compilation of the IWMP.

3.8 Status of waste collection services

3.8.1 Service Area and Refuse Collection

The Municipal Area incorporates a total of 45 wards. Solid waste is collected once a week from a total of 188,774 out of 220,135 households in Emfuleni. The remainder of the households represents the informal settlements that are serviced through the removal of illegal dumping sites.

Currently the Municipality is faced with challenges in household refuse collection as a result of vehicle shortages needed for waste collection. This has resulted in a backlog in household waste collection where in some areas; refuse removal has been interrupted.

3.8.2 Service and Receptacles provided

The Municipality makes use of a black bag system as well as the 240 litre wheelie bin system as receptacles (see Table 10 below). For businesses, waste is collected once a week. Businesses include the Vereeniging CBD, Three Rivers, Vanderbijlpark CBD, Becqueral shops and Palm Springs mall.

The type of service delivery varies amongst different areas in the municipal area. A kerb side collection service is rendered in certain areas, whilst in other areas a communal collection service is rendered. Both kerb side collection and communal collection services are offered in the Bophelong area.

Kerb side collection service is offered in the following areas;

- Sebokeng
- Vanderbijl Park
- Three rivers
- Bedworth Park
- Bonnene Boipatong
- Tshepiso Sharpville
- Vereeniging
- Sharpville
- Tshepiso
- Evaton West
- Evaton North

Communal service collection is offered in the following areas:

- Plots
- Informal areas
- Bioketlong Sonderwater

The table below summarises the waste receptacles in terms of the type of waste receptacles being used in respective municipal areas and indicates who is responsible for the supply of the receptacles.

Table 11: Waste receptacle

Area	Type of Receptacles used	Responsible to supply
Vanderbijl Park: SWS, SE2, SE6, SW1, SW2	240l bins	Municipality
All other VanderbijlPark area	Refuse bags	Owners
Vereeniging: Falcon Ridge, Arcon park, Three Rivers, Roshnee, Waldrift	240l bins	Municipality
Other Vereeniging areas	Refuse bags	Owners
Evaton: Evaton west, Bervelyhills, Palm Springs, Evaton North, Eatonside, Zone 7.	240l bins	Department of Housing (Provincial)
Sebokeng, Bophelong,	Refuse bags	Owners
Boipatong, Sharpville, Tshepiso, Bonnane	Refuse bags	Owners

3.8.3 Frequency of street cleansing

The frequency of street cleaning and cleaning of public toilets is indicated in Table 12 below:

Table 12: Street cleaning services in Emfuleni Local Municipality

Area	Frequency of service
Main streets: litter picking	Once a week
CBD: All streets (Vereeniging and Vanderbijlpark).	Daily (Monday to Saturday)
Open spaces	Once a week

3.8.4 Collection Needs

A total of 188,774 out of 220,135 households in Emfuleni. The remainder of the households represents the informal settlements that are serviced through the removal of illegal dumping sites. Currently the Municipality is faced with challenges in household refuse collection as a result of vehicle shortages needed for waste collection. This has resulted in a backlog in household waste collection where in some areas; refuse removal has been interrupted.

3.8.5 Equipment

The correct type and numbers of vehicles which are required to effectively deliver waste management services is a major contributing factor for the Municipality to ensure operative and efficient waste service delivery.

A summary of the equipment within Emfuleni is given below.

The tables below provide the some of the fleet details per depot. Included in the table are the fleet number, vehicle registration number, the description of the vehicle, the lease company and the operational status of the vehicle.

Table 13: Waste vehicles used in the Municipality (Vanderbijlpark)

VANDERBIJL PARK WASTE DEPARTMENT				
REG NO.	FLEET NR	DESCRIPTION	LEASE/OWNED	STATUS
MCM951GP	010813	MAN COMPACTOR	Emfuleni	Parked to rebuild
MCM954GP	010814	MAN COMPACTOR	Emfuleni	Standing/ Grab arm broken
MHL026GP	010817	NISSAN 7 TON TRUCK	Emfuleni	Repair suspension
NNR189GP	010896	NISSAN HARDBODDY	Emfuleni	Check transmission
NTD133GP	010946	NISSAN COMPACTOR	Emfuleni	Operational
TSM181GP	01F043	TOYOTA LDV	Emfuleni	Repair leaking valve bank
TTR080GP	01L024	M/BENZ AXOR COMPACTOR	New vaal	COF
TWM474GP	01L029	M/BENZ AXOR COMPACTOR	New vaal	Service at 150 000km / Check brake fluid leak
VKD215GP	011008	NISSAN UD60 FLATDECK TRUCK	Emfuleni	
DY99JWGP	011019			Service and check brakes
XKF343GP	01L064	HINO COMPACTOR	Vaal Toyota	Repair gears
XLR719GP	01L065	HINO COMPACTOR	Vaal Toyota	Repair hydraulic leak on valve bank
XLR738GP	01L072	HINO COMPACTOR	Vaal Toyota	Wind screen and side window damaged batteries
YSZ681GP	01L218	MAN COMPACTOR	Emfuleni	Accident damage
YTG281GP	01L178	TOYOTA DYNA 300	Vaal Toyota	Repair hydraulic leak
YXD019GP	01L239	MAN GRAB	Emfuleni	Check no power
YXP331GP	01L229	BELL 1204 FEL	Bell	Repair side steps
YYW742GP	01L280	HINO 500 SERIES 13-237 RE REF COMP TFM	Vaal Toyota	
ZBL418GP	01L279	HINO 500 SERIES 13-237 RE REF COMP TFM	Vaal Toyota	Operational
ZBW648GP	01L306	QUINTUMN BUS	Vaal Toyota	COF
BK46DZGP	011015	NISSAN UD 35	Emfuleni	Operational
ZPY265GP	01L325	NISSAN HARDBODDY NP 300	Moiponi	

Table 14: Waste vehicles used in the Municipality (Duncanville)

DUNCANVILLE WASTE DEPARTMENT				
Reg Nr	Fleet No	Description	Leased/ Owned	Status
SFR734GP	010987	M/BENZ COMPACTOR	Emfuleni	Accident damage
SFR730GP	010989	M/BENZ COMPACTOR	Emfuleni	Repair PTO shaft
SFR737GP	010990	M/BENZ COMPACTOR	Emfuleni	Operational
TTR076GP	01L023	M/BENZ COMPACTOR	New vaal	Operational
TWM476GP	01L028	M/BENZ COMPACTOR	New vaal	
WTJ112GP	01L048	BELL FRONT END LOUDER 1506D	Bell	Service/Replace teeth/ repair water leak
WTJ123GP	01L047	BELL FRONT END LOUDER 1506D	Bell	Oil and water mix
XFS956GP	01L055	HINO SKIP	Vaal Toyota	
XFS974GP	01L057	HINO SKIP	Vaal Toyota	Operational
XFS994GP	01L060	HINO SKIP	Vaal Toyota	Waite tyres
XFT007GP	01L059	HINO SKIP	Vaal Toyota	
XFT016GP	01L056	HINO SKIP	Vaal Toyota	Operational
XFV445GP	01L058	HINO SKIP	Vaal Toyota	awaiting licence
XLR776GP	01L073	HINO COMPACTOR	Vaal Toyota	Check overheating
YRR771GP	01L115	M/BENZ TIPPER	New vaal	Operational
YSZ677GP	01L217	MAN COMPACTOR	Emfuleni	Service
YSZ684GP	01L216	MAN COMPACTOR	Emfuleni	Fit bin lifters
YTF723GP	01L179	Toyota Dyna Tipper	Vaal Toyota	
YTS133GP	01L235	MAN/COMPACTOR	Emfuleni	Repair engine power
YXN355GP	01L180	Toyota Dyna Tipper	Vaal Toyota	
YXP322GP	01L225	BELL 1506 FEL	Bell	Operational
YXP326GP	01L228	BELL 1204 FEL	Bell	Repair alternator
ZBL331GP	01L278	HINO COMPACTOR	Vaal Toyota	
ZDG181GP	01L181	Toyota Dyna Tipper	Vaal Toyota	Waite tyres
ZPZ815GP	01L331	Nissan NP 200	Moiponi	
ZPZ814GP	01L332	Nissan NP 200	Moiponi	At Twin city panel beaters vehicle not released/non payment
BH90BGGP	011016	NISSAN UD 35	Emfuleni	COF
DZ56FVGP	011020	Hino 300 tipper	Emfuleni	Accident damage

Table 15: Waste vehicles used in the Municipality (Sebokeng)

SEBOKENG WASTE DEPARTMENT				
Reg Nr	Barr Code	Fleet Nr	Description	Status
NSS107GP	35772	010945	NISSAN COMPACTOR	Repair diesel filter / Replace batteries

SEBOKENG WASTE DEPARTMENT				
Reg Nr	Barr Code	Fleet Nr	Description	Status
NVF514GP	35791	010947	NISSAN COMPACTOR	Repair transmission
NVV677GP	35771	010948	NISSAN COMPACTOR	Repair air leaks
TMX717GP	40362	01L013	CAT FRONTEND LOUDER	Repair ecu/ Burnt wiring
TSM175GP	40339	01F042	TOYOTA HILUX	
TWM477GP	42814	01L026	M/BENZ COMPACTOR	Repair brakes binding
TWM479GP	42877	01L027	M/BENZ COMPACTOR	COF
TWM481GP	40357	01L025	M/BENZ COMPACTOR	COF/ Key broken in ignition
CT 54 LJ GP	Fleet matrix	01F302	NISSAN NP 200 1.6	Operational
CT 54 NP GP	Fleet Matix	01F277	NISSAN NP 300 4X2	accident damage
DM91ZSGP	Fleet matrix	01F408	IZUZU FVZ 1600 COMPACTOR	
DM91ZHGP	Fleet Matix	01F409	IZUZU FVZ 1600 COMPACTOR	Repair hydraulics
DM92BMGP	Fleet matrix	01F410	IZUZU FVZ 1600 COMPACTOR	Repair hydraulics
DM91ZNGP	Fleet Matix	01F412	IZUZU FVZ 1600 COMPACTOR	Repair hydraulics
DM91XBGP	Fleet matrix	01F416	IZUZU NPR 400 AMT	Operational
DP18LLGP	Fleet Matix	01F431	IZUZU TIPPER 1400 FVZ	
WTJ159GP	43073	01L049	BELL	
XTM745GP/Bin loader	45906	011011	NISSAN COMPACTOR	Parked
XTM753GP	45911	011014	NISSAN COMPACTOR	COF/ Service at 120 000km / Repair leaking cylinder
XTM756GP	45908	011013	NISSAN COMPACTOR	Repair electrical and replace batteries
XTM764GP/Bin loader	45914	011012	NISSAN COMPACTOR	Replace batteries

SEBOKENG WASTE DEPARTMENT				
Reg Nr	Barr Code	Fleet Nr	Description	Status
XLR695GP	43047	01L054	TOYOTA HINO MESH	Operational
YRR687GP	52693	01L112	M/BENZ TIPPER	Service at 100 000km replace wheel studs and nuts
YRR718GP	52694	01L116	M/BENZ TIPPER	Cof / Service at 120 000km / check gears and hooter
YRR742GP	52690	01L114	M/BENZ TIPPER	Repair starting
YRR757GP	52695	01L117	M/BENZ TIPPER	COF
YRR787GP	52692	01L113	M/BENZ TIPPER	COF
DZ55XTGP		011021	Hino 300 Tipper	Operational
YTV414GP	53753	01L177	TOYOTA DYNA TIPPER	COF
YXP339GP	55755	01L226	BELL 1506 FEL	
ZBL389GP	53795	01L277	12m ³ REL REFUSE COMPACTOR	Repair starting
ZBL412GP	53793	01L275	12m ³ REL REFUSE COMPACTOR	COF / Service repair accident damage
ZBL416GP	53785	01L276	12m ³ REL REFUSE COMPACTOR	Repair engine cof
YPY890GP		01L136	Toyota Corolla	Emerald panel beaters
YPY852GP		01L138	Toyota Corolla	
YPY878GP		01L146	Toyota Corolla	
YPZ390GP		01L166	Toyota Hilux	
BJ96XGGP	66804	011017	NISSAN UD 35	COF
BH89YHGP		011018	NISSAN UD 35	Operational
ZPY256GP	55787	01L328	NISSAN HARDBODDY NP 300	Service at 185 000km Check brakes

Most of the current vehicles used by the Municipality to render waste collection services, are old (older than 14 years).

Currently the Municipality is hiring additional vehicles to provide the waste collection services at approximately R2,400,000 per month. These vehicles (15 REL trucks) are all in a good condition.

Currently the Municipality is providing the drivers for all waste collection vehicles (owned vehicles and hired vehicles). Only 5 vehicles from the Municipality are being used for residential waste collection services, the rest of the vehicles are all hired. The municipality is currently hiring 15 REL trucks for residential waste collection services.

Tipper trucks (10m³ tipper trucks) and 12 TLBs are being hired for waste collection at transfer stations, to service informal settlements and for the clearance of illegal. The above-mentioned equipment/vehicles are hired under a Regulation 32 contract (which is usually once off, but is currently extended on a month to month basis)

For waste collection in the month of June 2019, a total amount of R 2,954,164.95 was paid for the hiring of the abovementioned vehicles/ equipment. Waste collection at the above-mentioned areas is done as and when reported or required. The abovementioned amount can vary on a month to month basis depending on the need to hire waste collection vehicles.

Should the Municipality be in a position to provide the full waste collection service in house, new vehicles should be purchased (at least 15 REL trucks, 27 x 10m³ tipper trucks and 31 TLBs). The Municipality should compile a vehicle replacement plan to ensure that future planning for the replacement of the vehicles is done at the appropriate time. The actions to be taken by the Municipality to address the collection fleet for service delivery and compile a vehicle replacement plan will be addressed in Phase II of this study i.e. compiling the draft IWMP.

Fleet vehicles used at the waste facility areas



3.9 Financing for Waste Management

The Municipal Systems Act, Act no. 32 of 2000 (Chapter 8, ss73-86A) requires that municipalities must ensure proper budgeting in order that they are able to deliver on their Constitutional mandate with regards to the provision of waste services. In order for a Municipality to successfully implement its IWMP, it is important to establish the current available resources in terms of finance; human resources, technical skills to deliver on the Municipality's mandate and to implement the goals and targets contained in the plan i.e. funding for operational and maintenance costs for equipment for the effective delivery of waste services and establishment of waste disposal facilities. Further, financial management/budgeting is key as it will assist in identifying future resource needs i.e. if there is an increase in the number of households requiring waste collection services what additional resources will be required to deliver the service.

3.9.1 Current Tariff Structure for Waste Collection

The Municipality provides a refuse collection function and owns a fleet of refuse compactors in this regard. The mechanical workshop also maintains the municipal fleet. This fleet is however old, and as a result of breakdowns, the Municipality has hired a number of waste collection vehicles for this purpose.

An 8% increase was allowed for from 2017/2018 to 2018/2019 financial year. The cost of service lead to the increase in tariffs but will also lead to higher inflation. Waste management suffers from a pervasive under-pricing, which means that the cost of waste management is not fully appreciated by consumers and industry (Table 16).

Table 16: Refuse Waste Charges

Ref	Tariff Description	Tariff Code	2017/2018	% Increase	2018/2019
Ref 1	All residential (Domestic) properties including townhouses/property or unit- No Wheelie bins	ERF 521/55/571 WRF001 WRF081 WR020	R121.30	8%	R131.00
Ref 2	Government properties per property or unit		R121.30	8%	R131.00
Ref 3	Residential (Domestic) properties including townhouses/property or unit- Wheelie bins	EMRFO1	R154.33	8%	R166.68
Ref 4	Residential flats services per flat	ERF541 WRF003	R81.39	8%	R87.90
Ref 5	All schools and churches per school or church	ERF674/WRF 006	R96.20	8%	R87.90
Ref 6	Old age Homes and Retirement villages per stand or unit	WRF007	R121.30	8%	R103.90
Ref 7	Agricultural (farm) properties		R459.67 R121.30 R165.5.38	8%	R131.00
Ref 8	Sport Clubs (Based on individual census): Daily removals	WRF015 WRF013 WRF014	R148.63	8%	R496.44 R120.19 R178.61

Ref	Tariff Description	Tariff Code	2017/2018	% Increase	2018/2019
	Once a week removal Twice a week removal				
Ref 9	Commercial/ Business and Industrial properties (Based on individual census) Daily removals Once a week removal Twice a week removal	WRF002 ERF511/561/58 1 ERF512/WRF00 4	R148.63	8%	R160.52
Ref 10	Commercial/ Business & Industrial properties (Sharpville, Sebokeng & Evaton) Daily removals Once a week removal Twice a week removal	ERF673	R121.30	8%	R130.00
Ref 11	Residential properties Vaaloewer	ERF521/551/57 1 WRF001 WRF018 WRF020			

Table 17: Collection and Transportation Tariffs

Ref	Waste Category	Non-Chargeable	Chargeable	2017/2018	% Increase	2018/2019
BR 1	Removal of builder's rubble/trade refuse Per load from ground level Per load	<0.5m ³	Free <5 to 5.5 m ³	R 498.92	8%	R 538.83
GR 1	Removal of builder's rubble /trade refuse Per load from ground level Per load	<0.5m ³	Free <5 to 5.5 m ³	R 199.41	8%	R 215.36
CF 1	Condemned food stuff Unhealthy and not fit for human consumption		Per m3 or part thereof	R 117.35	8%	R 126.74
DA 1	Removal of dead animals Domestic pets (Open areas) Small animals – all vets, animal clinics including		Free of charge Per bag 86L Per animal	R 24.07	8%	R 26.00

Ref	Waste Category	Non-Chargeable	Chargeable	2017/2018	% Increase	2018/2019
	SPCA Bigger animals- Horse/cattle					

Table 18: Disposal fees at Landfill sites

Ref	Waste Category	Non-Chargeable	Chargeable	2017/2018	% Increase	2018/2019
CB1	Clean builders' rubble	<300mm	Free of charge	R 165.26	8%	R 178.48
CC1	Clean cover material		Free of charge			
MB1	Mixed builders' rubble	<300mm	>1000kg	R 168.03	8%	R 181.47
G1	Greens excluding tree branches	<310mm radius	Free of charge			
BT1	Bulky tree stumps	<300mm Radius	>1000kg	R 151.62	8%	R 163.75
T1	Tyres all sizes	Not accepted	Not accepted			
DW1	Domestic waste Per day Per day	<1000kg	Free of charge >1000kg	R 196.25	8%	R 211.95
BB1	Big blocks- Bulky material	<1000kg	Free of charge >1000kg			
ID1	Emfuleni illegal dumps		Free of charge			
DI1	Delisted industrial waste	Charge per ton	>1000kg	R 196.25	8%	R 211.95
DI2	Dry industrial waste	Charge per ton	>1000kg	R 196.25	8%	R 211.95
SW1	Sludge, putrescible waste or filter dust	Not accepted	Not accepted			
DF1	Disposal fees for animal carcasses Per load Per load	< 0.5 m ³ < 0.5 m ³	Per animal	R 136.12 R 151.62	8%	R 147.01 R 163.75

Ref	Waste Category	Non-Chargeable	Chargeable	2017/2018	% Increase	2018/2019
	Horse/Cattle					

3.9.2 Budgeted Financials Performance for Waste Management

The following financial information was provided regarding budgets and expenditure.

Table 19: Budget/Expenditure

Operational Budget	Operational Expenditure	Income Budget	Income Expenditure
R 208,777,609.00	R 58,291,326.64 (as at April 2019 and the unspent amount was R145,486,282.36)	R 137,383,408.86	R -137,383,408.86 (as at April 2019 the expenditure was at 73% with an unspent amount of R -50,561,986.44)

It is clear that the budget is not sufficient to deliver an effective and efficient waste management service to the community. The estimated operational cost for the three landfills (pending on the award for the landfill operations tenders) for landfill operations is R12,100,000 for 2018/19 financial year. The budget is R5, 000,000, therefore a shortfall budget required of R7, 100,000. The final operational impact on the 2019/20 budget needs to be defined once all tenders are awarded.

3.10 Organisational and institutional matters

The organizational structure (organogram) of the Waste and Landfill Division is attached in Appendix 2.

The organogram highlights the number of available staff under each section such as staff to perform management duties, planning, waste collection, recycling and disposal, and enforcement etc. Further an organizational structure could potentially be used to evaluate gaps in areas where there are new functions that must be performed in order to fulfil the Waste Act's requirements.

The current organizational structure and human resources, including duties of the staff, delivering waste services within the Municipality is insufficient. The Municipality does not have the available resources and personnel to operate any landfill site in a sustainable manner.

The organisational structure has been updated (based on needs) and the following vacant positions exist and should be filled to ensure an effective and sufficient human resource staff component, especially if the Municipality decides to render waste collection services internally:

Table 20: Human Resource Capacity required

Area	Position	Number of Staff Required in vacant positions
Vereeniging	Superintendent	1
	Supervisor	2
	Drivers	20
	General Workers	40
	Machine operator	15
Sebokeng	Assistant Manager	1
	Superintendent	1
	Supervisor	1
	Drivers	8
	General Workers	31
	Machine Operator	1
Vanderbijlpark	Assistant Manager	1
	Supervisor	2
	Driver	13
	Machine Operator	1
	General Workers	33
	Grab operator	2
	Administrative Officer	1
	Total	174

In general, should any future need arise and if future development results in an unmanageable impact on the waste service delivery, the organizational capacity needs to be increased

accordingly and will at all times comply with the requirements of NEM:WA. It is recommended that the Manager: Waste Management also acts as Waste Management Officer (WMO) as per requirement of NEM:WA with associated duties.

All waste management staff should have proper training to carry out their duties and their performance should be monitored periodically.

3.11 Legal matters

3.11.1 Legal Compliance

This section outlines the municipality's current legal compliance pertaining to waste collection and their disposal facilities. All landfill sites at the municipality are licensed. The municipality is currently in the process of renewing the licenses for the Boitshepi and Waldrift landfill sites. It is envisaged that the process will be completed by end of Financial year 2019/2020.

The landfill sites are currently not being fully operated according to the license conditions, therefore does not comply fully with the applicable legislation and steps will have to be taken to correct this.

3.11.2 Municipal By-Law Pertaining to Waste

The Municipality has an updated set of waste management by-laws. A copy of these by-laws and is attached in **Appendix 3**. The Municipality at its discretion may set local waste service standards for waste separation, compacting of waste, management and disposal of solid waste, amongst others. The local standards must be aligned with any provincial and national norms and standards where these exist. The Municipality may also require transporters of waste to register on a list of waste transporters.

In assessing the National Environmental Management: Waste Act, it was evident that clear responsibilities are assigned to each sphere of government in relation to waste management activities.

The following section describes how the by-laws must be drafted according to Chapter 4 Part 6 of NEMWA and how the strategic priorities for the disposal of waste needs to be implemented in terms of the regulatory framework provided by NEMWA. Chapter 4 Part 6 of NEMWA prohibits the unauthorised disposal of waste and requires that where there is no household waste collection service the waste must be disposed of in the most environmentally and economically feasible manner. Section 26(1)(b) requires that waste disposal must be explicitly authorised and accomplished without polluting the environment or harming human health and well-being.

In terms of Section 68(1) of NEMWA a maximum penalty of R10,000,000 or a jail sentence of up to 10 years can be imposed for unauthorised waste disposal, depending on the severity of the impact on health and the environment.

Section 27(1) of NEMWA provides regulatory instruments focused specifically on littering. It stipulates that private land-owners that provide public access to their property must provide suitable receptacles for litter and ensure that it is disposed of (in an authorised manner) before it becomes a nuisance. This is reinforced by Section 27 (2), which prohibits littering of public places by individuals.

In terms of Section 68(2) a maximum fine up to R5,000,000 or imprisonment for up to 5 years can be imposed for littering offences, depending on the severity of the offence.

The waste disposal and anti-littering measures provided in NEMWA must be implemented through the aligned by-laws and should be enforced by local law enforcement agencies. These

measures should be seen as providing the minimum requirements that need to be implemented in terms of the by-laws.

Proper provision for monitoring, compliance, and enforcement, as well as the role of the Municipal Waste Management Officers (WMOs) should be described in the existing draft by-laws. Their duties should be limited to the regulatory aspects of NEMWA, whilst service-delivery should be fulfilled by other waste management personnel.

The responsibilities of the WMO in the Municipality will be as follows:

- Stakeholder management in relation to implementation of NEMWA.
- Liaison with Environmental Management Inspector (EMI) compliance monitoring activities in the Municipality.
- Municipal and local IWMP: alignment of planning and reporting cycles.
- Capacity building in relation to NEMWA implementation.
- Monitoring adherence to norms and standards in the delivery of waste services.

Chapter 7 of NEMWA addresses compliance and enforcement matters and stipulates the powers of the Minister in relation to the NEMWA provisions for:

- Preventing and remedying the effects of pollution.
- Rectifying contraventions of NEMWA.
- Obtaining a high court interdict against any person contravening the NEMWA.

Chapter 7, Section 66 of the Act provides for Waste Impact Reports which can be requested by EMIs in cases where a contravention of the Waste Act is suspected and by WMOs where a review of a waste management license is undertaken.

Section 67 of NEMWA lists provisions of NEMWA which constitute an offence if not complied with. The penalties for the offences are listed in section 68 of NEMWA, as mentioned earlier in this section of the report.

Section 6(1)(e) of NEMWA requires that the National Waste Management Strategy provides approaches for securing compliance with the provisions of NEMWA, including “monitoring of compliance”. Effective capacity to undertake compliance monitoring and the concomitant action where required is essential for the achievement of the objectives of NEMWA.

Chapter 7 of the National Environmental Management Act, 107 of 1998 (NEMA) provides for Environmental Management Inspectors (EMIs) to be designated by the Minister and MECs. EMIs are situated at all three levels of government. A key principle to inform the allocation of responsibilities is that an institution cannot police itself. A principle specifically relevant to the Municipality is that in circumstances where the NEMWA act regulates or controls issues that are typically covered by the by-laws and that fall within the competence of the local Municipality (e.g. public nuisance/cleansing), these issues needs to be dealt with by the Local Municipality.

The Department of Environmental Affairs will develop norms and standards which will be promulgated in terms of Section 7(1) of the Waste Act. The by-laws can refer to these norms and standards which will address norms and standards for the operation, maintenance and reporting requirements for general waste disposal sites that will be built on the existing Minimum Requirements for Waste Disposal by Waste disposal site guidelines.

The Municipality should take cognisance of the indigent policy on the provision of free basic services. Reference to the criteria for qualification should be set out in the by-laws.

Chapter 4 of the National Domestic Waste Collection Standards can be incorporated into the amended by-laws. It addresses separation at source, collection of recyclable waste, receptacles, bulk containers, communal collection points and frequency of collection.

3.11.3 Illegal Dumping

Illegal dumping occurs within the entire municipal area. The municipality has indicated that the areas with high occurrence of illegal dumping occurs mostly in townships i.e. Evaton, Sebokeng, Sharpeville, Boipatong, Bophelong and Tshepiso. Illegal dumping is a huge challenge in the country, and the situation in the Emfuleni area is not so different.

The Municipality has intervened by initiatives like the mayor's cleaning campaign, which is aimed reducing pollution, minimizing waste and protecting our natural resources. The mayor's cleaning campaign works as a bi-weekly program which compliments existing waste removal and dumpsite clearing activities of the municipality.

Despite boards put up by the municipality to discourage illegal dumping, this culture continues in Emfuleni.

Ward 6 community in extension 14 Bophelong have deemed it fit to start cleaning the illegal dumps in the area and planning to transform them into public parks suitable for the family. They have just finished clearing illegal dump sites, and then invited the waste management department to help with removing and dumping the waste in the designated dumping area.

The municipality needs to install the 'do not litter' boards. Volunteers from the communities will ensure that the areas stay litter-free.

It is the duty of the ward councillors to ensure that illegal dumping is being addressed and inform people about the benefits of caring for the environment. It is duty of the municipality to see to it that illegal dumping is cleared in every space where it exists, and in working with the communities will bring an end to this problem.

Property owners and-or the occupants must ensure that any form of waste is kept on their properties until it is removed either by the municipality on specified days or by themselves or contractors employed by them if it is rubble. Waste will only be allowed on a pavement, public place or open space if it is not placed directly into a bulk waste container or a skip for removal. The container or skip may not obstruct pedestrian or traffic movement or create a hazard to anybody.

The By-laws officers will show no remorse to any offender and the zero-tolerance rule will be applied.

Members of the public were urged by the Councillors to report to the Environmental Health inspectors anyone who dumps waste on any pavement, public place or open space.

When reporting offenders, as much detail as possible should be given and confidentiality is guaranteed. Pictures of the offender or the vehicle registration will go a long way in helping to curb the scourge of illegal dumping.

The Municipality does not have enough resources or budget to collect this waste. However, the municipality has adopted a 90 days maintenance plan that is reviewed at the end of each term, to clear illegal dumps in all the 45 wards. This maintenance plan includes community involvement which encourages the implementation of various programmes to cleaning the areas, which includes development of food gardens, greening and development of mini parks.

The Municipality should budget for the purchasing of mass containers/waste skips to place in strategic places and open spaces where illegal dumping is regularly occurring. The skips should

be regularly emptied/cleaned at the local waste disposal site when filled. If illegal dumping still occurs next these skips people must take photos of the offender, where the offender should then be fined, and the ethical person/photographer should be awarded. The Municipality has recognised the need for education of the people regarding this practice.



Illegal dumping in Sebokeng

3.12 New and future developments

The Municipality has already included the new developments i.e. Kwa Masiza (Zone 28), Golden Gardens, Sonderwater, Beverley Hills, Palmsprings, Tshepong, Zone 24, Miami Sands and Tshepiso Phase 5 into the current service delivery system.

It is essential that that any future residential and business area expansion are catered for in terms of refuse removal. This will allow the Municipality to, at an early stage, determine the possible costs involved and therefore will be able to adjust their budget accordingly. This will allow the Municipality to service the new areas when they are developed.

4. REVIEW OF THE PREVIOUS IWMP

The previous IWMP for Emfuleni Local Municipality was reviewed. The recommendations from the 2014 IWMP of Emfuleni Local Municipality was studied and is displayed in a table below to authenticate that those recommendations were implemented, partially implemented or not implemented.

Table 21: Review of previous IWMP

Recommendation	Implemented	Partially implemented	Not Implemented	Comments
Waste disposal site infrastructure: <ul style="list-style-type: none"> • Weighbridges • Access control • Site fencing • Retention dams 		X		The Emfuleni LM sites are licensed. All waste facility infrastructure should be repaired and

				properly maintained.
By-law: • By-laws	X			Emfuleni LM has a set of By-laws
Equipment Vehicles • Vehicle Replacement Plan should be developed • Replace old vehicles with new vehicles			X	No new vehicles, still a large number of old vehicles that need replacement. No Vehicle Replacement Plan is in place.
Human Resources • Personnel Organogram		X		Large staff turnover. A large number of vacant positions still not filled. New positions to be created.
Waste Minimisation Strategies • Any recycling strategies • Any composting strategies		X		There is no formal method of recycling driven by the municipality. Municipality has no composting strategies in place. With the establishment of the new Yakani landfill, a MRF and composting facility is envisaged

5. GAPS AND NEEDS ANALYSIS

After reviewing the 2014 IWMP of Emfuleni Local Municipality, certain needs pertaining to the waste management services in the Municipality were identified that require attention. These needs are summarised below.

- There is no formal Materials Recycling Facility or buy back centre within the Municipality. Educational and awareness programs should be encouraged by the Municipality to educate and inform community about recycling. The municipality should realise the need for waste minimisation and should initiate the corresponding strategies in due time.
- There are poor maintenance of weighbridges at the various landfill sites. This results in inaccurate record-keeping and inaccurate billing of customers. Weighbridges should be

repaired, regularly calibrated and well maintained to ensure that they are functional. This will ensure a faster efficient and more accurate billing system for effective monthly billing.

- The operations at the three operational landfills should be improved to ensure full compliance with the issued licenses for the sites.
- The Municipality must attend to the outcome of the Section 24 Directive issued by GDARD on the Boitshepe and Waldrift landfill sites.
- The municipality should properly maintain the landfill sites' infrastructure.
- The Municipality must ensure that the licensing and establishment of the proposed Yakani landfill be fast-tracked (as replacement site for the Boitshepe landfill).
- The illegal disposal of waste is common within the municipality area. The illegal disposal should be addressed in order to manage and minimise the illegal activities pertaining to waste disposal. Additional strategies should be put in place to combat illegal disposal. The Municipality should budget for the purchasing of mass containers/waste skips to place in strategic places and open spaces where illegal dumping is regularly occurring and transfer these skips for disposal at the authorised waste disposal sites when filled.
- The budget for cleaning up illegal dumping is insufficient and should be increased
- The Municipal Waste By-Law was recently updated and contain aspects related to NEMWA requirements. These by-laws should be updated regularly and with the new updated document, more detail can be incorporated as indicated in Section 3.11.2 of the report.
- The current organizational structure (organogram) indicates a large number of vacant positions. The biggest need is to address the slow process of filling of posts and then fill key vacant positions should be filled. All waste management staff should have proper training to carry out their duties and their performance should be monitored periodically.
- The Municipality should ensure that all future developments will be included in the waste collection and disposal service delivery. It is essential that in conjunction with the Town Planning Section that future residential and business area expansions are catered for in terms of refuse removal. This will allow the Municipality to, at an early stage, determine the possible costs involved and therefore will be able to adjust their budget accordingly. This will allow the Municipality to service the new areas when they are developed.
- The Springbok transfer station is vandalised. The site should be cleared and the feasibility of establishing a Material Recycling Facility (MRF) should be investigated.
- The security and access control should be upgraded at the various transfer stations and landfill sites, especially where fences are damaged or interrupted.
- Domestic waste has been observed in the in the Vaaloewer, Roshnee, Sonland Park transfer stations. The waste entering the transfer stations should be properly managed to ensure other waste streams except garden waste and builder's rubble is not accepted.
- Garden refuse are disposed of at the various transfer stations with no processing of the garden waste. The exact volumes of garden refuse need to be determined (weighbridge) to determine the feasibility of composting garden refuse. Future plans for composting garden waste at the proposed Yakani landfill site is underway as part of the licensing process.
- The waste management vehicles of the Municipality are in a poor condition. The Municipality should replace these vehicles and accordingly budget for the replacement, or, budget for the collection service to be outsourced.

- The Municipality also do not have the equipment and knowledge to properly operate the landfills. The service is currently outsourced to contractors, but the budget is not sufficient and should be amended and approved to allow a continuous disposal site operational service.
- A Detailed financial investigation should be done by the Municipality to ring-fence the waste management function.
- To provide a cost-effective waste management service, the payment of service tariffs should be improved, and the tariff structure should be investigated to be viable and be standardised. The distinction between the tariffs for waste collection at domestic, businesses and Government Institutions is supported and will ensure that the generators of waste pay for the waste they generate. This can also be an incentive for businesses and industries to minimise their waste streams.
- The extent and financial implications of the free basic refuse removal service to indigents should be determined to ensure that the cost shortfall not covered by the Equitable Share is budgeted for accordingly by the Municipality.
- A complete transportation study can be considered to optimize waste collection and improve the overall lifetime of the waste collection vehicles.

6. PERFORMANCE OF THE MUNICIPALITY

The landfills are not fully compliant, and operations should be improved. The Municipality is in the process to review the licenses for Waldrift and Boitshepe and pending the outcome of the Section 24G directive and study, must apply for either closure or continued operation of the sites.

The municipality has identified a replacement landfill site for the Boitshepe landfill and is in the final stages of the licensing of the site (Yakani landfill site).

The Municipality is still experiencing staff shortages and shortages of equipment to render a sustainable waste management service in the Municipality. In summary the Municipalities' performance can be seen as progressive but simultaneously there is room for improvement.

7. DESIRED END STATE

Introduction

Seven focus areas have been identified for the compilation of the IWMP for the Local Municipality. Based on the Gaps and Needs identified in the previous section, a Desired End State has been identified for each of the seven focus areas.

It is important to align the Desired End State in accordance with the National Waste Management Strategy. The official hierarchy adopted in the Government waste management hierarchy, in order of preference, is as follows:

- Waste avoidance
- Waste minimisation
- Waste re-use
- Waste recycling
- Waste treatment
- Waste disposal

It is important that there should be a target date by which these municipal strategic priorities are to be attained within the five years from the date the IWMP has been approved. The following timeframes are suggested for the strategic priorities:

- Immediate: 1 year
- Short-term: 2 to 3 years
- Medium term: 3 to 5 years
- Long term: 5 to 10 years

7.1 Safe and proper disposal of waste

This section relates to the development, upgrading and legal compliance of the waste disposal infrastructure. This includes the identification of new infrastructure required, the licensing of existing unlicensed facilities, upgrading of the current infrastructure as well as the improvement of waste management practices. Table 22 below provides the Desired End State for Waste Disposal Infrastructure in the Municipality.

Table 22: Desired End State for Safe and Proper Disposal of Waste

GOAL 1: ENSURE THE SAFE AND PROPER DISPOSAL OF WASTE			
Implementation Strategies			
Immediate	Short term	Medium term	Long term
Finalise licensing process for the proposed Yakani landfill site.	Construct the landfill site in accordance with the approved design plans	Properly operate and maintain infrastructure	Properly operate and maintain infrastructure
Ensure license renewal for Waldrift and Boitshepe Landfill sites. Attend to outcome of Section 24G EIR directive	Closure application for Boitshepe landfill site.	Waldrift closure application	Maintenance of both sites (Boitshepe and Waldrift).
Continual training should be provided to the waste disposal facility manager/supervisor to operate the landfill sites according to the license conditions.	Continue operation according to license conditions	Continue operation according to license conditions.	Continue operation according to license conditions.
Upgrade infrastructure at various transfer stations Springbok transfer station should be cleared, and a proper skip and ramp transfer station with a MRF should be established	Maintain infrastructure Construct transfer station and MRF	Properly operate and maintain infrastructure	Properly operate and maintain infrastructure

GOAL 1: ENSURE THE SAFE AND PROPER DISPOSAL OF WASTE			
Implementation Strategies			
Immediate	Short term	Medium term	Long term
Identify shortcomings with regards to the operational requirements	Resolve the identified operational shortcomings.	Audit and monitor waste disposal site operations.	Continue operation according to license conditions.

7.2 Effective and efficient delivery of waste service

The shortcomings in the available waste collection infrastructure have been identified. This will involve possible waste receptacles, new developments, repair and use of infrastructure (weighbridge), unserved areas and route planning. Table 23 below provides the Desired End State for Waste Collection in the Municipality.

Table 23: Desired End State for Waste Collection

GOAL 2: PROVIDE THE EFFECTIVE AND EFFICIENT DELIVERY OF WASTE SERVICES			
Implementation Strategies			
Immediate	Short term	Medium term	Long term
Maintain current service delivery to all areas within the Municipality and extend service delivery to all indigent populations where possible, including plan to extend service delivery to any new developments within the Municipality. Identify new developments in the municipal area.	Implement waste collection services to new developments.	Implement waste collection services to new developments.	Implement waste collection services to new developments.
Identify and compile a map or schedule of unserved areas within the municipality.	Identify various service points for the serviced and unserved areas (including indigents).	Extend waste services to ensure that all households have access to adequate levels of waste collection services by 2020.	Update and manage the schedule.

GOAL 2: PROVIDE THE EFFECTIVE AND EFFICIENT DELIVERY OF WASTE SERVICES			
Implementation Strategies			
Immediate	Short term	Medium term	Long term
Establish receptacle requirements in all areas within the municipality.	Determine the funding requirements for receptacles.	Implement the receptacle distribution for the identified municipal areas.	Continue and extend the receptacle service.

7.3 Effective and efficient delivery of waste service

This area involves the identification of shortcomings in the personnel, financial and equipment resources and development of strategies to ensure that the requirements are satisfied. The existing financial resources are analysed and new structures and strategies are developed. Table 24 below provides the Desired End State for Resource Extension in the Municipality.

Table 24: Desired End State for Resource Extension

GOAL 3: ENSURE SUFFICIENT RESOURCES TO PROVIDE AN EFFECTIVE WASTE MANAGEMENT SERVICE			
Implementation Strategies			
Immediate	Short term	Medium term	Long term
Personnel Resources			
Effective structure and extension of human resources.	Fill vacant positions and establish positions required for proper waste management.	Update organogram and appoint staff in vacant positions.	Update organogram and appoint staff in vacant positions.
Financial Resources			
Conduct a detail financial investigation for proper waste management budgeting.	Identify shortages in the budget and identify possible funding sources for these shortages and amend budget accordingly. Implement revised budget.	Identify shortages in the budget and identify possible funding sources for these shortages and amend budget accordingly. Implement revised budget.	Identify shortages in the budget and identify possible funding sources for these shortages and amend budget accordingly. Implement revised budget.
Review tariffs in terms of the tariffs policy which must adopted in terms of section 74 of the Municipal Systems Act.	Implement tariff model (as developed by DEA).	Implement tariff model and amend as required.	Implement tariff model and amend as required.
Develop strategy for proper revenue collection.	Implement revenue collection strategy.	Implement revenue collection strategy.	Implement revenue collection strategy.

GOAL 3: ENSURE SUFFICIENT RESOURCES TO PROVIDE AN EFFECTIVE WASTE MANAGEMENT SERVICE			
Implementation Strategies			
Immediate	Short term	Medium term	Long term
Equipment Resources			
Review current equipment and identify equipment that needs maintenance and/or replacement. Identify shortages of equipment to render a sustainable waste management service.	Develop an equipment replacement plan and acquire funding for the implementation of this replacement plan.	Replace equipment or extend vehicle fleet as required.	Update and amend equipment replacement plan and implement accordingly.

7.4 Waste minimisation

This section involves the identification of specific waste minimisation strategies. This can include separation and collection at source, privatisation of reclamation activities and development of collection points throughout the area. Table 25 below provides the Desired End State for Waste Minimisation in the Municipality.

Table 25: Desired End State for Waste Minimisation

GOAL 4: PROMOTE WASTE MINIMISATION, RE-USE, RECYCLING AND RECOVERY			
Implementation Strategies			
Immediate	Short term	Medium term	Long term
Establish Municipal Recycling Forum with stakeholders and hold quarterly forum meetings to co-ordinate waste minimisation in order to encourage growth on the recycling section and to discuss possible initiatives for, or by, entrepreneurs.			
Development of a Material Recycling Facility (MRF).	Apply for funding through available funding mechanisms for the development of an MRF.	Operate and maintain the MRF.	Operate and maintain the MRF.
	If feasible, establish mechanisms for promoting separation at source.	Roll out separation at source to 30% of households.	Roll out separation at source to 70% of households.
Establishment of a recycling buy back centre in CE6 area in Vanderbijlpark.	The project has been kicked off.	Operate and maintain recycling buy-back centre.	Operate and maintain recycling buy-back centre

7.5 Compliance with legislative requirements

This relates especially to illegal dumping activities within the municipal area. This involves identification of possible illegal dumping hot spots, development of clean up and anti-dumping campaigns, possible revision of by-laws as well as revision of collection strategies. Table 26 below provides the Desired End State for the Management of Illegal Activities in the Municipality.

Table 26: Desired End State for Management of Illegal Activities

GOAL 5: ENSURE THE DEVELOPMENT OF LEGISLATIVE TOOLS TO ENFORCE THE WASTE ACT AND OTHER APPLICABLE LEGISLATION			
Implementation Strategies			
Immediate	Short term	Medium term	Long term
Enforcement of updated by-laws	Proper enforcement of by-laws	Update by-laws to address more detail or shortcomings with regards to NEMWA requirements, if necessary	Proper enforcement of by-laws.
Develop a system for residents to report waste transgressions, for example illegal dumping.	Implement system.	Implement system.	Implement system.
Ensure compliance by medical facilities and funeral parlours in the municipal areas.	Audit and implement corrective action	Audit and implement corrective action	Audit and implement corrective action

7.6 Waste information system

This section covers the need for effective record keeping and development of a Waste Information System (WIS) as well as the sharing of available information and the co-operation of the various stakeholders within the Municipality. Table 27 below provides the Desired End State for Waste Information System in the Municipality.

Table 27: Desired End State for Waste Information System

GOAL 6: WASTE INFORMATION SYSTEM TO ACHIEVE WASTE MANAGEMENT PLANNING			
Implementation Strategies			
Immediate	Short term	Medium term	Long term
Maintain Waste Information System (WIS).	Keep proper records of waste quantities and types received at various waste disposal site. Provide information to District Municipality.	Use records for proper planning and decision making.	Ensure that the future planning is effectively carried out.
Update and Maintain database of industries, private waste disposal sites and medical facilities in municipal area.	Monitor and ensure that all industrial and HCRW is disposed of in a responsible manner.	Monitor and ensure that all industrial and HCRW is disposed of in a responsible manner.	Monitor and ensure that all industrial and HCRW is disposed of in a responsible manner.

7.7 Education and awareness

This section addresses the need for education and awareness campaigns to be launched with regards to proper waste management. This can take place on a community and on a more strategic level between stakeholders. Table 28 below provides Desired End State for Education and Awareness in the Municipality.

Table 28: Desired End State for Education and Awareness

GOAL 7: ENSURE THAT PEOPLE ARE AWARE OF THE IMPACT OF WASTE ON THEIR HEALTH, WELL-BEING AND THE ENVIRONMENT			
Implementation Strategies			
Immediate	Short term	Medium term	Long term
Recruit environmental/waste education personnel.	Develop an education and awareness strategy and training materials to roll out education and awareness campaigns.	Continue and revise implementation of education and awareness campaigns in a sustainable manner.	Continue and revise implementation of education and awareness campaigns in a sustainable manner.
Develop awareness campaign with regards to waste minimisation and hierarchy of waste management.	Launch awareness campaign in community, e.g. recycling competition at school level.	Amend and continue awareness campaign in order to reach entire community.	Amend and continue awareness campaign in order to reach entire community.
Develop information dissemination strategies between all stakeholders.	Implement information dissemination strategy, for example build community awareness through education.	Implement information dissemination strategy, for example communicate with stakeholders on regular basis in form of forums or workshops.	Implement and amend information dissemination strategy in order to ensure adequate communication between stakeholders.

8. STAKEHOLDER PARTICIPATION

The Situation Analysis and draft IWMP were presented during a stakeholder participation meeting to be held on 5 September 2019 at Vaal Boardroom, President Kruger Street, Vanderbijlpark located in the OK Building, 2nd floor. The meetings were as advertised in the Vaal Weekblad and Southern Ster local newspapers (refer to **Appendix 4** for a copy of the Tear sheets/advertisements placed in the DFA).

The purpose of the stakeholder engagement meeting was to introduce the situational analysis and to introduce the draft IWMP to the public and provide a platform to discuss any concerns/queries or to raise comments.

Copies of the draft IWMP document were widely distributed i.e. internally within the Emfuleni Municipality as well as at the various local libraries for stakeholders or for the public to have access to, prior to the meeting.

Comments were invited to be submitted by 23 September 2019 on the draft IWMP document. Interested and Affected Parties were also requested to register to provide any comments on the Report or to raise any concerns. Copies of the presentations were also made available to the Municipality to hand out to those who could not attend the meetings for some reason.

There were limited comments from the Municipal officials, which were considered and included in the Final Situational Analysis and IWMP Reports.

9. GOALS AND TARGETS

The following sections outline the goals and targets identified and the possible alternatives for each.

9.1 Waste Disposal Infrastructure

Goal 1: Improve and develop infrastructure to comply with legislative requirements and municipal needs.

Targets:

1. Ensure that all the landfill sites in the Municipality are licensed and comply with legislative requirements.

9.1.1 Target 1: Ensure that all the landfill sites in the Municipality are licensed and comply with legislative requirements

As indicated in the “Situation Analysis Report”, the Municipality has jurisdiction over three operational disposal sites viz the Boitshepe -, Waldrift – and Palm Springs disposal sites, one closed disposal site viz the Zuurfontein waste disposal site, one proposed waste disposal site viz the Yakani disposal site and 5 (five) transfer stations viz the Springbok -, Roshnee -, Arcon Park -, Sonland Park -, Vaaloewer - and Sebokeng transfer stations. The Sebokeng transfer station is constructed, but currently not yet operational while the Springbok transfer station is vandalised and not in use.

Except for the proposed Yakani disposal site, all the facilities are licensed in terms of the National Environmental Management: Waste Act (Act 59 of 2008)(NEMWA). The Yakani disposal site is in the final stages of licensing with the EIA and detailed design being completed. The issuing of the license by GDARD is awaited before construction can commence. This process should be fast-tracked where possible.

The Boitshepe and Waldrift disposal sites existing licenses are currently under review with a Section 24G Environmental Impact Report being completed and submitted to GDARD to decide whether these sites can continue with operation or whether an application for closure should be submitted. The airspace and site life of the Boitshepe landfill site is limited, and it is expected that the Municipality will have to apply for official closure and to properly close and rehabilitate the Boitshepe site in accordance with approved closure and capping designs.

The Springbok transfer station is vandalised and not in use.

The waste management facilities should be properly managed to ensure compliance with their license conditions. This inter alia includes bi-annual external auditing and water quality monitoring, which needs to be conducted and the reporting of the information to GDARD timeously as per license requirements.

9.1.2 Target 2: Maintain infrastructure on the various landfill sites

Management of landfill site operations is one of the most important functions of the Environmental Management and Planning department (Waste Management Division) because this is where the department can collect revenue, through the operation of the weighbridge system. The ageing of the weighbridges at Boitshepe and Waldrift landfill sites causes a constraint and affects collection of income. The consistent malfunctioning of the weighbridges leads to a loss of income and customers. It also creates disputes in terms of billing of customers and this affects the municipality's reputation of potential customers. The software utilised does not support the

automatic creation of monthly billing of registered and new customers. The lack of this function forces the municipality to use manual mechanisms which contribute in the delays of billing and loss of income

The weighbridge at the Palm Springs landfill is not in use due to the lack of electricity connection. Record-keeping of incoming waste is done by estimation which causes disputes with customers.

The weighbridges should be repaired, regularly calibrated and the weighbridge software systems should be updated to ensure a faster efficient and more accurate billing system is in place for effective monthly billing. The software license used for landfill billing systems should be legalised. These licenses should form part of the contract agreements with the operators appointed and a condition should be incorporated into their agreements that information might not be withheld.

Poor road infrastructure is not conducive for customer use. Roads should always be maintained. The fences, where vandalised or interrupted, should be repaired to prevent unauthorised entry to the various facilities, landfill sites and transfer stations.

Alternative:

1. Establish a proper transfer station and Materials Recycling Facility / Waste Sorting Facility / Buy-back facility at the Springbok transfer station site.
2. Privatisation of waste management operations at the proposed Yakani landfill site.
3. Establishment of a recycling buy back centre in CE6 area in Vanderbijlpark

Alternative 1: Establishing a transfer station with Materials Recycling Facility (MRF) /Waste Sorting Facility or Buy Back Centre at the Springbok transfer station site.

The growth in the Emfuleni Municipality's population and size has increased the amount of waste the Municipality must manage. The Municipality provides once-per-week refuse collection services for residences. The Municipality is not offering a kerbside recyclable collection service, but from the waste characterisation study, the results show that a large volume of waste can be diverted from landfilling. Several private recycling initiatives are being conducted in the municipal area, and should the Municipality establish a MRF/sorting facility/buy-back centre, it could first of all generate an income for the Municipality once they have entered into agreements with various recycling companies i.e. Consol (glass), Mondi (paper), and other recycling companies. Secondly the Municipality will save on valuable airspace at the landfill site by diverting recyclable material from landfilling. Job opportunities for informal recyclers can also be provided through the establishment of a MRF, as well as for trolley workers that can gather recyclable material and sell it off at the MRF or buy-back centre (if operated in the latter manner).

Transportation logistics and costs are two significant factors when the feasibility of recyclable materials to be delivered to a MRF, is considered. If the Municipality develop recycling programs, the transportation cost issue will be mitigated by the fact that materials must be transported to markets regardless of where they're collected.

Alternative 2: Privatisation of waste management operations at the proposed Yakani landfill site

Currently, all the operations at the existing three operational landfills, Palm Springs, Boitshepe and Waldrift landfills, have been outsourced. The outsourcing of operations at the proposed Yakani landfill should be considered as well.

In order to establish the feasibility to also privatise the management of the proposed Yakani landfill site within the Municipality, a Section 78 service delivery assessment should be conducted. A Section 78 (S78) assessment is a process required by the Municipal Systems Act (2000) to assess potential service delivery mechanisms for the provision of a municipal service. The S78 assessment is a strategic decision-making process that may have long term service delivery implications. The purpose of a S78 assessment for waste management services is to select the most appropriate service delivery mechanism(s) that will ensure access to efficient, affordable, economical and sustainable waste management services at the subject landfill.

Analysis for alternative no 1:

In considering the feasibility to establish a transfer station and MRF/Waste Sorting Facility at the Springbok transfer station site, economic -, environmental -, and social factors should be considered. Since the Springbok transfer station site was operated in the past as a waste transfer station, the environmental and social aspects in proofing feasibility is self-explanatory and make sense. From an economic point of view the MRF/Waste Sorting/Buy-back centre could first of all generate an income for the Municipality once they have entered into agreements with various recycling companies i.e. Consol (glass), Mondi (paper) and others, to buy the recyclable material, and secondly with the diversion of waste from landfilling, it will save valuable airspace at the existing operating landfill sites.

Transportation logistics and costs are two significant factors when the feasibility of recyclable materials to be delivered to a MRF, is considered. If the Municipality develop recycling programs, the transportation cost issue will be mitigated by the fact that materials must be transported to markets regardless of where they are collected.

The budget for establishing a transfer station and MRF/Waste Sorting/Buy back centre should take capital and operational cost into consideration. The typical capital cost estimate for the establishment of a MRF/Waste Sorting Facility will be as follows:

Table 29: Capital Cost Estimate for Establishment of MRF / Waste Sorting Facility

Schedule	Total Amount
A-Buildings and fence	R1,759,645.36
B-Site Clearance	R751,280.00
C-Concrete	R1,250,661.10
D-Earthworks (Roads, Subgrade}	R1,112,913.52
E-Preliminary and General	R70,000.00
F - Professional Fees Engineer: Design and Site Supervision - As built	R750,000.00
Sub Total	R5,694,499.98
10% Contingency	R6,263,949.98
Sub Total	R6,263,949.98
15% VAT	R939,592.50
Total	R7,203,542.47

It should be noted that this cost estimate is provided for a non-sophisticated MRF, without conveyor belt systems, but rather hand sorting, to keep the capital cost as low as possible. Hand sorting will also create job opportunities for the local community. The MRF can at any stage be upgraded to a more sophisticated MRF with conveyor belts, should the Municipality decide to follow this route. The reasoning is to rather start small and then upgrade if the operation proves to be feasible from a financial point of view, rather than going big and it becomes a white elephant for economic reasons.

Because recycling markets are volatile, revenues from recyclable sales should be conservatively estimated. The potential income from selling recyclable material is provided below, working on a 30% recycling factor (again a conservative recycling factor approach is followed):

Table 30: Potential Recycling Revenue Income

Recycle factor	30%		
	Tariff		Revenue / annum (262 working days)
	ELM (tons/day)	Tariff (R/ton)	
Organics	30	-	-
Cardboard	8	600	1,257,600
Paper	26	350	2,384,200
Glass	6	330	518,760
metal	3	300	235,800
Plastics	22	700	4,034,800
Builders Rubble	16	-	-
	111	2,280	8,431,160

The operating cost per month includes staff salaries, running cost (diesel and maintenance) as well as insurance, and is estimated as follows:

Table 31: Operating Cost Estimate for MRF / Waste Sorting / Buy back centre per annum

Item	No of items	Cost per month	Cost/Annum
Insurance for Skip loader truck	1	R 2,000.00	R 24,000.00
Diesel	1	R 16,000.00	R 192,000.00
Maintenance cost	1/3	R 1,500.00	R 6,000.00
Driver	1	R 12,500.00	R 150,000.00
Supervisor (Manager)	1	R 25,000.00	R 300,000.00
General Worker	10	R 5,000.00	R 600,000.00

Total Operational
Cost per Annum = **R 1,272,000.00**

It is assumed that the Municipality will allocate one of their existing skip loader trucks and therefore no provision was made for the purchase of a new vehicle.

From the above basic desk top feasibility investigation (revenue income from selling of recyclable materials and saving on airspace), versus the expenditure (capital cost for establishment and

monthly operating cost) it can be concluded that the establishment of a MRF/Waste Sorting Facility/Buy-back centre make absolute business sense.

It is however recommended that an in-depth feasibility study be conducted as part of the business plan to apply for donor funding to assist in covering the capital cost expenditure for the establishment.

Analysis for alternative no 2:

The Municipality has already decided to outsource the operations at the Palm Springs-, Boitshepe and Waldrift landfill sites and has benchmarked their operations in line with the best performing municipalities in Gauteng. The revised tender specifications allowed the Municipality to have proper control over the contractors to ensure improved operations on each landfill site.

A Section 78 (S78) assessment will cost the Municipality an estimated R 600,000.00 per study (to determine whether disposal service delivery at the proposed Yakani landfill should be conducted internally or also outsourced). The cost – benefit of privatisation of the municipalities' Yakani landfill site operations can only be determined after the study has been completed. It is therefore recommended that the Municipality allows for the study within their municipal budget in order to analyse the possible advantages to privatise the Yakani landfill site operations as well.

Possible benefits of privatisation of the Yakani landfill site operations could include:

1. Reduced operating cost of landfill sites,
2. Reduced capital expenditure for the Municipality in terms of plant and equipment procurement,
3. Reduced operational expenditure in terms of salaries,
4. Improved operation of landfill sites.

The Municipality has in principle decided to outsource the operations at the proposed Yakani landfill site and was captured as such in the waste management license application currently in process.

Due to the fact that the current landfill manager at ELM is responsible for overseeing the contractor operations at the Palm Springs-, Waldrift and Boitshepe landfills, it is therefore recommended that the Yakani landfill operations (once operational) be outsourced as well to ensure that the landfill manager can put all his time into the monitoring of operations at all the ELM landfill sites. The expenditure to conduct the Section 78 study is therefore not necessary and could rather be transferred to ensure enough budget for the Waste Management Division (landfill operations). The benefits are self-explanatory as provided above.

Analysis for alternative no 3:

Safripol, a polymer producer and marketer company has started with the process of kicking off a cooperative project for the establishment of a recycling buy back centre in CE6 area in Vanderbijlpark, with Petco and ELM. At a recycling buy-back centre, the incoming recyclables are weighed, a number allocated and then the recycler paid for in cash. Since there are no recycling facility in the Vanderbijlpark area, a buy-back centre will reduce the volumes of waste to be landfilled (saving valuable landfill airspace), and also create job opportunities and an income for the community. Such a facility would cost approximately R2,800,000 (capital cost for establishment).

9.1.3 Legal requirements/framework

All waste disposal facilities should be licensed in terms of Section 45 of NEMWA. The MRF, buy-back centre and transfer stations do not have to be licensed in terms of Section 45 of NEMWA if the facilities have a capacity to store less than 100m³ of general waste at any one time. It therefore falls outside the parameters of the listed activities in Schedule 1 of NEMWA.

9.1.4 Resources and finances

- Municipal Budget
- Municipal Infrastructure Grants or Special Municipal Infrastructure Fund.
- National Government three-year cycle and business plans have to be submitted and funds made available to District Municipalities.

9.1.5 The implications should there be lack of action on the strategic goal 1

If goal 1 is not implemented, the municipality will experience environmental impacts associated with landfilling such as the contamination of underground water resources, poorly run waste disposal facilities posing health and safety challenges to workers and reclaimers. If the landfill site is not operated in terms of the Legislative requirements, the Provincial authority has the right to close down the site until the daily operations meet the requirement or strict penalties can be imposed on the Municipality to a maximum of R10 000 000 per event.

9.2 Waste Collection

Goal 2: Provide effective waste collection.

Targets:

1. Maintain current service delivery to all areas within the Municipality and extend service delivery to all indigent populations where possible.
2. Effectively plan to extend service delivery to any new developments within the Municipality.
3. Conduct a transportation study to identify and optimise collection routes and number of service points.
4. Establish receptacle requirements within the Municipality and supply the receptacles to residents in order to optimise collection efforts.

9.2.1 Target 1: Maintain current service delivery to all areas within the Municipality and extend service delivery to all indigent populations where possible

The Municipality should maintain the current service delivery to all areas within the municipal area and extend the service delivery to all indigent households and new developments. The Municipality's vehicles are old and the turn-around time for refuse compactors and yellow plant is currently standing at delays on average going from 6 months and more. This is as a result of available budget for repairs and for purchasing new collection vehicles. This has resulted that the Municipality must hire contractors to conduct the waste collection service. The condition of the contractor's vehicles are good and the Municipality does not have the responsibility to maintain the vehicles. The budget should however be sufficient for the hiring of contractors for waste collection, alternatively, for the purchasing of new collection vehicles. The latter should be done preferably under a lease agreement to ensure that the vehicles have maintenance plans

and would not cause delays in waste collection services when vehicles are experiencing breakdowns.

The financial implications of the free basic refuse removal service to indigents should also be determined to ensure that the cost shortfall not covered by the Equitable Share is budgeted for accordingly by the Municipality

9.2.2 Target 2: Effectively plan to extend service delivery to any new developments within the Municipality

The Municipality has already included the new developments i.e. Kwa Masiza (Zone 28), Golden Gardens, Sonderwater, Beverley Hills, Palmsprings, Tshepong, Zone 24, Miami Sands and Tshepiso Phase 5 into the current service delivery system.

It is essential that that any future residential and business area expansion are catered for in terms of refuse removal. This will allow the Municipality to, at an early stage, determine the possible costs involved and therefore will be able to adjust their budget accordingly. This will allow the Municipality to service the new areas when they are developed.

Alternative:

1. Privatised waste collection for new developments.

Analysis for alternative no 1:

The Municipality could develop and enforce a strategy to ensure that any new developments within its jurisdiction should allow for a privatisation of its waste collection service. This will exempt the Municipality for a waste collection service to these areas. Although this will work well with mid and high-income developments, low income developments will not be able to cater for this requirement. The Municipality will have to allow for the planning and extension of the current collection capacity if any low-income housing developments take place.

9.2.3 Target 3: Conduct a transportation study to identify and optimise collection routes and number of service points

Transportation is an expensive component in the waste management cycle due to high fuel prices and vehicle wear and tear. Although it may seem to be a cost saving by reducing the number of trips required to transport the same volume of waste, overloading of vehicles increases wear and tear.

It is proposed that the Municipality conduct a transportation study to identify and optimise the waste transport system, especially with the establishment of the Yakani landfill as a replacement site for the Boitshepe landfill, since the site is much further away from the generation areas and will affect turnaround times. The study can also assist in ensuring that compacter trucks are not running to the landfills half full.

Simple logical systems can be put in place (e.g. effective use of available infrastructure and resources). Larger municipalities might find optimisation models useful to determine the most cost-effective transportation systems.

Alternative:

1. Alternative vehicle and transport options.

Analysis for alternative no 1:

Looking at alternative more efficient and cheaper transport systems is encouraged, especially where such alternatives already exist and there will be no additional capital costs required to establish them. This could for example be one of the outcomes of the route optimisation study.

9.2.4 Target 4: Establish receptacle requirements within the Municipality and supply the receptacles to residents in order to optimise collection efforts

It is recommended that the Municipality investigates the option to standardise to best use and supply the selected receptacles to the different communities within the Municipality. The cost of the supply of the receptacles should be carried by the individual property owner to defray the financial burden on the Municipality and to ensure that the individual owners take care of their receptacles.

The following must be considered when selecting suitable receptacles:

1. **Cost:** Wheelie bins are more costly than plastic bags but have a longer lifespan.
2. **Size:** The size of the receptacle will be determined by the bulk (volume) of non-recyclable waste generated by an average household in a certain area. The frequency of collection must be considered, as frequencies less than once a week become a health hazard in South African climatic conditions. The maximum size of receptacles for a household is therefore set at 240l.
3. **Pollution:** Plastic bags create an additional source of pollution if not re-used and/or recycled.
4. **Compatibility:** The receptacles must be compatible with the type of collection vehicle. In areas where wheelie bins will be feasible, wheelie bins must be phased in as and when transport vehicles that are currently not compatible with wheelie bins are replaced. However, compactor trucks may not be the best method of collection for mixed recyclables, nor for the collection of non-recyclables with low compaction potential.
5. **Handling:** The receptacles must be easy to handle by the household and the Service Provider/Municipality and must be easy to clean and have no sharp edges. However, some high-density areas on steep slopes (although there might be proper roads for trucks) might need other types of receptacles than areas on flat ground.
6. **Vermin and vector control:** The receptacles must be impermeable to vermin and flies. This implies that receptacles must not allow moisture or rain water to enter and must not discharge any leachate.
7. **Durability:** The receptacles must be fairly resistant to mechanical damage as well as be "animal proof". Various domestic and other animals damage receptacles in search of food.
8. **Availability:** The receptacles must be freely available in the market at competitive prices (to both the Municipality and consumers as the case may be).
9. **Number of receptacles:** The size of the household and the volume of waste generated will determine the number of receptacles required. A fixed number can be provided per household and additional receptacles on request and possibly at a cost to the household.

The following specifications are applicable to all receptacles for domestic waste collection.

1. Receptacles for the storage of non-recyclable and recyclable waste must be easily distinguishable.
2. Receptacles for the storage of non-recyclable waste at households must be:
 - Fit for the safe storage of waste
 - Such that pollution of the environment and harm to health are prevented

- Rigid and durable to within reason prevent accidental tipping, accidental spillage and leaking;
 - Intact and not corroded or worn out;
 - Covered to ensure that animals and insects cannot enter and that the waste cannot be blown away; and,
 - Not bigger than 240l.
3. Each household supplied with a bin or wheelie bin takes responsibility for the hygiene as well as safekeeping of the bin, and must not purposely damage it or use it for any other purpose than for keeping waste until collection day;
 4. The Service Provider/Municipality must take care to return the emptied receptacle to the same household from where it was collected for emptying;
 5. Where returnable receptacles are in use, household members must mark his or her receptacle to assist the Service Provider/Municipality in returning the receptacle to the same household from where it was collected; and,
 6. Elderly and disabled persons' households must have the choice to use smaller receptacles or bins that handle more easily than the standard bins provided by the Municipality.

Bulk Containers

Where bulk containers are the most applicable receptacle, the same standards apply as for receptacles as stipulated above. In addition, bulk containers must be fitted with reflectors and where appropriate be placed next to a platform for ease of access.

A formalised domestic waste collection system must be provided to transfer the waste from individual households to the bulk containers in cases where such containers are used for domestic waste. The job creation potential (i.e. involvement of community contractors) of such a domestic waste collection system must be optimised in favour of the local community.

It must be noted that skips are designed for collection of bulky waste such as building rubble or "hard" garden waste which will not become windblown during transportation. Skips are therefore not appropriate for domestic waste collection unless appropriate measures are put in place to prevent windblown litter from the skips i.e. covering nets.

Communal collection points

Communal collection points must be clearly demarcated areas with appropriate receptacles where household waste can be deposited for collection by the Service Provider/Municipality. The Municipality must ensure that communal collection points are kept tidy at all times.

The receptacles must be:

1. Covered so as to prevent windblown litter; and
2. User friendly to allow even children and disabled persons to safely deposit waste into the receptacles.

The collection points must:

1. Be easily accessible for waste collection vehicles; and
2. Encourage waste separation at source.

Frequency of collection

Acknowledging that waste minimisation is encouraged; the frequency of waste collection must not encourage illegal dumping or cause a nuisance in terms of odours and volumes of waste being stored.

Non-recyclable waste must be removed at least once a week.

Recyclable waste must be removed at least once every two weeks and removal must be coordinated with industry (the users of the recyclables) to minimise costs and the clogging of space at transfer stations and depots.

Waste deposited at communal collection points must be collected within 24 hours of receptacles being reported as full or at regular intervals so as not to attract vermin and increase health risks.

Bulk containers must be collected once filled up or within 24 hours of being reported as full, but not less than once a week.

Frequency of collection of recyclable and non-recyclable waste may differ depending on:

1. The size of the bins provided, and the volumes of waste generated;
2. The area of collection in terms of:
 - (a) type of service provided including types of vehicles and equipment used, and
 - (b) distances between collection points and disposal sites to minimise transport costs.
3. Climatic conditions - In South Africa's hot weather conditions, the collection of non-recyclable waste less than once a week is a health hazard.

9.2.5 Legal requirements/framework

Equitable waste collection services must be provided to all households within the jurisdiction of the Municipality. The Municipality should adhere to the National Waste Collection Standards developed by DEA. These standards can be included in the waste management by-laws that are necessary to enforce waste collection practises.

The Municipality should also take cognisance of the indigent policy to provide free waste collection services to those who cannot afford the service.

Weekly kerbside collection for all households are recommended with a community based waste collection system (making use of locals) recommended for densely populated areas such as informal settlements, which is not easy accessible, to collect waste to a centralised collection area (i.e. drop-off facility or transfer stations) from where the Municipality can collect the waste for disposal at a closest licensed waste management facility.

9.2.6 Resources and finances

Funding sources are the municipal budget and Equitable Share for assistance to provide free basic services to indigents.

The organizational capacity and current staff compliment within the Waste Management Division of the Municipality is not sufficient to service the existing households/service points and for proper landfill site operations.

The Municipality does not have the available resources and personnel to operate any landfill site in a sustainable manner.

The organisational structure has been updated (based on needs) and the following vacant positions exist and should be filled to ensure an effective and sufficient human resource staff component, especially if the Municipality decides to render waste collection services internally:

Table 32: Human Resource Capacity required

Area	Position	Number of Staff Required in vacant positions
Vereeniging	Superintendent	1
	Supervisor	2
	Drivers	20
	General Workers	40
	Machine operator	15
Sebokeng	Assistant Manager	1
	Superintendent	1
	Supervisor	1
	Drivers	8
	General Workers	31
	Machine Operator	1
Vanderbijlpark	Manager	1
	Assistant Manager	1
	Supervisor	2
	Driver	13
	Machine Operator	1
	General Workers	33
	Grab operator	2
	Administrative Officer	1
	Total	175

In general, should any future need arise and if future development results in an unmanageable impact on the waste service delivery, the organizational capacity needs to be increased accordingly and will at all times comply with the requirements of NEM:WA. It is recommended that the Manager: Waste Management also acts as Waste Management Officer (WMO) as per requirement of NEM: WA with associated duties.

9.2.7 The implications should there be lack of action on the strategic goal 2

- The Municipality will be in contravention of the National policy for the provision of basic refuse removal services to indigent households which requires that waste collection services should be delivered to indigent households.
- Will not contribute to government targets which aim to increase the number of households receiving a waste collection service (National Waste Management Strategy, November 2011 by Department of Environment Affairs and Tourism). This National Waste Management Strategy is currently (2018/2019) being reviewed and new targets will be set which Municipalities need to adhere to.

- Further, it will contravene any applicable municipal by-laws including the Municipality's Constitutional obligation on the delivery of waste collection services.
- The poor and the most vulnerable will continue to live in unhygienic conditions posing health and safety challenges such as vector borne diseases.

9.3 Resource Extension

Goal 3: Provide an Effective and a Cost-Efficient Waste Management Service

Targets:

1. Effective structure and extension of human resources,
2. Increase/approval of budget for Waste Collection and Waste Disposal for service delivery,
3. Effective financial management for waste management,
4. Implement improved tariff model, and
5. Decrease non – payment of tariffs.

9.3.1 Target 1: Effective structure and extension of human resources.

It is recommended that the Municipality fill any vacant positions. Thereafter the need for additional positions should be identified, the organogram updated, and the new vacant positions filled.

The organizational capacity and current staff compliment within the Waste Management Department of the Municipality is not deemed sufficient to service the existing households/service points and for the management of the landfill sites, if this is decided to be done in house.

The immediate Human Resource Capacity Staff needed to ensure an effective and efficient waste management service within the Municipality is provided in Section 3.2.6 of the Report above.

The Municipality must ensure that the vacant positions are filled with suitably qualified personnel and that the personnel receive the training required to fulfil their duties effectively.

Depending on the level of training required, general labourer versus compactor operator, it has to be decided whether to provide in-house training or whether to provide the employee with specialised training. In-house training should only be attempted if the capacity and knowledge exist within the Municipality. Since, for lower level employees the knowledge is available within the Municipality, it is recommended that experts be obtained to provide more specialised training.

9.3.2 Target 2: Increase/approval of budget for Waste Collection and Waste Disposal for service delivery.

All waste landfill operation services are currently being outsourced and additional waste collection vehicles are hired.

The budget is however not enough to pay the contractors and should be increased/amended and approved.

The estimated operational cost for the three landfills (pending on the award for the landfill operations tenders) for landfill operations is R12,100,000 for 2018/19 financial year. The budget is R5, 000,000, therefore a shortfall budget required of R7, 100,000.

The final operational impact on the 2019/20 budget needs to be defined once all tenders are awarded.

The table below gives a scenario under which future projections can be based. Column A represent annual average calculation increase of 6.5% under current operations whereas column B represents an annual increase calculated at 10.5% under ideal proposed changes as indicated

in the tender document. Therefore, the expected income for the next 3 years can be projected as follows:

Table 33: Financial Projection for Future Disposal Operations

PERIOD	A	B
	PROJECTIONS WITHOUT ADDITIONAL CHANGES ON THE CURRENT OPERATIONS. (6.5%)	PROJECTIONS WITH CHANGES ON THE CURRENT OPERATIONS. (10.5%)
Year-1	R15, 886,546	R16,483,225.08
Year-2	R16, 919,171.93	R18,213,963.71
Year-3	R18, 018,918.10	R20,126,429.90

Alternative:

1. Conduct Waste Collection Service internally.
2. Waste collection by community-based collection models

Alternative 1: Conduct Waste Collection Service internally.

Analysis for alternative no 1:

Most of the vehicles (waste collection trucks/REL compacter trucks) of the Municipality are old and needs replacement. Some of the vehicles are more than 14 years old. The Municipality also has a severe shortage of equipment for landfill operation.

The correct type and numbers of vehicles which is required for delivery of waste management services is a major contributing factor for the Municipality to ensure effective and efficient waste service delivery.

Should waste collection services be conducted in-house, Fleet Management must allocate a budget to purchase new vehicles for operational purposes within the waste department. Collaboration is required with the fleet management section of the Municipality and external service providers to ensure that turn-around time for servicing the waste fleet is reduced.

Collection vehicles that are the most appropriate for the specific task and geographical terrain must be used. Collection vehicles used for the collection of non-recyclable waste might not be appropriate for the collection of recyclable waste.

Consideration must be given to the following:

1. Type of waste to be removed - recyclable or non-recyclable;
2. The geographical area of collection;
3. The method of collection - e.g. whether the receptacles in use need specialised equipment to be lifted or not;
4. How much each type of waste can be compacted;

5. Any leachate forming when compacting the waste;
6. Whether different types of recyclables are collected in one receptacle at the households;
7. Collection vehicles, used for the collection and transportation of waste must not be used for any other purpose while collecting and transporting waste;
8. Health issues (regular cleaning of the vehicles is required) must be considered;
9. Waste must be collected and transported in closed vehicles (covered to ensure no windblown litter generation) to prevent littering during transportation. Non-compatible vehicles must be phased out.
10. Maintenance schedules must be adhered to and roadworthiness of vehicles ensured where applicable in order to ensure a reliable waste collection service.

Possible benefits of privatisation of the waste collection and disposal services could include:

1. Reduced operating cost of waste collection,
2. Reduced capital expenditure for the Municipality in terms of trucks and equipment procurement,
3. Reduced operational expenditure in terms of salaries,
4. Improved waste collection services within the municipal area.

Reasons why the Municipality cannot render an effective waste collection and disposal service include the following:

1. Collection Services:

Current Waste Collection vehicles are old and need replacement. The Municipality does not have the budget to replace and maintain the required fleet (at least 15 REL compactor trucks would be required). However, to purchase 15 new REL vehicles would cost the Municipality R18,000,000 approximately, but the costing for the Municipality to hire the 15 REL vehicles is currently costing the Municipality R2,400,000 per month. Considering that the life time of these REL vehicles are only 5 years (due to wear and tear), it would be more feasible for the Municipality to purchase their own vehicles (R18,000,000) rather than to hire vehicles over a 5-year period (cost would be R144,000,000 approximately). Equipment

For waste collection in the month of June 2019, a total amount of R 2,954,164.95 was paid for waste collection at transfer stations, to service informal settlements and for the clearance of illegal dumping. That amount can vary depending on the need to hire. Waste collection at the above mentioned areas is done as and when reported/ required. Sufficient budget needs to be allocated and approved for the hiring of vehicles/ equipment for these services. Hiring of this vehicles/ equipment is additional to the hiring of vehicles for waste collection in residential areas.

2. Disposal Services

The Minimum Requirements for Landfilling requires that there should be a Responsible Person with suitable qualifications and experience to operate the landfill sites not the Permit Holder. The landfill operations require yellow plant that includes landfill compactor, bulldozer, TLB, water cart, 6m³ skip bins and skip tractor loader. Staff compliment of Supervisor, weighbridge operators and operators for all the machinery stated above is also required.

Currently, ELM only has a Superintendent appointed to do oversight on the 3 operational and one closed Landfill site. The operations of the Palm Springs are currently also managed by himself that has experience in managing landfill sites for more than 20 years. Emfuleni does not have any of the yellow plant listed above and no personnel appointed nor provided in the organogram to execute any deliverable as indicated above.

The alternative to render disposal services in house is therefore not advisable, but for waste collection it would be more feasible.

Alternative 2: Waste collection by community-based collection models.

Locals can be used to service densely populated settlements such as informal settlements.

Increase SME participation by encouraging locals to explore opportunities in waste through using labour intensive collection models.

The main aim is to increase the number of households receiving a waste collection service and by promoting labour intensive collection methods a municipality could realize other spin offs such as creating job opportunities as well as encouraging entrepreneurship.

More information on a community-based waste collection system is as follows:

Collection in informal settlements is hampered by poor access and lack of roads within the settlements themselves. As such, conventional collection vehicles (compactors) cannot access individual households and therefore providing an individual household service in these areas is impossible. Furthermore, the lack of title and ownership of property restricts municipalities' collection budgets, as rates are not collected in these areas.

People living in informal settlements have the right to basic services including waste collection. Informal settlements are typically serviced at the expense of ratepayers. All municipalities have pro-poor or indigent policies that cater for the poor people who cannot afford to pay for the municipal services.

Some key obstacles with regards to financing free basic services are discussed below.

There is no financial recovery for the waste service in informal settlements in the form of rates; it is recommended that an innovation tariff system be implemented by the Municipality whereby tariffs are linked to waste volumes produced by the households. The municipality charges ratepayers only for the amount of waste that is collected by the municipality. The result of this has been that ratepayers are encouraged to recycle and thereby reduce the amount of waste generated.

No billing system can be established for informal settlements as there is no title or ownership structure for individual houses;

In order to meet the basic needs for all the residents in the municipality, the municipality must ensure that indigent residents have access to free lifeline basic services. The indigent and pro poor policies force the municipalities to render free basic services to the people who cannot afford to pay for such services.

To provide services in the un-serviced areas of the Municipality seems to be a daunting and impossible task. However, a solution recommended was found in the communities themselves providing the service. And therefore, a different approach was needed - one in which the entire community would benefit, and the local authority could achieve its service delivery goal.

A community-based refuse collection business model allows the municipality to achieve their service delivery goals by providing efficient, sustainable waste management services while at the same time answering to the wider need for government and the private sector to promote Black Economic Empowerment, create jobs, transfer skills and uplift communities. Waste collection is an ideal industry within which to create employment. It can be adapted to be labour intensive, instead of capital-intensive as is the case in many developed countries.

The first step in establishing a community based-waste collection system for the un-serviced or rural areas is that local municipal councillors and community leaders must identify suitable community contractors within a designated area within the municipality. These are generally unemployed individuals, men and women, who show entrepreneurial and leadership qualities, are literate and have valid driver's licenses. Importantly, they are individuals who are accepted by the community.

A contract is entered into between the municipality and a third party/ies in which the third party/ies agrees to sub-contract the collection service to community contractors, who are members of the community being serviced. The contractors commit to providing services to a defined standard; and the third party/ies agrees to train and assist the contractors set up and run their small businesses. The third party/ies arranges bank loans for the contractors to buy their vehicles and equipment, which they own from the first day of operating their businesses and also assists the contractors with all facets of establishing their businesses, from finding premises, to recruiting staff, from the legal aspects to financial and administrative systems.

The contractors are put through a five-year training programme in the management of small businesses, which has been accredited by the University of South Africa. The third party/ies remains involved throughout the entire contract period, which is usually five years. This is a key element of its success, since most new enterprises fail because the owners can perform the technical work but have no administrative experience. On-going service provision includes financial management support, quality control and community liaison.

The waste collection skills needed are easily taught and can be supplemented in a way that allows the new waste management entrepreneurs to remain in control of their own businesses. Jobs are created within the community for formerly unemployed and unemployable men and women, helping people in these communities prosper. Their environment is also far cleaner and healthier. As a result, they are more able and willing to contribute a small monthly payment for waste removal services. Typically, each contractor employs 12 to 16 people from within the local community to service 5000 collection points, and the programme endeavours to spend at least 70 per cent of the contract revenue within the community by way of salaries and wages, diesel purchases and consumables.

This alternative is advisable, especially in the informal settlements where access is limited for the outsourced contractors' collection trucks.

9.3.3 Target 3: Effective financial management for waste management

It is recommended that a detailed financial investigation be conducted by the Municipality which will address the following:

- Operational management of vehicles, salaries, etc.
- Basic service allocation (appropriation) from MIG funding (including total allocation for indigents)
- Credit control
 - assessment of effective use of financial system & reporting ability

- accessibility of pay points to the public
 - CRM
 - Indigent Management with specific regard to allocate equitable share to the accounts
- Pricing & tariffs
 - Review policies & compile by-law for legal compliances including Tariff Policy, Credit Control, debt collection & Indigent Policy
 - Identify gaps in terms of legislation & policies
 - Identify operational non-compliance
 - Assess tariff costing mechanism or formula
 - High level exercise to determine actual cost of services delivered
 - Contribution of developers to bulk infrastructure
- Billing
 - Differentiation of household, business(s) for billing purposes
- Other issues
 - Budget management
 - Cash flow assessment
 - High level balance sheet review

The current billing system does not seem to be effective. A pre-paid system should be investigated to be implemented where non-payment of fees is present. The Municipality must also take cognizance of the draft policy on Free Basic Refuse removal and develop an action plan for implementation.

It is further recommended that a detailed financial investigation be undertaken to investigate the operational management of vehicles, salaries, basic service allocation, credit control, pricing and tariffs, and other issues i.e. budget management etc.

9.3.4 Target 4: Implement improved tariff model

To provide a cost-effective waste management service the tariff structure should be investigated to be viable and be standardised. A distinction between the tariffs for waste collection at domestic, businesses and Government Institutions should be made that will ensure that the generators of waste pay for the waste they generate. This can also be an incentive for businesses to minimise their waste streams.

The financial implications of the free basic refuse removal service to indigents should be determined to ensure that the cost shortfall not covered by the Equitable Share is budgeted for accordingly by the Municipality.

In South Africa, each local municipality has a unique set of parameters that influences waste service delivery and tariff charges. Parameters can vary from the type of waste removed, municipal infrastructure and budgeted expenditure on unique services. A comprehensive tariff study is needed to accommodate the following:

- Upgrading service delivery and introduction of waste services throughout the municipal area will entail standardising the service that is delivered to all the households in the area.
- All households must therefore be serviced on an equal basis, either by the Municipality/ the contractor or by the community.
- In the medium term it is important that the tariffs identified for service delivery is comparable throughout each local municipal area in the District.
- Over a longer-term service need to be identified and uniform tariffs implemented throughout the municipal area.

- The standardisation of the tariff structure will provide uniformity that may encourage payment of tariffs.
- Tariffs for additional services, including garden and commercial waste removal, should also be according to service delivery.
- The Municipality must also take cognizance of the draft policy on Free Basic Refuse removal and develop an action plan for implementation.

DEA has developed a standard tariff model that can be used as a base for implementation and adaption by the municipality for an implementation of an improved tariff model.

9.3.5 Target 5: Decrease non – payment of tariffs

To provide a cost-effective waste management service, the payment of service tariffs should be improved. Formal households as well as businesses currently serviced are billed on a monthly basis in conjunction with their water and electricity bills. Penalties for non-payment of accounts should therefore easily be enforced by withholding services. This however is an administrative problem that generally takes a long time.

The inclusion of more areas, however, may increase the likelihood of non-payment by residents. A possible option is a pre-paid system similar to the one used for electricity. The system can be a coupon-based system where coupons can be bought in advance for a specific month. The negative aspect is that non-payment and subsequent non-delivery of services will lead to an increase in the instances of illegal dumping in the area. It is recommended that the pre-paid system be used in accordance with strategies to prevent illegal dumping in the municipal area. It would also be possible for the Municipality to retrieve some of the lost service fees from the Equitable Share.

9.3.6 Legal requirements/framework

Section 24 of The Constitution of the Republic of South Africa (Act No. 108 of 1996) gives every person a right to an environment that is not harmful to their health or well-being. Schedule 5B assigns the responsibility for waste collection services and disposal to local government. Furthermore, the delivery of municipal services is defined both in the Municipal Structures Act (Act No. 117 of 1998) and the Municipal Systems Act (Act No. 32 of 2000). In addition to the mandate outlined in The Constitution and the Municipal Systems and the Municipal Structures Acts, the Waste Act (Act No. 59 of 2008) requires municipalities to provide containers for recyclables, the waste information system and integrated waste management planning. The municipality must also draft waste management by-laws that are specific for their area of jurisdiction. The by-laws must be specific on the services that are provided, and the charges and tariffs associated with the services. It must also provide for the regulation of services not provided. For example, if garden waste is not removed by the municipality, regulations must state how communities must deal with this waste stream. It must provide for permits to be issued to private companies or persons providing the service on behalf of the municipality to allow control over these services. The by-laws should also make provision for the implementation of the waste management hierarchy. For example, the by-law may state that certain waste streams must be separated at source and taken to drop-off centres.

9.3.7 Resources and finances

Several financial resources options for the implementation of the various recommendations were identified.

- Municipal Budget (Shortage of Municipal funds)

- Municipal Infrastructure Grants or Special Municipal Infrastructure Fund. National Government three-year cycle and business plans have to be submitted and funds made available to District Municipalities
- Equitable Share provided by Government should be used for subsidising refuse removal tariffs.

9.3.8 The implications should there be lack of action on the strategic goal 3

If goal 3 is not implemented the municipality would not be able to provide the necessary waste management services as effective financial management and income generation if required for all aspects of management planning. Another problem is that due to the high demand for waste collection services and the limited resources available to municipalities, municipalities often find themselves having to work overtime. This practice is closely regulated by the municipal financial legislation as well as the labour laws. In trying to cope with the increased demand, municipalities often transgress these legislative prescripts of ensuring a certain maximum number of hours a worker can be expected to work overtime as well as the maximum amount of money a municipality can spend on overtime payments. The solution is to balance service delivery and available resources. Innovative planning of collection rounds and schedules can significantly cut the overtime required.

9.4 Waste Minimisation

Goal 4: Decrease waste deposited on landfill

Targets:

1. Formalise and encourage recycling activities,
2. Encourage waste minimisation,

9.4.1 Target 1: Formalise and encourage recycling activities.

In order to ensure maximum recycling in the Municipality, it is recommended that a formal agreement be reached with waste recycling industries and companies. These companies will then work together with potential waste recyclers in the municipal area. DEA has signed agreements with the plastic, glass, waste tyre and Poly-Ethylene Terephthalate (PET) industries. To this end, it is further recommended that the DEA be approached to facilitate the recycling of the aforementioned waste streams. In addition to this, appoint a Waste Specialist to enhance the current programmes and to identify, monitor and evaluate recycling opportunities and initiatives within the Municipality.

9.4.2 Target 2: Encourage waste minimisation

Waste minimisation at source is more effective than recycling since it reduces removal and transport costs. It is therefore recommended that waste sorting and minimisation be encouraged amongst the households and businesses within the Municipality.

9.4.3 Legal requirements/framework

Waste minimisation should be encouraged via by-laws that should be updated to make provision for the implementation of the waste management hierarchy.

9.4.4 Resources and finances

Several financial resources options for the implementation of the various recommendations were identified.

- Municipal Budget (Shortage of Municipal funds)

- Municipal Infrastructure Grants or Special Municipal Infrastructure Fund. National Government three-year cycle and business plans have to be submitted and funds made available to District Municipalities,
- Capital gains from the recycling market

9.4.5 The implications should there be lack of action on the strategic goal 5

If goal 4 is not implemented, the municipality will not adhere to the principles of the NEMWA and landfill airspace will not be optimised.

9.5 Management of Illegal Activities

Goal 5: Minimise/prevent illegal activities

Targets:

1. Develop an Illegal Dumping Management Strategy,
2. Improve removal of illegally dumped waste,

9.5.1 Target 1: Develop an Illegal Dumping Management Strategy

The Municipality experiences problems with illegal dumping within its jurisdiction. This can either be attributed to a lack of an effective refuse removal service, or residents being unaware of their options regarding private waste disposal. It is anticipated that a certain portion of these activities will be eliminated through proper community awareness programs.

It is imperative that the Municipality develops and implements a system to minimise or stop illegal dumping within the Municipal area. The major problem facing the Municipalities is that they do not have the specific manpower to police the illegal disposal of waste. Within the serviced areas it is easier to regulate illegal dumping and introduce a penalty system for offenders. There are several actions the Municipalities can take to minimise illegal dumping and introduce such a penalty system.

The first is that the Municipal By-laws must be formulated/revised and be enforced in order to issue spot fines for residents caught dumping waste in illegal areas. This will to a certain degree reduce and prevent illegal dumping within the town boundaries. The disadvantage is that it will not reduce dumping outside the town boundary and it will increase the pressure on already limited human resources.

A second option will be to introduce community awareness whereby a community watch movement is introduced. This will limit the pressure on the human resources of the municipality as neighbourhood watch systems are put in place. Incentives such as discount on regular fees for “clean” neighbourhoods can be introduced to encourage these activities.

A third option is the provision of garden/domestic refuse skips at strategic locations, or establishing garden refuse transfer stations, throughout the town to minimise travelling distances for the general public. The Municipalities can then remove the refuse on a monthly basis.

It is recommended that a combination of the above be implemented to find an effective solution to the illegal dumping of waste. The enforcement of the by-laws and policy and strategy development by the municipality will assist with the illegal dumping problem. Through community awareness and a neighbourhood watch system the residents will have all the information regarding the disposal of waste in their area. They will also be aware of the incentive scheme to prevent illegal dumping from taking place within their surrounds. To prevent illegal dumping

outside of town, garden refuse skips should be placed at strategic locations to provide convenient access to a disposal facility.

A Business plan was compiled and submitted to DBSA for the approval of funds to establish a large number of mini-transfer stations at identified illegal hot spot areas in the municipal area. The budget (operational cost) however does not allow for the servicing of these mini-transfer stations and therefore has not been implemented.

The costs of the skips are:

Table 34: Estimated Skip Costs

Estimated skip costs	
5.5 m ³	R 7,000.00
6 m ³	R 7,500.00
9 m ³	R 9,000.00
11 m ³	R 10,100.00

9.5.2 Target 2: Improve removal of illegally dumped waste

Illegal dumping of waste is common all over the Municipal area. The Municipality has to collect this waste at an unnecessary cost.

The Municipality should clean all areas where waste is illegally dumped. The Municipality should place skips in “illegally dumping hot spot areas”, as well as notice boards to try and prevent further illegal dumping in these areas once cleaned. The budget for clean-up operations is not sufficient and should be increased.

9.5.3 Legal requirements/framework

Section 24 of The Constitution of the Republic of South Africa (Act No. 108 of 1996) gives every person a right to an environment that is not harmful to their health or well-being. Illegal dumping should be prevented by enforcing the waste management by-laws of the Municipality.

9.5.4 Resources and finances

Several financial resources options for the implementation of the various recommendations were identified.

- Municipal Budget (Shortage of Municipal funds)
- Municipal Infrastructure Grants or Special Municipal Infrastructure Fund. National Government three-year cycle and business plans have to be submitted and funds made available to District Municipalities

9.5.5 The implications should there be lack of action on the strategic goal 5

If goal 5 is not implemented, the municipal officials will not be able to enforce waste management requirements i.e. as set in by-laws. This will result in transgressions i.e. illegal dumping of waste. A system to involve residents to assist the municipal officials to report waste transgressions will help the short-staffed municipality to keep a watch full eye all over the municipal area.

9.6 Waste Information System

Goal 6: Capacity building through information sharing

Targets:

1. Develop and maintain a waste information system,
2. Contribute to Inter Municipal Waste Information Workshops,

9.6.1 Target 1: Develop and maintain a waste information system

The main target would be to develop and maintain a WIS. This system would allow for record-keeping of comprehensive records of waste disposal and collection on which informed decision-making can be based and to comply with the reporting requirements of the relevant Provincial authority. The Municipality has weighbridges installed at all the operating landfill sites. The weighbridges are however not functioning as it should be and should be repaired and regularly calibrated. The information is required to provide more accurate waste disposal data which could be captured in the WIS.

The costs involved in the development of a WIS will vary depending on the structure and contentiousness of the area. **DEA has developed a generic WIS that may be provided to the Municipality for implementation.**

9.6.2 Target 2: Contribute to Inter Municipal Waste Information Workshops

The current difference in service delivery management within the Gauteng Province necessitates that frequent information sharing sessions be held to share capacity building information. Another option is to provide quarterly reports regarding waste management to other Local Municipalities. It is proposed that the information sharing sessions would be the preferred option since it would allow for discussions on problems encountered and not only provide information. These quarterly meetings should be attended by all the Local Municipalities within the District Municipality as well as representatives from the relevant Provincial Environmental Department.

9.6.3 Legal requirements/framework

Any person (including the Municipality) conducting an existing waste management activity listed in Annexure 1 of the National Waste Information Regulations under Section 69(1)(y) and (ee) of NEMWA must apply to the DEA to be registered on the South African Waste Information System (SAWIS) to report on the types of waste, source from which waste comes from and quantity of waste in tons. The Regulations is applicable to landfills where more than 150 tons of waste is being disposed of per day and is therefore the Regulations is indeed applicable to the Municipality.

9.6.4 Resources and finances

Several financial resources options for the implementation of the various recommendations were identified.

- Municipal Budget (Shortage of Municipal funds)

9.6.5 The implications should there be lack of action on the strategic goal 6

If goal 6 is not implemented, the performance within the municipal area will not improve. If personnel do not have the correct information at hand, they will not be able to properly plan and manage waste in the municipal area.

9.7 Education and Awareness

Goal 7: An educated community that is aware of the principles of responsible waste management

Targets:

1. Build Community Awareness

9.7.1 Target 1: Build community awareness

The Municipality presently has several formal community awareness campaigns that are directed at informing the general community with regards to waste management.

A top down approach by the Municipality relies heavily on non-payment penalties to ensure that residents comply with legislation. Recycling and waste minimisation initiatives, however, are not included in the normal service delivery and can only be effectively achieved with the co-operation of the residents.

It is therefore vitally important that the community is made aware of initiatives, waste recycling activities and the advantages of waste minimisation and recycling by the Municipality. This can either be achieved by advertisements and notices in the local newspapers or by providing information regarding these initiatives on the municipal bills distributed each month. The Municipality can also conduct road shows to demonstrate to and inform people of waste related issues.

An Awareness Campaign is crucial to make people aware of the Waste Minimisation Strategy and Waste Management Plan of the Municipality. This awareness campaign needs to have the full support of the Municipality and other Government Departments. This campaign will need to look at an integrated approach to community awareness, this can include one or more of the following campaigns: -

- **A.** Site visits by schools, community groups and businesses to a recycling centre.
- **B.** Awareness programs at schools, crèches, hostels etc.
- **C.** Town and school clean up campaigns, with prizes for the most waste collected.
- **D.** Awareness through plays, pantomimes, dances and song.
- **E.** Teaching of community members to use waste as a resource in their homes and to make crafts, which can be sold,
- **F.** Encouraging schools to establish recycling centres and use as much of the waste for arts, crafts, gardening and functional gadgets.
- **G.** Adopt a spot campaign.
- **H.** Environmental Clubs

A. Site visits by schools, community groups and businesses to a recycling centre.

Each recycling centre will have trained staff that will be capable of handling visiting groups to the centre. This site visit will teach the visiting group exactly how a recycling centre is run. They will also be exposed to the downstream projects like the composting and vegetable gardens. These ideas can then be replicated at each of the schools or community houses.

B. Awareness programs at schools, crèches, and hostels

This will involve individual site visits to each school (Can be done by Provincial Environmental officials). Each school will be required to firstly arrange a clean-up campaign in and around the school. This waste is to be brought back to the school where it will be analysed. The students will be given the opportunity to find uses for each type of waste. They will also be shown examples of things made from waste. They will then be shown what to do with the waste. This could include crafts, swings, and sold as scrap for income, arts, handy tools, blocks or useful agricultural gadgets. The school will also be encouraged to establish a waste management system at the school. This could include a recycling centre and waste management policy.

The students will then be introduced to the competition. This will include the following: -

- Drawing and colouring in competition which depicts a dirty and clean environment
- Make any toy from waste.
- Make a recreational item from tyres.
- Make any handy item from a PET bottle.
- Make anything from tin.
- Make anything from paper or cardboard.
- Make anything from glass.

The above categories are distributed between the grades by the Principle. The Provincial Environmental Department can allocate a small budget for the materials needed; will allocate a time period where they will return to monitor the progress. On completion the schools submit their best examples to the judging committee.

The final judging will be done by prominent members of the community and ended off with a ceremony and prize giving for the best categories.

The other competition can be run by “Collect a Can”, plastic or glass recycling companies and will also be introduced to each school. This involves the collection of tin cans only at each school. The school is encouraged to collect cans from homes, functions and public areas. These cans are sent to the recycling centre where the cans are weighed and documented. Each year the total tonnage is added up and submitted to Collect a Can Competition. The school with the most cans collected per school member wins a prize for the school.

C. Town and school clean up campaigns

Part of any waste program comes the initial cleaning up of the town, school or village. Here the local schools and church groups can be involved. To make the campaign more appealing there should be some sort of incentive like prizes, snacks or cash incentives for the schools' benefit. This can easily be coordinated with the Department of Education and School heads.

The Local Municipality will then arrange to take this waste away to the closest authorised landfill.

Part of the clean-up would include a presentation on what the clean-up is all about and why it is being done. The opportunity should be taken to encourage the setting up of small recycling centres. On completion of the clean up the children will return to the respective schools with the waste collected. This waste will then be tipped out and analysed to see what types of waste was collected and why people threw it away in the first place. The students should then be encouraged to think of uses for the waste.

Recyclable waste can be taken to the proposed Materials Recycling Facility (at Springbok T/S site) to be sold as an income for the school. The non-recyclable material will be transferred by the Municipality to the closest authorised landfill sites.

D. Awareness through plays, pantomimes, dances and song

This campaign would also involve schools in the area. This would start with a visit to the relevant institution to introduce the program. The institution would then develop a pantomime, dance or song to encourage waste awareness. The group would be allocated a small budget to create costumes and props. They would then visit public meetings for school functions to promote waste awareness.

E. Teaching of community members to use waste as a resource in their homes and to make crafts from the waste

This approach would be encouraging any interested community member to use waste as a resource at their homes. Poor communities are normally the best recyclers and waste users as they have through necessity used waste to build their homes. Some ideas would be as follows: -

- Using 2l plastic bottles for rain gauges, funnel or for planting in.
- Using waste paper/cardboard to make trays or bins.
- Using plastic bags to make bags, mats, jackets and hats. These items are of such good quality that they can be sold for income generation.
- Old glass bottles can be crushed and used to make concrete bricks and blocks.
- Tins can be used to make hats, lunch boxes, arty flowers and ashtrays.

F. Encouraging schools to establish recycling centres and use as much of the waste for arts, crafts, gardening and functional gadgets.

Schools can be taught how to use their waste for the arts and crafts programs or to be used in the vegetable gardens or be used to retain erosion banks.

G. Adopt a spot campaign.

The idea behind it is to encourage schools, businesses, Woman's groups, Municipalities etc. to adopt a part of the Municipality which is important to them. This might be a park area, which is overgrown, dirty and vandalized. The nearby school can now adopt that site and it will be there responsibility to keep it in working order for the year. Sponsors can be approached to assist in fixing the park up of paying for tools and labour. A sign is then erected on site with the Adopted groups name on it.

H. Environmental Clubs

- The establishment of environmental youth clubs is seen as an integral part of the programme that has a potential to draw youth involvement into implementing environmental outreach programs.

- Ward Councillors could be encouraged to revive or set up environmental desks where street representatives could be allocated.
- The Provincial Environmental Department will be intimately involved in establishing these clubs.

I. Community Awareness

The neighbouring schools are also involved in school competitions and drama performances in order to strengthen the public awareness campaign. Although there will be efforts made to inform the community about waste management and the importance of the environment, some community members will still burn their waste, hawkers will continue throwing waste on the ground despite the provision of waste bins for their convenience, the reason being they are creating more jobs for waste collection.

In order to enhance the public environmental awareness campaigns a few suggestions are made below:

- The environmental advisory unit within the Provincial Environmental Department should be engaged as their contribution could be enormous for the programme.
- The establishment of environmental youth clubs is seen as an integral part of the programme that has a potential to draw youth involvement into implementing environmental outreach programs.
- Community meetings, road shows, interaction through local radio station, door-to-door distribution of information are tools that should be implemented to encourage the recycling activities.
- Local schools should be encouraged to participate in recycling activities and environmental education should be involved in school curriculum.
- Ward Councillors could be encouraged to revive or set up environmental desks where street representatives could be allocated.
- Meeting with traditional leadership to encourage their ownership and communication of such initiatives into the rural areas.
- Publication of articles in local newspapers, printing of posters and information leaflets.

J. Workshops

Financial institutions should be engaging the community in environmental public awareness campaigns organized through workshops to inform the community about programmes and funders. The workshops should highlight to the community the importance of sorting their waste at home.

Although there were efforts made to inform the community about waste management and the importance of the environment, some community members still burn their waste, hawkers continue throwing waste on the ground despite the provision of waste bins for their convenience, the reason being they are creating more jobs for waste collection.

PUBLIC INFORMATION

The establishment of a library with lots of information on recycling, waste minimisation and integrated waste management. So, if you are looking for information, a central office which could

be at the existing Municipal offices will have a selection of books on the above subjects and numerous national and international publications on waste issues.

10. FUNDING/RESOURCES AND FINANCES

The Municipality will have to source funding for the proposed goals and targets. The funding mechanisms used could be from internal sources (operational budgets) or outside sources like government departments, private sector, and international funders/donors.

Possible donor sources for the Municipality are as follows:

- Municipal Infrastructure grant (MIG)
- Department of Environmental Affairs (DEA) - Various programmes and partnerships
- Department of Public Works (DPW) – Extended Public Works Programme (EPWP) for labour intensive construction methods.
- Department of Trade and Industry (DTI) – Various Programmes and Schemes
- Industrial Development Corporation (IDC) – Green Energy Fund
- Royal Danish Embassy (DANIDA)
- World Bank
- United Nations Development Programme
- Development Bank of South Africa (DBSA).

11. RECOMMENDATIONS

The following recommendations have been derived from the situation analysis and the desired end state:

Target	Recommendations	Implementation Detail
Goal 1: Ensure the safe and proper disposal of waste		
Target 1: Ensure that all the landfill sites/disposal and recycling facilities in the Municipality are licensed and comply with legislative requirements.	The waste management facilities should be upgraded, properly operated and maintained to ensure compliance with their license conditions. This inter alia includes bi-annual external auditing and water monitoring, which needs to be conducted and the reporting of the information to GDARD timeously as per license requirements.	All the facilities at the Municipality are licensed in terms of the National Environmental Management: Waste Act (Act 59 of 2008)(NEMWA) except for the proposed Yakani disposal site. The Yakani disposal site is in the final stages of licensing with the EIA and detailed design being completed and the issuing of the license by GDARD is awaited before construction can commence. This process should be fast-tracked where possible.
	Provide training for waste disposal facility supervisors and operators.	The existing licenses of the Boitshepe and Waldrift disposal sites are currently under review with a Section 24G Environmental Impact Report being completed and submitted to GDARD as a result of GDARD Directives. GDARD will soon decide about the future of these sites, i.e., whether these sites can continue with operation or whether an application for closure should be submitted.
	Conduct external audits and improve operations.	Waste disposal facility operators and supervisors should attend courses to have the “know-how” to operate waste disposal facilities.
		A professional service provider should be appointed on a bi-annual basis to audit all the municipal landfill sites to ensure conformance to license conditions and/or minimum requirements. The landfill audit reports will enable the municipality to take corrective steps on non-conformance items in order to improve the management at the landfill site and in order to comply with the applicable license conditions.

Target	Recommendations	Implementation Detail
Target 2: Upgrade infrastructure at the various transfer stations Springbok transfer station should be cleared, and a proper skip and ramp transfer station with a MRF should be established on the property.	Maintain infrastructure Clear Springbok transfer station area and construct transfer station and MRF on the property.	The weighbridges should be repaired, regularly calibrated and the weighbridge software systems should be updated to ensure a faster efficient and more accurate billing system is in place for effective monthly billing. The software license used for landfill billing systems should be legalised. These licenses should form part of the contract agreements with the operators appointed and a condition should be incorporated into their agreements that information might not be withheld. The fences, where vandalised or interrupted, should be repaired to prevent unauthorised entry to the various facilities, landfill sites and transfer stations. Construct MRF at Springbok transfer station property.
Establishment of a recycling buy back centre in CE6 area in Vanderbijlpark	Identify and provide land for the establishment of the recycling buy back centre	Design and Construct recycling buy back centre in CE6 area in Vanderbijlpark
Goal 2: Provide effective waste collection		
Target 1: Maintain current service delivery to all areas within the Municipality and extend service delivery to all indigent populations and rural areas where possible.	Extend services to unserved areas.	The Municipality should also extend the free basic refuse removal service to indigents in serviced settlements on an on-going basis.
Target 2: Effectively plan to extend service delivery to new developments within the municipal area	Implement waste collection services to new developments	Extend services to include the proposed new developments in service delivery system. Section 3.12 of this Report lists all the proposed new developments.
Target 3: Identify and compile a map or schedule of unserved areas within the municipality	Extend waste services to ensure that all households have access to adequate levels of waste collection services by 2020.	Update and manage the collection schedule. Conduct Transportation Route study.

Target	Recommendations	Implementation Detail
Target 4: Establish receptacle requirements in all areas within the municipality.	Determine the funding requirements for receptacles; and implement the receptacle distribution for the identified municipal areas.	Continue and extend the receptacle service.
Goal 3: Provide an Effective and a Cost-Efficient Waste Management Service		
Target 1: Effective structure and extension of human resources.	Fill current vacant positions and employ additional staff to service new areas and to manage disposal and transfer facilities.	It is recommended that the Municipality fill any vacant positions. Thereafter the need for additional positions should be identified, the organogram updated, and the new vacant positions filled.
Target 2: Conduct a detail financial investigation for proper waste management budgeting.	Identify shortages in the budget and identify possible funding sources for these shortages and amend budget accordingly. Implement revised budget.	Identify shortages in the budget and identify possible funding sources for these shortages and amend budget accordingly. Implement revised budget.
	Provide training for low level staff and for specialised positions	Locally train low level staff and provide specialised training for specialised positions and ensure proper training of contracted personnel
Target 3: Review current equipment and identify equipment that needs maintenance and/or replacement. Identify shortages of equipment to render a sustainable waste management service.	Develop an equipment replacement plan and acquire funding for the implementation of this replacement plan.	Update and amend equipment replacement plan and implement accordingly. Collection vehicles that are the most appropriate for the specific task and geographical terrain must be used.
	Collection vehicles that are the most appropriate for the specific task and geographical terrain must be used.	Collection vehicles that are the most appropriate for the specific task and geographical terrain must be used.
	Maintain equipment	It should be ensured that all collection fleet are maintained.
Target 4: Effective financial management for waste management	Performed Detailed Financial Investigation	Performed Detailed Financial Investigation
Target 5: Implement improved tariff model	Evaluate Level of Service Delivery. Develop Standardised	To provide a cost-effective waste management service, the payment of service tariffs should be improved, and the tariff

Target	Recommendations	Implementation Detail
	Tariffs for Specific Levels of Service and update on a yearly basis	structure should be investigated to be viable and be standardised. A distinction should be made between the tariffs for waste collection at domestic, businesses and Government Institutions and will ensure that the generators of waste pay for the waste they generate. This can also be an incentive for businesses to minimise their waste streams
Goal 4: Decrease waste deposited on landfill		
Target 1: Develop a Waste Minimisation Strategy	Compile a Waste Minimisation Strategy	A Waste Minimisation Study should be undertaken in order to determine from existing and new initiatives the volumes of waste that is currently being recycled, re-used and recovered and should contain actions/recommendations on how to decrease the volumes of waste being landfilled.
Target 2: Formalise and encourage recycling activities.	Provide Recycling Containers Throughout Town - Locate containers at strategic places	Provide Recycling Containers throughout Town - Locate containers at strategic places
	Apply for funding through available funding mechanisms for the development of an MRF.	Operate and maintain the MRF.
	If feasible, establish mechanisms for promoting separation at source.	Roll out separation at source to 30% of households by 2021.
	Add Additional Containers to Service New Development Areas	Add Additional Containers to Service New Development Areas
	Formal agreements should be reached with waste recycling industries and companies. These companies will work together with potential waste recyclers in the municipal area.	Formal agreements should be reached with waste recycling industries and companies. These companies will work together with potential waste recyclers in the municipal area.
Target 3: Encourage waste minimisation	Promote Waste Minimisation under residents and businesses.	Promote Waste Minimisation under residents and businesses. A target of 25% of the total waste stream generated in ELM

Target	Recommendations	Implementation Detail
		should be recycled by 2020/2021, 40% by 2024/2025 and 50% by 2027/2028.
	Formal agreements between waste recycling industries and companies/businesses	Formal agreements between waste recycling industries and companies/businesses. Approach DEA for assistance on their agreements with the plastic, glass, waste tyre and Poly-Ethylene Terephthalate (PET) industries. Identify, monitor and evaluate recycling opportunities and initiatives within the Municipal area.
	Regular forum meetings with stakeholders to co-ordinate waste minimisation and to encourage growth on the recycling section	Regular forum meetings with stakeholders to co-ordinate waste minimisation and to encourage growth on the recycling section
	Implement incentive Schemes for In-House Recycling for business and homes	Implement incentive Schemes for In-House Recycling for business and homes
	Fully utilise composting facility at the Yakani landfill, once operational.	All green waste to be sent to the Yakani composting facility once operational.
Goal 5: Minimise/prevent illegal activities		
Target 1: Develop an Illegal Dumping Management Strategy	Establish Community Watch Programme with incentive schemes	Establish Community Watch Programme with incentive schemes
	Provide Accessible Containers for Illegal Dumping Throughout Towns and Settlements	Provide Accessible Containers for Illegal Dumping Throughout Towns and Settlements
Target 2: Improve removal of illegally dumped waste	Clean Illegally Dumping Hot Spot Areas	Clean Illegally Dumping Hot Spot Areas
Goal 6: Capacity building through information sharing		
Target 1: Develop and maintain a waste information system	Develop WIS	Develop WIS
	Maintain and update WIS as the situation changes in the Municipality	Maintain and update WIS as the situation changes in the Municipality. With the repairing of the weighbridge at the various landfill sites, more accurate waste disposal data could be captured in the WIS.
Target 2: Contribute to Inter Municipal Waste Information Workshops	Attend workshops	Attend workshops

Target	Recommendations	Implementation Detail
Goal 7: An educated community that is aware of the principles of responsible waste management		
Target 1: Build community awareness	Build Community Awareness through Newspaper Notices and Flyers. Conduct Road Shows	Build Community Awareness through Newspaper Notices and Flyers. Conduct Road Shows

12. IMPLEMENTATION PLAN

The following recommendations have been derived from the situation analysis and the desired end state:

Desired End State

Goal 1: Improve and develop infrastructure to comply with legislative requirements and municipal needs.

Situation Analysis (Gaps and Needs)	Targets	Action	2019	2020	2021	2022	2023	Alternative	Resources		
									Human Resources	Equipment	Finance
<p>The Municipality must ensure that the licensing and establishment of the proposed Yakani landfill be fast-tracked (as replacement site for the Boitshepe landfill).</p> <p>Properly close and rehabilitate the Boitshepe landfill (once Yakani has been constructed and operational)</p>	<p>Target 1:</p> <p>Ensure that all the landfill sites/disposal/recycling facilities in the Municipality are licensed and comply with legislative requirements.</p>	<p>Fast-track licensing process for Yakani.</p> <p>Apply for MIG funding for:</p> <p>1. Construct Yakani landfill</p> <p>2. Closure application for Boitshepe landfill site. Close and rehabilitate Boitshepe landfill</p>	X	X	X	X	X	<p>Alternative:</p> <p>Legislative Requirement to operate the landfill in compliance with license conditions - no alternative</p>	<p>Operations to be outsourced</p> <p>Fill vacant positions to monitor operations at the various disposal/transfer facilities</p>	<p>Contractor/operator responsibility in accordance with contract agreement</p>	<p>Construction cost for Yakani landfill approximately R168 000 000 (this amount excludes ancillary infrastructure on site)</p> <p>Closure cost Boitshepe landfill: (Construction cost and professional fees) R128,936,037</p>
Properly operate and maintain various disposal facilities		Conduct bi-annual audits at each of the sites and implement recommendations resulting from the audit.	X	X	X	X	X				<p>R60 000 per audit/ landfill site.</p> <p>R20 000 per audit per transfer station</p>
Upgrade the infrastructure at various transfer	<p>Target 2:</p> <p>Maintain infrastructure</p>	Maintain infrastructure on landfills, transfer	X	X	X	X		None	1 supervisor, 10 general workers		R 7,749,965.13

stations. Springbok transfer station should be cleared, and a proper transfer station and Materials Recycling Facility should be established on the property	on the various landfill sites Establish MRF at Springbok Transfer station	stations and MRF, Construct new MRF at Springbok transfer station property						X				Refer to Appendix 5, 6 and 7 for the breakdown of cost.
There is poor maintenance of weighbridges at the various landfill sites. This results in inaccurate record-keeping and inaccurate billing of customers		The weighbridges should be repaired, regularly calibrated and the weighbridge software systems should be updated.	X	X	X	X	X			Existing Staff and Service Providers	None	Forms part of the operational contractors 'agreement
Facility manager/supervisor not adequately trained.		Training analysis to be conducted and relevant parties to undergo training	X	X	X	X	X			See Goal 2 & 3	See Goal 2 & 3	See Goal 2 & 3
Establishment of a recycling buy back centre in CE6 area in Vanderbijlpark	Target 3: Establishment of a recycling buy back centre in CE6 area in Vanderbijlpark	Identify property/land and Construct recycling buy back centre in CE6 area in Vanderbijlpark	X	x	x	x	x		None	1 supervisor, 10 general workers		Buy land or make land available for project. Funding through Petco

Please note that the ELM must apply timeously for MIG funding for Goal 1 infrastructure developments.

Goal 2: Provide effective waste collection.

Situation Analysis (Gaps and Needs)	Targets	Action	2019	2020	2021	2022	2023	Alternative	Resources		
									Human Resources	Equipment	Finance
The Municipality should extend the free basic refuse removal service to indigents in serviced settlements on an on-going basis.	Target 1: Maintain current service delivery to all areas within the Municipality and extend service delivery to all indigent populations	Extend services to un-serviced areas. Ensure budget as per Section 3.9.2 of this Report.		X	X	X	X		Existing Staff	None	None. Internal Budget as per Section 3.9.2 of this Report

Situation Analysis (Gaps and Needs)	Targets	Action	2019	2020	2021	2022	2023	Alternative	Resources		
									Human Resources	Equipment	Finance
The Municipality should properly plan to extend service delivery to any new developments within the Municipality.	Target 2: Effectively plan to extend service delivery to any new developments within the Municipality.	Implement waste collection services to new developments. Identify new developments in the municipal area.	X	X	X	X	X	Alternative: Privatise waste collection for new developments.	Existing Staff	None	Internal budget as and when required.
A map or schedule of unserved areas within the municipality to be Identified and compiled. Identify various service points for the serviced and unserved areas (including indigents).	Target 3: Conduct a transportation study to identify and optimise collection routes and number of service points.	Optimise Collection Route. Update and manage the schedule.	X	X	X	X	X	Alternative: Alternative vehicle and transport options.	Existing Staff and Service Providers	None	R 80 000
	Target 4: Establish receptacle requirements within the Municipality and supply the	Continue with current refuse collection system. Determine the funding requirements the	X	X	X				Existing Staff	None	None

Situation Analysis (Gaps and Needs)	Targets	Action	2019	2020	2021	2022	2023	Alternative	Resources		
									Human Resources	Equipment	Finance
	receptacles to residents in order to optimise collection efforts.	for receptacles.									
Optimise receptacle usage within the municipal area		Continue and extend the receptacle service Phase in 240 litre bins where appropriate				X	X		Existing Staff	None	R800 per wheelie bin

Goal 3: Provide an Effective and a Cost-Efficient Waste Management Service

Situation Analysis (Gaps and Needs)	Targets	Action	2019	2020	2021	2022	2023	Alternative	Resources		
									Human Resources	Equipment	Finance
The Municipality has a shortage of personnel for waste collection and for the proper management of the disposal facilities	Target 1: Effective structure and extension of human resources	Fill current vacant positions	X	X	X	X	X		Existing Staff, Fill vacancies as per Municipality's organogram		None, to be negotiated by the Municipality
		Employ Additional Staff to service new areas and to manage disposal and transfer / MRF facilities			X	X	X		It is recommended that the municipality appoints additional three supervisors to manage the proposed Yakani landfill and an additional Waste Management Specialist (to drive Recycling Initiatives).		None, to be negotiated by the Municipality
		Employ new staff as vacancies develop			X	X	X		Fill vacancies as it develops	None	None, to be negotiated by the Municipality

Situation Analysis (Gaps and Needs)	Targets	Action	2019	2020	2021	2022	2023	Alternative	Resources		
									Human Resources	Equipment	Finance
		Provide training for low level staff and for specialised positions	X	X	X	X	X		Existing Staff and Service Providers	None	R 100 000 per annum (low for 6% CPI increase per annum)
There is a shortage of the correct type and numbers of vehicles which are required to effectively deliver waste collection services. This is a major contributing factor for the Municipality to ensure operative and efficient waste collection service delivery, should the service be rendered internally.	Target 2: Increase/approval of budget for Waste Collection and Waste Disposal for service delivery	Develop an equipment replacement plan and acquire funding for the implementation of this replacement plan.		X				Alternative: Waste collection by community-based collection models	Existing Staff and Service Providers	None	R40,000 (vehicle replacement plan)
		Purchase required equipment and replace equipment as and when required and Maintain equipment.		X					Existing Staff and Service Providers	15 REL trucks, should the service be rendered internally. +/- 27 Tipper trucks should the service be rendered internally.	Should the collection service be rendered internally, the below listed cost estimates should be incorporated into the municipality's annual budget allocations: 15 REL trucks- R 18,000,000

Situation Analysis (Gaps and Needs)	Targets	Action	2019	2020	2021	2022	2023	Alternative	Resources		
									Human Resources	Equipment	Finance
										+/- 31 TLBs should the service be rendered internally.	31 TLBs- R 27,900,000 (under lease agreement) 217 Tipper trucks- R 29,700,000.00 for (under lease agreement) <i>If these 15 REL vehicles be hired, a monthly budget of R2,400,000 should be approved and made available. If the TLBs and Tipper trucks be hired, a monthly budget of approximately R 2,954,164.95 should be approved and made available. Not recommended feasible over a 5-year period</i>

Situation Analysis (Gaps and Needs)	Targets	Action	2019	2020	2021	2022	2023	Alternative	Resources		
									Human Resources	Equipment	Finance
A detailed financial investigation should be conducted by the Municipality. The extent and financial implications of the free basic refuse removal service to indigents should be determined to ensure that the cost shortfall not covered by the Equitable Share is budgeted for accordingly by the Municipality	Target 3: Effective financial management for waste management,	Conduct a detail financial investigation for proper waste management budgeting.	X						Existing Staff and Service Providers	None	R 500 000
To provide a cost-effective waste management service, the payment of service tariffs should be improved, and the tariff structure should be investigated to be viable and be standardised. A distinction should be made between the tariffs for waste collection at domestic, businesses and Government Institutions and will ensure that the generators of waste	Target 4: Implement improved tariff model.	Evaluate Level of Service Delivery Develop Standardised Tariffs for Specific Levels of Service and update on a yearly basis. Review tariffs in terms of the tariffs policy which must adopted in terms of section 74 of		X	X	X	X		Existing Staff	None	None

Situation Analysis (Gaps and Needs)	Targets	Action	2019	2020	2021	2022	2023	Alternative	Resources		
									Human Resources	Equipment	Finance
pay for the waste they generate. This can also be an incentive for businesses to minimise their waste streams		the Municipal Systems Act.									
	Target 5: Decrease non – payment of tariffs.	Implement Pre-paid system. Implement tariff model (as developed by DEA).		X					Existing Staff and Service Providers	None	R 120 000

Goal 4: Decrease waste deposited on landfill.

Situation Analysis (Gaps and Needs)	Targets	Action	2019	2020	20201	2022	2023	Alternative	Resources		
									Human Resources	Equipment	Finance
<p>No formalised recycling activities taking place</p> <p>Garden refuse are disposed of at the various transfer stations with no processing of the garden waste. The exact volumes of garden refuse need to be determined (entrance control at disposal facilities) to determine the feasibility of composting garden refuse.</p>	Target 1: Formalise and encourage recycling activities.	Provide Recycling Containers Throughout Town - Locate containers at strategic places	X						Existing Staff and Service Providers	None	R 120 000
		Add Additional Containers to Service New Development Areas		X	X	X	X		Existing Staff and Service Providers	None	R 120 000 per year (Allow for 6% CPI increase per annum)
		Establish a Materials Recycling facility (MRF) in the municipality at Springbok transfer station		X					See Goal 1	See Goal 1	Refer to Goal 1, included as part of infrastructure development
	Target 2: Encourage waste minimisation	Promote Waste Minimisation under residents and businesses	X	X	X	X	X		See Goal 7	See Goal 7	See Goal 7

Situation Analysis (Gaps and Needs)	Targets	Action	2019	2020	2021	2022	2023	Alternative	Resources		
									Human Resources	Equipment	Finance
	A target of 25% of the total waste stream generated in ELM should be recycled by 2020/2021, 40% of the waste stream by 2024/2025 and 50% of the waste stream by 2027/2028.	Formal agreements between waste recycling industries and companies/businesses. Approach DEA for assistance on their agreements with the plastic, glass, waste tyre and Poly-Ethylene Terephthalate (PET) industries. Identify, monitor and evaluate recycling opportunities and initiatives within the Municipal area.		X	X	X	X		Waste Management Specialist (to drive Recycling Initiatives)	See Goal 7	See Goal 7
		Regular forum meetings with stakeholders to co-ordinate waste minimisation and to encourage growth on the recycling section	X	X	X	X	X		Existing Staff and Service Providers	None	None
		Implement incentive Schemes for In-House Recycling for business and homes		X					Existing Staff and Service Providers	None	None
	Target 3: Conduct Waste Minimisation Study	Compile Waste Minimisation Strategy. If feasible, establish mechanisms for promoting separation at source.		X					Existing Staff and Service Providers	None	R 120 000

Goal 5: Minimise/prevent illegal activities

Situation Analysis (Gaps and Needs)	Targets	Action	2019	2020	2021	2022	2023	Alternative	Resources		
									Human Resources	Equipment	Finance
The illegal disposal of waste is common all over the municipal area	Target 1: Develop an Illegal Dumping Management Strategy	Establish Community Watch Programme with incentive schemes		X					Existing Staff and Service Providers	None	R 40 000 for Strategy Development
		Provide Accessible Containers for Illegal Dumping Throughout Towns and Settlements		X	X	X	X		Existing Staff and Service Providers	Skip Truck	R 10 000 per skip - capex. Existing skip loaders to be used when skips are filled, no cost assigned for additional vehicle
		Municipal By-laws must be enforced in order to issue spot fines (amend the by-laws to include provision for issuing spot fines)				X					R 80,000 in 2022

Situation Analysis (Gaps and Needs)	Targets	Action	2019	2020	2021	2022	2023	Alternative	Resources		
									Human Resources	Equipment	Finance
	Target 2: Improve removal of illegally dumped waste	Clean Illegally Dumping Hot Spot Areas	X	X	X	X	X		Existing Staff, operator, driver and/or Service Providers	TLB/Tractor back actor and a 10m ³ truck	TLB - R900,000 capex Truck – R1,100,000 capex or R600,000 per year should service providers be used for clean-up operations (Allow for 6% CPI increase per annum)

Goal 6: Capacity building through information sharing

Situation Analysis (Gaps and Needs)	Targets	Action	2019	2020	2021	2022	2023	Alternative	Resources		
									Human Resources	Equipment	Finance
The Municipality must develop a Waste Information System for waste reporting purposes, so that waste information can be reported to the district municipality where the district municipality can then communicate the information to provincial authorities	Target 1: Develop and maintain a waste information system	Develop WIS, approach DEA for standard WIS	X						Existing and new staff	None	None
		Maintain and update WIS as the situation changes in the Municipality. Keep proper records of waste quantities and types received at various waste disposal site. Provide information to District Municipality.	X	X	X	X	X		Existing and new staff	None	None

Situation Analysis (Gaps and Needs)	Targets	Action	2019	2020	2021	2022	2023	Alternative	Resources		
									Human Resources	Equipment	Finance
The Municipality has to Update and Maintain the database of industries, private waste disposal sites and medical facilities in municipal area.	Target 2: Contribute to Inter Municipal Waste Information Workshops	Frequent information sharing sessions should be held to share capacity building information	X	X	X	X	X		Existing and new staff	None	None

Goal 7: An educated community that is aware of the principles of responsible waste management

Situation Analysis (Gaps and Needs)	Targets	Action	2019	2020	2021	2022	2023	Alternative	Resources		
									Human Resources	Equipment	Finance
Responsible waste management within the community is lacking	Target 1: Build community awareness	Build Community Awareness through Newspaper Notices and Flyers. Conduct Road Shows. Awareness campaigns such as competitions at school level can be conducted.	X	X	X	X	X		Existing Staff and Service Providers	None	R 50 000 per year (Allow for 6% CPI increase per annum)

13. SUMMARY

13.1 Waste Disposal Infrastructure

I. Landfill sites

The Municipality has jurisdiction over three operational disposal sites viz the Boitshepe, Waldrift and Palm Springs disposal sites. The Zuurfontein landfill has been closed in August 2005 and received a closure permit from the Department of Environmental Affairs and Tourism on 1 April 2008. The operation of the three operating landfill sites are currently being outsourced under contract to WJ Makume, a waste contractor company.

All the landfill sites are licensed. The landfill sites are experiencing operational problems in varying degrees, but mainly as a result of financial constraints. The operational sites are covered on a daily basis and wind-blown litter, vectors, fires, dust and odours are common concerns.

The Municipality is in the process to review the licenses for Waldrift and Boitshepe and pending the outcome of the Section 24G directive and study, must apply for either closure or continued operation of the sites.

The municipality has identified a replacement landfill site for the Boitshepe landfill and is in the final stages of the licensing of the site (Yakani landfill site). The Municipality must ensure that the licensing and establishment of the proposed Yakani landfill be fast-tracked (as replacement site for the Boitshepe landfill).

There is poor maintenance of the weighbridges at the various landfill sites. This results in inaccurate record-keeping and inaccurate billing of customers. Weighbridges should be repaired, regularly calibrated and well maintained to ensure that they are functional. This will ensure a faster efficient and more accurate billing system for effective monthly billing. The security and access control should be upgraded at the various transfer stations and landfill sites, especially where fences are damaged or interrupted.

Operations should be improved at all landfill sites and bi-annual audits should be conducted to ensure compliance with license conditions and recommendations resulting from the audit should be implemented.

II. Transfer Stations

Infrastructure at the various transfer stations should be upgraded as follows:

Sebokeng Transfer station

There is an access gate with security guard and a guard house at the Sebokeng Transfer station. However, the gate is not functional and needs to be repaired to control access to the site.

Roshnee Transfer Station

Waste at the transfer station is directly deposited on the ground. The site should be cleared and skip bins should be provided for the storage of the waste. The transfer station should be upgraded to make provision for a skip and ramp method of operation. The total cost estimate for the upgrading of the Roshnee transfer station is provided in **Appendix 5**.

Sonland Park Transfer Station

Fencing is not adequate at the site as the concrete palisade fence is broken, resulting in various access control problems. The fencing should be re-erected, and a gate installed. The total cost estimate required for the fencing and gate is outlined in **Appendix 6**.

Springbok Transfer Station

The site is purely used as a dumping area. The Springbok transfer station is vandalised. The site should be cleared and a Material Recycling Facility (MRF) should be established. The Cost Estimate for this is outlined in **Appendix 7**.

Proposed recycling buy-back centre in CE6 area in Vanderbijlpark

The Municipality must identify land and make it available for the establishment of a recycling buy-back center in CE6 area in Vanderbijlpark, in accordance with the project kicked off with Petco.

13.2 Waste Collection

Since the Municipality is experiencing collection vehicle breakdowns due to age as well as vehicle shortages, additional vehicles for waste collection is hired.

The shortcomings in the available waste collection infrastructure have been identified. This will involve possible waste receptacles, new developments, repair and use of infrastructure (weighbridge), unserviced areas and route planning.

The Municipality has already included the new developments i.e Kwa Masiza (Zone 28), Golden Gardens, Sonderwater, Beverley Hills, Palmsprings, Tshepong, Zone 24, Miami Sands and Tshepiso Phase 5 into the current service delivery system.

The Municipality should ensure that all future developments will be included in the waste collection and disposal service delivery. It is essential that that any future residential and business area expansion are catered for in terms of refuse removal. This will allow the Municipality to, at an early stage, determine the possible costs involved and therefore will be able to adjust their budget accordingly. This will allow the Municipality to service the new areas when they are developed.

It is recommended that the Municipality continue with current refuse removal system, but phase in Standard Refuse Receptacles with new collection equipment i.e. wheelie bins with REL compactor trucks. The cost of the supply of the receptacles should be carried by the individual property owner to defray the financial burden on the Municipality and to ensure that the individual owners take care of their receptacles. Wheelie bins are more costly than plastic bags but have a longer lifespan.

A complete transportation study needs to be done to optimize waste collection.

Should the waste collection vehicles be continued to be hired, the Municipality must ensure that the budget be amended and approved to ensure payment of the contractors. It is however recommended that the Municipality should rather purchase their own new waste collection vehicles in future.

13.3 Resource Extension

The Emfuleni Local Municipality has a severe shortage of personnel for waste collection and for the proper management of the disposal facilities. The Municipality should fill current vacant positions and create posts to extend human resources capacity to fulfil service requirements. It is recommended that the municipality appoints the personnel as indicated in **Table 31** of the Report.

Equipment should be reviewed and equipment that needs maintenance and/or replacement should be identified. An equipment and vehicle replacement plan should be developed and funding should be secured for the replacement of equipment/vehicles.

The payment of services in the Municipal Area is low due to various reasons. The current billing system does not seem to be effective (due to reasons that inter alia includes the malfunctioning of weighbridges at the landfills). The Municipality should rectify the weighbridge problems by including the calibration and linkages with the billing system to the contractors' agreements.

The municipality must also take cognizance of the policy on Free Basic Refuse removal and develop an action plan for implementation.

It is further recommended that a detailed financial investigation be done to investigate run of vehicles, salaries, basic service allocation, credit control, pricing and tariffs, and other issues i.e. budget management etc. This will assist in ring-fencing the waste management services, should this be decided by the Municipality.

To provide a cost-effective waste management service, the payment of service tariffs should be improved, and the tariff structure should be investigated to be viable and be standardised. A distinction between the tariffs for waste collection at domestic, businesses and Government Institutions is recommended and will ensure that the generators of waste pay for the waste they generate. This can also be an incentive for businesses to minimise their waste streams.

The extent and financial implications of the free basic refuse removal service to indigents should be determined to ensure that the cost shortfall not covered by the Equitable Share is budgeted for accordingly by the Municipality.

13.4 Waste Minimisation

There are currently Municipal driven waste minimisation activities taking place in the Municipality. Recycling initiatives involve community engagement that are supported by the municipality. The areas that participate in the recycling strategies are cooperatives such as Majakathata, Mojaka, Palm Springs, Evaton west. Other Municipality strategies are currently in the process of being implemented and put in place. At the various landfill sites, informal reclamation activities are evident. This informal reclamation activities should be formalised, and the reclaimers be issued with protective clothing.

A target of 25% of the total waste stream generated in ELM should be recycled by 2020/2021, 40% of the waste stream by 2024/2025 and 50% of the waste stream by 2027/2028.

To give effect to the above targets, it is recommended that a transfer station (skip and ramp) and MRF be established at the Springbok transfer station, as well as a buy-back centre in CE6 area in Vanderbijlpark. This proposed MRF at Springbok transfer station, buy-back centre and the MRF at the proposed Yakani landfill site, will assist in diverting waste from landfilling and create an income for the Municipality.

Educational and awareness programs should be encouraged by the Municipality to educate and inform community about recycling. The municipality should realise the need for waste minimisation and should initiate the corresponding strategies in due time.

13.5 Management of Illegal Activities

The illegal disposal of waste is common all over the municipal area. The existing initiatives that the Municipality is implementing should continue and be expanded. Options include the following:

- The Municipality should budget for the purchasing of mass containers to place in strategic places and open spaces where illegal dumping is regularly occurring and clean these skips at the various landfill when filled.
- To further improve the current situation, the Municipality can introduce a neighbourhood watch system that will aim to prevent illegal dumping within their specific area.
- The Municipality can also deploy skips at strategic locations across the towns and settlements to minimise illegal dumping

13.6 Waste Information System

The Municipality must maintain a Waste Information System for waste reporting purposes. This system would allow for record-keeping of comprehensive records of waste disposal and collection on which informed decision-making can be based and to comply with the reporting requirements of the relevant Provincial authority. The malfunctioned weighbridges should be repaired so that they are able to provide more accurate waste disposal data which could be captured in the WIS.

The Municipality has to compile a list or database of all industries and medical waste facilities (including old age homes) in their area of jurisdiction, with a contact person and an indication of what is being done with their medical / industrial waste not collected by the Municipality i.e. who collects the waste and where is it being disposed of.

The costs involved in the development of a WIS will vary depending on the structure and contentiousness of the area. DEA has developed a generic WIS that may be provided to the Municipality for implementation.

13.7 Education and Awareness

The Municipality presently does not have any formal community awareness campaigns that are directed at informing the general community with regards to waste management.

A top down approach by the Municipality relies heavily on non-payment penalties to ensure that residents comply with legislation. Recycling and waste minimisation initiatives, however, are not included in the normal service delivery and can only be effectively achieved with the co-operation of the residents.

It is therefore vitally important that the community is made aware of initiatives, waste recycling activities and the advantages of waste minimisation and recycling by the Municipality. This can either be achieved by advertisements and notices in the local newspapers or by providing information regarding these initiatives on the municipal bills distributed each month. The Municipality can also conduct road shows to demonstrate to and inform people of waste related issues.

An Awareness Campaign is crucial to make people aware of the Integrated Waste Management Plan of the Municipality. This awareness campaign needs to have the full support of the Municipality and other Government Departments. This campaign will need to look at an integrated approach to community awareness. Examples of such campaigns are provided in **Section 9.7.1** of this Report.

APPENDIX 1

WASTE DISPOSAL FACILITY LICENSES

APPENDIX 2

PERSONNEL ORGANOGRAM

APPENDIX 3

EMFULENI LOCAL MUNICIPALITY

WASTE MANAGEMENT BY-LAWS

APPENDIX 4

TEAR SHEETS: PUBLIC PARTICIPATION NOTICE

APPENDIX 5

ROSHNEE TRANSFER STATION UPGRADE COST ESTIMATE

APPENDIX 6

SONLAND TRANSFER STATION UPGRADE COST ESTIMATE

APPENDIX 7

SPRINGBOK MRF AND TRANSFER STATION ESTABLISHMENT - COST ESTIMATE

APPENDIX 8

COMMENTS REPORT: PUBLIC PARTICIPATION