

(Final Draft 27 May 2024)

THEEWATERSKLOOF MUNICIPALITY

INTEGRATED WASTE MANAGEMENT BY-LAW, 2024

To regulate the provision of solid waste services in the jurisdictional area of the Theewaterskloof Municipality and to provide for matters connected therewith.

Under the provisions of Section 156(2) of the Constitution, 1996 read with Section 11(3)(m) of the Local Government: Municipal Systems Act, 2000, the Municipal Council of Theewaterskloof Local Municipality hereby enacts as follows: -

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CHAPTER 1
GENERAL PROVISIONS

Definitions and interpretation

1. In this By-law words used in the masculine gender include the feminine, the singular includes the plural and vice versa; a natural person includes a juristic person and vice versa and unless the context otherwise indicates-

“accredited service provider” means a person or entity accredited by and registered with the Municipality and having obtained an authorisation to collect and transport specified types of waste in the municipal area;

“agricultural and farm waste” means all waste generated on farms as part of agricultural processes or through ordinary domestic and business activities and may include different types of waste;

“agricultural land” means land zoned for agricultural purposes, located in either urban or rural areas;

“animal proof container” means an approved waste container which protects the contents from problem animals, as required by the Municipality in specific areas;

“applicable charge” means the rate, charge, tariff, flat rate, subsidy or any other cost prescribed by the Municipality from time to time;

“approved” in the context of bins, bin liners, waste bags, containers, receptacles and wrappers, means approved by the Municipality or an accredited service provider;

“approved container” means a container approved for the temporary storage of domestic or business waste until removed by the municipality or an accredited service provider;

“approved business waste container” means a refuse bag, a container with a storage capacity of 85-90 litres or 240 litres or 770 litres or any other approved container prescribed by the Municipality for business use;

“approved domestic waste container” means a refuse bag, a container with a storage capacity of 240 litres or any other approved container prescribed by the Municipality for domestic use;

“authorised official” means a waste management officer or other person in the employ of the Municipality, authorised by the Municipality for the purposes of this By-law, or if the Municipality has appointed a municipal service provider to perform municipal services, an employee of such service provider, authorised by it as an authorised official in terms of this By-law and acting within the scope of the powers, functions and duties assigned to that municipal service provider by the Municipality in terms of section 81(2) of the Local Government Municipal Systems Act, Act 32 of 2000 or another applicable law;

“best practicable environmental option” means the option that provides the most benefit or causes the least damage to the environment as a whole, at a cost acceptable to society, in the long term as well as in the short term;

“building waste” means waste produced during the construction, alteration, repair or demolition of any structure both manmade or natural, and includes rubble, earth, vegetation, wood and rock displaced during such construction, alteration, repair or demolition but excludes hazardous waste and garden waste;

“bulky waste” means waste which can be classified as domestic or business waste but which, by virtue of its mass, shape, size or quantity, cannot easily be accumulated in or removed from an approved container;

“business waste” means waste, other than domestic and business hazardous waste, hazardous and infectious organic waste, health care waste, health care risk waste, building waste, industrial waste, garden waste, bulky waste, special waste, e-Waste and special industrial waste; generated on premises that are used wholly or mainly for commercial, retail, wholesale, entertainment or government administration purposes;

“collection” means the act of collecting domestic or business waste at the place of generation or storage by the Municipality or an accredited service provider and removal has a similar meaning;

“commercial value” means the retail value a thing would have if it was offered for sale;

“commercial services” means any waste management service, relating or connected to accumulating, collecting, managing, recycling, sorting, storing, treating, transporting, disposing or trading in of waste or any other manner of handling waste excluding municipal services rendered by the Municipality;

“compost” is a product of controlled aerobic biological decomposition of biodegradable materials. The organic waste undergoes mesophilic and thermophilic temperatures, which significantly reduces the viability of pathogens and weed seeds, and stabilises the carbon such that it is beneficial to plant growth;

“compostable organic waste” means carbon-based materials of animal or plant origin such as garden waste that naturally enhances fertility of soil but excludes human made organic chemicals and naturally occurring organic chemicals which have been refined or concentrated by human activity, and health-care risk waste;

“composting” means a controlled biological process in which organic materials are broken down by micro-organisms by means of aerobic processes;

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

“dailies” means putrescible business waste generated by hotels, restaurants, food shops, hospitals and canteens that must be collected on a more frequent basis, often a daily basis, to prevent the waste from decomposing and presenting a nuisance, environmental or health risk;

“damage to the environment” means any pollution, degradation or harm to the environment whether visible or not;

“DFFE” means the national Department of Forestry, Fisheries and the Environment;

“DEADP” refers to the provincial Department of Environmental Affairs and Development Planning;

“domestic and business hazardous waste” means hazardous waste generated in a household or a business in small quantities such as paints and solvents, automotive wastes, pesticides, herbicides, rodenticides, electronics, aerosols, cleaning agents, batteries, fluorescent lamps, refrigerant containing appliances and all types of e-waste which contain hazardous parts or components since these products exhibit many of the same dangerous characteristics as fully regulated hazardous waste due to their potential for reactivity, ignitability, corrosivity, toxicity, or persistence;

“domestic health care waste” means health care waste generated in a household in minimum quantities consistent with the home use of materials for medical purposes and includes waste such as syringes, unused medicines and pills, used bandages, that could cause a health hazard when not appropriately disposed of;

“domestic waste” means waste that emanates from premises used wholly or mainly for-

- (a) residential purposes, such as a dwelling house, flat, boarding house, old age home or group development;
- (b) educational, sport or recreational purposes;
- (c) purposes of public worship, including a hall or other building used for religious purposes, and includes domestic health care waste but excludes business waste, domestic and business hazardous waste, hazardous and infectious organic waste, building waste, garden waste, bulky waste, special waste, e-Waste, liquid matter or night soil;

“dump” means placing waste anywhere other than in an approved container or a place designated as a waste handling facility or waste disposal facility by the Municipality;

“DWS” means the National Department of Water and Sanitation;

“ECA” means the Environment Conservation Act, 1989 (Act 73 of 1989) and any regulations made in terms thereof, or any superseding legislation;

“EIA” means an environmental impact assessment as contemplated in NEMA, and/or the ECA and the EIA Regulations as published in Government Notice R 1183 on 5 September 1997, as amended from time to time;

“enforcement notice” means any notice issued by an authorised official under this By-law which instructs the person to whom it is issued to comply with the terms of the notice, and includes a compliance notice contemplated in section 61;

“environment” means the individual parts and total sum of all elements, properties, conditions and the like making up the surroundings within which living organisms exist and any part or combination of the interrelationships among and between them;

“environmental emergency” means any situation that has caused or may cause serious harm to human health or damage to the environment, irrespective of whether the potential for harm or damage is immediate or delayed;

“EPR” means extended producer responsibility;

“event” means an activity of a sporting, entertainment, recreational, religious, cultural, organisational or similar nature hosted at a venue or along a route or in a specific area at which more than 2000 people are expected to attend or participate;

“event waste” means waste that originates from the activities related to an event that is held in the municipal area;

“e-Waste” means all types of WEEE and its parts that have been discarded by the owner or a person as waste without the intention of re-use and which could be due to any of its parts or components be hazardous to human health or the environment;

“garden services activities” means the provision of gardening services including the cutting of grass, pruning of trees or any other horticultural activity including landscaping, to any domestic, business, commercial, education and training, recreational, institutional or industrial premises;

“garden waste” means organic waste which emanates from domestic gardening activities, including grass cuttings, leaves, plants, flowers, branches, tree stumps and other similar waste;

“general waste” means waste that does not pose an immediate hazard or threat to health or to the environment, and includes-

- (a) domestic waste;
- (b) business waste;
- (c) building waste;
- (d) inert waste,
- (e) garden waste; or
- (f) any waste classified as non-hazardous waste in terms of the Waste Act and its regulations;

“group development” means a high-density residential development with common property or facilities and which is managed by a homeowners’ association, body corporate or other managing body;

“hazardous chemical substance” means any toxic, harmful, corrosive, irritant or asphyxiant substance, or a mixture of such substances for which-

- (a) an occupational exposure limit is prescribed;
- (b) an occupational exposure limit is not prescribed but which creates a hazard to health and the environment;

“hazardous organic waste” means any waste that contains organic elements or compounds that may, owing to their inherent physical, chemical or toxicological characteristics of that waste, have a detrimental impact on human health and the environment, and has been classified in terms of the Waste Classification and Management Regulations in accordance with SANS 10234;

“hazardous waste” means any waste that contains organic or inorganic elements or compounds that may, owing to the inherent physical, chemical or toxicological characteristics thereof, have a detrimental impact on health and the environment;

“health care risk waste” means all hazardous waste generated at any health care facility such as a frail care centre, hospital, clinic, laboratory, medical research institution, dental or medical practitioner or veterinarian including but not limited to infectious waste, pathological waste, sharp waste, pharmaceutical waste, genotoxic waste, chemical waste, pressurized container waste, waste with heavy metals, radio-active waste, or any waste that has been in contact with blood, bodily fluids or tissues from humans or infected animals from veterinary practices and also includes any and all waste that may be generated due to pandemic situations;

“health care waste” means all waste generated by or derived from medical care or medical research including but not limited to infectious waste, pathological waste, sharp waste, pharmaceutical waste, genotoxic waste, chemical waste, pressurized container waste, waste with heavy metals, radio-active waste, or any waste that has been in contact with blood, bodily fluids or tissues from humans or infected animals from veterinary practices;

“holder of waste” means any person or entity that imports, generates, collects, handles, accumulates, stores, transports, transfers, processes, treats, trades, exports, recovers, recycles, re-uses or disposes of waste including waste pickers such as recycling or waste minimisation persons or groups, scrap dealers and other similar buy-back centres or initiatives;

“industrial waste” means waste generated as a result of manufacturing, industrial, fabricating, processing, dismantling or maintenance activities and may include waste generated by commercial agricultural, mining or power plant activities but does not include any other category of waste;

“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;

“infectious organic waste” means organic waste which contains or may be reasonably presumed to contain pathogens which normally cause or significantly contribute to the cause of morbidity or mortality in human beings;

“infectious waste” means waste which is generated during diagnosis, treatment or immunization of humans or animals, in the research pertaining to this, in the manufacturing or testing of biological agents including blood products, cultures, pathological waste, sharp objects, human and animal anatomical waste and isolation waste that contain or may contain infectious substances;

“integrated waste management plan” means an integrated waste management plan required by the Municipality in terms of this By-law or that is required in terms of any other applicable legislation;

“interest” means a levy with the same legal property as service fees and calculated in terms of this By-law on all amounts in arrears in respect of prescribed fees for waste management services at a standard rate equal to an interest rate as determined by the Customer Care, Credit Control and Debt Collection By-law of the Municipality;

“IPWIS” means the Integrated Pollutant and Waste Information System of the Western Cape Government as established in accordance with the national and provincial legislative and policy framework including the Waste Act;

“litter” means any object or matter which is discarded by a person in any place except in an approved container provided for that purpose or at a waste disposal facility or a waste handling facility;

“minimisation” means the steps are taken by the Municipality, residents, businesses and industries to avoid and reduce the amount and toxicity of waste generated and disposed of;

“Minister” means the Minister of the Department of Forestry, Fisheries, and the Environment;

“mixed recyclables” mean a mixture of commonly recycled materials (e.g. wood, metal, corrugated cardboard, plastics, cans or paper) where ideally less than 30% by weight of the total load consists of non-recyclable materials;

“municipality” means –

- (a) the Theewaterskloof Local Municipality established in terms of section 12 of the Structures Act by Provincial Notice No. P.N. 488/2000 or its successors in title, and includes a structure or person exercising a delegated power or carrying out an instruction in terms of this By-law and legislation applicable to local government; or
- (b) a municipal service provider fulfilling a responsibility under this By-law, assigned to it in terms of section 81(2) of the Systems Act or any other law, as the case may be;

“municipal council” means a municipal council referred to in section 157(1) of the Constitution;

“municipal service” means the municipal service relating to the collection of waste, including domestic waste, business waste and dailies and related waste activities provided by the Municipality or a municipal service provider on behalf of the Municipality, in accordance with this By-law;

“municipal service provider” means a person or entity which provides a municipal service on behalf of the Municipality and in accordance with this By-law;

“NEMA” means the National Environmental Management Act, 1998 (Act 107 of 1998), its amendments and regulations;

“Waste Act” means the National Environmental Management: Waste Act, 2008 (Act 59 of 2008), its amendments and regulations;

“non-conforming waste” means, in respect of an organic waste composting facility, organic or inorganic waste that is not permitted to be processed in terms of the facility’s approved environmental management programme or waste that has been determined by the composting facility operator not to be accepted; or waste that is otherwise not suitable as per applicable norms and standards and, in respect of an organic waste separation and / or treatment facility, organic or inorganic waste that does not adhere to the category and maximum quantities of waste to be processed at that facility; or waste that is otherwise not suitable as per applicable environmental legislation, norms and standards;

“nuisance” means any injury, harm, damage, inconvenience or annoyance to any person which is caused in any way whatsoever by the improper handling or management of waste, including but not limited to, the storage, placement, collection, transport or disposal of waste or by littering;

“occupier” means a person who occupies any premises or part thereof, without regard to the title under which he or she so occupies, and includes –

- (a) any person in actual occupation of those premises;
- (b) any person legally entitled to occupy those premises;
- (c) in the case of those premises being subdivided and let to lodgers or various tenants, the person receiving the rent payable by such lodgers or tenants whether on the person’s own account or as agent for any person entitled thereto or interested therein;
- (d) any person having the charge of or management of those premises, and includes the agent of any such person when the person is absent from the Republic of South Africa or his or her whereabouts are unknown; or
- (e) the owner of those premises;

“organics” means both processed and unprocessed biodegradable organic material;

“organic waste” means waste of biological origin such as garden waste which can be broken down, in a reasonable amount of time, into its base compounds by micro-organisms and other living things;

“organic waste compost facility” means any site or premises that receives organic waste for composting, and which is operated in terms of national norms and standards to ensure implementation of the best practicable environmental option in the composting of organic waste;

“organic waste separation and / or treatment facility” means any site or premises that receives organic waste for separation and / or treatment for beneficial use and which is operated in terms of environmental legislation, norms and standards to avoid, prevent, and minimise potential negative impacts on the biophysical environment;

“organ of state” has the meaning assigned to it in section 239 of the Constitution;

"owner" includes -

- (a) the person in whom is vested the legal title to premises, including, but not limited to, the registered owner according to the title deed;
- (b) where the person in whom the legal title to the premises is vested is insolvent or dead, or is under any form of legal disability whatsoever, the person in whom the administration and control of such premises is vested as curator, trustee, executor, administrator, judicial manager, liquidator or other legal representative;
- (c) in any case where the Municipality is unable to determine the identity of such person, a person who is entitled to the benefit of the use of such premises or a building or buildings thereon; and
- (d) in the case of premises for which a lease agreement of ten years or longer has been entered into and registered in the Deeds Office, the lessee thereof;
- (e) in relation to
 - (i) a piece of land delineated on a sectional plan registered in terms of the Sectional Titles Act, 1986 (Act 95 of 1986), the developer or the body corporate in respect of the common property; or
 - (ii) a section as defined in the Sectional Titles Act, the person in whose name such section is registered under a sectional title deed, and includes the lawfully appointed agent of such a person;
- (f) the person who has purchased immovable property from the Municipality, in terms of a scheme that allows for the purchase price to be paid in instalments and who has not received transfer from the Municipality;

"person" means any natural person, local government body or like authority, a company incorporated under any law, a body of persons whether incorporated or not, a statutory body, public utility body, voluntary association or trust;

“pollution” means any change in the environment caused by –

- (a) substances; or
- (b) radio-active or other waves; or
- (c) noise, odours, dust or heat, emitted from any activity, including the storage or treatment of waste or substances, construction and the provision of services, whether engaged in by any person or an organ of state, where that change has an adverse effect on human health or well-being or on the composition, resilience and productivity of natural or managed ecosystems, or on materials useful to people, or will have such an effect in the future;

“premises” means an erf or any other portion of land, including any building thereon or any other structure utilised for business, industrial or residential purposes;

"prescribed" means, determined by resolution of the Municipal Council from time to time;

"prescribed fee" means a fee including a tariff or charge determined by Municipal Council resolution;

"prescribed tariff" means a schedule of prescribed fees as entailed in the Municipality's Tariff By-laws;

"problem animal areas" means areas identified from time to time by the Municipality where animals behave in a way that creates problems;

"public notice" means notice to the public in a manner determined by the Municipality;

"public place" includes any public building, public road, overhead bridge, subway, foot pavement, footpath, sidewalk, lane square, open space, garden, park, sports ground, enclosed space vested in a Municipality, and any road, place or thoroughfare however created which is in the undisturbed use of the public or which the public has the right to use or the right to access;

"public road" means any road, street or thoroughfare or any other place (whether a thoroughfare or not) which is commonly used by the public or any section thereof or to which the public or any section thereof has a right of access and includes—

- (a) the verge of any such road, street or thoroughfare;
- (b) any bridge, ferry or drift traversed by any such road, street or thoroughfare; and
- (c) any other work or object forming part of or connected with or belonging to such road, street or thoroughfare;

"receptacle" means an approved container for the purpose of temporary storage of domestic waste or business waste until removal thereof by the Municipality or an accredited service provider;

"recovery" means the controlled extraction or retrieval of energy, or material from waste;

"recyclable waste" means waste that could be separated from the waste stream and set aside for purposes of re-use or recycling and include mixed recyclables;

"recycling" means a process where recovered waste is further processed as a product or raw material;

"refuse bag" means a plastic bag at least 22 micron thick with dimensions of 750mm x 950mm or as otherwise prescribed by the Municipality and the same applies to a bin liner;

"re-use" means to utilise the whole, a portion of or a specific part of any substance, material or object from the waste stream for a similar or different purpose without changing the form or properties of such substance, material or object;

"route" means the way or course taken in getting from a starting point to a destination during an event which takes the form of a race or procession;

"safety data sheet" means the information sheet to be completed by all generators of hazardous waste in accordance with relevant regulations and the latest edition of SANS 10234 and to be in the possession of all holders of waste that handles such hazardous waste;

"SANS" means South African National Standard;

"SANS 10234" means the latest edition of the South African Standard Globally Harmonized System of

Classification and Labelling of Chemicals (GHS);

“**SAWIS**” means the national waste information system established by the national government in accordance with the Waste Act;

“**separation at source**” refers to the practice of separating recyclable and organic waste at the point of generation from the household waste stream to enable the recovery of mixed recyclables and the diversion of organic waste from landfill;

“**service levels**” means the frequency of the municipal service and the type of service point;

“**special industrial waste**” means waste consisting of a liquid, sludge or solid substance, resulting from a manufacturing process, industrial treatment or the pre-treatment for disposal purposes of any industrial or mining liquid waste;

“**special waste**” means a non-hazardous industrial waste that may include a number of waste types which has physical or chemical characteristics, or both, that requires special handling at a waste disposal facility such as contaminated soil, raw animal manure, dead animals and any other material determined to be special waste by the Municipality;

“**storage**” means the accumulation of waste in a manner that does not constitute treatment or disposal of that waste;

“**Structures Act**” means the Local Government: Municipal Structures Act, 1998 (Act 117 of 1998);

“**sustainable development**” means the integration of social, economic and environmental factors into planning, implementation and decision-making so as to ensure that development serves present and future generations;

“**Systems Act**” means the Local Government: Municipal Systems Act, 2000 (Act 32 of 2000);

“**tariff**” means the annually revised user charge for the provision of the municipal service, determined and promulgated by the Municipality through its Tariff By-laws;

“**traded in**” means buying, selling, or bartering and “trading in” has a similar meaning;

“**transport**” means the movement of waste from one place to another;

“**venue**” means a stadium, or any area or place where an event is hosted; that has a seating or standing spectator capacity of at least 2000 persons as certified by the Municipality, within which other permanent or temporary structures may be erected and which may be demarcated by an enclosed or semi-enclosed permanent or temporary structure;

“**venue owner**” means a person who owns, manages or is entitled to exercise the rights of an owner or occupier of a venue used for events;

“**verge**” means a verge as defined in section 1 of the National Road Traffic Act, 1996 (Act No. 93 of 1996), as amended;

“**waste**” means—

- (a) any substance, material, or object—
 - (i) that the generator of that substance, material or object has no further use for within its own processes, whether or not it has any commercial value for the generator, but which can be re-used, recycled, recovered or traded in by any person; or
 - (ii) that is rejected, abandoned, discarded, or disposed of, either temporary or permanently, or is intended to be discarded or disposed of by the generator of that substance, material or object, regardless of whether or not that substance, material or object has any commercial value for the generator or can be re-used, recycled, recovered or traded in by any person; or
- (b) any other substance, material or object that may be defined as a waste by the Minister by notice in the *Gazette*;

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

- (aa) once it is re-used, recycled or recovered or traded in by the holder of that waste or portion of waste in accordance with a condition stipulated in a valid waste management license, where applicable, or in accordance with an applicable norm or standard made in terms of the Waste Act; or
- (bb) where the Minister has, in the prescribed manner, excluded the holder of any waste stream or a portion of a waste stream from the definition of waste, enabling the holder thereof to trade in the excluded waste stream or portion of the excluded waste stream, provided that the holder has satisfied the requirements of proving the environmentally safe use of the waste stream or portion of waste stream by it or any other person and committed to provide the Minister with annual reports of the use thereof;

“waste bag” means a plastic bag at least 40 microns thick with dimensions of 750mm x 950mm or as otherwise prescribed by the Municipality and the same applies to a bin liner;

“waste disposal facility” means any site or premise which receives waste for treatment or disposal thereof, and which is operated in terms of a license obtained from a statutory licence authority or otherwise in accordance with NEMA;

“waste handling facility” means any site or premise that receives, accumulates, handles, recycles, sorts and temporarily stores or treats waste prior to its transfer for final disposal and is operated in terms of a license obtained from a statutory licence authority or otherwise in accordance with NEMA;

“waste pickers” means people who collect, sort and sell reusable and recyclable materials, which recyclables predominantly include metal, paper, cardboard, plastic and glass;

“waste information system” means SAWIS and / or IPWIS, as the circumstances dictate;

“waste management activity” means any one or more of the activities that a holder of waste may be involved in as listed in and from time to time amended by the Waste Act and has the same meaning as assigned to it in section 1 of the Waste Act;

“waste management licence” has the same meaning as assigned to it in section 1 of the Waste Act;

“waste management officer” means a person designated by the Municipality to be responsible for co-ordinating matters pertaining to waste management for the Municipality in accordance with the Waste Act;

“waste management plan” means a waste management plan required by the Municipality in terms of this By-law and the Waste Act;

“waste management services” means services that relate to any one or more of the waste management activities;

“waste manifest documents” means the control documents containing information as legally prescribed and maintained by the holders of waste involved; which documents must accompany each load of hazardous waste from point of generation to final management of it;

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

“waste removal system” means a system by means of which waste is removed and disposed of by the Municipality;

“waste tyre” means a new, used, retreaded, or un-roadworthy tyre, not suitable to be retreaded, repaired or sold as a part worn tyre and not fit for its original intended use;

“WEEE” means electrical and electronic equipment waste, e.g. computers, phones, TVs, radios, refrigerators, washing machines, lighting equipment, home entertainment and stereo systems, toys, toasters, kettles and other such similar objects, etc. which if discarded and no longer re-useable, needs to be recycled for material recovery;

“working day” means a day other than a Saturday, Sunday or public holiday but in the context of the Municipality’s waste handling and waste disposal facilities it includes all calendar days except Christmas Day and New Year’s Day.

The interpretation and application of this By-law must be guided by the Waste Act and NEMA.

In the event of any conflict between a section of this By-law and national legislation, the national legislation will prevail. In the event of any conflict between any section of this By-law and provincial legislation, the provincial legislation will prevail.

Principles

2. (1) The Municipality has the responsibility to ensure that—
 - (a) all domestic and business waste generated within the municipal area is collected, disposed of, or recovered in accordance with this By-law; and
 - (b) such collection, disposal or recovery takes account of the waste management hierarchy outlined in subsection (2).
- (2) The principle underpinning this By-law is the establishment and enablement of a waste management hierarchy in the following order of priority—
 - (a) avoidance, minimisation and reduction of waste;
 - (b) re-use of waste;
 - (c) recycling, re-claiming, recovery, reprocessing and treatment of waste; and
 - (d) disposal of waste.
- (3) An official authorised in terms of this By-law must as is reasonably possible, take the hierarchy specified in subsection (2) into account.

Main objects

3. (1) The main objects of this By-law are—
 - (a) to regulate the collection, handling, storage, transport, recycling, treatment and disposal of waste;

- (b) to create an enabling environment for the private sector to fulfil their EPR obligations of materials recovery that is linked to priority wastes and for which they are required to follow a DFFE approved industrial waste management plan and / or establish and implement an EPR scheme;
 - (c) to optimise the existing and future municipal waste collection scheme, handling practices, and public drop off facilities so that they allow for the most efficient recovery of materials;
 - (d) to regulate the pursuance of an integrated waste management approach;
 - (e) to promote the diversion of organic waste from landfill;
 - (f) to regulate the provision of municipal services by municipal service provider/s, as may be applicable and commercial services by accredited service providers; and
 - (g) to enhance sustainable development.
- (2) In pursuing the main objects of this By-law, the Municipality shall, within its financial and administrative capacity—
- (a) endeavour to ensure local community involvement in local waste planning;
 - (b) endeavour to effect and unlock the recovery of materials by private sector parties as part of their EPR obligations;
 - (c) endeavour to minimise the consumption of natural resources;
 - (d) promote the recycling and re-use of waste within government, within the public domain and within the private sector;
 - (e) encourage waste separation at source (both at household and private sector level) to facilitate and optimise re-use and recycling opportunities and the composting of suitable organic waste;
 - (f) promote the effective resourcing, planning and delivery of municipal services and commercial services;
 - (g) endeavour to achieve integrated waste management, planning and services in a local context;
 - (h) promote and ensure environmentally responsible municipal services and commercial services; and
 - (i) endeavour to ensure compliance with the provisions of this By-law.

Duties and obligations

4. (1) A holder of waste must take all reasonable measures to:
- (a) reduce or avoid waste generation and minimise the amount and toxicity of waste generated;
 - (b) re-use, recycle and recover waste (e.g. for repair and refurbishment);
 - (c) dispose waste in an environmentally sound manner;
 - (d) manage waste in a manner not endangering health or the environment and cause no nuisance related to sight, noise or odour;
 - (e) prevent waste from being used for an unauthorised purpose including the prevention of persons under his supervision from contravening this By-law;
- (2) A person who imports, manufactures and/or sells a product which may be used by the public and is likely to result in the generation of hazardous waste must as part of its EPR obligations take all reasonable steps to inform the public of the impact of that waste on health and the environment.
- (3) Any person subject to the duties and obligations imposed in subsections (1) and (2) may be required by the Municipality or an authorised official to take measures to ensure compliance with these duties and obligations, which measures may be to—
- (a) investigate, assess and evaluate the impact on the environment;
 - (b) inform and educate employees about the environmental risks of their work and the manner in which their tasks must be performed in order to avoid causing significant pollution or degradation of the environment;

- (c) cease, modify or control any act, activity or process causing the pollution or degradation;
- (d) contain or prevent the movement of pollutants or the cause of degradation;
- (e) eliminate any source of the pollution or degradation;
- (f) remedy the effects of the pollution or degradation.

CHAPTER 2

INTEGRATED WASTE MANAGEMENT

Waste management plans

5. (1) The Municipality shall—
- (a) establish, review and revise its integrated waste management plan in accordance with the prescriptions of national and provincial legislation and municipal planning and development legislation;
 - (b) annually report on the implementation of its integrated waste management plan; and
 - (c) follow prescribed processes of community consultation in terms of subsections (1)(a) and (b).
- (2) All events organised and hosted in the municipal area must at least one month prior to the event taking place submit to the Municipality a waste management plan that includes the waste management services to be provided, outline the strategy how to prevent and reduce waste from the planning outset and such other information as may be required by the Municipality.
- (3) An owner or occupier or any other person responsible for a new development must submit to the Municipality an integrated waste management plan including such information as the Municipality may require prior to the start of the development and also during the development, if so, requested by the Municipality.
- (4) The Municipality may grant conditional exemption in terms of subsections (2) and (3) depending on the size, nature, route and duration of the event or the size of the development;
- (5) The Municipality shall require a holder of waste involved in a listed waste management activity that has or is likely to have, a detrimental effect on the environment in terms of the Waste Act to submit its integrated waste management plan to the Municipality within a specified time and thereafter at intervals coinciding with the requirements of national and provincial legislation or standards.
- (6) The Municipality may require from any other holder of waste excluding domestic waste to submit within a reasonable time and thereafter, at intervals determined by the Municipality, an integrated waste management plan containing such information as the Municipality deems necessary or, if applicable, a copy of its industry waste management plan as required by national legislation.
- (7) If an integrated waste management plan as referred to in subsections (3), (5) or (6) is in any way changed or amended, the holder of waste must submit such changed or amended plan to the Municipality within thirty (30) days of it been amended or changed.

Waste information system

6. (1) The Municipality shall establish and maintain a waste information system including information on the levels and extent of waste management services provided by it and enter such information on the SAWIS and / or IPWIS as and when required.

- (2) The Municipality may require from a holder of waste or any person to furnish the Municipality within a reasonable time or on a regular basis with such data, documents, information, samples or materials and the verification of information reasonably required by the Municipality to discharge its responsibilities in terms of subsection (1).
- (3) The Municipality may request a person or holder of waste that it reasonably believes should be registered on the SAWIS and / or IPWIS to affect such registration and submit proof thereof to the Municipality or to submit proof of not conducting a waste management activity obligating such registration within a time that the Municipality regards as reasonable.

Waste minimisation and recycling

7. (1) The Municipality shall in accordance with its responsibilities and its resources progressively implement a waste minimisation programme and other measures in partnership with EPR obligated private sector parties to reduce the generation and disposal of waste and promote the recovery, re-use and recycling of waste including through waste separation at source and the diversion of organic waste from landfill.
- (2) The Municipality may on a regular basis and in a manner, it deems suitable acknowledge outstanding achievements in respect of waste avoidance, waste minimisation, recycling or other waste management practices advancing environmentally responsible integrated waste management.

Waste management activities

8. (1) The Municipality may require a holder of waste in possession of or responsible for waste that must be classified, recorded, labelled or in any way assessed or re-assessed, to submit proof of compliance with the relevant prescriptions of national and provincial legislation, norms and standards as applicable thereto and the Municipality will strictly adhere to any such legislation, norms and standards in respect of its own waste management activities.
- (2) The Municipality's approval, inspection and monitoring of waste storage facilities, scrap metal yards, private buy-back centres, vehicle scrapping or recovery facilities including any facilities where materials suitable for re-use or recycling are recovered (for and without financial gain) and organic waste composting and organic waste treatment facilities shall be in accordance with national and provincial legislation, norms and standards and the Municipality's by-laws and will require the owners or occupiers of these premises to submit such information, plans and records as the Municipality deems necessary to fulfil its duties as a waste management authority.

CHAPTER 3

COLLECTION OF WASTE

Service levels

9. (1) The levels of waste collection may differ between areas based on the practicality and cost-efficiency of delivering the service. Service levels in areas may vary between:
 - (a) on-site appropriate and regularly supervised or monitored disposal;

- (b) community transfer to a central collection point;
- (c) organised transfer to a central collection point and kerbside collection; and
- (d) a combination of these levels.

Service agreement

- 10.** (1) The Municipality shall render a service for the collection of business and domestic waste from built upon premises at such charges as it may determine, and the owner or occupier of such premises shall make use of the waste collection service provided by the Municipality.
- (2) The waste collection service rendered by the Municipality in terms of subsection (1) shall be in accordance with the agreement for services concluded with the Municipality; which agreement may be amended in writing to make provision for an increase in the frequency or volume of the waste removal service rendered should it be required by the Municipality or in response to a request by the owner or occupier of residential or business premises.
- (3) An owner or occupier of premises where business or domestic waste is generated shall, where a waste collection service is available, within seven (7) days of such occupation or changes in such occupation, notify the Municipality in writing—
- (a) that the premises is being occupied by one or more occupant; and
 - (b) indicate whether the waste collection service is for business or domestic purposes.
- (4) If the applicant for services in terms of subsection (3) is not the owner, the Municipality shall require any owner to be bound jointly and severally as surety and co-principal debtor with the consumer, for the payment of any prescribed fees payable to the Municipality in terms of this By-law.
- (5) An owner or occupier of premises may contract with an accredited service provider to collect its business or domestic waste but shall not be entitled to exemption from or a reduction in the prescribed fee determined by the Municipality merely on the grounds that no or limited use is made of the waste collection services rendered by the Municipality.
- (6) An owner or occupier of premises is liable to pay the Municipality the prescribed fee for the provision of waste collection services on the due date for payment stipulated in the municipal account, failing which the Municipality will deal with the matter in accordance with its Customer Care, Credit Control and Debt Collection By-laws.
- (7) Availability tariffs may be charged on vacant premises, as determined by the Municipality from time to time.
- (8) The Municipality will determine which waste items are unsuitable for collection because these do not constitute domestic waste or business waste or could be classified as bulky waste, domestic and business hazardous waste or e-Waste and, if waste is determined to be unsuitable for collection, a process for removal and disposal of such waste shall be recommended by the Municipality to the owner of the waste or occupier of the premises.
- (9) If the Municipality's scheduled waste collection services are interrupted for whatever reason, the Municipality will resume the service as soon as reasonably possible and address backlogs as a matter of priority.

- (10) Complaints about the Municipality's waste collection service will be dealt with in accordance with the Municipality's customer care policy.
- (11) The owner or occupier of premises must notify the Municipality in writing when the collection of waste is no longer required in which case the prescribed fees shall be payable until the end of the calendar month following the month in which the notice is received unless section 10(5) applies.

Frequency of waste collection

11. (1) The Municipality shall collect domestic waste and business waste at least once per week on scheduled dates for different areas. Occupiers or owners of premises will be informed of revised waste collection arrangements reasonably in advance, through one or more of the methods prescribed by the Systems Act.
- (2) The Municipality will determine which business premises generate waste that can be regarded as dailies and may instruct an increase in the frequency of waste collection from such premises as provided for in section 10(2).
- (3) If the Municipality is of the opinion that a business creates a nuisance, health risk, bad odour or danger to public health due to the fact that waste is not removed during weekends from its premises, the Municipality may instruct the owner or occupier of the premises to make use of an additional waste collection service rendered by the Municipality at a prescribed fee or to use an accredited service provider to collect the waste during weekends.
- (4) An owner or occupier of a business premise who receives a waste removal service once per week may apply to the Municipality in writing to increase the number of waste removals to multiple times per week if so available and as provided for in section 10(2).

Volume of waste collected

12. (1) The Municipality shall determine—
 - (a) the number of receptacles to be collected from each residential premise per collection;
 - (b) the number of receptacles to be collected from each business premise per collection based on an inspection of the waste volumes with the owner or occupier; and
 - (c) the maximum amount of business waste that may be placed for collection without the provision of an additional service or the payment of an additional prescribed fee.
- (2) Should the Municipality require the provision of an additional service to a residential or business premise or the owner or occupier of a residential or business premise apply to the Municipality in writing to increase the number of containers to be collected per collection from its premises, these changes will be affected as provided for in section 10(2).

Receptacles

13. (1) The Municipality will collect domestic waste placed in approved domestic waste containers and business waste placed in approved business waste containers from a location and in a condition as determined. Waste placed in a location or a container not meeting the prescriptions of the Municipality will not be collected and the Municipality will not accept liability for lost or damaged containers.
- (2) The owner or occupier of residential or business premises shall be responsible for marking his/her container/s with the stand number or business signage to ensure easy identification thereof and to assist the municipal employees to return it to the correct stand or business location.

- (3) Containers for the temporary storage of waste at business and residential premises must be kept in good condition and fit for the safe storage of waste to prevent damage to the environment and harm to health.
- (4) In case of damage caused through the negligence of the owner or occupier of the premises a container may be replaced by the Municipality after receiving a written request for such replacement and full payment of the cost involved.
- (5) No person may allow an animal in his or her control to interfere with, overturn or otherwise damage a container which has been placed for collection.
- (6) The owner or occupier of business or residential premises must ensure that—
 - (a) a container contains no hot ash, unwrapped glass or other domestic waste, business waste including dailies which may cause injury to the municipal employees while carrying out their duties in terms of this By-law or damage to the container;
 - (b) no material, including any liquid, which by reason of its mass or other characteristics is likely to render a container unreasonably difficult for the municipal employees to handle or carry, is placed in such container;
 - (c) a container contains no material which is of a hazardous nature or contains hazardous components, e.g. domestic and business hazardous waste and e-Waste;
 - (d) containers are kept closed to avoid animal and insect interference and wind-blown litter and in a clean and hygienic condition;
 - (e) containers are placed outside the entrance to the premises on a date and time specified by the Municipality by written notice to the owner or occupier of the premises, except where the Municipality has indicated, in writing, that it is satisfied that a person is physically infirm or otherwise incapable of complying with this provision;
 - (f) in accordance with the Municipality's specifications, whether contained in approved building plans or a Municipal Council notice, a designated space and any other facility deemed necessary by the Municipality are provided on the premises for the storage of containers without these been visible from a public road or public place and the designated space so allowed permitting convenient access to and egress for the Municipality's waste collection vehicles;
 - (g) the pavement in front of or abutting the premises is kept clean and free of waste.
- (7) If dailies are generated, the owner or occupier must ensure that—
 - (a) the dailies are not placed in a container where they could contaminate another waste stream;
 - (b) the containers are placed in a designated area easily accessible from the entrance of the premises from where the waste is collected by the Municipality.
- (8) Notwithstanding anything to the contrary contained in this By-law, the Municipality may, having regard to the avoidance of a nuisance and the convenience of collection of waste, indicate a specific position within or outside the premises concerned where approved containers must be placed for the collection and removal of waste and such containers must then be placed in that position at such times and for such period as the Municipality may require.
- (9) No owner or occupier of premises is allowed to place any waste bags or other containers containing waste other than domestic or business waste outside the premises unless approved by the Municipality for a specific purpose and subject to conditions as the Municipality may impose.
- (10) Only animal proof containers may be used by residents in areas which the Municipality has declared as problem animal areas and these containers are at cost obtainable from the Municipality.

- (11) If an owner or occupier of premises in a problem animal area is using a container that does not comply with the requirements of the Municipality, he/she will be instructed to obtain an animal proof container from the Municipality and, in cases where the Municipality is of the opinion that more than one animal proof container is needed due to the volume of waste, the owner or occupier will be compelled to purchase such from the Municipality.
- (12) Nothing that may cause damage to the refuse compactor of the Municipality may be deposited in approved domestic and business waste containers or animal proof containers and where such care is not taken and damage of municipal equipment takes place, the Municipality will hold the owner or occupier liable for the full cost of such damages.

Communal collection

14. (1) The Municipality shall in high-density residential areas where a sustainable, formalised domestic waste collection service can be rendered, collect the waste of individual households on a weekly basis.
- (2) The Municipality shall, as its resources allow, place appropriate bulk containers at central communal collection points determined by the Municipality as suitable for communal collection.
- (3) Communal collection points will be clearly demarcated areas.
- (4) The bulk containers referred to in subsection (2) will be in accordance with the Municipality's specifications and its location will as far as reasonably possible—
 - (a) allow secure and easy access to the community;
 - (b) prevent windblown litter;
 - (c) enable easy access for the Municipality's waste collection vehicles.
- (5) The waste will as far as reasonably possible be collected once per week or within 24 hours of a bulk container being reported full to the Municipality.
- (6) Waste separation at source will be encouraged in respect of communal collection by providing separate bulk containers for mixed recyclables and non-recyclable waste at the communal collection points should the Municipality determine it to be viable and as its resources allows.

Collection in rural areas

15. (1) Where it is not economically viable for the Municipality to provide bulk waste containers or any other form of collection of waste in its rural areas, communities and farmers are encouraged to dispose of waste at designated municipal waste handling or waste disposal facilities.
- (2) Notwithstanding the above, the Municipality will in co-operation with rural communities work to find cost-effective ways to expand waste collection practices to the rural areas.
- (3) The Municipality is in accordance with national legislation generally not permitting on-site disposal of waste but may as an exception (and only with the relevant authorisation in place) allow on-site waste disposal in rural areas if no other feasible alternatives could be made available; in which case, the Municipality will supervise or monitor such practices and exercise control over it in so far as it is reasonably possible.

Recycling of waste

- 16.** (1) Any owner or occupier of a business or residential premise or any other holders of waste as determined by the Municipality and in areas as determined by the Municipality may be required to—
- (a) separate their waste in mixed recyclables (e.g. metal, paper, glass and plastic) and non-recyclables in accordance with the directives of the Municipality;
 - (b) use different containers for waste so separated as directed and / or provided by the Municipality or an accredited service provider;
 - (c) place containers containing the mixed recyclables and non-recyclable waste outside the entrance to the premises at a time and day specified by the Municipality or an accredited service provider or, if so requested, drop the mixed recyclables off at places as directed by the Municipality; and
 - (d) follow any other reasonable prescribed procedures.
- (2) The Municipality may locate drop-off centres for mixed recyclables and non-recyclable waste in all the towns at places ensuring easy and safe access for the public.

Accumulation of waste

- 17.** (1) The owner or occupier of business or residential premises must ensure that all domestic or business waste generated on the premises be placed for collection and not be accumulated.
- (2) Where a type or quantity of waste is not collected by the Municipality or regularly removed by an accredited service provider, the owner or occupier of the premises or holder of the waste must arrange for the removal, transport and disposal of the waste at a waste handling or waste disposal facility, as often as may be necessary to prevent undue accumulation and any nuisance or detrimental impact on human health or the environment arising from the waste.
- (3) The Municipality may enter any premises where it suspects waste of any type is accumulated and may instruct the person generating the waste or the owner or the occupier of the premises where it is so accumulated to remove the waste immediately or the Municipality may proceed to do so at the cost of the owner or occupier of the premises where the waste is accumulated.

CHAPTER 4

Handling Different Waste Types

Part 1

Garden and Organic Waste

Household composting

- 18.** The owner or occupier of premises on which garden waste is generated in small quantities may and is encouraged to compost such garden waste and other compostable organic waste on the premises, provided that aerobic processes acceptable to the Municipality are used and the composting does not cause a nuisance nor has a detrimental impact on human and environmental health and adheres to any relevant legal requirements including obtaining any authorisations from a competent authority should such be required.

Removal and disposal of organic compostable waste

19. (1) The owner or occupier of premises on which garden and other compostable organic waste is generated in small quantities but not composted as contemplated in section 18 or otherwise dealt with as part of domestic waste, must within a reasonable time after generation of the waste remove and dispose of it at an organic waste composting, waste handling or waste disposal facility determined by the Municipality.
- (2) Organic compostable waste generated on premises because of garden services activities must be removed and disposed of by an accredited service provider at an organic waste composting, waste handling or waste disposal facility determined by the Municipality.

Collection and disposal of non-compostable organic waste

20. Only the Municipality or an accredited service provider may collect non-compostable organic waste from premises where it is generated in substantive quantities and transport and dispose of it at an organic waste treatment, waste handling or a waste disposal facility determined by the Municipality.

Part 2

Domestic and business hazardous waste

Storage, collection, and disposal

21. (1) An owner or occupier of residential or business premises generating small quantities of domestic and business hazardous waste, may temporarily store such waste including WEEE in a manner not creating a nuisance or causing harm to human health or polluting the environment.
- (2) The materials stored in terms of subsection (1) must be either be collected by an accredited service provider or dropped off by the owner or occupier of the residential or business premises to a waste handling or disposal facility determined by the Municipality or a legally compliant special industry body, buy-back centre or recycler as directed by the Municipality.

Part 3

Bulky Waste

Removal and disposal

22. (1) The owner or occupier of premises on which bulky waste is generated, shall ensure that such waste is removed and disposed of in terms of this By-law within fourteen (14) days after generation thereof at a waste handling or waste disposal facility determined by the Municipality.
- (2) At the request of the owner or occupier of any premises the Municipality may remove bulky waste from premises, provided that the Municipality is able to do so with its waste removal equipment and subject to the payment of the prescribed charges.

Part 4

Building Waste

Plans and inspection

- 23.** (1) An owner or occupier or any person responsible for the submission of building plans for a new building or an alteration to an existing building must include therein the way building waste will be handled as well as the anticipated volumes of building waste to be generated.
- (2) An authorised official of the Municipality must inspect and verify that the waste arrangements contemplated in subsection (1) were followed and all building waste appropriately disposed of as part of the final municipal sign-off of the building activities.

Generation and storage

- 24.** (1) Notwithstanding the waste arrangements contemplated in section 23, the owner or occupier of premises on which building waste is generated and/or the person engaged in any activity which causes such waste to be generated, must ensure that—
- (a) all building waste and the containers used for the storage thereof is kept on the premises on which the building waste is generated;
 - (b) the premises on which the building waste is generated does not become unsightly or cause a nuisance as a result of accumulated building waste;
 - (c) any building waste which is blown off the premises, is promptly retrieved.
- (2) Upon written request and subject to conditions as it may determine the Municipality may approve the use of a bulk container placed on a verge for a specified duration.
- (3) The Municipality may instruct an owner or occupier of premises on which building waste is generated and/or the person engaged in any activity which causes such waste to be generated to make use of special containers to dispose of it and will determine a tariff for the use of such containers should these be provided by the Municipality.

Removal and disposal

- 25.** (1) The owner or occupier of premises on which building waste is generated and/or the person engaged in any activity which causes such waste to be generated, must ensure that all building waste is removed and disposed of continuously so as to prevent unnecessary accumulation of such waste.
- (2) Building waste must be disposed of at a waste handling and/or waste disposal facility determined by the Municipality.

Part 5

Special Industrial, Health Care and Hazardous Waste

Notification and verification

- 26.** (1) Any person that will engage in activities which will generate special industrial, health care and hazardous waste must prior to the generation of such waste, notify the Municipality in writing of—
- (a) the expected or known composition of such waste;
 - (b) the quantity to be generated;
 - (c) how and where it will be stored;

- (d) how it will be collected and disposed of; and
 - (e) the identity of the accredited service provider who will be responsible for its removal, transportation and disposal.
- (2) Any person engaged in waste activities as referred to in subsection (1) which were established and in operation prior to the commencement of this By-law, must notify the Municipality as contemplated in subsection (1) within ninety (90) days of the commencement of this By-law of such activities and provide the information required in terms of subsection (1).
 - (3) If so, required by the Municipality, a notification referred to in subsection (1) or (2) must be substantiated by—
 - (a) an assessment and analysis of the waste composition certified by an appropriately qualified industrial chemist;
 - (b) safety data sheets or completed waste manifest document/s; and
 - (c) such other records required to verify compliance with applicable legislation, national standards and SANS Codes.
 - (4) The person referred to in subsection (1) or (2) must when changes occur and annually before or on the 30th of June submit to the Municipality a written report containing:
 - (a) the information stipulated in subsection (1);
 - (b) the substantiating documents referred to in subsection (3); and
 - (c) any other information which the Municipality may reasonably require.
 - (5) An authorised official may enter premises at any reasonable time to ascertain whether waste referred to in subsection (1) is generated or stored on such premises and may take samples and test any waste found on such premises to ascertain its composition.

Storage

- 27. (1) Special industrial, health care and hazardous waste generated on premises must be stored thereon in an approved container until it is collected from the premises, and it must be stored in a manner not creating a nuisance or causing harm to human health or polluting the environment and in accordance with applicable legislation, national norms and standards, and SANS Codes.
- (2) If the waste referred to in subsection (1) is not stored as stipulated, the Municipality may require a full record of the waste content, date of containment and quantity and if such a record is not available the Municipality may instruct the person generating the waste or the owner or the occupier of the premises where it is stored to remove the waste immediately or the Municipality may proceed to do so at the cost of the owner or occupier of the premises where the waste is stored.

Collection and disposal

- 28. (1) Only an accredited service provider may collect special industrial, health care and hazardous waste from premises where it is stored and transport it to and dispose of it at a waste disposal facility designated by the Municipality to receive such waste.
- (2) An accredited service provider must collect, transport, and dispose of the waste referred to in subsection (1) in accordance with its accreditation terms and conditions and in compliance with applicable legislation, national norms and standards, and SANS Codes.

Part 6
Industrial Waste and Special Waste including e-Waste

Storage

29. (1) The owner or occupier of premises on which industrial waste or special waste is generated must ensure that until such time as the waste is collected by an accredited service provider from the premises on which it was generated—
- (a) the waste is stored in accordance with applicable legislation, national standards and SANS Codes in approved containers which are not kept in a public place; and
 - (b) no nuisance, health risk or environmental damage is caused by the waste during generation or storage.

Collection and disposal

30. (1) Only an accredited service provider may collect industrial or special waste from premises where it is stored and transport and dispose of it at a waste disposal facility designated by the Municipality to receive such waste.
- (2) An accredited service provider must collect, transport, and dispose of the waste referred to in subsection (1) in accordance with its licence terms and conditions and subject to the requirements of any applicable legislation, national standards, and SANS Codes.
- (3) The Municipality may determine specific times for acceptance of special waste at the site referred to in subsection (1).

Part 7
Tyres, Disused Vehicles or Machinery, Scrap Metal and WEEE

Storage and disposal

31. (1) No owner or occupier of premises with an operational area in excess of the statutory determined limit may temporary accumulate, store or stockpile waste tyres, disused, scrapped, dismantled or recovered vehicles or machinery, scrap metal or WEEE unless the waste management activity is managed in accordance with national standards or licensed in terms of national legislation, whichever is applicable.
- (2) Waste tyres, disused, scrapped, or dismantled vehicles or machinery, scrap metal and WEEE are not accepted at municipal owned waste handling or waste disposal facilities. Any person having to dispose of any of these materials must dispose thereof at the premises of a legally compliant special industry body, local waste processor, buy-back centre or recycler as directed by the Municipality.
- (3) The Municipality may enter the premises of any person involved in the storage or stockpiling of waste tyres, disused vehicles or machinery, scrap metal or WEEE and request proof of any plans including its waste tyre storage plan, integrated waste management plan, licenses, or other applicable documents to verify compliance with applicable legislation.

Part 8
Recyclable Waste

Storage, collection, and disposal

- 32.** (1) An owner or occupier of premises or any other person may not temporary accumulate, sort, store or stockpile recyclable waste on any premises within the municipal area unless acting in accordance with subsection (2).
- (2) An owner or occupier of premises or any other person must prior to commencing an activity involving the re-use, reclamation, or recycling of waste (including the wastes referred to in Part 6), comply with national and provincial legislation and standards and applicable SANS Codes for such activity and provide the Municipality with a copy of his integrated waste management plan and such other information as the Municipality may require.
- (3) Only an accredited service provider may collect recyclable waste from premises where it is generated or separated from other waste and transport and dispose of it at a material recovery facility or a waste disposal facility designated by the Municipality to receive such waste.

Part 9 Agricultural and Farm Waste

Disposal

- 33.** (1) An owner or occupier of farmland may subject to subsections (2) and (3) use on-site disposal of waste but burning of waste is strictly prohibited unless authorised by the Chief Fire Officer in terms of the Fire Safety By-law of the Municipality.
- (2) An owner or occupier of farmland may not dispose any quantity of hazardous waste including hazardous and infectious organic waste, which may be present in agricultural waste, to the land unless in possession of the applicable waste management license in terms of national legislation, and if applicable, provincial legislation.
- (3) An owner or occupier of farmland may dispose of general waste, which may include agricultural and farm waste, to the land provided this is done in accordance with applicable legislation, national standards, and SANS Codes and, if the quantity of waste requires it, authorisation thereof by a valid waste management license.
- (4) An authorised official of the Municipality may request an owner or occupier of farm land who he suspects is disposing hazardous waste and/or general waste exceeding the quantity allowed for disposal to provide proof of the licences referred to in subsections (2) or (3) and, irrespective of the composition or quantity of the waste disposed of to land by the owner or occupier, the Municipality may request the owner or occupier to submit an integrated waste management plan to the Municipality within a determined time frame.
- (5) An owner or occupier of farmland may apply in writing to make use of the Municipality's waste handling and waste disposal facilities, the approval of which will provide the applicant access to the Municipality's coupon system and disposal of waste excluding hazardous and health care waste at waste handling or waste disposal facilities as directed by the Municipality in its approval.

Transportation and Disposal

Part 1 Transportation of Waste

Safe transportation

- 34.** (1) No person may—
- (a) operate a vehicle for the conveyance of waste upon a public road unless the vehicle has a body of adequate size and construction for the type of waste being transported; and
 - (b) fail to maintain a vehicle used for the conveyance of waste in a clean, sanitary, and roadworthy condition at all times.

No wastage or spillage

- 35.** (1) A person transporting waste through the municipal area must ensure that—
- (a) loose waste on an open vehicle is covered with a tarpaulin or suitable net; and
 - (b) no waste become detached, leak, or fall from the vehicle transporting it.

Legal compliance

- 36.** (1) A transporter of waste, specifically hazardous waste, must ensure he or she operates in compliance with all relevant national and provincial legislation, national standards, and SANS Codes.

Part 2 Waste Disposal

Diversion

- 37.** (1) The Municipality may determine that compostable and non-compostable organic waste be diverted to respectively organic waste composting and organic waste separation and / or treatment facilities as directed by the Municipality and at a prescribed fee. No organic waste composting and organic waste separation and / or treatment facility shall be allowed to receive non-conforming waste.
- (2) The Municipality may determine that building waste be diverted to waste handling and / or waste disposal facilities as directed by the Municipality and at a prescribed fee.
- (3) The Municipality may determine that recyclables be diverted to waste handling and / or waste disposal facilities as directed by the Municipality and at a prescribed fee.
- (4) The conditions set out in sections 38, 39, 40, 41 and 42 of this By-law shall, as practical, also apply to the waste composting and waste separation and / or treatment facilities referred to in subsection (1).

Permitted use

- 38.** (1) The Municipality may prescribe which types of waste may be disposed of at a particular waste handling or waste disposal facility as permitted in terms of the license stipulations of each facility and further in compliance with national legislation and standards.

- (2) Different tariffs for the disposal of different waste types and volumes are applicable but residents are allowed free disposal of a certain volume of general waste as determined by the Municipality.

Liability

39. (1) No person may dispose of waste at a waste disposal facility which is not licensed for such use. Any person who acts in contravention of any prescriptions of the Municipality as contemplated in section 38(1) will be liable for all reasonable costs incurred by the Municipality in removing or otherwise dealing with the waste improperly disposed.
- (2) The Municipality shall not be liable for any claim resulting from access to any waste handling or waste disposal facility and any person who enters any of the sites of these facilities does so at own risk.

Conduct at facilities

40. (1) No person may enter a waste handling or a waste disposal facility for any purpose other than the disposal of waste in terms of this By-law and only at such times and between such hours as the Municipality may determine and display on a clearly visible notice board at the entrance of the waste handling or waste disposal facility.
- (2) Every person who, for the purpose of disposing waste enters a waste handling or a waste disposal facility must—
 - (a) enter and leave the facility at the designated entrance and exit points;
 - (b) supply all the particulars required regarding the source and composition of the waste, which waste may be inspected by the Municipality;
 - (c) follow all instructions regarding access to the actual disposal, transfer or recycling point and the place where and the manner in which the waste should be deposited.
- (3) No person may bring any intoxicating liquor or narcotic substances into any waste handling or waste disposal facility.
- (4) The Municipality may prescribe the maximum size of a vehicle allowed to enter a waste handling or waste disposal facility.

Accepting waste from others

41. (1) The Municipality may consider an application from another municipality to dispose waste at a designated waste disposal facility provided that the acceptance of waste from another municipality will not impact on the Municipality's authority and ownership of the said waste disposal facility.
- (2) The Municipality may allow a person to dispose waste generated outside the Municipality's municipal area at a designated waste disposal facility of the Municipality provided such person first becomes an accredited service provider as provided for in this By-law.
- (3) The tariffs applicable to accredited service providers referred to in subsection (2) may differ from the waste disposal tariffs stipulated in the Municipality's Tariff By-laws.

Enabling Private Party Initiatives

42. (1) The Municipality may allow for the provision of private drop-off, organic waste composting, organic

waste treatment and other value-add treatment facilities at municipal waste handling and waste disposal facilities to enable the execution of EPR obligations, the diversion and reduction of waste disposed to landfill and the generation of renewable energy through public-private partnership arrangements to reach national targets in this regard.

CHAPTER 6

Littering and Dumping

Provision of facilities for litter

- 43.** (1) The Municipality must take reasonable steps to ensure that enough containers are provided for the discarding of litter by the public on any premises to which the public has access.
- (2) The owner or occupier of private land to which the public has access must ensure that sufficient containers are provided to contain litter which is discarded by the public.
- (3) The Municipality or the owner or occupier of private land must ensure that a container provided in terms of subsections (1) or (2) is suitably located, sized, weighted, constructed, and anchored to fulfil its intended purpose, regularly emptied and kept in a good and hygienic condition.

Littering and dumping

- 44.** (1) No person may drop, throw, deposit, spill, dump or in any other way discard, any litter or waste into or onto any public place, public road, road, municipal drain, land, vacant erf, stream, or any other places not allowed for in this By-law or allow any person under their control to do so.
- (2) No person may use a container provided for litter to dispose of domestic, business or garden waste or disturb or remove litter from such a container in a way that the litter is spilled.
- (3) An authorised official may act against any of the contraventions listed in subsections (1) or (2) through a written notice directing such person to—
- (a) cease the contravention within a specified time;
 - (b) prevent a repeat of the contravention or a further contravention;
 - (c) take whatever measures that the Municipality considers necessary to clean up or remove the waste and rehabilitate the affected environment within a specified time; and
 - (d) to pay a fine or appear in court in terms of the Criminal Procedure Act, 1977 (Act 51 of 1977).
- (4) An owner or occupier of land or premises or any other person in control of land or premises, may not use or permit the land or premises to be used for unlawful dumping of waste and must take reasonable steps to prevent the use of the land or premises for that purpose.
- (5) Should the Municipality regard it necessary to remove waste or litter from land or premises, the owner, occupier, or person having control over the land or premises will be held liable for the costs incurred by the Municipality for the removal operation.
- (6) In the case of hazardous waste, the Municipality will immediately remove such waste and thereafter issue notices to the person liable for the cost of removal and rehabilitation of the environment.

Burning of waste

45. Burning of waste is strictly prohibited unless authorised by the Chief Fire Officer in terms of the Fire Safety By-law of the Municipality.

Abandoned objects

46. A person who abandons any article which may be classified as waste in terms of this By-law, is liable for any damage which that article has caused or may cause as well as for the cost of removing that article notwithstanding the fact that such person may no longer be the owner thereof.

CHAPTER 7

External Service Providers

Part 1

Accredited Service Providers for Commercial Services

Accreditation applications

47. (1) No person may provide commercial services for the collection and transport of waste in the municipal area unless such person has registered with the Municipality and obtained an accreditation authorising these waste management activities in the municipal area.
- (2) An application for accreditation must be submitted in writing in a format or on a form prescribed by the Municipality including such information as the Municipality requires and the prescribed fee and, unless subsection (3) applies, the Municipality's approval for the collection and transportation of waste must first be obtained before such waste services may commence.
- (3) Any person already providing these commercial services at the commencement of this By-law, must within ninety (90) days of such commencement date apply for accreditation in terms of subsection (1), failing which the person will as from the date that the said ninety days' period expired no longer be able to render such services in the municipal area.
- (4) The Municipality will consider and grant or reject the application submitted in terms of subsection (3) within thirty (30) days of its receipt having regard to the health, safety and environmental record of the applicant and the nature of the commercial service to be provided and will furnish written reasons if such application is rejected.

Terms and conditions of accreditation

48. (1) An accreditation must-
- (a) clearly identify the accredited person or entity;
 - (b) specify the accreditation period;
 - (c) specify the categories of waste which the accredited service provider may collect, transport and dispose;
 - (d) outline the information recording and submission requirements of the Municipality for its own integrated waste management plan and IPWIS; and
 - (e) specify other procedural matters that may be necessary.

- (2) An accreditation authorisation—
 - (a) may not be ceded or assigned without the prior written consent of the Municipality;
 - (b) is valid for one year from the date of issue; and
 - (c) is valid only for the categories of waste specified therein.
- (3) An accreditation authorisation will include a display sticker for each of the vehicles identified in the accreditation application indicating the validity period and the category of waste for which the licence is granted, which sticker must be clearly displayed on the front window of the identified vehicles.
- (4) The Municipality will not receive waste at its waste handling facilities or waste disposal facilities from service providers or contractors who are not able to provide proof of accreditation by the Municipality should it be requested and without an accreditation sticker on the vehicle.
- (5) An accredited service provider may not fail or refuse to provide the Municipality with any information reasonably requested with regards to the terms and conditions of the accreditation or give false or misleading information.
- (6) An accredited service provider is fully liable for any act or omission by any of his or her employees if such act or omission could be seen as a transgression of the accreditation conditions and/or have a detrimental impact on human health or the environment.

Renewal of accreditation

49. (1) An accreditation renewal application must be submitted at least sixty (60) days prior to the expiry date thereof and will be considered and either granted or rejected by the Municipality within thirty (30) days of receipt of the renewal application. The Municipality must provide substantive reasons for the rejection of an accreditation renewal.
- (2) Notwithstanding anything to the contrary in this By-law, the Municipality must temporary extend an accreditation for a specific duration not exceeding thirty (30) days if an accredited service provider followed the correct procedure as contemplated in subsection (1) and due to the Municipality's processes, the renewal application has not been considered and a new accreditation granted or rejected.

Suspension and revocation of accreditation

50. (1) The Municipality may suspend or revoke an accreditation if a service provider failed to comply with any of the terms and conditions of the licence or any other provision of this By-law, or any national or provincial legislation regulating the collection, transportation or disposal of waste or any other grounds considered by the Municipality as substantive reason to revoke or suspend an accreditation.
- (2) The Municipality must give an accredited service provider written notice of the intended suspension or revocation of his or her accreditation and thirty (30) days from the date of issuing the notification to submit reasons for such action not to be taken by the Municipality.
- (3) The Municipality must make a final decision within fourteen (14) days of the expiry of the period stated in subsection (2) irrespective if a representation was received from the service provider and notify the service provider in writing within seven (7) days of taking a final decision.

Accreditation exemptions

51. The Municipality may exempt an external service provider or a commercial service from any or all the provisions

in Part 1 of Chapter 7 and such other sections as may be deemed necessary by the Municipality.

Consumer responsibilities

52. (1) The owner or occupier of premises or the holder of waste that contracts with an accredited service provider must ensure that—
- (a) the service provider is accredited to collect and transport the categories of waste for which he or she is contracted;
 - (b) until such time as the accredited service provider collects such waste from the premises on which it was generated, the waste is stored in an approved container and no nuisance, including but not limited to dust and smells, is caused by the handling of the waste in the course of its generation, storage or collection; and
 - (c) the service rendered is only in respect of the categories of waste authorised in the accreditation.

Part 2 Municipal Service Providers

Outsourcing of waste services and support activities

53. The Municipality may enter into agreements with external service providers, whether public or private, for the rendering of municipal waste services and support activities and must do so in accordance with municipal, provincial, and national legislation.

Consumer charter

54. If a service provider as contemplated in section 51 is appointed by the Municipality, to render a service to a large geographical area or part of its population, the service provider will be required to compile and adopt a consumer charter in consultation with the community.

CHAPTER 8

General

Ownership

55. (1) The person holding the licence to operate a waste handling, or a waste disposal facility becomes the owner of all waste upon disposal thereof at that facility.
- (2) A person who generates domestic or business waste is the owner thereof until it is collected by the Municipality who then becomes the owner thereof.
- (3) An owner or occupier of premises or the holder of waste who contracts with an accredited service provider to collect and transport certain categories of waste, remains the owner of these categories of waste until such waste is collected from the premises by the accredited service provider who then becomes the owner thereof.

Access to premises

56. (1) Should the Municipality be impeded from collecting or handling waste due to the layout of the premises

and/or such layout is likely to result in damage to private property or municipal property or injury to the Municipality's employees, the Municipality may require the owner or occupier to do such alterations as necessary at own cost to remove any impediments.

- (2) Should the owner or occupier fail or refuse to comply with the Municipality's request, the Municipality may suspend the service and require the owner or occupier to indemnify the Municipality in writing in respect of such damage or injury or any claims arising from it before resuming the service.

CHAPTER 9

Compliance and Enforcement

Compliance with this By-law and other laws

57. (1) The owner or occupier of premises is responsible for ensuring compliance with this By-law.
- (2) Any person or entity who requires a waste related license or authorisation in terms of national, provincial or municipal legislation must submit proof of such licence or authority to an authorised official upon request or within such other period specified by the authorised official.

Authorisation of an official

58. (1) The Municipality or a municipal service provider as contemplated in section 51 of this By-law, may authorise any person in its employ to give effect to the provisions of this By-law.
- (2) The waste management officer of the Municipality is an authorised official.

Functions and powers of an authorised official

59. (1) An authorised official may execute work, conduct an inspection and monitor and enforce compliance with this By-law and, as applicable, national and provincial legislation relating to waste management.

Servicing of notices and documents

60. (1) A notice or document issued by the Municipality in terms of this By-law must be deemed to be duly authorised if an authorised official signed it.
- (2) If a notice or document is to be served on an owner, occupier or any other person in terms of this By-law it shall be deemed to be effectively and sufficiently served on such a person-
 - (a) when it has been delivered to him or her personally or to his or her duly authorised agent;
 - (b) when it has been left at his or her residence or place of business or employment to a person apparently not less than sixteen years of age and residing or employed there;
 - (c) if he or she has nominated an address for legal purposes, having been delivered to such an address;
 - (d) if he or she has not nominated an address for legal purposes, having delivered it to the address given by him or her in his or her application for the provision of waste services, for the reception of an account for the provision of waste services;
 - (e) when it has been sent by pre-paid registered or certified post addressed to his or her last known address for which an acknowledgement of the posting thereof will be obtained from the postal service;
 - (f) in the case of a legal person, by delivering it at the registered office or business premises of

- such legal person; or
- (g) if service cannot be effected in terms of subsections (a) to (f), by affixing it to a conspicuous place on the premises concerned.

Compliance notices

61. (1) An authorised official may issue a written notice to any person contravening the provisions of this By-law.
- (2) A notice in terms of subsection (1) must
- (a) provide details of the provision of the By-law that has not been complied with;
 - (b) provide the owner, occupier, or other party a reasonable opportunity to make representations within a specified period;
 - (c) specify the steps that the owner, occupier or other person must take to rectify or remedy the failure;
 - (d) specify the period within which the owner, occupier or other person must take these steps to rectify the failure; and
 - (e) indicate that the Municipality may-
 - (i) if the notice is not complied with, undertake or allow the work that is necessary to rectify the failure to be undertaken and recover from the owner, occupier or other person the actual cost of such work; and
 - (ii) take any other action it deems necessary to ensure compliance.
- (3) If an owner or occupier or any other person fails to comply with a written notice served on him or her by the Municipality in terms of this By-law, the Municipality may take such action as in its opinion is necessary to ensure compliance, including-
- (a) Undertaking the actions and/or work necessary and recovering the cost of such actions and/or work from the owner, occupier, or other person; or
 - (b) Instituting legal proceedings against the owner, occupier, or other person in terms of the Criminal Procedure Act, 1977 (Act 51 of 1977).
- (4) In the event of an emergency, notwithstanding any other provisions of this By-law, the Municipality may without prior notice undertake the work contemplated in subsection (3) and recover such costs from the owner, occupier or other person.
- (5) The actual costs recoverable by the Municipality in terms of subsections (3) and (4) shall be the full costs associated with such work.
- (6) In the case where compliance with a notice is required within a specified number of working days, such period shall be deemed to commence on the date of issue of such notice.
- (7) A notice or document issued in terms of subsection (2) is valid until one of the following events occurs:
- (a) it is carried out;
 - (b) it is cancelled by the authorised official who issued it or, in that person's absence, by a person with similar authority;
 - (c) the purpose for which it was issued, has lapsed.
- (8) An authorised official who is satisfied that the owner or occupier or person apparently in control of any

premises has satisfied the terms of a compliance notice may issue a compliance certificate to that effect.

Power of entry and inspection

62. (1) An owner or occupier must, on request, allow an authorised official access to premises to carry out such inspection and examination as he or she may deem necessary to investigate any contravention of this By-law and ensure compliance therewith.
- (2) When accessing the premises, the authorised official must, if requested, identify him or herself through written proof of authorisation.

Using force to enter

63. (1) Force may not be used to affect entry to execute work or conduct an inspection on any premises in terms of section 62 unless an environmental emergency arises.
- (2) An authorised official carrying out a written authorisation in terms of section 62 which is regarded as an environmental emergency situation, may overcome any resistance to entry, execution of work or inspection by using as much force as is reasonably required, including breaking a lock, door or window of the premises to be entered.
- (3) Before resorting to force to gain entrance to the premises, the authorised official carrying out the written authorisation must audibly demand admission and must announce his or her purpose, unless he or she reasonably believes that doing so may induce a person to destroy, dispose of, or tamper with, the article or document or object that is the focus of the inspection.

Liabilities and compensation

64. The Municipality will not be liable for damages or compensation arising from anything done by it in terms of this By-law.

False statement or information

65. No person may make a false statement or furnish false information to the Municipality, an authorised official or an employee of the Municipality, or falsify a document issued in terms of this By-law.

Appeals

66. A person whose rights are affected by a decision of the Municipality in terms of delegated authority may appeal against that decision by giving written notice of the appeal and the reasons therefor in terms of section 62 of the Local Government Municipal Systems Act, Act 32 of 2000 to the municipal manager within twenty-one (21) days of the date of notification of the decision.

Offences

67. (1) It is an offence for any person to -
- (a) refuse to grant an authorised official access to premises to which that authorised official is duly authorised to have access;
 - (b) obstruct, interfere or hinder an authorised official who is exercising a power or carrying out a duty under this By-law;

- (c) fail or refuse to provide an authorised official with a document or information that the person is required to provide under this By-law;
 - (d) give false or misleading information to an authorised official;
 - (e) unlawfully prevent the owner of any premises, or a person working for that owner, from entering the premises in order to comply with a requirement of this By-law;
 - (f) pretend to be an authorised official;
 - (g) alter an authorisation to an authorised official or written authorisation, compliance notice or compliance certificate issued in terms of this By-law;
 - (h) enter any premises without a written notification in circumstances requiring such notification;
 - (i) act contrary to a written notice or document issued in terms of this Chapter;
 - (j) disclose any information relating to the financial or business affairs of any person which was acquired in the performance of any function or exercise of any power in terms of this By-law, except –
 - (i) to a person who requires that information in order to perform a function or exercise a power in terms of this By-law;
 - (ii) if the disclosure is ordered by a court of law; or
 - (iii) if the disclosure is in compliance of the provisions of any law.
 - (k) contravene or fail to comply with any of the provisions of this By-law;
 - (l) fail to comply with any notice issued in terms of this By-law;
 - (m) fail to comply with any lawful instruction given in terms of this By-law;
 - (n) Contravene or fail to comply with any conditions imposed upon the granting of any licence, consent approval, concession, exemption or authority in terms of this By-law.
- (2) A person who causes or incites another person to commit an offence referred to in subsection (1), or who, being in a position of authority over another person, permits or allows him or her to commit an offence, will be guilty of that offence.

Penalties

- 68.** (1) Any person who contravenes any of the provisions of section 67 shall be guilty of an offence and liable on conviction to-
- (a) a fine or imprisonment or to such imprisonment without the option of a fine or to both such fine and such imprisonment and,
 - (b) in the case of a continuing offence, to an additional fine or an additional period of imprisonment or to such additional imprisonment without the option of a fine or to both such additional fine and imprisonment for each day on which such offence is continued and,
 - (c) a further amount equal to any costs and expenses found by the court to have been incurred by the Municipality as a result of such contravention or failure.
- (2) In addition to any penalty imposed in terms of subsection (1) the Municipality may terminate the rendering of waste services to such a person.
- (3) The Municipality may without compensation, confiscate the property or other equipment or instruments through which unauthorised services were obtained.

Application of this By-Law

- 69.** This by-law applies to all persons or bodies, including organs of State, situated within the area of jurisdiction of the Theewaterskloof Local Municipality.

Jurisdiction of Magistrates Court

- 70.** Notwithstanding any other provision referred to in any legislation regarding the jurisdiction of a Magistrate's Court, a magistrate has the jurisdiction to issue an order on application by the Municipality, for the implementation of any provision of this By-law, or for any approval, refusal or conditional approval granted or applicable in terms of this By-law.

Repeal of By-laws

- 71.** The by-law listed in Schedule "A" is hereby repealed.

Short title and commencement

- 72.** This By-law is called the Integrated Waste Management By-law, No. of 2024 and commences on the date of publication in the Western Cape Provincial Gazette.

SCHEDULE A

BY-LAWS REPEALED

The following By-law is hereby repealed in terms of section 71 of this By-law:

NUMBER AND YEAR OF NOTICE	TITLE OR SUBJECT	EXTENT OF REPEAL
Provincial Gazette 7430 dated 21 July 2015	Theewaterskloof Municipality: Waste Management By-law	In full

Theewaterskloof Municipality

Organic Waste Diversion Plan: Phase 1

Reference: 1001186
Revision:2

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Term/acronym	Definition
CoC	Constituents of Concern
GLB+	General landfill with a positive water balance that is expected to generate leachate
GLB-	General Landfill with a negative water balance that is not expected to generate leachate
TC	Leachable concentration threshold
LC	Leachable concentrations
NEMWA	National Environmental Management: Waste Act, 2008 (Act 59 of 2008) (as amended)
SANAS	South African National Accreditation System - national body responsible for carrying out accreditations in respect of conformity assessment, as mandated through the Accreditation for Conformity Assessment, Calibration and Good Laboratory Practice Act
TC	Total concentrations
TCT	Total concentration threshold
WCMR	The Waste Classification and Management Regulations
WWTW	Wastewater Treatment Works
LISTED TERMS	
Disposal	Disposal means the burial, deposit, discharge, abandoning, dumping, placing or release of any waste into, or onto, any land.
Domestic/general waste	Domestic waste means waste, excluding hazardous waste, that emanates from premises that are used wholly or mainly for residential, educational, health, sport or recreation purposes, which include: <ul style="list-style-type: none"> ▪ garden and park wastes ▪ municipal waste ▪ food waste
Hazardous 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 and includes hazardous substances, materials or objects within business waste, residue deposits and residue stockpiles.
Waste disposal facility	Waste disposal facility (landfill) means any site of premises used for the accumulation of waste with the purpose of disposing of that waste or on that premise.
Leachate	Leachate is formed when rainwater infiltrates and percolates through the degrading waste
Litter	rubbish such as paper, cans, and bottles left lying in an open or public place
Pollution	Pollution means any change in the environment caused by- <ul style="list-style-type: none"> ▪ Noise odours, dust or heat, emitted from any activity, including the storage or treatment of waste or substances, construction and the provision of services, whether engaged in by any person, or organ of state, where that changes has an adverse effect on human health or well-being or on the composition, resilience and productivity of natural or managed ecosystems, or on materials useful to people, or will have such an effect in future.
Putrescible waste	Solid waste that contains organic matter

Term/acronym	Definition
Waste	<p>Act No. 26 of 2014: National Environmental Management: Waste Amendment Act, 2014</p> <p>“‘waste’ means—</p> <ul style="list-style-type: none"> (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— <ul style="list-style-type: none"> 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 <p>where the Minister has, in the prescribed manner, excluded any waste stream or a portion of a waste stream from the definition of waste.</p>
Waste generator	<p>A waste generator will be treated as a waste holder as defined in the National Environmental Management: Waste Act. 2008, Act No. 59, 2008:</p> <p>A holder of waste must, within the holder's power, take all reasonable measures to—</p> <ul style="list-style-type: none"> ■ avoid the generation of waste and where such generation cannot be avoided: ■ to minimise the toxicity and amounts of waste that are generated; ■ reduce, re-use, recycle and recover waste; ■ where waste must be disposed of, ensure that the waste is treated and disposed of in an environmentally sound manner; ■ manage the waste in such a manner that it does not endanger health or the environment or cause a nuisance through noise, odour or visual impacts; ■ prevent any employee or any person under his or her supervision from contravening this Act; and ■ prevent the waste from being used for an unauthorised purpose.

Listed terms:	Description
Accreditation	Accreditation for stakeholders is necessary to prove that they are registered and meet a general standard of quality with a recognised institution.
Aquaculture	Cultivation of aquatic animals and plants, especially fish, shellfish, and seaweed, in natural or controlled marine or freshwater
Basic waste management service	A basic waste management service means to have access to at least once-a-week refuse removal services.
Building and demolition waste	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.
Buy-back Centre	Buy-back Centre means a location where discarded materials can be exchanged for money for further transportation to a recycling facility. The price for the waste is determined by the current markets and the quantities of waste.
Business Waste	Business Waste means waste that emanates from premises that are used wholly or mainly for commercial, retail, wholesale, entertainment or government administration purposes.
Compost	Compost is decayed organic material used as a fertilizer for growing plants to which no plant nutrients have been added and that is free of substances or elements that could be harmful to man, animal, plant or the environment
Composting	Composting means biologically degrading organic materials in the presence of oxygen, yielding carbon dioxide, and heat and stabilised organic residues that may be used as a soil additive.
Container	Container 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 bags, bins, bin-liners and skips.
Disposal	Disposal means the burial, deposit, discharge, abandoning, dumping, placing or release of any waste into, or onto, any land.
Domestic waste	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, which include: <ul style="list-style-type: none"> (a) garden and park wastes (b) municipal waste (c) food waste
Designated Waste Management Officer	Designated Waste Management Officer means a person in the employ of the Council authorised to be a designated officer in terms of (Section 10(3)) to be a designated officer with the responsibility set aside in (section 10 (5)) of the NEMWA, Act 59 of 2008
General waste	General waste means waste that does not pose an immediate hazard or threat to health or to the environment, and includes— <ul style="list-style-type: none"> • Domestic waste; • Building and demolition waste; • Business waste: and • Inert waste.
Garden waste/ green waste	Garden waste or green waste is meant as biodegradable waste material generated from the likes of a typical garden such as flower cuttings, hedge trimmings, wood pieces from pruning etc.
Hazardous 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 and includes hazardous substances, materials or objects within business waste, residue deposits and residue stockpiles.
High income group	High income group means households which fall within the Living Standard Measure (LSM) of 5 – 10).

Listed terms:	Description
Inert Waste	<p>Inert Waste means waste that—</p> <ul style="list-style-type: none"> • Does not undergo any significant physical, chemical or biological transformation after disposal; • 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 • Does not impact negatively on the environment, because of its pollutant content and because the toxicity of its leachate is insignificant.
Integrated Waste Management Plan	<p>Integrated Waste Management Plan means a plan prepared in terms of section 12 of NEMWA.</p>
Landfill	<p>Waste disposal facility means any site of premises used for the accumulation of waste with the purpose of disposing of that waste or on that premise.</p>
Low income group	<p>Low income group means households which fall within the Living Standard Measure (LSM) of 1 – 5</p>
Materials Recovery Facility	<p>Materials Recovery Facility means a centre for the reception and transfer of materials recovered from the waste stream for recycling. Materials are sorted by type and treated (cleaning and compression).</p>
Organic waste	<p>A carbon-based material of animal or plant origin (that is defined as waste in terms of the South African gazetted National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008:) that naturally enhances fertility of soil through a natural degradation process (natural occurring fertilizer) but excludes human made organic chemicals (such as solvents, chemicals and cleansing agents) and naturally occurring organic chemicals which have been refined or concentrated by human activity (such as oil, petroleum, diesel and tar products). “Organic Waste” will generally comprise materials that can be accepted for disposal at a licensed municipal general waste landfill facility (i.e. excludes infectious, poisonous, health-care and hazardous organic wastes)”. </p>
Pollution	<p>Pollution means any change in the environment caused by-</p> <ul style="list-style-type: none"> • Substances; • Radioactive or other waves; or • Noise odours, dust or heat, emitted from any activity, including the storage or treatment of waste or substances, construction and the provision of services, whether engaged in by any person, or organ of state, where that changes has an adverse effect on human health or well-being or on the composition, resilience and productivity of natural or managed ecosystems, or on materials useful to people, or will have such an effect in future.
Recovery	<p>Recovery means the controlled extraction of a material or the retrieval of energy from waste to produce a product.</p>
Recycle	<p>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.</p>
Re-use	<p>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.</p>
Separation at Source	<p>Separation at Source means the separation of recyclable material from other waste at the point and time the waste is generated. This includes separation of recyclable material into its component categories and may include further separation within each category.</p>
Treatment	<p>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.</p>

Listed terms:	Description
Waste	Act No. 26 of 2014: National Environmental Management: Waste Amendment Act, 2014 “‘waste’ means— (c) 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 (d) 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— iv. 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; v. where approval is not required, once a waste is, or has been re-used, recycled or recovered; vi. 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 vii. 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 Avoidance	Waste Avoidance aims to achieve waste minimization therefore reducing the amount of waste entering the waste stream. This is especially important where the recycling, recovery, treatment or disposal is problematic.
Waste generator	A waste generator will be treated as a waste holder as defined in the National Environmental Management: Waste Act, 2008, Act No. 59, 2008: A holder of waste must, within the holder's power, take all reasonable measures to— (a) avoid the generation of waste and where such generation cannot be voided, (a) to minimise the toxicity and amounts of waste that are generated; (b) reduce, re-use, recycle and recover waste; (c) where waste must be disposed of, ensure that the waste is treated and disposed of in an environmentally sound manner; (d) manage the waste in such a manner that it does not endanger health or the (e) environment or cause a nuisance through noise, odour or visual impacts; (f) prevent any employee or any person under his or her supervision from contravening this Act; and (g) prevent the waste from being used for an unauthorised purpose.
Waste Hierarchy	The management hierarchy concept provides a systematic and hierarchical approach to integrated waste management, addressing in turn waste avoidance, reduction, reuse, recycling recovering treatment and the safe disposal of waste as a last resort.
Waste Management Services	Waste Management Services means waste collection, treatment, recycling and disposal services
Waste Minimisation	Waste Minimisation means techniques used to keep waste generation at a minimum level in order to divert materials from landfill. The term waste minimisation is also applied to recycling and other efforts to reduce the amount of waste going into the waste stream.
Waste Transfer Facility	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.
Wood waste	Wood waste is a material from pruning or tree removal operations that would otherwise be discarded in a landfill.

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1 Introduction

The Draft National Norms and Standards for Organic Waste Composting (2019), defines organic waste as ‘waste of biological origin which can be broken down, into its base compounds by micro-organisms and other living things and/or by other forms of treatment. In South Africa, organic waste mainly originates from households, while the rest comes from agriculture, forestry, alien clearing, municipal solid waste and commercial or industrial solid waste. A large percentage is also generated from sewage treatment plants. Sewage sludge will however not be addressed within the Provincial Organic Waste Strategy (2020) but can be included as an additive feedstock in any of the prescribed waste to energy beneficiation technologies. Organic waste types generated nationwide include garden waste, food waste (including abattoir waste), wood waste, sewage sludge and industrial organic wastes (e.g. paper mill sludge, meat processing waste, brewery wastes, and textile mill fibres).

1.1 Background

Theewaterskloof Municipality (TWKM) is a local municipality located within the Overberg District Municipality, in the Western Cape Province of South Africa. It is one of four municipalities in the district, making up a third of its geographical area. Theewaterskloof Municipality is the gateway to the Overberg and is surrounded by unique natural assets such as the Theewaterskloof Dam, Kogelberg Biosphere, illustrious vineyards, crop and fruit fields, fynbos, wild flowers and blue cranes. With its Local Economic Development Strategy (LED strategy), the municipality is constantly driving local economic development in primary economic sectors such as agriculture, tourism, agricultural product processing, and industries. Area: 3 259km². The locality of the TWKM is shown in Figure 1.

The Cities/Towns are Bot River, Caledon, Myddleton, Genadendal, Grabouw, Greyton, Riviersonderend, Theewaterskloof, and Villiersdorp.

The main Economic Sectors are Wholesale and retail trade, catering and accommodation (17.9%), finance, insurance, real estate and business services (15.9%), agriculture, forestry and fishing (15.7%), manufacturing (13.9%), general government (8.4%), construction (7.7%), community, social and personal services (6.6%), mining and quarrying (0.1%).

(<https://municipalities.co.za/overview/1225/theewaterskloof-local-municipality>, 29 March 2021)

This Draft Organic Waste Diversion Plan (OWDP) has been developed for the Waste Facilities in TWKM in order to determine which of the above waste streams are generated in TWKM, the generation rates and to propose alternative management and processing options to landfill.

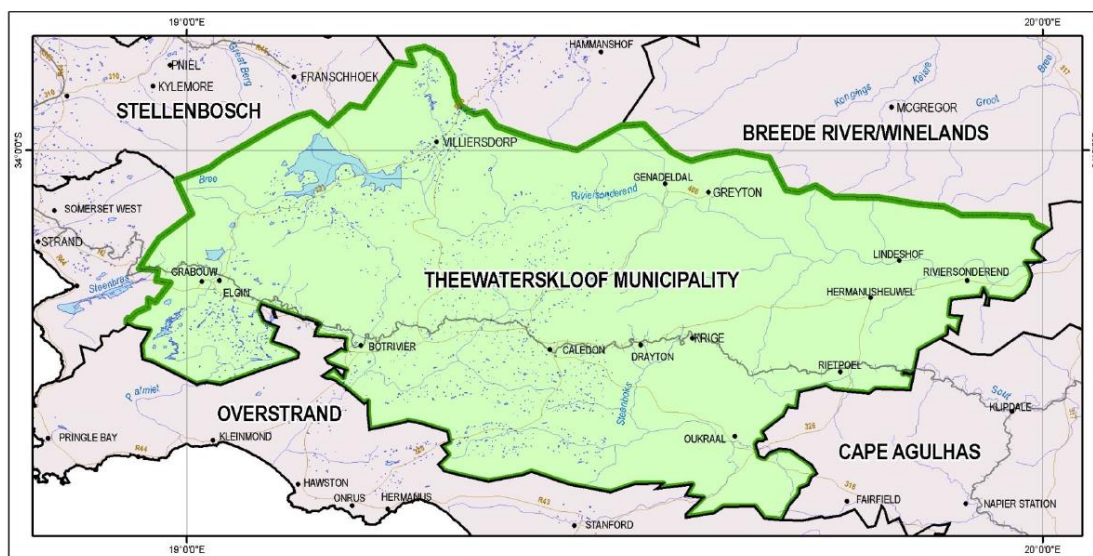


Figure 1 Locality of Theewaterskloof Municipality

2 Status Quo of Organic Waste

2.1 Status of waste management facilities in Theewaterskloof Municipality

An OWDP is required for the facilities listed below, however one overarching OWDP has been compiled for TWKM in order to take into account all the operations in the TWKM and to ensure an integrated approach is required for managing organic waste.

- Caledon Waste Disposal Facility
- Genadendal Waste Disposal Facility
- Greyton Waste Disposal Facility
- Villiersdorp Transfer Station
- Riviersonderend Waste Disposal Facility
- Grabouw Transfer Station

TWKM currently has a number of waste management facilities accepting organic and other municipal solid waste. These are described in Table 1.

Table 1 Waste management facilities in TWKM

Waste Management Facility	Status	Waste accepted	Description
Caledon Landfill	Operational Landfill site	Domestic	<ul style="list-style-type: none"> ■ Domestic waste including organic waste accepted
Caledon Transfer station and MRF	Transfer Station & MRF		<ul style="list-style-type: none"> ■ Busy with construction. ■ This facility will accommodate green waste separation.
Genadendal Landfill	Decommission license	Accepting domestic waste from community	<ul style="list-style-type: none"> ■ Difficulties with the community – they do informal recycling on the site ■ Burning of waste on site ■ No green waste separation
Greyton Landfill	Decommissioned license	Accepting domestic waste	<ul style="list-style-type: none"> ■ Agreement with Municipality for recycling on site. ■ WWTW adjacent to site. ■ Irrigation with wastewater taking place adjacent to the site. ■ Green waste separation happening on site. Stockpiling until stockpile is enough for chipper to be established.
Greyton Drop Off	Drop Off		<ul style="list-style-type: none"> ■ Busy with construction. ■ This facility will accommodate green waste separation.
Villiersdorp Landfill	Decommissioned site		<ul style="list-style-type: none"> ■ No Waste received on this site.

Waste Management Facility	Status	Waste accepted	Description
Villiersdorp Transfer Station	Transfer station operational	Domestic for transport to Karwyderskraal	<ul style="list-style-type: none"> ■ Poorly managed as transfer station has been vandalised.
Riviersonderend (RSE) Landfill	Decommissioned license	Some recycling and green waste accepted	<ul style="list-style-type: none"> ■ Private vehicles bringing in domestic waste ■ No separation of green waste ■ Very small volumes of waste dumped at the facility as the domestic waste is transported to Karwyderskraal.
Riviersonderend (RSE) Transfer station and MRF	Transfer station and MRG		<ul style="list-style-type: none"> ■ Busy with construction. ■ This facility will accommodate green waste separation.
Grabouw	Transfer station	Domestic to be transported to Karwyderskraal Regional Landfill	<ul style="list-style-type: none"> ■ Stockpiling of green waste at the facility until sufficient volumes is reached for the chipper to establish on site to chip greens. ■ WWTW has a "hot rod" that is used to convert organic sludge to compost to be purchased by public. ■ Operation of Hot rod is a challenge as spare parts are not available locally.
Botrivier landfill	Closed (Closure license)	None	<ul style="list-style-type: none"> ■ Informal settlement to be relocated
Botrivier drop-off	Operational	Domestic	<ul style="list-style-type: none"> ■ No separation ■ Investigating moving due to incorrect zoning in agricultural area
Tesselaarsdal	Drop-off	Domestic household	<ul style="list-style-type: none"> ■ Bin for the community to drop off domestic waste ■ No separation. ■ No green waste accepted.
Karwyderskraal	Operational regional site in Overberg District Municipality, Swellendam	Domestic	<ul style="list-style-type: none"> ■ Theewaterskloof and Overstrand dispose of domestic waste at the regional site. ■ Chipped Green waste from the municipalities are taken to the site to be composted.


2.2 Organic waste management


Waste, including organic waste, is accepted at the municipal disposal facilities and transfer stations as shown in the pictures below.

Table 2: Handling of garden waste at different sites

Waste Management Facility	Photographic evidence
<p>Caledon: Garden refuse stored on site</p>	
<p>Genadendal: Garden waste disposed on landfill</p>	
<p>Greyton: Garden waste stockpiled on site.</p>	

Waste Management Facility	Photographic evidence
<p>Villiersdorp:</p> <p>Garden waste mixed with domestic waste; this will be dumped at the regional landfill site.</p>	 <p>A wide-angle photograph showing a massive pile of waste at a landfill site. The waste is a mix of colorful plastic bags, cardboard, and other household debris. In the background, there is a white fence and a small concrete building. The site is situated at the base of a rocky, green hillside under a clear blue sky.</p>
<p>Riviersonderend (RSE):</p> <p>Garden waste disposed on landfill</p>	 <p>A close-up photograph of a landfill site. The ground is covered with a thick layer of brown, organic garden waste, including grass, twigs, and soil. Interspersed among the organic matter are numerous white and blue plastic bags, some of which are partially filled with waste. The background shows a line of trees and a cloudy sky.</p>

Waste Management Facility	Photographic evidence
<p>Grabouw:</p> <p>Garden waste is disposed of after hours outside the Transfer Station. This gets chipped with the garden waste inside the facility.</p> <p>Garden waste disposed at public dumping area or TS apron for chipping and processing in biodigester during operational hours.</p>	 <p>The top photograph shows an outdoor area with a dirt ground, a blue car, and a large pile of garden waste in the background under a clear blue sky. The bottom photograph shows industrial green machinery, including a large vertical tank and a conveyor system, situated next to a green corrugated metal building. A yellow excavator is partially visible on the right.</p>
<p>Botrivier drop-off</p>	 <p>The photograph shows a wide, paved area made of grey interlocking bricks, curving to the right. There are trees and a clear blue sky in the background.</p>

Waste Management Facility	Photographic evidence
Tesselaarsdal drop-off	

2.3 Current organic waste generation

The Integrated Waste Management Plan (IWMP) 2014 (compiled by Jan Palm Consulting Engineers) provides the following data and treatment options on organic waste.

2.3.1 Garden Waste

From the waste calculator data, the average percentage of garden waste by mass of the waste stream is 12%, which equals 2835 tonnes per annum (2014 data).

2.3.2 Organic Waste

Accurate data on the organic waste quantities are not readily available and further investigation into the different organic waste streams is required. Obtaining quantities and identifying the generators of these wastes will enable the Municipality to ensure that it is correctly handled and disposed without becoming a threat to human health or the environment

The main organic waste streams in the Theewaterskloof Municipality are the following:

- **Abattoir waste:** Apart from contaminated water from abattoirs, the solid waste generated mainly consists of animal parts which cannot be used for human consumption or other purposes like gelatin recovery from hooves. Abattoir waste must be properly handled and disposed of at approved licensed landfill sites. The landfill staff must be trained to ensure that abattoir waste is disposed correctly. For example, the waste must be pre-treated with lime, trenched and immediately covered. The disposal of infectious animal carcasses and waste is not allowed to be landfilled. Non-infectious animal waste and carcasses are allowed to be disposed at licensed landfill sites as per the National Norms and Standards of Waste Disposal to Landfill, August 2013.

- **Sewage sludge:** If the classification of the sludge from a wastewater treatment plant is not known, it must be determined. The classification (which indicates the microbiological, stability and pollutant class) will allow the different management options to be identified for that particular sludge. In the Theewaterskloof Municipality, it is not likely that the sludge from the various wastewater treatment plants would contain high amounts of heavy metals. This must be verified in each case, but if the classification then allows, the sludge can be managed for beneficial use such as composting. It must be ensured that a license is acquired for this purpose.

- **Wet waste from hotels, restaurants, etc. (dailies) and industry:** The regulation of waste coming from industry can be monitored as soon as the Industry Waste Management Plans have been

implemented. The dailies are collected as part of the municipal waste collection rounds and as such, separate volumes are not recorded or available. Further investigation is required.

- Agricultural waste from grain, stock farming and wool production. The green waste is generated from clearing of vegetation and manure from livestock production. This waste is managed independently by the farmers themselves and usually does not end up in the municipal waste streams. Further investigation is required to determine volumes of waste generated and how it is managed.

2.4 Waste characterisation

No recent waste characterisation has been conducted for TWKM. It is proposed that the guidelines proposed in the 2014 IWMP are implemented and that a waste characterisation is done for the TWKM. In order for the quantities of all waste streams, including organic within TWKM to be assessed the following is required:

Timelines	Resources	Cost/Budget
<ul style="list-style-type: none"> ■ Wet season waste characterisation (November/ December) ■ Dry season waste characterisation (June/ July) 	<ul style="list-style-type: none"> ■ Human resources <ul style="list-style-type: none"> – Collectors of waste from households – Sorters to separate waste streams – Data capturers ■ Machinery <ul style="list-style-type: none"> – Collection vehicle (bakkies) – Scale to weigh waste streams ■ Other <ul style="list-style-type: none"> – PPE – Bins for sorting waste – Sorting table 	<p>Depending on whether study will be outsourced or completed by the municipality, an average would amount to R500,000.00 per study.</p>

3 Verification of data

For the purpose of estimating waste disposal volumes in Theewaterskloof Local Municipality, the waste volume data was collated from the following Landfill Sites i.e., Caledon Landfill Site, Genadendal Landfill Site, Greyton Landfill Site and Karwyderskraal Landfill Site.

The different types of waste disposed at the above-mentioned landfill sites are as follows:

- Domestic/General Waste
- Construction and Demolition Waste
- Organic Waste
- Commercial and Industrial Waste

The estimated waste disposal quantities in tonnes are stipulated in the tables below per landfill site: Caledon, Genadendal, Greyton, Villiersdorp and Karwyderskraal Landfill Site:

Table 3: Estimated Waste Disposal (Average Tons/month) for the various landfill sites as reported to IPWIS

Landfill	CALEDON			GENEDENDAL	GREYTON	VILLIERSDORP	Est. Total/ Month
	2018*	2019	2020	2020*	2020*	2020	
Waste type	Est. Average Waste Disposal (tonnes/month)						
Total Domestic/ Municipal waste	62.6	66.4	71.0	34.6	37.8	143.6	282.6
Total Construction & Demolition waste	32.7	20.6	15.1	36.5	60.8	4.8	124.9
Total Organic waste	13.9	7.8	22.6	8.6	17.3	17.5	58.2
Total Commercial & Industrial waste	5.2	5.3	4.6	0.3	0.0	12.8	18.1
Total estimated % of Green Waste	13%	8%	21%	11%	15%	11%	12%
TOTAL							483.8

*Six months data only, averages adjusted

Table 4: Estimated Waste Disposal (Tons/annum) for the various landfill sites as reported to IPWIS

Landfill	CALEDON			GENEDENDAL	GREYTON	VILLIERSDORP	Est. Total/ Month
	2018*	2019	2020	2020*	2020*	2020	
Waste type	Est. Average Waste Disposal (tonnes/month)						
Total Domestic/ Municipal waste	750.9	797.0	852.0	415.3	453.2	1722.9	3391.3
Total Construction & Demolition waste	392.2	247.6	181.7	438.0	729.0	57.8	1498.7
Total Organic waste	166.3	94.1	271.1	103.6	208.0	210.2	699.0
Total Commercial & Industrial waste	62.8	63.3	55.1	3.2	0.0	153.4	217.0
Total estimated % of Green Waste	13%	8%	21%	11%	15%	11%	12%
TOTAL							5805.9

*Six months data only, averages adjusted

Table 5: Summary of TWKM disposal record at Karwyderskraal

From	Total Tonnage	General Waste	Mix	# Bins	Small rubble	Sludge	# Bins
TWKM	1000.8	969.8	10.8	1.4	0.3	19.9	3.7
Botrivier DO	33.2	33.2	-	-	-	-	-
Grabouw RTS	452.7	452.7	-	-	-	-	-
Greyton DO	44.3	44.3	-	-	-	-	-
Helderstroom DO	6.9	6.9	-	-	-	-	-
Tesselaarsdal DO	18.8	18.8	-	-	-	-	-
Botrivier Mun.	69.2	58.1	10.7	1.2	0.3	-	-

From	Total Tonnage	General Waste	Mix	# Bins	Small rubble	Sludge	# Bins
Villiersdorp RTS	282.2	280.1	0.1	0.2	-	2.0	0.3
Villiersdorp WWTW	20.0	4.7	-	-	-	15.3	2.9
Riemvasmaak DO	2.6	-	-	-	-	2.6	0.4
Riviersonderend DO	65.7	65.7	-	-	-	-	-
Caledon DO	5.3	5.3	-	-	-	-	-

Table 6 Total green waste volumes at TWK landfills (2020)

FACILITY NAME: CALEDON LANDFILL SITE														
Waste Type: Organic Waste														
Facility Name		Year 2020 (Total Estimate Waste Disposal Tons/Month)												
From	To	Jan 20'	Feb 20'	Mar 20'	April 20'	May 20'	Jun 20'	Jul 20'	Aug 20'	Sep 20'	Oct 20'	Nov 20'	Dec 20'	Total 2020
Caledon Landfill	Caledon Landfill	28.563	11.000	22.188	4.550	19.313	33.813	18.688	26.188	32.313	34.188	23.250	17.563	232.817
FACILITY NAME: VILLIERSDORP TRANSFER STATION														
Waste Type: Organic Waste														
Facility Name		Year 2020 (Total Estimate Waste Disposal Tons/Month)												
From	To	Jan 20'	Feb 20'	Mar 20'	April 20'	May 20'	Jun 20'	Jul 20'	Aug 20'	Sep 20'	Oct 20'	Nov 20'	Dec 20'	Total 2020
Villiersdorp Transfer Station	Karwyderskraal	33.295	23.130	14.83	3.600	12.89	14.3	19.92	12.58	21.255	21.315	26.190	No Data	150.385
Distance (km): 36.91km														
FACILITY NAME: GENADENDAL LANDFILL														
Waste Type: Organic Waste														
Facility Name		Year 2020 & 2021 (Total Estimate Waste Disposal Tons/Month)												
From	To	Jan 20'	Jul 20'	Aug 20'	Sep 20'	Oct 20'	Nov 20'	Dec 20'	Jan 21'	Feb 21'	Mar 21'	Apr 21'	May 21'	Total 2020&2021
Genadenadal Landfill	Greyton Landfill	No Data	4	4	15.4	1.6	4	22.8	2.6	No Data	No Data	No Data	No Data	54.4
Distance (km) : 4.11km														
FACILITY NAME: GREYTON LANDFILL SITE														
Waste Type: Organic Waste														
Facility Name		Year 2020 (Total Estimate Waste Disposal Tons/Month)												
From	To	Jan 20'	Feb 20'	Mar 20'	April 20'	May 20'	Jun 20'	Jul 20'	Aug 20'	Sep 20'	Oct 20'	Nov 20'	Dec 20'	Total 2020
Greyton Landfill	Greyton Landfill	59.6	0	0	0	0	0	12.8	27.6	23.8	15.2	22	2.6	163.6

The diversion targets as determined by DEADP are based on the total amount of organic waste generated within the Municipality that could potentially be disposed of. These volumes are not available and once data is available can be used to calculate the total diversion rates of organic waste. The available estimates are shown in Table 7.

Table 7 Total volumes of organic waste generated in TWK

Waste stream	Volumes tonnes per annum or month (tpa or m)	Current diversion rate from TWK Municipal landfill
Organic household waste (food waste)	40 692 total tpm – 12% = 4 883 tpm	0%
Garden waste received at landfills and drop-offs		
Caledon	271 tpa	0%
Villiersdorp	210tpa	71%

Waste stream	Volumes tonnes per annum or month (tpa or m)	Current diversion rate from TWK Municipal landfill
	150tpa to Karwyderskraal	Current 0% as transfer station not operational
Genadendal	104tpa	0%
Greyton	208 tpa	0%
Botrivier Drop off	Total waste = 396tpa assume 12%organic thus 48tpa	100%
Total garden waste	841 tpa (198 diverted)	24%
Commercial organic waste from restaurants, shopping malls etc	Total volume not available Sludge from	unknown
Botrivier WWTW	Volume to Karwyderskraal = 15.3tpm	100%
Villiersdorp WWTW	Volume to Karwyderskraal = 20tpm TOTAL 424tpa	100%
Agricultural organic waste	Volume not available	100%
Industrial organic waste (abattoir and food producer waste)	Volume not available	Unknown

Based on the above information and what was visually observed during recent site visits, the record of the tonnage of green waste received and disposed of at Karwyderskraal landfill, does not seem accurate.

None of the landfills have weighbridges with quantities being estimated in cubic metres (m³) and converted to tonnes using the formulas in the IPWIS sheets. The recording of waste going into the sites could also be inaccurate as the record keeping appears inconsistent. Also mixed waste is being recorded as domestic waste so the portion of organic waste in many loads is unknown if the waste is mixed.

At the time of compiling this report, no data was available on the garden waste fraction handled at the Grabow Transfer Station. This data will have to be included in the updated report.

This reinforces the need for a waste characterisation study to confirm the actual portion of organic waste in the waste stream in order to enable an accurate determination of percentages available for organic waste processing.

The implementation of accurate volume reporting mechanisms must be coupled with the required weighbridge data and must be strictly monitored, as this is essential to the accuracy in monitoring organic waste diversion.

4 Review of legislation and by-laws

The following Legislative requirements and underlying principles will need to be considered when developing the strategy for organic waste management in TWKM.

4.1 Underlying principles for waste management

4.1.1 The 'polluter pays principle'

The National Environmental Management Act (NEMA) states that all costs associated with the management of waste should be borne by the persons who generated the waste. Such costs may include the following:

- Waste minimization;
- Waste separation;
- Containing, treating and disposing of waste; and
- Rectifying environmental harm caused by waste.

4.1.2 Cradle to grave

This is a process where a waste generator is responsible for and develops intervention programmes throughout the lifecycle until final disposal.

4.1.3 Cradle to cradle

The concept of cradle-to-cradle or closed-loop recycling. It is different from cradle to grave in that each part of a product is made with its entire life cycle in mind. Closed-loop recycling reduces the demand for raw materials and the fuel to produce a new product. Cradle-to-cradle materials are either biologically consumable, where they can be returned straight to the earth, or technically reusable, where the materials can be reused or placed directly back into the production cycle.

4.1.4 Co-ordination

This is a process where a waste generator ensures that waste management is integrated across all sectors of the organization.

4.1.5 Capacity building and education

The TWKM, in order to successfully implement its OWDP, recognizes the need to ensure the development of skill, capacity and understanding of its employees, and other stakeholders for effective participation in achieving integrated waste management.

4.1.6 Accountability

The TWKM is responsible for environmental policy monitoring and enforcement. This will ensure accountability for waste management.

4.1.7 Ensuring Sustainable Development

This WRMP need to achieve a better balance between economic prosperity, social equity and environmental protection – i.e. making sure that sustainable development takes place in the context of 'living today with tomorrow in mind'.

4.2 Legislation

The Waste Classification and Management Regulations (WCMR) were promulgated on 23 August 2013 (GN R. 634 of 2013), in terms of the National Environmental Management: Waste Act, 2008 (Act 59 of 2008) (as amended) (NEMWA), with the associated Norms and Standards. Waste needs to be managed according to the following standards:

- Classification of waste in terms of the South African National Standard: Globally Harmonised System of Classification and Labelling of Chemicals (GHS) SANS 10234:2008 according to the WCMR (GN R.634, 23 August 2013);
- Norms and Standards for Assessment of Waste for Landfill Disposal (GN R.635, 23 August 2013) to differentiate between the different types of the waste (Type 1 to Type 4); and
- The National Norms and Standards for Disposal of Waste to landfill (GN R.636, 23 August 2013).

4.2.1 The Constitution of the Republic of South Africa, 1996, as amended

The South African Constitution (Act 108 of 1996) is the supreme law of the land. Section 24 (a) of the Act states that: “everyone has the right to an environment that is not harmful to their health or wellbeing.” This poses a duty on waste generators to:

- Promote social and economic development; and
- Promotion of a safe and healthy environment.

4.2.2 National Environmental Management Act, 1998 (Act No. 107 of 1998), (NEMA) as amended

The National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended (NEMA) was promulgated in November 1998. It is the key legislation for environmental management in South Africa. NEMA promotes social, economic and environmental sustainability with a key focus on conservation of the environment. The Act requires environmental processes to be transparent and to provide capacity for disadvantaged stakeholders to participate. NEMA promotes the need for co-operative governance where more than one government department may be involved in decision-making for a proposed development.

NEMA was amended in 2006 and again in June 2010, providing a new list of activities that require environmental authorisation through different processes. The list describes those activities that require a basic environmental assessment (BA) and those that require a full environmental impact assessment (EIA). Both the BA and EIA involve public participation. Certain waste management activities may require environmental authorisation depending on whether they fall into the category of listed activities.

4.2.3 National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008), (NEMWA) as amended

Chapter 1, Section 2 of the National Environmental Management Waste Act provides the following objectives of the act:

- To protect health, well-being and the environment by providing reasonable measures
- Minimising the consumption of natural resources;
 - Avoiding and minimising the generation of waste;
 - Reducing, re-using, recycling and recovering waste;

- Treating and safely disposing waste as a last resort;
- Preventing pollution and ecological degradation;
- Securing ecologically sustainable development while promoting justifiable economic and social development;
- Promoting and ensuring the effective delivery of waste services;
- Remediating land where contamination presents, or may present a significant risk or harm to human health or the environment; and
- Achieving integrated waste management and reporting and planning.
- To ensure that people are aware of the impact of waste on their health, well-being and the environment;
- To provide for compliance; and
- To give effect to section 24 of the Constitution in order to secure an environment that is not harmful to health and well-being.

The NEMWA provides definitions of waste as well as the listed activities that require licensing. This Act also provides specific waste management measures for remediation of contaminated land as well as for compliance and enforcement. Waste and waste management activity as amended by Act 14 of 2003 is defined as follows:

“Waste” as defined as:

- 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 that includes all wastes as defined in Schedule 3 of the Act; or
- b. Any other substance, material, or object that is not included in Schedule 3 that may be defined as waste by the Minister by notice in the Gazette,
- c. 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;
- d. Where approval is not required, once a waste is, or has been re-used, recycled or recovered;
- e. 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
- f. 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 management activity” means any activity listed in Schedule 1 or published by notice in the Gazette under section 19, and includes:

The generation of waste, including the undertaking of any activity or process that is likely to result in the generation of waste;

- a. The accumulation and storage of waste;
- b. The collection and handling of waste;
- c. The reduction, re-use, recycling and recovery of waste;
- d. The trading in waste;
- e. The transportation of waste;
- f. The transfer of waste;

- g. The treatment of waste; and
- h. The disposal of waste.

4.2.4 National Waste Management Strategy (2011)(revised in 2020),

The National Waste Management Strategy (2011) (NIWMP) came into effect on 4 May 2012 to address South Africa's waste management challenges, and gave effect to the suite of policies and relevant legislation which preceded it. The overall objective of the strategy is to reduce the generation of waste and reduce the impact of all forms of waste on economic development, health and the quality of environmental resources.

The NIWMP sought to achieve the following goals:

- Promote waste minimisation, re-use, recycling and recovery;
- Ensure effective and efficient waste delivery services;
- Growing the contribution of the waste sector to the green economy;
- Ensure that people are aware of the impact of waste on their health, well-being and the environment;
- Achieve integrated waste management planning;
- Ensure sound budgeting and financial management for waste services;
- Provide measures to remediate contaminated land; and
- Effective compliance with and enforcement of the Waste Act.

4.2.5 National Norms and Standards for Assessment of Waste for Landfill Disposal, Government Notice No. 635 of 23 August 2013

The National Norms and Standards for the assessment of waste for landfill disposal prescribe the requirements for the assessment of waste prior to landfill.

4.2.6 National Norms and Standards for disposal of Waste to Landfill, Government Notice No. R. 636 of 23 August 2013

The norms and standards for disposal of waste to landfill stipulate the waste acceptance criteria for disposal to landfill and the various waste disposal restrictions.

4.2.7 Waste Classification and Management Regulations, Government Notice No. 634 of 23 August 2013

These regulations regulate classification and management of waste to give effect to provisions of the NEMA.

4.2.8 National Norms and standards for the Storage of Waste, Government Notice No. 926 of 29 November 2013

The purpose of the norms and standards is to-

- a. Provide a uniform national approach relating to the management of waste storage facilities;

- b. Ensure best practice in the management of waste storage facilities; and
- c. Provide minimum standards for the design and operation of new and existing waste storage facilities.

4.2.9 National Norms and Standards for the Sorting, Shredding, Grinding, Crushing, Screening or Baling of General Waste, Government Notice No. 1093 of 11 October 2017

The purpose of the norms and standards is to provide a uniform approach to the above activities so as to determine which waste management activities require Environmental Authorisation.

Facilities with an operational area of 1000 m² or more must comply with these standards.

Facilities with an operational area of less than 1000 m² Must comply with section 4(4) of the Norms and Standards which requires registration and compliance with the principles of Duty of Care as contained in NEMA and NEMWA.

4.2.10 Polokwane Waste Summit Declaration (September 2001)

During September 2001 a national waste summit was held at Polokwane. It was attended by all stakeholder groupings in the waste field in order to jointly chart a way forward in terms of waste management. The resultant Polokwane Declaration includes a vision and goal for the management of all waste, i.e. domestic, commercial and industrial:

- Vision - To implement a waste management system, this contributes to sustainable development and a measurable improvement in the quality of life by harnessing the energy and commitment of all South Africans for the effective reduction of waste.
- Goals - To reduce waste generation and disposal by 50% and 25% respectively by 2012 and develop a plan for zero waste by 2022. The Polokwane Declaration has significant implications for local government. In order to move towards the goal, it will be necessary for government and other stakeholders to engage more closely toward the achievement of this goal in a realistic and practical manner.

The key actions in the Polokwane Declaration that impact on local government include the following:

- Implement the NIWMP (2011).
- Develop and implement legislative and regulatory framework.
- Waste reduction and recycling.
- Develop waste information and monitoring systems

4.2.11 International Conventions

South Africa is a signatory to the Basel (1994) and Stockholm (2001) Conventions. The key objectives of the Basel Convention are:

- To minimise the generation of hazardous waste in terms of quantity the severity of the hazard;
- To dispose of them as close to the source of generation as possible;
- To reduce the movement of hazardous waste.

A central goal of the Basel Convention acceded to by South Africa in 1994, is “environmentally sound management” (ESM), the aim of which is to protect human health and the environment by minimising hazardous waste production whenever possible. ESM means addressing the issue through an

“integrated life-cycle approach”, which involves strong controls from the generation of a hazardous waste to its storage, transport, treatment, reuse, recycling, recovery and final disposal.

The Stockholm Convention on Persistent Organic Pollutants (POPs), to which South Africa became a signatory in 2001, is a global treaty to protect human health and the environment from POPs. POPs are particularly carcinogenic and are toxic to both humans and wildlife. Burning of waste in open landfill sites or by incineration has the potential to produce high volumes of POPs into the atmosphere.

4.2.12 Minimum Requirements for Waste Disposal by Landfill, 1998

The then Department of Water Affairs and Forestry (DWAFF), having a concern for the protection of water resources of South Africa and at the time being responsible for permitting of waste facilities developed a part series of documents commonly referred to as the ‘Minimum Requirements’. The first edition was published in 1994, followed by the 2nd edition, which superseded the 1st edition in 1998. The general objectives of the Minimum Requirements are to:

- Set out minimum requirements in terms of processes to be followed and information required for the application of a permit for a facility;
- Provide a minimum set of environmentally acceptable ways of handling, transportation, treatment and disposing of different types of waste that has to be achieved; and
- Set minimum standards and specification, which had to be adhered to, in order to protect water resources from potential pollution from waste facilities.

A draft Third Edition was made available for comment but was then replaced by promulgation of the Waste Regulations, although they are still used as guidelines.

4.3 Waste By-Laws

4.3.1 Theewaterskloof Municipality Waste Management By-Law (21 July 2015)

The objective of this by-law is, amongst others, to regulate the removal, handling, storage, transport, re-cycling, treatment and disposal of waste. Specifically:

Chapter4, S1 Garden waste

Chapter 4, S Agricultural and farm waste

Chapter4, S1 Allows the composting of waste:

The owner or occupant of premises on which garden waste is generated, may compost garden waste on such property, provided that such composting do not cause a nuisance or is properly screened from the road or has a detrimental impact on human health and the environment.

Section 8 – Agricultural and Farm Waste

Chapter4, S8 allows an owner or occupant of farm land to dispose of agricultural and farm waste at a suitable location on such farm land, but the burning of waste is prohibited without prior written approval of the Municipality.

4.4 Provincial Organic Waste Strategy

Western Cape Government – Environmental Affairs & Development Planning released a Provincial Organic Waste Strategy in March 2020 which focusses on the following:

- A comprehensive strategy that is aligned to the principles of the waste hierarchy to address various aspects of organic waste
- Organic waste preventative strategies, making material available as a resource, develop the required infrastructure for recovery and to support the uptake and beneficiation of this resource
- The strategy also includes and recognises the initiatives being implemented by the private sector and other agencies with a view of forming synergies with these entities to work towards a fully integrated
- Identifies possible policy instruments that can be applied by various organs of state to meet the 50% and 100% organic waste bans for 2022 and 2027 respectively.

5 Gap Analysis

Table 8 below provides a Gap analysis of Organic Waste Management/Practices/Requirements within the TWKM.

Table 8 Gap analysis

Item no.	Objective / Target	Current state	Gaps	Actions required to address Gaps
1.	Legislative compliance i.t.o. National (2011) and Draft (2019) National Waste Management Strategy, GNR 636, NNS for Organic Waste composting as a minimum	Not meeting any of the legislative requirements on sites, however waste diverted to Regional site complies	Not meeting any of the legislative requirements	Addressed below
2.	Adjust By-Laws to address management of organic waste	Composting allowed by individuals on private properties	Inadequate measures to ensure that garden waste specifically and other identified organic waste are dealt with in line with provincial and national legislation	Once the first version of this plan is finalised, the By-laws needs to be adjusted accordingly to support the implementation of this plan
3.	Adequate information regarding organic and garden waste generators, quantities generated and current methods of treatment/disposal	Garden waste is disposed of at the landfill and transfer station where records are kept of loads entering the facilities. No data is kept of private generators such as fruit industry, abattoirs, restaurants, hotels, road stalls etc.	Limited record of garden waste disposal at landfills, no records of organic waste generators	Formal record keeping system of garden waste processing. Without the relevant information proper planning cannot be done.
4.	Organic waste stream prevention strategies	No formal organic waste stream prevention strategies	No plan for formal organic waste stream prevention strategies. Can only be finalised once this plan is finalised	Implement a phased approach to identify and implement organic waste stream prevention strategies on a community base level since each community responds differently to such actions. The OWDP is to be included in the IDP.
5.	Implement a phased approach to manage, process, treat and reduce organic waste to landfill considering the provincial targets	Disposal and or chipping of garden waste for disposal at Karwyderskraal landfill. Trial composting project on Portion 57 of Farm 781 Caledon district	Facilities and equipment to effectively process garden waste. Waste awareness campaign regarding organic waste in general. Organic waste producers buy-in to separation at source and municipal capability to collect and process waste. Alternatively, private contracting	Municipality is to collect information on commercial organic waste generators and types of organic waste generated within the area to make informed decisions on working towards set targets
6	Adequate budgets for human resources and weighing equipment allocated for weighing waste that is recycled and disposed	No weighbridge at any facility	Inadequate allowance made for strategic infrastructure at current WDF	The new Transfer Stations will have the required equipment and this must be implemented once operational

7.	Communicating strategies to the various communities whilst respecting the diversity and uniqueness of each community	No communication since there is no strategy – to be updated	No communication since there is no strategy – to be updated	Finalise first version of this plan and update accordingly. Development of a communication strategy which includes engagement and awareness with generators is required to be developed
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6 Options available for beneficiation of organic waste

6.1 Overall planning considerations

Baseline information determine the starting point of any planning process. Due to the lack of proper waste characterisation, the exact quantities and composition of the organic waste stream is not known. Based on the information in section 3 some planning can be done in terms of. green waste processing.

The development and implementation of this plan will therefore follow a phased approach as set out below.

Figure 2: Phase 1 - Waste Characterisation

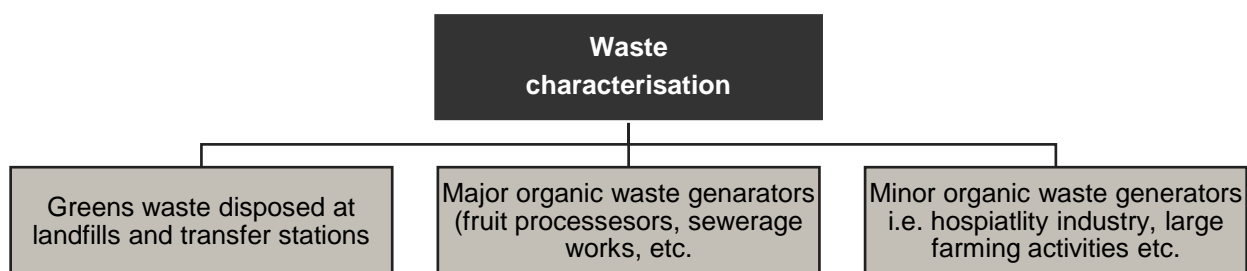
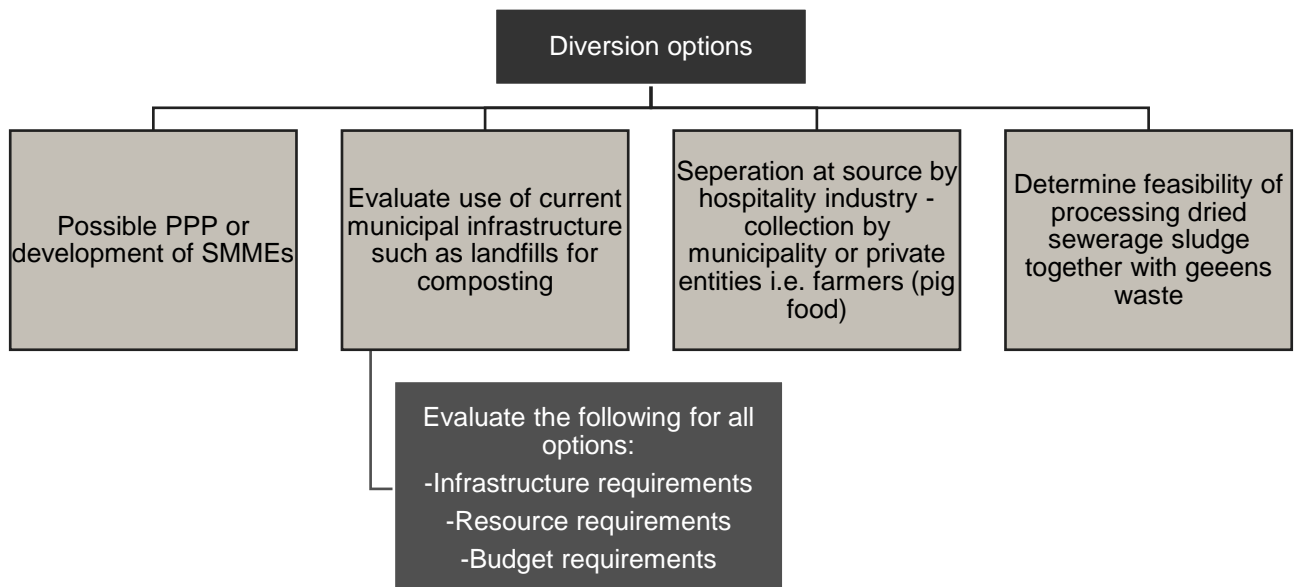


Figure 3: Options analysis



6.2 Current possibilities

As the volumes of organic waste being accepted at the landfill sites is small, limited options are available. The only organic that can currently be separated without too much effort is the greens waste

being disposed of at the various municipal landfills. A number of these landfill will be closed in the near future due to the implementation of a Transfer Station system at most of the towns.

Based on the above, the consideration of options has to be done on a short, medium and longer term basis keeping in mind the targets set by provincial government. A waste characterisation study will provide detail to evaluate and ensure a feasible medium- and long-term strategy.

As a possible short-term measure, it is proposed that waste should be separated, and a mobile chipper is used to process the green waste at the operational sites.

Chipped material can be transported to a identified site or sites where the chipped green waste can be composted. **This is seen as a possible short-term intervention until more data is available to develop a more comprehensive organic waste diversion plan.**

The WWTW at Grabouw has a “Hot Rod” that is used to convert sludge from the WWTW to compost that is sold to the public. The processing capability and capacity of this equipment should be determined and recorded.

For organic waste in general the possibility of separation at source by households and the hospitality industry can be implemented as a trial project.

Larger organic waste producers such as the fruit farming industry can be targeted for involvement with the municipal initiatives.

As highlighted earlier in this report, the various communities within the TWKM each has its own unique way of involvement with municipal initiative and it will be important that public engagement are done considering these unique attributes.

Considering financial and resource constraints, partnering with the private sector to use the organic waste as part of composting, feedstock for pigs etc. could also be considered. The TWKM can also consider providing assistance for an existing SMME to process organic waste.

6.2.1 Composting

Based on the lack of information regarding organic waste within the TWKM, only composting options are discussed in this section of the report. As mentioned above, this is seen as the short term intervention until more data is gathered regarding organic waste generation within the municipality. The following was proposed in the Integrated Waste Management Plan (IWMP), (Jan Palm Consulting Engineers, 2014)

Composting Facilities in Theewaterskloof

Composting of garden waste at a centralised composting facility requires approximately a minimum 350 tonnes of garden waste per month in order to achieve financial sustainability. From the waste calculator data recorded thus far, approximately 12% of the generated waste stream is garden waste. This equates to approximately 236 tonnes per month (2 832 tonnes per annum) for 2014.

However from the data provided in 2021, the estimated tonnes per annum for 2020 was 699 tonnes (excluding the fraction from the Grabow Transfer Station). This makes a centralised composting facility for Theewaterskloof a financially unsustainable option without additional sources of green waste. Agreements can be made with other Municipalities to contribute to a centralised facility.

Organic material that is disposed by landfill and not composted decomposes in the absence of oxygen, that is, anaerobically, and produces methane gas and carbon dioxide while decomposing. These gases are greenhouse gases and must be minimised. Methane is 23 times as effective (bad) as carbon dioxide as a greenhouse gas and all attempts must be made to prevent its generation. During the composting process the decomposition takes place in the presence of oxygen (aerobic) resulting in

no methane gas being generated. If the garden waste is simply chipped and used as mulch, it is preferable above disposal by landfill.

Home Composting

Home composting in South Africa has traditionally been practiced for the purpose of having an inexpensive and reliable source of compost for the garden. More recently, the realization that composting is a means of conserving resources, saving landfill airspace and the recycling of organic matter, has become the driving force for composting under individuals as well as clubs / associations.

It has been shown that home composting can reduce the waste stream by 20% to 30% if carried out properly. This is a prime example of “reduction at source” or waste avoidance.

This represents probably the only feasible means of composting kitchen waste, as large-scale post-collection composting has proven ineffective on many occasions in South Africa.

Leaflets or other methods of information should be made available to inform the general public of the advantages and “recipe” for making good quality home compost.

Home composting bins can be bought at selected nurseries throughout the Western Cape. These are normally one of two types. The first type is a moulded plastic bin which comes in two sizes as follows:

- Small – volume approximately 500 litres
- Medium – volume approximately 1000 litres

The second type is one made from chicken wire around a plastic framework. This one is also of approximately 1000 litre capacity. The disadvantage to the chicken wire model is the possibility of leaching, flies and foul odours.

However, it does allow for good aeration, whereas the plastic model may tend to result in anaerobic conditions (rotting) if not manually aerated by turning.

The Municipal website and social media should be used to share useful information about home composting and diversion. However, as not all of the public may have access to the website, additionally utilizing municipal bills as opportunities for awareness should be considered.

Vermicomposting

Vermicomposting refers to the deliberate introduction of earthworms (typically) during early stages of the composting process. These would appear naturally at an advanced stage of natural composting, which would be after stabilization, where macrofauna use some of the microflora as a substrate.

The earthworms have the following beneficial effects on the composting process:

- Reduction of particle size
- Removal of old bacteria, stimulating the growth of new bacteria
- Enriching the compost by excretions high in Nitrogen
- Promotes penetration of oxygen into the compost
- Increases pathogen control
- Produces worm castings, a good soil amendment

Vermicomposting lends itself well to household-sized ventures, as it requires very careful control, but produces very high-quality compost in a relative short period of time.

It is a very clean process which does not attract flies. This type of composting is typically done inside special bins designed for the purpose. Most kitchen-type wastes can be composted in this manner, although onions, citrus & other acidic foods should be avoided as they can be toxic to the worms. The

worms are also quite sensitive to extreme temperatures, humidity and rain. Therefore this process does not lend itself to large-scale industrial composting.

6.2.2 Regional sites composting – current initiatives

Currently when there is sufficient stockpile of greens waste this is chipped and transported to Karwyderskraal. This is part of the current contract with the haulage service provider.

Guangzhou GC International Trading Co Ltd has initiated a one-year trial on Portion 57 of Farm 781 Caledon district to clear and chip alien vegetation, safely and compliantly process any waste manure or sludge from livestock farmers and assist in the land application thereof. If successful, this trial can be extended to the other sites. This project can potentially result in a 50% reduction in wet waste going to landfill.

6.3 Infrastructure requirements to meet targets

Depending on the short-term implementation it is proposed that green waste be chipped on the existing landfills to reduce transport cost. The Caledon landfill currently has ample space to process (compost) greens waste. An area can be developed at minimal cost as an interim measure to compost the greens waste at the landfill. As an alternative the involvement of a private sector partner can be investigated.

6.4 Budgetary requirements

For the short-term implementation is suggested that personnel at the current site be trained to ensure that “clean” green waste is disposed of at a separate area to be chipped. The TWKM has a mobile chipper that can be moved between sites. The chipped green and other clean green can be loaded into bulk containers already used for transporting waste to Karwyderskraal and transported to Caledon landfill for processing.

An area can be prepared for composting with the equipment currently on site and the material (builders’ rubble and soil) being disposed of on site.

There should be minimal if any additional cost to implement the short-term option.

For the medium and longer term a more detailed feasibility study will be required once the waste characterisation has been completed.

6.5 Resourcing requirements

To implement the short-term option someone needs to be trained to do the composting at the Caledon landfill site. However as there are other initiatives underway for Regional composting this might not be necessary.

Training must be conducted on the sites accepting green waste on how to effectively separate waste so that as much as possible can be diverted from the landfill for alternative treatment.

The medium- and long-term options resource requirements will be informed by the above-mentioned feasibility study.

6.6 Key stakeholders and role players

The table below provides a guideline for the key stakeholders that will need to be involved going forward.

- Restaurants
- Waste Water Treatment Works
- Fruit and crop farmers
- Wineries
- Livestock farmers
- Food processing facilities
- Abattoirs
- Households
- Communities

6.7 Design plan

The detailed plan will be developed in the next phase as soon as the waste characterisation has been completed.

The second phase plan will include the following tasks:

- Waste characterisation
- Evaluation of various organic waste processing options
- Involvement of private sector
- Resource requirements
- Budgetary requirements
- Public and council engagements including Public Participation Process (PPP)
- Elevating plan to include provincial initiatives
- Implementation plan with proposed budget and timeframe requirements
- Monitoring plan of implementation

6.8 Implementation Plan

The establishment of a Monitoring Committee will be developed with members of the municipality to monitor and manage the progress of the OWDP. The committee will meet quarterly to establish compliance to the OWDP, progress to meet the National targets, verify calculations and reporting to the Department and IPWIS through an established monitoring and evaluation system to monitor progress. Quarterly reports must be sent to the Department, accompanied by graphic representations of percentages diverted.

Table 9 below provides a preliminary implementation plan.

Table 9 Proposed action plan

Action	Responsible person	Budget	Estimated timeframe
Establish a Monitoring Committee	H Martinus	R50 000	Financial year 2022/2023
Verification of data collection and reporting (install weighbridges)	H Martinus	TBC	Financial year 2022/2025 as WTS become operational
Waste characterisation	H Martinus	R 200 000	Financial year 2022/2023
Resource requirements and training plan	H Martinus	TBC	Financial year 2022/2023
Public and council engagements including Public Participation Process (PPP)	H Martinus	TBC	Financial year 2023/2024
Allocation and budgeting for human resources	H Martinus	TBC	Financial year 2023/2024
Involvement of private sector and appointment of contractors to implement recycling and composting	H Martinus	TBC	Financial year 2023/2024
Mobile chipping to be done on site and this removed to Karwyderskraal regional site for composting	H Martinus	TBC	In place on some sites
Implementation plan with proposed budget and timeframe requirements	H Martinus		Financial year 2023/2024

Table 10 Planned infrastructure to improve diversion rates with budgets

Existing and planned facilities	Responsible person	Budget	Volumes received tpm (2020)	Diversion rate 2022/2023	Diversion rate 2025/27
Botrivier drop-off	H Martinus				
Botrivier additional Drop-off	H Martinus	R7,500,500	-	0	100%
Caledon WTS/MRF	H Martinus		22.6		
Refurbishment of Villiersdorp WTS	H Martinus	R9,000,000	17.5	0	100%
Greyton WTS	H Martinus		17.3		
Genadendal	H Martinus		8.6		
RSE WTS/MRF	H Martinus		Unknown 0	0	

The preliminary implementation plan will be refined and structured into a proper timeline as soon as the TWKM agrees on a suitable methodology for waste characterisation.

7 Conclusion

This plan is seen as Phase 1 to set the process in motion for the development of a detailed “Organic Waste Diversion Plan” with associated actions and timelines.

A waste characterisation study is required to quantify the organic waste content of the waste stream that will enable the proper planning and determining the feasibility of alternatives.

The TWKM will have to initiate a waste characterisation study as soon as possible to enable the commencement of Phase 2 of this plan. What would also be beneficial would be weighbridges at the sites or more accurate record keeping. In addition data should be obtained on organic waste generated by agriculture, restaurants, shops WWTW, etc.

The Western Cape target is 50% by 2022 and 100% by 2027. Currently the 50% target for 2022 will not be achieved and there is insufficient data to confirm accurate diversion rates.

Phase 2 should provide planning for the necessary resources and financing to achieve the required diversion rates by 2025, which should be in the order of 75% of the 100% by 2027. If recommendations in the IWMP action plan are implemented this target should be achievable.

In diversity there is beauty
and there is strength.

MAYA ANGELOU

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Theewaterskloof Municipality

Integrated Waste Management Plan

FINAL REPORT

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1 Executive Summary

Zutari was commissioned to develop an Integrated Waste Management Plan (IWMP) for Theewaterskloof Municipality (TWKM). As required by the National Waste Management Strategy (NWMS) 2020 and the Integrated Development Plan (IDP) process all municipalities are obliged to develop an IWMP and review it every five years.

The plan covers all 14 wards of the municipality falling within Grabouw, Villierdorp, Caledon, Genadendal, Greyton, Riviersonderend, Botrivier and Tesselaarsdal. It reviews services currently rendered, identify needs and sets goals to be achieved in order to meet the needs in term of requirements of the National Environmental Waste Management Act (Act 59 of 2008) (NEWMA), as amended and the NWMS.

The development of the plan included the following steps:

1. Background study.
2. Status quo analysis.
3. Legislative and policy review
4. Identifying gaps and needs
5. Development of goal and objectives
6. Development of an implementation strategy
7. Development of a monitoring plan
8. Public consultation

The desired end state identified priorities and goals that the municipality should attain with regards to waste management. Using the information collected on the historical and current waste management situation the following strategic goals for the IWMP were developed:

The needs identified can be summarised as follows:

1.1.1 Service provision

- ▶ Adequate equipment and personnel is required to render an effective service to the communities; and
- ▶ Education and awareness campaigns need to be implemented throughout the area. General waste awareness, management and recycling should be key focus areas.

1.1.2 Equipment

- ▶ New Mobile Compactor Units are required due to extreme age of collection fleet;
- ▶ A replacement policy needs to be developed;
- ▶ Adequate budget allocation for new collection fleet required;
- ▶ A proper assessment to determine the optimum collection fleet required; and
- ▶ Proper equipment is required to operate Solid Waste Facilities (Loaders for transfer facilities).

1.1.3 Personnel

- ▶ Sufficient personnel for all waste facilities is critical for the efficient operation of the facilities.
- ▶ Training for all personnel is also important.
- ▶ There is a need for sufficient street sweepers in all areas. An in-depth assessment of street sweeping requirements is required.

1.1.4 Landfills and other WDFs

- ▶ Landfill and other Waste Disposal Facilities (WDFs) need to comply to licence condition, especially where there is a risk of environmental contamination by WDFs;
- ▶ The Villiersdorp WDF needs to be repaired and 24 hour security implemented;
- ▶ The Botrivier Drop Off Public Participation process was concluded. The next step would be to commence the planning/ design for the facility in order to commence implementation after the relocation of New France has taken place;
- ▶ The N2 lane adjustment to provide safe access to Caledon WTF and MRF needs to be completed 2022/23 financial year;
- ▶ Final phase of the Riviersonderend WTF and MRF must be completed in 2022/23 financial year; and
- ▶ Rehabilitation of Riviersonderend, Caledon, Greyton, Genadendal, Botrivier and Villiersdorp landfill site must commence.

1.1.5 Street Cleaning/Sweeping

- ▶ There is a need for proper street cleaning/sweeping services in all the areas (informal areas to be included). Consider community-based contracts for informal areas.

1.1.6 Waste Minimisation and Recycling

- ▶ Finalise and implement WMP and OWDP.

1.1.7 Illegal Dumping

- ▶ The illegal dumping of waste is a priority and needs to be addressed as part of community educations and community-based campaigns and contracts for waste collection. The National DEA ran a project (Clean Green Project) that assisted with this capacity but came to an end 2021.

1.1.8 Industrial Waste

- ▶ A proper industrial waste survey needs to be conducted to determine the volumes and types of industrial waste generated in the area. The methods of disposal also need to be recorded. This information should be incorporated into the waste information system.

1.1.9 Waste Management By-laws

- ▶ Review Waste Management By-laws and update where required to incorporate NWS.

An implementation program was developed of which a high-level summary is shown in Table 1.

Closely linked to the implementation program is a monitoring program that needs to be implemented to ensure successful implementation of the IWMP.

The table provides a summary of the implementation plan. The detailed plan is included in Appendix A showing all the various component in detail.

Table 1 Summary of implementation plan

No.	Component	Project	Resource requirement	Estimated cost 2022	Implementation	Annual cost
1	Governance	Review and amend Waste Management By-laws.	External Consultant	R 30 000,00	Asap	No
		Implement waste data collection system. Monitoring of various waste types including domestic, commercial, industrial (non-hazardous and hazardous) and health care waste	Waste management data officer	R 350 000,00	Asap	Yes, internal
2	Public Awareness	Appoint competent person/s within the TWKM to develop a community participation strategy. Train the trainer principle. Focus on negative impact of illegal dumping	PPP specialist dedicated to Waste Management	R 350 000,00	Asap	Yes, internal
3	Waste Minimisation and Recovery	Establish Buyback centres	Consultant / contractor	R 18 000 000,00	Asap	Phased over a number of years
		Develop community-based initiatives	Waste management specialist	R 350 000,00	Asap	Yes, internal
4	Service Provision	Improve round/route balancing	Can be done internally or appoint consultant	R 200 000 if consultant is used	Asap	No
		Implement appropriate collection and if required transfer system in informal areas, can be local entrepreneurs collecting into bulk containers for the municipality to collect. This will aid with curbing illegal dumping. Appoint suitable consultant to investigate	Consultant together with municipality	R 250 000,00	Asap	Consultant once of, service provision is an annual cost
		Engage with local businesses regarding specific needs and how the TWKM can better service delivery at each business	Internal	N/A	Asap	Time and effort dependant
		Replace one collection unit each year		R 8 500 000,00	Replace one unit per year	R 1 500 000,00

No.	Component	Project	Resource requirement	Estimated cost 2022	Implementation	Annual cost
		Assessment of street cleansing requirements	Consultant together with municipality	R 150 000,00	Asap	Consultant once of, service provision is an annual cost.
5	Waste Disposal Facilities/Landfills	Numerous projects currently budgeted, closure cost for existing landfill were provided during 2021 and updated cost taking CPI of 5,9% shown for 2022 cost	Consultant / Contractor	R 108 354 713,60	Phased	Cost for consultancy fees and construction cost
		Investigate the feasibility of public disposal facilities and communal collection systems. Linked to service provision	Consultant			
6	Institutional	Employing adequate personnel and train all waste management related personnel adequately for their respective positions. Fill vacant positions according to organigrams	Internal	To be determined by TWKM		

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Definitions

Listed terms:	Description
Accreditation	Accreditation for stakeholders is necessary to prove that they are registered and meet a general standard of quality with a recognised institution.
Aquaculture	Cultivation of aquatic animals and plants, especially fish, shellfish, and seaweed, in natural or controlled marine or freshwater
Basic waste management service	A basic waste management service means to have access to at least once-a-week refuse removal services.
Building and demolition waste	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.
Buy-back Centre	Buy-back Centre means a location where discarded materials can be exchanged for money for further transportation to a recycling facility. The price for the waste is determined by the current markets and the quantities of waste.
Business Waste	Business Waste means waste that emanates from premises that are used wholly or mainly for commercial, retail, wholesale, entertainment or government administration purposes.
Compost	Compost is decayed organic material used as a fertilizer for growing plants to which no plant nutrients have been added and that is free of substances or elements that could be harmful to man, animal, plant or the environment
Composting	Composting means biologically degrading organic materials in the presence of oxygen, yielding carbon dioxide, and heat and stabilised organic residues that may be used as a soil additive.
Container	Container 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 bags, bins, bin-liners and skips.
Disposal	Disposal means the burial, deposit, discharge, abandoning, dumping, placing or release of any waste into, or onto, any land.
Domestic waste	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, which include: <ul style="list-style-type: none"> (a) garden and park wastes (b) municipal waste (c) food waste
Designated Waste	Designated Waste Management Officer means a person in the employ of the Council authorised to be a designated officer in terms of (Section 10(3))
Waste Management Officer	Designated officer with the responsibility set aside in (section 10 (5)) of the NEMWA, Act 59 of 2008

Listed terms:	Description
General waste	General waste means waste that does not pose an immediate hazard or threat to health or to the environment, and includes— <ul style="list-style-type: none"> – Domestic waste; – Building and demolition waste; – Business waste: and – Inert waste.
Garden waste/ green waste	Garden waste or green waste is meant as biodegradable waste material generated from the likes of a typical garden such as flower cuttings, hedge trimmings, wood pieces from pruning etc.
Hazardous 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 and includes hazardous substances, materials or objects within business waste, residue deposits and residue stockpiles.
High income group	High income group means households which fall within the Living Standard Measure (LSM) of 5 – 10).
Inert Waste	Inert Waste means waste that— <ul style="list-style-type: none"> – Does not undergo any significant physical, chemical or biological transformation after disposal; – 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 – Does not impact negatively on the environment, because of its pollutant content and because the toxicity of its leachate is insignificant.
Integrated Waste Management Plan	A plan prepared in terms of section 12 of NEMWA.
Landfill	Waste disposal facility means any site of premises used for the accumulation of waste with the purpose of disposing of that waste or on that premise.
Low-income group	Low-income group means households which fall within the Living Standard Measure (LSM) of 1 – 5
Materials Recovery Facility	Materials Recovery Facility means a centre for the reception and transfer of materials recovered from the waste stream for recycling. Materials are sorted by type and treated (cleaning and compression).
Organic waste	A carbon-based material of animal or plant origin (that is defined as waste in terms of the South African gazetted National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) that naturally enhances fertility of soil through a natural degradation process (natural occurring fertilizer) but excludes human made organic chemicals (such as solvents, chemicals and cleansing agents) and naturally occurring organic chemicals which have been refined or concentrated by human activity (such as oil, petroleum, diesel and tar products). “Organic Waste” will generally comprise materials that can be accepted for disposal at a licensed municipal general waste landfill facility (i.e. excludes infectious, poisonous, health-care and hazardous organic wastes)”.

Listed terms:	Description
Pollution	<p>Pollution means any change in the environment caused by-</p> <ul style="list-style-type: none"> – Substances; – Radioactive or other waves; or – Noise odours, dust or heat, emitted from any activity, including the storage or treatment of waste or substances, construction and the provision of services, whether engaged in by any person, or organ of state, where that change has an adverse effect on human health or well-being or on the composition, resilience and productivity of natural or managed ecosystems, or on materials useful to people, or will have such an effect in future.
Recovery	<p>Recovery means the controlled extraction of a material or the retrieval of energy from waste to produce a product.</p>
Recycle	<p>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.</p>
Re-use	<p>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.</p>
Separation at Source	<p>Separation at Source means the separation of recyclable material from other waste at the point and time the waste is generated. This includes separation of recyclable material into its component categories and may include further separation within each category.</p>
Treatment	<p>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.</p>
Waste	<p>Act No. 26 of 2014: National Environmental Management: Waste Amendment Act, 2014</p> <p>“‘waste’ means—</p> <ul style="list-style-type: none"> (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— <ul style="list-style-type: none"> 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.

Listed terms:	Description
Waste Avoidance	Waste Avoidance aims to achieve waste minimization therefore reducing the amount of waste entering the waste stream. This is especially important where the recycling, recovery, treatment or disposal is problematic.
Waste generator	<p>A waste generator will be treated as a waste holder as defined in the National Environmental Management: Waste Act, 2008, Act No. 59, 2008:</p> <p>A holder of waste must, within the holder's power, take all reasonable measures to—</p> <ul style="list-style-type: none"> (a) avoid the generation of waste and where such generation cannot be voided (b) to minimise the toxicity and amounts of waste that are generated. (c) reduce, re-use, recycle and recover waste (d) where waste must be disposed of, ensure that the waste is treated and disposed of in an environmentally sound manner (e) manage the waste in such a manner that it does not endanger health or the (f) environment or cause a nuisance through noise, odour or visual impacts. (g) prevent any employee or any person under his or her supervision from contravening this Act; and (h) prevent the waste from being used for an unauthorised purpose.
Waste Hierarchy	The management hierarchy concept provides a systematic and hierarchical approach to integrated waste management, addressing in turn waste avoidance, reduction, reuse, recycling recovering treatment and the safe disposal of waste as a last resort.
Waste Management Services	Waste Management Services means waste collection, treatment, recycling and disposal services
Waste Minimisation	Waste Minimisation means techniques used to keep waste generation at a minimum level to divert materials from landfill. The term waste minimisation is also applied to recycling and other efforts to reduce the amount of waste going into the waste stream.
Waste Transfer Facility	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.
Wood waste	Wood waste is a material from pruning or tree removal operations that would otherwise be discarded in a landfill.

Acronyms

<i>DEA</i>	Department of Environmental Affairs
<i>DEADP</i>	Department of Environment and Development Planning
<i>DWAF</i>	Department of Water Affairs and Forestry
<i>DWS</i>	Department of Water and Sanitation
<i>EIA</i>	Environmental Impact Assessment
<i>EMP</i>	Environmental Management Plan
<i>IDP</i>	Integrated Development Plan
<i>IPWIS</i>	Integrated Pollutant and Waste Information System
<i>IWMP</i>	Integrated Waste Management Plan
<i>IDZ</i>	Industrial Development Zone
<i>GDP</i>	Gross Domestic Product
<i>NEMA</i>	National Environmental Management Act No 107 of 1998, as amended
<i>NEMWA</i>	National Environmental Management: Waste Act No 59 of 2008, as amended
<i>NT</i>	National Treasury
<i>NWMS</i>	National Waste Management Strategy of 2020
<i>PP</i>	Public Participation
<i>PPP</i>	Public Private Partnerships
<i>SDF</i>	Spatial Development Framework
<i>SLA</i>	Service Level Agreement
<i>TWKM</i>	Theewaterskloof Municipality
<i>SAWIS</i>	South African Waste Information System
<i>WIS</i>	Waste Information System

1 Scope of plan

Zutari was commissioned to develop an Integrated Waste Management Plan (IWMP) for Theewaterskloof Municipality (TWKM). As required by the National Waste Management Strategy (NWMS) 2020 and the Integrated Development Plan (IDP) process all municipalities are obliged to develop an IWMP and review it every five years.

The plan covers all 14 wards of the municipality falling within Grabouw, Villierdorp, Caledon, Genadendal, Greyton, Riviersonderend, Botrivier and Tesselaarsdal. It reviews services currently rendered, identify needs and sets goals to be achieved in order to meet the needs in term of requirements of the National Environmental Waste Management Act (Act 59 of 2008) (NEWMA), as amended and the NWMS.

1.1 Overall aim and goals

The aim of the IWMP is to ensure that the Municipality provides waste management services that are compliant with the NEMWA and NWMS to communities. The goals set focus on minimising waste to landfill by encouraging waste minimisation, re-use and recycling.

1.2 IWMP Responsibilities

The NWMS has allocated the following responsibilities for an IWMP under Pillar 2: Effective and Sustainable Waste Services:

- ▶ Regional planning of waste management infrastructure such as landfills with Material Recovery Facilities (MRFs) and drop-off centres;
- ▶ Reviewing adjusting municipal budgets towards effective and sustainable waste services;
- ▶ Clarify and strengthen the role of provinces in terms of integrated planning, review and monitoring of metro and local government integrated waste management plans, and reporting requirements to national government;
- ▶ Five (5) year Provincial Integrated Waste Management Plans approved by the Minister of Department of Environmental Affairs and Development Planning (DEA&DP) and reported on annually. Annual reports to include aggregated data on provincial waste streams, service delivery and infrastructure rolled up from local and metro IWMPs;
- ▶ Develop and annually update a waste management planning reference guide and on-line knowledge sharing platform that will include planning tools, guidelines, models and case studies; and
- ▶ Provide support to municipalities through amongst other initiatives, including the Cities Support Programme by National Treasury.

1.3 Waste Management Principles

The underlying principles or factors for this IWMP are as follows:

Principle	Description
The 'polluter pays principle'	<p>The National Environmental Management Act, (NEMA), Act 107 of 1996, states that all costs associated with the management of waste should be borne by the persons who generated the waste. Such costs may include the following:</p> <ul style="list-style-type: none">Waste minimisation;Waste separation;Containing, treating and disposing of waste; andRectifying environmental harm caused by waste.

Principle	Description
Cradle to grave	This is a process where a waste generator is responsible for and develops intervention programmes throughout the lifecycle until final disposal.
Cradle to cradle	The concept of cradle-to-cradle is different from cradle to grave in that each part of a product is made with its entire life cycle in mind. Closed-loop recycling reduces the demand for raw materials and the fuel to produce a new product. Cradle-to-cradle materials are either biologically consumable, where they can be returned straight to the earth, or technically reusable, where the materials can be reused or placed directly back into the production cycle
Co-ordination	This is a process where a waste generator ensures that waste management is integrated across all sectors of the organization
Capacity building and education	To successfully implement its IWMP the TWKM recognizes the need to ensure the development of skill, capacity and understanding of its employees, service providers, business, industry and other stakeholders for effective participation in achieving integrated waste management.
Accountability	The TWKM is responsible for environmental policy formulation, implementation, monitoring and enforcement. This will ensure accountability for waste generated and managed.
Ensuring Sustainable Development	This IWMP needs to achieve a better balance between economic prosperity, social equity and environmental protection – i.e. making sure that sustainable development takes place in the context of 'living today with tomorrow in mind'

2 Methodology

2.1 Status Quo

The first step in compiling an IWMP is to conduct a Status Quo Investigation and Gap Analysis. The following methodology was followed for the Status Quo investigation:

- ▶ All available relevant documentation/records were obtained for the purposes of the study.
- ▶ Relevant officials from the Municipality were interviewed.
- ▶ The study area was visited to obtain first-hand information on the existing status of the waste management services rendered.
- ▶ Individuals and Organisations involved in solid waste management were interviewed.
- ▶ The municipal area was assessed taking into consideration waste generation, collection volumes, existing collection systems, equipment, personnel and landfill status. The status quo was completed based on the assessment findings.
- ▶ The current waste management practices were evaluated against the principles contained in the waste management hierarchy and waste management aspects were evaluated from the points of generation through to disposal/landfill.

The Status Quo report compiled for the IWMP provided an indication of the planning context within which the IWMP for the TWKM was formulated, as well as additional legislative frameworks that needed to be considered when undertaking the compilation of an IWMP. It sets the platform for the completion of all subsequent stages of the integrated waste management planning process for the TWKM.

The following assumptions were made where insufficient information was available:

- ▶ Waste Generation Calculations
 - Domestic Waste Generation – 7 days a week
 - Business Waste Generation – 6 days a week
 - Waste Collection Calculations:
 - Domestic and Business – 5 days a week

Where recorded generation rates were not available the following quantities were used:

- Rural settlements (poor communities) – 0.3 kg/person/day
- Urban – 0.8 kg/person/day

The status quo report provides legislative frameworks that was considered as well as an indication of the context within which the IWMP was conducted.

2.2 Waste management needs

Based on the information collected, the needs of the TWKM for the immediate future were identified and measured against the existing IDP objectives and Spatial Development Framework (SDF) strategies.

2.3 Goals and objectives

Goals and Objectives were developed to ensure that an environmentally and socially acceptable service based on a certain standard and legislative requirements, is rendered at a reasonable price to the communities within the TWKM.

Priority issues were identified in the Status Quo report, as well as the Gap Analysis and Needs assessment. Objectives were identified in order to ensure the Goals are achieved in time. Objectives have to be in line with applicable legislation, environmental systems and principles, best practice, etc., that have been adopted nationally and internationally.

2.4 Evaluate alternatives

Where applicable, alternatives were evaluated on various levels to determine the best method or way of implementing a system, process etc to achieve a goal or objective.

2.5 Implementation strategy

An implementation strategy was developed to guide the TWKM with the implementation of the IWMP and to assist with integration into the IDP and SDF.

2.6 Monitoring

A monitoring plan was developed to keep track and monitor the implementation of the IWMP.

3 Policy and Legislation

South Africa has extensive legislation that has been promulgated to ensure protection of the environment and people. Relevant acts, regulations, guidelines and international conventions are discussed below. This section addresses most relevant policy and/or legislation that must be considered when compiling the IWMP.

3.1 The Constitution of the Republic of South Africa, 1996, as amended

The South African Constitution (Act 108 of 1996) is the supreme law of the land. Section 24 (a) of the Act states that: “everyone has the right to an environment that is not harmful to their health or wellbeing.” This poses a duty on all organs of state to promulgate legislation and to implement policies that ensure that this right is upheld. Chapter 7 of the Constitution states that the roles and responsibilities of local government include:

- ▶ Promotion of social and economic development; and
- ▶ Promotion of a safe and healthy environment.

The Municipality is responsible for waste removal, managing waste disposal facilities and cleansing as this is seen as part of basic services and as per Schedules 4 and 5 of the Constitution.

3.2 National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA), as amended

The National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended (NEMA) was promulgated in November 1998. It is the key legislation for environmental management in South Africa. NEMA promotes social, economic and environmental sustainability with a key focus on conservation of the environment. The Act requires environmental processes to be transparent and to provide capacity for disadvantaged stakeholders to participate. NEMA promotes the need for co-operative governance where more than one government department may be involved in decision-making for a proposed development.

NEMA was amended in 2006 and again in June 2010, providing a new list of activities that require environmental authorisation through different processes. The list describes those activities that require a basic environmental assessment (BA) and those that require a full environmental impact assessment (EIA). Both the BA and EIA involve public participation. The two processes are detailed and involved, however the EIA involves a longer timeframe, being broken down into scoping and impact assessment phases in comparison to a BA:

- ▶ Environmental management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural and social interests equitably.
- ▶ Development must be socially, environmentally and economically sustainable. The Act further defines in considerable detail the approach to sustainable development.
- ▶ Environmental management must be integrated, acknowledging that all elements of the environment are linked and interrelated.
- ▶ Environmental justice must be pursued so that adverse environmental impacts are not in any way discriminatory to any part of the population.
- ▶ There must be equitable access to environmental resources, benefits and services to meet basic human needs and ensure human well-being.
- ▶ The participation of all interested and affected parties in environmental governance must be promoted throughout the life cycle of any project or programme and any decision-making process.
- ▶ Community well-being and empowerment must be promoted through environmental education, the raising of environmental awareness, the sharing of knowledge and the recognition of all forms of knowledge, including traditional and ordinary knowledge.
- ▶ The social, economic and environmental impacts must be considered, assessed and evaluated.
- ▶ Processes must be transparent.
- ▶ The rights of workers must be protected and the vital role of women and youth in environmental management and development must be recognised and their full participation promoted.
- ▶ There must be harmonisation between policies, legislation and actions relating to the environment. Global and international responsibilities relating to the environment must be incorporated at national interest.

3.3 National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008), as amended (NEMWA)

Chapter 1, Section 2 of the National Environmental Management Waste Act provides the following objectives of the act:

- ▶ To protect health, well-being and the environment by providing reasonable measures
- ▶ Minimising the consumption of natural resources;
- ▶ Avoiding and minimising the generation of waste;
- ▶ Reducing, re-using, recycling and recovering waste;
- ▶ Treating and safely disposing waste as a last resort;

- ▶ Preventing pollution and ecological degradation;
- ▶ Securing ecologically sustainable development while promoting justifiable economic and social development;
- ▶ Promoting and ensuring the effective delivery of waste services;
- ▶ Remediating land where contamination presents, or may present a significant risk or harm to human health or the environment;
- ▶ Achieving integrated waste management and reporting and planning;
- ▶ To ensure that people are aware of the impact of waste on their health, well-being and the environment;
- ▶ To provide for compliance; and
- ▶ To give effect to section 24 of the Constitution in order to secure an environment that is not harmful to health and well-being.

The Act requires that a NWMS be drafted in order to achieve its objectives. The NWMS was drafted and finalised in 2011 and all spheres of government must implement this strategy. It also sets waste service standards, covering areas such as tariffs, quality of service and financial reporting. Municipalities are also required by the Act to designate a waste management officer.

According to the Act, each municipality must produce an IWMP and submit it to the Member of the Executive Council (MEC) for approval. The approved IWMP must be included in the Municipal IDP. Prior to finalising the IWMP, the Municipality is required to follow the consultative process as defined in Section 29 of the Municipal Systems Act. This can be done either as a separate process or as part of the consultative process relating to its IDP.

Minimum contents required in an IWMP are outlined in the NEMWA. The contents of this IWMP were guided by those for a standard IWMP.

The NEMWA provides definitions of waste as well as the listed activities that require licensing. This Act also provides specific waste management measures for remediation of contaminated land as well as for compliance and enforcement. Waste and waste management activity as amended by Act 14 of 2003 is defined 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 that includes all wastes as defined in Schedule 3 of the Act; or
- b) Any other substance, material, or object that is not included in Schedule 3 that may be defined as waste by the Minister by notice in the Gazette,
- c) 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;
- d) Where approval is not required, once a waste is, or has been re-used, recycled or recovered;
- e) 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
- f) 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 management activity” means any activity listed in Schedule 1 or published by notice in the Gazette under section 19, and includes:

The generation of waste, including the undertaking of any activity or process that is likely to result in the generation of waste;

- a) The accumulation and storage of waste;
- b) The collection and handling of waste;
- c) The reduction, re-use, re-cycling and recovery of waste;
- d) The trading in waste;
- e) The transportation of waste;
- f) The transfer of waste;

- g) The treatment of waste; and
- h) The disposal of waste.

3.4 NEMWA (Act 59 of 2008): Regulations regarding extended producer responsibility

These Regulations apply to the identified products in terms of section 18(1)(a) of the Act and its related waste streams published and apply to the identified products in terms of section 18(1)(a) of the Act and its related waste streams that were placed on the market prior to the regulations coming into effect.

The purpose of the GN 1184 (2020) regulations under NEMWA is:

- (1) To provide the framework for the development, implementation, monitoring and evaluation of extended producer responsibility schemes by producers in terms of section 18 of NEMWA.
- (2) To ensure the effective and efficient management of the identified end-of-life products; and
- (3) To encourage and enable the implementation of the circular economy initiatives.

3.5 Guideline for the development of Integrated Waste Management Plans (IWMPs)

The IWMP guidelines provide a background for the compilation of IWMPs which includes a short historical overview of IWMPs to date and a basic description of the legal framework pertaining to IWMP development. The integrated waste management planning process incorporates all major stages of the environmental planning process, namely:

- ▶ Analysing the current situation and legal framework;
- ▶ Making projections of future requirements;
- ▶ Setting objectives;
- ▶ Developing projects and programmes to reach the set objectives;
- ▶ Implementation of plan (activities, projects and programmes);
- ▶ Monitoring and Evaluation (M & E) of the programmes and plans implemented; and
- ▶ Periodic review of the plans to ensure continuous improvement.

3.6 National Waste Management Strategy (2020 Revised)

The NWMS was revised and released during 2020 to address South Africa's waste management challenges and gave effect to the suite of policies and relevant legislation which preceded it. The following was copied from the NWMS 2020.

The NWMS provides a coherent framework and strategy for the implementation of the Waste Act and outlines government's policy and strategic approach to waste management within the South African government's context and agenda of socio-economic development that is "equitable, inclusive, sustainable and environmentally sound".

The NWMS 2020, which revises and updates the 2011 strategy, achieves the following:

- ▶ Assimilates our strategic approach to waste management with the commitments and directives of the Sustainable Development Goals 2030 (hereinafter referred to as "the SDG's") and South Africa's National Development Plan: Vision 2030 (hereinafter referred to as "the NDP");
- ▶ Unequivocally locates waste management as one of the key underpinnings of South Africa's economy and social fabric; and
- ▶ Integrates and provides an enabling environment for the DEFF's 2017 Chemicals and Waste Economy Phakisa and government's 2019 Good Green Deeds Programme.

The NWMS 2020 is also responsive to the Sustainable development goal 12 i.e. “Responsible Consumption and Production” and well as the National Development Plan 2030. The table below list the key principles underpinning the NWMS 2020.

Table 2: Key principles underpinning the NWMS 2020

Principle	Explanation
Waste Minimisation	Avoiding the amount and toxicity of waste that is generated and, in the event that waste is generated, the reduction of the amount and toxicity of the waste that is disposed.
Waste Prevention	Avoiding the generation of waste and avoiding toxicity in waste.
Waste as a Resource	Beneficiating waste through re-use, recycling, treatment and recovery to reduce the amount and the toxicity of waste disposed of.
Strategic Sustainable Partnerships	Government establishing and sustaining collaborative working relationships with non-government role-players involved in the management of waste, i.e. private sector, academia, civil society organisations and other development funding institutions.
Environmentally sound socioeconomic growth and development	Ensuring that the intent and commitments of the SDGs, NDP are continuously integrated and aligned to all environmental protection considerations, and that environmental protection programmes contribute to improving the socio-economic lives of people.

3.7 National Norms and Standards

National Norms and Standards for Assessment of Waste for Landfill Disposal, Government Notice No. 635 of 23 August 2013

The National Norms and Standards for the assessment of waste for landfill disposal prescribe the requirements for the assessment of waste prior to landfill.

National Norms and Standards for disposal of Waste to Landfill, Government Notice No. R. 636 of 23 August 2013

The norms and standards for disposal of waste to landfill stipulate the waste acceptance criteria for disposal to landfill and the various waste disposal restrictions.

Waste Classification and Management Regulations, Government Notice No. 634 of 23 August 2013

These regulations regulate classification and management of waste to give effect to provisions of the NEMWA.

National Norms and standards for the Storage of Waste, Government Notice No. 926 of 29 November 2013

The purpose of the norms and standards is to-

- a) Provide a uniform national approach relating to the management of waste storage facilities;
- b) Ensure best practice in the management of waste storage facilities; and
- c) Provide minimum standards for the design and operation of new and existing waste storage facilities.

3.8 Municipal Waste Management By-Laws

Municipalities are required to draft and maintain municipal by-laws which detail the responsibilities of the municipalities and the residents within a defined municipal boundary. In terms of Chapter 7 on Local Government, section 162 on the publication of by-laws of the Constitution of the Republic of South Africa:

- ▶ A municipal by-law may be enforced only after it has been published in the official gazette of the relevant province.

- ▶ A provincial official gazette must publish a municipal by-law upon request by the Municipality.
- ▶ Municipal by-laws must be accessible to the public.

The TWKM has Waste Management By-Laws that was Gazetted during 2015.

3.9 Polokwane Waste Summit Declaration (September 2001)

During September 2001 a national waste summit was held at Polokwane. It was attended by all stakeholder groupings in the waste field in order to jointly chart a way forward in terms of waste management. The resultant Polokwane Declaration includes a vision and goal for the management of all waste, i.e. domestic, commercial and industrial:

Vision - To implement a waste management system, this contributes to sustainable development and a measurable improvement in the quality of life by harnessing the energy and commitment of all South Africans for the effective reduction of waste.

Goals - To reduce waste generation and disposal by 50% and 25% respectively by 2012 and develop a plan for zero waste by 2022. The Polokwane Declaration has significant implications for local government. In order to move towards the goal it will be necessary for government and other stakeholders to engage more closely toward the achievement of this goal in a realistic and practical manner.

The key actions in the Polokwane Declaration that impact on local government include the following:

- ▶ Implement the NWMS (2020).
- ▶ Develop and implement legislative and regulatory framework.
- ▶ Implement waste reduction and recycling.
- ▶ Develop waste information and monitoring systems

3.10 International Conventions

South Africa is a signatory to the Basel (1994) and Stockholm (2001) Conventions. The key objectives of the Basel Convention are:

- ▶ To prevent waste being taken from developed countries and disposed in less developed countries where there will be significant impact from incorrect handling;
- ▶ To minimise the generation of hazardous waste in terms of quantity the severity of the hazardous waste;
- ▶ To dispose of them as close to the source of generation as possible;
- ▶ To reduce the movement of hazardous waste.

A central goal of the Basel Convention acceded to by South Africa in 1994, is “environmentally sound management” (ESM), the aim of which is to protect human health and the environment by minimising hazardous waste production whenever possible. ESM means addressing the issue through an “integrated life-cycle approach”, which involves strong controls from the generation of a hazardous waste to its storage, transport, treatment, reuse, recycling, recovery and final disposal.

The Stockholm Convention on Persistent Organic Pollutants (POPs), to which South Africa became a signatory in 2001 is a global treaty to protect human health and the environment from POPs. POPs are particularly carcinogenic and are toxic to both humans and wildlife. Burning of waste in open landfill sites or by incineration has the potential to release high volumes of POPs into the atmosphere.

3.11 The National Health Act, 2003 (Act No. 61 of 2003)

The National Health Act, 2003 defines “municipal health services” to include water quality monitoring; food control; waste management; health surveillance and prevention of communicable diseases, excluding immunisations; vector control; environmental pollution control; disposal of the dead; and chemical safety, but excludes port health, malaria control and control of hazardous substances.

Section 32 of the Act requires that municipal health services (including waste management) be effectively and equitably provided. Furthermore, national and provincial government must enter into a

service level agreement as contemplated in section 156(4) of the Constitution, assigning the administration of the listed matters to the municipality.

The service level agreement must according to section 32(3) provide for:

- a) The services to be rendered by the municipality;
- b) The resources that the relevant member of the executive council must make available;
- c) Performance standards which must be used to monitor services rendered by the municipality; and
- d) Conditions under which the agreement may be terminated.

This Act also pertains to health care waste management. The Act, in relation to waste activities designates the municipal services by including waste management in terms of formulating regulations regarding medical and health care waste by the Minister Responsible.

3.12 Municipal Structures Act, 1998 (Act No 117 of 1998)

The Municipal Structures Act, 1998 (Act 117 of 1998) delineates powers and functions of different categories of municipalities. In terms of the Act, municipalities have powers and functions relating to integrated, sustainable and equitable social and economic development of the district. This role should be performed by ensuring integrated development planning for the district as a whole, building the capacity of local municipalities to perform their functions, exercising local municipal powers where capacity is lacking, and promoting the equitable distribution of resources between the local municipalities in its area. The Act further reiterates the functions of local municipalities as contained in the Constitution excluding the ones referred to as district functions. This includes the provision of waste collection and disposal services and cleansing.

3.13 Municipal Systems Act, 2000 (Act No. 32 of 2000)

The Municipal Systems Act, 2000 (Act 32 of 2000) defines alternative approaches that may be employed in delivering municipal services and the processes to be followed when such alternatives are considered. The need for integrated planning and performance monitoring of both external and internal mechanisms of service delivery are emphasised in the Systems Act. The Act further mandates communities to be encouraged to participate in strategic decisions making relating to service delivery.

3.14 Waste Tyre Regulations, Government Notice No.149, 3 February 2009

The Waste Tyre Regulations are designed based on Section 24C of Environmental Conservation Act (ECA) 1989, (Act No. 73 of 1989). This design is intended to regulate the handling, storage and disposal of used tyres.

3.15 Minimum Requirements for Waste Disposal by Landfill, 1998 (revised in 2005)

The then Department of Water Affairs and Forestry (DWAF), having a concern for the protection of water resources of South Africa and at the time being responsible for permitting of waste facilities developed a part series of documents commonly referred to as the 'Minimum Requirements'. The first edition was published in 1994, followed by the 2nd edition, which superseded the 1st edition in 1998. The general objectives of the Minimum Requirements are to:

- ▶ Set out minimum requirements in terms of processes to be followed and information required for the application of a permit for a facility;
- ▶ Provide a minimum set of environmentally acceptable ways of handling, transporting, treating and disposing of different types of waste that has to be achieved; and

- ▶ Set minimum standards and specification, which had to be adhered to, in order to protect water resources from potential pollution from waste facilities.

4 Status Quo and situation analysis

To determine the status quo of waste management services in the TWKM, a situational analysis was conducted to evaluate and quantify all waste management aspects within the municipality. This includes the number of residents in the municipality, the demographic profile, socio-economic composition and delivery of waste management services in the area.

4.1 Geographic Profile

TWKM is the largest local authority in the Overberg District with an area of approximately 3258km² consisting of 14 wards. The TWKM houses 42% of the total population in the Overberg district and is a Category B municipality that can be categorised as rural area with open spaces and farming activities.

4.2 Climate

There has been significant rainfall throughout the years with the majority of the rainfall occurring from May to August. The areas surrounding the Groenlandberg Nature Reserve (Grabouw, Botrivier and Vyeboom farms) receives an average rainfall of 900 mm annually. In contrast, the eastern part of the TWKM (Riviersonderend) receives an average annual rainfall of 340 mm.

The average maximum temperatures vary from 26 °C during the summer months to 17 °C during winter. The minimum temperatures vary from 16 °C during summer to 7 °C during winter.

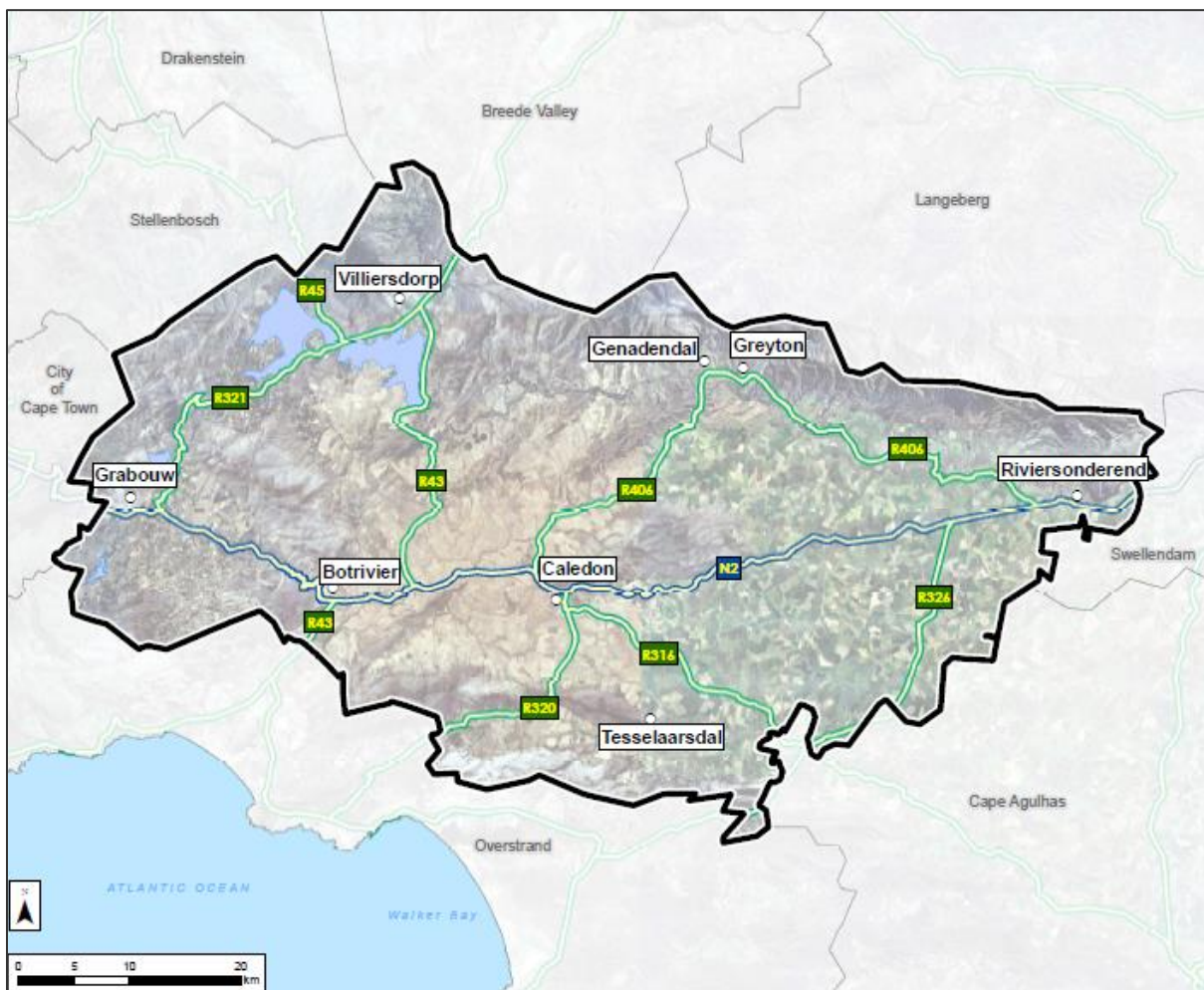


Figure 1: Theewaterskloof Municipality locality and extent

4.3 Demographics (Population and Development Profiles)

The following information regarding population growth is cited from the Draft 2021 IDP - “The 2011 Census indicate TWK population at 108,790 and Community Survey estimates predict it to be at 117,109 translating into a growth rate over the period (2011 – 2016) of 7.6%. The Social Economic Profile ((SEP 2019) estimates provided by the provincial government) estimate the municipality population to have increased to 120,823 in 2019 and to reach 125,285 by 2023 translating into a growth rate of 3.69% over a five-year period.”

Table 3: Population data

Name	Population 2011	Population 2016	Population 2019	Population 2023
Botrivier	5505	5926	6111	6332
Caledon	13020	14016	14453	14977
Dennehof	121	130	134	139
Elgin	953	1026	1058	1096
Genadendal	5663	6096	6286	6514
Grabouw	30337	32658	33676	34897
Greyton	2780	2993	3086	3198
Middleton	963	1037	1069	1108
Riviersonderend	5245	5646	5822	6033
Theewaterskloof NU	34200	36816	37964	39341
Villiersdorp	10004	10769	11105	11508
Total	108791	117114	120765	125144

According to the “Demographics overview” in the IDP approximately 79.3% of households has access to the basic refuse removal services.

The municipality is divided into 14 Wards as shown in the table below.

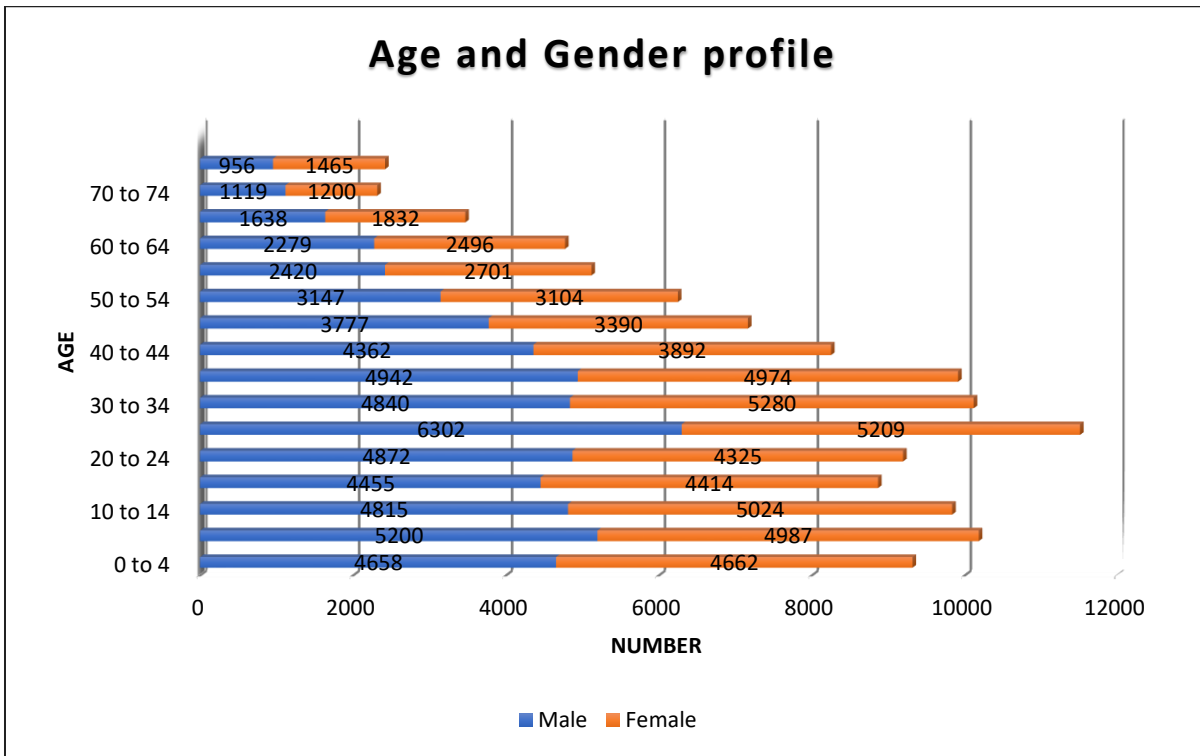
Table 4: Wards in TWKM

Ward	Name
1	Riviersonderend
2	Greyton/Genadendal
3	Caledon & Tesselaarsdal
4	Caledon
5	Villiersdorp
6	Villiersdorp
7	Botrivier

Ward	Name
8	Grabouw
9	Villiersdorp (Vyeboom, Greymead)
10	Grabouw
11	Grabouw
12	Grabouw
13	Grabouw
14	Grabouw

4.3.1 Age and Gender Profile

The TWKM has a very young population, with 61.26% of the population under the age of 35, see Figure 2, with the largest number of people between the ages 20-29. The population is comprised of 49% females and 51% males.



*Based on SEP 2019 and IHS

Figure 2: Age and gender Profile of TWKM

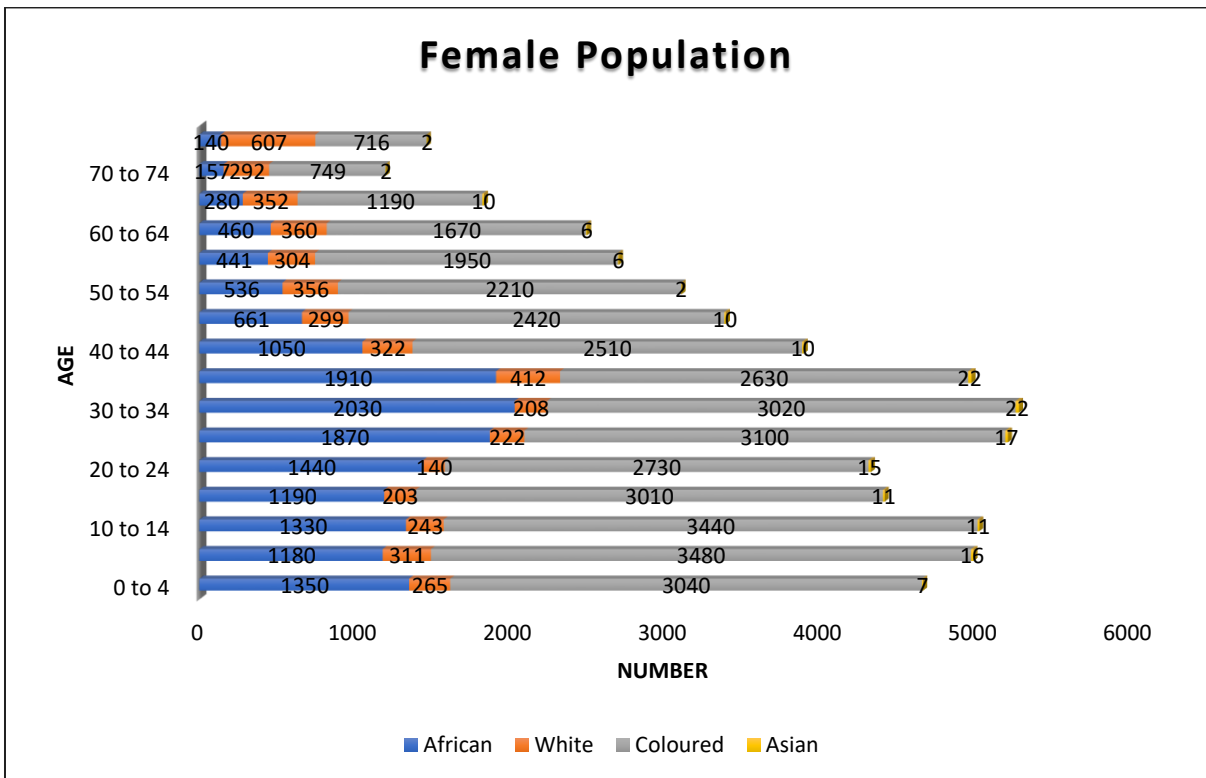


Figure 3: Female Race and Age Population of TWKM

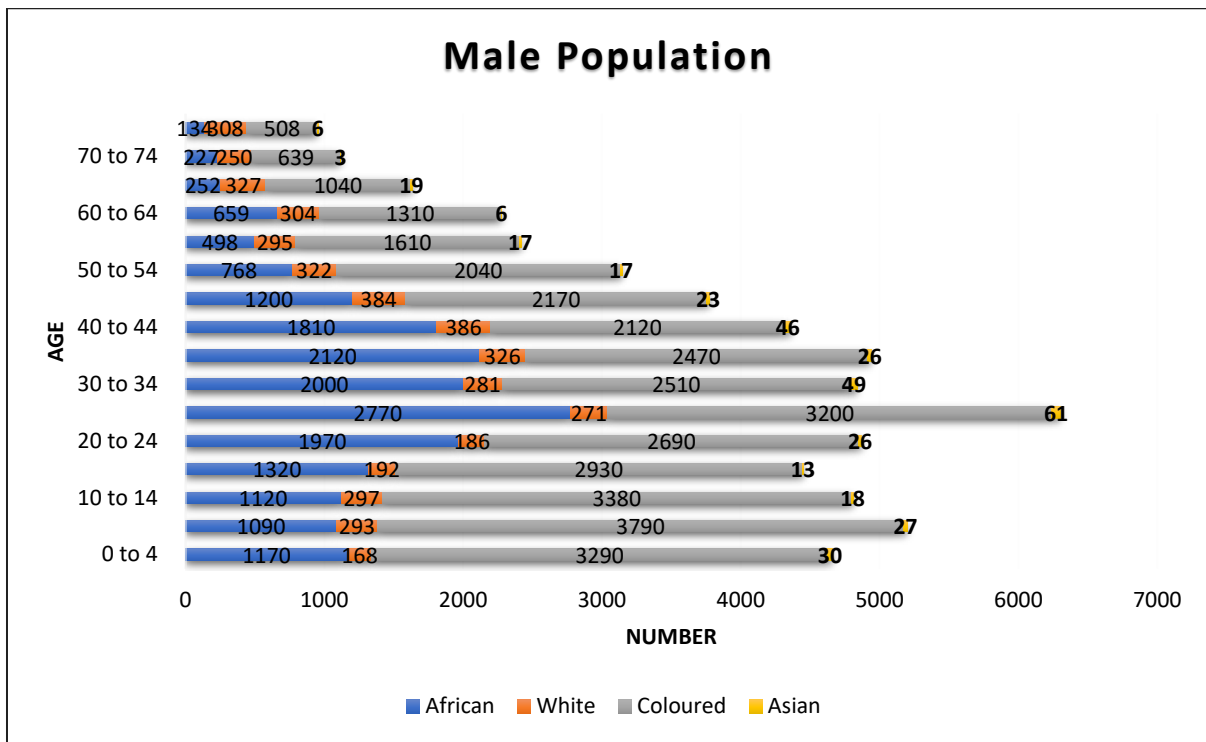


Figure 4: Race and Age Population of TWKM

4.3.2 Households

The municipality consists of 28,884 households, including agricultural households. Census 2011 indicated that 68,6% and 31,4% households are in urban areas and on farmland respectively. The growth rate between the 2001- 2011 Census was 1.7% per annum, while the estimated growth rate between 2011- 2018 is 2.8 per annum.

The Social Economic Profile ((SEP 2019) estimates provided by the provincial government) estimate the number of municipality households to decreased to 34 948 in 2018 and to reach 41 147 by 2028 translating into a growth rate of 1.7% (2018-2028) per annum.

The household profile is used to measure the average household size of 3,5. This information is important because the number and size of households will assist the municipality with proper planning for waste collection and management. Smaller household sizes are often attributed to more affluent areas. However, this statement does not take into account culture and preferences and therefore cannot be used as the only determinant of waste volumes according to area.

Table 5 Household overview of TWKM, OD and WC

Region	Overview of Households						
	12011	22016	32018	32019	32020	32021	32022
Theewaterskloof Municipality	28 885	33 097	34 948	35542	36146	36761	37386
Overberg District Municipality	77 196	91 835					
Western cape Province	1 634 000	1 933 876					

¹ Values generated from stats sa census 2011,

² community survey 2016

³ 2018 MYPE

Table 6 Household overview of TWKM towns

Estimated population within Theewaterskloof						
Towns	Population					
	¹ 2011	³ 2018	² 2019	² 2020	² 2021	2022
Grabouw	30 337	38 703	34 617	35 192	35 778	36 373
Villierdorp	10 004	12 438	11 415	11 605	11 798	11 994
Caledon	13 020	16 451	14 857	15 104	15 355	15 610
Genadendal	5 663	6 662	6 462	6 569	6 679	6 790
Greyton	2 780	3 271	3 172	3 225	3 279	3 333
Riviersonderend	5 245	6171	5 985	6 084	6 186	6 289
Botrivier	5 505	6 477	6 282	6 386	6 492	6 600
Tesselaarsdal	1 395	1566	1 592	1 618	1 645	1 673
TWK Rural		30 579	31 532	32 676	33 861	35 089
TWK Urban		91 739	84 382	85 783	87 212	88 662
TOTAL	73 949	122 318	115 914	118 459	121 073	123 751

¹Values generated from stats sa census 2011, 2018 MYPE SDF

4.3.3 Employment

Taking into consideration that the employment rate within a municipality is vital for an integrated approach to waste management, the municipality may use employment figures to predict the volumes of waste produced and make provision of resources to provide the necessary waste management services. According to StatsSA, there is an estimated 40568 employed and 7076 unemployed persons in 2011 within the municipality.

Economically active people (employed or unemployed but looking for work) amounted to 47 644 people, and of these 14,9% are unemployed. Of the 23 559 economically active youth (15 – 34 years), 19,8% are unemployed. Figure 5 shows the employment status the TWKM population. Youths and discouraged work seekers may be trained, upskilled and employed in areas where the need for human resources is critical.

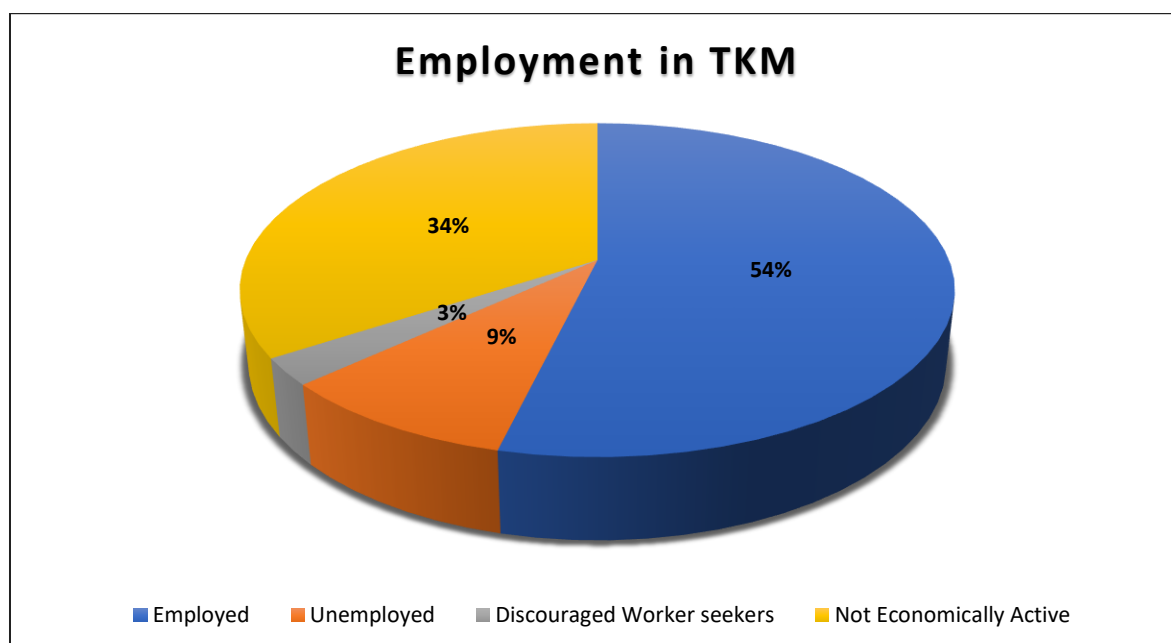


Figure 5: Employment in TWKM

4.3.4 Annual Household Income

Household income is a vital determinant of welfare and the standard of living. Household income is a family’s ability to meet their basic needs in the acquisition of food, shelter, and clothing. One of the most important poverty indicators is the Minimum Living Level (MLL). The Minimum Living Level indicates the minimum financial requirements of a family if they are to maintain their health and have acceptable standards of hygiene and adequately meet their needs. 11.8% of the population have no income; 45.8% earn an average of less than R 50 613 per year and only 42.3% earn more than R 50 613 on average per year (see Figure 6).

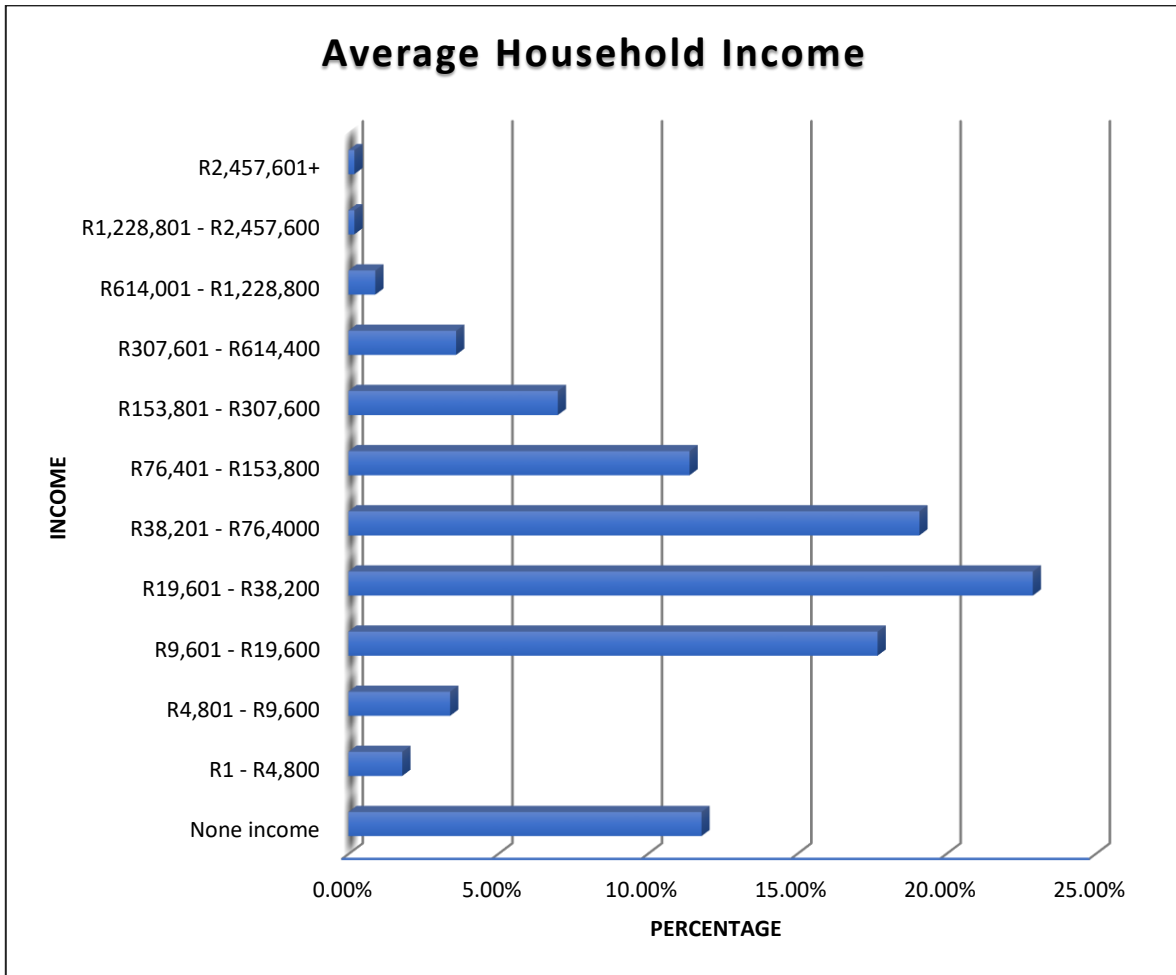


Figure 6: TWKM Average household income

Waste generation tends to increase with household income; however, there is no direct correlation between waste generation and household income and many variances occur. Therefore, it is difficult to predict the impact that income has on waste generation rate. However, it is acceptable to assume that huge economic growth could be accompanied by growth in waste generated before possible waste minimisation strategies take effect.

4.3.5 Economy

The TWKM economy focusses on agriculture, environmental and culturally based tourism, manufacturing and commercial businesses that provides in the holistic products and services needs of residents and tourists. Agriculture focusses on grain production, vineyards, apples and cattle farming.

More than 52% of residents is part of the indigent population. Key municipal challenges include financial sustainability through the broadening of the economic sector and tax and tariff bases. The municipality focusses on socio-economic and welfare development and the alleviation of poverty through job and wealth creation.

4.4 Determining current waste generation and estimating future waste generation rates and quantities

It is important to determine the current waste generation rates and type of waste generated in order to ensure that there are adequate resources for collection of waste and adequate facilities to properly handle and manage the amount of waste generated with the intention of minimising the amount of solid waste disposed at landfill sites. Estimating future generation rates and quantities will assist with planning to ensure that there will be adequate resources to meet future waste service demands.

4.4.1 Service level standards

Table 7 below indicates the level of waste services being rendered in TWKM.

Table 7 Schedule of waste service delivery practices

Standard	Service level
Premise based removal (Residential Frequency)	Domestic collections are done on weekly basis from all formal residential dwelling within the TWKM. Collection in some informal areas is a challenge due to access limitation i.e. poor road infrastructure, inaccessible areas due to narrow roads or footpaths to informal structures and lack of receptacle.
Premise based removal (Business Frequency)	1 – 3 removals weekly. A number of restaurants arrange for food waste to be collected by farmers for use as pig food.
Bulk Removal (Frequency)	Refuse removal is done per request, excluding industrial refuse or refuse originating from any premises which mass, shape, size or quantity thereof cannot be easily collected in a plastic lining.
Removal from farms	No collection services from farms
Health care risk waste	Each health care facility makes use of private contractors to collect health care risk waste on an as and when required basis
Removal Bags provided (Yes/No)	No, Farmers do self-dumping or can apply for refuse services in order for the finances department to make a cost calculation.
Garden refuse removal Included (Yes/No)	Resident are expected to dispose of their garden refuse at the WDFs.
Cleaning Frequency in towns	Street cleansing daily
Cleaning Frequency in areas excluding towns (Between)	Monthly
How soon are public areas cleaned after events (24hours/48hours/longer)	48 hours, 2 workdays
Clearing of illegal dumping (24hours/48hours/longer)	If illegally dumped waste poses a serious healththreat, it will be cleaned within 48 hours.
Recycling or environmentally friendly practices (Yes/No)	Yes (informal)
Licensed WDF (Yes/No)	All formal WDF are licensed

4.4.2 Waste generation rates

The estimated waste generation rates are shown in Table 8. An annual growth rate of 3% was used and a waste generation rate of an average of 0,5kg/person/day.

Table 8 Waste generation rates

Towns	2021	Growth rate	Est waste generation rate	Tons/day	2025	2030
Grabouw	35 778	3%	0,5	17,9	20,1	23
Villierdorp	11 798	3%	0,5	5,9	6,6	7,7
Caledon	15 355	0%	0,5	7,7	7,7	8
Genadendal	6 679	3%	0,5	3,3	3,8	4,4
Greyton	3 279	3%	0,5	1,6	1,8	2
Riviersonderend	6 186	3%	0,5	3,1	3,5	4,0
Botrivier	6 492	3%	0,5	3,2	3,7	4
Tesselaarsdal	1 645	3%	0,5	0,8	0,9	1,1
TWK Rural	33 861	3%	0,5	16,9	19,1	22
TWK Urban	87 212	3%	0,5	43,6	49,1	56,9
TOTAL	121 073	3%	0,5	60,5	68	79

4.5 Waste Characterisation

According to the Overberg District IWMP (2018), a waste characterisation study was completed for TWKM. The DEA&DP commissioned a study in 2007 to determine the characterisation of the disposed waste at various landfills in the Overberg District. From that study, the anticipated average waste composition of the TWKM can be derived to include the following recyclable materials (by mass):

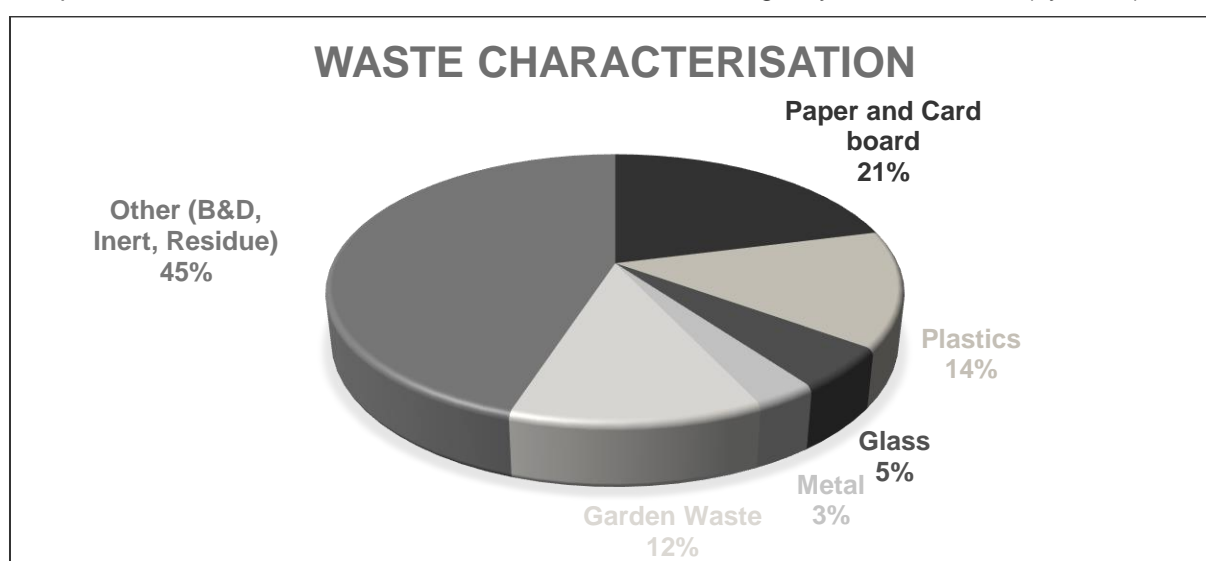


Figure 7: Waste Characterisation Study (ODM IWMP, 2018)

4.6 Specific Waste Streams

4.6.1 Health care risk waste

Waste from healthcare facilities Health Care Risk Waste (HCRW) is classified as hazardous waste. These streams are required to be packaged, labelled, handled, stored and treated according to their level of hazard in order to create a safe and environmentally sound HCRW management system. HCRW which can be found in every healthcare facility is the infectious waste, including sharp waste. HCRW is generated at the clinics and hospitals in the TWKM municipal area.

The removal of HCRW is not the responsibility of the TWKM and each medical facility makes arrangements for the safe disposal of their HCRW.

4.6.2 Hazardous Waste

Hazardous waste can be defined as waste that may have a detrimental effect on public health and is categorised according to the degree at which it might cause harm. According to the Minimum Requirements for the Handling, Classification and Disposal of Hazardous Waste (MRHW) and SANS 10234: Globally Harmonised System (GHS) of Classification and Labelling of Chemicals, hazardous waste must be classified as follows:

Table 9 Waste Levels

Waste Level		
Level 1	Level 2	Level 3
Hazardous waste	H01 Explosives	
	H02 Gasses	H02.01 Flammable gases H02.02 Non-flammable, non-toxic gases H02.03 Toxic gases
	H 03 Flammable Liquids	
	H04 Flammable solids and substances	H04.01 Flammable solids H04.02 Substances liable to spontaneous combustion H04.03 Substances that, on contact with water emit flammable gases
	H05 Oxidizing substances and organic peroxides	H05.01 Oxidizing substances H05.02Organig peroxides
	H06 Toxic and infectioussubstances	H06.01 Toxic substances H06.02 Infectious substances
	H07 Radioactive substances	
	H08 Corrosives	
	H09 Miscellaneous dangerous substances and goods	

Hazardous waste in the municipality can be produced mainly by industries, healthcare facilities and farming activities. The TWKM does not currently have records of hazardous waste generated within its boundaries.

The guideline for the development of integrated waste management plans is based on the NWMS and indicates that a local municipal IWMP must only cover hazardous domestic waste in detail.

Framework planning for hazardous industrial waste, agricultural and forestry waste (pesticides), HCRW, mining waste, power station waste, radioactive medical waste and radioactive mining waste will be done at provincial level. The NWMS requires Provincial Environmental Departments to produce Integrated Hazardous Waste Management Plans.

The closest licensed hazardous waste disposal facility is Vissershok, north of the City of Cape Town. Currently, industries in the municipal area generating hazardous waste appoint a hazardous waste contractor to manage their on-site waste facilities and/or to collect and dispose of this waste at a licensed hazardous landfill site.

4.7 Waste Recycling, Treatment and Disposal

This section describes the status quo of landfill sites; treatment facilities; recyclers; illegal dumping; garden; and builder's rubble waste.

4.7.1 Status Quo of Waste Recyclers

There are numerous individuals that are informally active in recycling activities within TWKM. Limited recycling volumes are available. The organic waste stream collected at the landfills is separated and recycled/composted the Karwyderskraal landfill.

Table 10 Estimated waste disposal (average tons/month) for the various landfill sites as reported on IPWIS

LANDFILL	Caledon			Genadendal	Greyton	Villiersdorp	Est.Total Month
	2018	2019	2020	2020	2020	2020	
Waste Type	ESTIMATED AVERAGE WASTE DISPOSAL (TONNES/MONTH)						
Total Domestic/Municipal Waste	62.6	66.4	71	34.6	37.8	143.6	282.7
Total Construction and Demolition Waste	32.7	20.6	15.1	36.5	60.8	4.8	124.9
Total Organic Waste	13.9	7.8	22.6	8.6	17.3	17.5	58.2
Total Commercial and Industrial Waste	5.2	5.3	4.6	0.3	0	12.8	18.1
Total Estimated Percentage of Green Waste	14%	8%	25%	12%	18%	11%	14%
TOTAL							483.9

There are also informal recyclers that visit the waste disposal facilities daily to reclaim recyclable material. They only recycle specific material depending on the available market. As much of this is recycled before being landfilled no records or volumes are available for this waste.

Greyton and Genadendal have successful Swop Shops in the local communities that collect over 700kgs of recyclable waste every week.

4.7.2 Status Quo of Waste Disposal Facilities

The TWKM operates a number of waste disposal facilities as shown in the table below:

Table 11: Summary of WDF operated by the TWKM

Waste Disposal Facility	Licence Number	Licence Type	Date issued	Validity	Licenced commence ment of activity
Botrivier WDF	19/2/5/1/E4/4/WL00 32/14	Closure	20-Feb-2015	5 years	
Caledon WDF	19/2/5/4/E4/5/WL00 75/18	Operational	06-Aug-18		
Genadendal WDF	19/2/5/4/E4/5/WL01 80/19	Decommissioning	03-Dec-19	10 Years 7/11/2029	07-Nov-24
Grabouw Solid Waste Transfer Station	16/2/7/G401/D15/Z2 /P472 (Permit)				

Waste Disposal Facility	Licence Number	Licence Type	Date issued	Validity	Licensed commencement of activity
Greyton WDF	19/2/5/4/E4/12/WL0 179/19	Decommissioning	07-Sep-18	10 Years 7/11/2029	07-Nov-25
Riviersonderend WDF	19/2/5/4/E4/27/WL0 178/19	Decommissioning	03-Dec-19	10 Years 11/12/2029	11-Dec-24
Villiersdorp WDF	19/2/5/4/E4/27/WL0 129/18	Operational	31-Aug-18	03-Sep-28	
Tesselaarsdal Drop-off Facility	Not applicable				

Grabouw Solid Waste Transfer Station – TS situated on north-eastern section, WTW adjacent to TS

The Grabouw Solid Waste Transfer Station is adjacent to the Wastewater Treatment Works on the eastern outskirts of Grabouw. The locality is shown in Figure 8 and described in Table 12.



Figure 8 Grabouw Solid Waste Transfer Station

Table 12: Grabouw Transfer Station Summary

Information item ¹	Facility particulars
Position of site	34°09' 25.32' 'S, 19°01' 16.3" E
License to operate	Permit No. 16/2/7/G401/D15/Z2/P472/Registration in Terms of Norms and Standards
Year issued	July 2002
Classification of site	GSB-
Life span	N/A

¹ Minimum requirements (DWAF, 1998)

Information item ¹	Facility particulars
Expected year of closure	N/A
Type of operation	Transfer station
Size	N/A
Airspace available	N/A
Cover material available	N/A
Operated	Mon - Fri
Regulatory compliance	88.8%
Daily Cover	N/A
Access control	Yes
Buffer	Yes
Type of equipment	Static Compactor, TLB
Ablution facilities	Yes
Guardhouse	Yes
Storm water management	Yes
Leachate management	N/A
Record keeping	Yes
Signage	Good
Recycling	Yes

The results of the external audit report (2021/2) are shown below.

Name:	Type:	Location:	Reference No.:
Grabouw Transfer Station	WDF	Portion of Erf 281, Grabouw in the Overberg District Municipality, Western Cape Province.	16/2/7/G401/D15/Z2/P472

Category	No. of Conditions Audited	Score	Compliance (Average)	Weight (Average)	Weight (Adjusted)	Weighted Score (%)
Administration (A)	5	8	80.00%	12.82%	10%	8.00%
Operations	26	40	76.92%	66.67%	50%	39.29%
General Operations (O)	14	20	71.43%	35.90%	20%	14.29%
Special Operations (SO)	12	20	83.33%	30.77%	30%	25.00%
Monitoring (M)	8	14	87.50%	20.51%	40%	35.00%
Average Previous Compliance Rating						78.38%
Environmentally Weighted Previous Compliance Rating						81.29%
Category	No. of Conditions Audited	Score	Compliance (Average)	Weight (Average)	Weight (Adjusted)	Weighted Score (%)
Administration (A)	4	8	100.00%	12.12%	10%	10.00%
Operations	23	41	89.13%	69.70%	50%	45.42%
General Operations (O)	13	22	84.62%	39.39%	20%	16.92%
Special Operations (SO)	10	19	95.00%	30.30%	30%	28.50%
Monitoring (M)	6	10	83.33%	18.18%	40%	33.33%

Average Current Compliance Rating	89.39%
Environmentally Weighted Current Compliance Rating (X)	88.76%

Villiersdorp Refuse Transfer Station

Villiersdorp transfer station layout is shown in Figure 9 and details given in Table 13



Figure 9: Villiersdorp Refuse Transfer Station

Table 13: Villiersdorp Refuse Transfer Station summary

Information item ²	Facility Particulars
Position of site	Latitude: 33°58'36.45"S, Longitude: 19°17'06.05"E
Licence to operate	19/2/5/4/E4/27/WL0129/18
Year issued	2018
Class	B (G:C:B+)
Type of operation	Transfer Station (illegal dump site)
Size	Approximately 32 000m ²
Cover material available	Builders' rubble
Access control	Yes
Fenced	Partially
Buffer	Yes
Type of equipment	TLB from time to time
Ablution facilities	None
Guardhouse	None
Storm water management	Partial, upper slope cut-off system
Record keeping	Records are kept
Signage	None, stolen

² Minimum requirements (DWAF, 1998)

Information item ²	Facility Particulars
Recycling	Recycling contractors appointed between March 2019 to September 2021. New appointment in process.

The results of the external audit report are shown below.

Name:	Type:	Location:	Reference No.:
Villiersdorp Waste Management Facility (WMF)	WDF	Portion of the Remainder of the Farm Radyn Nr 24, Division of Caledon in the Overberg District Municipality	19/2/5/4/E4/27/WL0129/18

Category	No. of Conditions Audited	Score	Compliance (Average)	Weight (Average)	Weight (Adjusted)	Weighted Score (%)
Administration (A)	23	27	58.70%	30.67%	10%	5.87%
Operations	39	35	44.87%	52.00%	50%	22.38%
General Operations (O)	21	19	45.24%	28.00%	20%	9.05%
Special Operations (SO)	18	16	44.44%	24.00%	30%	13.33%
Monitoring (M)	13	14	53.85%	17.33%	40%	21.54%
Average Previous Compliance Rating						50.67%
Environmentally Weighted Previous Compliance Rating						49.79%
Category	No. of Conditions Audited	Score	Compliance (Average)	Weight (Average)	Weight (Adjusted)	Weighted Score (%)
Administration (A)	19	29	76.32%	28.79%	10%	7.63%
Operations	35	27	38.57%	53.03%	50%	21.20%
General Operations (O)	19	10	26.32%	28.79%	20%	5.26%
Special Operations (SO)	16	17	53.13%	24.24%	30%	15.94%
Monitoring (M)	12	15	62.50%	18.18%	40%	25.00%
Average Current Compliance Rating						53.79%
Environmentally Weighted Current Compliance Rating (X)						53.83%

Caledon Landfill site



Figure 10: Caledon Landfill site

Table 14: Caledon WDF summary

Information item ³	Facility Particulars
Position of site	Latitude: 34° 12' 54.26" S, Longitude: 19° 25' 22.36" E
Licence to operate	19/2/5/4/E4/5/WL0075/18
Year issued	2018
Class	B (G:S:B+)
Type of operation	Operational Landfill
Size	Approximately 55 000m ²
Cover material available	Yes
Access control	Yes, during operational hours
Fenced	Partial
Buffer	Yes
Type of equipment	Bulldozer & TLB
Ablution facilities	Potable
Guardhouse	Shipping container used as office and access control
Storm water management	Cut-off trench upstream of site
Record keeping	Records are kept of waste entering the site
Signage	Yes
Recycling	Recycling contractors appointed between March 2019 to September 2021. New appointment in process

³ Minimum requirements (DWAF, 1998)

The results of the external audit report (2021/2) are shown below.

Name:	Type:	Location:	Reference No.:
Caledon Landfill Site	WDF	Portion 1 of the Municipal Commonage of Caledon, Western Cape Province.	19/2/5/4/E4/5/WL0075/18

Category	No. of Conditions Audited	Score	Compliance (Average)	Weight (Average)	Weight (Adjusted)	Weighted Score (%)
Administration (A)	15	25	83.33%	24.59%	10%	8.33%
Operations	30	30	50.00%	49.18%	50%	24.16%
General Operations (O)	19	20	52.63%	31.15%	20%	10.53%
Special Operations (SO)	11	10	45.45%	18.03%	30%	13.64%
Monitoring (M)	16	28	87.50%	26.23%	40%	35.00%
Average Previous Compliance Rating						68.03%
Environmentally Weighted Previous Compliance Rating						67.50%
Category	No. of Conditions Audited	Score	Compliance (Average)	Weight (Average)	Weight (Adjusted)	Weighted Score (%)
Administration (A)	12	24	100.00%	18.75%	10%	10.00%
Operations	31	40	64.52%	48.44%	50%	31.23%
General Operations (O)	20	27	67.50%	31.25%	20%	13.50%
Special Operations (SO)	11	13	59.09%	17.19%	30%	17.73%
Monitoring (M)	21	26	61.90%	32.81%	40%	24.76%
Average Current Compliance Rating						70.31%
Environmentally Weighted Current Compliance Rating (X)						65.99%

Genadendal Landfill site



Figure 11: Genadendal Landfill site

Table 15: Genadendal WDF summary

Information item ⁴	Facility Particulars
Position of site	Latitude: 34°03'22.12"S, Longitude:19°34'07.34"E
Licence to decommission	19/2/5/4/E4/5/WL0180/19
Year issued	2019
Class	B (G:C:B-)
Type of operation	Operational Landfill
Size	Approximately 15 000m ²
Cover material available	Builders' rubble
Access control	Yes, during operational hours
Fenced	Partial
Buffer	Yes
Type of equipment	TLB
Ablution facilities	None
Guardhouse	Access control shared with WWTW
Storm water management	None
Record keeping	No
Signage	None except for Information board
Recycling	Informal recycling

The results of the external audit report (2021/2) are shown below.

Name:	Type:	Location:	Reference No.:
Genadendal Landfill Facility	WDF	Remainder of Farm no. 39, Genadendal	19/2/5/4/E4/9/WL0079/18

⁴ Minimum requirements (DWAF, 1998)

Category	No. of Conditions Audited	Score	Compliance (Average)	Weight (Average)	Weight (Adjusted)	Weighted Score (%)
Administration (A)	18	23	63.89%	29.51%	10%	6.39%
Operations	28	21	37.50%	45.90%	50%	20.11%
General Operations (O)	17	11	32.35%	27.87%	20%	6.47%
Special Operations (SO)	11	10	45.45%	18.03%	30%	13.64%
Monitoring (M)	15	17	56.67%	24.59%	40%	22.67%
Average Previous Compliance Rating						50.00%
Environmentally Weighted Previous Compliance Rating						49.16%
Category	No. of Conditions Audited	Score	Compliance (Average)	Weight (Average)	Weight (Adjusted)	Weighted Score (%)
Administration (A)	15	19	63.33%	23.44%	10%	6.33%
Operations	32	24	37.50%	50.00%	50%	18.00%
General Operations (O)	20	16	40.00%	31.25%	20%	8.00%
Special Operations (SO)	12	8	33.33%	18.75%	30%	10.00%
Monitoring (M)	17	15	44.12%	26.56%	40%	17.65%
Average Current Compliance Rating						45.31%
Environmentally Weighted Current Compliance Rating (X)						41.98%

Greyton Landfill site



Figure 12: Greyton Landfill site

Table 16: Greyton WDF summary

Information item ⁵	Facility Particulars
Position of site	Latitude: 34°3'50.4''S, Longitude:19°36'8.28''E
Licence to decommission	19/2/5/4/E4/5/WL0180/19
Year issued	2019
Class	B (G:C:B-)
Type of operation	Operational Landfill
Size	Approximately 27 000m ² (Licence co-ordinates differ from fenced area)
Cover material available	Builders' rubble
Access control	None
Fenced	Yes
Buffer	Yes
Type of equipment	Front end Loader
Ablution facilities	None
Guardhouse	None
Storm water management	None
Record keeping	No
Signage	None except for Information board
Recycling	Recycling contractors appointed between March 2019 to September 2021. New appointment in process

The results of the external audit report (2021/2) are shown below.

Name:	Type:	Location:	Reference No.:
Greyton Waste Disposal Facility	WDF	Located on the Remainder of ERF No.595, Greyton , Western Cape Province	19/2/5/4/E4/12/WL0179/19

Category	No. of Conditions Audited	Score	Compliance (Average)	Weight (Average)	Weight (Adjusted)	Weighted Score (%)
Administration (A)	14	22	78.57%	22.58%	10%	7.86%
Operations	29	41	70.69%	46.77%	50%	33.83%
General Operations (O)	22	32	72.73%	35.48%	20%	14.55%
Special Operations (SO)	7	9	64.29%	11.29%	30%	19.29%
Monitoring (M)	19	32	84.21%	30.65%	40%	33.68%
Average Previous Compliance Rating						76.61%
Environmentally Weighted Previous Compliance Rating						75.37%
Category	No. of Conditions Audited	Score	Compliance (Average)	Weight (Average)	Weight (Adjusted)	Weighted Score (%)
Administration (A)	11	14	63.64%	18.97%	10%	6.36%
Operations	28	32	57.14%	48.28%	50%	28.57%
General Operations (O)	21	24	57.14%	36.21%	20%	11.43%
Special Operations (SO)	7	8	57.14%	12.07%	30%	17.14%
Monitoring (M)	19	26	68.42%	32.76%	40%	27.37%

⁵ Minimum requirements (DWAF, 1998)

Average Current Compliance Rating	62.07%
Environmentally Weighted Current Compliance Rating (X)	62.30%

Riviersonderend (RSE) Landfill site



Figure 13: Riviersonderend (RSE) Landfill site

Table 17: Riviersonderend WDF summary

Information item ⁶	Facility Particulars
Position of site	Latitude: 34°8'6.36"S, Longitude: 19°55'39.09"E
Licence to decommission	19/2/5/4/E4/27/WL0178/19
Year issued	2019
Class	B (G:C:B-)
Type of operation	Operational Landfill
Size	Approximately 11 000m ² (Licence indicates approximately 14 000m ²)
Cover material available	Builders' rubble
Access control	Yes
Fenced	Partially
Buffer	Yes
Type of equipment	TLB from time to time
Ablution facilities	None
Guardhouse	None
Storm water management	Partial
Record keeping	Yes
Signage	None
Recycling	Recycling contractors appointed between March 2019 to September 2021. New appointment in process

⁶ Minimum requirements (DWAF, 1998)

The results of the external audit report (2021/2) are shown below.

Name:	Type:	Location:			Reference No.:	
Riviersonderend Waste Disposal Facility	WDF	Erf No. 289, Northern Extent of Riviersonderend, Overberg District Municipality			19/2/5/4/E4/20/WL0051/18	
Category	No. of Conditions Audited	Score	Compliance (Average)	Weight (Average)	Weight (Adjusted)	Weighted Score (%)
Administration (A)	14	15	53.57%	21.21%	10%	5.36%
Operations	36	35	48.61%	54.55%	50%	21.27%
General Operations (O)	26	28	53.85%	39.39%	20%	10.77%
Special Operations (SO)	10	7	35.00%	15.15%	30%	10.50%
Monitoring (M)	16	12	37.50%	24.24%	40%	15.00%
Average Previous Compliance Rating						46.97%
Environmentally Weighted Previous Compliance Rating						41.63%
Category	No. of Conditions Audited	Score	Compliance (Average)	Weight (Average)	Weight (Adjusted)	Weighted Score (%)
Administration (A)	10	14	70.00%	15.87%	10%	7.00%
Operations	35	40	57.14%	55.56%	50%	23.30%
General Operations (O)	24	33	68.75%	38.10%	20%	13.75%
Special Operations (SO)	11	7	31.82%	17.46%	30%	9.55%
Monitoring (M)	18	21	58.33%	28.57%	40%	23.33%
Average Current Compliance Rating						59.52%
Environmentally Weighted Current Compliance Rating (X)						53.63%

Botrivier Landfill site

Table 18: Botriver WDF summary

Information item ⁷	Facility Particulars
Position of site	Latitude: 34°13'16.09"S, Longitude:19°11'36.07"E
Type of operation	Landfill to be closed. There is currently an informal settlement on the site; the TWKM is in the process of relocating the settlement
Size	Approximately 18 500m ² (Note that a reservoir was constructed on the northern side of the site). This is almost three times the size of the footprint in the licence (6 300m ²)
Remaining life of site	None
Cover material available	No
Access control	No
Fenced	No
Buffer	No
Type of equipment	N/A
Facilities	N/A

⁷ Minimum requirements (DWAF, 1998)

Information item ⁷	Facility Particulars
Ablution facilities	N/A
Guardhouse	N/A
Storm water management	No
Record keeping	N/A
Signage	No
Recycling	No

Tesselaarsdal Drop-off Facility



Figure 14: Tesselaarsdal Drop-off

Table 19 Tesselaarsdal Drop-off

Information item ⁸	Facility Particulars
Position of site	Latitude: 34°21'58.92"S, Longitude:19°31'24.74"E
License to operate	N/A
Year issued	N/A
Classification of site	N/A
Life span	40 Years
Expected year of closure	N/A
Type of operation	Drop-off facility
Size	500 m2
Airspace available	N/A
Cover material available	N/A
Operated	Weekday's
Regulatory compliance	NA
Daily Cover	N/A
Access control	Yes
Buffer	Yes
Type of equipment	30 m ³ Roll on Roll off container

⁸ Minimum requirements (DWAF, 1998)

Information item ⁸	Facility Particulars
Ablution facilities	No
Guardhouse	No
Storm water management	No
Leachate management	N/A
Record keeping	Yes
Signage	Yes
Recycling	Informal, small scale

Airspace

As part of a Solid waste services project, Zutari followed the following methodology to try and fulfill the license requirements in term of airspace determination.

- ▶ Geophysical surveys of the five surveys were commissioned;
- ▶ Conceptual final landforms models were used to compare to the surveys to determine the remaining airspace. For the final landforms 1:3,5 side slopes were assumed with a minimum slope of 2% on the top portions of the landfills for the final landform models; and
- ▶ Drawings were developed to show conceptual final landform and estimated available airspace

The following should be noted regarding the “airspace survey”:

- ▶ The standard methodology for determining airspace is described above;
- ▶ For the airspace determination for the project the following information was lacking:
 - A final landform design for each site;
 - A previous survey of each site;
 - Accurate volumes disposed of.
- ▶ The airspace indicated is based on an assumed final landform and may vary drastically depending on the designed final landform.

Table 20: Airspace determination

Waste Disposal Facility	Design landfill volume (m ³)	Waste volume outside boundary (m ³)	Remaining airspace (m ³)
Genadendal WDF	26534,00	22637,00	3897,00
Greyton WDF	49983	785,00	49198,00
Villiersdorp WDF	11165	415,00	10750,00
Riviersonderend WDF	97256	5243,00	92013,00
Caledon WDF	26534	2993,00	23541,00

4.7.3 Status Quo of illegal dumping (Bulk cleansing)

Several areas on the outskirts of settlements have been identified as illegal dumping areas in the municipality. General waste, builder’s rubble and garden waste are waste types illegally dumped. TWKM removes illegally dumped waste as and when required at additional expense. This is a challenge where illegal dumping takes place as waste management services and cleaning up waste is costly and requires additional manpower.

Skips were placed at predetermined problem areas but removed after skips were set alight by communities. Reaction to interventions by the Municipality is handled differently by every community. It is recommended that the Municipality consider the implementation of the Department’s co-design methodology to aid the implementation of a working and sustainable waste solution.

4.7.4 Status Quo of Garden Waste and Builder's Rubble

Garden waste and building rubble are disposed of at the landfill sites or illegally in open fields. Table 21 is a summary of the activities.

Table 21 Status Quo of garden waste and builders rubble

Town	Garden waste	Builder's rubble
Botrivier	Garden waste is separated and stockpiled in Bulk container. The garden refuse is chipped and transported to Karwyderskraal compost site	Not accepted
Caledon	Disposed of separately on the landfill	Used as cover on landfill
Genadendal	Disposed of on the landfill	Disposed of on the landfill
Grabouw	Garden waste is separated and stockpiled. The garden refuse is chipped and transported to Karwyderskraal compost site	Disposed of at illegal dump outside Transfer facility
Greyton	Garden waste is separated and stockpiled. The garden refuse is chipped and transported to Karwyderskraal compost site	Disposed of on the landfill
Riviersonderend	Disposed of on the landfill	Disposed of on the landfill
Villiersdorp	Disposed of on the landfill	Disposed of on the landfill
Tesselaarsdal	Disposed in Bulk container and transported to Karwyderskraal landfill	Not accepted

4.8 Status of Waste Collection Services

Waste collection services are provided in all of the mentioned towns. Waste collection takes place once a week for households and once to three times a week for businesses. TWKM is ranked number 70 in South Africa for providing refuse removal services, see Table 22.

Table 22 Waste services within TWKM (StatsSA 2011)

Refuse Disposal	Percentage
Removed by local authority/private company at least once a week	79,5%
Removed by local authority/private company less often	3,1%
Communal refuse dump	2%
Own refuse dump	11,3%
No rubbish disposal	1,6%
Other	2,6%

4.8.1 Waste Removal

According to the IDP 100% of formal housing receives refuse removal services. The informal settlements in the various town each have their own challenges since each community is unique in what they will allow and require.

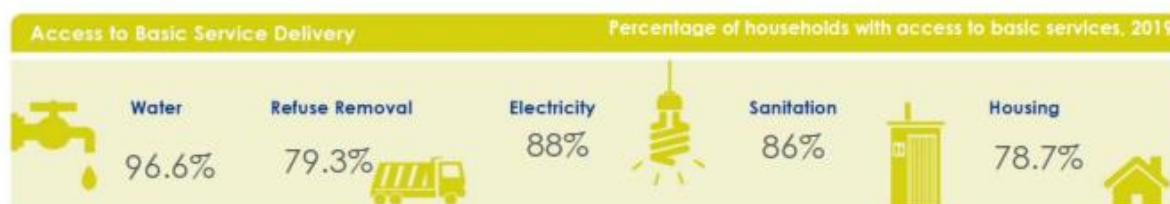


Figure 15: Collection areas within TWKM

The distances from towns to WDF indicated in Table 23.

Table 23 Distance between towns and Caledon

Collection area	WDF	Distance to WDF
Grabouw	Karwyderskraal WDF	35km
Villierdorp	Karwyderskraal WDF	55km
Genadendal	Genadendal WDF	4km
Greyton	Greton WDF	2km
Riviersonderend	Caledon WDF	52km
Botrivier	Karwyderskraal WDF	14km
Teslaarsdal	Karwyderskraal WDF	45km
	Caledon WDF	26km
Caledon	Caledon WDF	3km

4.9 Reporting on the Integrated Pollutant and Waste Information System (IPWIS)

The TWKM is reporting to the Western Cape Government, Integrated Pollutant and Waste Information System (IPWIS). The waste categories to be reported on are MSW, construction and demolition waste, garden waste and recycling for all the waste disposal facilities on a monthly basis.

4.10 Waste Management Financing

Finances relating the waste management is discussed below. The budget related items shown are for the 2020/2021 financial year.

4.10.1 Free basic services

Based on information received from the TWKM, 6 396 Indigent households receive free basic services. The total amount received from National Government to provide free basic services is R 17 026 278 whereas the total expenditure equates to R18 804 120. A breakdown of cost relating specifically to waste management was not provided.

4.10.2 Waste Management

The budget for waste management is split into the following components:

Table 24: Waste management cost centres

Cost Centre	Description
5510	Refuse Removal
5511	Refuse Sites
5512	Street Cleansing
5610	Refuse Removal (Head Office)
5611	Refuse Dumping (Head Office)
5612	Street Cleaning (Head office)

Table 25 Waste Management Budget

Budget	2020/21
Operating	R 17,043,893
Capital budget	R 16,775,436

4.10.3 Capital programmes and projects

The following capital projects will be implemented:

Table 26 Approved capital projects

Project description	Budget				
	2017/18	2018/19	2019/20	2020/21	2021/22
Caledon - Waste Transfer Station	R 4 356 152	R 7 604 813	R 7 150 778	R 5 016 536	R 4 782 609
Riviersonderend - Waste Drop-off station	R 131 579	R 3 859 191	R3 557 235	R 4,782,608	R 3 913 043
Ablution facilities disposal site				R 75,000	
Greyton waste drop off			R347 826	R 5,503,757	
Greyton waste drop off				R 1,631,462	

Table 27 Planned Capital Expenditure on projects 2022 to 2027

PROJECT	2022/23	2023/24	2024/25	2025/26	2026/27
Riviersonder and WTF Phase 3	R2,907,809				
Riviersonder and WTF Phase 4	R3,538,00				
Caledon WTF Entrance N2 Lane adjustment	R926,100				
Botrivier Drop Off Planning		R500,000	R3,500,000	R3,500,000	
Greyton Landfill Rehab		R3,000,000	R4,561,254	R3,000,000	R3,000,000
Villiersdorp Landfill Rehab		R4,000,000	R5,614,922	R4,000,000	R4,000,000
RSE Landfill Rehab			R1,000,000	R3,000,000	R3,000,000
Genadendal Landfill Rehab					R1,000,000
Caledon Landfill Rehab				R1,000,000.00	R3,000,000
Botrivier Landfill Rehab					R500,000
Refurbishment Villiersdorp WTF		R1,000,000	R4,000,000	R4,000,000	
Total	R7,371,909	R8,500,000	R18,676,176	R18,500,000	R14,500,000

4.10.4 Tariff Structure

Table 28 Waste management Fleet

Refuse Removal Tariff	2020/21 (excl. VAT)
Households (3 standard refuse bags per refuse unit)	R203.65
Flats/Town Houses (Wheelie bin system, 1 standard container per week)	R203.65

Refuse Removal Tariff	2020/21 (excl. VAT)
Businesses / Offices	
Catering Premises (per standard container for 3 removals per week)	R796.35
Non-catering Premises (per standard container for 2 removals per week)	R545.83
Hospitals (per standard container for 2 removals per week)	R545.83
Bulk Refuse	
One Removal	R2,193.04
Two Removals	R4,385.83
Three Removals	R6,578.78
Four Removals	R8,771.57
Five Removals	R10,964.43
Special Removals on weekdays	R2,778.09
Self-dumping: Transfer Stations/ Dumping Sites	
Residential Consumers (up to 1 ton)	Free of Charge
Vehicles up to 1 ton per request	R258.96
Vehicles up to 3 ton per request	R776.87
Vehicles up to 4 ton per request	R1,035.83
Non-Residential Consumers	
Vehicles up to 1 ton per request	R258.96
Vehicles up to 3 ton per request	R776.87
Vehicles up to 4 ton per request	R1,035.83
Other refuse removals (per month)	
Helderstroom Correctional Services	R128,944.52
Dennehof	R10,365.65
Eskom Grabouw	R9,521.30
Veterinary Services	
Veterinary Services per month	R545.74
Disposal of dead animal carcass	R219.22
House shop & Guesthouse/bed and breakfast tariff	R203.65

4.11 Organisational and Institutional Matters

The Waste Management Division falls under the Directorate Community Services. The appointed Waste Management Officer (WMO) as required in terms of NEWMA is Mr Hegans Marthinus. The WMO designated in terms of Section 10 (3) of NEMWA, is responsible for ensuring that the dedicated waste management staff and the services provided by these staff meet the requirements of the Policy and are compliant with the legislation of South Africa. The WMO is also responsible for the coordination of waste

management activities to ensure integration. It is the responsibility of all staff to adhere to all relevant legislation, including the IWM Policy, and this IWMP.

The Council of TWKM has the following organisational structure to effect and efficiently deliver services in line with the overarching Key Performance Areas and Strategic Objectives of the municipality. The current organogram and organisational structure is shown in Figure 16 to Figure 21.

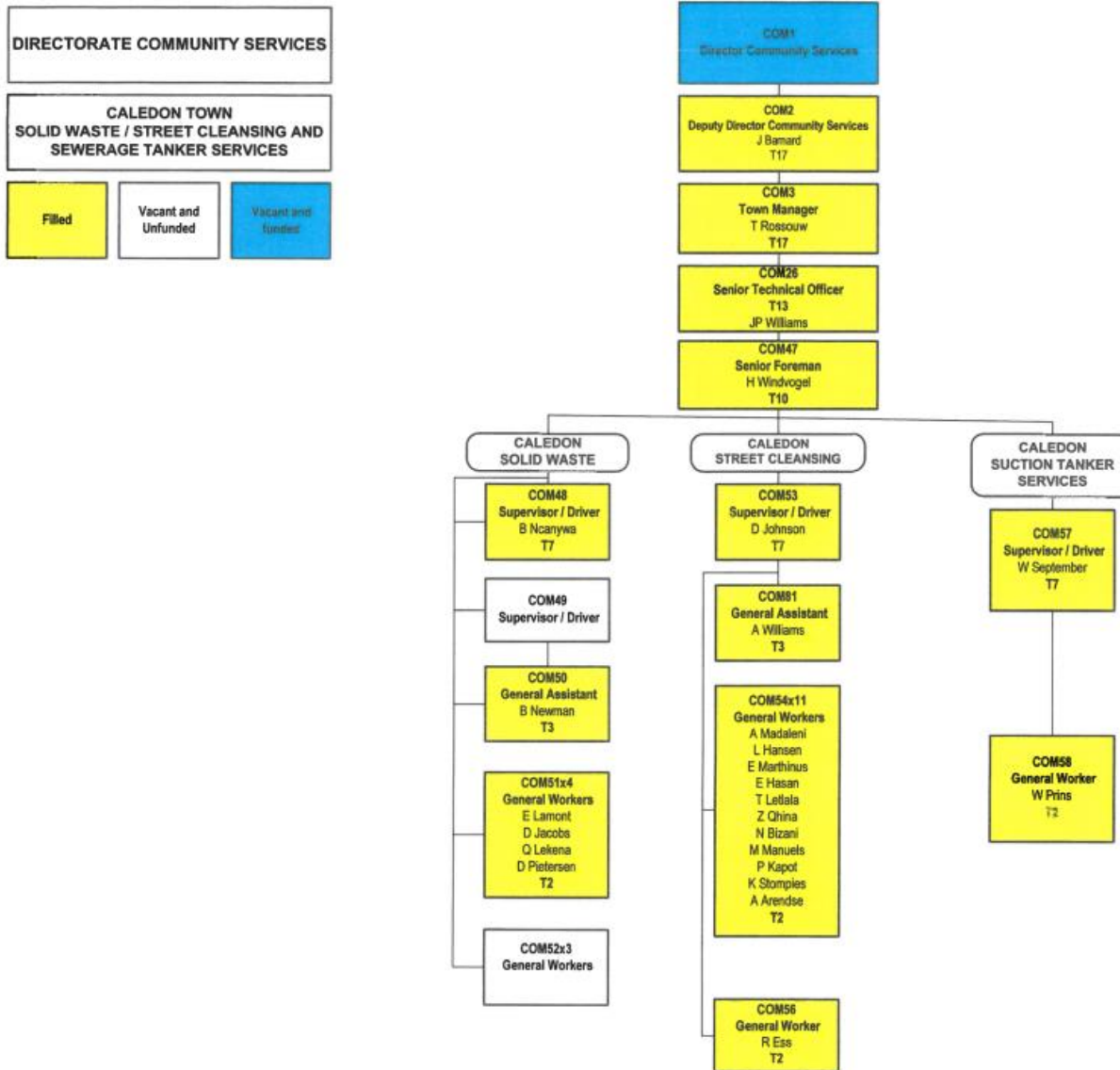


Figure 17: Caledon Town Organogram

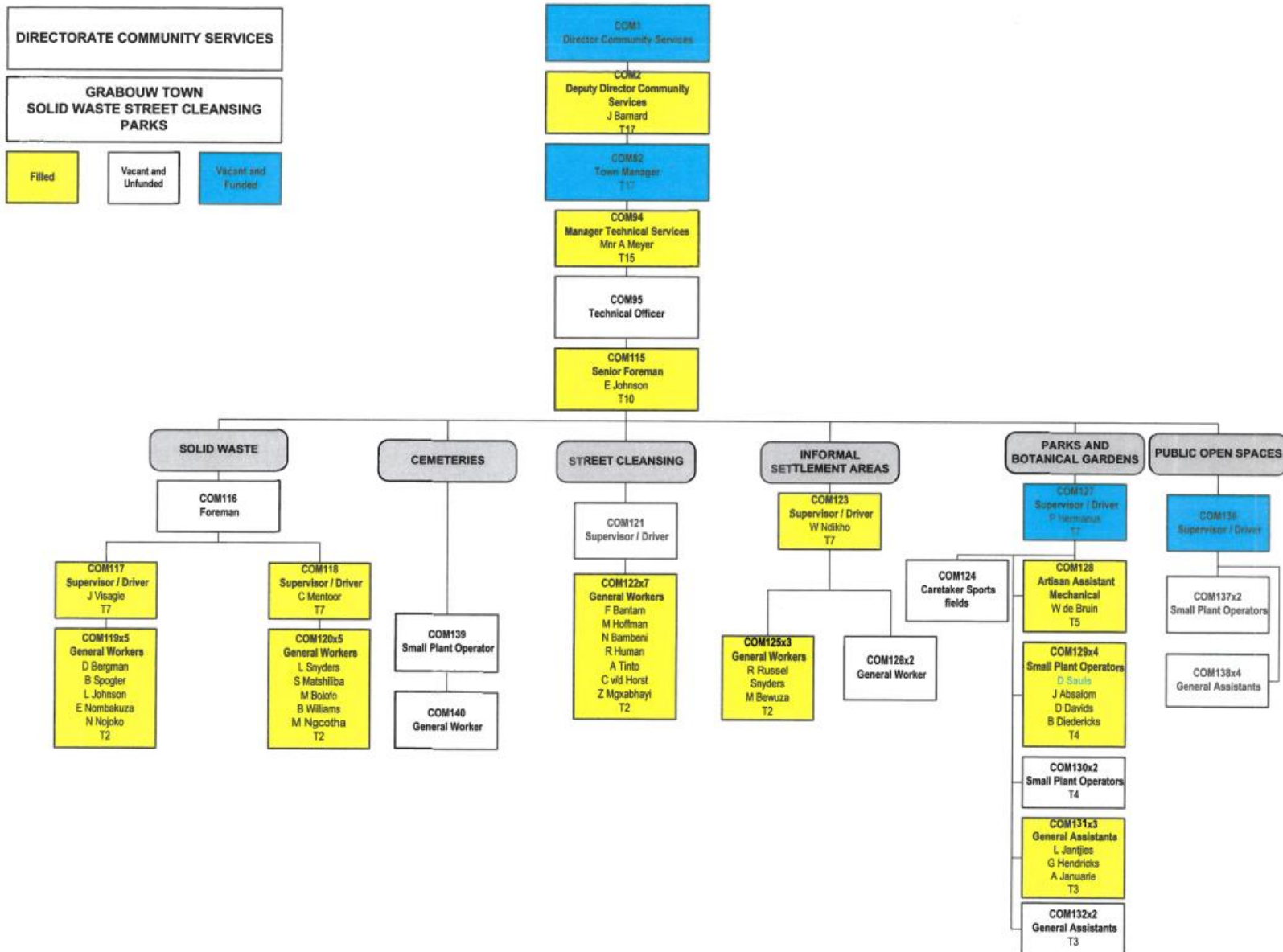


Figure 18: Grabouw Town Organogram

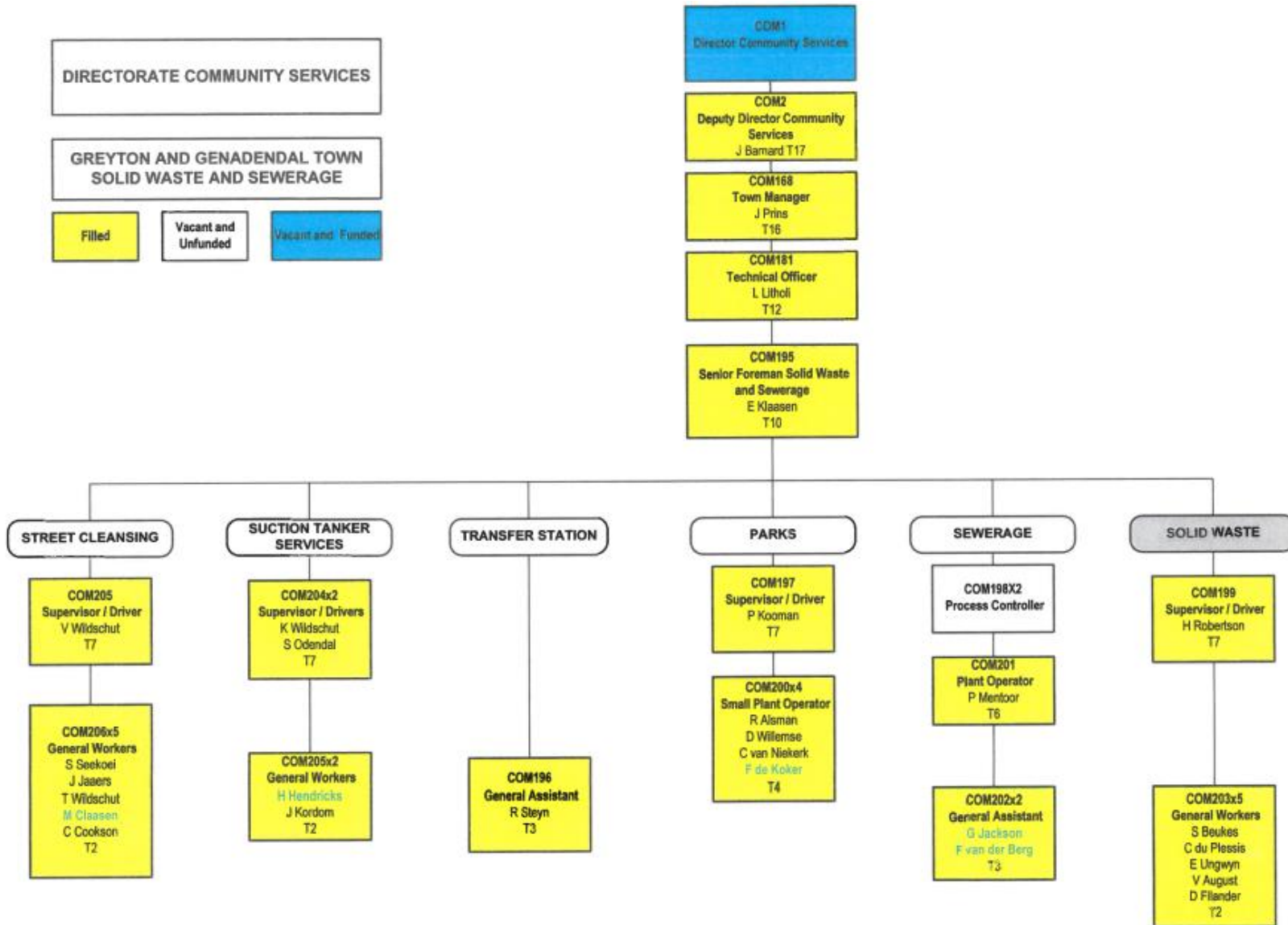


Figure 19: Greyton Town Organogram

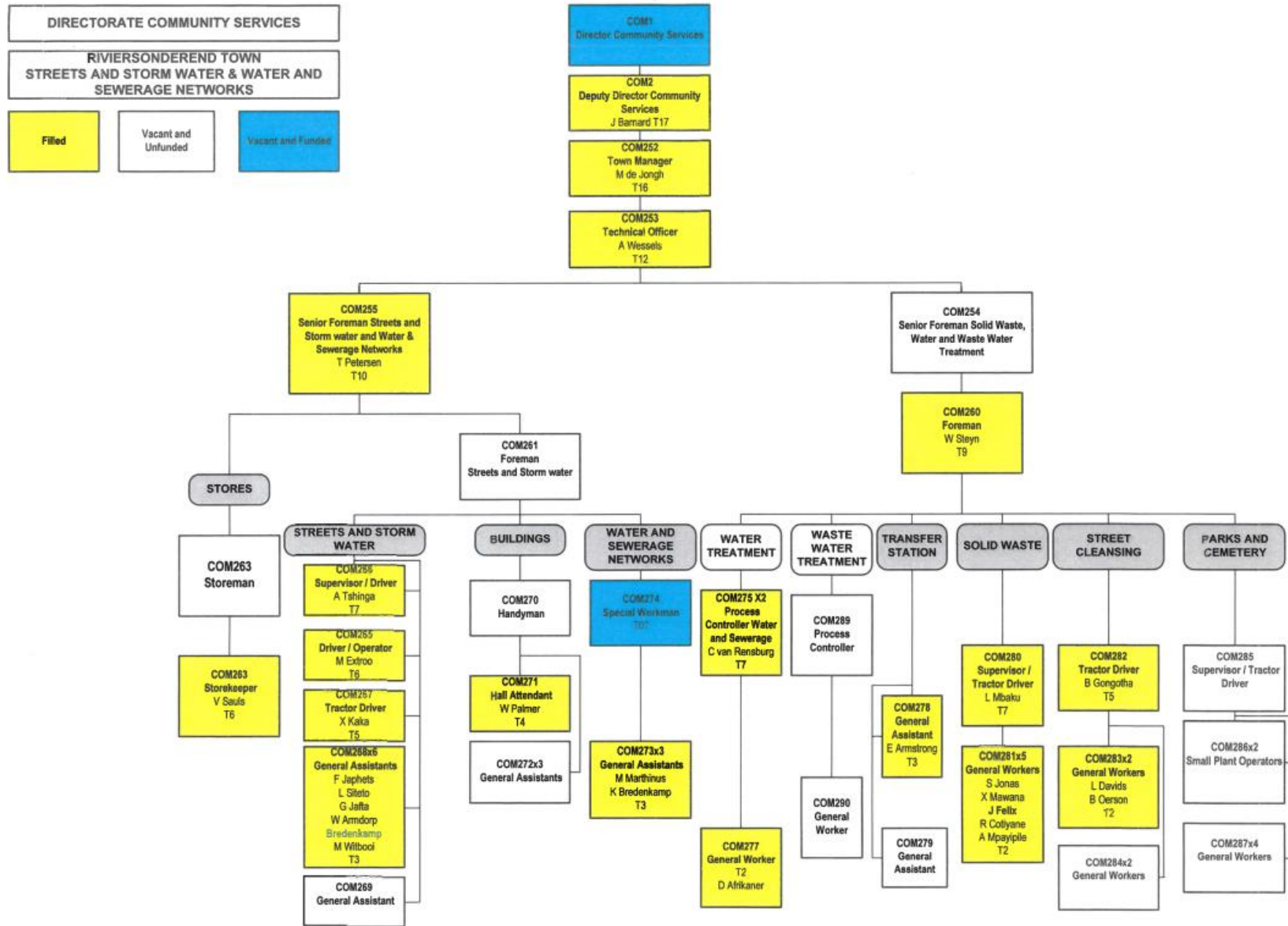


Figure 20: Riversnderend Town Organogram

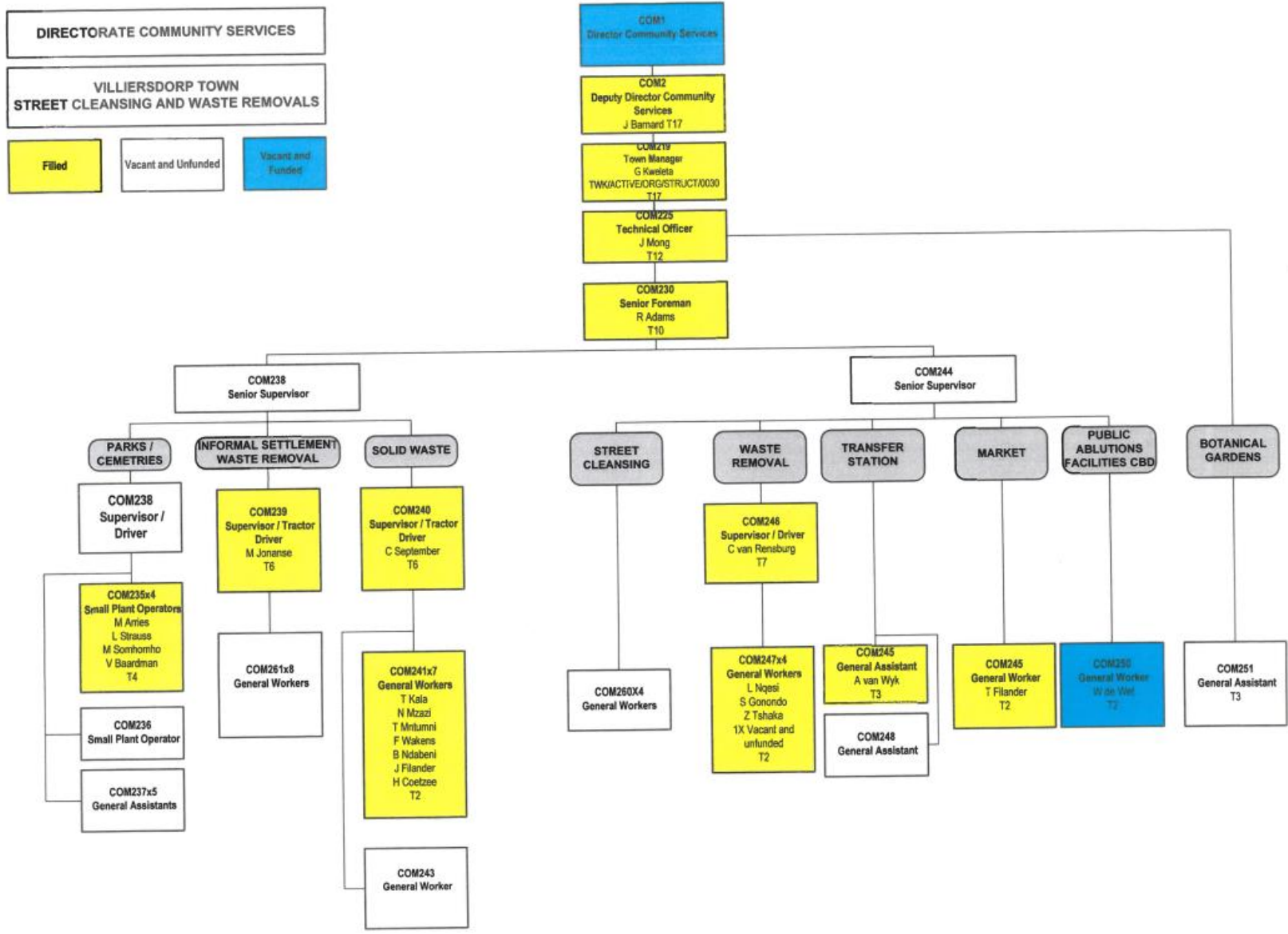


Figure 21: Villiersdorp Town Organogram

4.12 Equipment

4.12.1 Fleet used for refuse collection

TWKM has several Rear End Loading Mobile compactors (RELMs) and one “Cage truck” collecting waste in the various towns. The vehicles are rotated when breakdowns occur. See Table 29 for the condition of the fleet.

The condition of vehicles is based on information provided by the TWKM and no mechanical assessment was done to confirm.

From the information provided, seven of the nine vehicles are older than 10 years, of which two are over 20 years old and one 19 years old. The replacement age of a collection vehicle is typically 7 years.

Shown below is some of the collection equipment currently being used by TWKM.



Figure 22: 19m³ REL used in Caledon



Figure 23: Cage truck used in Botrivier



Figure 24: Tractor & Trailer and flatbed truck used in Genadendal and Greyton



Figure 25: 12m3 REL used in Villiersdorp

Table 29 Waste management Fleet

Registration no.	Make / Model	Type	Year model	Age	Current condition of the vehicle	Vehicle waste collection capacity (m ³)	Current Odometer reading (kms)	Collection areas	No. of days in use per week	No. of loads /trips per day when vehicle is in use
CAM 14034	Isuzu F-Series	Compactor (REL)	2018	3	Good/Fair	12m ³	72149	Caledon, Botrivier, Middleton, Tesselaarsdal, Lebanon	6	3
CAM 5554	Hino F-Series	Compactor (REL)	1999	22	Good/Fair	12m ³	103158	Caledon, Botrivier, Middleton	6	3
CAM 13077	Nissan UD80	Compactor (REL)	2002	19	Good/Fair	15m ³	201906	Grabouw	6	2
CAM 25570	Nissan UD90	Compactor (REL)	2016	5	Good/Fair	12m ³	60793	Grabouw	6	3
CEO 3914	Nissan A 520	Compactor (REL)	2000	21	Poor	15m ³	173249	Grabouw	6	2
CAM 22148	Nissan UD40	Tipper (Caged)	2009	12	Good/Fair	4.3m ³	162736	Genadendal, Greyton Bereaville V, Kraal B Kloof heuwelkroon	Defect on vehicle engine - struggle to get new engine	5
CAM 16878	Fuso FK/FM	Compactor (REL)	2010	11	Good/Fair	12m ³	125826	Riviersonderend	5	2
CAM 11874	Nissan UD80	Compactor (REL)	2009	12	Good/Fair	12m ³	165927	Villiersdorp	6	3
	Tractor & trailer and flatbed truck							Genadendal and Greyon		

4.13 Other Waste Management Systems and Practices

4.13.1 Existing waste avoidance in Theewaterskloof

Based on current observations there are limited waste avoidance drives in the TWKM.

4.13.2 Waste minimisation strategies

A Waste Minimisation Strategy (WMS) has been developed and will form an integral part of this IWMP.

4.13.3 Waste Reduction

This is included in the WMS.

4.13.4 Composting

The Grabouw composting unit is the only formal composting activity currently undertaken by the TWKM. At Botrivier and Greyton Drop Off as well as Grabouw Transfer station the green waste is chipped and transported to the Karwyderskraal composting site. The chipping of green waste will be implemented at the other facilities as well.

4.13.5 Alternative waste treatment initiatives

There are currently no alternative waste treatment initiatives planned by the TWKM.

4.13.6 Public cleansing

Public cleansing involves the cleansing of streets (gutters and kerbs) and open spaces (government and municipal property). The function is currently the responsibility of Community Services Department. In general, most of the areas falling under the TWKM are kept neat and tidy. The informal settlements are a challenge where waste is dumped in open spaces and on the edges of the informal settlements. This is cleaned by TWKM.

4.13.7 Awareness and education

Education and public awareness was done at ten (10) schools in Theewaterskloof area. Continued awareness is done by recyclers appointed by the municipality.

4.13.8 Private initiatives

There are private initiatives in Greyton, Genadendal and Botrivier which are successfully collecting and recycling waste from the community.

Greyton Transition Town : Waste. Swop Shops. GTT has opened four swop shops, in local communities. High end waste is sourced from retailers local to the swop shops. Over 700 kgs of recyclable waste is collected every week from the Genadendal swop shop alone. This is swapped at an on-site shop for essentials such as clothing, blankets, food and stationery bringing these goods to those who need them the most. The environment local to the swop shops is significantly cleaner and the local recycling entrepreneur now has a greater volume of waste, so his business is more viable.

Botrivier: Lucky Point has initiated a recycling programme for the community. Community needs have been identified and educated on the benefits the project brings, whether it is recycling paper, bottles, tin cans, batteries et cetera in exchange for points. Their reward points can be converted into clothes, food, toiletries, bicycles, sports goods and more. Most of the items in the Point Shop are provided by donors in Switzerland, who send containers full of donated goods regularly.

5 Gap Analysis and needs assessment

5.1 Background

The objective of this section of the document is to identify the issues, concerns, gaps and needs which have to be addressed by the IWMP. This will provide a guideline for service provision mechanisms and an Implementation Strategy. The objectives of the of the following are considered:

- ▶ The National Environmental Management Waste Act, Act 59 of 2008.
- ▶ National Waste Management Strategy (Copied from the NWMS 2020).
 - Significant strategic shifts from the 2011 strategy made in the NWMS 2020 includes:
 - Addressing the role of vulnerable groups, waste pickers and the informal sector and supporting women, youth and people living with disabilities in the circular economy;
 - Promoting approaches to the design of products and packaging that reduce waste or encourage reuse, repair and preparation for recycling, support markets for source separated recyclables;
 - Investigating potential regulatory or economic interventions to increase participation rates in residential separation at source programmes;
 - Investing the economies associated with transporting of recyclables to waste processing facilities;
 - Addressing the skills gap within the sector with a special focus on women, youth and people living with disabilities;
 - Engagement with the National Treasury regarding the operational expenditures for municipalities associated with implementing the NWMS and the Waste Act.
 - The three pillars of the NWS towards Zero waste in landfills are as follows:
 - Cleaner communities;
 - Well managed and financially stable waste services; and
 - A culture of zero tolerance of pollution, littering and illegal dumping.
- ▶ The principles listed in the NEMA.
- ▶ The first-generation Western Cape Provincial IWMP (WCIWMP) was revised in 2017 (2017-2022). The WCIWMP is centred around four (4) goals and 14 strategic objectives as shown in Table 30.

Table 30: WCIWMP goals and strategic objectives

Goals	Strategic Objectives
Goal 1. Strengthen education capacity and advocacy towards integrated waste management.	<ul style="list-style-type: none"> ▶ Facilitate consumer and industry responsibility in integrated waste management. ▶ Promote and ensure awareness and education of integrated waste management. ▶ Build and strengthen waste management capacity.
Goal 2. Improved integrated waste management planning and implementation for efficient waste services and infrastructure.	<ul style="list-style-type: none"> ▶ Facilitate municipal waste management planning. ▶ Promote industry waste management planning. ▶ Promote the establishment of integrated waste management infrastructure and services; and ▶ Ensure effective and efficient waste information management.

Goal 3. Effective and Efficient utilisation of resources.	<ul style="list-style-type: none"> ▶ Minimise the consumption of natural resources. ▶ Stimulate job creation within the waste economy. ▶ Increase waste diversion through re-use, recovery and recycling.
Goal 4. Improved compliance with environmental regulatory framework.	<ul style="list-style-type: none"> ▶ Strengthen compliance monitoring and enforcement. ▶ Remediate and rehabilitate contaminated land. ▶ Facilitate the development of waste policy instruments. ▶ Promote self/co-regularly measures.

The information in the above documents was used together with the priority issues identified, to determine baseline objectives and / or targets to measure the Gaps and Needs.

Table 31 below indicates the Objectives / Targets, Gap Analysis and Needs Assessment relating to waste management within the various areas.

Table 31: Gap Analysis and Needs Assessment.

Area	Objectives / Targets	Gap Analysis	Needs Assessment
Strategic	Key interventions and outcomes from NWMS 2020		
	Prevent waste, and where waste cannot be prevented ensure - 40% of waste from diverted from landfill within 5 years; 55% within 10 years; and at least 70% within 15 years leading to Zero-Waste going to landfill.	Targets set by the TWKM were lower than the NWS, following provincial guideline as a minimum. TWKM needs to increase the targets set.	<ul style="list-style-type: none"> ▶ Avoiding and minimising the generation of waste ▶ Reducing, re-using, recycling and recovering waste ▶ Treating and safely disposing of waste as a last resort ▶ Preventing pollution and ecological degradation ▶ Securing ecologically sustainable development while promoting justifiable economic and social development
	All South Africans live in clean communities with waste services that are well managed and financially sustainable.	The needs of individual communities need to be better understood and system implemented accordingly. Some communities do not want to comply with municipal initiatives.	Closer interaction with local communities that have specific requirements regarding waste related issues.
	Mainstreaming of waste awareness and a culture of compliance resulting in zero tolerance of pollution, litter and illegal dumping.	Limited waste awareness campaigns. Lack of a proper budget, action plan and personnel to drive the education and awareness process fulltime.	Formal waste awareness and training on NWMS needs to be implemented. Co-operation with local NGOs should be considered. A proper action plan with an associated budget as well as dedicated persons to drive the public education and awareness campaigns, are required.
Relevant waste management by-laws		The waste management By-Laws has been Gazetted six years ago.	Although very comprehensive, the Waste Management By-Laws should be reviewed once this IWMP has been finalized to ensure integration with IWMP and NWMS.
General	Render a sustainable, equitable and cost-effective refuse removal service to all domestic and business premises in TWKM area.	Personnel to assist with roles and tasks as set out in the waste management section structure.	Ensure that recruitment procedures are followed when interviewing new candidates. Staff employed should have all the relevant qualifications required. Criteria and job descriptions to be reviewed.
	Improve refuse collection in informal settlements.	Lack of service and or sustainable initiatives.	Detail evaluation of existing waste collection relating to the proposed collection system in the informal areas. Alternative collection systems and methodologies to be investigated.

Area	Objectives / Targets	Gap Analysis	Needs Assessment
	Promote separation of waste at source, i.e. at the point of generation (commencing with recycling and composting projects)	In process to appoint Recycler to continue separation at source.	Education on separation at source should be included in the public education and awareness campaigns described above. Educate the private sector to assist or get involved with the municipality on projects of this nature. Start with a pilot project to establish feasibility and co-operation. Can consider separating dry and wet waste as a first step
	Assist and encourage the development of buy-back centers, recycling sorting centers following separation at source. Provide for public recycling drop-off facilities such as at shopping centers, landfills, etc.	TWKM are in process of completing Caledon and RSE Material Recovery Facility. Once completed this will form part of the appointed recyclers Scope of Work.	A formal partnership with recycling companies will be established after completion of the MRF's.
	Implement a Waste Information System (WIS) based on accurate tonnages	Waste related information is kept in format provided by DEA&DP (Waste calculator). After Caledon and RSE facilities are completed, weighbridges will be used. All waste going to Karwyderskraal Regional Landfill site is weighed on the weighbridge.	Implement a coordinated WIS. Require accurate information concerning waste collection i.e. number of service points and landfill data i.e. weighbridge data. Development of the WIS can be based on the short-, medium- and long-term needs of the TWKM as well as requirements from national and provincial government. Implementation of a waste licensing system is required by legislation. Integration of the WIS and licensing system should be considered. Accurate tons are only recorder for waste going to Karwyderskraal. Recording of tonnages to be done once infrastructure is in place.
	Decrease the volume of illegal dumping.	A lack of proper public dumping/disposal facilities throughout the TWKM.	Implement formal public dumping/disposal facilities for residents to dispose of various waste types. The planned and already constructed transfer facilities should incorporate public dumping areas/facilities.
	To have all the vacant posts staffed in the waste management section.	There are a number of posts that have never been staffed.	Staff all the vacant posts to ensure the effective management and operation of the waste management section.
	Manage Industrial waste	Little to no information regarding industrial waste being generated within the TWKM	Conduct a survey to determine the extent of industrial waste being generated within the TWKM and update IWMP accordingly

Area	Objectives / Targets	Gap Analysis	Needs Assessment
Landfill (general) Site	Proper operation and maintenance of the landfill site in line with license requirements.	Most of the landfills are understaffed and do not meet general operating requirements. Caledon landfill is the only landfill where operation is managed although contaminated water management is lacking.	Training of personnel responsible for the day-to-day operation of the landfill site.
	Proper rehabilitation and closure of landfills.	The IDP does not reflect the anticipated closure cost for the landfill due for closure in the next number of years.	The IDP need to be adjusted to the closure provisions since a number of landfills are due for closure in the next few years
Caledon landfill	Operate towards final landform and ensure landfill compliance.	The Caledon landfill is not operated with a view to closure. Contaminated water management system is lacking.	Operate the landfill in a such a manner that the final landform is achieved before final closure. Until then a adequate contaminated water management system needs to be implemented.
Villiersdorp	Ensure compliance to the landfill and transfer station license.	The transfer station needs to be repaired asap. The landfill closure needs to commence in line with the planned greens facility.	Ensure compliance to the WDF license i.e. budget for repair of transfer station as well as 24 hour security to ensure that the facility is not vandalized and can remain operational. The landfill portion needs to be rehabilitated and closed according to the license conditions and the greens facility needs to be developed.
Botrivier	Transfer facility for Botrivier	Landfill not operational anymore and Public Drop Off facility still in planning phase	The Botrivier Drop Off Public Participation process was concluded. The next step would be to commence the planning/design for the facility in order to commence implementation after the relocation of New France has taken place.
Collection	Reliable collection system for domestic and commercial service points.	Lack of sufficient back-up collection units as well as sufficient personnel to assist with collection. No equipment replacement policy or adequate budget for the provision of new collection equipment. Most of the collection fleet is past their operational life. Typically RELs needs to be replaced every seven years.	Implement a vehicle replacement policy for waste collection equipment and allow for adequate budget in the IDP. Investigate alternative collection methods for areas with access problems. Consider outsourcing of current un-serviced areas and /or informal settlements. Consider outsourcing to local community by dividing informal areas into smaller serviceable areas that can be serviced by a team with a small LDV (bakkie) for disposal at the landfills or transfer facilities.

Area	Objectives / Targets	Gap Analysis	Needs Assessment
Street cleaning	Comprehensive street cleaning service.	Informal areas dump waste on boundaries of informal settlements.	<p>Implement local contracting to solve lack of waste collection. Local contractor can be made responsible for street cleaning in his area as well.</p> <p>Workshop proposed system with relevant communities to ensure buy-in.</p> <p>Public education program with the implementation of a new system to ensure community understand the suggested system.</p>
Waste Minimisation Strategy (WMS)	Implement Waste Minimisation strategy.	The WMS is newly developed and not yet adopted and implemented.	Adopt and implement WMS.
	Establish buy-back centres	No formal buyback centres established by TWKM.	Implement buy-back centres in collaboration with NGOs and other community-based initiatives.
Organic Waste Diversion	Implement Organic Waste Diversion Plan (OWDP)	The OWDP is newly developed and not yet adopted and implemented.	Adopt, and implement OWDP.
Illegal dumping	Eradicate illegal dumping	<p>There is inadequate public waste dumping/disposal facilities in some of the areas.</p> <p>Lack of enforcement of by-laws and legislation.</p> <p>Lack of formalised service to the informal areas in particular is creating illegal dumping in those areas.</p>	<p>Implement adequate public dumping/disposal facilities for residents to dispose of various waste types. Conduct a proper investigation into the need for such facilities. Determine best locations for such facilities.</p> <p>Public educations and enforcement By-laws.</p> <p>Consider the implementation of the Department's co-design methodology to aid the implementation of a working and sustainable waste solution.</p>

5.2 Summary of needs

The needs identified can be summarised as follows:

5.2.1 Service provision

- ▶ Adequate equipment and personnel is required to render an effective service to the communities;
- ▶ Education and awareness campaigns need to be implemented throughout the area. General waste awareness, management and recycling should be key focus areas.

5.2.2 Equipment

- ▶ New Mobile Compactor Units are required due to extreme age of collection fleet;
- ▶ A replacement policy needs to be developed;
- ▶ Adequate budget allocation for new collection fleet required;
- ▶ A proper assessment to determine the optimum collection fleet required; and
- ▶ Proper equipment is required to operate Solid Waste Facilities (Loaders for transfer facilities).

5.2.3 Personnel

- ▶ Sufficient personnel for all waste facilities is critical for the efficient operation of the facilities;
- ▶ Training for all personnel is also important; and
- ▶ There is a need for sufficient street sweepers in all areas. An in-depth assessment of street sweeping requirements is required.

5.2.4 Landfills and other WDFs

- ▶ Landfill and other WDFs need to comply to licence condition, especially where there is a risk of environmental contamination by WDFs;
- ▶ The Villiersdorp WDF needs to be repaired and 24 hour security implemented;
- ▶ The Botrivier Drop Off Public Participation process was concluded. The next step would be to commence the planning/ design for the facility in order to commence implementation after the relocation of New France has taken place;
- ▶ The N2 lane adjustment to provide safe access to Caledon WTF and MRF needs to be completed 2022/23 financial year;
- ▶ Final phase of the Riviersonderend WTF and MRF must be completed in 2022/23 financial year; and
- ▶ Rehabilitation of Riviersonderend, Caledon, Greyton, Genadendal, Botrivier and Villiersdorp landfill site must commence.

5.2.5 Street Cleaning/Sweeping

There is a need for proper street cleaning/sweeping services in all the areas (informal areas to be included). Consider community-based contracts for informal areas.

5.2.6 Waste Minimisation and Recycling

Implement WMP and OWDP.

5.2.7 Illegal Dumping

The illegal dumping of waste is a priority and needs to be addressed as part of community educations and community-based campaigns and contracts for waste collection. The National DEA ran a project (Clean Green Project) that assisted with this capacity but came to an end 2021.

5.2.8 Industrial Waste

An industrial waste survey needs to be conducted to determine the volumes and types of industrial waste generated in the area. The methods of disposal also need to be recorded. This information should be incorporated into the waste information system.

5.2.9 Waste Management By-laws

Review Waste Management By-laws and update where required to incorporate NWS.

6 Goals and Objectives

Goals and Objectives have to be developed to ensure that an environmentally and socially acceptable service based on a certain standard and legislative requirements, is rendered at a reasonable price to the communities within the TWKM.

Priority issues were identified in the Status Quo report, as well as the above Gap Analysis and Needs assessment. An implementation mechanism needs to be developed that will set clear goals to ensure that the issues identified are addressed. Objectives have to be identified in order to ensure the goals are achieved in time. Objectives must be in line with applicable legislation, environmental systems and principles, best practice, etc., that have been adopted nationally and internationally.

Baseline Goals and Objectives are listed below. These Goals and Objectives were made available to the stakeholders for their comment and input.

6.1 Goals identified

The following Goals pertaining to waste management within the TWKM were identified:

- ▶ Strategic
 - Key interventions and outcomes from NWMS 2020.
 - Relevant and up to date Waste Management By-Laws.
- ▶ General
 - Render a sustainable, equitable and cost-effective refuse removal service to all domestic and business premises in TWKM area.
 - Improve refuse collection in informal settlements.
 - Promote separation of waste at source, i.e. at the point of generation (commencing with recycling and composting projects).
 - Assist and encourage the development of buy-back centres, recycling sorting centres following separation at source. Provide for public recycling drop-off facilities such as at shopping centres, landfills, etc.
 - Manage Industrial waste.
- ▶ Landfill site and WDFs
 - Ensure that all WDF meets license requirements and have sufficient security.
 - Rehabilitation of landfill sites to commence.
- ▶ Public awareness
 - Community involvement, awareness and education programmes concerning recycling, separation at source and waste management in general.
- ▶ Waste minimisation and recycling
 - Implement OWDP and WMP.
- ▶ Service provision (Collection)
 - ▶ Domestic collection
 - Rendering a sustainable, affordable, reliable and effective collection service to all residential areas within the TWKM.
 - ▶ Commercial collection

- To render a sustainable cost-effective commercial refuse removal service in formal areas as per the required frequency. To further ensure the standardisation of commercial containers and adequate storage space at the service point.
- ▶ Public dumping facilities / garden sites.
 - To investigate the feasibility of public dumping facilities to provide an additional facility for the community to primarily take their garden waste and uncollected domestic waste to and as a method of reducing illegal dumping, collection time and transport cost.
- ▶ Equipment
 - Vehicle replacement policy and allocation of budget to implement policy.
- ▶ Street sweeping
 - To implement a proper, adequately staffed street cleaning service in all business areas, decentralised business areas and along all major routes at the various towns within the TWKM area.
 - To place an adequate number of litter bins within business areas and high use areas throughout the TWKM which are serviced on a regular basis.
- ▶ Personnel
 - Have adequate, medically fit, well-trained personnel to cover the range of tasks required to deliver a total waste management service to the communities. All management and supervisory positions to be filled.
- ▶ Industrial and Health Care Risk Waste
 - To ensure the safe handling and disposal of Industrial (non-hazardous and hazardous) waste and HCRW generated or handled within the municipal area.
- ▶ Finances / income / revenue
 - Have council committed to the IWMP, to ensure that the correct budgeting takes place and that the appropriate revenue collections systems are in place.

6.2 Discussion on Goals and objectives

6.2.1 Governance

Integrated Waste Management Plan

Goal

To have an Integrated Waste Management Plan in place that will assist the TWKM with future planning of waste related activities within the municipality to ensure an integrated approach is followed with regards to the implementation of solid waste services.

Objectives

In order to reach the above goal, the following objectives for the IWMP are set:

- ▶ The 2021 baseline conditions must be clearly stated i.e. the Status Quo needs to be factual;
- ▶ The gaps and needs must be identified;
- ▶ Achievable goals and objectives must be identified;
- ▶ Establish sustainable and fit-for-purpose solutions / option;
- ▶ Programmes and budgets must be developed in order to meet the goals and objectives; and
- ▶ Five yearly review of the plan including the baseline (status quo).

6.2.2 Up to date Waste Management By-Laws and licensing system

Goal

To have relevant and up-to-date Waste By-Laws in place and to ensure the implementation of a formal licensing system.

Objectives

- To ensure that the By-laws is not in conflict with any current legislation;
- ▶ To ensure that the By-laws support the outcomes and implementation strategy from the Integrated Waste Management Plan;
- ▶ To have an adequate waste information system to support the actions required in Waste By-laws.
- ▶ To implement an appropriate licensing system with the associated support systems and personnel. This will be applicable to the licensing of the collection of commercial waste by private contractors and to keep track of hazardous, industrial and Health Care Risk Waste;
- ▶ Requirements, which form part of the licensing aspect to be indicated. This could include what information is required of the licensee for input into the Waste Information System;
- ▶ Development of standards for the licensees; and
- ▶ Aspects on waste minimisation, recycling and separation at source should be included in the By-laws.

6.2.3 Implementation of a waste information system (WIS)

Goal

To have a waste information system that will assist in future planning of waste management and allow for quick and easy access to information not limited to but including aspects such as number of service points per area, population densities, equipment available, reliability of equipment, personnel involved in various aspects, volumes of waste from areas, volumes of waste disposed of at the landfills and auditing information on the landfills.

Objectives

- ▶ To develop a WIS linked to a database. This system should be easy to use and maintain;
- ▶ The WIS must contain operational information as well as financial information;
- ▶ Appoint and train personnel to collect the information required and to operate and to maintain the system;
- ▶ Undertake a survey to identify hazardous, industrial and Health Care Risk Waste generators and put in place a monitoring system to ensure that they deal with their specific waste type in an appropriate manner. Also include major agricultural waste generators;
- ▶ All information relating to waste types such as domestic, commercial, industrial, hazardous and health care waste should be recorded and updated on a regular basis;
- ▶ The system must be linked to all the departments that provide input to the Waste Management Section i.e. Financial Dept., Transport Dept, Human Resources Dept, etc.; and
- ▶ The WIS should be aligned to the South African Waste Information System (SAWIS) but should provide more detail than currently required by the SAWIS.

6.2.4 Public awareness

Community involvement, awareness and education programmes concerning recycling, separation at source and waste management in general.

Goal

Develop, promote, introduce involve and educate the communities and general public regarding waste related issues such as separation at source, waste minimisation, recycling and getting the people involved in waste management issues.

Objectives

- ▶ Develop a strategy that will encourage community participation in waste related issues such as separation at source, waste minimisation, and recycling. The strategy will have to be phased since aspects such as waste collection in the informal areas first have to be addressed before separation at source can be introduced in these areas;
- ▶ The strategy will allow for a number of tiers of programmes to accommodate the various communities' needs and insure appropriate mechanism for communicating the message;
- ▶ Appoint a person/s that will be responsible for the development, promotion, driving and education aspects of this strategy;
- ▶ Training and awareness on environmental issues need to developed or sourced from existing programmes;
- ▶ Make the communities aware of the negative impact of illegal dumping and provide them with adequate facilities or services to reduce the need for illegal dumping;
- ▶ Establish community based environmental programmes that involve the community in awareness and clean-up campaigns;
- ▶ Develop anti-litter campaigns and have a suitable litter system in place; and
- ▶ Join forces with NGOs currently active within the TWKM.

6.2.5 Waste minimisation and recycling

One of the strategic pillars of the NWMS is linked closely to Public Awareness since re-use, recycling and recovery should commence at the source of generation

Goal

Implement achievable, sustainable and feasible waste minimisation and recycling programmes and initiatives.

Objectives

- ▶ To establish buyback centres at strategic locations, where possible have formal partnership with NGOs and/or others for the establishment of centres;
- ▶ Development and implementation of formal recycling programmes. High recyclable generation areas such as the commercial sector and medium to high income areas should be targeted in the short-term;
- ▶ Develop and support community based environmental, waste minimisation and recycling initiatives; and
- ▶ Appoint a person/s that will be responsible for the development, promotion, driving and management aspects of this strategy with where possible involvement with NGOs and other community initiatives.

6.2.6 Service provision (Collection)

Domestic collection

Goal

To render a sustainable, affordable, reliable and effective residential collection services.

Objectives

- ▶ Round balancing needs to be done on collection routes to optimise the routes and to ensure effective utilisation of resources;
- ▶ Separation at source projects to be initiated. Collection systems to be to be flexible to accommodate separation at source;
- ▶ Obtain additional collection unit as backup to existing collection units;
- ▶ Waste receptacles should be provided to households in informal areas and a system of collection should be investigated, and
- ▶ Improve refuse collection in informal settlements.

6.2.7 Commercial collection

Goal

To render a sustainable cost-effective commercial refuse removal service in formal areas as per the required frequency. To further ensure the standardisation of commercial containers and adequate storage space at the service point.

Objectives

- ▶ The implementation of a reliable service i.e. to service each service point as per the number of times paid for per week.
- ▶ Inputs from the WMS into building and development plans to ensure that adequate allowance has been made for waste storage areas.
- ▶ Incentives for recycling at source such as reduced rates should be considered for commercial service points. The feasibility of such an option should be investigated.

6.2.8 Equipment

Goal

There should be serviceable collection equipment as well as sufficient back-up collection equipment at all times.

Objectives

- ▶ Ensure that waste collection equipment is replaced in cycles of a maximum of 7 years;
- ▶ Collection equipment should be serviceable at all times, full maintenance leasing or service plans should be included in procurement of equipment;
- ▶ Ensure that there is adequate spare capacity for any type of collection unit or systems (additional equipment that can be on standby) as well as reliable backup service from leasing company. Reliable back-up service will result in less down time and overtime;
- ▶ The appropriate waste handling unit should be investigated for any new service; and
- ▶ The possibility of outsourcing the operations at WDFs should be investigated.

6.2.9 Street cleaning/Sweeping

Goal

To implement a proper, adequately staffed street cleaning service in all business areas, decentralised business areas and along all major routes at the various towns within the TWKM area.

To place an adequate number of litter bins within business areas and high use areas throughout the TWKM which is serviced on a regular basis.

Objectives

- ▶ To implement a regular reliable street sweeping service in all business areas decentralised business areas and major access routes within the municipality. Adequate permanent staffing will be required for each area. A survey should be done of each area to determine the total area to be covered and the personnel required;
- ▶ Acquire an adequate number of street bins for each business area and high use area within the municipality. A survey should be done of all these areas within the municipality to determine the need and if required the number of street bins for each area;
- ▶ The method of servicing these bins and the time and cost implication should also be investigated. Recommendation should be made on the implementation of the service and possible financial social and environmental impacts; and
- ▶ Equipment dedicated to the street cleaning service should be sourced. This will make collection equipment available and assist with the transport of the street sweeping personnel.

6.2.10 Industrial, Hazardous and Health Care Risk Waste

Goals

To ensure the safe handling and disposal of Industrial (non-hazardous and hazardous) waste and Health Care Risk Waste generated or handled within the municipal area.

Objectives

- ▶ That the TWKM keeps track of any/ all Industrial (non-hazardous and hazardous) and Health Care Risk Waste generated or handled within the municipal area;
- ▶ The implementation and management of the WIS will have to be such as to ensure the successful monitoring of these types of waste; and
- ▶ Ensure that the collectors of Industrial (non-hazardous and hazardous) and HCRW register with the TWKM (should be capture in By-laws). Further that they handle and dispose of the waste as prescribed by the By-laws (TWKM to ensure that this aspect is covered correctly in the By-laws) and that this process is monitored through the WIS.

6.2.11 Waste Disposal Facilities/Landfills

Landfills, also part of compliance, a strategic pillar of the NWMS

Goal

To ensure that the WDFs/landfills are run according the Minimum Requirements for Waste Disposal By landfill (DWAf 1998) as well as license conditions. Decommissioned landfills should be properly rehabilitated and monitored on a regular basis.

Objective

- ▶ The proper upgrading, rehabilitation, operation, maintenance and monitoring of WDFs should be prioritised due to the current situation at most of the facilities; and
- ▶ The existing landfill sites, the closed landfill and any future WDFs have to be monitored on a regular basis. Any operational WDFs also needs to be audited on a regular basis. (At least annually, ideally bi-annually). The monitoring and auditing of the facilities by competent external service suppliers, and budget allocated.

6.2.12 Public disposal facilities

Goal

To investigate the feasibility of public disposal facilities so as to provide an additional facility for the community to primarily take their garden waste and uncollected domestic waste to and as a method of reducing illegal dumping, collection time and transport cost.

Objectives

- ▶ Investigate the feasibility of utilising public disposal facilities as a method of reducing illegal dumping (possible time lost and transport cost savings should also be investigated in more detail once the WIS is operation since no data is currently available on volumes and costs associated with illegal dumping).
- ▶ Incorporate such facilities as the newly and currently being developed transfer stations;
- ▶ Public acceptability of public disposal facilities (communal disposal facility where resident dispose of their waste themselves) should be investigated for the informal areas and areas where there is a lack of proper service. The option of appointing local/community based entrepreneurs for collection in the informal areas should be investigated. They can collect from the informal areas and dispose at a public disposal / transfer facility from where the municipality can than collect to landfill; and
- ▶ All aspects of the operation of such facilities should be considered. Facilities should comply with legislative requirements.

6.2.13 Institutional

Personnel

Goals

To staff all management and supervisory positions and to have adequate, medically fit, well-trained personnel to cover the range of tasks required to deliver a total waste management service to the communities.

Objectives

- ▶ To have medically fit personnel to use as runners for the collection service. This is physically demanding work and requires personnel that can handle the physical stress. There needs to be at least 4 runners per collection vehicle for domestic collection;
- ▶ Personnel should be trained in their respective task since they are dealing with potentially hazardous material. There are numerous training modules available from private waste contractors on the various aspects of waste management;
- ▶ The WDF manager, access controller, spotter and operator need to undergo various levels of training to ensure that the landfills are operated according to the required standards; and
- ▶ Consideration should be given to creating a position for an education and awareness / recycling and waste minimisation co-ordinator.

Finances / income / revenue

Goal

Have council committed to the IWMP, to ensure that the correct budgeting takes place and that the appropriate revenue collections systems are in place.

Objectives

- ▶ Council should adopted the IWMP in its entirety, including the associated budgets and programmes;
- ▶ The IDP should be adjusted accordingly as to ensure the correct budgeting and implementation of recommendations;
- ▶ Council should ensure that the revenue generated by the WMS is channelled back into the department; and
- ▶ Utilisation of subsidised funding schemes.

The above section of the report initially formed a separate report (Gap Analysis and Needs Assessment, the Goals and Objectives) and was made available for public comment together with the Status Quo report.

7 Implementation

7.1 Introduction

An implementation plan was developed based on the overall Goal and Objectives as shown in Appendix A of this document. The attached plan is Revision Zero and is structured in such a way that it can be used as a live document that can be adjusted, amended and developed further as the need arises. The next section shows a summary of the plan.

The anticipated cost shown in the plan is a combination of cost estimates, current budgets and other unknown costs not known at the stage of compiling the plan. It will be the TWKM's responsibility to keep the plan updated with the latest available information. The detailed plan is shown in Appendix A and a summary in Table 32.

7.2 Implementation Plan summary

The table provides a summary of the implementation plan. The detailed plan is included in Appendix A showing all the various component in detail.

Table 32: Summary of Implementation Plan

No.	Component	Project	Resource requirement	Estimated cost 2022	Implementation	Annual cost
1	Governance	Review and amend Waste Management By-laws.	External Consultant	R 30 000,00	Asap	No
		Implement waste data collection system. Monitoring of various waste types including domestic, commercial, industrial (non-hazardous and hazardous) and health care waste	Waste management data officer	R 350 000,00	Asap	Yes, internal
2	Public Awareness	Appoint competent person/s within the TWKM to develop a community participation strategy. Train the trainer principle. Focus on negative impact of illegal dumping	PPP specialist dedicated to Waste Management	R 350 000,00	Asap	Yes, internal
3	Waste Minimisation and Recovery	Establish Buyback centres	Consultant / contractor	R 18 000 000,00	Asap	Phased over a number of years
		Develop community-based initiatives	Waste management specialist	R 350 000,00	Asap	Yes, internal
4	Service Provision	Improve round/route balancing	Can be done internally or appoint consultant	R 200 000 if consultant is used	Asap	No
		Implement appropriate collection and if required transfer system in informal areas, can be local entrepreneurs collecting into bulk containers for the municipality to collect. This will aid with curbing illegal dumping. Appoint suitable consultant to investigate	Consultant together with municipality	R 250 000,00	Asap	Consultant once of, service provision is an annual cost

No.	Component	Project	Resource requirement	Estimated cost 2022	Implementation	Annual cost
		Engage with local businesses regarding specific needs and how the TWKM can better service delivery at each business	Internal	None	Asap	Time and effort dependant
		Replace one collection unit each year		R 8 500 000,00	Replace one unit per year	R 1 500 000,00
		Assessment of street cleansing requirements	Consultant together with municipality	R 150 000,00	Asap	Consultant once of, service provision is an annual cost
5	Waste Disposal Facilities/Landfills	Numerous projects currently budgeted, closure cost for existing landfill were provided during 2021 and updated cost taking CPI of 5,9% shown for 2022 cost	Consultant / Contractor	R 108 354 713,60	Phased	Cost for consultancy fees and construction cost
		Investigate the feasibility of public disposal facilities and communal collection systems. Linked to service provision	Consultant			
6	Institutional	Employing adequate personnel and train all waste management related personnel adequately for their respective positions. Fill vacant positions according to organigrams	Internal	To be determined by TWKM		

8 Aspects to consider for Implementation

8.1 Governance

8.1.1 Waste Policy and By-Laws

Waste policy: A policy outlines what a government institution hopes to achieve and the methods and principles it will use to achieve them. A policy document is not law, but it will often identify new laws needed to achieve its goals. A draft waste policy needs to be developed for TWKM and needs to be approved by the council and implemented.

By-Laws: A By-Law for Waste Management is available and was Gazetted on 21 July 2015. Compliance monitoring of the By-Laws will also need to be implemented. A “polluter pays” system must be implemented to fine transgressors disposing waste illegally and the tariff structure must reflect it.

The By-Laws provide the legislative power to enforce the goals in the Waste Policy.

8.1.2 Institutional and planning matters

The main purpose of an institutional arrangement is to present a strategic plan on how to grow the institutional capacity of the Waste Management Division in line with its future plan. The institutional structure was approved by council to support the growth of waste management services to ensure that there is sufficient capacity to manage the work in the foreseeable future, in line with the strategy.

The designated Waste Manager should be appointed by the Municipal Manager as required in terms of NEWMA.

All the vacant posts should be funded and filled to render an efficient waste management service; to alleviate the demand for waste services; and to ensure the municipality has the required capacity. As part of the future institutional strategy the Waste Management Division needs to develop tasks that are required throughout the division to ensure sustainability and effective service provision. These tasks may include:

- ▶ Developing a training plan to address skills shortages and gaps;
- ▶ Implementing annual skills and training matrix program to monitor development; and
- ▶ Proactive recruitment and a needs analysis should be undertaken to ensure that the right people, with the right skills are in the right place at the right time. This should be determined by continuous evaluation and enactment of the desired future state and activities conducted to reach this and alignment of institutional practices therewith.

8.2 Sustainability Study

The overall aim of an economic waste sustainability study is to implement the waste hierarchy and reduce the amount of waste diverted to landfill, as well as to make recommendations to improve the economics and effectiveness of waste management through initiatives to move up the waste hierarchy and therefore establish long term priorities for waste management.

8.3 Waste Avoidance

Public awareness and education plays a critical part in developing a culture of waste avoidance in a municipality. A campaign will highlight ways in which the public can avoid or prevent waste generation and suggest alternatives to high waste products or activities. This is in line with the NWMS which is to ensure that communities are educated about waste that can be recycled and reused.

This Waste Avoidance Project is considered a medium priority project as it will need to build on the completion of other projects such as the implementation of the Waste Policy and enforcement of the By-Law. It will include the development of Waste Prevention Guidelines for various sectors of the business

community as well as the general public (e.g. waste separation at source and manufacture take back initiatives).

The project will explore setting of realistic waste avoidance targets and means to encourage households, schools and businesses to participate in the initiative.

8.4 WMF and landfills closures

Table 33 was received from the TWKM indicating the proposed capital expenditure budget for the next five years.

The information in this table was used to compare the with the anticipated closure cost for each facility as per the landfill provisions report dated June 2021. These costs were escalated by 5,9% based on the April CPI index.

Table 33: Proposed budgets

PROJECT	2022/23	2023/24	2024/25	2025/26	2026/27
Riviersonder and WTF Phase 3	R2,907,809				
Riviersonder and WTF Phase 4	R3,538,00				
Caledon WTF Entrance N2 Lane adjustment	R926,100				
Botrivier Drop Off Planning		R500,000	R3,500,000	R3,500,000	
Greyton Landfill Rehab		R3,000,000	R4,561,254	R3,000,000	R3,000,000
Villiersdorp Landfill Rehab		R4,000,000	R5,614,922	R4,000,000	R4,000,000
RSE Landfill Rehab			R1,000,000	R3,000,000	R3,000,000
Genadendal Landfill Rehab					R1,000,000
Caledon Landfill Rehab				R1,000,000.00	R3,000,000
Botrivier Landfill Rehab					R500,000
Refurbishment Villiersdorp WTF		R1,000,000	R4,000,000	R4,000,000	
Total	R7,371,909	R8,500,000	R18,676,176	R18,500,000	R14,500,000

The cost highlighted in yellow indicates the proposed closure budgets. The total for the highlighted sections is R 43 676 176 which is R 49 806 626 less than the total estimated closure cost of R 93 482 804 for all the landfill facilities combined as shown in the table below.

Table 34: Anticipated closure costs for landfills

DESCRIPTION	BOTRIVIER	CALEDON	GENADENDAL	GREYTON	RIVIERSONDEREND	VILLIERSDORP
Preliminary and General	R 760 676,18	R 6 253 200,40	R 1 358 993,91	R 1 826 824,36	R 1 060 044,84	R 2 879 045,46
General Site work	R 134 151,25	R 140 770,35	R 58 386,44	R 55 076,89	R 71 624,64	R 55 076,89
Leachate collection system	R 207 551,12	R 460 890,89	R 321 707,65	R 445 768,34	R 245 195,27	R 375 338,55
Capping	R 2 401 761,38	R 20 362 692,13	R 4 371 564,46	R 6 091 323,75	R 3 353 867,98	R 10 363 452,44
Stormwater Drainage	R 182 196,29	R 2 208 072,80	R 567 272,38	R 598 083,79	R 452 446,78	R 546 151,05
Storm Water drainage structures	R 117 044,69	R 234 089,38	R 117 044,69	R 117 044,69	R 117 044,69	R 176 162,94
Fencing	R -	R 1 606 286,06	R -	R -	R -	R -
Total	R 3 803 380,92	R 31 266 002,02	R 6 794 969,53	R 9 134 121,82	R 5 300 224,21	R 14 395 227,32
10% contingencies	R 380 338,09	R 3 126 600,20	R 679 496,95	R 913 412,18	R 530 022,42	R 1 439 522,73
Net Total	R 4 183 719,01	R 34 392 602,22	R 7 474 466,48	R 10 047 534,00	R 5 830 246,63	R 15 834 750,06
Professional fees						
Professional fees	R 502 046,28	R 4 127 112,27	R 896 935,98	R 1 205 704,08	R 699 629,60	R 1 900 170,01
Specialist input i.e. slope stability, check list compliance	R 84 720,00	R 158 850,00	R 84 720,00	R 84 720,00	R 84 720,00	R 84 720,00
Site supervision	R 508 320,00	R 508 320,00	R 508 320,00	R 508 320,00	R 508 320,00	R 508 320,00
ECO	R 133 434,00	R 266 868,00	R 133 434,00	R 133 434,00	R 133 434,00	R 133 434,00
Boreholes with lockable caps	R 127 080,00	R 127 080,00	R 127 080,00	R 127 080,00	R 127 080,00	R 127 080,00
Review EMP	R 31 770,00	R 31 770,00	R 31 770,00	R 31 770,00	R 31 770,00	R 31 770,00
Close out report	R 127 080,00	R 127 080,00	R 127 080,00	R 127 080,00	R 127 080,00	R 127 080,00
Survey	R 15 885,00	R 26 475,00	R 15 885,00	R 15 885,00	R 15 885,00	R 15 885,00
Total Fees	R 1 530 335,28	R 5 373 555,27	R 1 925 224,98	R 2 233 993,08	R 1 727 918,60	R 2 928 459,01
PROJECT TOTAL	R 5 714 054,29	R 39 766 157,49	R 9 399 691,46	R 12 281 527,08	R 7 558 165,23	R 18 763 209,06

8.5 Treatment and Recycling

8.5.1 Establishing Separation at Source Initiative

There is currently limited separation at source initiative at TWKM. Promotion of expanding separation at source will require an education and training programme as well as support from the community.

Separation at source must then be supported by a service delivery system capable of transporting non-organic recyclables and remaining waste. To encourage waste separation TWKM can start implementing separation of waste at source into wet and dry waste components. The initiative should aim to change public attitudes and behaviour towards waste. Local campaigns should be run to encourage people to Reduce, Reuse and Recycle waste.

The municipality is in the process of appointing a recycler as a service provider to implement the two-bag system in Grabouw, Villiersdorp, Greyton, Caledon and Riviersonderend. Initiatives were in place previously and were very successful thus the need to appoint a service provider is high priority.

8.5.2 HCRW Treatment Facilities

There is a risk that HCRW generated from public and private health care facilities could be disposed of illegally. The provision of HCRW treatment facilities can be considered. Although this is not a function of the municipality, generation of HCRW should be reported to the relevant department to ensure the safe handling of HCRW.

HCRW collectors register with the municipality as authorised waste collectors and report waste removed within the boundaries of the municipality on a monthly basis.

8.5.3 Hazardous waste

Hazardous waste must be collected and removed by private contractors and taken to a licensed Hazardous Landfill near Cape Town.

The Municipality should provide a drop-off facility for household hazardous waste including electronic waste.

8.5.4 Garden waste and builders' rubble

In order to prolong the lifespan of the landfill sites waste separation can be implemented at the proposed drop-off facilities in the short term. Garden waste and builders' rubble can be separated and ultimately diverted from the waste disposal facility. Builders' rubble can be used as cover material after it is sorted and garden waste can be shredded and used for the rehabilitation of the landfill site.

8.6 Collections

8.6.1 Collection Services

One of the key features of a developmental state is to ensure that all citizens especially the poor and other vulnerable groups have access to basic services. The Constitution of the country places the responsibility on government to ensure that such services are progressively expanded to all, within the limits of available resources. Government policy on most of these issues is progressively moving towards universal access including Waste Management.

To ensure a cost-effective collection service and to make provision for expanding of collection services, the municipality should investigate how to deal with the waste generated by households in indigent areas to prevent illegal disposal of waste.

8.7 Fleet Management and Equipment

8.7.1 Challenges faced with regards to equipment and logistics

Municipalities are faced with challenges with regards to fleet.

- ▶ Municipalities do not always analyse or investigate the vehicle and equipment types required for waste collection;
- ▶ The above has an impact on the selection and design of vehicles / plant / equipment in terms of “right fit for purpose” and on the operating and maintenance costs of vehicles / plant and equipment; and
- ▶ The waste management fleet is one of the municipality’s most valuable assets and therefore should be maintained as per manufacturer’s conditions.

8.7.2 Equipment/vehicle considerations (collection/transportation)

The following should be considered when determining the equipment needed to execute the waste management services effectively.

- ▶ Waste type to be removed (recyclable or non-recyclable);
- ▶ Waste volumes;
- ▶ Frequency of collection;
- ▶ Geographical area of collection;
- ▶ Container / receptacle type(Method of collection);
- ▶ Separation at source;
- ▶ Collection of recyclable waste;
- ▶ Distance between collection points and disposal facilities;
- ▶ Communal collection points;
- ▶ Accessibility to informal settlements and appropriate vehicle type;
- ▶ Transfer station / recycling / garden site/Waste disposal facility;
- ▶ Drop-off centre’s / shopping centre collection points;
- ▶ Road conditions;
- ▶ Traffic conditions;
- ▶ Transfer Station conditions;
- ▶ Driver /Operator skills / know how;
- ▶ Maintenance infrastructure (Internal / external);
- ▶ Supplier after sales support;
- ▶ Efficiency / Fuel consumption (carbon footprint); and
- ▶ Asset optimization.

8.7.3 Vehicle replacement

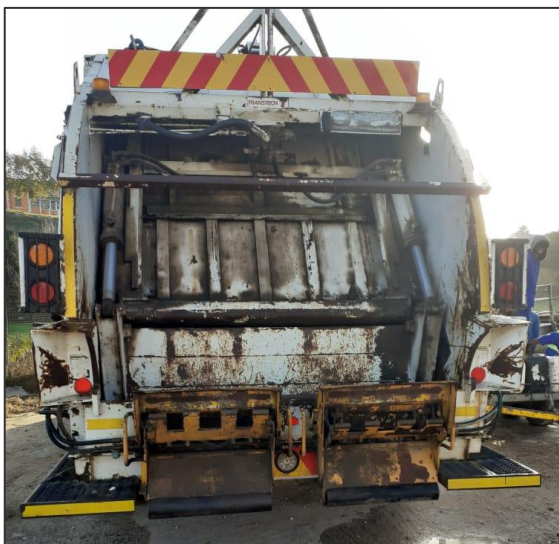
Table 35 provides information regarding the fleet at the time of drafting the IWMP. A seven-year replacement policy is proposed with the current estimated cost shown for each of the vehicles. Please note that final vehicle cost is chassis and body dependant.

Table 35 Fleet information

Reg no.	Make / Model	Type	Year	Age	Current condition of the vehicle	Capacity (m ³)	Current Odometer reading (kms)	Collection areas	Replace	Estimated replacement cost (2022)
CAM 14034	Isuzu F-Series	REL	2018	3	Good/Fair	12m ³	72149	Caledon, Botrivier, Middleton, Tesselaarsdal, Lebanon		

Reg no.	Make / Model	Type	Year	Age	Current condition of the vehicle	Capacity (m ³)	Current Odometer reading (kms)	Collection areas	Replace	Estimated replacement cost (2022)
CAM 5554	Hino F-Series	REL	1999	22	Good/Fair	12m ³	103158	Caledon, Botrivier, Middleton		R 1 500000,00
CAM 13077	Nissan UD80	REL	2002	19	Good/Fair	15m ³	201906	Grabouw		R 1 500000,00
CAM 25570	Nissan UD90	REL	2016	5	Good/Fair	12m ³	60793	Grabouw		
CEO 3914	Nissan A 520	REL)	2000	21	Poor	15m ³	173249	Grabouw		R 1 500000,00
CAM 22148	Nissan UD40	Tipper (Caged)	2009	12	Good/Fair	4.3m ³	162736	Genadendal, Greyton Bereaville V, Kraal B Kloof heuwelkroon		R 1 000000,00
CAM 16878	Fuso FK/FM	REL	2010	11	Good/Fair	12m ³	125826	Riviersonderend		R 1 500000,00
CAM 11874	Nissan UD80	REL	2009	12	Good/Fair	12m ³	165927	Villiersdorp		R1 500 000,00
Total										R 8 500000,00

Examples of TWKM trucks requiring replacement:





8.8 Waste Information System

The Integrated Pollutant and Waste Information System (IPWIS) is intended to provide the public, business, industry and government with access to information on the management of waste, by capturing routine data on the tonnes of waste transported, treated, landfilled and recycled on a monthly and annual basis. The implementation of an IPWIS follows requirements by the NWMS (2020) in terms of monitoring and reporting and can only be done if the waste management activities are in place in terms of structure, systems, personnel, infrastructure and services.

It is important to collect waste data because it can be used to:

- ▶ Support local planning, in particular the development of integrated waste management plans;
- ▶ Support budgeting for waste management services and facilities;
- ▶ Support effective operation of waste management facilities, e.g. waste disposal facility, transfer station;
- ▶ Assist with the implementation of effective waste reduction and reuse initiatives;
- ▶ Assist with local, provincial and national reporting obligations;
- ▶ Monitor the effectiveness of local waste management and waste minimisation initiatives; and
- ▶ Capacitate local communities through providing public access to information.

It remains a municipality's responsibility to make sure that waste information submitted to the IPWIS is correct.

All data should be captured and stored electronically. This will facilitate efficient data management and will enable the municipality to easily feed information into the IPWIS and for future planning purposes. This is considered a high priority project.

The successful implementation of an IPWIS will involve the following steps by the municipality:

- ▶ Step 1: Data Collection
- ▶ Step 2: Data Capture
- ▶ Step 3: Submission of data to IPWIS
- ▶ Step 4: Verification data

These steps are discussed and depicted schematically in Figure 266 and Figure 27 below. The resources required in each step are also outlined.

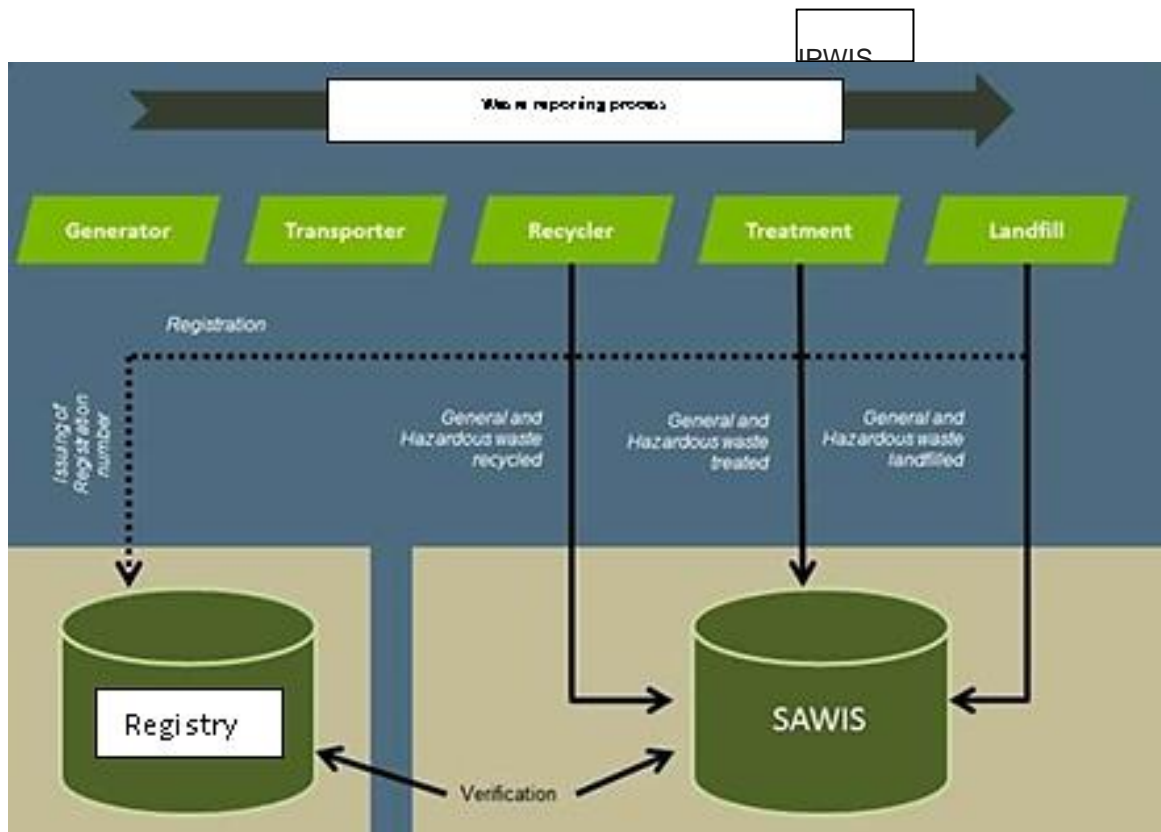


Figure 26: Waste reporting process

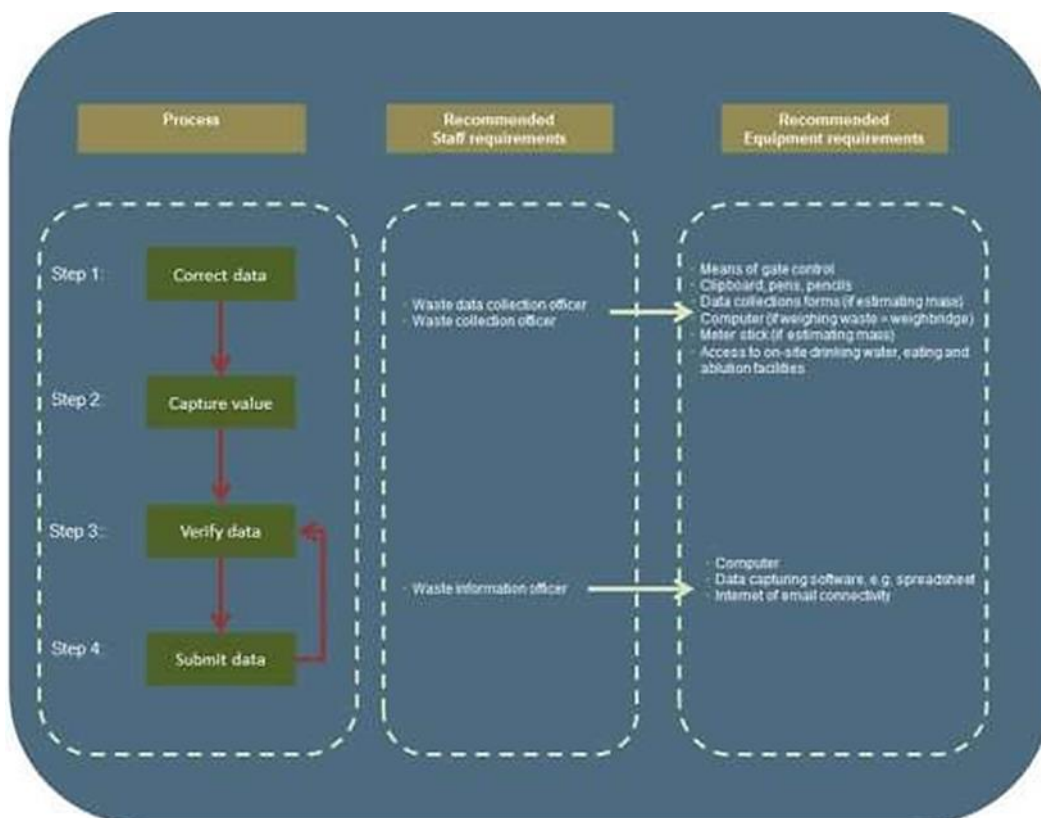


Figure 27: IPWIS Steps Implementation Process

8.9 Education and Awareness

A three-year education and awareness strategy needs to be devised and implemented. Part of this would include ensuring communities are informed about the health risk of illegal dumping which is part of the implementation strategies of the NWMS (2020).

With the assistance and involvement of local media and communication organisations, waste management and the role of the community would be covered.

This is considered a high priority project as it is a critical part of improving the handling of waste management in the Municipality. If waste is to be well managed in the municipality, it will require active participation of the community. TWKM will also need to include information on the management of hazardous waste in their education and awareness programme.

Table 36 Waste and Education Strategy

Waste and Education Awareness Strategy	
Project Description	The TWKM should develop a Public Awareness/Education Strategy aimed at promoting awareness over waste management related issues within the TWKM. The strategy should, in particular, focus on bringing to the attention of residents residing in the TWKM their applicable waste management By-Laws
Strategy focus	<p>The strategy should be focused on identifying priority focus groups within the TWKM to target during active awareness campaigns. Homeowners and lawful occupiers of homes within the TWKM should be the primary focal point of the campaign. Schools and businesses within the TWKM should be the secondary focus of the campaigns.</p> <p>Different communication mediums (Television, radio, posters, billboards, flyers) should be identified and evaluated, in terms of their anticipated effectiveness, in the development of the strategy.</p> <p>The required strategy should make allowance for an initial focused six months campaign roll out. Thereafter, it is recommended that bi-annual campaigns be undertaken in each respective town to ensure that there is a constant awareness amongst TWKM residents over waste management issues and achievements by the TWKM.</p>
Project Objective	<p>To improve compliance by the TWKM residents to Waste Management By-Laws. In particular, the potential penalties relating to illegal dumping should be clearly communicated.</p> <p>The project will ultimately be aimed at addressing the following key issues:</p> <ul style="list-style-type: none"> ■ Reducing the level of illegal dumping and littering; ■ Separation of waste in different bins at the transfer station; ■ Waste Separation at source; ■ Dangers of informal recyclers; ■ Impact of waste in regards to the environment and human health; ■ Importance of having a waste infrastructure; ■ Shifting the mind-set of residents in relation to issues to waste management.
Responsibility	TWKM

Waste and Education Awareness Strategy	
Project Period	<p>Development of Waste Education and Awareness Strategy by TWKM and roll out of first active campaign – six months.</p> <p>Bi-annual awareness campaigns to be run by TWKM in respective towns on an on-going basis (Operational Budget).</p>

8.10 General

The following general gaps amongst others were identified in the TWKM:

- ▶ Limited drop-off centres available for recyclable items;
- ▶ limited co-operatives in place to aid recycling initiatives;
- ▶ Insufficient human resources due to vacant and unfunded critical posts (e.g. driver/workers/operators);
- ▶ Limited lack of skills of human resources;
- ▶ Inadequate law enforcement and services to prevent illegal dumping, often from outskirts of informal settlements;
- ▶ Limited access control at the landfill with regards to waste dumped illegally;
- ▶ Fleet vehicles are old and/or in poor condition;
- ▶ Waste management plans are not available for businesses / industries / new developments;
- ▶ Collection vehicles travel long distances to towns;
- ▶ Tyres are dumped illegally on occasion;
- ▶ Limited education and awareness campaigns;
- ▶ Inadequate resources (personnel, equipment); and
- ▶ Inadequate provisions are made on the proposed organisational structure for waste management by-law enforcement.

9 Communication and Stakeholder Participation

9.1 Consultation Process Summary

The draft IWMP was made available to the general public for their inputs by advertising in the local newspaper. Additionally, the draft IWMP was advertised for public comment on both the municipal website as well as social media site (Facebook page).

PUBLIC NOTICE
Theewaterskloof Municipality
Integrated Waste Management Plan

Notice is hereby given in terms of the provisions of section 13 & 21 of the local government Municipal Systems Act 32 of 2000 read with section 121 of the Constitution of the Republic of South Africa, 1996 and the National Environmental Management Waste Act 59 of 2008 as amended, that the Theewaterskloof Local Municipality intends to:

Implement its 4th Generation Integrated Waste Management Plan (IWMP).
The general purpose is to assist the municipality in the process of planning (needs determination, resource allocation), implementation and evaluation of the waste management functions over a period of 5 years in an integrated manner.

A copy of the IWMP is available for inspection during office hours at the following places:

- Library: Biblioteek Caledon Library - 26 Kerk Street, Caledon
- Municipal offices: Theewaterskloof Municipal Offices, 6 Plein Street, Caledon, TWK.
- Municipal website: <http://www.twk.org.za/waste-management>
- Municipal Facebook page: <https://www.facebook.com/twkmun>

The document will be available for inspection for a period of Eighteen (18) days from the date of this publication.

The public comment period is from 3 June 2022 until 20 June 2022.
Any person who wishes to comment on the above-mentioned IWMP, must send them it in writing within Eighteen (18) days from the date of the publication of this notice to the following people:

Consultant details:
Michele Muller
Michele.muller@zutari.com

Figure 28: Advert for Draft IWMP for public comments placed in the Burger Times Newspaper

PUBLIC NOTICE
Theewaterskloof Municipality
Integrated Waste Management Plan

Notice is hereby given in terms of the provisions of section 13 & 21 of the local government Municipal Systems Act 32 of 2000 read with section 121 of the Constitution of the Republic of South Africa, 1996 and the National Environmental Management Waste Act 59 of 2008 as amended, that the Theewaterskloof Local Municipality intends to:

Implement its 4th Generation Integrated Waste Management Plan (IWMP).

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- n Municipal website: <http://www.twk.org.za/waste-management>
- n Municipal Facebook page: <https://www.facebook.com/twkmun>

The document will be available for inspection for a period of eighteen (18) days from the date of this publication.

The public comment period is from 3 June 2022 until 20 June 2022.

Any person who wishes to comment on the above-mentioned IWMP, must send them in writing within 18 days from the date of the publication of this notice to the following people:

Consultant details:
Michele Muller
Michele.muller@zutari.com

Figure 29: Advert for Draft IWMP for public comments placed in the Transoverberg Newspaper

Draft copies of the IWMP's were placed for information purposes at the following venues for perusal by the public and give comments:

- ▶ Library: Biblioteek Caledon Library - 26 Kerk Street, Caledon;
- ▶ Municipal offices: Theewaterskloof Municipal Offices, 6 Plein Street, Caledon, TWK;
- ▶ Municipal website: <http://www.twk.org.za/waste-management>;

The screenshot shows a web page with a breadcrumb trail 'Home > TWK IWMP 03/06/2022'. The main heading is 'News'. Below it is a large grey box containing the date '03 June 2022' and the title 'TWK IWMP 03/06/2022'. At the bottom of the page, there is a search bar with the text 'Search here' and a magnifying glass icon. A small footer at the bottom reads 'TWK IWMP 03/06/2022' and 'Last published 09 June 2022'.

Figure 30: IWMP uploaded to municipal website for public comment

- ▶ Municipal Facebook page: <https://www.facebook.com/twkmun>;
- ▶ To date, no comments have been received.

The IWMP was submitted to the Department (Lance-McBain-Charles and Muneeb Baderoon) on 11 July 2022.

10 Implementation Instruments

10.1 Partnerships

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

Public-public Partnerships: This is a partnership between two public sector institutions or organisations where neither partner seeks profit from the partnership. A typical example of such a partnership could be in cases of operating regional waste facilities. All concerned municipalities would come together in the joint development of such a facility and share the costs.

Public-private partnerships: This is normally a partnership between a public sector institution/organisation and a private company or party. The private company or party takes the financial risks for the project including capital costs, designing and building the facility as well as the operational costs. The land typically belongs to the public entity with the fixed assets sponsored by the private entity but ultimately becoming state property.

Public-community partnerships: This partnership includes members of the community receiving the service forming part of the partnership with the public entity giving the service. A typical example in waste management is when community-based contractors are involved in recycling programmes by among other collecting the recyclables which have been separated at source.

The main purpose of an institutional strategy is to present a strategic plan on how to grow the institutional capacity of the Waste Management Division in line with its future plan. The institutional structure is designed to support the growth of Waste Management Services as further investment occurs, thereby ensuring that there is sufficient capacity to manage the work in the foreseeable future, in line with the strategy, the municipality should make provision for additional waste services due to population growth. The implementation of additional capacity should precede the demand for waste services to ensure the municipality has the required capacity once the additional workload realises.

As part of the future institutional strategy the Waste Management Division needs to develop an organisational structure that would have the ability to serve the future plan as specified above. Tasks that are required throughout to ensure sustainability and effective service provision of the department:

10.2 Legislative instruments: Development and enforcement of By-Laws

A critical component to the implementation of the IWMP is the supporting legal framework. The following framework needs to support and guide the implementation of the objectives of the IWMP:

By-Laws: The TWKM by-laws must be reviewed. The by-laws will put in place the necessary institutional and legal frameworks that will enable TWKM to achieve their aims. This should be in line with the departmental objective stated in the IDP to ensure that waste management by-laws are in place. Compliance monitoring of the by-laws will also need to be implemented.

This project is considered a high priority project as the development of waste policy provides the framework for waste management in the municipality and the by-laws provide the legislative power to enforce the goals in the waste policy.

10.3 Funding mechanisms

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

- ▶ Undertake on a full cost accounting exercise for waste management services to include aspects of collection, transportation, landfill, street cleansing, fee collection, debt payment and depreciation.
- ▶ Implementing recycling programmes will reduce the disposal costs and generate revenue for the municipality. The cost accounting exercise referred to above could include the costs of these recycling programmes against their gains in terms of real monetary returns as well as cost savings relating to increased landfill life span through saved air space.
- ▶ Increasing the service charges to correlate with the actual costs may be a challenge to low-income groups, given the current backlog specifically to those areas. The concept of Pay-as-you-throw may be a better approach, where the service charge is proportional to the waste produced per household.
- ▶ Address the shortfall in the provision of closure budgets for the various landfills
- ▶ The implementation of this IWMP can necessitate both capital and operational costs which can be funded through potential avenues listed below.

Table 37 Funding Options

Capital	Operational
Own funding	Tariffs
Municipal Infrastructure Grant (MIG)	Rates
Consolidated Municipal Infrastructure Programme (CMIP) Equitable share	Equitable share
Extended Public Works Programme (EPWP) Carbon credits	Donor funding
Donor funding	Carbon credits
Financial institution (e.g. DBSA)	Product revenue
Public-private partnerships	
Provincial and National government allocations	

10.4 Theewaterskloof responsibilities

10.4.1 Municipal Manager

The Municipal Manager is ultimately responsible for ensuring that waste within his/her areas of jurisdiction is managed in accordance with legislative requirements of South Africa.

10.4.2 Waste Management Officer

The Waste Management Officer (WMO) designated in terms of Section 10 (3) of NEMWA.

The Waste Management Officer will be responsible for co-ordination of all functions or powers assigned by the Act to Theewaterskloof Municipality. The Waste Management Officer will address the legislative requirements as provided for in section 10 of the NEMWA.

10.4.3 Waste Management Section

The Waste Management Section is primarily responsible for strategic planning and policy formulation making it the core section to play the coordination and integration role within the TWKM. Their specific roles will thus include the following:

- ▶ Integrated Pollutant and Waste Information System (IPWIS);
- ▶ Auditing to ensure that all TWKM departments, Contractors and Agencies dealing with waste are in compliance with this plan;
- ▶ Monitoring of compliance with applicable legislation;
- ▶ Internal audits must become part of the TWKM waste management plan to address compliance;
- ▶ Accident and incident management and reporting; and
- ▶ Ensure that the TWKM adheres to all national and provincial legal obligations.

10.4.4 Line Managers

Other line Departmental/Directorate Managers within the TWKM where relevant will be responsible for:

- ▶ Ensuring that staff under their control is aware of the IWMP and that the mandatory training requirements of staff are fulfilled.
- ▶ Ensuring that where appropriate operational plans in relation to the implementation of the IWMP are developed and progress reporting in relation to same is undertaken.
- ▶ Assisting the Waste Management Section to make improvements to their waste management systems where accidents or incidents occur.
- ▶ Check organograms and who is responsible specifically for daily operations

10.4.5 Daily Operations Organogram Structure per Town

Supervisor

- ▶ They supervise the waste management operations and oversee staff.
- ▶ Supervise the transportation of waste to ensure that it takes place efficiently without contaminating the surrounding area.
- ▶ Ensure compliance with current legislation in the transportation, handling and disposal of waste.
- ▶ Aim to meet waste reduction and recycling targets.
- ▶ Consult with residents, community groups and stakeholders at large about waste management issues, identify their requirements and provide appropriate solutions.

General Worker

- ▶ Clean and maintain the waste facility in a good condition.
- ▶ Ensure compliance with current legislation in the handling and disposing of waste.
- ▶ Maintaining and cleaning of equipment and tools used and to ensure the safekeeping and good working condition thereof.
- ▶ Ensure daily tasks are carried in a satisfactory manner.

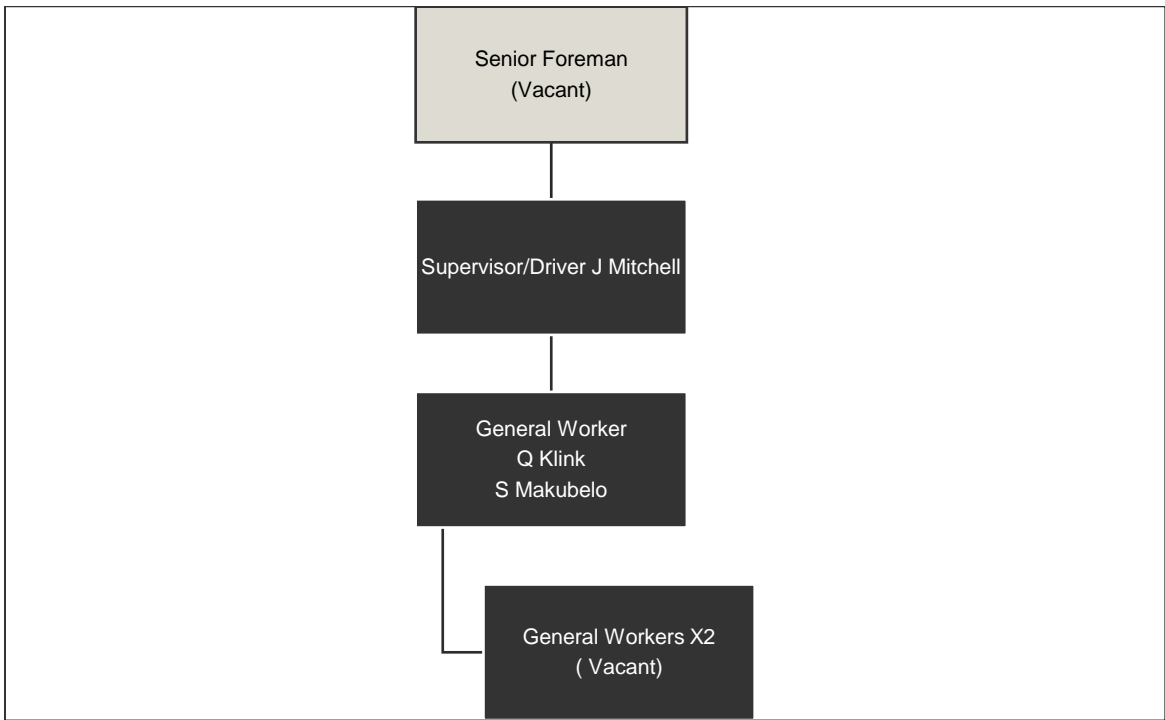


Figure 31: Botrivier Town Daily Operation Organogram

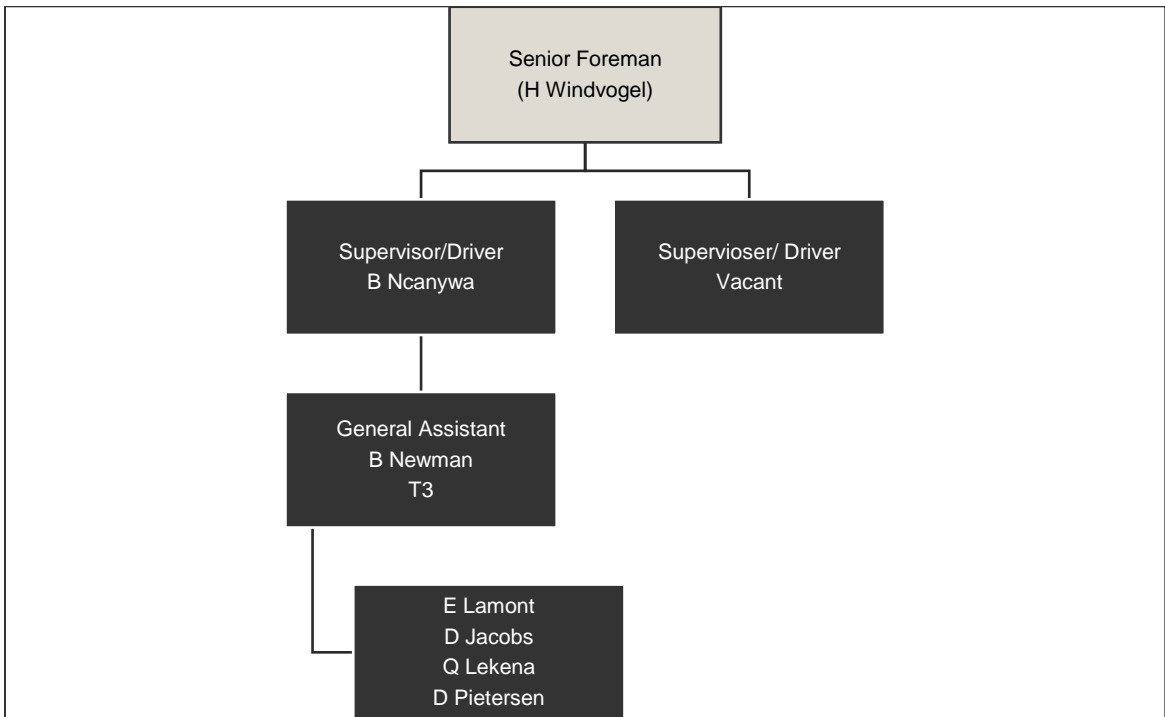


Figure 32: Caledon Town Daily Operation Organogram

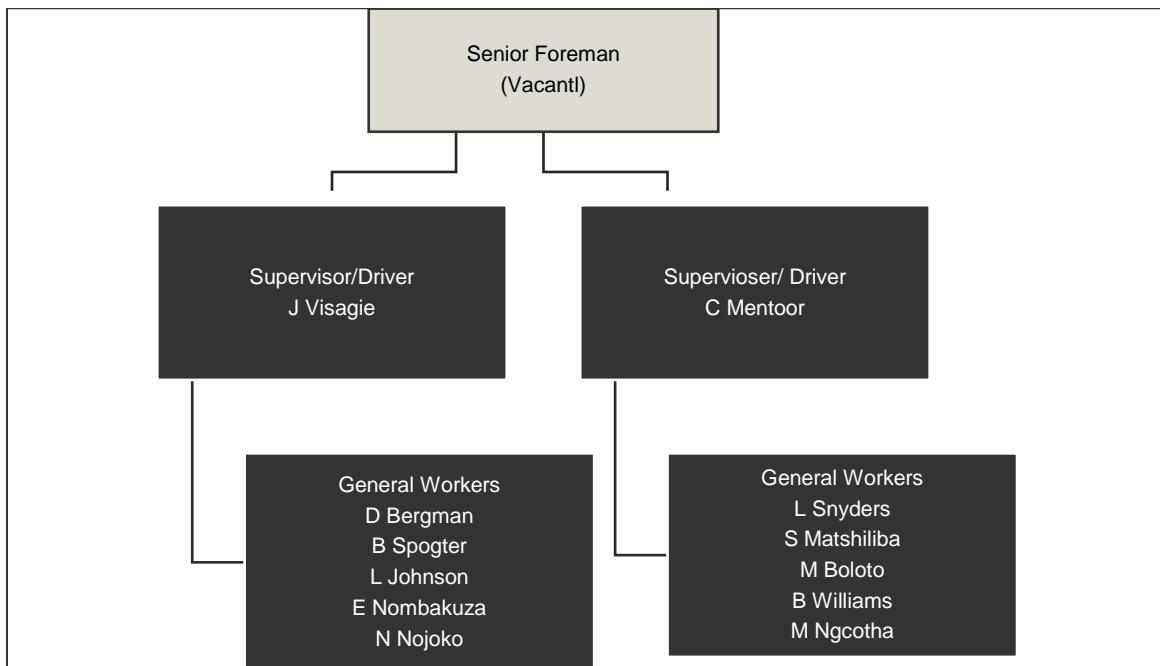


Figure 33: Grabouw Town Daily Operation Organogram

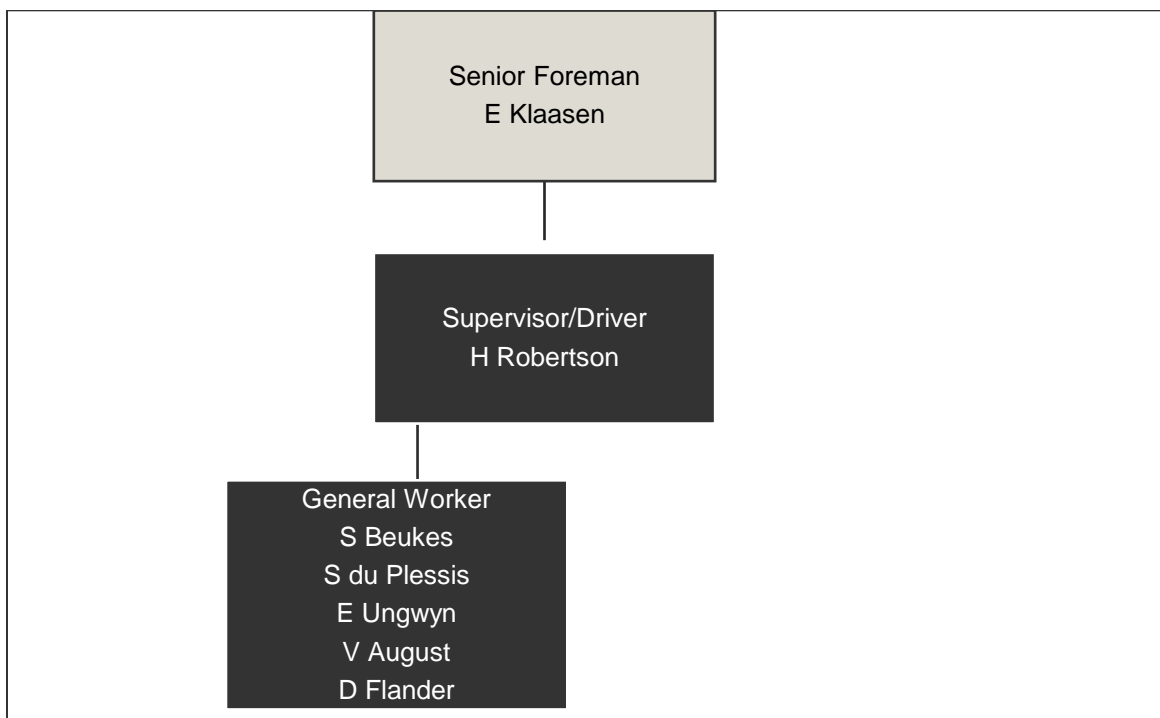


Figure 34: Greyton and Genadendal Town Daily Operations Organogram

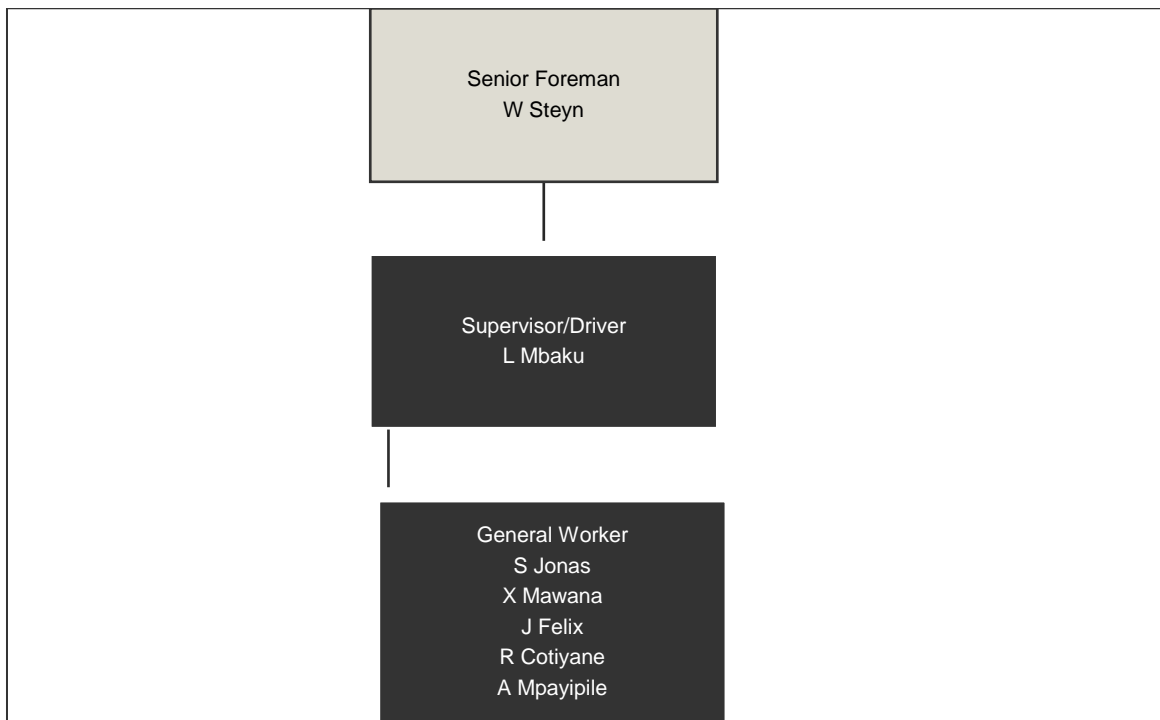


Figure 35: Riversonderend Town Daily Operations Organogram

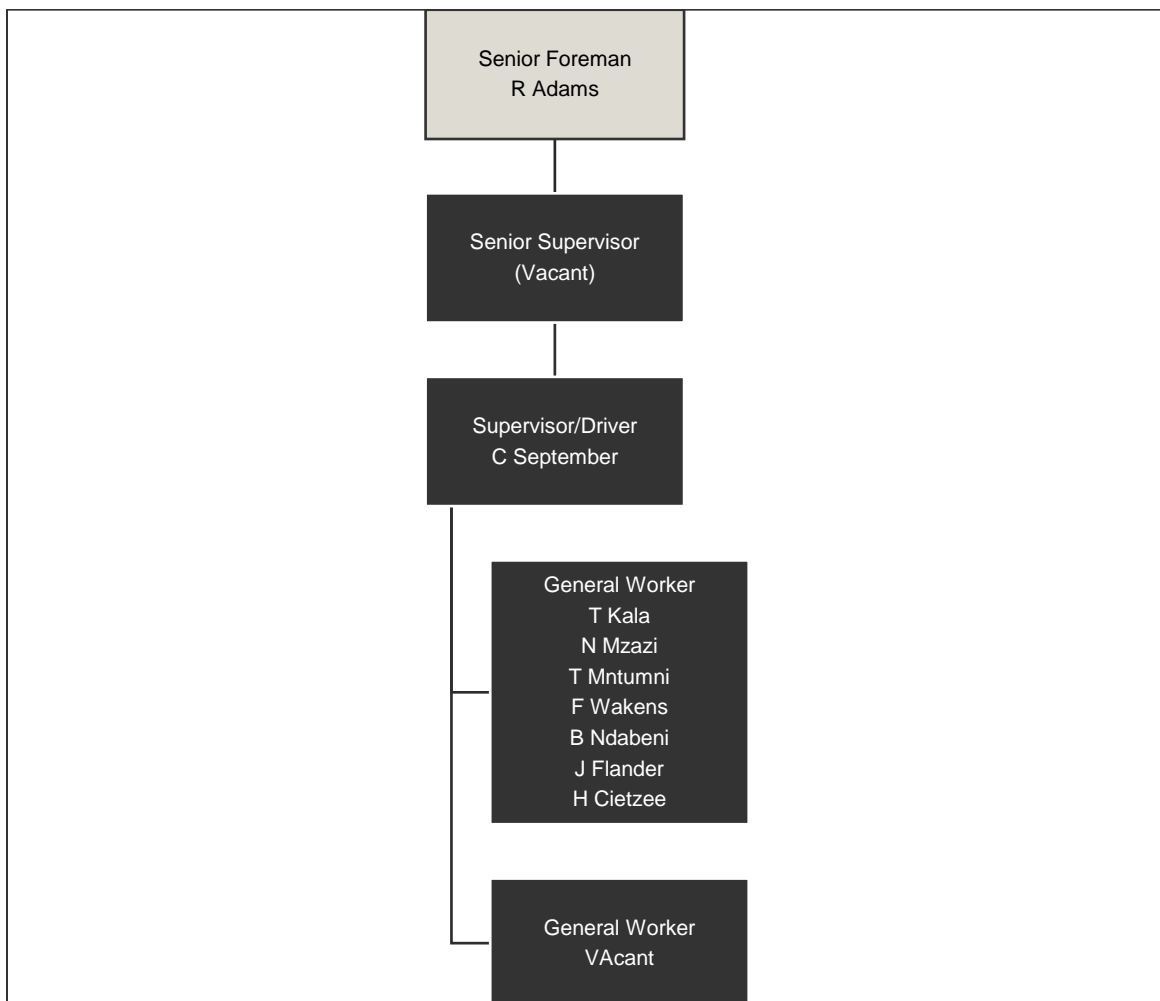


Figure 36: Villiersdorp Town Daily Operations Organogram

10.4.6 Stakeholder Responsibilities

Households and industry shall avoid negative impacts from waste on the environment and also play a role in terms of separation of waste at source, waste exchange and cleaner production. Changes in consumption patterns will reduce generation of waste and save our non-renewable natural resources. In terms of waste avoidance and minimization, the co-operation and additional effort of the manufacturers and producers in terms of “Cleaner Production and Sustainable Consumption” and “Extended Producer Responsibility” (EPR) initiatives, and participation by the consumers of goods as part of individual waste minimization effort is required. In this regard the responsibilities of residents, visitors or entities inside the TWKM’s boundaries include the following:

- ▶ All stakeholders must avoid generating waste as far as possible;
- ▶ All residents, property owners, government departments, non-governmental or community service organizations, and business entities handling waste must be registered on the TWKM waste information system.
- ▶ All entities and individuals engaging in commercial waste minimization and recycling activities inside TWKM boundaries that will divert waste from landfill must be accredited and authorised by TWKM to operate in the TWKM’s boundaries;
- ▶ All events organized and hosted in the TWKM must have a waste management plan that includes source separation and a provision for the cost of associated waste management services.
- ▶ Industrial and health care entities must have a contract with a registered service provider able to provide a service according to the nature of the waste that must be collected, and/or treated, and/or recycled, and/or disposed;
- ▶ Health care risk waste generators, transporters and facility operators must have a valid permit and/or licence issued by the TWKM or the Provincial Government;
- ▶ Property owners, traders or businesses may only use the receptacles (once implemented) for their own use at the site and for the purpose it has been provided, or can purchase additional receptacles or enhanced services at additional cost;
- ▶ The occupant of a dwelling or property, manager of a facility, amenity or a business entity, or entrepreneur that generates waste, must ensure that recyclable waste is separated and stored in an approved container;
- ▶ The waste generator must transport recyclables or have these collected at own cost to a specially provided facility, where the recyclable materials must be placed in separate bulk containers or a separate area provided at the facility;
- ▶ Property owners of vacant land and occupants of occupied property are responsible for maintaining cleanliness and hygiene standards inside the boundaries of the property in terms of TWKM’s applicable by-laws. The TWKM reserves the right to clean waste and overgrowth that accumulates on such land at the owner’s expense at the cost of cleaning and disposing of the waste.
- ▶ Property owners and/or developers of land and buildings must provide for waste management infrastructure according to the TWKM’s guidelines, and must submit a waste management plan as part of the TWKM’s plans approval process.
- ▶ All relevant stakeholders in terms of the Action Plans set in this plan must develop operating plans and ensure regular reporting on progress of implementation of the plan to the Waste management section.

11 Monitoring of the IWMP

An ongoing monitoring plan for the implementation of the IWMP detailed above should be developed. This monitoring constitutes an essential and integral part of the planning process.

Performance and development indicators should be developed during the course of developing operating plans for the different sections responsible for waste management. The monitoring will focus on the short-term objectives of the IWMP to ensure that corrective action can be taken where necessary.

The following diagram illustrates the initial review cycle when a new IWMP is developed:

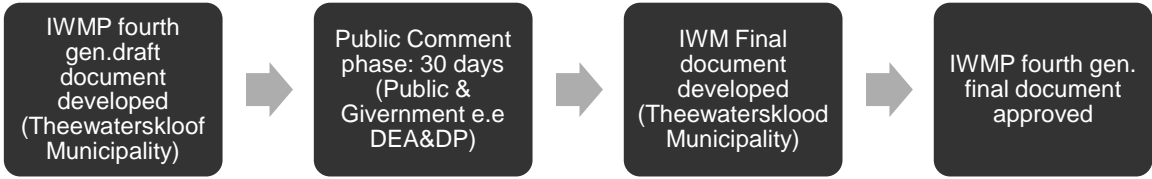


Figure 37: Initial Review cycle of a new IWMP

The date of which the final IWMP fourth generation document is approved, must be recorded and will serve as the base date on which further monitoring and review dates are based. This will also be the start date of the approved implementation schedule. Continuous project implementation and goal tracking must be done by individual project team as and when each project is running and report to the Waste Management Officer. Annual IWMP report must be submitted along with the other Municipal annual reports and a copy sent to DEADP as well.

The following diagram illustrate the review steps that must be followed after the final IWMP is published:

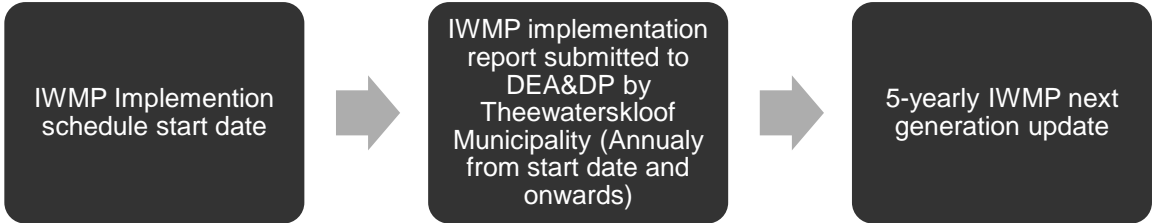


Figure 38: Review Steps after the final WIMP is published

The annual implementation reports will be submitted by the TWKM and will be compiled by the Waste Management Officer, or to whom the task is delegated too. The annual report must contain the approved implementation goals and dates of the IWMP and the progress thereof of the past year. Based on the progress and possible new budget allocations, the implementation schedule of the IWMP must be updated and included in the annual report. This new implementation schedule must provide for three (3) upcoming years from the report date.

The progress of each task on the implementation schedule, if under way according to the schedule for that year, must be summarised and the estimated completion date must be updated. The reasons for the lack of progress or practical difficulties must be stated along with a summarised action plan to adhere to the schedule as close as possible. Each item and progress must be continually evaluated by the person responsible. This will allow the information, whether a project has been completed or is on-going, to be included in the annual report and allow for the implementation schedule of the IWMP to be updated as part of the IWMP annual review report.

The report must further discuss the effectiveness of completed projects. For example, when a new drop-off facility has been commissioned, the collected data must be reported on and added to the IPWIS. Also, the participation rates of source separation can be monitored along with the public awareness and education campaign.

Wherever issues are reported or identified in the projects, these issues must also be evaluated in terms of the relevant legislation and by-laws. It must be stated if there is relevant legislation applicable to the issue and if so, was it the lack of enforcement, for example, that caused the issue. If no relevant legislation exists, it must be noted to adapt the by-laws accordingly in future revisions.

Below is the proposed review cycle of the IWMP and its projects:

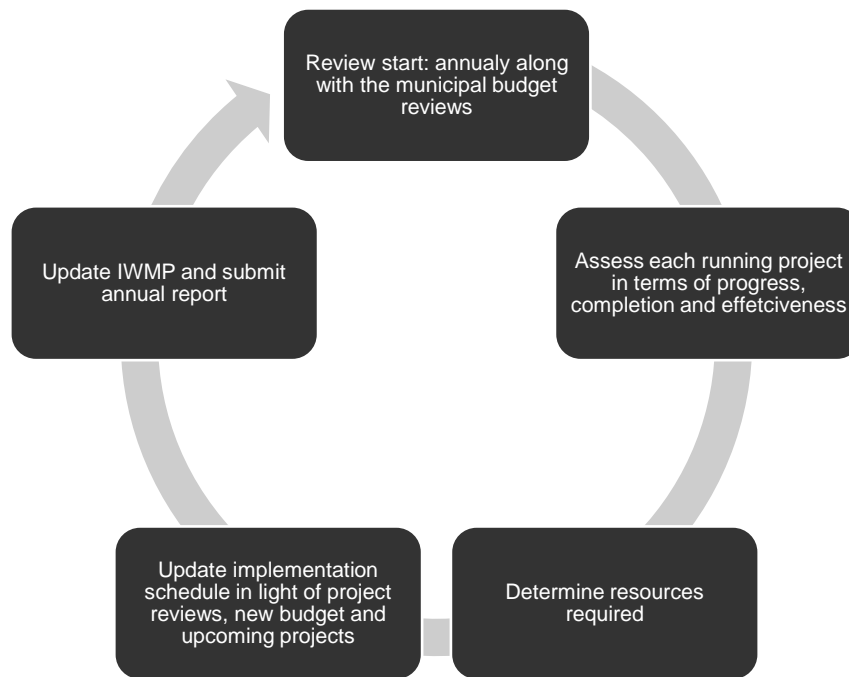


Figure 39: Review Cycle of the IWMP projects

Monitoring activities that should be considered include:

► General issues

- Resource situation: budget allocations;
- Human resources: Vacancies, skills and training;
- Payment for services: Tariff setting and collection thereof;
- Rates of generation of waste, verified by the waste information system;
- Registering of facilities on IPWIS and reporting;
- Reporting to provincial and national environmental departments;
- Illegal dumping and littering: amounts cleared and the costs involved;
- Legislation, regulations and by-laws in place;
- Complaints regarding inadequate waste management.

► Waste prevention and minimisation

- Annual reports of waste minimisation programmes and projects;
- Achievement of targets for priorities for waste streams and pollutants;
- Information exchange and the establishment of waste minimisation clubs.

► Collection and transportation

- Annual reports on the implementation of collection and transportation services.
- Payment received for waste collection and transportation services as against the actual cost for provision of these services.

► Reuse, Recycling and Recovery

- Annual reports on waste reuse, recycling and recovery programmes and projects;
- Information exchange between stakeholders;

- Stakeholder forums coordinating new reuse, recycling and recovery activities;
- Social and environmental impacts of the implementation of new reuse, recycling and recovery initiatives.

► Disposal

- Auditing of general waste disposal facilities by provincial departments;
- Management and control of salvaging at waste disposal facilities.

11.1 Communication and public participation plan

11.1.1 Public Review and Approval Process

The draft IWMP was made available to the general public for their inputs by advertising in the local newspaper. Additionally, the draft IWMP was advertised for public comment on both the municipal website as well as social media site (Facebook page).

Draft copies of the IWMP's were placed for information purposes at the Library and Municipal offices for perusal by the public and give comments. To date, no comments have been received.

11.1.2 Approval Process for IWMP

The approval of the IWMP's will generally be as follows: Local government will receive information and data directly from industry, will be responsible for monitoring the waste management activities within its area of jurisdiction, and will compile its own IWMPs (including a waste management implementation plan) to submit to provincial government MEC for consideration and approval.

Provincial government will receive all information and general waste data (including household hazardous waste) from local government. Hazardous waste information will be submitted directly to provincial government by industry. Provincial government will receive and approve the IWMPs from those industries that have their own waste treatment and disposal facilities. Provincial government is responsible for monitoring the implementation of waste management plans by local government and for undertaking those responsibilities that cannot be fulfilled by local government. Provincial government must compile and submit environmental and waste management plans to DEA, for consideration and approval by the Committee for Environmental Co-ordination (CEC). These plans will comprise an overview of the general waste IWMP submitted to them by local government, a hazardous waste IWMP prepared by the province, as well as the waste management plans submitted by industry.

The national government, through the Department of Environmental Affairs (DEA), will receive aggregated information and data on waste generation, transportation and disposal from the provincial governments. DEA will receive the provincial environmental and waste management plans for approval by the Committee for Environmental Co-ordination (CEC). National government is responsible for monitoring the implementation of the IWMP by provincial and local governments, as well as industry, and for undertaking those responsibilities that cannot be fulfilled by provincial government.

11.2 Review of IWMP

The main objective for reviewing the IWMP is to ensure that it is implemented successfully. This IWMP is to be reviewed every five years in line with IDP requirements. Apart from reviewing the IWMP every five years, the annual performance should also act as a reviewing mechanism wherein the municipality

should evaluate its progress and take steps in ensuring that it does not lack behind in reaching the goals and targets set out in the implementation plan.

12 References

1. Theewaterskloof Local Municipality, Draft Integrated Development Plan 2017/2022.
2. Working with waste: Guideline on recycling of Solid Waste developed for DEA.
3. TWK IWMP 2014, JPCE.
4. Western Cape Integrated Waste Management Plan, 2017-2022
5. List of websites
 - www.environment.gov.za
 - www.sawic.org.za
 - www.statssa.gov.za
 - www.TWKM.org.za

Annexure A - Implementation Plan

Human	WASTE MANAGEMENT COMPONENT	Comment	Project	Type of Personnel Required	No Required	Cost per Annum (Level)	Estimated cost	Possible funding	Implementation programme					
									Year					
									2022 - 2023	2023 - 2024	2024 - 2025	2025-2026	2026-2027	Medium term
A														
1														
1.1	Goal													
	To have an Integrated Waste Management Plan in place that will assist the TWKM with future planning of waste related activities within the municipality to ensure an integrated approach is followed with regards to the implementation of solid waste services	Plan also need to be adopted by Council for funding purposes	Already funded and in process	Consultant and Waste officer DEADP DFFE Overberg District Mun	1		R 349 000			2023/2024				Review IWMP 2026 /27
1.2	Objectives													
1.2.1	The 2022 baseline conditions must be clearly stated i.e. the Status Quo needs to be factual		Form part 2023/24 IWMP	WMO and Consultant	1				2022/23	2023/24				
1.2.2	The gaps and needs must be identified		Form part 2023/24 IWMP	WMO	1				2022/23	2023/24				
1.2.3	Achievable goals and objectives must be identified		Form part 2023/24 IWMP	WMO	1				2022/23	2023/24				
1.2.4	Establish sustainable and fit-for-purpose solutions / option		Form part 2023/24 IWMP	WMO	1				2022/23	2023/24				
1.2.5	Programmes and budgets must be developed in order to meet the goals and objectives	Current operational budgets		WMO And Finance	4 Financial Years					R 71 Mill	R 74 Mill	R 78 Mill		
1.2.6	Five yearly review of the plan including the baseline (status quo)			WMO	1		R 400,000.00							2027/28

Human	WASTE MANAGEMENT COMPONENT	Comment	Project	Type of Personnel Required	No Required	Cost per Annum (Level)	Estimated cost	Possible funding	Implementation programme					
									Year					
									2022 - 2023	2023 - 2024	2024 - 2025	2025-2026	2026-2027	Medium term
2														
2.1	Goal													
	To have relevant and up-to-date Waste By-Laws in place and to ensure the implementation of a formal licensing system		Review and amend Waste management By-Laws	WMO	1	R 113 000	R113,000	Internal		2023/24				
2.2	Objectives		Review and amend Waste management By-Laws	Legal Consultant	1			external		2023/24				
2.2.1	To ensure that the By-laws is not in conflict with any current legislation		Review and amend Waste management By-Laws	WMO	1			external		2023/24				
2.2.2	To ensure that the By-laws support the outcomes and implementation strategy from the Integrated Waste Management Plan		Review and amend Waste management By-Laws	WMO	1			external		2023/24				
2.2.3	To have an adequate waste information system to support the actions required in Waste By-laws	Implement at new facilities. Caledon and RSE WTF & MRF.	WIS- Review and amend Waste management By-Laws	Data officer	12 months per year		R 2 400 000.00 (2 x Weighbridge already installed)	external			2024/25	2025/26	2026/27	
2.2.4	To implement an appropriate licensing system with the associated support systems and personnel. This will be applicable to the licensing of the collection of commercial waste by private contractors and to keep track of industrial and Health Care Risk Waste	Improve Waste Collectors Authorisation Registration.	Appoint Service provider to develop a system.	WMO	12 months per year		R200 000	internal		2023/24	2024/25	2025/26	2026/27	
2.2.5	Requirements, which form part of the licensing aspect to be indicated. This	Subject to approval on budget.	Appoint Data Officer	Data Officer	12 months per year	R 200 000	Operational budget	internal			2024/25	2025/26	2026/27	

Human	WASTE MANAGEMENT COMPONENT	Comment	Project	Type of Personnel Required	No Required	Cost per Annum (Level)	Estimated cost	Possible funding	Implementation programme					
									Year					
									2022 - 2023	2023 - 2024	2024 - 2025	2025-2026	2026-2027	Medium term
	could include what information is required of the licensee for input into the Waste Information System													
2.2.6	Development of standards for the licensees	Learn from counter parts.		Data officer	1		Operational budget	internal			2024/25			
2.2.7	Aspects on waste minimisation, recycling and separation at source should be included in the By-laws		Review and amend Waste management By-Laws	WMO	1	Indicated in 1.3	Funded	external		2023/24				
3														
3.1	Goal													
	To have a waste information system that will assist in future planning of waste management and allow for quick and easy access to information not limited to but including aspects such as number of service points per area, population densities, equipment available, reliability of equipment, personnel involved in various aspects, volumes of waste from areas, volumes of waste disposed of at the landfills and auditing information on the landfills	Forms part of IDP ,Annual report and IWMP	Waste policy	WMO	12 months per year		Operational budget	internal		2024	2025	2026	2027	
3.2	Objectives		Waste data collection and management											
3.2.1	Investigate different WIS that can be linked to a database. This system should be		Investigate different systems being used.	Waste Data officer ITC section	1	Once off	Operational budget			2024/25				

Human	WASTE MANAGEMENT COMPONENT	Comment	Project	Type of Personnel Required	No Required	Cost per Annum (Level)	Estimated cost	Possible funding	Implementation programme					
									Year					
									2022 - 2023	2023 - 2024	2024 - 2025	2025-2026	2026-2027	Medium term
	easy to use and maintain													
3.2.2	The WIS must contain operational information as well as financial information		Investigate different systems being used.	Waste Management data officer	12 months per year		Operational budget	Internal			2024/25			
3.2.3	Appoint and train personnel to collect the information required and to operate and to maintain the system			Waste Management data officer	1	R 350,000.00		Internal				2025/26		
3.2.4	Undertake a survey to identify hazardous, industrial and Health Care Risk Waste generators and put in place a monitoring system to ensure that they deal with their specific waste type in an appropriate manner. Also include major agricultural waste generators;		Survey to identify hazardous, industrial and Health Care Risk Waste generator	Waste Management data officer	yearly		R 250 000	Internal		2024	2025	2026		
3.2.5	All information relating to waste types such as domestic, commercial, industrial (non-hazardous and hazardous) and health care waste should be recorded and updated on a regular basis		Hazardous waste survey	Waste data officer	12 months per year		Operational budget	Internal External		2024	2025	2026		
3.2.6	The system must be linked to all the departments that provide input to the Waste Management Section i.e. Financial Dept., Transport Dept, Human Resources Dept, etc		WIS	WMO	12 months per year		Operational budget	Internal			2024/25	2025/26	2026/27	

Human	WASTE MANAGEMENT COMPONENT	Comment	Project	Type of Personnel Required	No Required	Cost per Annum (Level)	Estimated cost	Possible funding	Implementation programme					
									Year					
									2022 - 2023	2023 - 2024	2024 - 2025	2025-2026	2026-2027	Medium term
3.2.7	The WIS should be aligned to the South African Waste Information System (SAWIS) but should provide more detail than currently required by the SAWIS		WIS	Waste data officer	12 months per year		Operational budget	Internal			2024/25	2025/26	2026/27	
3.2.8	Waste characterisation study to provide updated information regarding various categories of waste	Regional Waste characterisation being conducted currently.	Waste Characterisation study	WMO Tempory Workers EPWP	6	R 30 000	R 30 000	internal			R 250 000			
B														
1														
1.1	Goal													
	Develop, promote, introduce involve and educate the communities and general public regarding waste related issues such as separation at source, waste minimisation, recycling and getting the people involved in waste management issues	Part of a new tender for 2024 - 2027	New tender for recycling Grabouw Villiersdorp Caledon RSE Greyton	WMO and Data officer	36 months	As per tender.		Operational Budget		2023/24	2024/25 R 1 690 560.00	2025/26 R 1 788 609.00	2026/27 R 2 133 000.00	
1.2	Objectives													
1.2.1	Develop a strategy that will encourage community participation in waste related issues such as separation at source, waste minimisation, and recycling. The strategy will have	Form part of tender (quarterly awareness)	Appoint competent person/s within the TWKM to develop a community participation strategy. Train the trainer principle.	WMO			R 450 000 /A					2025/26	2026/27	

Human	WASTE MANAGEMENT COMPONENT	Comment	Project	Type of Personnel Required	No Required	Cost per Annum (Level)	Estimated cost	Possible funding	Implementation programme						
									Year						
									2022 - 2023	2023 - 2024	2024 - 2025	2025-2026	2026-2027	Medium term	
	to be phased since aspects such as waste collection in the informal areas first have to be addressed before separation at source can be introduced in these areas														
1.2.2	The strategy will allow for several tiers of programmes to accommodate the various communities' needs and ensure appropriate mechanism for communicating the message	Must form part of IDP and annual report. Collaborate with communications.	Appoint competent person/s within the TWKM to develop a community participation strategy. Train the trainer principle.	WMO	1	Operational budget R 450,000	Operational budget R 450,000	Operational budget R 450,000				2025/26	2026/27		
1.2.3	Appoint a person/s that will be responsible for the development, promotion, driving and education aspects of this strategy			PPP specialist dedicated to Waste Management	1			External				2025/26	2026/27		
1.2.4	Training and awareness on environmental issues need to be developed or sourced from existing programmes												2025/26	2026/27	
1.2.5	Make the communities aware of the negative impact of illegal dumping and provide them with adequate facilities or services to reduce the need for illegal dumping	Skip Project also to be implemented to reduce illegal dumping.									2023/24 R 1 700 000 (skip Project)	2024/25	2025/26	2026/27	
1.2.6	Establish community based environmental programmes that involve the community in awareness and clean-up campaigns	Form part of blue deal project			Blue deal project BOCMA Twk Dutch Water Authority				External Internal		2023/24	2024/2025	2025/26	2026/27	

Human	WASTE MANAGEMENT COMPONENT	Comment	Project	Type of Personnel Required	No Required	Cost per Annum (Level)	Estimated cost	Possible funding	Implementation programme					
									Year					
									2022 - 2023	2023 - 2024	2024 - 2025	2025-2026	2026-2027	Medium term
1.2.7	Develop anti-litter campaigns and have a suitable litter system in place		Form part of blue deal project. Investigating installing more bins in CBD areas.	Blue deal project BOCMA Twk Dutch Water Authority	Team		TBD			2023/24	2024/25	2025/26	2026/27	
1.2.8	Join forces with NGOs currently active within the TWKM		Form part of blue deal project	Blue deal project BOCMA Twk	Team		TBD			2023/24	2024/25	2025/26	2026/27	
C														
1														
1.1	Goal													
	Implement achievable, sustainable and feasible waste minimisation and recycling programmes and initiatives	New recycling tender B 1.1	New recycling tender 2024-2027. Implement minimisation plan.	Recycling Contractor.	Recycler	R 1 570 000	R 4 700 000	Operational		2023/24	2024/25	2025/26	2026/27	
1.2	Objectives													
1.2.1	To establish buyback centres at strategic locations, where possible have formal partnership with NGOs and/or others for the establishment of centres	Appoint consultant to conduct feasibility and design. Collaborate with NGO's.	Establish Buyback centres	NGO's Recycler WMO	6	R3 000 000	R 18,000,000	MIG/DEA				R 3,000,000	R 3,000,000	R 3,000,000
1.2.2	Development and implementation of formal recycling programmes. High recyclable generation areas such as the commercial sector and medium to high income areas	Form part of recycling tender	Two Bag System	WMO	5	R 1 570 000	R 4 700 000	Operational			2024/25	2025/26	2026/27	

Human	WASTE MANAGEMENT COMPONENT	Comment	Project	Type of Personnel Required	No Required	Cost per Annum (Level)	Estimated cost	Possible funding	Implementation programme					
									Year					
									2022 - 2023	2023 - 2024	2024 - 2025	2025-2026	2026-2027	Medium term
	should be targeted in the short-term													
1.2.3	Develop and support community based environmental, waste minimisation and recycling initiatives	Form part of recycling tender Collaborate with NGO's.	New recycling tender 2024-2027. Implement minimisation plan. Blue Deal Project	WMO Blue Deal Team.	Team	R 1 570 000	R 4 700 000	Operational		2024/25	2025/26	2026/27		
1.2.4	Implement Organic Waste Diversion Plan	Already implemented.	Revise plan Annually	WMO	ongoing			Operational	2022/23	2023/24	2024/25	2025/26	2026/27	
1.2.4a	Regional composting	No cost at Regional Site	Part of Solid Waste Bulk Transport Contract. New Tender to commence 01 July 2024.	Site manager	1	R 100 00	R 300,000		2022/23	2023/24	2024/25	2025/26	2026/27	
1.2.4b	Feasibility study on medium term options once waste characterisation is completed		Appoint consultant to conduct feasibility study	Waste management specialist	1	R 100 000	R 100 000				2024/25			
D														
	A strategic pillar of the NWMS													
1	Domestic collection													
1.1	Goal													
	To render a sustainable, affordable, reliable, and effective residential collection services	Part of operational budget funded. 2023/24	No Project. Daily Operations.	Finance Community Services Technical Service	Operation Staff	R 74 333 333				2023/24 R 71 000 000	2024/25 R 74 000 000	2025/26 R 78 000 000	2026/27	
1.2	Objectives													
1.2.1	Round balancing needs to be done on collection routes to optimise the routes and to ensure effective utilisation of resources		Improve round/route balancing	Can be done internally or appoint consultant	8	R200 000	R 200 000 if consultant is used				2024/25			
1.2.2	Obtain additional collection unit as backup to existing collection units	Fleet management		Fleet Manager Finance Budget office	3		R 2,500,000.00	Internal			2024/25	2025/26	/2026/27	

Human	WASTE MANAGEMENT COMPONENT	Comment	Project	Type of Personnel Required	No Required	Cost per Annum (Level)	Estimated cost	Possible funding	Implementation programme					
									Year					
									2022 - 2023	2023 - 2024	2024 - 2025	2025-2026	2026-2027	Medium term
1.2.4	Waste receptacles should be provided to households in informal areas and a system of collection should be investigated	Investigate best possible system for each area in consultation with respective communities	Investigation on best receptacles to be provided to residents.	Consultant DEA&DP	1	TBD						2025/26		
1.2.5	Improve refuse collection in informal settlements	Investigate best possible system for each area in consultation with respective communities. Refere to 1.2.5 3	Implement appropriate collection and if required transfer system in informal areas, can be local entrepreneurs collecting into bulk containers for the municipality to collect. Appoint suitable consultant to investigate	Community Service Directorate WMO	1		R 1 700 000	Funded Internal			2024/25			
2														
2.1	Goal													
	To render a sustainable cost-effective commercial refuse removal service in formal areas as per the required frequency. To further ensure the standardisation of commercial containers and adequate storage space at the service point	Part of Wheelie bin plan	Long term policy to purchase, already being implemented for Households. Investigation to supply businesses	WMO	1	N/A							2025/26	
2.2	Objectives													
2.2.1	The implementation of a reliable service i.e. to service each service point as per the number of times paid for per week	Part of route planning and business register	Engage with local businesses regarding specific needs and how the TWKM can better service delivery at each business	WMO	1	N/A				2023/24	2024/25	2025/26	2026/27	

Human	WASTE MANAGEMENT COMPONENT	Comment	Project	Type of Personnel Required	No Required	Cost per Annum (Level)	Estimated cost	Possible funding	Implementation programme					
									Year					
									2022 - 2023	2023 - 2024	2024 - 2025	2025-2026	2026-2027	Medium term
2.2.2	Inputs from the WMS into building and development plans to ensure that adequate allowance has been made for waste storage areas	Town planning		Waste manager to play oversight role	1	N/A	N/A	Operations		2023/24	2024/25	2025/26	2026/27	
3														
3.1	Goal													
	There should be always serviceable collection equipment as well as sufficient back-up collection equipment	Already received a collection vehicle from DFFE		Fleet Section					2022/23					
3.2	Objectives													
3.2.1	Ensure that waste collection equipment is replaced in cycles of 7 years maximum	Currently only two collection units is less than 7 years old	Replace one collection unit each year	Fleet Section						R 2,500,000	R 2,500,000	R 2,500,000	R 2,500,000	
3.2.2	Collection equipment should be serviceable at all time, full maintenance leasing or service plans should be included in procurement of equipment		Investigate lease and maintenance options With fleet	Fleet Section	6 as from 2023		TBD	Capital		TBD	TBD	TBD	TBD	TBD
3.2.3	Ensure that there is adequate spare capacity for any type of collection unit or systems (additional equipment that can be on standby) as well as reliable backup service from leasing company. Reliable back-up service will result in less down time and overtime	We did received a new truck from DFFE - Government	Investigate possible sponsors/ grants.	Fleet Section	3		R 7 500 000				2023/24	2024/25	2025/26	
3.2.4	The possibility of outsourcing the operations at	Possible Section 78 investigation		Deputy Director Community Service			Funded	Internal		2023/24 R 650 000				

Human	WASTE MANAGEMENT COMPONENT	Comment	Project	Type of Personnel Required	No Required	Cost per Annum (Level)	Estimated cost	Possible funding	Implementation programme					
									Year					
									2022 - 2023	2023 - 2024	2024 - 2025	2025-2026	2026-2027	Medium term
	WDFs should be investigated													
4														
4.1	Goal													
	To implement a proper, adequately staffed street cleaning service in all business areas, decentralised business areas and along all major routes at the various towns within the TWKM area.		Part of Extended public works program	Temporary workers appointed per year Ongoing			Operational	Public works and TWK		2023/24 R 1 700 000	2024/25	2025/26	2026/27	
	To place an adequate number of litter bins within business areas and high use areas throughout the TWKM which is serviced on a regular basis		Investigation in process .	WMO				Internal		2023/24				
4.2	Objectives													
4.2.1	Acquire an adequate number of street bins for each business area and high use area within the municipality. A survey should be done of all these areas within the municipality to determine the need and if required the number of street bins for each area	Detailed assessment of requirements for number of litter bins required in all areas	Already in process							2023/24	2024/25	2025/26	2026/27	
4.2.2	The method of servicing these bins and the time and cost implication should also be investigated. Recommendation should be made on the implementation of the service and possible financial social and		As above 4.2.1	Community Service Directorate	1	R 200 000					2024/25	2025/26	2026/27	

Human	WASTE MANAGEMENT COMPONENT	Comment	Project	Type of Personnel Required	No Required	Cost per Annum (Level)	Estimated cost	Possible funding	Implementation programme					
									Year					
									2022 - 2023	2023 - 2024	2024 - 2025	2025-2026	2026-2027	Medium term
	environmental impacts													
5														
5.1	Goal													
	To ensure the safe handling and disposal of Industrial (non-hazardous and hazardous) waste and Health Care Risk Waste generated or handled within the municipal area		Waste Collectors to comply to registration to ensure collection is done by competent and registered companies.	WMO	1		N/A	internal	2022/23	2023/24	2024/25	2025/26	2026/27	
5.2	Objectives													
5.2.1	That the TWKM keeps track of any/ all Industrial (non-hazardous and hazardous) and Health Care Risk Waste generated or handled within the municipal area		Waste Collectors to report on all collections in the municipal area as per authorisation provided to collectors when registered.	WMO	1	N/A	N/A	Internal	2022/23	2023/24	2024/25	2025/26	2026/27	
5.2.2	The implementation and management of the WIS will have to be such as to ensure the successful monitoring of these types of waste		Appoint data officer.				R300 000	Internal				2025/26		
5.2.3	Ensure that the collectors of Industrial (non-hazardous and hazardous) and Health Care Risk Waste register with the TWKM (should be capture in By-laws). Further that they handle and dispose of the waste as prescribed by the		Review bylaw Project funded. Refer to A 2.1.3	TWK Consultant			R 113 000	Internal		2023/24				

Human	WASTE MANAGEMENT COMPONENT	Comment	Project	Type of Personnel Required	No Required	Cost per Annum (Level)	Estimated cost	Possible funding	Implementation programme					
									Year					
									2022 - 2023	2023 - 2024	2024 - 2025	2025-2026	2026-2027	Medium term
	By-laws (TWKM to ensure that this aspect is covered correctly in the By-laws) and that this process is monitored through the WIS		Refer to A 2.1.3											
E														
1	Landfills, also part of compliance, a strategic pillar of the NWMS													
1.1	Goal													
	To ensure that the WDFs/landfills are run according the Minimum Requirements for Waste Disposal By landfill (DWAF 1998) as well as license conditions. Decommissioned landfills should be properly rehabilitated and monitored on a regular basis		Operational	WMO		R 3 000 000		Operational		2023/24	2024/25	2025/26	2026/27	
1.2	Objectives													
1.2.1	The proper upgrading, rehabilitation, operation, maintenance and monitoring of WDFs should be prioritised due to the current situation at most of the facilities	The TWKM provided a capital expenditure budget for the next 5 years for rehabilitation and establishment of new WTFs	Numerous projects currently budgeted, closure cost for existing landfill were provided during 2021 and updated cost taking CPI of 5,9% shown for 2022 cost	Consultant / Contractor			R 117,354,713.60	Interna/MIG	R 7,371,909.00	R 8,500,000.00	R 18,676,176.00	R 18,500,000.00	R 14,500,000.00	R 49,806,628.60
1.2.2	The existing landfill sites, the closed landfill and any future WDFs must be monitored on a regular basis. Any operational WDFs also needs to be audited on a regular basis. (At least annually,	Is currently happening	Managing Landfill Sites	Consultant annually				Internal		2023/24	2024/25	2025/26	2026/27	

Human	WASTE MANAGEMENT COMPONENT	Comment	Project	Type of Personnel Required	No Required	Cost per Annum (Level)	Estimated cost	Possible funding	Implementation programme					
									Year					
									2022 - 2023	2023 - 2024	2024 - 2025	2025-2026	2026-2027	Medium term
	ideally bi-annually). The monitoring and auditing of the facilities by competent external service suppliers, and budget allocated													
2.2.2	Incorporate such facilities as the newly and currently being developed transfer stations	In Process		WMO						2023/24				
F	INSTITUTIONAL													
1	Personnel													
1.1	Goal													
	To staff all management and supervisory positions and to have adequate, medically fit, well trained personnel to cover the range of tasks required to deliver a total waste management service to the communities		Human resources section Seta Application medical test Hepatitis B Injections	All staff in waste management in TWK			R 80 000 for	Operational Budget SETA Grant			2024/25	2025/26	2026/27	
1.2	Objectives													
1.2.1	To have medically fit personnel to use as runners for the collection service. This is physically demanding work and requires personnel that can handle the physical stress. There needs to be at least 4 runners per collection vehicle for domestic collection	Implement proposed staff organograms Process to review organogram	Employing adequate personnel and train all waste management related personnel adequately for their respective positions	Human resource section HR Policy							2024/25	2025/26	2026/27	
1.2.2	Personnel should be trained in their respective task	Train Personnel	SETA Application	Human resources section			R 300 000	Grant			2024/25	2025/26	2026/27	

Human	WASTE MANAGEMENT COMPONENT	Comment	Project	Type of Personnel Required	No Required	Cost per Annum (Level)	Estimated cost	Possible funding	Implementation programme					
									Year					
									2022 - 2023	2023 - 2024	2024 - 2025	2025-2026	2026-2027	Medium term
	since they are dealing with potentially hazardous material. There are numerous training modules available from private waste contractors on the various aspects of waste management													
1.2.3	The WDF manager, access controller, spotter and operator need to undergo various levels of training to ensure that the landfills are operated according to the required standards	Train Personnel	SETA application	Human resources section			R 250 000	Internal			2024/25	2025/26	2026/27	
1.2.4	Consideration should be given to creating a position for an education and awareness / recycling and waste minimisation co-ordinator		Appoint data officer and education section.				R 500 000					2025/26	2026/27	
2	Finances / income / revenue													
2.1	Goal													
	Have council committed to the IWMP, to ensure that the correct budgeting takes place and that the appropriate revenue collections systems are in place	Item taken to council		Finance section ,Council and WMO				MIG TWK			2024			
2.2	Objectives													
2.2.1	Council should adopted the IWMP in its entirety, including the associated budgets and programmes	Item taken to Council		WMO	1					2024				

Human	WASTE MANAGEMENT COMPONENT	Comment	Project	Type of Personnel Required	No Required	Cost per Annum (Level)	Estimated cost	Possible funding	Implementation programme						
									Year						
									2022 - 2023	2023 - 2024	2024 - 2025	2025-2026	2026-2027	Medium term	
2.2.2	The IDP should be adjusted accordingly as to ensure the correct budgeting and implementation of recommendations		Part of IDP Public Meetings for new objectives	WMO	1					2023/24	2024/25	2025/2026	2026/27		
2.2.3	Council should ensure that the revenue generated by the WMS is channelled back into the department	Capital levy part of Municipal Account	Rehabilitation fund	Finance and budget office WMO						2023/24	2024/25	2025/2026	2026/27		
2.2.4	Utilisation of subsidised funding schemes	Ongoing for projects	Funding applications	MIG							2024/25	2025/2026	2026/27		
G															
	Total Cost	The various funding mechanisms should be finalised for the proposed projects and personnel requirements and this section of the planning document should be updated							R	R	R	R	R	R	
	National treasury - Section 78 studies									7,371,909.00	10,030,000.00	20,426,176.00	26,000,000.00	22,000,000.00	57,306,628.60
	Total MIG funded														
	Counter funding														
	Municipal funded														
	Total Municipal Funded														

Appendix B – OWDP and WMS

Appendix C – Audit action plans

Caledon Action Plan

Genadendal Action Plan

Grabouw Action Plan

Greyton Action Plan

Appendix D – Comments received from Department of Forestry, Fisheries and the Environment

In diversity there is beauty
and there is strength.

MAYA ANGELOU

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