CEDERBERG MUNICIPALITY

INTEGRATED WASTE MANAGEMENT PLAN
(4TH Generation)

(*Draft Report*)

COMPILED BY:

JPCE
(Specialist Consulting Engineers)

June 2022

REPORT: CEDERBERG MUNICIPALITY – INTEGRATED WASTE MANAGEMENT PLAN – DRAFT REPORT

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CEDERBERG MUNICIPALITY

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ABBREVIATIONS

CBD	Central Business District
CM	Cederberg Municipality
D:EA&DP	the Department: Environmental Affairs and Development Planning
DEFF	the Department of Environment, Forestry and Fisheries
HCGW	Health Care General Waste
HCRW	Health Care Risk Waste
HDPE	High Density Polyethylene
IDP	Integrated Development Plan
IPWIS	Integrated Pollutant and Waste Information System
IWMP	Integrated Waste Management Plan
KPI	Key Performance Indicator
LDPE	Low Density Polyethylene
MEC	Member of the Executive Council
MRF	Material Recovery Facility
NDP	National Development Plan
NWMS	National Waste Management Strategy
NU	Non-urban
OWDP	Organic Waste Diversion Plan
PET	Polyethylene terephthalate
PVC	Polyvinyl Chloride
SAWIS	South African Waste Information System
SDF	Spatial Development Framework
SP	Sub-place
WCDM	West Coast District Municipality
WCPSDF	Western Cape Provincial Spatial Development Framework
WMO	Waste Management Officer
WWTW	Waste Water Treatment Works

CEDERBERG MUNICIPALITY

INTEGRATED WASTE MANAGEMENT PLAN

FOURTH GENERATION

EXECUTIVE SUMMARY

INTRODUCTION

JPCE (Pty) Ltd has been appointed by the Cederberg Municipality (CM) in the West Coast District of the Western Cape Province to assist in developing their fourth generation Integrated Waste Management Plan (IWMP). This fourth generation IWMP was developed during 2022 and will now replace the third (2015) generation IWMP currently in circulation.

The terms of reference for this development are to source the required information, interpret the relevant data and plan accordingly in order to complete the IWMP in terms of the requirements as set out in the National Environment Management: Waste Act (Act no. 59 of 2008) and the contents listed below as required by the Department: Environmental Affairs and Development Planning (D:EA&DP).

Chapter 3, Section 11 (4) of the Waste Act states that each Municipality must submit its IWMP to the Member of the Executive Council of a province (MEC) for approval and include the approved IWMP in its Integrated Development Plan (IDP) contemplated in Chapter 5 of the Municipal Systems Act.

Chapter 3, Section 12 of the Waste Act further states that the contents of an IWMP must be at least the following:

(a) A situation analysis

(b) Within the domain of the Department, provincial department or municipality, set out how that Department, provincial department or municipality intends –

   i. To give effect, in respect of waste management, to Chapter 3 of the National Environmental Management Act;
   ii. To give effect to the objects of this Act;
   iii. To identify and address the negative impact of poor waste management practices on health and the environment;
   iv. To provide for the implementation of waste minimisation, reuse, recycling and recovery targets and initiatives;
   v. In the case of a municipal IWMP, to address the delivery of waste management services to residential premises;
   vi. To implement the Republic's obligations in respect of any relevant international agreements;
   vii. To give effect to best environmental practice in respect of waste management;

(c) Within the domain of the Department or provincial department, set out how the Department or provincial department intends to identify the measures that are required and that are to be implemented to support municipalities to give effect to the objects of this Act;

(d) Set out the priorities and objectives of the Department, provincial department or municipality in respect of waste management;

(e) Establish targets for the collection, minimisation, re-use and recycling of waste;

(f) Set out the approach of the Department, provincial department or municipality to the planning of any new facilities for disposal and decommissioning of existing waste disposal facilities;

(g) Indicate the financial resources that are required to give effect to the plan;

(h) Describe how the Department, provincial department or municipality intends to give effect to its IWMP; and

(i) Comply with the requirements prescribed by the Minister.

The Cederberg Municipality compiled a draft IWMP document in August 2021 and submitted it to the D:EA&DP for comment. D:EA&DP's comments were substantial and required a re-write of the IWMP which resulted in the Municipality appointing JPCE for the compilation of this report. The D:EA&DP comments received on 27 October 2021 have been addressed in the compilation of this report.

The waste types measured and discussed are the following:

- Domestic waste
- Garden waste
- Building (construction) waste
- Household hazardous waste
- Hazardous waste (including health care risk waste)

The main goals of the IWMP are as listed below. These goals are aligned with the Western Cape IWMP, the National Waste Management Strategy, the National Development Plan, the Cederberg Spatial Development Framework and Integrated Development Plans. The achievement of the main goals will be through the planned implementation of actions as detailed in Chapter 6 of the IWMP.

Goal 1: Strengthened education, capacity and advocacy towards Integrated Waste Management
Goal 2: Improved integrated waste management planning and implementation for efficient waste services and infrastructure
Goal 3: Effective and efficient utilisation of resources
Goal 4: Improved compliance with environmental regulatory framework

The municipality is approximately 8,007km^2 in area and the major towns are Clanwilliam, Citrusdal, Elands Bay, Lamberts Bay and Graafwater. Other smaller settlements are Wupperthal, Leipoldtville, Eselsbank and Algeria. The N7 traverses the municipality from Piketberg in Bergrivier Municipality through Clanwilliam to Vanrhynsdorp in Matzikama Municipality.

STATUS QUO

The status quo assessment entails the situational analysis of the Cederberg Municipality, which includes amongst others, the applicable legislation, population description, waste types and quantities generated and waste management services overview.

The applicable legislation discussed in the IWMP consists of the following:

- Constitution of the Republic of South Africa
- National Environmental Management Act
- Environment Conservation Act, 1989 (Act NO. 73 of 1989)
- The Western Cape Health Care Waste Management Amendment Act
- National Water Act (Act no. 36 of 1998)
- National Environment Management: Air Quality Act 2004 (Act no. 39 of 2004)
- National Waste Management Strategy (2020)
- White Paper on Education and Training (1995)
- The Municipal Systems Act (Act 32 of 2000)
- The Municipal Structures Act, 1998 (Act no. 117 of 1998)
- National Environmental Management: Waste Act, 2008 (Act no. 59 of 2008) ("The Waste Act") and subsequent Norms and Standards
- National Policy for the Provision of Basic Refuse Removal Services to Indigent Households, Government Notice 34385, 22 June 2011
- White paper: policy on pollution prevention, waste minimisation, impact management and remediation (March 2000)
- The Western Cape Provincial Spatial Development Framework (March 2014)
- The OneCape 2040
- Western Cape Provincial Strategic Plan (2014 – 2019)
- WC Green Economy Strategy Framework
- The Basel Convention

- The Montreal Protocol
- The Rotterdam Convention
- The Stockholm Convention
- Municipal By-laws

The Cederberg Municipal waste by-law was recently updated and requires no amendment at this time.

DEMOGRAPHICS

The demographics and related statistics were obtained from Statistics SA and the Western Cape Government's Socio-Economic Profiles.

The 2011 Census figures indicate that the Cederberg Municipality had a total population of 49,773 people with a 2.3% annual population growth rate since the 2001 Census. The 2016 Community Survey estimated the Cederberg population to be 52,949 which equates to a 1.25% annual increase (between 2011 and 2016). The population of Cederberg was 59,382 people in 2020 according to the 2020 Socio-Economic profile published by the Western Cape Government, equating to an annual population growth rate of 2.91% between 2016 and 2020. This total is expected to growth to 63,057 by 2024, equating to an average annual growth rate of 1.5% for that period and this growth rate was then used for future projections and calculations in this report. The CM is the least populated municipality within the West Coast District and contains 12.3% of the total West Coast District 2022 population (481,267).

The majority of the population resides in rural areas (49.65%), followed by Clanwilliam (13%), Lambert's Bay (12%) and Citrusdal (12%). The Cederberg Municipality has a population density of 7 people/km^2 compared to 15 people /km^2 for the West Coast District Municipality.

WASTE CLASSIFICATION

With reference to the Waste Act, *National Norms and Standards for Disposal of Waste to Landfill as well as Assessment of Waste for Landfill Disposal*, *23 August 2013,* the only types of waste allowed for disposal at the Cederberg disposal facilities are general or Type 2, 3 and 4 wastes. No Cederberg municipal facilities are allowed to accept hazardous or Type 1 wastes for disposal.

The CM uses the Citrusdal, Clanwilliam, Lambert's Bay and Eland's Bay landfills for waste disposal. None of these facilities have weighbridges for the recording of waste data so the gate controllers use the IPWIS form to manually record waste tonnages.

General Waste characterisation

A waste characterisation study was undertaken by Aquila Environmental in June 2022 from data obtained on the general waste stream in certain Cederberg Municipality suburbs. It took place over a 5 day period from Monday 6 June to Friday 10 June at the Cederberg, Citrusdal, Lambert's Bay and Elands Bay Landfills.

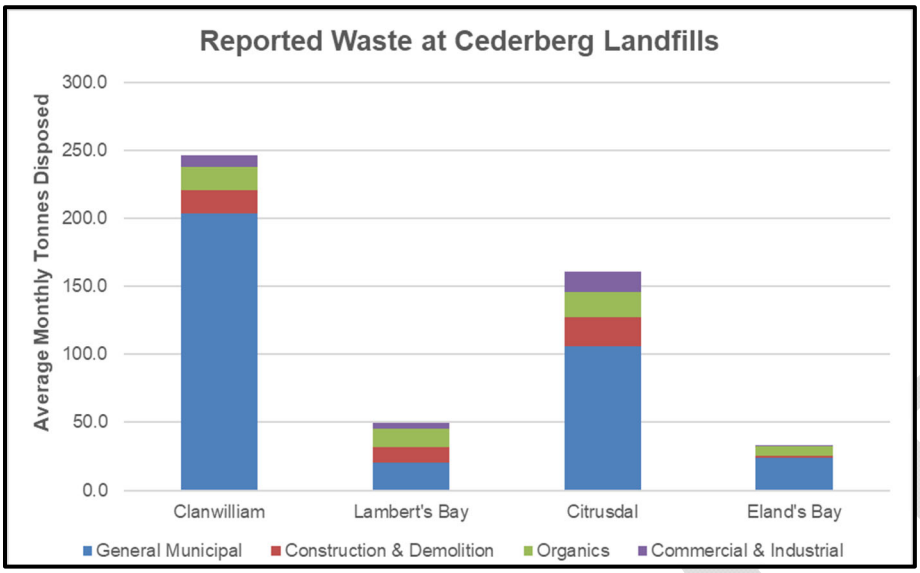
The waste was sorted into 14 categories and data was captured by hand on site on fit-for-purpose data capturing sheets. It was digitised with the assistance of Microsoft Excel, post characterisation. Data was analysed with Microsoft Excel. Only waste collected by the municipality's compactor vehicle was characterised. Waste taken to site by private contractors, individuals or businesses were not characterised.

Little food waste was observed from the areas characterised which were mostly low income areas. The one higher income area characterised (Elands Bay South) does not have many permanent residents so the waste characterised from there cannot be seen as a true representation of that area as it was done outside season. However, the waste fraction was noticeably different from a visual perspective, i.e. included wine bottles, fewer Tetrapak, different packaging types etc.

The limitations of the study did not allow sampling to take place across all income groups so the results should be seen as representative of the lower income groups of the Municipality.

General Waste quantities

The data provided to the IPWIS shows that the Cederberg landfills on average about 490 tonnes per month (about 5,870 tonnes per annum), which is made up of mostly general municipal waste and sent mostly to the Citrusdal and Clanwilliam landfills. The monthly average data was taken from reported figures for the calendar years of 2020 and 2021.



When determining municipal waste generation quantities, assumed waste generation rates of 0.41kg per person per day was used for low-income groups, 0.74kg per person per day for middle income groups and 1.10kg per person per day for high income groups. These are in line with findings from the DEA 2006 State of the Environmental Report and adapted for a low population municipality like CM. Using the available data from the population and income group statistics discussed under previous headings, the estimated current and future quantities of general waste for the Cederberg Municipality was calculated as being about 7,300 tonnes per annum in 2021. The difference in tonnages between the landfilled waste of about 5,900 tonnes per annum and the approximately 7,300 tonnes per annum in the estimate, is mostly made up of the waste portion that gets recycled, re-used, composted etc. post consumption and pre-disposal.

Hazardous waste

A Hazardous and Health Care Risk Waste (H&HCRW) Survey was conducted in June 2022 in Cederberg Local Municipality. The survey found that H&HCRW generated in the study area could be categorised under four of the potential seventeen Industrial Groups listed in Schedule 3 of the National Environmental Management: Waste Amendment Act (NEM:WAA) (Act No. 26 of 2014). The study found that 12 400 litres of waste oils are generated in the study area per annum. It is estimated that at least 2 000 units of waste tyre waste is generated per annum. The quantity of Health Care Risk Waste generated in the study area per annum is approximately 7 tons. The study found that the majority of businesses generating H&HCRW have adequate systems in place to deal with such waste in a responsible manner.

EXISTING WASTE MANAGEMENT STRUCTURE, SYSTEMS AND PRACTICES

Organisational structure

Waste Management falls under the responsibility of the Operational Services Directorate in CM and the Director: Operational Services position is currently vacant. Similarly, the position of Solid Waste Manager, who needs to be appointed as per the requirements of the Waste Act, is also vacant.

There are three civil engineering services teams which are each led by a senior foreman, based in Lamberts Bay, Citrusdal and Clanwilliam. The foreman is responsible for overseeing the operations of solid waste management. The waste management teams report to the supervisors but are led by a refuse team leader or supervisor. The teams consist of truck and tractor drivers, WMF operators and general workers.

Although the organisational structure is sufficient to effectively deliver the current required solid waste services in Cederberg, there are a number of vacancies that need to be filled. It must be noted that once the regional landfill starts operation there will be a review of the organogram in order to ensure that updated roles are assigned.

Collection and cleansing services

The collections are split into three teams as mentioned in the waste organogram. Collections are done for all towns, but the three teams are based in Lamberts Bay, Citrusdal and Clanwilliam. The Lamberts Bay team also collects waste in Graafwater and Elands Bay. The waste collection schedule is provided on the CM website. The CM uses wheelie bins in most areas with black bags being distributed to informal settlements for collection.

Street cleaning is divided into two teams: one in Citrusdal comprising four full time street cleaners and the other four full time street cleaners are responsible for Clanwilliam. Both street cleaning teams are overseen by the refuse team leader or supervisor of each town. The main method of collection is via road transport. Black bin bags and bins are provided in urban areas and collected by rear end loading (REL) compactor vehicles whilst garden greens are collected by tractor trailers.

The Census 2011 data for Cederberg Municipality showed that only about 58% of people received a weekly refuse collection service. In the latest Municipal IDP (2017-2022) document it was reported that this percentage had increased to almost 70% in 2017, and currently the Municipality reports that all people in urban areas have access to a weekly solid waste removal service. Considering that more than 47% of the total population of the Municipality lives in rural areas, it is clear that many if not most people in rural suburban areas also receive a waste collection service. It is unclear how many of the population reported as rural are housed on farms and smallholdings, but farms and smallholdings do not receive a weekly refuse collection service, and the people in these areas take their waste to the nearest drop-off or landfill facility or manage it themselves.

Recycling and Diversion

The recycling is done by private contractors under agreement with the Municipality. They collect from businesses and some households and although not all recovered waste is reported to the Municipality the information provided to IPWS shows that only about 1% of the general waste generated gets recovered for recycling. The Municipality requires an increased effort to improve on recycling of waste.

The CM does not currently divert any organic waste from its landfills and garden and food waste get taken to the Clanwilliam, Cederberg, Elands Bay and Lamberts Bay Landfills through municipal collection of wheelie bins, and dropped off in bulk by members of the public. An Organic Waste Diversion Plan was developed, and the Municipality needs to source funding to ensure implementation thereof.

Awareness & Education

The Cederberg Municipality understands the importance of awareness and education when it comes to waste management, and they conduct regular campaigns to reinforce this with the community. Examples of the types of campaigns conducted are:

- Street Clean-ups.
- Door-to-door campaigns to share information
- Provisions of wheelie bins for recycling to schools
- Recycling awareness campaigns at schools
- Awareness and educational site visits to businesses
- Providing tools and equipment to schools

The Municipality reports on these campaigns on a monthly basis and these initiatives need to remain and improve to ensure that the population understands the importance of waste minimisation and diversion.

Waste disposal facilities

The disposal facilities of the Cederberg Municipality that are discussed in the IWMP are the following:

Operating Landfills: Citrusdal, Clanwilliam, Lambert's Bay and Eland's Bay

Closed Landfills: Algeria, Wupperthal, Leipoldtville, Graafwater and Eselsbank

Some of the licences for the closed landfills have lapsed and an application process for new closure licences is required. Some of the closure licenses are still valid and decommissioning need to commence before the dates as stipulated in theses licences.

There are currently no public solid waste drop-off facilities, waste transfer stations or material recovery facilities in the Cederberg Municipality.

The new regional landfill to service the Matzikama and Cederberg Municipalities is planned to start operation by mid-2024, and all of the Cederberg Municipal landfills will then have to be closed and rehabilitated with a transfer station developed in Clanwilliam for loading of waste onto long-haul vehicles for final disposal at the regional landfill. Waste collection will remain a municipal function for transport to the proposed new transfer station and public drop-off facilities would then have to be developed in all of the towns within the Municipal area.

Gaps and Needs

From the status quo evaluation, the gaps and needs were identified. These are discussed in chapter 4 under the following categories:

- Legislation
- Waste Generation Quantities
- Collection Needs
- Waste Transportation and Waste Transfer Needs
- Waste Minimisation, Recycling and re-use initiatives
- Landfill Licence Compliances
- Airspace Requirements
- Institutional and Organisational needs
- Identification of Alternatives
- Funding Mechanisms

Arising from the gaps and needs the implementation of the IWMP was developed, aligned with the main goals.

Goal 1: Strengthened education, capacity and advocacy towards Integrated Waste Management							
Objectives		**2022**	**2023**	**2024**	**2025**	**2026 and on**	**Priority**
Strategic Objective 1:	Facilitate consumer and industry responsibility in integrated waste management	Create a permanent position in the solid waste department or appoint a person that will address and co-ordinate the requirements of awareness. This person will co-ordinate the follow-up visits to the special and hazardous waste generators in the Swartland municipality to ensure that all these generators are aware of applicable legislation and are following steps to become compliant if required. This person will also oversee the information gathering as per the by-laws, in other words, ensure that generators and transporters report to the municipality as required. General public awareness and feedback on recycling issues and information will also fall under the duties of this person. If this role can be assigned to an existing person with adequate skill and capacity, this needs to be done. A focused campaign addressing illegal dumping must be executed. In addition, it is crucial that the implications of the existing airspace challenge and the resulting need to develop a new regional landfill and waste transfer infrastructure, be explained tot the public through a number of workshops.					Mild
Strategic Objective 2:	Promote and ensure awareness and education of integrated waste management						High
	Costs & Human Resources	Clean-up & Awareness campaigns: R200,000 per annum					
Strategic Objective 3:	Build and strengthen waste management capacity	Fill all vacant posts as needed. Municipal solid waste employees to attend education seminars and waste forums as is appropriate for their specific responsibility levels. Capacity training and education must be conducted within the municipality where needed. It must be ensured that the solid waste management employees are informed regarding the latest legislation and how to appropriately handle and identify various waste types. Law enforcement departments must also be approached and receive education in solid waste legislation and management to enable them to identify issues and act when required. The South African Institute of Waste Management (www.iwmsa.co.za) is a voluntary organization that provides training on the management of waste. The Cederberg Municipality is encouraged to have their staff become members of this institute and to attend the training sessions that is available on their website. The Waste Management Officer attends the Western Cape Provincial Waste Forum and The Western Cape Recycling Action Group.					High
	Costs & Human Resources	Costs to be determined (OPEX). One to two persons in the municipality required, or a consultant can be appointed for public awareness and education. Additional costs are dependent on the number of employees attending educational and capacity building events.					

Goal 2: Improved integrated waste management planning and implementation for efficient waste services and infrastructure							
Objectives		**2022**	**2023**	**2024**	**2025**	**2026 and on**	**Priority**
Strategic Objective 1:	Facilitate municipal waste management planning	Finalise 4th generation IWMP	Review IWMP and submit IWMP annual report along with implementation projects update and additional implementation	Review IWMP and submit IWMP annual report along with implementation projects update and additional implementation	Review IWMP and submit IWMP annual report along with implementation projects update and additional implementation	Start IWMP 5th generation development.	High and under way
	Costs & Human Resources	R400,000. Appointed consultants and specialists	R160,000. Appointed consultants	R160,000. Appointed consultants	R170,000. Appointed consultants	R170,000. Appointed consultants	
	Facilitate municipal waste management planning	Waste Management Masterplan annual update	Waste Management Masterplan annual update	Waste Management Masterplan annual update	Waste Management Masterplan annual update	Waste Management Masterplan annual update	High
	Costs & Human Resources	R150,000. In-house and consultants	R150,000. In-house and consultants	R150,000. In-house and consultants	R150,000. In-house and consultants	R150,000. In-house and consultants	
Strategic Objective 2:	Promote industry waste management planning	This objective is coupled with Goal 1, where the appointed persons will liaise with industry to ensure that they are aware of the relevant legislation. Follow-up meetings and on-going communication will ensure that industry sufficiently plans and implements actions in order to be compliant and reduce waste generation along with responsible handling/treatment/transport/disposal.					High
Strategic Objective 3:	Promote the establishment of integrated waste management infrastructure and services	Continued Collection Service Review: The municipality must ensure that all residents receive an affordable waste service at an acceptable level at all times. The Solid Waste departments must liaise with the town planning department to stay up to date with new areas that require or will require services. The complaints registry and service requests must be reviewed monthly by the Waste Management Officer. The older Municipal collection vehicles currently in the Municipal fleet aged above 7 to 8 years, must be assessed in terms of running cost and effectivity. Where vehicles are operating beyond their effective economic lifetimes or are not the most efficient vehicles for their functions, they must be replaced. It must also be ensured that each vehicle's function is thoroughly assessed in order to replace the old vehicles with the most efficient and cost-effective ones. The Waste Management Officer will be responsible for planning and coordinating with the Operations department, who will be responsible for vehicle assessment.					High
		New chipper & trailer	19m^3 REL Collection vehicle		Additional Collection vehicles		
	Costs & Human Resources	R1,000,000	R2,500,000.00		To be determined during 2024 Annual Report		

Goal 2: Improved integrated waste management planning and implementation for efficient waste services and infrastructure							
Objectives		**2022**	**2023**	**2024**	**2025**	**2026 and on**	**Priority**
	Promote the establishment of integrated waste management infrastructure and services	Replace sign boards, access gates and fences at existing landfill sites as per external audit outcomes.	Work with WCDM for development of Transfer Station in Clanwilliam as per regional landfill business case	Develop solid waste public drop-off facilities in all towns except Clanwilliam.			High
	Costs & Human Resources	R500,000	R24 Million (financed by WCDM)	R3.5 Million (Lambert's Bay), R2.2 Million (Graafwater), R3.3 Million (Citrusdal), R2.2 Million (Eland's Bay)			
	Promote the establishment of integrated waste management infrastructure and services	Equipment: Refuse bins, traps, skips, general					Medium
	Costs & Human Resources	R100,000	R120,000	R140,000	R160,000	R180,000	
Strategic Objective 4:	Ensure effective and efficient waste information management	Improve the detail with which the waste data is recorded, both for generation and transportation. Continue recording at landfill gates and reporting to IPWIS by the Waste Management Officer.					High

Goal 3: Effective and efficient utilisation of resources							
Objectives		**2022**	**2023**	**2024**	**2025**	**2026 and on**	**Priority**
Strategic Objective 1:	Minimise the consumption of natural resources	This also ties in with Goal 1 to promote waste minimisation and recycling, which will in turn reduce pressure on natural resources by re-using materials efficiently. New facility designs must take cognisance of natural resource protection. For example, a rehabilitated disposal site must be covered with indigenous vegetation suited to the climate so as not to require additional watering to thrive. Awareness and education should place additional focus on waste avoidance, reducing the need for diversion methods and disposal.					High
Strategic Objective 2:	Stimulate job creation within the waste economy	Assess job creation opportunities, both permanent and temporary in the waste management field and upcoming projects. Job creation remains a top need in the community.					High
Strategic Objective 3:	Increase waste diversion through reuse, recovery and recycling	Initiate OWDP implementation	Conduct organic waste detail study to inform and update the OWDP and direct implementation for achieving targets.				Very high
	Costs & Human Resources	TBD	TBD	TBD	TBD	TBD	

Goal 4: Improved compliance with environmental regulatory framework							
Objectives		**2022**	**2023**	**2024**	**2025**	**2026 and on**	**Priority**
Strategic Objective 1:	Strengthen compliance monitoring and enforcement	Conduct required internal and external compliance audits at all waste management facilities as required according to licences and legislation. Findings must be communicated to the D:EA&DP as required.					High
	Costs & Human Resources	Appoint independent external auditors. R150,000 per annum (increasing with inflation) which includes Clanwilliam, Citrusdal, Lambert's Bay and Eland's Bay. Costs to increase if other sites are added.					
	Strengthen compliance monitoring and enforcement	Ties in with Goal 1: Illegal Dumping Committee to enforce action on illegal dumpers.					High
Strategic Objective 2:	Remediate and rehabilitate contaminated land	Apply for Closure Licences For Algeria, Eselsbank & Leipoldtville sites	Close and rehabilitate the Lambert's Bay Graafwater and Wupperthal landfills		Close and rehabilitate the Eland's Bay, Citrusdal and Clanwilliam landfills		High
	Costs & Human Resources	R180,000 per site	R4 Million each for Graafwater and Wupperthal. R16 Million for Lambert's Bay		R22 Million for Citrusdal, 18 Million for Clanwilliam and 5.6 Million for Eland's Bay		
Strategic Objective 3:	Facilitate the development of waste policy instruments			Update by-laws		Update by-laws	Low
	Costs & Human Resources					TBD	
Strategic Objective 4:	Promote self/co-regulatory measures	Ties in with Goal 1. Person responsible to liaise with industry should promote the implementation of these measure e.g. through reviewing industry waste management plans. Ensure annual IWMP review and reporting.					Medium

CEDERBERG MUNICIPALITY

INTEGRATED WASTE MANAGEMENT PLAN

FOURTH GENERATION

1. INTRODUCTION

1.1 TERMS OF REFERENCE

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Chapter 3, Section 12 of the Waste Act further states that the contents of an IWMP must be at least the following:

(j) A situation analysis that includes

i. A description of the population and development profiles of the area to which the plan relates;
ii. An assessment of the quantities and types of waste that are generated in the area;
iii. A description of the services that are provided, or that are available, for the collection, minimisation, reuse, recycling and recovery, treatment and disposal of waste; and
iv. The number of persons in the area who are not receiving waste collection services;

(k) Within the domain of the Department, provincial department or municipality, set out how that Department, provincial department or municipality intends –

viii. To give effect, in respect of waste management, to Chapter 3 of the National Environmental Management Act;
ix. To give effect to the objects of this Act;
x. To identify and address the negative impact of poor waste management practices on health and the environment;
xi. To provide for the implementation of waste minimisation, reuse, recycling and recovery targets and initiatives;
xii. In the case of a municipal IWMP, to address the delivery of waste management services to residential premises;
xiii. To implement the Republic's obligations in respect of any relevant international agreements;
xiv. To give effect to best environmental practice in respect of waste management;

(l) Within the domain of the Department or provincial department, set out how the Department or provincial department intends to identify the measures that are required and that are to be implemented to support municipalities to give effect to the objects of this Act;

(m) Set out the priorities and objectives of the Department, provincial department or municipality in respect of waste management;

(n) Establish targets for the collection, minimisation, re-use and recycling of waste;

(o) Set out the approach of the Department, provincial department or municipality to the planning of any new facilities for disposal and decommissioning of existing waste disposal facilities;

(p) Indicate the financial resources that are required to give effect to the plan;

(q) Describe how the Department, provincial department or municipality intends to give effect to its IWMP; and

(r) Comply with the requirements prescribed by the Minister.

The IWMP content requirements further detailed by the D:EA&DP IWMP guideline table of contents are as follows. Only the main headings are shown here. This IWMP was developed to contain all the required information:

- Introduction and background information to the IWMP
- Status Quo:
  - Legislation
  - Demographic profile
  - Waste management cost and financing
  - Services and delivery
  - Compliance and enforcement
  - Waste generation and composition
  - Waste avoidance, reduction and recycling
  - Operational structure and staff capacity
  - Waste awareness and education
  - Waste information management
- Gaps and needs analysis
- Objectives and targets
- IWMP implementation
- Monitoring and review

The Cederberg Municipality compiled a draft IWMP document in August 2021 and submitted it to the D:EA&DP for comment. Their comments were substantial and required a re-write of the IWMP which resulted in the Municipality appointing JPCE for the compilation of this report. The D:EA&DP comments received on 27 October 2021 is attached as **Annexure A** to this report and all the comments have been addressed in the compilation of this report.

1.2 BACKGROUND

The IWMP is a statutory requirement of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) that has been promulgated and came into effect on 1 July 2009 and has as its goal the transformation of the current methodology of waste management, i.e. mostly collection and disposal, to a sustainable practice focussing on waste avoidance and environmental sustainability. Implementation of this IWMP will be through municipal by-laws and in accordance with an implementation schedule.

The development of the IWMP is necessary as it is an integral tool to identify current needs and act as a guide towards sustainable waste management. With regular updates of this document the changing needs as well as progress in the waste management field can be tracked and strategies adapted accordingly.
It also provides a framework for budgeting purposes. The IWMP must be incorporated as part of each Municipality's Integrated Development Plan (IDP) but is submitted as a separate document. The IWMP also shows alignment of its goals with the Western Cape IWMP, the District Municipality IWMP and the National Waste Management Strategy (NWMS). This generation IWMP improved upon the previous generation document in that progress has been made with shortcomings identified in the previous draft plan.

There is increasing pressure on government, the public and industry to be more environmentally responsible especially in terms of solid waste generation and management. Making waste disposal priority can be seen as archaic planning and is not sustainable as disposal airspace is becoming limited and the establishment of new disposal facilities are becoming increasingly difficult due to the unavailability of suitable land. Establishing new disposal facilities are also increasingly expensive due to the design and construction requirements in order to safely dispose the waste to land. Although the eradication of the practice of waste disposal is currently not possible, the IWMP aims to identify ways on how to decrease disposal, increase diversion and move towards being an environmentally responsible society.

Since the previous generation IWMP, greater focus has been placed on the identification, handling, treatment and disposal of the organic waste stream and also receives bigger focus in the National Waste Management Strategy 2020. Municipalities are required to develop Organic Waste Diversion Plans (OWDPs) to implement and achieve diversion targets for organic waste. The Cederberg's OWDP has been developed and is included as part of this IWMP. (**Annexure B**)

1.3 SCOPE OF THE IWMP

The scope of this local municipal IWMP includes an investigation into the current state of the solid waste management system of the CM and provides the overview thereof. This investigation aims to include all the various aspects of the solid waste management system which ranges from legislation, waste types and generation, waste facilities and infrastructure to financing and all other details as listed under the terms of reference above.

The status quo is evaluated to determine the gaps and needs of the system. The scope also includes goals and objectives to improve the system where required, but is limited to implementation on the local authority level. The implementation items aim to improve the waste management system and to achieve goals that are coupled with a monitoring and review programme to ensure that the IWMP is up to date and is implemented.

The waste types measured and discussed are the following:

- Domestic waste
- Garden waste
- Building (construction) waste
- Household hazardous waste
- Hazardous waste (including health care risk waste)

The sources of the above waste types are also discussed and include the following:

- Residential areas
- Businesses
- Industry
- Farms
- Waste as a result of illegal dumping
- Street cleansing waste

1.4 METHODOLOGY AND APPROACH TO THE IWMP

The planning phase of the 4th generation IWMP included the following:

JPCE has successfully developed a number of IWMP documents for municipalities within the Western Cape. This creates an opportunity to be in regular contact with D:EA&DP on what the IWMP requirements are through evaluation reports on other IWMP documents etc. Planning thus included addressing the standard D:EA&DP requirements as well as recently received comments on other municipal IWMP documents in the Western Cape.

Aquila Environmental (Pty) Ltd was appointed as sub-consultant to JPCE in order to conduct the general waste characterisation study and hazardous waste survey in the Cederberg Municipal Area. All the generators of these waste types were identified and interviewed in order to obtain the quantities generated and the treatment and/or disposal methods as follows:

The first step in the hazardous waste survey was a confirmation of the database of possible hazardous waste producing industries as compiled during the last IWMP cycle. A list was compiled based on the physical survey for each town. All the possible industries were listed but not all businesses, as some were regarded as non-hazardous waste producers due to their nature of business, size, physical structure, etc. Each business listed in the hazardous waste survey list was contacted, telephonically and/or via e-mail.

Aquila Environmental were also appointed to undertake a general waste characterisation study (WCS) with the assistance from the municipality. The methodology and results are described in section 2.3.3 of this IWMP report. Officials from the Cederberg Municipality provided additional information and references required to inform the IWMP. The municipality also coordinated and provided some of the workers for the (WCS) as well as provided the premises.

Extensive input and information were provided by the Cederberg Municipality and the plan development included lengthy discussions with and guidance received from the Waste Manager at the time, Mr Jacob Klaase. All the acquired information was reworked into the format presented in this report in order to reflect the status quo, draw conclusions and to make recommendations.

Public input into the final report will be obtained by making this draft report available to the public through ward council meetings and by making the document available on the website of the Municipality and JPCE. Hard copies of the document will also be available for review at public libraries of the towns in the Municipality. Notice for public comment on the IWMP will also be placed in the “Ons Kontrei” local newspaper.

The final IWMP will be submitted to the D:EA&DP for evaluation and approval once public comments have been received and addressed. The IWMP is only finalised after the Cederberg Municipal Council and the D:EA&DP approves and endorses it.

1.5 OVERALL AIMS AND GOALS OF THE IWMP

The primary objective of Integrated Waste Management (IWM) planning is to integrate and optimise waste management, in order to maximise efficiency and minimise the associated environmental impacts and financial costs as well as to improve the quality of life of all residents within the Cederberg Municipality.

The Plan takes particular note of importance of local authority waste management planning. This document underlines the following principles of the National Waste Management Strategy:

- The prevention of waste generation;
- The recovery of waste of which the generation cannot be prevented, and
- The safe disposal of waste that cannot be recovered.

The Plan will address all areas of waste management – from waste prevention and minimisation (Waste avoidance) to its collection, storage, transport, treatment, recovery and final disposal. It will not only address the practicalities of waste management in context of this Municipality, but also the issues of public education and changing concepts, as these are vital to a successful management system.

The main goals of the Cederberg IWMP are aligned with the goals of the Western Cape Provincial IWMP, the NWMS, the Municipal Spatial Development Framework (SDF), the municipal Integrated Development Plan (IDP), the National Development Plan (NDP) and the Provincial Spatial Development Framework (SDF). These are shown in **Table 1-1** and these main goals are shown in further detail and sub-goals and implementation items in Section 5: Implementation and Strategy Plan of the report.

Table 1-1: National and Provincial Goals and Strategic Linkages

Western Cape IWMP (2017-2022)*		NWMS 2020		NDP 2030		Western Cape SDF (2014)	
Goal 1:	**Strengthened education, capacity and advocacy towards Integrated Waste Management**						
Strategic Objective 1:	Facilitate consumer and industry responsibility in integrated waste management	Pillar 1, Focus Area:	Advance cleaner production and EPR	Chapter 9:	Improving education, training and innovation	Aim 5 (iii):	Seeks to improve the effectiveness of public investment in the Western Cape's built and natural environments by opening-up opportunities for community and business development in targeted areas.
Strategic Objective 2:	Promote and ensure awareness and education of integrated waste management	Pillar 3, Focus Area:	Compliance promotion and awareness; Awareness and Community Participation; Reduce littering and illegal dumping				
		Pillar 1, Focus Area:	Prevent Food Waste				
Strategic Objective 3:	Build and strengthen waste management capacity	Pillar 1, Focus Area:	Build sustainable partnerships with all government and non-government role-players				
Goal 2:	**Improved integrated waste management planning and implementation for efficient waste services and infrastructure**						
Strategic Objective 1:	Facilitate municipal waste management planning	Pillar 2, Focus Area:	Integrated Waste Management Planning; Producers with the concurrence of Municipalities to provide recycling drop-off / buy-back / storage centres	Chapter 3:	Develop proposals for an acceptable minimum standard of living and proposals on how to achieve this over time.	Aim 3	Supports municipalities to fulfil their municipal planning mandate in line with the national and Provincial agendas.
Strategic Objective 2:	Promote industry waste management planning	Pillar 2, Focus Area:	Integrated Waste Management Planning; Producers with the concurrence of Municipalities to provide recycling drop-off / buy-back / storage centres			Aim 2	Serve as basis for coordinating, integrating and aligning 'on the ground' delivery of national and Provincial departmental programmes.

Western Cape IWMP (2017-2022)*		NWMS 2020		NDP 2030		Western Cape SDF (2014)	
Strategic Objective 3:	Promote the establishment of integrated waste management infrastructure and services	Pillar 1, Focus Area:	Increase technical capacity and innovation for beneficiation of waste			Aim 1	Give spatial expression to the National and Provincial development agendas.
		Pillar 2, Focus Area:	Integrated Waste Management Planning; Producers with the concurrence of Municipalities to provide recycling drop-off / buy-back / storage centres; Waste Collection including separation at source			Aim 4	Communicate government's spatial development intentions to the private sector and civil society.
		Pillar 3, Focus Area:	Waste Services Infrastructure Provision				
Strategic Objective 4:	Ensure effective and efficient waste information management						
Goal 3:	**Effective and efficient utilisation of resources**						
Strategic Objective 1:	Minimise the consumption of natural resources	Pillar 1, Focus Area:	Prevent Food Waste; Advance Waste as a Resource; Increase technical capacity and innovation for beneficiation of waste	Chapter 5:	Environmental Sustainability and Resilience: Put in place a regulatory framework for land use to ensure the conservation and restoration of protected areas.		
Strategic Objective 2:	Stimulate job creation within the waste economy	Pillar 1, Focus Area:	Create an enabling environment	Chapter 3:	Economy and Employment	Aim 5 (iii):	- opening-up opportunities for community and business development in targeted areas.
Strategic Objective 3:	Increase waste diversion through reuse, recovery and recycling	Pillar 1, Focus Area:	Minimise general waste streams from landfill; Minimise hazardous waste streams	Chapter 5:	Environmental Sustainability and Resilience: Absolute reductions in the total volume of waste disposed to landfill each year.	Aim 3	Supports municipalities to fulfil their municipal planning mandate in line with the national and Provincial agendas.
		Pillar 2, Focus Area:	Waste Collection including separation at source				

Western Cape IWMP (2017-2022)*		NWMS 2020		NDP 2030		Western Cape SDF (2014)	
Goal 4:	**Improved compliance with environmental regulatory framework**						
Strategic Objective 1:	Strengthen compliance monitoring and enforcement	Pillar 2, Focus Area:	Safe Management of hazardous household wastes and absorbent hygiene products waste.	Chapter 5:	Environmental Sustainability and Resilience: Put in place a regulatory framework for land use to ensure the conservation and restoration of protected areas.	Aim 4	Communicate government's spatial development intentions to the private sector and civil society.
		Pillar 3, Focus Area:	Enforcement; Reduce littering and illegal dumping				
Strategic Objective 2:	Remediate and rehabilitate contaminated land	Pillar 3, Focus Area:	Ensure municipal landfill sites and waste management facilities comply with licensing requirements				
Strategic Objective 3:	Facilitate the development of waste policy instruments	Pillar 3, Focus Area:	Enforcement				
Strategic Objective 4:	Promote self/co-regulatory measures						

*Note that the new Western Cape IWMP (2022-2027) is still in development

The Cederberg Municipality IWMP links with these national and provincial documents in that it will adopt the goals and strategic objectives of the Western Cape Provincial Integrated Waste Management Plan, namely:

Goal 1: Strengthened education, capacity and advocacy towards Integrated Waste Management

Strategic Objective 1: Facilitate consumer and industry responsibility in integrated waste management
Strategic Objective 2: Promote and ensure awareness and education of integrated waste management
Strategic Objective 3: Build and strengthen waste management capacity

Goal 2: Improved integrated waste management planning and implementation for efficient waste services and infrastructure

Strategic Objective 1: Facilitate municipal waste management planning
Strategic Objective 2: Promote industry waste management planning
Strategic Objective 3: Promote the establishment of integrated waste management infrastructure and services
Strategic Objective 4: Ensure effective and efficient waste information management

Goal 3: Effective and efficient utilisation of resources

Strategic Objective 1: Minimise the consumption of natural resources
Strategic Objective 2: Stimulate job creation within the waste economy
Strategic Objective 3: Increase waste diversion through reuse, recovery and recycling

Goal 4: Improved compliance with environmental regulatory framework

Strategic Objective 1: Strengthen compliance monitoring and enforcement
Strategic Objective 2: Remediate and rehabilitate contaminated land
Strategic Objective 3: Facilitate the development of waste policy instruments
Strategic Objective 4: Promote self/co-regulatory measures

The Cederberg Spatial Development Framework (SDF, 2017) contained a table showing the alignment of the Cederberg Integrated Development Plan (IDP, 2017-2022) and Strategic Focus Areas with the Strategic Directions of the SDF. This table is replicated in Error! Reference source not found. with the Cederberg IWMP goals and their specific strategic objectives linked to them.

The CM forms part of the West Coast District Municipality (WCDM) and the WCDM is currently busy with the review of their next generation IWMP document which is to coincide with the compilation of the Cederberg IWMP. The goals of the latest WCDM IWMP are expected to be updated during the development of the third generation CWDM IWMP in order to align with the goals of the Western Cape Provincial IWMP.

Table 1-2: Cederberg IWMP, IDP and SDF Goals and Linkages

	Cederberg SDF Spatial Objectives				
Cederberg IDP Strategic Objectives	**Spatial Objective 1**: Grow (& unlock) economic prosperity	**Spatial Objective 2**: Proximate convenient and equal access	**Spatial Objective 3**: Sustain material, physical & social well-being	**Spatial Objective 4**: Protect and grow place identity & cultural integrity	**Spatial Objective 5**: Protect ecological & agricultural integrity
Strategic Objective 1: Improve and sustain basic service delivery and infrastructure development	***IWMP Goal 4: Improved compliance with environmental regulatory framework.*** *Strategic Objective 3: Facilitate the development of waste policy instruments*		***IWMP Goal 1: Strengthened education, capacity and advocacy towards Integrated Waste Management.*** *Strategic Objective 3: Build and strengthen waste management capacity*		
Strategic Objective 2: Implement strategies to ensure financial viability and economically sustainability	***IWMP Goal 2: Improved integrated waste management planning and implementation for efficient waste services and infrastructure*** *Strategic Objective 1&2: Facilitate municipal waste management planning & Promote industry waste management planning.*		***IWMP Goal 1: Strengthened education, capacity and advocacy towards Integrated Waste Management.*** *Strategic Objective 2: Promote and ensure awareness and education of integrated waste management*		
Strategic Objective 3: Good Governance, Community Development & Public Participation		***IWMP Goal 4: Improved compliance with environmental regulatory framework.*** *Strategic Objective 4: Promote self/co-regulatory measures*			
Strategic Objective 4: Aggressive facilitate, expand and nurture sustainable economic growth and eradicate poverty	***IWMP Goal 1: Strengthened education, capacity and advocacy towards Integrated Waste Management.*** *Strategic Objective 1: Facilitate consumer and industry responsibility in integrated waste management.*				
Strategic Objective 5: Enable a resilient, sustainable, quality and inclusive living environment and human settlements i.e. Housing development and informal settlement		***IWMP Goal 2: Improved integrated waste management planning and implementation for efficient waste services and infrastructure*** *Strategic Objectives 3 & 4: Promote the establishment of integrated waste management infrastructure and services & ensure effective and efficient waste information management.*		***IWMP Goal 3: Effective and efficient utilisation of resources****. Strategic Objective 1&2: Minimise the consumption of natural resources & Stimulate job creation within the waste economy*	
Strategic Objective 6: To facilitate social cohesion, safe and healthy communities	***IWMP Goal 3: Effective and efficient utilisation of resources****. Strategic Objective 3: Increase waste diversion through reuse, recovery and recycling*			***IWMP Goal 4: Improved compliance with environmental regulatory framework.*** *Strategic Objective 1&2: Strengthen compliance monitoring and enforcement & remediate and rehabilitate contaminated land*	

1.6 GEOGRAPHIC AREA OF STUDY

Cederberg Municipality is a part of the West Coast District Municipality in Western Cape, South Africa. Cederberg is neighboured by the municipalities of Matzikama to the north, Bergrivier to the southeast, Witzenberg to the south- west and Hantam Local Municipality (Northern Cape) to the north-east.

The municipality is approximately 8,007km^2 in area and the major towns are Clanwilliam, Citrusdal, Elands Bay, Lamberts Bay and Graafwater. Other smaller settlements are Wupperthal, Leipoldtville, Eselsbank and Algeria. The N7 traverses the municipality from Piketberg in Bergrivier Municipality through Clanwilliam to Vanrhynsdorp in Matzikama Municipality.

The area is predominantly urban with a high unemployment rate, and it's dominated by low income households (Stats SA, 2011). Refer to Figure 1-1for a Plan of the Study Area.

1.6.1 Topography and climate

The Municipal area is dominated by the Cederberg Mountain range which runs south-north from Bergrivier Local Municipality to Clanwilliam. The Sandveld plains make up the western part of the Municipality, the Pakhuis Mountains the north section, the Springbok flats the eastern section and the Kouebokkeveld Mountains are located to the south. The topography ranges up to approximately 1200m high at the Cederberg Mountain range and decreases to mean sea level at the coast.

The area experiences hot dry summers and cold wet winters with an average annual rainfall of approximately 800mm at Algeria to an average of less than 250mm/annum around Matjiesrivier, Cederberg Oasis, Nuwerust and Mount Ceder. The minimum temperatures vary between -3°C and 3°C and maximum temperatures in summer can reach up to 44°C. The mean annual rainfall varies across the region with the Cederberg Mountains experiencing approximately 1500mm.

According to the Cederberg Conservancy website lightning is the most common cause of periodic veld fires. South-easterly winds predominate in the summer while North-westerly winds indicate the possibility of rain during winter.

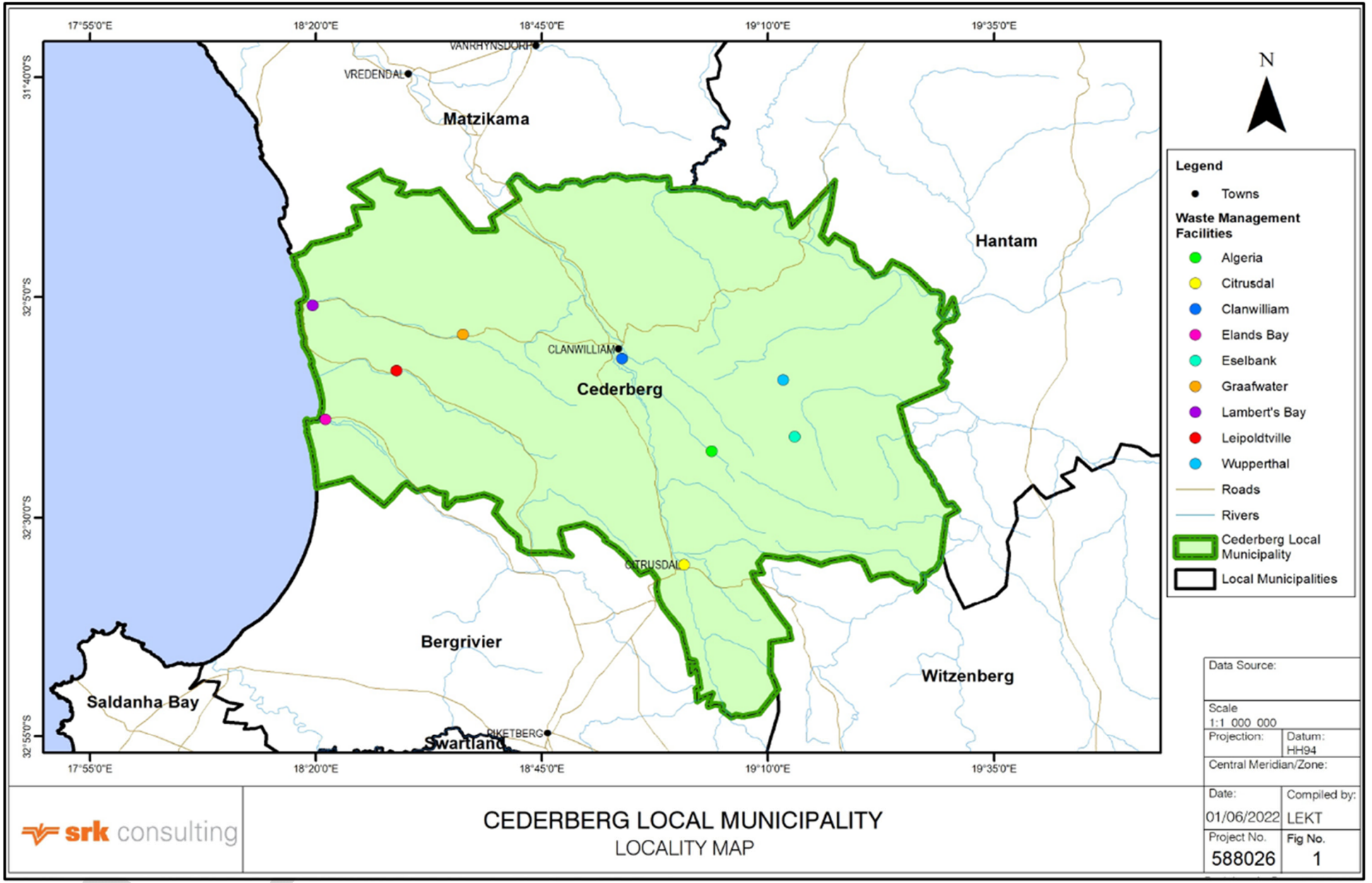

Figure 1-1: Study Area – Cederberg Municipality

1.6.2 Geology and Hydrogeology

(Maps for this section courtesy of SRK Consulting)

1.6.2.1 Geology

The Cederberg area is underlain, in chronological order, by rocks of the Table Mountain, Bokkeveld, Witteberg and Sandveld groups. The Table Mountain Group (TMG) rocks are the most important and prominently occurring rocks in the area ('predominantly arenaceous rocks' on **Figure 1-2**).

The whole sequence is present from the basal Piekenierskloof Formation to the upper Nardouw Subgroup, comprising approximately 4,000 m of sediments. They predominantly comprise resistant quartzitic sandstones that form the Cedarberg Mountain Range that dominates this area. These mountains form the northern extension of the western limb of the Cape Fold Belt.

The lower Piekenierskloof, Graafwater and Peninsula formations (1,800 m) and the upper Nardouw Subgroup of the TMG are separated by the Cedarberg Shale Formation. This is a distinctive marker horizon whose smooth green slopes contrast with the grey-brown crags of the surrounding sandstones. The TMG rocks also underly the Coastal Plain area before outcropping again at the coast at Eland's Bay and north of Lambert's Bay. Sporadic outcrops also occur in the Sandveld Area. The Bokkeveld Group rocks occupy two narrow and elongate valley areas, the main one being the Citrusdal Valley. They comprise an alternating sequence of shales and sandstones. However, in this area the sandstones are poorly developed compared to further to the south-west. The Witteberg Group also comprises an alternating sequence of shales and sandstones, but the latter are more quartzitic than the Bokkeveld.

The Sandveld Group occurs in two main areas: the Coastal Plain area between the TMG mountains and the coast (the Sandveld Area), and a strip between Yzerfontein and Elands Bay. It comprises a sequence of fine to coarse grained non-indurated Tertiary to Recent age sediments up to 50m in thickness. The two major features are the Wadrif and Graafwater palaeochannels which trend in a northwest-southeast direction (see **Figure 1-3**).

Alluvial deposits comprising sand and gravel occur in narrow belts following the main drainage channels, namely the Olifants River. A number of large, regional fault systems cut across the area, mainly trending northwest-southeast, with some minor east-west faulting. The main fault is the Clanwilliam Fault. Several large fold systems are also developed, including the Olifants River Syncline.

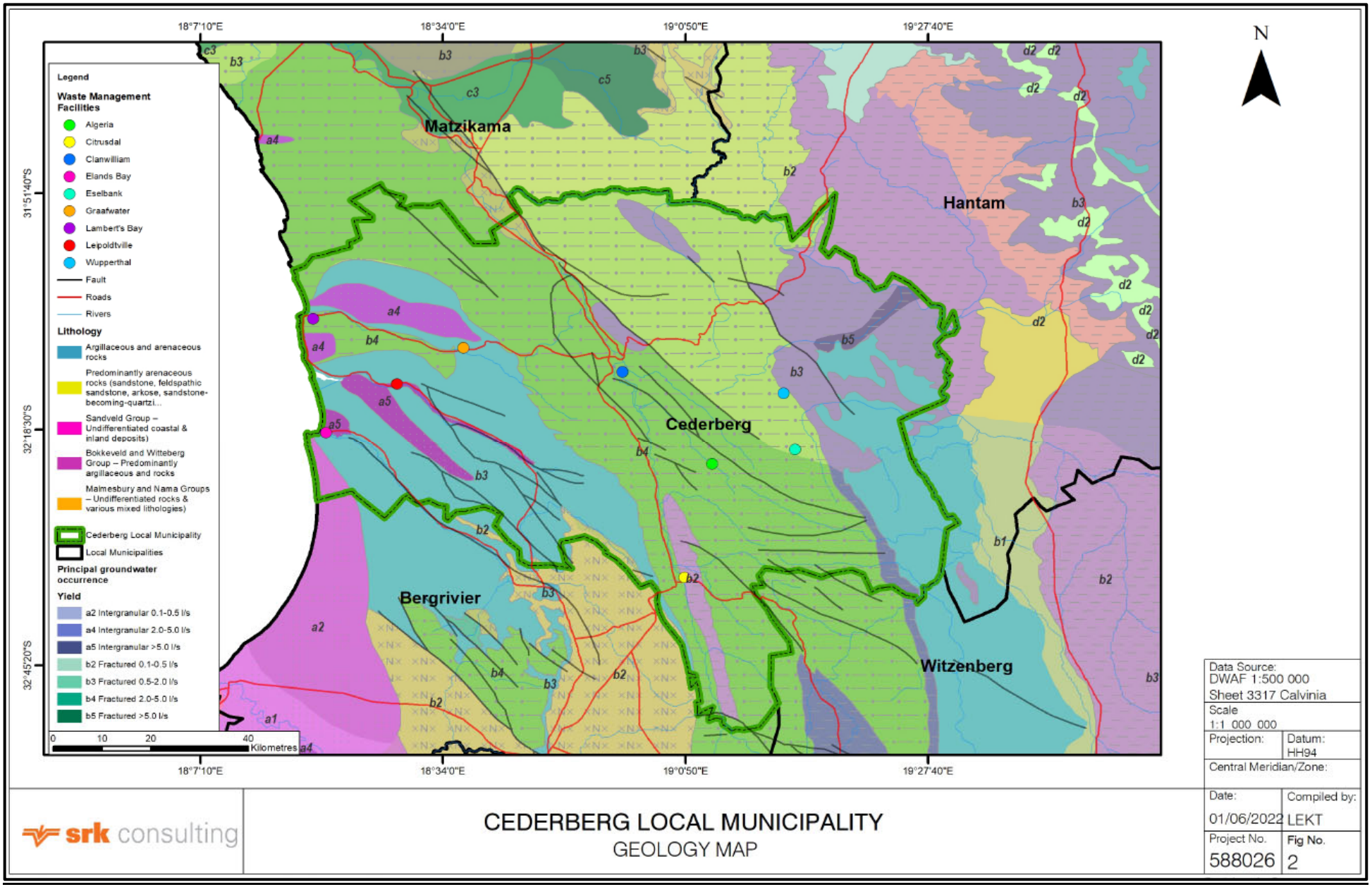

Figure 1-2: Geology of the Cederberg Municipal Area

1.6.2.2 Groundwater

In broad terms, any aquifers developed in rocks of the Table Mountain, Bokkeveld and Witteberg groups will be of the fractured or secondary type (**Figure 1-3**). Aquifers developed in the unconsolidated coastal and alluvial deposits will be of the intergranular or primary type. Major centres of groundwater abstraction identified in 2006 are shown on **Figure 1-3**.

A key groundwater issue in this area is the presence of Subterranean Government Water Control Areas. (SGWCAs). These are important aquifers demarcated by government within which groundwater abstraction is limited to defined volumes. The control areas present in the study area are the Wadrif and Graafwater SGWCAs, as shown on **Figure 1-3**.

The TMG Aquifer (TMGA) has the highest potential (median borehole yield) of the fractured aquifers, 2-5 ℓ/s and >5 ℓ/s and is recognized as one of the major aquifers in South Africa, particularly in the Cedarberg areas. However, the TMGA has limited accessibility in many places inland due to the rugged mountainous topography developed as a result of the resistant quartzitic sandstones. Artesian groundwater flow from boreholes is characteristic of the Citrusdal area and high yields are attainable, e.g. 25 ℓ/s in the Boschkloof to the east of Citrusdal. Relatively large-scale groundwater abstraction for irrigation use occurs from the aquifer in the Citrusdal area.

Groundwater circulation in the TMGA is deep-seated and borehole depths of 250m or deeper are not uncommon. It has been postulated that the major fault zones act as conduits for groundwater flow from the inland mountainous recharge areas to the coast. The Bokkeveld rocks form an aquitard in the area because of their predominantly shaley nature and have a median borehole yield of 0.1-0.5 ℓ/s.

The Witteberg rocks mostly occur in remote unpopulated areas and not much is known about existing exploitation. Adjacent to the TMGA there should be a moderate groundwater potential. The Sandveld Aquifer is extensively exploited, in particular for irrigation of potatoes in the Graafwater area, where >10 million m^3 is abstracted and median borehole yields are >5 ℓ/s.

The best quality groundwater (EC <70 mS/m) is associated with the TMGA in the eastern areas of the study area (**Figure 1-4**). The Sandveld Aquifer also has reasonable groundwater quality between 70 – 300 mS/m.

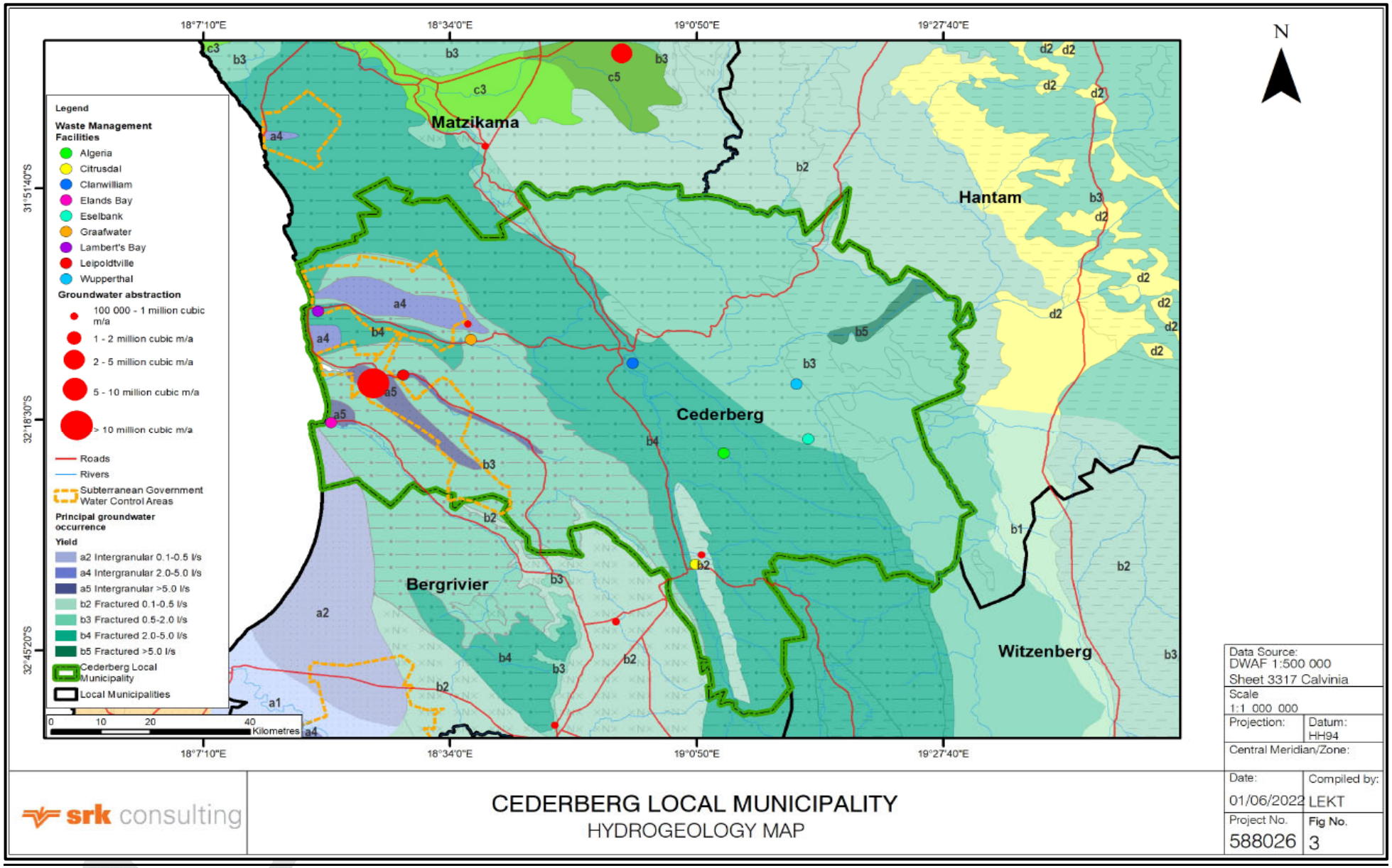

Figure 1-3: Hydrogeology of the Cederberg Municipal Area

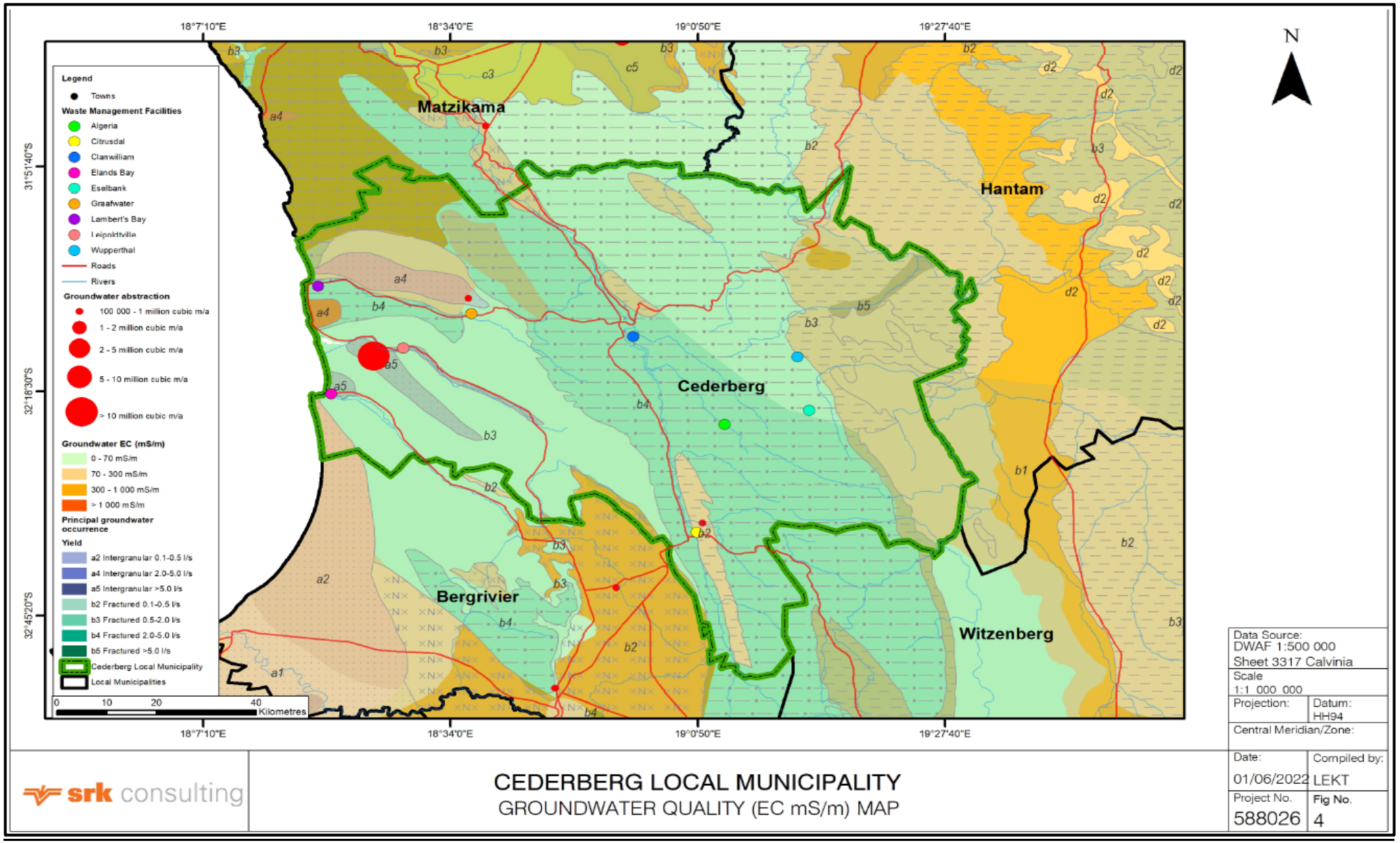

Figure 1-4: Groundwater Quality of the Cederberg Municipal Area

1.7 DISTRICT MUNICIPALITY

The CM is located in the West Coast District Municipality (WCDM). This District is comprised of the Bergrivier, Cederberg, Matzikama, Saldanha Bay and Swartland local municipalities.

The role of the District Municipality does not affect the solid waste functions of the local Municipalities. Only when waste crosses a municipal border such as for the use of a regional disposal site, does it become a District function.

The West Coast District does not have a District Solid Waste Forum at this stage. It is recommended that such a Forum is established as it allows for the municipalities in the District to work and plan together and achieve the solid waste goals and targets as a District. Further opportunities and solutions can also be further explored between Forums of different Districts.

The WCDM's purpose is stated on their website as follows:

The purpose of the WCDM and the five affiliates (local municipalities), is to share the responsibility for the local government in their areas, and to ensure that all communities, particularly disadvantaged communities, have equal access to resources and services. WCDM assist local municipalities, who don't have the capacity in finances, facilities, staff or knowledge to provide them with services to enhance their communities.

The following Key Functions of the WCDM are listed:

- Develop the district as a whole
- Municipal health services for the area
- Bulk supply of water, electricity, sewerage purification and disposal, as well as
- Fire-fighting services for the whole region
- Promoting local tourism in the district; and
- Providing good infrastructure

The WCDM's vision and mission are as follows:

VISION: A quality destination of choice through an open opportunity society

MISSION: To ensure outstanding service delivery on the West Coast by pursuing the following objectives:

1. ***Ensuring environmental integrity for the West Coast***
2. ***Pursuing economic growth and facilitation of jobs opportunities***
3. ***Promoting social wellbeing of the community***
4. ***Promoting bulk infrastructure development services***
5. ***Ensuring good governance and financial viability***

The WCDM's IDP explains their core values as follows:

- Integrity: accountability and ethics to the citizens
- Transparency: to be transparent and open in our business
- Loyalty: putting the organisation first
- Respect: will treat public and colleagues with fairness, respect and consideration
- Quality: achieving or exceeding measurable standards
- Ownership: taking pride in our work
- Teamwork: working together to achieve our goals

The West Coast District's IWMP is currently undergoing an update and is expected to be developed in conjunction with the Cederberg Municipality IWMP.

1.8 LOCAL MUNICIPALITY

The Cederberg Local Municipality has the following policies, vision and mission:

1.8.1 Policies

The policies of the Cederberg Municipality which address solid waste management directly or indirectly are the following:

- **The Cederberg Municipality Tariff Policy.** The objectives of this policy are to comply with the provisions of section 74 of the Local Government: Municipal Systems Act, 2000 and to give guidance to the councillor responsible for finance regarding tariff proposals to be submitted to council annually during the budget process. Section 9 deals with waste removal, including units of measurement and method of calculation.

- **The Cederberg Local Municipality Indigent Support Policy.** This policy includes the requirements for providing a free refuse removal service to residents that qualify for it under this policy.

- **The integrated solid waste by-law** is discussed under the legislation section of this IWMP.

- **The Cederberg Municipality Second Generation Coastal Management Programme (2019 – 2024).** This document describes the requirements of sustainable management of the coastline in the Municipal area and has a number of key areas linked to proper and sustainable waste management practices. Waste, in this case litter/rubbish, along the CM coastline is managed through the Working for the Coast (WftC) initiative, which is a national programme. WftC are responsible for collecting waste from the coastal environment and maintaining facilities at all the accessible beaches. It is important that the CM uses the WftC as a tool to aid them in ensuring that beaches are kept clean.

- **Integrated Second Generation of the West Coast District Municipality Inclusive of five Local Municipalities Air Quality Management Plan (2019 – 2024).** This planning document outlines the contributions that landfills and other forms of waste treatment within the CM potentially contributes to air pollution and on the methods and processes required to minimise and manage this.

1.8.2 Vision

Cederberg Municipality, your future of good governance, service excellence, opportunities and a better life

(Cederberg Municipality IDP (2017 – 2022) as revised by Council)

1.8.3 Mission

We will achieve our vision by:

- **Unlocking opportunities with for economic growth and development for community prosperity.**
- **Ensure sustainable, efficient and effective service delivery in an environmental sustainable manner.**
- **Making communities safer.**
- **Developing and executing policies and projects, which are responsive and providing meaningful redress.**
- **Ensure good governance ,financial viability and sustainability .**
- **Promote quality services in a cost effective manner through partnerships, information, knowledge management and connectivity.**
- **Advancing capacity building programs for both our staff and the community**

(Cederberg Municipality IDP (2017 – 2022) as revised by Council)

1.8.4 Connection with other Local Municipalities

The CM has a Service Level Agreement in place with the neighbouring Matzikama Municipality and the West Coast District Municipality for the development and use of a shared regional landfill site. Discussions and site selection for this site was started as far back as 2001 and following a lengthy Environmental Impact Assessment process a Waste Management Licence was obtained in 2014 for the landfill to be located on Portion 2 (a portion of portion 1) of the Farm Vaderlandsche Rietkuil no. 308, Vanrhynsdorp in the Matzikama Municipality.

This waste licence was updated in 2019 (Ref: 19/2/5/4/F3/11/WL00155/18) and although the regional landfill has not yet been developed, the process is at an advanced stage and the design and tender documentation for the construction of the site have been completed. Once the submitted building plans have been approved by the Matzikama Municipality

The financial and operational impacts of the regional landfill development to the waste management planning of the CM will be further discussed under the relevant sections of this report.

1.9 STAKEHOLDER PARTICIPATION

The CM compiled a draft 4th generation IWMP and submitted it to D:EA&DP in August 2021. The resulting D:EA&DP Assessment Report dated October 2021 formed the first consultation with authorities as it was issued by the D:EA&DP. It served as the first identifier of the specific issues that needed to be addressed during the IWMP update process to the third-generation plan. The D:EA&DP Assessment Report contained seven pages of comments and recommendations for inclusion in the revised report and the full assessment report is included as **Annexure A** to this IWMP report.

Upon completion of this amended draft IWMP report by JPCE, the IWMP will be submitted to the CM Council for approval to go out for a public comment period. The draft report will then be put out for public comment and submitted to the WCDM for further comment. The public comments and further comments from the authorities will then be included in a final IWMP report to be submitted to Council and the D:EA&DP. The department will then be informed of council approval of the IWMP in order for endorsement to be confirmed.

For solicitation of maximum public comments on the draft IWMP, it was made available in more than one way. A soft copy was made available on the website of the Municipality, and/or from direct request to JPCE. Hard copies were made available at the libraries of the main towns in the Municipality, from the office of the waste manager, and an advertisement on the request for comments was placed in the local newspaper (Ons Kontrei).

2. STATUS QUO

This section of the IWMP entails the situational analysis of the Cederberg Municipality, which includes amongst others, the applicable legislation, population description, waste types and quantities generated and waste management services overview.

2.1 LEGISLATION

The applicable legislation is listed here in chronological order and includes the latest Cederberg municipal integrated waste management by-law. Where policies or guidelines are linked to a certain piece of legislation, these are discussed under the main heading of the legislation in question.

2.1.1 Environment Conservation Act, 1989 (Act NO. 73 of 1989)

On 1 July 2009 the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) (“the Waste Act”) came into effect. The Waste Act repealed Section 20 of the Environment Conservation Act, 1989 (Act No. 73 of 1989) (“ECA”) and introduces new provisions regarding the licensing of waste management activities.

The Environment Conservation Act, 1989 Waste Tyre Regulations (2009) which were published on 13 February 2009 came into effect on 30 June 2009, and makes provision for effective and integrated management of waste tyres in the country. It provides regulations for tyre producers, tyre dealers and waste tyre stockpile owners.

The regulations furthermore require the compilation of industry waste tyre management plans and waste tyre stockpile abatement plans and details the requirements for waste tyre storage areas.

2.1.2 White Paper on Education and Training (1995)

The 1995 *White Paper on Education and Training* states that "environmental education, involving an interdisciplinary, integrated and active approach to learning, must be a vital element of **all levels and programmes of the education and training system**, in order to create environmentally literate and active citizens and ensure that all South Africans, present and future, enjoy a decent quality of life through the sustainable use of resources".

The White Paper advocates environmental education and training **at all levels**. This would include the local government sphere, particularly when it comes to the environmental education & training of government officials and workers.

The education of the youth is the responsibility of national and provincial government. However, the Constitution does state that where the capacity exists, functions can be delegated to local government, and that the spheres of government, while distinctive, are interdependent and interrelated. Local government should support the other spheres of government (such as the national Department of Education, DoE) in areas of its own focus, such as environmental management and sustainable development.

2.1.3 Constitution of the Republic of South Africa (1996)

In 1996 the new Constitution created the right to the environment as a fundamental right. This fundamental right to the environment ensures everyone's right to an environment that is not harmful to their health or well-being. South African law, the environment and all South Africans have a constitutional right to have the environment protected for present and future generations. This means that there must be reasonable legal and other measures to prevent ecological degradation, promote conservation and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

All legislation has to fall within the stipulations of the Constitution. The following sections are of particular relevance where waste is concerned:

- **Section 24(a)**

  Provides everyone the right to an environment that is not harmful to a person's health and well-being.

- **Section 24(b)**

  Provides everyone the right to have the environment protected through reasonable legislative and other measures. The implementation of section 21, 22 and 26 of the Environment Conservation Act, 1989 is such a legislative measure to protect the environment.

- **Section 25**

  Provides for property rights. The Constitution makes provision for both property rights and the right to a healthy environment. A situation may arise in extreme cases where there is a conflict due to rejecting an application for a listed activity from taking place. In such cases it will be up to the court to decide whether the interest of the community (right to a healthy environment) weights heavier than the right to the individual.

- **Section 32**

  Provides the right to access to information. The lack of information is one of the major obstacles in environmental impact management. Provision has been made in the regulations in terms of section 26 of the Environment Conservation Act, 1989, that any report submitted becomes a public document.

- **Section 38**

  Provides *locus standi* or the "right to get involved" to any member of the public. This means that any member of the public has the right to take appropriate action to prevent environmental damage. This may include taking action against the relevant authority for failing to perform its duties in preventing environmental damage or any individual or authority who is in the process of undertaking listed activities in terms of section 21 of the Environment Conservation Act, 1989, without the necessary authorisation to undertake such activities.

- **Section 41**

  Provides principles for co-operative governance and intergovernmental relations. The Constitution allocates legislative authority as well as executive and administrative powers to all three levels of government. Schedules 4 and 5 determine the functional areas of government. The environment is a cross-sectorial matter and it is therefore important that co-operation between government on all levels is necessary. Furthermore, Chapter 7 of the Constitution of South Africa (Act 108 of 1996) describes the role and responsibilities of Local Government, which include the objectives in Section 152:

  "The objects of local government are:

  - to promote social and economic development.
  - to promote a safe and healthy environment…".

  These principles are further developed in the National Environmental Management Act 1998 (Act 107 of 1998).

  The Constitution (Act No. 108 of 1996) is relevant to pollution and waste management for two reasons. Firstly, the Bill of Rights (Chapter Two of the Constitution) contains a number of rights relevant to integrated pollution and waste management, to the extent that an Act or particular statutory provision that does not uphold these rights, is unconstitutional. Secondly, the Constitution provides the legal basis for allocating powers to different spheres of government, and is thus relevant to the institutional regulation of integrated pollution and waste management.

Sovereign

The Constitution states that South Africa is a sovereign, democratic state. In terms of environmental management, it is important to recognize that sovereignty includes the ability to limit sovereign powers by entering into international agreements where the need arises.

The Bill of Rights

The most pertinent fundamental right in the context of integrated pollution and waste Management is the Environmental Right (Section 24), which provides that:

"Everyone has the right

(a) to an environment that is not harmful to their health or well-being; and
(b) to have the environment protected, for the benefit of present and future generation through reasonable legislative and other measures that –

(i) prevent pollution and ecological degradation;
(ii) promote conservation; and
(iii) secure ecologically sustainable development and the use of natural resources while promoting sustainable economic and social development."

The section of the Bill of Rights specifically imposes a duty on the State to promulgate legislation and take other steps to ensure that the right is upheld and that, other things, pollution and ecological degradation are prevented.

2.1.4 National Water Act (Act no. 36 of 1998)

The purpose of the Act is to ensure that the Municipality's water resources are protected, used, developed and conserved in ways which take into account the protection of aquatic and associated ecosystems; that addresses basic human needs; that ensures the reduction and prevention of pollution; and that meets international obligations.

Section 19 of the NWA deals with landowners and users involved in any activity or process which causes, has caused or is likely to cause pollution of water resources. Such landowners and users are obliged to take all reasonable measures to prevent any such pollution from occurring, continuing or recurring. This includes measures to comply with any prescribed waste standard or management practice.

Furthermore, the NWA requires anyone who intends undertaking a water use, as defined, to obtain a licence. The water uses that may be relevant to waste management activities are:

- discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit; and
- disposing of waste in a manner which may detrimentally impact on a water resource.

The applications for permits, licences and exemptions made before the promulgation of this Act could still be dealt with in terms of the Water Act 1956 (Act No. 54 of 1956).

2.1.5 National Environmental Management Act (1998)

The NEMA (Act 107 of 1998) provides for co-operative environmental governance by establishing principles for decision making on matters affecting the environment, institutions that will promote co-operative governance and procedures for co-ordinating environmental functions exercised by organs of state; and to provide for matters connected therewith.

As the principal framework act for environmental issues, it has direct relevance to the implementation of the National Waste Management Strategy, one of the key implications being the designation of the DFFE as lead agent for the environment. Chapter 7 of NEMA has important direct implications for the achievement of the NWMS initiative.

The environment as defined in NEMA is the natural environment along with its physical chemical, aesthetic and cultural properties that influence human health and well-being.

NEMA contains the following environmental principles:

- Environmental management must put people and their needs at the forefront, and must serve their interest fairly.
- Development must be socially, environmentally and economically sustainable. This means that the following things must be considered before there is development:
  a) Disturbance of ecosystems and loss of biodiversity
  b) Pollution and degradation of the environment
  c) Disturbance of landscapes and sites where the nation's cultural heritage is found
  d) Non-renewable resources must be used responsibly
  e) The precautionary principle must be applied
  f) Negative impacts must be anticipated and prevented and if they can't be prevented they must be minimized or remedied.
- Environmental management must be integrated. The best practical environmental option must be pursued.
- Environmental justice must be pursued so that there is not unfair discrimination in the way that negative environmental impacts are distributed

- There should be equitable access to environmental resources, benefits and services to meet basic human needs. Special measures may be taken to ensure access for persons disadvantaged by unfair discrimination.
- Responsibility for environmental health and safety of any policy, programme or project must continue throughout the life cycle of a project
- Public participation in environmental decision-making must be promoted. The participation of vulnerable and disadvantaged groups must be ensured
- Decisions must take into account the interests, needs and values of all interested and affected parties. This includes recognizing all forms of knowledge including traditional and ordinary knowledge
- Community well-being and empowerment must be promoted through environmental education
- The social, economic and environmental impacts of the activities must be assessed
- The rights of workers to refuse to do work that is harmful to human health or the environment and to be informed of dangers must be respected
- Decisions must be taken in an open and transparent manner and access to information provided in accordance with the law
- There must be inter government co-ordination and harmonization of policies and laws
- Actual or potential conflicts of interest between organs of state must be resolved through conflict resolution procedures
- Global and international responsibilities relating to the environment must be discharged in the national interest
- The environment is held in a public trust for the people and the use of environmental resources must serve the public interest, and be protected as the people's common heritage
- The polluter must pay for the costs of remedying pollution, environmental degradation and adverse health impacts
- The vital role of youth and women in environmental management must be recognized and their full participation promoted
- Sensitive or stressed ecosystems must receive special attention in planning which might affect them especially when they are subject to significant resource usage and development pressure.

NEMA also stipulates in Section 24 that there must be an environmental impact assessment before any activity or development that needs permission by law and which may significantly affect the environment.

Section 28 places a specific duty of care on every person to prevent, or mitigate and remediate, environmental damage and pollution. Any person, who was responsible for, or directly or indirectly contributed to the pollution, can be held liable. This includes the owner of the land at the time the pollution occurred or their successor in title, a person in control of the land at that time, or any person who negligently failed to prevent the situation.

The public can use NEMA to exercise their rights when they believe that the right procedures were not followed. Therefore it is extremely important to make sure that when there is a proposed development where the municipality is involved e.g. change of land-use – to make sure that the consultant and/or developers follow the right procedures.

The NEMA Environmental Impact Assessment Regulations

Sections 24 and 44 of NEMA make provision for the promulgation of regulations that identify activities that may not commence without environmental authorisation or existing activities in respect of which an application for environmental authorisation is required. In this context, EIA Regulations contained in three General Notices in terms of NEMA (GN R385, 386 and 387) (came into force on 3 July 2006.)

The 2006 Regulations were repealed by the June 2010 EIA Regulations (GN R543), and the June 2010 EIA Regulations were repealed and replaced by the 2014 EIA Regulation (GNR 982, GNR 983, GNR 984 and GNR 985.) The purpose of the Regulations is to regulate the procedure and criteria as contemplated in Chapter 5 of the Act relating to the submission, processing and consideration of, and decision on, applications for environmental authorisations for the commencement of activities in order to avoid detrimental impacts on the environment, or where it can con be avoided, ensure mitigation and management of impacts to acceptable levels, and to optimise positive environmental impacts, and for matters pertaining thereto.

2.1.6 National Environmental Management Act: Fees for consideration and processing of applications for environmental authorisations and amendments thereto (Government Notice 28 February 2014)

These regulations apply to the above applications excluding community based projects funded by government grants or applications made by organs of state. The commencement date is 1 April 2014. Payment details are discussed regarding the different applicable fees which are listed as follows:

Application	Fee
Application for an environmental authorisation for which basic assessment is required in terms of the Environmental Impact Assessment Regulations	R2000.00
Application for an environmental authorisation, for which a S&EIR is required in terms of the Environmental Impact Assessment Regulations	R10000.00
Application dealt with in terms of section 24L of the Act	(a) 100% of the most expensive application, namely, R10 000 (Ten Thousand Rand) if S&EIR is triggered and R2000 (Two Thousand Rand) if the basic assessment is triggered;
	(b) 50% of the other application, namely, R5000 (Five Thousand Rand) if the S&EIR is triggered or R1000 (One Thousand Rand) if the basic assessment is triggered)
Amendment of an environmental authorisation on application by the holder of an environmental authorisation.	R2000.00

2.1.7 The Municipal Structures Act, 1998 (Act no. 117 of 1998)

This act makes provision for the establishment of municipalities in accordance with the requirements relating to categories and types of municipality. It establishes criteria for determining the category of municipality to be established in an area and defines the types of municipality that may be established within each category.

The Act furthermore provides for an appropriate division of functions and powers between categories of Municipality and regulates the internal systems, structures and office-bearers of the municipalities. It also provides for appropriate electoral systems for matters in connection therewith.

2.1.8 White paper: policy on pollution prevention, waste minimisation, impact management and remediation (March 2000)

In line with international trends and our national objectives of efficient and effective management of our nation's resources, priority is given to prevention of waste. Unlike previous policies that focused predominantly on so called "end of pipe" treatment, this White Paper underscores the importance of preventing pollution and waste and avoiding environment degradation.

Effective mechanisms to deal with unavoidable waste will remain necessary, but much greater attention must be directed to the introduction of preventative strategies aimed at waste minimisation and pollution prevention. Ever increasing urban and industrial development throughout the world is leading to levels of pollution, which seriously threaten the natural resources upon which humankind depends for its survival.

Although South Africa has extensive environment, pollution and waste management legislation, responsibility for its implementation is scattered over a number of departments and institutions.

The fragmented and uncoordinated way pollution and waste is currently being dealt with, as well as the insufficient resources to implement and monitor existing legislation, contributes largely to the unacceptably high levels of pollution and waste in South Africa.

The White Paper on Integrated Pollution and Waste Management will result in a review of the existing legislation and the preparation of a single piece of legislation dealing with waste and pollution matters.

Pollution and waste management is not the exclusive preserve of government. The private sector and civil society have crucial roles to play. The fostering of partnerships between government and the private sector is a prerequisite for sustainable and effective pollution and waste management to take place. Similarly, the spirit of partnerships and co-operative governance between organs of state is equally important due to the crosscutting nature of pollution and waste management.

Monitoring and collection of information on pollution and waste generation are crucial for the implementation of pollution and waste reduction measures. Moreover, the sharing of such information and creating awareness about the issues will enable all stakeholders, including communities, to gain a better understanding of the relation between pollution, waste management and the quality of life.

The White Paper proposes a number of tools to implement the objectives of the policy it sets out. The most significant of these is a legislative programme that will culminate in new pollution and waste legislation. This proposed legislation, amongst other things, will address current legislative gaps, and clarify and allocate responsibilities within government for pollution and waste management.

The policy presents seven strategic goals, which are as follows:

Goal 1: Effective Institutional Framework and Legislation
Goal 2: Pollution Prevention, Waste Minimisation, Impact Management and Remediation
Goal 3: Holistic and Integrated Planning
Goal 4: Participation and Partnerships Governance in Integrated Pollution and Waste Management
Goal 5: Empowerment and Education in Integrated Pollution and waste Management
Goal 6: Information Management
Goal 7: International Cooperation

The role of Local Government

Municipalities will be responsible for providing waste management services, and managing waste disposal facilities. Specific functions to be carried out by municipalities will include:

- compiling and implementing general waste management plans, with assistance from provincial government
- implementing public awareness campaigns
- collecting data for the Waste Information System
- providing general waste collection services and managing waste disposal facilities within their areas of jurisdiction
- implementing and enforcing appropriate waste minimisation and recycling initiatives, such as promoting the development of voluntary partnerships with industry, including the introduction of waste minimisation clubs where possible, regional planning, establishment and management of landfill sites, especially for regionally based general waste landfills.

2.1.9 The Municipal Systems Act (Act 32 of 2000)

This Act outlines the role and responsibilities of local governments as to:

- Provide democratic and **accountable** government for local communities;
- Ensure the provision of services to communities in a **sustainable** manner;
- Promote **social** and economic development;
- Promote a safe and healthy **environment**;
- Encourage the **involvement** of communities and community organisation in the matters of local government; and
- Strive, within its financial and administrative capacity, to achieve the objectives above.

These responsibilities indicate a need for an environmentally educated work force (accountable) as well as an environmentally educated public (involvement). The municipal Systems Act (32 of 2000) requires municipalities to promote public participation and to build the capacity of residents, councillors and municipal officials to engage in participatory processes. As a means of tracking progress in this area, the executive of a municipality is obliged to report annually on the level of public participation in municipal matter.

Each Municipality must include in its integrated development plan contemplated in Chapter 5 of the Municipal Systems Act, an integrated waste management plan that is consistent with the relevant provincial integrated waste management plan. The annual performance report which must be prepared in terms of section 46 of the Municipal Systems Act must contain information on the implementation of the municipal integrated waste management plan.

2.1.10 National Environment Management: Air Quality Act 2004 (Act no. 39 of 2004)

This Act has been promulgated in order to reform the law regulating air quality in order to protect the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development while promoting justifiable economic and social development. It also provides for national norms and standards regulating air quality monitoring, management and control by all spheres of government; for specific air quality measures; and for matters incidental thereto.

The object of this Act is:

a) to protect the environment by providing reasonable measures for-

   (i) the protection and enhancement of the quality of air in the Republic;
   (ii) the prevention of air pollution and ecological degradation; and
   (iii) securing ecologically sustainable development while promoting justifiable economic and social development; and

b) generally to give effect to section 24(b) of the Constitution in order to enhance the quality of ambient air for the sake of securing an environment that is not harmful to the health and well-being of people.

2.1.11 National Environmental Management: Waste Act, 2008 (Act no. 59 of 2008) ("The Waste Act")

On 1 July 2009 the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) ("the Waste Act") came into effect. The Waste Act repealed Section 20 of the Environment Conservation Act, 1989 (Act No. 73 of 1989) ("ECA") and introduces new provisions regarding the licensing of waste management activities.

Provision has been made in the form of legislative and regulatory tools to facilitate and ensure implementation of the Act by all spheres of government.

The Waste Act was published to reform the law regulating waste management in order to protect the health of the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development.

The purpose of this Act is to protect health, well-being and the environment by providing reasonable measures for –

- the minimisation of the consumption of natural resources;
- the avoidance and minimisation of the generation of waste;
- the recovery, re-use and recycling of waste;
- the treatment and safe disposal of waste as a last resort;
- the prevention of 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 of harm;
- achieving integrated waste management reporting and planning;

- to ensure that people are aware of the impacts of waste on health and the environment;
- to provide for compliance and generally to give effect to section 24 of the Constitution in order to secure an environment that is not harmful to the health and well-being of people.

The interpretation and application of this Act must be guided by the national environmental management principles set out in section 2 of the National Environmental Management Act.

The Waste Act allows for the compilation of a Waste Management Strategy, national, provincial and local standards.

Municipalities must in terms of their by-laws:

- establish service standards and levels of service for the collection of waste;
- may identify requirements in respect of the separation, compacting and storage of waste;
- may identify requirements for the management of waste, including requirements in respect of the avoidance of the generation of waste and the recovery, reuse and recycling of waste;
- the requirements in respect of the directing of waste to specific treatment and disposal facilities.

Each Municipality must include in its integrated development plan contemplated in Chapter 5 of the Municipal Systems Act, an integrated waste management plan that is consistent with the relevant provincial integrated waste management plan.

The annual performance report which must be prepared in terms of section 46 of the Municipal Systems Act must contain information on the implementation of the municipal integrated waste management plan.

Municipalities must also in terms of the Act:

- conduct municipal activities in accordance with the National Waste Management Strategy and any national or provincial norms and standards;
- compile an integrated waste management plan;
- ensure that waste management services are provided within the municipality in a manner which prioritises the recovery, re-use or recycling of waste and provides for the treatment and safe disposal of waste as a last resort;
- designate a waste management officer;
- ensure that provision is made for the management and collection of litter;
- secure compliance with the objects of this Act that are in the domain of the municipality; and
- implement any other measures that are necessary for securing the objects of this Act that are within the domain of the municipality.

Duty to provide collection services - Every municipality has an obligation to progressively ensure that efficient, effective and affordable waste collection services are provided in its area.

A municipality may, by notice, require any person making use of the municipal collection service to separate specified types of waste from the general waste for the purposes of recovery, re-use or recycling.

In terms of Section 19(1) of the Waste Act, the Minister may publish a list of waste management activities that have, or are likely to have, a detrimental effect on the environment. In terms of Section 20 of the Waste Act no person may commence, undertake or conduct a waste management activity except in accordance with the following:

- the requirements or standards determined in terms of Section 19(3) of the Waste Act for that activity; or
- a waste management licence issued in respect of that activity, if a license is required.

On 3 July 2009 a list of waste management activities were published. These activities were published in Government Notice 178 in Government Gazette No. 32368 of 3 July 2009. No person may commence with, undertake or conduct these activities unless a waste management licence is issued in respect of the activity.

A person who wishes to commence, undertake or conduct an activity listed under Category A must conduct a Basic Assessment process whilst activities listed under Category B requires a Scoping and EIA process to be undertaken.

In terms of Section 49(2) of the Waste Act a decision to grant a waste management licence in respect of a waste disposal facility is subject to the concurrence of the Minister responsible for Water Affairs. The Waste Act further specifies that the issuing of a waste management licence for a waste disposal facility is subject of the inclusion in the licence of any conditions contained in a Record of Decision issued by the Minister responsible for Water Affairs regarding any measures that the Minister responsible for Water Affairs considers necessary to protect a water resource as defined in the National Water Act, 1998 (Act No. 36 of 1998).

As far as hazardous waste goes, the National Department of Environment, Forestry and Fisheries (DFFE) is the regulatory body for the licensing of Hazardous Waste Facilities, according to NEM:WA's Chapter 5. In addition, the management of hazardous waste is included in the concurrent legislative competence of both National and Provincial Government assigned by the South African Constitution with respect to environment and pollution control.

2.1.12 National Environmental Management: Waste Act, 2008 (Act no. 59 of 2008): List of waste management activities that has, or is likely to have a detrimental effect on the environment. Government Notice 41175, 11 October 2017

The notice replaces the amended 2013 list of activities that trigger a waste licence requirement and because of its impact on financial budgets and budget scheduling, all the activities, quoted verbatim (except where grammatically corrected) from the notice, are listed below:

"GENERAL

No person may commence, undertake or conduct a waste management activity listed in this schedule unless a licence is issued in respect of that activity.

CATEGORY A

3. A person who wishes to commence, undertake or conduct an activity listed under this Category, must conduct a basic assessment process, as stipulated in the environmental impact assessment regulations made under section 24(5) of the National Environmental management Act, 1998 (Act No. 107 of 1998) as part of a waste management licence application.

Storage of waste

(1) The storage of general waste in lagoons.

Recycling or recovery of waste

(2) The recycling of general waste at a facility that has an operation area in excess of 500m^2, excluding recycling that takes place as an integral part of an internal manufacturing process within the same premises.

(3) The recycling of hazardous waste in excess of 500kg but less than 1 tonne per day calculated as a monthly average, excluding recycling that takes place as an integral part of an internal manufacturing process within the same premises.

(4) The recovery of waste including the refining, utilisation, co-processing of the waste in excess of 10 tonnes but less than 100 tonnes of general waste per day or in excess of 500kg but less than 1 tonne of hazardous waste per day, excluding recovery that takes place as an integral part of an internal manufacturing process with in the same premises.

Treatment of waste

(5) The treatment of general waste using any form of treatment at a facility that has the capacity to process in excess of 10 tonnes but less than 100 tonnes.

(6) The treatment of hazardous waste using any form of treatment at a facility that has the capacity to process in excess of 500kg but less than 1 tonne per day excluding the treatment of effluent, wastewater or sewage.

(7) The remediation of contaminated land.

Disposal of waste

(8) The disposal of inert waste in excess of 25 tonnes and with a total capacity of 25 000 tonnes, excluding the disposal of such waste for the purposes of levelling and building which has been authorised by or under other legislation.

(9) The disposal of general waste to land covering an area of more than 50m^2 but less than 200m^2 and with a total capacity not exceeding 25 000 tonnes.

(10) The disposal of domestic waste generated on premises in areas not services by the municipal service where the waste disposed exceeds 500kg per month.

Construction, expansion or decommissioning of facilities and associated structures and infrastructure

(11) The construction of facilities for waste management schedule activity listed in Category A of this Schedule (not in isolation to associated activity)

(12) The expansion of waste management activity listed in Category A or B of this Schedule which does not trigger an addition waste management activity of this Schedule

(13) The decommissioning of facility for a waste management activity listed in Category A or B of this Schedule.

CATEGORY B

4. A person who wishes to commence, undertake or conduct a waste management activity listed under this Category, must conduct a scoping and environmental impact reporting process, set out in the Environmental Impact Assessment Regulations made under section 24(5) of the National Environmental Management Act, 1998 (Act No. 107 of 1998) as part of a waste management licence application contemplated in section 45 read with section 20(b) of this Act.

Storage of hazardous waste

(1) The storage of hazardous waste in lagoons excluding storage of effluent, wastewater or sewage.

Reuse, recycling and recovery of waste

(2) The reuse and recycling of hazardous waste in excess of 1 tonne per day, excluding reuse or. Recycling that takes place as an integral part of an internal manufacturing process within the same premises.

(3) The recovery of waste including the refining, utilisation or co-processing of waste at a facility with a facility that processes in excess of 100 tonnes of general waste per day or in excess of 1 tonne of hazardous waste per day, excluding recovery that takes place as an integral part of an internal manufacturing process within the same premises.

Treatment of waste

(4) The treatment of hazardous waste in excess of 1 tonne per day calculated as a monthly average; using any form of treatment excluding the treatment of effluent, wastewater or sewage.

(5) The treatment of hazardous waste in lagoons, excluding the treatment of effluent, wastewater or sewage.

(6) The treatment of general waste in excess of 100 tonnes per day calculated as a monthly average, using any form of treatment.

Disposal of waste on land

(7) The disposal of any quantity of hazardous waste to land.

(8) The disposal of general waste to land covering an area in excess of 200m^2 and with a total capacity exceeding 25 000 tonnes.

(9) The disposal of inert waste to land in excess of 25 000 tonnes, excluding the disposal of such waste for the purposes of levelling and building which has been authorised by or under other legislation.

Construction of facilities and associated structures and infrastructure

(10) The construction of facilities for a waste management activity listed in Category B of this this Schedule (not in isolation to associated waste management activity).

CATEGORY C

5. A person who wishes to commence, undertake or conduct a waste management activity listed under this Category, must comply with the relevant requirements or standards determined by the Minister listed below-
   (a) Norms and Standards for Storage of Waste, 2013 or
   (b) Standards for Extraction, Flaring or recovery of Landfill Gas, 2013; or
   (c) Standards for Scrapping or Recovery of Motor Vehicles, 2013; or
   (d) National Norms and Standards for the Sorting, Shredding, Grinding, Crushing, Screening or Baling of General Waste, 2017.

Storage of waste

(1) The storage of general waste at a facility that has the capacity to store in excess of 100m^3 of general waste at any one time, excluding the storage of waste in lagoons or temporary storage of such waste.
(2) The storage of hazardous waste at a facility that has the capacity to store in excess of 80m^3 of hazardous waste at any one time, excluding the storage of hazardous waste in lagoons or temporary storage of such waste.
(3) The storage of waste tyres in a storage area exceeding 500m^2.

Recycling or recovery of waste

(4) The scrapping or recovery of motor vehicles at a facility that has an operational rea in excess of 500m^2.
(5) The extraction, recovery or flaring of landfill gas.
(6) The sorting, shredding, grinding, crushing, screening or baling of general waste at a waste facility that has an operational area that is 1000m^2 and more."

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

The purpose of this publication is to redress past imbalances in the provision of waste collection services. The provision of waste collection services improves the quality of life of the entire community and ensures a clean and more acceptable place to live and work in. The lack of or poor quality waste collection services can however result in a number of environmental and human health problems.

It is recognised that South Africa is a developing country and the purpose of the setting of standards is to ensure a service to all while complying with health and safety regulations without unnecessarily changing current creative collection processes as long as they function well and deliver a service of acceptable standard to all households. These National Domestic Waste Collection Standards are therefore applicable to all domestic waste collection services throughout the country.

This notice distinguishes between the levels of service relating to waste collection. It further states that equitable waste collection services must be provided to all households within the jurisdiction of the municipality. In areas where travelling distances and the resulting costs may render regular waste collection services impractical, the municipality, through by-laws, must allow for more feasible alternative ways of waste handling, such as on-site disposal.

From here regulations and guidelines on separation at source, collection of recyclable waste, receptacles, bulk containers, communal collection points, and frequency of collection, drop-off centres and collection vehicles are given.

Existing Occupational Health and Safety legislation must be adhered to and the general health of waste collection workers must be addressed by ensuring they receive:

(i) regular medical check-ups to ensure their health and well-being;
(ii) appropriate personal protective equipment e.g. gloves, masks, overalls and raincoats, gumboots; and
(iii) on-going training on health and safety issues.

The role of the Waste Management Officer regarding waste awareness and the handling of complaints are prescribed. The municipality must create awareness amongst households about the following:

(i) the types of waste collection services provided;
(ii) separation at source - the removal of recyclables and re-usable waste from the general household waste;
(iii) the potential of composting of some of the household waste and the benefit of such to the household;
(iv) the unacceptability of illegal dumping and littering;
(v) measures to be taken against individuals that litter and dump waste illegally;
(vi) the cost of cleaning up illegal dumping and littering, and the implications on household waste collection rates; and
(vii) the advantages of reporting illegal dumping activities.

The municipality must provide clear guidelines to households about the following:

(i) the different types of waste generated in households;
(ii) separation of non-recyclable and non-reusable household waste from compostable waste and recyclable waste;
(iii) appropriate containers for each type of waste;
(iv) removal schedules for each type of waste; and
(v) what to do with waste other than those waste forming part of the regular schedule of waste collection services.

Awareness raising and guideline communications must be done at regular intervals to ensure that all households are well informed about the issues listed above.

The Waste Collection customer service standards for Kerbside collection are described with respect to collection schedule, interruptions, the replacement of bins, collection during holidays and general points.

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

The purpose of the Regulations is to regulate the collection of data and information to fulfil the objectives of the national waste information system set out in section 61 of the Act.

The Regulations apply uniformly to all persons conducting an activity listed in Annexure 1 of the Regulations. A person who conducts an activity in a province that has an established waste information system in terms of section 62 of the Act and collects the minimum information required by the Regulations must submit the information to the provincial waste information system.

Where a province has developed waste information regulations that are compatible with the Regulations, a person who conducts an activity contemplated in Annexure 1 to the Regulations must comply with the provincial waste information regulations.

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

The purpose of the Regulations is to regulate the classification and management of waste in a manner which supports and implements the provisions of the Act; to establish a mechanism and procedure for the listing of waste management activities that do not require a Waste Management Licence; to prescribe requirements for the disposal of waste to landfill; to prescribe requirements and timeframes for the management of certain wastes and to prescribe general duties of waste generators, transporters and managers. It is stated in the Regulations that waste transporters and waste managers must not accept waste that has not been classified in terms of regulation 4 unless such a waste is listed in Annexure A of the Regulations.

Chapter 2 of the Notice covers Waste Classification and Safety Data Sheets. This regulation imposes an obligation on waste generators to prepare safety data sheets for all hazardous waste.

Chapter 3 covers Waste Management in General, Waste Treatment and Waste Disposal to Landfill. Waste Transporters and Waste managers must NOT accept waste that has not been classified in terms of Section 4 unless such waste is listed in Annexure A of the Regulations.

Chapter 4 covers Waste Management Activities that do not require a Waste Management Licence. With reference to section 4: Waste classification: Wastes which were not previously classified in terms of the Minimum Requirements for the Handling, Classification and Disposal of Hazardous Waste, 2nd Edition 1998 must be classified in terms of SANS 10234 within 18 months from the publication of the regulations, thus on or before 23 February 2015. Wastes which were previously classified in terms of the Minimum Requirements for the Handling, Classification and Disposal of Hazardous Waste, 1998 must be classified in terms of SANS 10234 within 3 years from the publication of the regulations of 23 August 2013 (thus on or before 23 August 2016).

The safety data sheets for wastes listed in item 2(b)(i) of Chapter 7: Annexure A must be prepared (in accordance with SANS 10234) for the product the waste originates from. The safety data sheets for hazardous waste, must be prepared (in accordance with SANS 10234) reflecting the details of the specific hazardous wastes or hazardous chemicals in the waste.

Chapter 5 covers the Record Keeping and Waste Manifest System:

10(1) the waste **generators** must keep accurate and up to date records of the management of the waste generated, the records must reflect:-
- (a) The classification of the waste
- (b) The quantity of each waste generated in tons or cubic metres per month;
- (c) The quantity of each waste that has been re-used, recycled, recovered, treated or disposed of, and
- (d) By whom the waste was managed

10(2) the sub regulation does not apply to item 2(a) of Annexure A *(general waste*)

11(4) Waste Transporters must NOT accept waste that has not been classified in terms of Section 4(2) or waste that has been listed in 2(b) of Annexure A of the Regulations for Transport unless the Waste Manifest Document accompanies the Waste

11(5) All transporters of hazardous waste in terms of Regulation 4(2) or waste that is listed in item 2(b) of Annexure A to the Regulations must:-
- (a) Complete a waste manifest for each consignment of waste transported
- (b) Provide information to the generator before the waste is transported from the premises
- (c) Provide the information to the facility waste manager at the time of delivery.

11(8) all waste generators, transporters and managers subjected to the requirements of sub-regulation 1, 2, 4, 5, 6 and 7 must-
- (a) Retain copies or be able access copies/records, of the waste manifest document for at least (5) years.

Chapter 6 covers General Matters which includes Implementation and Transitional Provisions and Offences and Penalties.

Chapter 7 contains the following Annexures:

Annexure 1: Wastes that do not require Classification or Assessment

(2) General waste.
- (i) Domestic Waste;
- (ii) Business waste not containing hazardous waste or hazardous chemicals;
- (iv) Non-infectious animal carcasses;
- (iv) Garden waste;
- (v) Waste packaging;
- (vi) Waste tyres;
- (vii) Building and demolition waste not containing hazardous waste or hazardous chemicals; and
- (viii) Excavated earth material not containing hazardous waste or hazardous chemicals.

(3) Hazardous waste
  (i) Waste Products;
    Asbestos
    PCB or PCB containing waste
    Expired, spoiled or unusable hazardous products
  (ii) Mixed waste
    General waste excluding domestic- that may contain hazardous waste or hazardous chemicals.
    Mixed hazardous chemical wastes from analytical laboratories and laboratories from academic institutions less than 100 litre.
  (iii) Other:
    Health Care Risk Waste (HCRW)

Based on physical and chemical characteristics hazardous waste can be grouped according to the South African National Standards 10234 (SANS 10234:2008) into the following classes:

Hazardous Waste Class (SANS 10234:2008)	
Classes	**Description**
9.1	Explosives
9.2	Flammable gases
9.3	Flammable aerosols
9.4	Oxidising gases
9.5	Gases under pressure
9.6	Flammable liquids
9.7	Flammable solids
9.8	Self-reactive substances and mixtures
9.9	Pyrophoric substances
9.10	Self-heating substances and mixtures
9.11	Substances and mixtures that, on contact with water, emit flammable gases
9.12	Oxidizing substances and mixtures
9.13	Organic peroxides
9.14	Corrosive to metals

Annexure 2: Waste Manifest System Information Requirements

(1) The information required in (2) must be reflected in the Waste Manifest Document required in terms of Regulation 11.
(2) (a) Information supplied by the waste generator(consignor):
  (i) Unique consignment identification number
  (ii) South African Waste Information Number (SAWIS), if applicable
  (iii) Generator's contact details
  (iv) Physical address of site where the waste was generated
  (v) Contact number
  (vi) Origin/source of the waste. (process or activity)
  (vii) Classification of the waste (*SANS 10234*) and Safety Data Sheet (SDS)
  (viii) Quantity of waste by volume or ton
  (ix) Date of collection/dispatch
  (x) Intended receiver (waste Manager)
  (xi) Declaration (content of the assignment is fully and accurately described, classified, packed, marked and labelled, and in all respects in a proper condition for transportation in accordance with the applicable by-laws and applications
  (b) Information to be supplied to the waste Transporter:
    (i) Name of transporter
    (ii) Address and telephone number
    (iii) Declaration acknowledging receipt of the waste.
  (c) Information supplied by the waste manager (consignee):
    (i) Name, address and contact details
    (ii) Receiving facility details

(iii) Waste management facility licence number
(iv) Date of receipt
(v) Quantity of waste received
(vi) Type of waste management applied
(vii) Any discrepancies in information between the different holders of waste
(viii) Waste management reporting description and code in terms of the National Waste Information Regulations 2012
(ix) Details on any waste diverted to another facility
(x) Certification and declaration of receipt and final management of waste.

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

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

The Standard Assessment methodology to assess waste for the purpose of disposal to landfill the following are required:

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

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

2.1.17 National Environmental Management: Waste Act, 2008 (Act no. 59 of 2008): National Norms and Standards for Disposal of Waste to Landfill, Government Gazette no. 36784, 23 August 2013

The purpose of the Norms and Standards are to determine the requirements for the disposal of waste to landfill as contemplated in regulation 8(1)(b) and (c) of the Regulations.

Chapter 2 describes and illustrates the Landfill Classification and corresponding minimum engineering design requirements for the Containment Barriers. These are for Class A to Class D landfills. The requirements that are to be included in an application for a waste management license are stipulated.

The waste acceptance criteria for disposal to landfill are summarised as follows:
Waste assess in terms of the Norms and Standards for Assessment of Waste for Landfill Disposal set in terms of section 7(1) of the Act must be disposed to a licensed landfill as follows:

Waste Type	Landfill Disposal Requirements
Type 0	Disposal to landfill not allowed
Type 1	Disposed at Class A landfill or H:h/H:H landfill as specified
Type 2	Disposed at Class B landfill or G:L:B+ landfill as specified
Type 3	Disposed at Class C landfill or G:L:B+ landfill as specified
Type 4	Disposed at Class D landfill or G:L:B- landfill as specified

Waste listed in section 2(a) of Annexure A to the Regulations must be disposed as follows:

Listed Waste	Landfill Disposal Requirements
Domestic waste. Business waste not containing hazardous waste or hazardous chemicals. Non-infectious animal carcasses. Garden waste.	Disposed at Class B landfill or G:L:B+ landfill as specified
Post-consumer packaging. Waste tyres.	Disposed at Class C landfill or G:L:B+ landfill as specified
Building and demolition waste not containing hazardous waste or hazardous chemicals. Excavated earth material not containing hazardous waste or hazardous chemicals.	Disposed at Class D landfill or G:L:B- landfill as specified

Unless assessed in terms of the Norms and Standards for Assessment of Waste for Landfill Disposal set in terms of Section 7(1) of the Act and disposed of in terms of section 4(1) of these Norms and Standards, the following waste included in section 2(b) of Annexure 1 to the Regulations must be disposed as follows:

Listed Waste	Landfill Disposal Requirements
Asbestos waste; Expired, spoilt or unstable hazardous products; PCBs; General waste, excluding domestic waste, which contains hazardous waste or hazardous chemicals; Mixed, hazardous chemical wastes from analytical labs and labs from academic institutions in containers less than 100 litres.	Disposed at Class A landfill or H:h/H:H landfill as specified

Waste that has been classified in terms of the Minimum Requirements for the Handling, Classification and Disposal of Hazardous Waste (2nd Edition, 1998; DWAF) prior to the Regulations coming into operation, may be accepted and disposed of as set out below for a period not exceeding 3 years after the date of coming into operation of the Regulations:

Waste	Landfill Disposal Requirements
Hazardous Waste - Hazard Rating 1 or 2	Disposed at Class A landfill or H:H landfill as specified
Hazardous Waste - Hazard Rating 3 or 4	Disposed at Class A landfill or H:h landfill as specified
Hazardous Waste - Delisted	Disposed at Class B landfill or G:L:B+ landfill as specified
General Waste	Disposed at Class B landfill or G:S/M/L:B-/B+ landfill as specified

The Norms and Standards lists prohibitions and restrictions on the disposal of waste to landfill which comes into effect after the timeframes indicated for each waste and activities from the date of the Regulations coming into operation. For garden waste specifically, it states that diversion of garden waste must reach 25% by 2018 and 50% by 2023.

Waste Prohibited or Restricted in terms of Disposal	Compliance Timeframe
a. Waste which, in the conditions of a landfill, is explosive, corrosive, oxidising (according to SANS 10234 or SANS 10228).	Immediate
b. Waste with a pH value of <6 or >12.	Immediate
c. Flammable waste with a closed cup flashpoint lower than 61°Celsius.	Immediate
d. Reactive waste that may react with water, air, acids or components of the waste, or that could generate unacceptable amounts of toxic gases within the landfill.	Immediate
e. Waste compressed gases (according to SANS 10234 or SANS 10228)	Immediate
f. Untreated Healthcare Risk Waste (HCRW).	Immediate
g. (i) POPs pesticides listed under the Stockholm Convention.	Eight (8) years

Waste Prohibited or Restricted in terms of Disposal	Compliance Timeframe
(ii) Other waste pesticides.	Four (4) years
h. Lead acid batteries.	Immediate
i. Other batteries.	Eight (8) years
j. Re-usable, recoverable or recyclable used lubricating mineral oils, as well as oil filters, but excluding other oil containing wastes.	Four (4) years
k. Re-usable, recoverable or recyclable used or spent solvents.	Five (5) years
l. PCB containing waste (>50 mg/kg or 50 ppm).	Five (5) years
m. Hazardous waste Electric and Electronic Equipment (WEEE) – Lamps.	Three (3) years
n. Hazardous waste Electric and Electronic Equipment (WEEE) – Other.	Eight (8) years
o. Waste tyres: Whole.	Immediate
p. Waste tyres: Quartered.	Five (5) years
q. Liquid waste- (i) Waste which has an angle of repose of less than 5 degrees, or becomes free-flowing at or below 60°C or when it is transported, or is not generally capable of being picked up by a spade or shovel; or (ii) Waste with a moisture content of >40% or that liberates moisture under pressure in landfill conditions, and which has not been stabilised by treatment.	Six (6) years
r. Hazardous waste with a calorific value of: i > 25MJ/kg ii > 20MJ/kg iii> 10MJ/kg iv > 6% TOC	 Four (4) years Six (6) years Twelve (12) years Fifteen (15) years
s. Brine or waste with a high salt content (TDS > 5%), and a leachable concentration for TDS of more than 100 000 mg/l.	Eight (8) years
t. Disposal of garden waste: (i) 25% diversion from the baseline at a particular landfill of separated garden waste. (ii) 50% diversion from the baseline at a particular landfill of separated garden waste	 Five (5) years Ten (10) years
u. Infectious animal carcasses and animal waste.	Immediate

Restrictions on activities related to the disposal of waste to landfill:

Waste Prohibited or Restricted in terms of Disposal	Compliance Timeframe
(a) Disposal of- (s) Type 1 Waste that has been treated, with waste listed in paragraph (2)(a) of Annexure 1 to the Regulations (ii) Waste classified as hazardous in terms of regulation 4(1), or waste listed in paragraph (2)(b) of Annexure 1 to the Regulations, with waste listed in paragraph (2)(a) of Annexure 1 to the Regulations; and (iii) Type 4 waste with any waste other than Type 4, unless part of treatment.	 Five (5) years Five (5) years Five (5) years
(b) Macro-encapsulation of waste, meaning the isolation (or long-term storage) of waste through containment in containers within a sealed or reinforced cell in a specifically prepared and engineered area within a permitted hazardous waste landfill.	Eight (8) years

2.1.18 National Environmental Management: Waste Act, 2008 (Act no. 59 of 2008): Fee Structure for Consideration and Processing of Applications for Waste Management Licences, Transfer and Renewal thereof, Government Gazette No. 37383, 28 February 2014

These regulations apply to the above application excluding community based projects funded by government grants or applications made by organs of state. The commencement date is 1 April 2014. Payment details are discussed regarding the different applicable fees which are listed as follows:

Application	Fee
Application for a waste management license for which basic assessment is required in terms of the Act.	R200.00
Application for a waste management license for which S&EIR is required in terms of the Act.	R10000.00
Application for a transfer of a waste management license in terms of section 52(2) or for the renewal of a waste management license in terms of section 55(2) of the Act.	R2000.00

2.1.19 National Environmental Management: Waste Act, 2008 (Act no. 59 of 2008): National Norms and standards for the Extraction Faring or Recovery of Landfill Gas, Government Gazette No. 37086, 29 November 2013

The purpose of these Norms and Standards is to aim at controlling the flaring, extraction or recovery of landfill gas at facilities in order to prevent or minimise the potential negative impacts on the bio-physical and socio-economic environments. It describes how these facilities must be designed, operated, monitored and decommissioned.

2.1.20 National Environmental Management: Waste Act, 2008 (Act no. 59 of 2008): National Norms and Standards for the Scrapping or Recovery of Motor Vehicles, Government Gazette No. 37087, 29 November 2013

These Norms and Standards are applicable to a vehicle scrapping or recovery facility with an operational area exceeding 500m^2 and describes how such a facility must be designed, operated, monitored and decommissioned.

2.1.21 National Environmental Management: Waste Act, 2008 (Act no. 59 of 2008): National Norms and Standards for the Storage of Waste, Government Gazette No. 37088, 29 November 2013

The purpose of these Norms and Standards is to provide a uniform national approach to the management of waste storage facilities, ensure best practice and to provide minimum standards for the design and operation of new and existing facilities. These Norms and Standards are applicable to waste storage facilities that have the capacity to store in excess of 100m^3 general waste continuously or 80m^3 of hazardous waste continuously.

2.1.22 National Environmental Management: Waste Act, 2008 (Act no. 59 of 2008): National Norms and Standards for the Remediation of Contaminated Land and Soil Quality, Government Gazette No 37603, 2 May 2014

The purpose of these Norms and Standards is provide a uniform national approach to determine the contamination status of an area and to limit uncertainties about the most appropriate criteria and method to apply in such an assessment. Also provide minimum standards for assessing necessary environmental protection measures for remediation activities.

2.1.23 National Environmental Management: Waste Act, 2008 (Act no. 59 of 2008): National Norms and Standards for the sorting, shredding, grinding, crushing, screening or baling of general waste, Government Gazette No. 41175, 11 October 2017

The purpose of these norms and standards is to provide a uniform national approach relating to the management of waste facilities that sort, shred, grind, crush, screen, chip or bale general waste and applies to a waste facility that has an operational area that is 1000m^2 and more.

It requires any new facility to register with the competent authority within 90 days prior to construction taking place and it allows for any existing facilities that undertake these activities, and which are already registered in terms of the National Norms and Standards for Storage of waste, to comply with the norms and standards without having to re-register.

A waste facility that is less than 1,000m^2 must register with the competent authority and comply with the principle of duty of care as contained in Section 28 of the National Environmental Management Act, 1998 (Act No. 107 of 1998) and Section 16(1) and 16(3) of the National Environmental Management: Waste Act, 2008 (Act 59 of 2008).

2.1.24 National Environmental Management: Waste Act, 2008 (Act no. 59 of 2008): National Norms and Standards for Organic Waste composting, Government Gazette No. 44762, 25 June 2021

These Norms and Standards are applicable to organic waste composting facilities that have the capacity to process in excess of 10 tonnes of compostable organic waste per day and describes how such a facility must be designed, operated, monitored and decommissioned.

2.1.25 National Environmental Management: Waste Act, 2008 (Act no. 59 of 2008): National Norms and Standards for the Treatment of Organic Waste, Government Gazette No. 46169, 1 April 2022

These Norms and Standards were developed to assist int eh diversion of organic waste from landfills and are applicable to any organic waste treatment facility that has the capacity to process in excess of 10 tonnes of organic waste per day and describes how such a facility must be designed, operated, monitored and decommissioned. These norms and standards are not applicable to composting as composting has its own norms and standards as described int eh previous heading.

2.1.26 The Western Cape Health Care Waste Management Amendment Act, 2007 (No 6 of 2010)

Act 7 of 2007 was amended in 2010 so as to align the terminology with that used in the National Environmental Management: Waste Act, 2008; to define or redefine certain expressions; to delete certain unnecessary definitions; to provide for the issuing of compliance notices; to amend the provisions relating to offences and penalties; to make further provision regarding regulations; to effect certain textual changes; and to provide for matters incidental thereto. The Health Care Management Bill provides for the effective handling, storage, collection, transportation, treatment and disposal of health care waste by all persons in the Province of the Western Cape; and provides for matters incidental thereto.

The object of this Act is to promote integrated health care waste management and thereby—

(a) reduce the risks of health care waste to human health;
(b) prevent the degradation of the environment;
(c) prevent the illegal dumping of health care waste;
(d) promote sustainable development, and
(e) ensure responsible management of health care waste within the Province.

Under this Act a Municipality must:

(a) enforce the relevant provisions of this Act within its area of jurisdiction;
(b) perform audits of generators, transporters, treaters or disposers of health care waste within its area of jurisdiction to ensure compliance with the provisions of this Act;
(c) report annually to the Provincial Minister on the number of incidents of illegal dumping of health care risk waste within its area of jurisdiction, the number of incidents of illegal dumping of health care risk waste pursued in a court of law, and the number of incidents of illegal dumping of health care risk waste successfully convicted in a court of law.

Health Care Waste is produced by hospitals, clinics, physicians, offices, dentists, funeral homes, veterinary clinics and medical- and research laboratories.

Currently only 10-15% of medical waste is considered infectious. The enormous volumes of health care waste requiring special handling and disposal for all infectious and pathological waste are responsible for the current re-evaluation of the terminology for health care waste.

The modern trend in infection control is dictated by the risk posed by the procedure and not by the diagnoses. Thus health care waste is divided into Health Care General Waste (HCGW) and Health Care Risk Waste (HCRW). HCRW generally indicates infectious waste, pathological waste, sharps, chemical and pharmaceutical waste, radioactive and cytotoxic waste.

2.1.27 The Western Cape Health Care Waste Management Amendment Act, 2007: Western Cape Health Care Risk Waste Management Regulations, 2013

These regulations were published in the Western Cape: Provincial Gazette Extraordinary 15 March 2013. These are the regulations set out in the Schedule under section 14 of the Western Cape Health Care Waste Management Act, 2007.

The regulations address the requirements for packaging, storage, internal transport, external transport, vehicles, drivers, treatment and disposal of health care risk waste. Furthermore the required training, registration of health care risk waste generators, transporters, treaters and disposers, reporting, auditing and record keeping is discussed. Health care waste management plans must be prepared by those who meet the criteria listed. The required actions regarding compliance notices are also listed.

All addressed forms in the regulations are given in the Annexures:

Annexure 1: Minimum Requirements for health care risk waste containers
Annexure 2: Minimum Requirements for storage of health care risk waste in terms of regulation 3
Annexure 3: Form 1, Minimum Requirements for a tracking document
Annexure 4: Minimum Requirements for information to be contained in a Health Care Waste Management Plan
Annexure 5: Form 2.1, IPWIS registration form for health care risk waste generators, transporters, treaters and disposers
Annexure 6: Form 2.2, Registration Certificate; Form 3.1, Monthly record keeping form for generators; Form 3.2 Monthly record keeping form for transporters, treaters and disposers
Annexure 7: Form 4.1, Compliance Notice; Form 4.2, Compliance certificate.

2.1.28 National Waste Management Strategy (2011)

The National Waste Management Strategy (NWMS) 2011 has been updated with the publication of the NWMS 2020, but is included here for information. The NWMS 2011 presented Government's strategy for integrated waste management for South Africa and is a legislative requirement of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) The purpose of the Strategy is to achieve the objectives of the Waste Act.

The strategy gives effect to the Bill of Rights, Constitution of South Africa, Act 107 of 1998, on the basis of which the people of South Africa have the right to an environment that is not detrimental to their health. Furthermore, the strategy translates into action Government's policy on waste as set out in the Draft White Paper on Integrated Pollution and Waste Management for South Africa (published in 1998).

The objective of integrated pollution and waste management is to move away from fragmented and uncoordinated waste management to integrated waste management. Such a holistic and integrated management approach extends over the entire waste cycle from cradle to grave, and covers the prevention, minimisation, generation, collection, transportation, treatment and final disposal of waste. Integrated waste management thus represents a paradigm shift in South Africa's approach to waste management, by moving away from waste management through impact management and remediation and establishing instead a waste management system which focuses on waste prevention and waste minimisation.

The Strategy was built around a framework of eight goals, as listed below, along with specific goals that was aimed to be reached by 2016:

Goal 1: Promote waste minimisation, reuse, recycling and recovery of waste.
- 25% of recyclable diverted from landfill sites for re-use, recycling or recovery.
- All Metropolitan Municipalities, secondary cities and large towns have initiated separation at source programmes.

Goal 2: Ensure the effective and efficient delivery of waste services.
- 95% of urban households and 75% of rural households have access to adequate levels of waste collection services.
- 80% of waste disposal sites have permits.

Goal 3: Grow the contribution of the waste sector to the green economy.
- 69 000 new jobs created in the waste sector.

Goal 4: Ensure that people are aware of the impact of waste on their health, well-being and the environment.
- 80% of municipalities running local awareness campaigns.
- 80% of schools implementing waste awareness programmes.

Goal 5: Achieve integrated waste management planning
- All Municipalities have integrated their IWMPs with their IDPs and have met the targets set in the IWMPs.
- All waste management facilities required to report to SAWIS have waste quantification systems that report information to WIS.

Goal 6: Ensure sound budgeting and financial management for waste services.
- All municipalities that provide waste services have conducted full-cost accounting for waste services and have implemented cost reflective tariffs.

Goal 7: Provide measures to remediate contaminated land.
- Assessment complete for 80% of sites reported to the contaminated land register.
- Remediation plans approved for 50% of confirmed contaminated sites.

Goal 8: Establish effective compliance with and enforcement of the Waste Act.
- 50% increase in the number of successful enforcement actions against non-compliant activities.
- 800 EMIs appointed in the three spheres of government to enforce the Waste Act.

The strategy aimed to reduce both the generation and the environmental impact of waste. It presented a plan for ensuring that the socio-economic development of South Africa, the health of its people and the quality of its environmental resources are no longer adversely affected by uncontrolled and uncoordinated waste management. It establishes a waste management system that concentrates on avoiding, preventing and minimising waste and makes provision for waste management services for all by extending an acceptable standard of waste collection, as well as transportation, treatment and disposal services to all communities.

While the long-term objective of the strategy is waste prevention and minimisation, a number of remedial actions such as improved waste collection and waste treatment are required in the shorter term due to prevailing inadequate waste management practices.

The Strategy is an institutionally inclusive strategy because its achievement relies on participation by numerous role-players in the public sector, private sector and civil society.

To implement the Waste Act, government must:

- Draft legislation, regulations, standards and Integrated Waste Management Plans.
- Regulate waste management activities through licences and enforce their conditions.
- Implement the South African Waste Information System (SAWIS)
- Coordinate waste management activities using a system of Waste Management Officers.
- Give effect to multilateral agreements and ensure proper import and export controls.
- Progressively expand access to at least a basic level of waste services and plan for future needs.
- Facilitate the establishment of a national recycling infrastructure.
- Provide the framework for the remediation of contaminated land.
- Work in partnership with the private sector and civil society.

2.1.29 National Waste Management Strategy (2020)

The strategy is an update of the 2011 NWMS to be implemented under the Waste Act. It is updated in light of progress, challenges and lessons learned from implementing the 2011 strategy. It was based on a 4-phase approach, which consist of the following:

- The review of the 2011 NWMS
- A situational analysis
- Recommendations
- A Revised and Updated NWMS

The latest indications in the 2018 State of Waste Report are that as waste generation continues to grow in South Africa, no significant diversion from disposal is taking place, therefore the depletion of disposal airspace continue at unsustainable rates. Implementation of the waste management hierarchy informed the 2011 NWMS, but progress has been limited. The revised strategy needs to be more specific in terms of objectives, targets and actions in relation to the different levels of the waste management hierarchy and particular waste streams. Progress has been made in terms of recycling as compared to other developing countries. However, with the generated general waste stream consisting of approximately 47% organics (State of Waste Report), this waste stream needs to be prioritised and waste minimisation opportunities above and below recycling in the hierarchy need to be more actively addressed.

The concept of the circular economy is highlighted as being a useful way of understanding the implementation of the waste management hierarchy in terms of its contribution to the green economy and the decoupling of economic activity from harmful environmental impacts. The circular economy consists of closing the loop between resource extraction and waste disposal by the application of waste avoidance, reuse, repair, recycling and recovery throughout the economic cycle to minimise waste and reduce demand for virgin materials.

The table below lists the key principles underpinning the NWMS 2020:

Principle	Explanation
Waste Minimisation	This refers to avoiding the amount and toxicity of waste that is generated and, in the event that waste if generated, the reduction of the amount and toxicity of the waste that is disposed.
Waste Prevention	This refers to avoiding the generation of waste and avoiding toxicity in waste.
Waste as a Resource	This refers to beneficiating waste through re-use, recycling, treatment and recovery to reduce the amount and the toxicity of waste disposed of.
Sustainable Strategic Partnerships	This refers to 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 socio-economic growth and development	This refers to 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.

The following are the expected outcomes that will be achieved through effective and efficient implementation of the NWMS 2020 by all stakeholders from all sectors of society:

- *Prevent waste, and where waste cannot be prevented ensure* –
  40% of waste diverted from landfill within 5 years; 55% within 10 years; and at least 70% within 15 years leading to Zero-Waste going to landfill;
- All South Africans live in clean communities with *waste services that are well managed* and financially sustainable; and
- Mainstreaming of waste a*wareness and a culture of compliance* resulting in zero tolerance of pollution, litter and illegal dumping.

Furthermore, the strategic entry points in terms of the circular economy are:

- Waste prevention: This includes interventions around the design and packaging of products, cleaner production and industrial symbiosis by reducing the substances, materials and products that become waste. These interventions have the highest priority and should be the first applied to any waste stream.
- Waste as a resource: This includes interventions to stimulate secondary resources economy that take place after products or materials have become waste. Examples are recycling and recovery and generating energy from waste.

The 2011 NWMS revolved around 8 goals. This approach has been updated to focus on three overarching goals containing sets of strategic objectives which will be monitored in terms of performance indicators. The three strategic goals correspond to the following implementation themes:

- Waste Minimisation: the focus is on waste prevention and building a secondary resources economy. The role of government is to create an enabling environment for the private sector that supports extended producer responsibility and waste beneficiation.
- Effective and Sustainable Waste Services: the focus is on government, particularly local government, in ensuring that citizens receive appropriate waste services in a way that contributes to sustainable development.
- Compliance, enforcement and awareness: the focus is improving behaviour and attitude amongst citizens, businesses and government to lead to a culture of compliance to manage the environmental impact of waste and preventing pollution.

NWMS 2020 implementation plan:

Pillar 1: Waste Minimisation					
Outcome 1: 40% of waste diverted from landfill within 5 years; 55% within 10 years; and at least 70% within 15 years leading to Zero-Waste going to landfill.					
Key intervention	**Action/s**	**Performance indicators**	**Targets**	**Timeline**	**Implementing Agent/s**
Prevent waste generation through cleaner production, industrial symbiosis and extended producer responsibility	Develop and implement EPR schemes for priority wastes (i.e. WEEE, Paper and Packaging and Lighting) that includes measures for cleaner production, industrial symbiosis and extended producer responsibility.	(i) Number of EPR schemes finalised, adopted and implemented. (ii) Number of EPR meeting or exceeding performance targets within 5 years	(i) Three (3) x EPRs for WEEE, Paper and Packaging and lighting (ii) % Reduction of waste disposed to landfill (as per outcome 1); toxicity of waste streams; waste in manufacturing and across its value chain	(i) 2021 (ii) 2025	DFFE CSIR, Producers and Industry Associations
	Strengthen the capacity and national reach of the NCPC-SA through establishing waste symbiosis programmes in all provinces	(i) Number of Provinces with well established Industrial Symbiosis Programmes (ii) Increase the training and technical support provided by NCPC-SA with a special focus on women, youth and people living with disabilities	(i) a. 5 x provinces – Gauteng, KZN, E.Cape, Mpumulanga, North West b. 3 x provinces – Free State, Limpopo, N.Cape (ii) 15 of training and technical support programmes implemented by the NCPC-SA	(i) a. 2021 b. 2022 (ii) 2025	NCPS-SA DFFE, DSI (TIA and Waste RDI Roadmap), provinces, industrial development zones, business chambers and industry associations
	Minimise the production and retail of single-use plastics for consumption within the country and replace the products with bio-degradable alternatives	Single use plastics to be covered by generic reference to the National Pricing Strategy for Waste Management	80% reduction in production of single use plastics not covered by deposit scheme under the National Pricing Strategy	2025	DFFE DTIC, DSI (TIA and Waste RDI Roadmap), Producers and other affected industries
	Standardise design and packaging of sustainable products that reduces production of waste, maximises resource recovery for recycling or re-use and supports consumption of materials and products with a prolonged life	(i) Waste Streams that utilise most resources with high potential for circularity identified (ii) Circular economy principles implemented across the waste management value chain	(i) and (ii) National Circular Economy Action Plan developed and implemented	(i) and (ii) 2023	DFFE DTIC, industry associations, research institutions,

Pillar 1: Waste Minimisation					
Outcome 1: 40% of waste diverted from landfill within 5 years; 55% within 10 years; and at least 70% within 15 years leading to Zero-Waste going to landfill.					
Key intervention	**Action/s**	**Performance indicators**	**Targets**	**Timeline**	**Implementing Agent/s**
Prevent Food Waste	Develop and implement a strategy for reducing food losses and waste prior to retail and that is associated with harvesting, processing and transport of food with food producers and retailers.	(i) Strategy developed (ii) Annual reporting on implementation of the strategy.	(i) 1 x adopted strategy ready for implementation (ii) 1 x annual report each financial year	(i) 2021 (ii) Annual (each financial year)	DALLRD, DFFE, food producers and retailers
	Improve consumer awareness and standards for labelling and marketing of perishable foodstuffs and "ugly" fruit and vegetables	(i) Marketing and labelling standards reviewed and revised (ii) Consumer Awareness Campaigned implemented	(i) 1 x set of revised standards adopted and implemented (ii) Launch of awareness campaign	(i) and (ii) 2021	SABS, DFFE, DoH, food retailers, DTIC, National Consumer Commission (NCC)
	Develop guidelines, norms and standards for redistributing surplus foods and composting of spoilt foods	(i) Guidelines / Norms and Standards developed and implemented Reduction in food losses prior to retail and food waste in the retail sector	(i) 1 x Guidelines / norms and standards adopted and implemented (ii) 30% reduction in food waste	(i) 2022 (ii) 2025	DFFE, DoH, food retailers, the hospitality sector and NPO's
Increase re-use, recycling and recovery rates	Develop and implement a public procurement framework to support recycling, encompassing requirements for recycled content	Achievement of procurement targets for recycled content in the public sector	1 x Procurement targets gazetted	2021	DFFE, NT, COGTA, SALGA and Municipalities
	Establish MRFs and Recyclate processing plants as Public Private Partnerships based on regionally integrated waste management planning	Number of MRFs and recyclate processing plants established	All new and existing landfills with longer airspace/years to include MRFs	2021	DFFE, producers, Provinces, local government, SALGA, COGTA, NT
	Develop and implement industry standards that align technology requirements between primary producers and recyclers of all materials, by ensuring that the design and packaging of products maximise the value of the materials that circulate within the economy	(i) Number of Standards developed and implemented (ii) % increase in materials recovery and recycling rates	(i) 1 x Industry standards adopted and implemented (ii) 70% of paper recycled, 60% of plastic recycled, 90% of glass recycled, 90% of metals recycled and 40% of fly-ash recycled	(i) 2021 (ii) 2025	DFFE, Waste Bureau, DTIC, Research Institutions, NGOs, SABS, industry associations / partners, DSI, Innovation Hub, DoE, Eskom, Transnet and Producers
Divert organic waste from landfill through composting and the recovery of energy	Develop and implement an enabling environment to produce biogas through anaerobic bio-digestion of organic waste treating sewage and organic domestic waste	(i) Number of Statutory and regulatory framework developed (ii) Number of biogas projects involving organic waste	(i) 1 x Strategy and Regulatory framework adopted and ready for implementation (ii) 5number of projects implemented	(i) 2022 (ii) 2023	DFFE DMRE, DSI, DHSWAS, Biogas Association

Pillar 1: Waste Minimisation					
Outcome 1: 40% of waste diverted from landfill within 5 years; 55% within 10 years; and at least 70% within 15 years leading to Zero-Waste going to landfill.					
Key intervention	**Action/s**	**Performance indicators**	**Targets**	**Timeline**	**Implementing Agent/s**
		(iii) Volume of biogas produced from waste	(iii) 40% biogas produced from organic waste	(iii) 2025	
	Develop and implement biogas digester projects linked to the National School Nutrition Programme	(i) Number of MoU's signed (ii) Number of schools with biogas digesters	(i) 1 x MoU with DBE signed and implemented (ii) 50 schools have biogas digesters	(i) 2021 (ii) 2024	DFFE DBE, DMRE
	Include and implement organic waste technologies in local government IWMPs	(i) Number of metros implementing organic waste technologies (ii) Number of districts implementing organic waste technologies (iii) Number of municipalities implementing organics waste technologies (iv) Number of new composting projects identified and implemented	(i) All Metros (ii) All districts (iii) All municipalities (iv) 35 projects	(i) 2021 (ii) 2023 (iii) 2025 (iv) 2025	DFFE Provinces, local government, SALGA, COGTA, other stakeholders
Divert construction and demolition waste from landfill through beneficiation	Develop and implement best practice guidelines and standards for the re-use of C & D waste in roads and other building materials e.g. bricks	(i) C & D waste only disposed to landfill as cover (ii) Number of C & D Beneficiation	(i) Guidelines and Standards approved and implemented (ii) 20 C & D beneficiation programmes implemented	(i) 2021 (ii) 2024	DFFE SANRAL SABS Construction Industry Association
Increase technical capacity and innovation for the beneficiation of waste	Promote research and Innovation in the waste sector	(i) Number of MoU's signed (ii) Number of waste beneficiation projects supported by TIA (iii) Number of research reports published	(i) 1 x MoU with DSI signed and implemented (ii) 25 projects supported (iii) 2 research reports published annually	(i) 2021	DFFE DSI (TIA and the Waste RDI RoadMap)
	Review and update or developed new legislation/instruments to keep abreast of technical developments and remove unnecessary regulatory barriers to the uptake of new technologies	Number of instruments reviewed and/or developed	4 Instruments adopted and implemented	2022	DFFE DSI (TIA and the Waste RDI Roadmap), DPME
	Increase technical capacity and skills in the waste sector	(i) Number of waste management graduates prioritising women, youth and people living with disabilities	(i) 120 new graduates prioritising women, youth and people with disabilities	(i) 2023	DSI (TIA and the Waste RDI Roadmap) Tertiary institutions

Pillar 1: Waste Minimisation					
Outcome 1: 40% of waste diverted from landfill within 5 years; 55% within 10 years; and at least 70% within 15 years leading to Zero-Waste going to landfill.					
Key intervention	**Action/s**	**Performance indicators**	**Targets**	**Timeline**	**Implementing Agent/s**
		(ii) Number of waste management professionals in the public sector	(ii) 20 waste management professionals in public sector prioritising women, youth and people with disabilities	(ii) 2024	

Pillar 2: Effective and sustainable waste services					
Outcome 2: All South Africans live in clean communities with waste services that are well managed and financially sustainable					
Key action	**Sub-Action/s**	**Performance indicators**	**Targets**	**Timeline**	**Implementing Agent/s**
Separate Waste at Source	Integration of waste pickers into the waste management system	(i) Number of Integration guidelines developed (ii) Number of metros with integration programmes in place (iii) Number of secondary cities with integration programmes in place (iv) Number of sustainable jobs/decent livelihoods created in collecting recyclables	(i) 1 x Guidelines adopted and implemented (ii) All metros (iii) All secondary cities iv) 500 jobs created/decent livelihoods created prioritising women, youth and persons living with disabilities	(i) 2020 (ii) 2021 (iii) 2024 (iv) 2024	DFFE, Producers through EPR schemes, local government, SALGA, COGTA, Waste Pickers Association, African Reclaimers Association and
	Separate collection of post-consumer waste of products identified for EPR	(i) % of waste collected	(i) Aligned with the targets set in respective Notices	(i) 2021 (ii) 2022 (iii) 2023 (iv) 2024	Producers
	Public online and annually update guidelines, case studies and planning tools on separation at source for municipal managers	(ii) Number of downloads of annual updates (iii) Percentage of households separating at source	(ii) 100 downloads per update (iii) 50% of households in municipalities implementing services	(v) 2021 onwards (vi) 2024	Waste Bureau, Waste RDI Roadmap, COGTA, SALGA and municipalities
	National Awareness campaign on recycling and waste management	Number of Good Green Deeds programme activities implemented on an ongoing basis	20 of Good Green Deeds activities	2020 onwards	DFFE Provinces, municipalities, COGTA and SALGA
Safe and environmentally sustainable disposal of hazardous household wastes	Develop and implement a strategy for the safe disposal of household hazardous waste that includes a communication and awareness plan and EPR as core components	(i) Strategy developed and implemented (ii) Percentage reduction of hazardous wastes in general landfill sites	(i) 1 x Strategy adopted and implemented (ii) 10% reduction of hazardous waste in general landfills	(i) 2021 onwards (ii) 2024	DFFE, DoH, DTIC, Industry Associations, Producers through EPR schemes

Pillar 2: Effective and sustainable waste services					
Outcome 2: All South Africans live in clean communities with waste services that are well managed and financially sustainable					
Key action	**Sub-Action/s**	**Performance indicators**	**Targets**	**Timeline**	**Implementing Agent/s**
	Develop and implement a strategy and standards relating to the design and disposal of AHPs such as baby and adult diapers, feminine care products	(i) Strategy developed and implemented (ii) Percentage reduction in disposal of AHPs to landfill	(i) 1 x Strategy adopted and implemented (ii) 10% reduction of AHPs in landfills	(i) 2021 onwards	DFFE DoH, Private Sector, DTIC SABS
Effective integrated waste management planning	Development and implementation of 5-year provincial and municipal integrated waste management plans	(i) Number of provinces to have updated IWMPs ii) Number of municipalities with IWMPs reporting on SAWIS (iii) Number of guidelines and reporting standards for provincial and municipal IWMPS, updated (iv) Percentage of households receiving waste collection services in compliance with DWCS (v) Percentage of IWMPs reflected in municipal budgets (vi) Number of municipal IWMPs submitted to Provinces for approval	(i) All (9) updated provincial IWMPs adopted and implemented (ii) All municipalities (iii) 1 x Guidelines and reporting standards updated (iv) 95% of households (v) 80% of IWMPS in municipal budgets (vi) All municipal IWMPs submitted to provinces for approval	(i) 2022 (ii) 2022 (iii) 2021 (iv) 2024 (v) 2025	Provinces Municipalities DFFE SALGA COGTA
	Improve collection, reporting and dissemination of information on SAWIS	(i) Percentage improvement of reporting on SAWIS (ii) Training and compliance to waste information regulations	(i) 60% improvement in reporting (ii) 20 Training interventions per annum	(i) 2022 (ii) 2022	DFFE, Provinces, municipalities, SALGA, and COGTA
	Build capacity in integrated waste management planning and provide revised IWMPs guidelines	(i) Number of revised guidelines on IWMPS developed (ii) Number of capacity building programmes implemented per annum	(i) 1 x revised IWMPS guidelines adopted and implemented (ii) 35 of capacity building programme implemented per annum	(i) 2022 (ii) 2025	DFFE Waste Bureau, Waste RDI Roadmap, SALGA, COGTA, Universities with waste management programmes, provinces and municipalities

Pillar 2: Effective and sustainable waste services					
Outcome 2: All South Africans live in clean communities with waste services that are well managed and financially sustainable					
Key action	**Sub-Action/s**	**Performance indicators**	**Targets**	**Timeline**	**Implementing Agent/s**
	Municipalities include provisions for recycling drop-off/buy back/storage centres in their IWMPs, supported by fiscal mechanisms / EPR schemes	(i) Number of new recycling drop-off/buy-back/storage centres established	(i) 20 (number of centres established	(i) 2023	DFFE Waste Bureau, Waste RDI Roadmap, NT, SALGA, Provinces, Municipalities, SALGA, COGTA and Producers through EPR schemes

Pillar 3: Compliance, enforcement and awareness					
Outcome 3: Mainstreaming of waste awareness and a culture of compliance resulting in zero tolerance of pollution, litter and illegal dumping					
Key action	**Sub-Action/s**	**Performance indicators**	**Targets**	**Timeline**	**Implementing Agent/s**
Reduce Pollution, littering and illegal dumping	Develop and implement a national awareness campaign about litter and illegal dumping	(i) Rand value of media spend – print, tv, radio (ii) Social Media Campaign statistics	(i) 5 million (ii) 12 per annum	(i) 2024 (ii) 2024	DFFE Provinces, municipalities, COGTA, SALGA and private sector
	Establish a micro-grant facility training and purchasing of equipment for community-based clean-up operations	(i) Number of micro-grants issued with priority focus on women, youth and people living with disabilities (ii) Number of reports from micro-grant recipients	(i) 20 (iii) 20	(i) 2024 (ii) 2024	DFFE Waste Bureau, civil society, Cities Support Programme, NT
Enhance capacity to monitor compliance and enforce the Waste Act and International Agreements	Agreement between DEFF, SAPS and NPA on increasing enforcement of Waste Act and municipal by-laws relating to pollution, littering and illegal dumping	(i) Number of Agreements signed (ii) Number of reports on compliance and enforcement reports	(i) 1 x Agreement signed and implemented (ii) 1 x National Environmental Compliance and Enforcement Report (NECER) per annum	(i) 2021 (ii) 2024	DFFE SAPS, NPA
	Increase the number of EMIs dedicated to monitor compliance and enforce the Waste Act	Number of EMIs appointed	· At least 1 EMI per metro district · All districts · All national, provincial and local municipalities	(i) 2025	DFFE Provinces, local municipalities
	Proclamation on import and export of waste	Number of proclamations developed	1 x proclamation adopted and implemented	2021	DFFE
Ensure municipal landfill sites and waste management facilities comply with licensing requirements	Develop financial mechanisms to enforce compliance to license conditions	(i) Number of policy recommendations on financial mechanisms developed and implemented (ii) Number of national action plan on landfill licensing compliance (iii) Number of municipal landfills complying with licensing conditions	(i) 1 x financial mechanism adopted and implemented (ii) 1 x National Action Plan (iii) All municipalities compliant	(i) 2021 (ii) 2021 (iii) 2024	DFFE NT, Provinces, local municipalities

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

The main criterion for determining the qualifying recipients of Basic Refuse Removal (BRR) services is registration on a municipality's indigent register as provided for by the indigent policy of the municipality.

The following criteria can be used in the absence of or in addition to the main criterion to determine the qualifying recipients of the BRR services:

- Level of income: Monthly net household income of members of less than or equal to *two old age pensions (including children/individuals who may get state grants).*
- Residence status: Everybody residing in the municipality provided their indigent status have been verified.
- Special considerations: All child headed households, households headed by pensioners and people with disabilities.
- Value of property (need to note that inherited properties might give false income level status).
- Any other criteria as determined by the specific municipality

A municipality may for practical reasons, declare certain areas or clusters as qualifying recipients of BRR. Examples may include low-income areas and high density, urban informal areas.

- Such declarations have added advantages in terms of administrative feasibility (logistics and costs included) especially where rate collection is challenging.
- A municipality may declare certain low density rural areas as areas where on-site disposal is deemed to be an appropriate waste management option.

If the recipient dos not fall under a qualifying indigent area, he/she may register as an indigent at his/her municipality. The municipality must set out certain dates/times for these registrations.

2.1.31 Planning documents

The Western Cape Provincial Spatial Development Framework (March 2014)

The Western Cape Provincial Spatial Development Framework (PSDF) states that if the increasing amounts of waste generated are not minimised, it will give rise to the need for more disposal sites which is not desirable. A mind set of "reduce, rethink, recycle" still needs to be mainstreamed and further challenges are created by illegal dumping, shortfalls in hazardous waste facilities, growing informal settlements and a lack of recyclables collection from homes. The following provincial spatial policies related to waste management are included:

Policy R4: Recycle and recover waste, deliver clean sources of energy to urban consumers, shift from private to public transport, and adapt to and mitigate against climate change.

1. Unlock economic opportunities and increase the lifecycle of current disposal sites and apply the principles of "reduce, reuse, and recycle".

2. Close down illegal sites and locate new regional waste sites adjacent to rail facilities to decrease operational costs and energy requirements associated with the need for road freight.

The OneCape 2040

OneCape2010 was developed by the Western Cape Economic Development Partnership (EDP) for the Western Cape Government (WCG) and the City of Cape Town (CCT). The purpose is to encourage and provide a vision for a more inclusive and resilient economic future for the Western Cape. It does not replace any existing statutory plans required of province or municipalities, but is intended as a guideline for stakeholders in order to:

- Promote fresh thinking and critical engagement on the future;
- Provide a common agenda for private, public and civil society collaboration;
- Help align government action and investment decisions;

- Facilitate the necessary changes we need to make to adapt to our (rapidly) changing local and global context;
- Address our development, sustainability, inclusion and competitiveness imperatives.

Under the Ecological transition, the goal is that all people have access to water, energy and waste services that are delivered in a sustainable resource-efficient manner.

The Western Cape Provincial Strategic Plan (2014 – 2019)

The Plan is aligned with the NDP, PSDF and also the OneCape2040. The following Provincial Strategic Goals are set out in the document:

- Strategic Goal 1: Create opportunities for growth and jobs.
- Strategic Goal 2: Improve education outcomes and opportunities for youth development.
- Strategic Goal 3: Increase wellness, safety and tackle social ills.
- Strategic Goal 4: Enable a resilient, sustainable, quality and inclusive living environment.
- Strategic Goal 5: Embed good governance and integrated service delivery through partnerships and spatial alignment.

The Western Cape Green Economy Strategy Framework

The Green Economy Strategy Framework is about achieving the double dividend of optimising green economic opportunities and enhancing our environmental performance. The framework is for the Western Cape to become the lowest carbon province and leading green economic hub of the African continent.

"Drivers" and "Enablers" are identified in the Framework as listed below:

Drivers:

- Smart living and working
- Smart mobility
- Smart eco-systems
- Smart agri-production
- Smart enterprise

Enablers:

- Finance
- Rules and Regulation
- Knowledge Management
- Capabilities
- Infrastructure

2.1.32 International treaties

This section lists the international agreements to which South Africa has acceded. The following is as described in section 4.10 of the National Waste Management Strategy 2011:

Various international agreements to which South Africa has acceded relate to waste management. A number of non-binding conventions and protocols are also relevant to waste management. This section summarises the main actions in the NWMS related to implementing international agreements.

2.1.32.1 The Basel Convention

The Basel Convention, adopted in 1989, has the greatest bearing on the Waste Act as it addresses the trans-boundary movement of hazardous wastes and their disposal, setting out the categorization of hazardous waste and the policies between member countries.

DFFE is developing MOUs with the International Trade Administration Commission (ITAC) and the South African Revenue Service (SARS) that effectively address the provisions of the Basel Convention.

DFFE is considering accession to the amendments to the Basel Convention that ban the import and export of hazardous wastes. DFFE is also currently developing a policy on imports and exports of waste that will address this.

DFFE and DTI are jointly addressing the import and export control aspects of the Basel Convention, together with the chemical conventions. Control will happen through ITAC permits and SARS tariff codes.

2.1.32.2 The Montreal Protocol

The Montreal Protocol Treaty, revised in 1999, protects the ozone layer by phasing out the production of several substances that contribute to ozone depletion, with the aim of ozone layer recovery by 2050. This has relevance for waste management in instances where such obsolete products enter the waste stream. DFFE will finalise and publish the National Implementation Plan for the Montreal Protocol. The plan will include the development on an Ozone Depletion Substance (ODS) strategy and regulations will provide for the phasing out of specified substances and their safe disposal.

2.1.32.3 The Rotterdam Convention

The Rotterdam Convention promotes and enforces transparency in the importation of hazardous chemicals and whilst it explicitly excludes waste, its implementation may lead to bans on listed chemicals. Some of these chemicals may occur in stockpiles of obsolete chemicals such as pesticides that have been identified as a major waste management challenge. Extended producer responsibility schemes will be used to effectively manage obsolete chemicals.

A study to investigate the extent of manufacture, use, import and export of new chemicals listed in the Rotterdam Convention will determine whether South Africa should ratify the newly added chemicals. A process to identify and ban pesticides and industrial chemicals listed in Annex III (that South Africa has not yet banned) has started.

2.1.32.4 The Stockholm Convention

The Stockholm Convention on Persistent Organic Pollutants (POPs), which entered into force in 2004, requires that member countries phase out POPs and prevent their import or export. Parties to the Convention are also required to undertake the following responsibilities:

- Develop and implement appropriate strategies to identify stockpiles, products and articles in use that contain or are contaminated with POPs.
- Manage stockpiles and wastes in an environmentally sound manner.
- Dispose of waste in a way that destroys or irreversibly transforms POPs content.
- Prohibit recycling, recovery, reclamation, direct re-use or alternative use of POPs.
- Endeavour to develop strategies to identify contaminated sites and perform eventual remediation in an environmentally sound manner.

2.1.33 Municipal By-laws

The Cederberg Municipality published their integrated waste management by-law in terms of Section 13 of the Local Government Systems Act 2000, (Act 32 of 2000). The by-law was published in the **Western Cape Provincial Gazette nr. 8481, 30 August 2021**. Below is a summary of the by-law to illustrate the main themes and contents. The full by-law can be requested from the Cederberg Municipality.

Chapter 1: General Provisions

1. Definitions and interpretation

2. Application of by-law

   The by-law must be rad with the applicable provisions of the Waste Act, applies to all persons within the area of the Municipality and this by law prevails in the event of any inconsistency between a provision of this by law and any other by-law regulating waste management.

3. Principles

   The Council is responsible to ensure that all waste generated in the municipal area is collected, disposed of or recovered in accordance with the by-law and in line with the waste hierarchy as outlined.

4. Obligations of waste generators

   A person must manage any waste generated by his or her activities or the activities of persons working in his or her employ or under his or her direction or control in such a manner that the waste does not cause harm to human health or damage to the environment. An authorised municipal official may issue a compliance notice to a person contemplated to take measures to ensure compliance with this subsection.

5. Storage and Receptacles for general waste

   Persons generating waste must place the waste in a receptacle approved, designated or provided by the Municipality or the relevant service provider, as the case may be, for that purpose. All waste generators must ensure that the receptacle is stored on the premises where the waste is generated and away from a public place between collection days.

   Where a receptacle is stolen, an authorised municipal official may request that the theft be reported to the South African Police Service before issuing a new receptacle.

6. Ownership of Waste

   A person who generates waste is the owner of that waste until it is made available by that person for collection by the Municipality or a service provider in accordance with this by-law. Waste becomes the property of the Municipality once it is made available for collection.

Chapter 2: Integrated Refuse Management Plan

7. Preparation of Integrated Refuse Management Plan

   The municipal manager may issue a directive to a person or any category of persons who generates waste in the area of the Municipality, to prepare an integrated refuse management plan and to submit the plan to the Municipality for approval.

8. Contents of integrated refuse management plan

   The refuse management plans submitted must include inter alia information on quantity of waste generated, targets for minimisation, measures to manage the waste, period required for implementation of the plan etc.

Chapter 3: Provision of Waste Management Services

9. Service Providers

   The Municipality may discharge any of its functions (pending compliance of conditions of this by-law) pertaining to waste separation, collection, storage, processing, recycling, treatment and disposal by entering into a service delivery agreement with a service provider.

10. Collection and Transportation of General Waste

    The Municipality must set a schedule of the days for the collection of waste and the location where the waste receptacles must be placed on those days. The Municipality must publish this schedule and if waste that is being transported is spilt, leaked or detached or falls from a receptacle, vehicle or other conveyance, the Municipality may recover costs from the transporter for reasonable remedial measures undertaken by the Municipality.

11. Transporting waste for gain

    A person transporting general waste for gain in the area of the Municipality must ensure that the receptacle for transport is fit for purpose, transport the waste without creating any nuisance, ensure the receptacles are in good condition and ensure that the waste is transported to a facility that is licensed to accept it.

12. Collection of unsuitable waste

    A person may not place waste identified as unsuitable for collection, either on its own or mixed with any other waste for which the Municipality provides collection services, unless prior arrangement is made with the Municipality for special collection by the Municipality or a service provider.

13. Waste transfer facilities

    A waste generator must, where applicable use an appropriate waste transfer facility as instructed by an authorised municipal official, a waste disposal facility operator or a service provider; and adhere to the operational procedures of the waste transfer facility as determined by the Municipality.

14. Disposal of waste

    An authorised municipal official, waste disposal facility operator or service provider may inspect all waste loads entering a waste transfer facility, general waste storage facility, recycling facility or waste disposal facility. If an authorised municipal official has concerns about the potential detrimental impact of any waste if not disposed of correctly, the authorised municipal official may dispose of the waste at an appropriate waste disposal facility.

Chapter 4: Recyclable Waste

15. Storage, separation and collection of recyclable waste

    A person who undertakes any activity involving the reuse, recycling or recovery of waste, including any scrap dealer and formalised recycling group, must, before undertaking any such activity, ensure that the reuse, recycling or recovery of the waste is less detrimental to the environment than its disposal.

16. Waste separation in geographical area

    The Municipality may, by notice in the *Provincial Gazette*, require the holder of waste within a geographical area specified in the notice to separate specified recyclable waste, use different receptacles for different wastes and make recyclable waste available for collection.

Chapter 5: Prohibitions

17. Prohibition of unauthorised disposal of waste

    No person may dispose of waste in or on any land or water body or at any facility unless the disposal of that waste is authorised by law; or If waste has been disposed of in contravention of this by-law, the municipal manager may issue a directive to the responsible person to remove the waste to an authorised waste disposal facility within a specified period. The Municipality may recover any costs incurred in terms of unauthorised disposal of waste from every responsible person, jointly and severally.

18. Prohibition of burning of waste

    No person may burn, incinerate or apply any other thermal treatment technology to waste except in a thermal treatment facility authorised by the Municipality or the relevant competent authority.

19. Prohibition of littering

    No person may litter or dispose of waste onto any public place. If litter has been disposed of or discarded in contravention of this by-law on privately owned land to which the public has access, the owner of that land must remove the litter from the property within a reasonable period.

20. Prohibition of nuisance

    A person handling waste, whether during storage, collection, transportation, recycling, treatment or disposal, must take reasonable measures to prevent it from being a nuisance to anybody or the environment, and take measures at his or her own cost to remedy any nuisance caused. The municipal manager may issue a directive to a responsible person to take measures to ensure compliance.

Chapter 6: Handling different types of waste

21. Organic Waste

    The occupant of premises on which organic waste is generated, may compost the waste on the premises, provided that the composting does not cause a nuisance or harm to human health or damage to the environment. The Municipality or a service provider may, on the written request of the occupant of premises on which organic waste is generated, deliver an appropriate receptacle for the purpose of storing organic waste, in addition to any receptacle provided for general waste, on payment of a tariff.

22. Bulky Waste

    A person generating bulky waste may not place the bulky waste with other waste that is to be collected by the Municipality in accordance with the waste collection day schedule, and must ensure that the bulky waste is recycled or, when it cannot be recycled, disposed of at a facility designated by the Municipality to receive bulky waste.

23. Building and Demolition Waste

    A person generating building and demolition waste may not mix building and demolition waste with waste to be collected by the Municipality in accordance with the waste collection day schedule, and must ensure that the building and demolition waste is recycled or, when it cannot be recycled, is disposed of at a facility designated by the Municipality to receive building and demolition waste.

24. Hazardous Waste

    The Municipality may, by notice in the *Provincial Gazette*, require a person who generates, treats, transports or disposes of hazardous waste, or who wishes to generate, treat, transport or dispose of hazardous waste, in the area of the Municipality to register with the Municipality before undertaking such work, and provide such information as is specified in the notice or as the Municipality may reasonably require. An application for registration that has been sent back for correction must be amended and resubmitted to the Municipality within 30 days after the date on which the Municipality issued the written notice to the applicant for the correction of the application.

25. Waste Tyres

    The Municipality may, by notice in the *Provincial Gazette*, require a person operating or wishing to operate as a tyre producer, tyre dealer, waste tyre collector, tyre stockpile owner or tyre recycling processor to register with the Municipality before undertaking such work and provide such information as is specified in the notice or as the Municipality may reasonably require.

26. Event Waste

    An event organiser must submit an event waste management plan together with his or her application to the Municipality for an event permit. The event waste management plan must set out in detail all information relating to the waste generation at the event as set out in the by-law.

27. Abandoned Articles

    The Municipality may remove and dispose of any article it reasonably considers abandoned, taking into account the location of the article, the length of time that the article has been at that location and the nature and condition of the article.

Chapter 7: Administrative matters, compliance and enforcement

28. Liability to pay tariffs

    The owner of premises for which the Municipality is providing waste management services contemplated in this by-law is liable for the payment of tariffs. The Municipality may exempt or grant a rebate to any person or category of persons that are regarded to be indigent in terms of the municipal indigent policy from paying tariffs for waste management services.

29. Exemptions

    A person may apply in writing to the Municipality for exemption from any provision of this by-law.

30. Designation of certain officials

    The municipal manager may designate as an authorised municipal official, any staff member of the Municipality. Designate as a waste disposal facility operator any staff member of the Municipality, any other organ of state or a service provider, and at any time withdraw a designation made.

31. Functions of authorised municipal officials and waste disposal facility operators

    An authorised municipal official must administer, implement and enforce this by-law; and may perform any function assigned to an authorised municipal official by this by-law, including conducting an inspection, investigating any act or omission that may constitute an offence in terms of this by-law, and monitoring and enforcing compliance with this bylaw.

32. Premises inaccessible for waste collection

    If employees of the Municipality or a service provider are impeded from handling or collecting waste at any premises due to the layout of the premises, or endangered by an impediment on the premises when handling or collecting waste at any premises, the municipal manager may issue a directive requiring the owner of the premises to undertake such alterations or additions to the premises as are necessary to remove the impediment at the owner's cost.

33. Duty to produce documents

    A person to whom a certificate, permit, authorisation or any other document contemplated in this by-law has been issued must produce it at the request of a peace officer or an authorised municipal official.

34. Directives

    The municipal manager may issue a directive to any person as contemplated in this by-law to take specific measures pertaining to waste within a specified period to ensure that the impact of waste on human health or damage to the environment is mitigated and to give effect to the waste management hierarchy.

35. Compliance Notices

    An authorised municipal official may issue a written compliance notice to a person if there are reasonable grounds for believing that the person has not complied with a provision of this by-law, or a term or condition of any permit, authorisation, exemption or other document issued in terms of this by-law.

36. Appeals

    A person whose rights are affected by a decision taken by the Municipality in terms of this by-law may, unless the decision was taken by the municipal council, appeal against that decision in terms of section 62 of the Municipal Systems Act. An appeal under this section suspends the operation of the decision concerned pending the finalisation of the appeal, subject to this by-law.

37. Limitation of Liability

    Neither the Municipality nor any other person is liable for any damage or loss caused by the exercise of any power or the performance of any duty under this by-law, or the failure to exercise any power or perform any duty under this by-law, unless the exercise or performance of, or the failure to exercise or perform the power or duty, is unlawful and negligent or in bad faith.

38. Offences

    A list of ways that constitutes the commitment of an offence is given in the by-law.

39. Penalties

    The by-law provides details of various fines and penalties that are applicable to the contravention of the given sections in the by-law.

40. Repeal of by-laws

    The previous Cederberg Waste Management by-law is repealed.

41. Interpretation

    In the event of a conflict between English, IsiXhosa and the Afrikaans versions of this By-law, the English version shall be decisive.

42. Short title

    This by-law is called the Waste Management By-law of the Cederberg Municipality.

2.1.34 Discussion of legislation (effectiveness & implementation)

The above listed legislation (national, international and local by-law) provide comprehensive rule-sets by which the solid waste life-cycle and the management thereof are governed. Although there is always room for improvement, it can be argued that South African solid waste legislation is of a high standard and is comparable internationally. This is even more true with the publication of the NWMS 2020. We must therefore ask to what extent is solid waste legislation implemented and, if possible, how to ensure compliance by all and what are the stumbling blocks. Without compliance with the above legislation we will not be able to create a sustainable future for the stunning and diverse natural South African environment. The NWMS 2020 substantially expands on the different role players and how the aim is to move to a culture of compliance.

In South Africa's history the more comprehensive legislation and knowledge of better waste management practices are relatively "new" and therefore still in the stages of establishing a secure foothold in our society. Past waste management practices have in essence created a "back-log" of acceptable waste management practices and in many ways, the current generations are now required to address the complications created by old methods, poor management or uninformed decisions. A great number of instances of non-compliances to legislation are a direct result of pre-legislation practices that were not addressed, which can be due to various factors, and are still in some places the norm.

Legislation enforcement on a local level will almost definitely be lacking without the willing co-operation from the public and industry. In a rural Municipality such as Cederberg with vast open spaces between towns and even within towns, the capacity of law enforcement is limited. There is simply not enough man-power to monitor all areas and prevent illegal practices. From the amount of illegally dumped waste that is collected and disposed in the Cederberg Municipality compared to the total waste stream, it is clear that this is a concern, but it can be improved as it requires regular attention and a team to do clean-ups.

In terms of the hazardous waste compliance and implementation of relevant legislation, the following was observed during the survey (Hazardous waste further discussed under 3.3):

2.1.34.1 IMPLEMENTATION OF OHS ACT: OHS ASBESTOS REGULATIONS AS WELL AS THE ECA ASBESTOS REGULATION 341 OF 2008.

The OHS Act is administered by Department of Labour and does not concern waste managers with the demolition, handling and transport of asbestos cement waste. However, once the load enters a landfill NEMWA empowers the ECA Regulations for asbestos cement waste transport and disposal.

OHS REGULATIONS:

The OHS Act addresses the demolition of the asbestos cement products and should be monitored by Department of Labour. The transport and final disposal of asbestos cement waste should be according to specifications to minimise the release of fibres and such waste must be buried in hazardous waste landfills (Both H:H and H:h in the ECA classification and Class A in the NEMWA Classification).

Non-compliance with OHS Act:

The problem arises that various house owners remove asbestos cement tiles, roof sheets and guttering without being aware of any relevant Acts or Regulations. The demolition is either performed by a building contractor or even the owner himself, usually with assistance of day labourers. The asbestos cement waste is often found in mixed general waste loads going to landfill.

The labourers/person exposed to the fibre when handling the asbestos waste is often not even aware that they can refuse to do the work for a demolition contractor (often an ignorant owner and not Registered by Department of Labour as a Contractor) if not trained in safety occupational health requirements for asbestos cement waste in the OHS Act. Labourers must be supplied with PPE.

ECA REGULATION 341 OF 28 MARCH 2008 ON ASBESTOS WASTE DISPOSAL:

Waste must be covered in double plastic of prescribed thickness to encapsulate the broken pieces or sheets of asbestos cement waste. The waste must be slipped into a trench without bags being broken. The trench must be covered once the waste is disposed of. The idea of keeping the waste wet is not a legal requirement but does prevent fibre release.

2.1.34.2 General

In general, the pressure on law enforcement will be lessened with the continued awareness and education of the public, industry and all generators of waste. All parties MUST realise their part in the waste management cycle and accept accountability, so that the response to legislation and waste management practices is not “why?”, but “how?”. The “how” will have to be continually addressed through education as new technologies, practices, waste types and opportunities emerge. The waste industry cannot afford to get comfortable and settle on “that is how it has always been done”, but must be innovative, up-to-date and achieve co-operation between all spheres of society in order to ensure the sustainable future of our environment.

The legislation is therefore sufficient, but compliance must be improved through awareness and education and improved enforcement. The public must also assist the Municipality and report all instances where the law is not obeyed. Instances related to solid waste can be reported to the Municipality: (027) 482 8000.

Another aspect to consider is affordability. As mentioned, certain practices were the norm in previous years, but are drastically affected by recent legislation. Aligning with legislation and licence requirements are unaffordable in the short- to medium term. Further pressure on budgets are meeting diversion targets and acquiring the required infrastructure for this.

All of the Cederberg Municipality's disposal facilities are licensed or closed, and therefore in that respect compliant with legislation. The extent of implementation of the licence requirements are assessed via regular internal and external audits of the facilities. Requirements are identified and as far as possible provided for in the budget in order for implementation to take place. As mentioned above, financial restrictions hamper the full implementation of the requirements in the short term, but the municipality is not oblivious of the requirements and continues to improve on compliance.

2.2 DEMOGRAPHICS

The demographics and related statistics were obtained from Statistics SA and the Western Cape Government's Socio-Economic Profiles.

2.2.1 Current and projected population and density

The 2011 Census figures indicate that the Cederberg Municipality had a total population of 49,773 people with a 2.3% annual population growth rate since the 2001 Census. The 2016 Community Survey estimated the Cederberg population to be 52,949 which equates to a 1.25% annual increase (between 2011 and 2016). The population of Cederberg was 59,382 people in 2020 according to the 2020 Socio-Economic profile published by the Western Cape Government, equating to an annual population growth rate of 2.91% between 2016 and 2020. This total is expected to growth to 63,057 by 2024, equating to an average annual growth rate of 1.5% for that period and this growth rate was then used for future projections and calculations in this report. The CM is the least populated municipality within the West Coast District and contains 12.3% of the total West Coast District 2022 population (481,267).

The Census 2011 statistics are available in terms of sub-places into which the Municipality was divided for the study. The Socio-Economic Profile did not include data for sub-places but did provide total projections. The population and household totals per sub-place of the 2011 Census were reworked in order to total to the projected population for each year, with the assumption that the sub-places would grow in proportion to the total population.

The current and projected populations per sub-place based on the above are shown in **Table 2-1** below:

Table 2-1: Current and projected population of Cederberg per sub-area

Sub-area	2011	2022	2023	2024	2025	2026
Lamberts Bay	5 952	7 316	7 426	7 539	7 653	7 768
Malkopbaai	171	210	213	217	220	223
Cederberg (Rural)	24 714	30 376	30 835	31 302	31 775	32 256
Graafwater	2 262	2 780	2 822	2 865	2 908	2 952
Hopland	1 173	1 442	1 464	1 486	1 508	1 531
Clanwilliam	6 501	7 990	8 111	8 234	8 358	8 485
Leipoldtville	297	365	371	376	382	388
Elands Bay	1 524	1 873	1 901	1 930	1 959	1 989
Citrusdal	5 781	7 105	7 213	7 322	7 433	7 545
Oranjeville	1 398	1 718	1 744	1 771	1 797	1 825

From the above table, the population densities in Cederberg can be graphically displayed as per **Figure** 2-1. The majority of the population resides in rural areas (49.65%), followed by Clanwilliam (13%), Lambert's Bay (12%) and Citrusdal (12%). The Cederberg Municipality has a population density of 7 people/km^2 compared to 15 people /km^2 for the West Coast District Municipality.

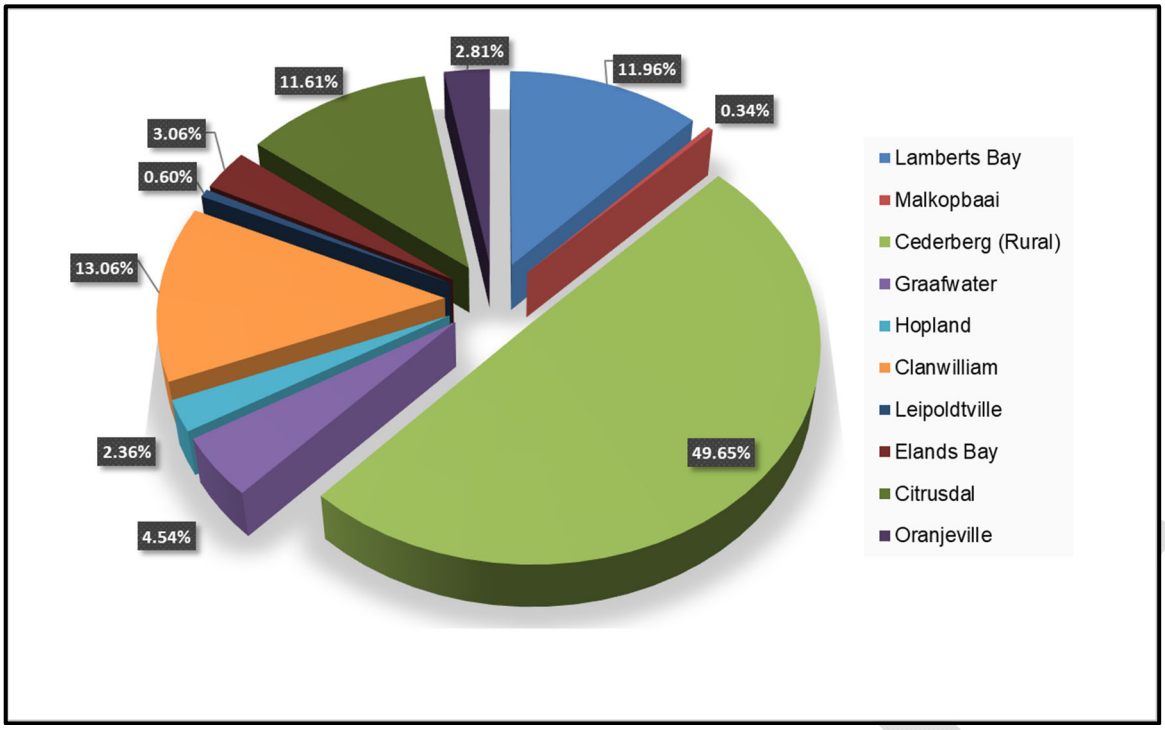

Figure 2-1: Population density per sub-place

Figure 2-2 below shows the graphical representation of the Cederberg population growth up to 2026 based on the above information.

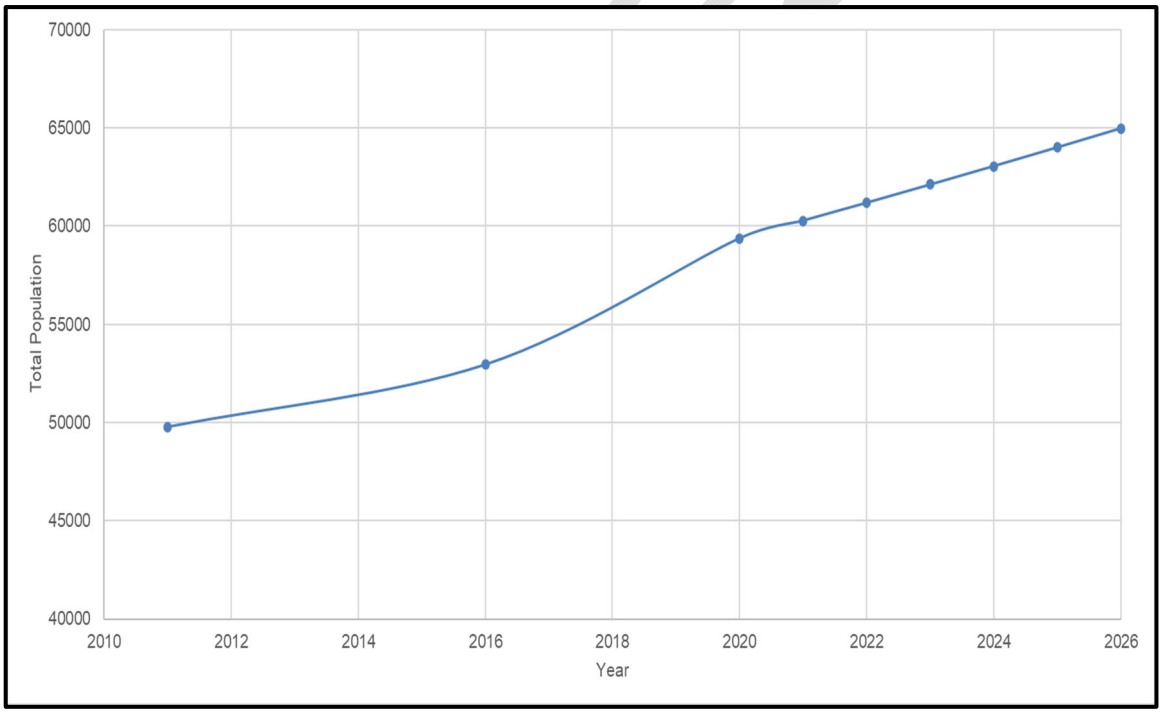

Figure 2-2: Cederberg Projected Population

2.2.2 Socio-economic profile and education

Table 2-2 shows the 2011 socio-economic profile of the Cederberg municipality according to annual household income obtained from Census 2011. In order to estimate the current number of households, the assumption was made that the average number of persons per household for each sub-area would remain constant.

Table 2-2: Population Profile According to Household Income (2011 & Estimated 2022)

Sub-area	No of Households 2011	Population (2011)	Persons per Household	Very Low and Low Income	Middle Income	High and Very High Income	No of Households 2022	Population (2022)
				R0 - R38200	R38201 - R76400	R76401 or more		
Lamberts Bay	1638	5 952	3.6	53.7%	20.7%	25.6%	2 014	7 316
Malkopbaai	66	171	2.6	40.9%	18.2%	40.9%	82	210
Cederberg (Rural)	6399	24 714	3.9	62.3%	22.3%	15.5%	7 865	30 376
Graafwater	594	2 262	3.8	50.0%	25.8%	24.2%	731	2 780
Hopland	348	1 173	3.4	67.2%	22.4%	10.3%	428	1 442
Clanwilliam	2016	6 501	3.2	59.7%	15.2%	25.1%	2 478	7 990
Leipoldtville	72	297	4.1	58.3%	25.0%	16.7%	89	365
Elands Bay	441	1 524	3.5	76.2%	11.6%	12.2%	543	1 873
Citrusdal	1605	5 781	3.6	42.4%	22.8%	34.8%	1 973	7 105
Oranjeville	315	1 398	4.4	39.0%	29.5%	31.4%	388	1 718

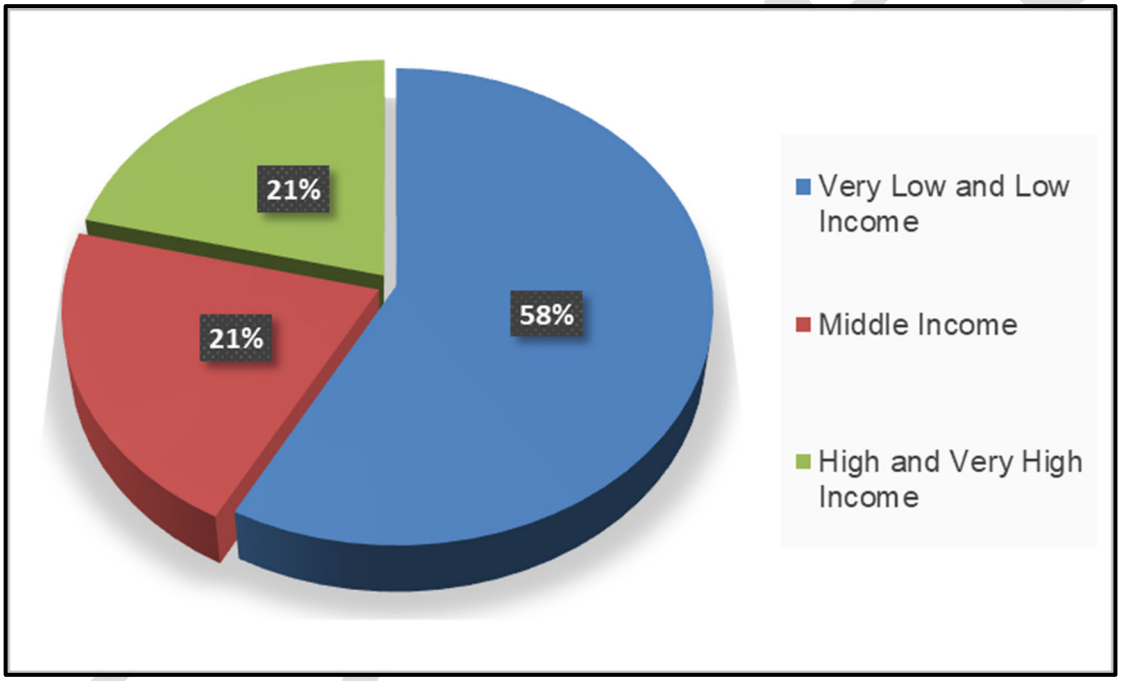

Figure 2-3: Graphical Display of Socio-Economic Distribution

According to the Western Cape Government's Socio-Economic Profile 2020 for Cederberg, the following education statistics are indicated:

- Learner retention rate for Cederberg is 69.6% (vs. 68.7% average for the West Coast District)
- Number of public ordinary schools = 23 of which 14 have libraries/media centres
- Matric pass rate 87.5% as of 2019 which is the highest of all Municipalities within the WCDM
- Unemployment rate of 7.9% (78.8% employed people are in formal sector and 21.2% informal)
- At R41,000.00 in 2018, Cederberg's real GDPR per capita is marginally below the West Coast District figure of R44,000.00, while marginally above that of neighbouring municipalities (Matzikama). However, Cederberg's per capita income ranks well below that of the Western Cape Figure of R59,000.00.

The Census 2011 and 2016 Community Survey information on education levels in the Cederberg Municipality is shown in **Table 2-3** and **Figure 2-4**. There are no more recent statistics on the education levels, and it must be noted that the 2016 community survey data excluded the people who answered, "don't know", "other" and "unspecified". The below information does however show that the secondary schooling and higher education percentages did increase from 2011 to 2016.

Table 2-3: Education Levels

Education level	2011 Population %	2016 Population %
No Schooling	7.0%	5.9%
Some Primary	32.0%	12.2%
Completed Primary	9.0%	7.6%
Some Secondary	33.0%	42.4%
Completed Secondary	15.0%	24.1%
Higher Education	4.0%	7.9%

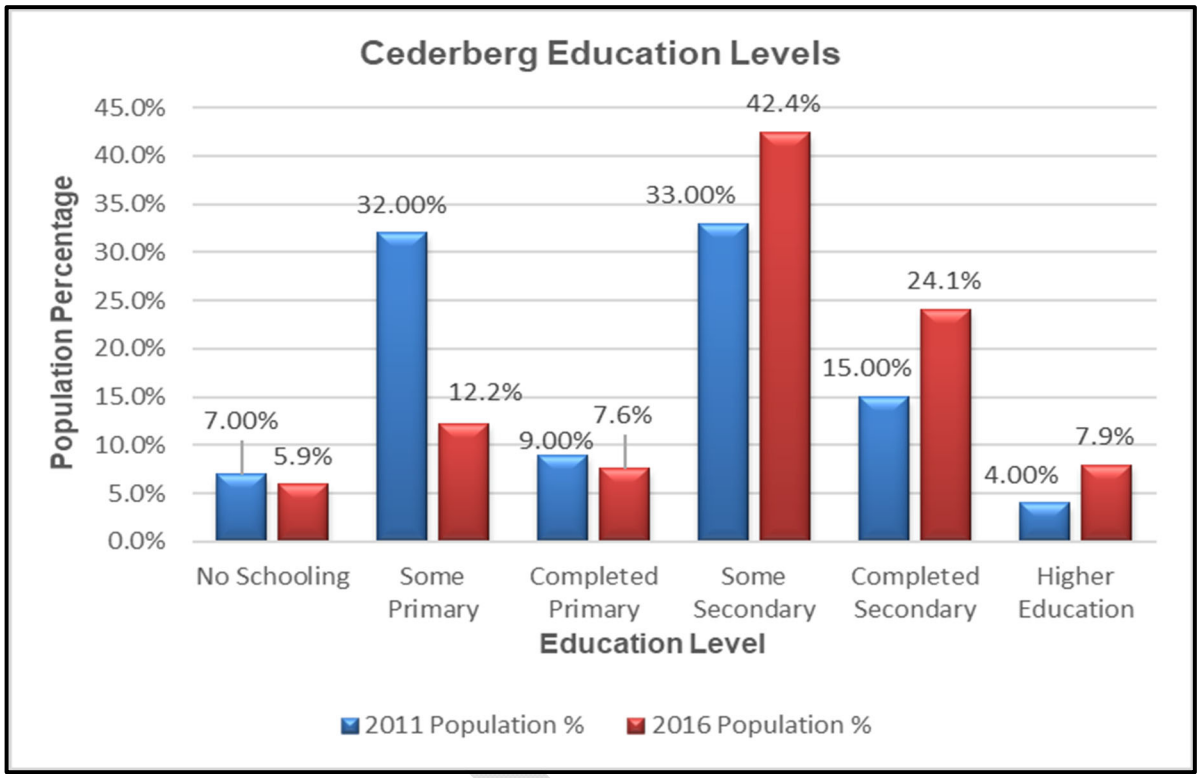

Figure 2-4: Education Levels

2.2.3 Service Delivery

According to the Western Cape Government's Socio-Economic Profile 2020 for Cederberg, the following is true regarding basic service delivery within the Cederberg Municipality:

- 86.2% of households are formal main dwellings compared to 86.7% for the WCDM
- 97.5% of people have access to piped water inside the dwelling compared to 98.3% for the WCDM
- 82.2% of people have access to a flush/chemical toilet compared to 87.2% for the WCDM
- Only 58.1% of people have access to a refuse removal service once a week compared to the reported figure of 76.9% for the WCDM. It is assumed that this includes all rural populations.

The CM also provide a package of free basic services to households who are financially vulnerable and struggle to pay for services. This includes a free waste collection service. The number of households receiving free basic services in the Cederberg municipal area has shown a generally consistent trend up to 2018 and is reported to be 2,049 in 2022. The stressed economic conditions are anticipated to exert pressure on household income levels, which is in turn likely to see the number of indigent households and the demand for free basic services increase.

2.2.4 Gender and age distribution

The sex ratio depicts the number of males per 100 females in the population. The data indicates that there are slightly more males than females in the Cederberg municipal area with a ratio of 100.1 males per 100 females reported in the 2020 Spatial Economic Framework, with an expected 101.0 males per 100 females in 2024.

Table 2-4: Age distribution

	Children: 0 - 14 years	Working Age: 15-65 Years	Aged: 65+ Years	Dependency Ratio
2020	16,018	40,361	3,004	47.1
2023	16,409	42,592	3,107	45.8
2026	16,996	44,905	3,221	45.0

2.2.5 Development

The planned and potential development were obtained from the 2014 Western Cape Growth Potential Study of Towns by the D:EA&DP. This study determined the growth potential and socio-economic needs of settlements in the Western Cape outside of the Cape Town metropolitan area using quantitative data (e.g. factors relating to socio-economic, economic, physical-environmental, infrastructure and institutional aspects). The results of the quantitative analyses were combined with qualitative information (e.g. stakeholder engagements) to identify potential interventions that might unlock latent potential within settlements and regions.

Table 2-5: Growth Potential Study Results

Area	Composite Growth Potential	Socio-economic needs index	Human Capital index	Economic index	Physical index	Infra-structure index	Institutional index
Cederberg Municipality	Low	Medium	Low	Low	Low	Low	High
Citrusdal	Low	Medium	Medium	Low	High	Low	High
Clanwilliam	Low	Medium	Medium	Low	Medium	Low	High
Graafwater	Low	Very Low	High	Very Low	Low	Medium	Medium
Elands Bay	Medium	Very Low	Medium	Low	Medium	Medium	High
Lamberts Bay	Low	Low	Medium	Very Low	Very Low	High	High

The institutional index of CM referring the ability to govern and operate the municipality was ranked as high whilst the other indices except socio-economic needs (rated as medium) were rated as low. The growth potential, human capital (workforce), economic index (gross produce and income), physical (access the natural resources) and infrastructure (access to infrastructure and service delivery) are low and require attention.

The rating of the municipality as a whole is not the same as the towns as it is an average that includes the rural areas too. An example is human capital which in most towns is medium or high whilst is low at a municipality level. This is due to high unemployment rates and a lack of skilled people in rural areas. This indicates that there is a need in CLM to improve governance, infrastructure and increase efforts in education and training whilst improving service delivery. The economic index is to an extent dependent on the socio-economic conditions of CLM residents which are impacted by the provision of the other resources or indices e.g. (human capital, physical, infrastructure and institutional).

The following development proposals per Cederberg town are indicated in the Municipal SDF:

Clanwilliam:

As a regional and service centre and rooibos tea capital - development proposals include:

- Provide sufficient zoned land for industrial and commercial development
- Provide sufficient zoned land for residential development
- Balance protection of heritage resources and industrial development
- Enhance tourism and Agri-tourism

Citrusdal:

As an agricultural service centre - development proposals include:

- Provide sufficient zoned land for industrial and commercial development and enhance Agri processing
- Cederberg Spatial Development Framework 2017-2022 xiii
- Provide sufficient zoned land for residential development
- Protect heritage and culture of the Citrusdal as the citrus capital of the Western Cape
- Capitalise on N7 connectivity

Graafwater:

A small rural town and its surrounds to be enhanced as an agricultural service centre and the enhancement of Agri-processing.

Leipoldtville:

A rural settlement enhanced as an Agri-tourism node

Elands and Lamberts Bays:

Coastal towns changed their focus from being fishing villages to potato processing - development proposals include:

- Enhance tourism and Agri-tourism
- Rejuvenate fishing industry and enhance Agri-industrial activity (e.g. potato & tea
- processing).
- Conserve natural resources and protect heritage resources

Wuppertal:

As an agricultural mission station:

- Strengthen agricultural service activity
- Strengthen tourism and Agri-tourism in the surrounding areas
- Enhance the integration of agriculture and conservation
- Development proposals

2.2.6 Housing Types

The latest information available is the StatsSA 2016 Community survey, which is shown in the table below.

Table 2-6: Housing Types

Housing Type	Number of dwellings	%
Formal Dwelling	11,936	78.1
Traditional Dwelling	140	0.9
Informal Dwelling	3,065	20.1
Other	138	0.9

2.2.7 Employment Levels

According to the 2020 Socio-Economic Profile the Cederberg municipal area was valued at R3.9billion (current prices) in 2018 and created 26,793 jobs for the same period. The increase in GDPR at current prices between 2018 and 2019 is a result of inflation but in real terms the economy contracted by 0.4 percent in 2019. Regardless of the contraction in the municipal economy, 44 jobs were created in the Cederberg municipal area. The agriculture, forestry and fishing sector and the manufacturing sector were the main contributors to GDPR in the Cederberg municipal area in 2018, contributing 21.7% and 21.3% to GDPR respectively.

Table 2-7: Employment per sector

Sector	Contribution to employment (%)	Number of jobs
Primary sector	**21.9%**	**11 407**
Agriculture, forestry and fishing	**21.7%**	11 397
Mining and quarrying	**0.2%**	10
Secondary sector	**28.3%**	**3 477**
Manufacturing	**21.3%**	2 280
Electricity, gas and water	**2.2%**	59
Construction	**4.9%**	1 138
Tertiary sector	**49.7%**	**11 909**
Wholesale and retail trade, catering and accommodation	**13.9%**	4 040
Transport, storage and communication	**12.2%**	972
Finance, insurance, real estate and business services	**9.9%**	2 090
General government	**8.5%**	2 126
Community, social and personal services	**5.2%**	2 681
Total Cederberg	**100.0%**	**26 793**

Source: Cederberg Socio-Economic Profile 2020

Table 2-8: Unemployment levels in percentage

Area	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Cederberg	5.6	6.7	7.1	6.8	6.3	6.8	5.7	6.4	7.0	7.2	7.9
West Coast	8.3	9.7	10.1	9.8	9.3	9.9	8.7	9.7	10.6	10.8	11.9
Western Cape	14.2	15.5	15.7	15.8	15.7	16.0	16.1	17.3	18.1	18.0	19.4

Source: Cederberg Socio-Economic Profile 2020

2.3 WASTE CLASSIFICATION

The waste types and quantities generated in the Cederberg Municipality are discussed in this section.

2.3.1 Waste types and classification

With reference to the Waste Act, *National Norms and Standards for Disposal of Waste to Landfill as well as Assessment of Waste for Landfill Disposal*, *23 August 2013,* the only types of waste allowed for disposal at the Cederberg disposal facilities are general or Type 2, 3 and 4 wastes. No Cederberg municipal facilities are allowed to accept hazardous or Type 1 wastes for disposal.

The above legislation divides waste in South Africa into two main categories, being Hazardous and General. The current legislated definitions being:

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"*

Residue deposits and residue stockpiles refer to mining waste that does not form part of the municipal waste function. **Business waste** means "*waste that emanates from premises that are used wholly or mainly for commercial, retail, wholesale, entertainment or government administration purposes*".

General Waste – *"means waste that does not pose an immediate hazard or threat to health or to the environment, and includes –*

(a) Domestic waste;
(b) Building and demolition waste;
(c) Business waste;
(d) Inert waste; or
(e) Any waste classified as non-hazardous waste in terms of the regulations made under section 69, and includes non-hazardous substances, materials or objects within business, domestic, inert, building and demolition wastes"

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 and includes:*

(a) Garden and park wastes;
(b) Municipal waste;
(c) Food 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*".

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, and which include:*

(a) Discarded concrete, bricks, tiles and ceramics;
(b) Discarded glass
(c) *Discarded soil, stones and dredging spoil*".

2.3.2 Methodology

The CM does not have any weighbridges at their landfills. Waste quantities are recorded by hand at the entrances of the facilities and reported to the department's Integrated Pollutant and Waste Information System (IPWIS). This information was used as basis of waste quantities in the Municipality.

Aquila Environmental was appointed as sub-consultant and conducted the hazardous waste study throughout the Cederberg Municipal area. The general waste characterisation study (WCS) sampling and recording was done by Mrs Charlotte Nell from Aquila with cooperation of the informal waste pickers and staff of the Cederberg Municipality during the second week of June 2022.

2.3.3 General Waste characterisation

A waste characterisation study was undertaken by Aquila Environmental. It took place over a 4-day period from Monday 6 June to Thursday 9 June 2022. Waste disposed of at four waste disposal facilities within CM was characterised, with a total sample of 4279.37 kg sorted with details as per **Table 2-9.**

Table 2-9: Sample Information

Date	Name of landfill site	Suburb sampled	Weight sorted
Monday 6 June 2022	Citrusdal	Riverview	1058.86 kg
Tuesday 7 June 2022	Elands Bay	Leipoldtville Elands Bay South Elands Bay North	725.72 kg 428.91 kg 298.02 kg
Wednesday 8 June 2022	Lamberts Bay	Graafwater	826.81 kg
Thursday 9 June 2022	Clanwilliam	Cederberg settlement	941.05 kg
		TOTAL:	**4279.37 kg**

2.3.4 Sampling

The sample size was affected by two major factors. Firstly, the waste collection schedule affecting availability of waste materials since only waste loads collected by CM's compactor vehicles on the sorting day, and delivered to the landfill site, was sampled. This was to ensure that the origin of the waste was known and recorded. Secondly the quantity of waste that can be sorted per day. It was possible to sort between 800 and 1,300 kg waste per day. The sorting efficiency was greatly affected by the weather conditions on site.

In Citrusdal, the compactor truck delivered a full load of waste from Riverview, a lower income area with mostly RDP houses. From this waste load, a sample from the middle section of the truck was selected and sorted. This sample was equivalent to approximately one-fifth of the full waste load. The total sample weighed 1058.86 kg. The conditions on site were hot and sunny with a maximum of 31°C recorded, with little wind. Multiple fires on site affected sorting efficiency and the fire brigade assisted with smoke management. Waste was dry. Dogs on site ate some of the organic waste sample before it was weighed.

In Elands Bay, waste from three different areas were delivered to site on the day: one from Leipoldtville; one from Elands Bay South and one from Elands Bay North. The full load from Leipoldtville was sorted which means that the entire town's waste was sorted. Leipoldtville is a small town with homes, a local clinic, a church and some businesses. Half of the load from Elands Bay South was sorted. This is a higher income area with few permanent residents and mostly holiday homes. One quarter of the load from Elands Bay North was sorted, this area is a lower income area with mostly RDP houses. The total sample weighed 1452.65 kg. It was a very hot and windy day with bergwind conditions. A maximum of 31°C was recorded. The strong wind continuously lifted small and light waste materials from the sample and blew it to other parts of the site. Waste was dry. Dogs on site ate some of the organic waste sample before it was weighed.

In Lamberts Bay, one scoop load from the Graafwater waste load was selected by the on-site front end loader and sorted. This area is a lower income area with mostly RDP houses. The total sample weighed 826.81 kg. Weather conditions were very hot and windy with a maximum temperature of 32°C recorded and a very strong wind. When the waste load was delivered, some small and light waste materials like soft plastics or expanded polystyrene blew away and did not form part of the sample. Sorting was conducted under roof, so once the sample arrived in the store room, no more waste materials were blown away. Waste was dry.

In Clanwilliam, waste from the lower income area with RDP houses and informal dwellings was sorted. From this waste load, a sample from the middle section of the truck was selected and sorted. This sample was equivalent to approximately one quarter of the full waste load. The total sample weighed 941.05 kg. Although still hot, this was a cooler day with no wind and a maximum temperature of 28°C recorded. Waste was dry. Dogs on site ate some of the organic waste sample before it was weighed. This sample also contained some commercial and industrial waste such as leather offcuts (textiles) and butchery waste (food waste).

2.3.5 Waste Categories for Sorting

Sampled waste was sorted in the following categories identified prior to the study and in accordance with the D:EA&DP guidelines. Waste items were sorted into 20 litre plastic buckets and weighed once full. Weighing was done on a platform scale tared for the bucket's weight.

Data was captured by hand on site on fit-for-purpose data capturing sheets. It was digitised with the assistance of Microsoft Excel, post characterisation. Data was analysed with Microsoft Excel.

Waste fraction	Detailed information of waste stream	WIS classification
1. Hard Plastics	• PVC • HDPE • PP • PET • HIPS (e.g. Video/CD/DVD cases excluding expanded polystyrene)	GW51.03 GW51.02 GW51.05 GW51.01 GW51.06
2. Soft Plastics	• LDPE • LLDPE • HDPE film • BOPP • Multi-laminates	GW51.04
3. Metals	• Aluminium packaging (e.g. foil) • Steel cans (e.g. canned food tins) • Aluminium cans (e.g. certain soft drink cans) • Scrap metal (e.g. steel offcuts) • Pieces of copper (copper contained in e-waste not separated during characterisation) • Aerosol cans (aluminium)	GW53.01 GW53.02
4. Glass	• Glass items (e.g. bottles, containers and jars both returnable and non-returnable) • Other/special glass/2D (windowpanes etc)	GW52
5. Paper and Cardboard	• Office Paper • Newspaper • Magazines • Phonebooks • Books & Booklets • Tissue Paper • Photo Paper • Paper plates and cups • Cards • Envelopes • Receipts • Wrapping paper • Non-recyclable/badly soiled paper • Paper/cardboard packaging • Cardboard (K4) (corrugated and non-corrugated) • Egg cartons	GW50.01 GW50.02 GW50.03 GW50.04
6. Food Waste	• All kitchen waste – vegetable and animal derived	GW20.02
7. Garden Waste	• All garden waste (incl. plant material, woody plant material, hay, flower bouquets, grass etc.)	GW20.01
8. TetraPak®	• Multi-laminate liquid packaging board	GW99
9. Expanded Polystyrene	• PS (Expanded Polystyrene (EPS) only)	GW51.06

Waste fraction	Detailed information of waste stream	WIS classification
10. E-Waste	• Small household appliances • IT and telecommunications equipment • Electric and Electronic Tools • Electrical toys (e.g. battery operated) • Ink and toner cartridges • Globes and bulbs	H18.02 H18.03 H18.04 H18.06 H18.07
11. Textiles	• Clothes • Shoes • Linen • Material off-cuts • Rubber • Leather	GW99
12. Construction Waste	• Construction-related waste from new builds or renovations	
13. Fines	• Sand, soil and yard sweepings • Ash	GW99
14. Clinic waste	• Mixed general/domestic waste from clinics (including pharmaceuticals but no infectious waste)	GW50 GW51 GW52 GW53

2.3.6 Assumptions and Limitations

- Results for Citrusdal is from one suburb and income type only, Riverview: low income.
- Results for Lamberts Bay is from one suburb and income type only, Graafwater: low income.
- Results for Clanwilliam is from one suburb and income type only, Cederberg: low income.
- The results from Citrusdal, Lamberts Bay and Clanwilliam cannot be seen as representative for the entire town but is representative of the low income areas in the municipality.
- Once all large or identifiable waste was removed, or once sorting time has run out (which ever came first) the residual waste was combined, put into buckets and weighed. An estimate was then made as to the composition of the residual waste, by waste fraction weight percentage.
- “Other” waste not present in the waste composition as such small items formed part of the residual waste and is left unaccounted for. It should not have a significant influence on the results.
- Only waste collected by the municipality’s compactor vehicle was characterised. Waste taken to site by private contractors, individuals or businesses were not characterised.
- The absence of, or limited quantities of garden waste observed in the results is not a true reflection on the quantities of garden waste generated in the study area. This needs to be quantified separately.
- Bulky waste and construction waste was mostly excluded from this study as it is not collected by the compactor vehicles.

2.3.6.1 Results

The tables and charts on the following pages provide a breakdown of the results from the waste characterisation study undertaken at the Cederberg Landfills. The information in **Table 2-10** is broken down into results per load sampled with a graphic representation shown on **Figure 2-5** to **Figure 2-7**. The combined data for all sampling is then given in **Table 2-10** and **Figure 2-8.**

Table 2-10: Waste Characterisation Results

Waste fraction	Citrusdal (Kg)	Citrusdal (%)	Leipoldtville (Kg)	Leipoldtville (%)	Eland's Bay South (Kg)	Eland's Bay South (%)	Eland's Bay North (Kg)	Eland's Bay North %	Graafwater (Kg)	Graafwater %	Clanwilliam (Kg)	Clanwilliam (%)
Paper and cardboard	178.97	16.9%	85.81	11.8%	66.57	15.5%	41.75	14.0%	50.09	6.1%	146.12	15.5%
Glass	77.40	7.3%	74.76	10.3%	93.23	21.7%	35.23	11.8%	65.20	7.9%	55.74	5.9%
Soft Plastics	104.84	9.9%	58.05	8.0%	43.06	10.0%	26.31	8.8%	63.41	7.7%	89.74	9.5%
Hard Plastics	84.54	8.0%	70.65	9.7%	27.62	6.4%	27.82	9.3%	54.99	6.7%	62.97	6.7%
Expanded Polystyrene	4.83	0.5%	1.06	0.1%	1.59	0.4%	0.65	0.2%	1.06	0.1%	6.418	0.7%
Metals	74.65	7.1%	35.98	5.0%	7.05	1.6%	15.63	5.2%	36.34	4.4%	34.90	3.7%
E-waste	3.11	0.3%	0	0.0%	0	0.0%	0	0.0%	1.15	0.1%	7.12	0.8%
Diapers	158.44	15.0%	123.05	17.0%	38.27	8.9%	37.57	12.6%	63.53	7.7%	120.80	12.8%
Mixed Food Waste	166.77	15.8%	141.33	19.5%	40.00	9.3%	37.98	12.7%	186.35	22.5%	162.41	17.3%
Garden Waste	25.81	2.4%	0	0.0%	0	0.0%	10.90	3.7%	50.45	6.1%	46.22	4.9%
Construction waste	4.63	0.4%	3.57	0.5%	50.00	11.7%	2.80	0.9%	57.88	7.0%	0	0.0%
Garage waste	0	0.0%	1.90	0.3%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Textiles	67.15	6.3%	19.27	2.7%	10.12	2.4%	8.02	2.7%	34.14	4.1%	50.71	5.4%
Tetrapak	4.41	0.4%	2.44	0.3%	11.38	2.7%	8.35	2.8%	1.99	0.2%	7.28	0.8%
Clinic Waste	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	20.93	2.2%
Fines/Soil	103.25	9.8%	107.80	14.9%	40.00	9.3%	45.00	15.1%	160.16	19.4%	129.63	13.8%
Totals	**1058.85**	**100%**	**725.72**	**100%**	**428.91**	**100%**	**298.02**	**100%**	**826.80**	**100%**	**941.05**	**100%**

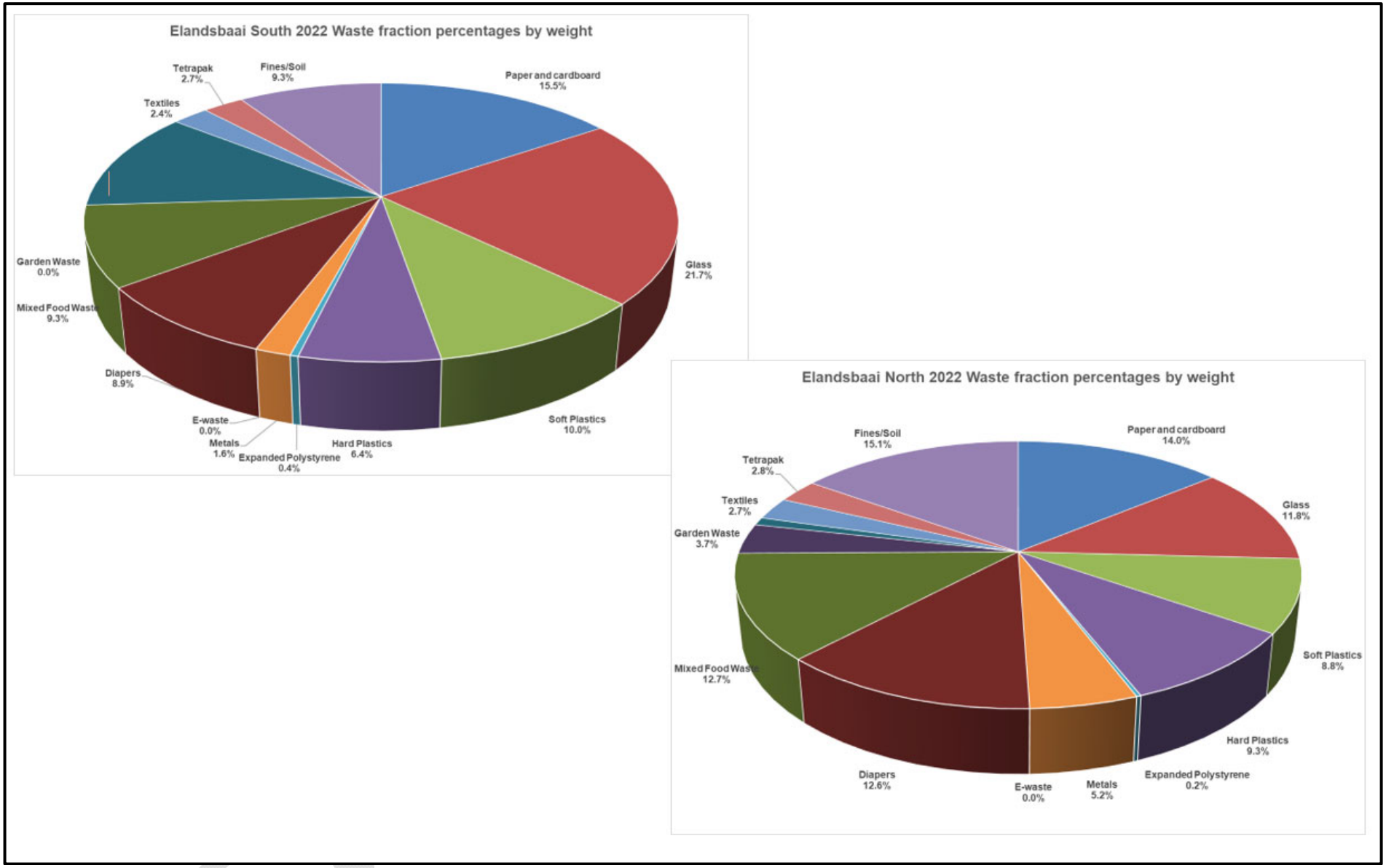

Figure 2-5: Waste Characterisation Results by Weight (Eland's Bay South and North)

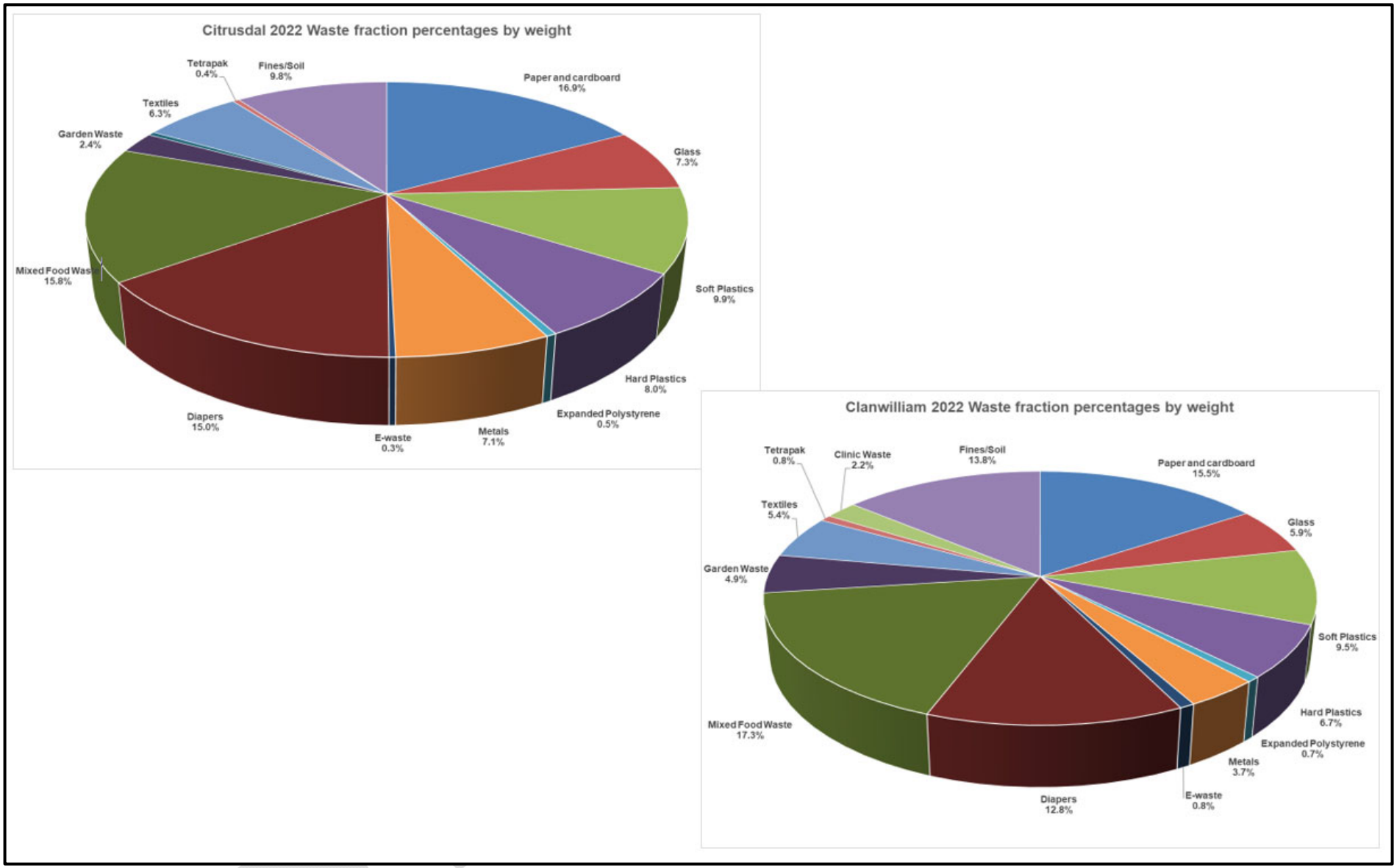

Figure 2-6: Waste Characterisation Results by Weight (Citrusdal and Clanwilliam)

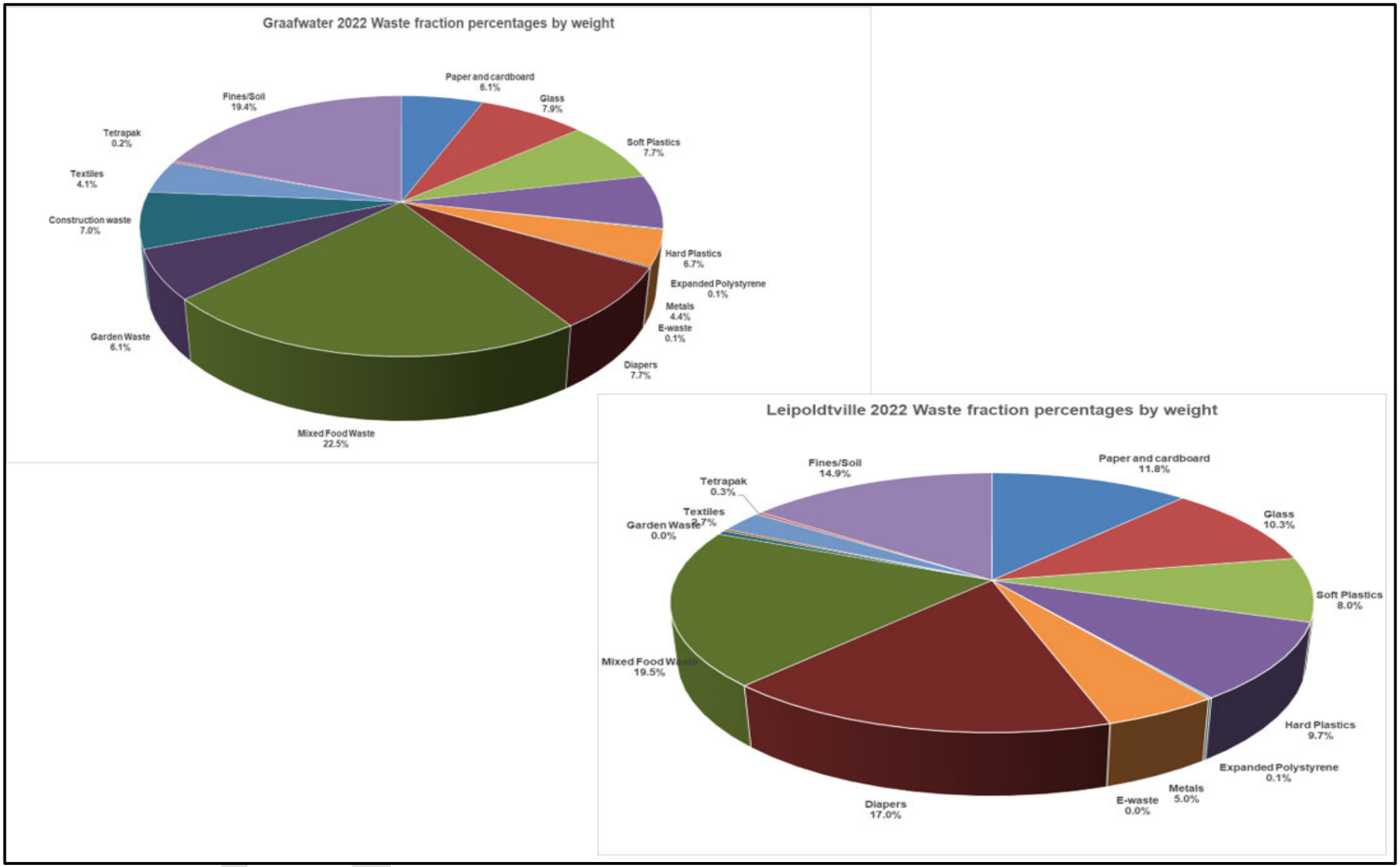

Figure 2-7: Waste Characterisation Results by Weight (Graafwater and Leipoldtville)

Table 2-11: Combined Cederberg Waste Characterisation by Weight

Waste fraction	Total weight (Kilogram)	Total %
Paper and cardboard	569.33	13.30%
Glass	401.58	9.38%
Soft Plastics	385.43	9.01%
Hard Plastics	328.62	7.68%
Expanded Polystyrene	15.63	0.37%
Metals	204.58	4.78%
E-waste	11.40	0.27%
Diapers	541.68	12.66%
Mixed Food Waste	734.86	17.17%
Garden Waste	133.40	3.12%
Construction waste	118.89	2.78%
Garage waste	1.90	0.04%
Textiles	189.42	4.43%
Tetrapak	35.86	0.84%
Clinic Waste	20.94	0.49%
Fines/Soil	585.86	13.69%
Totals	**4279.37**	**100.00%**

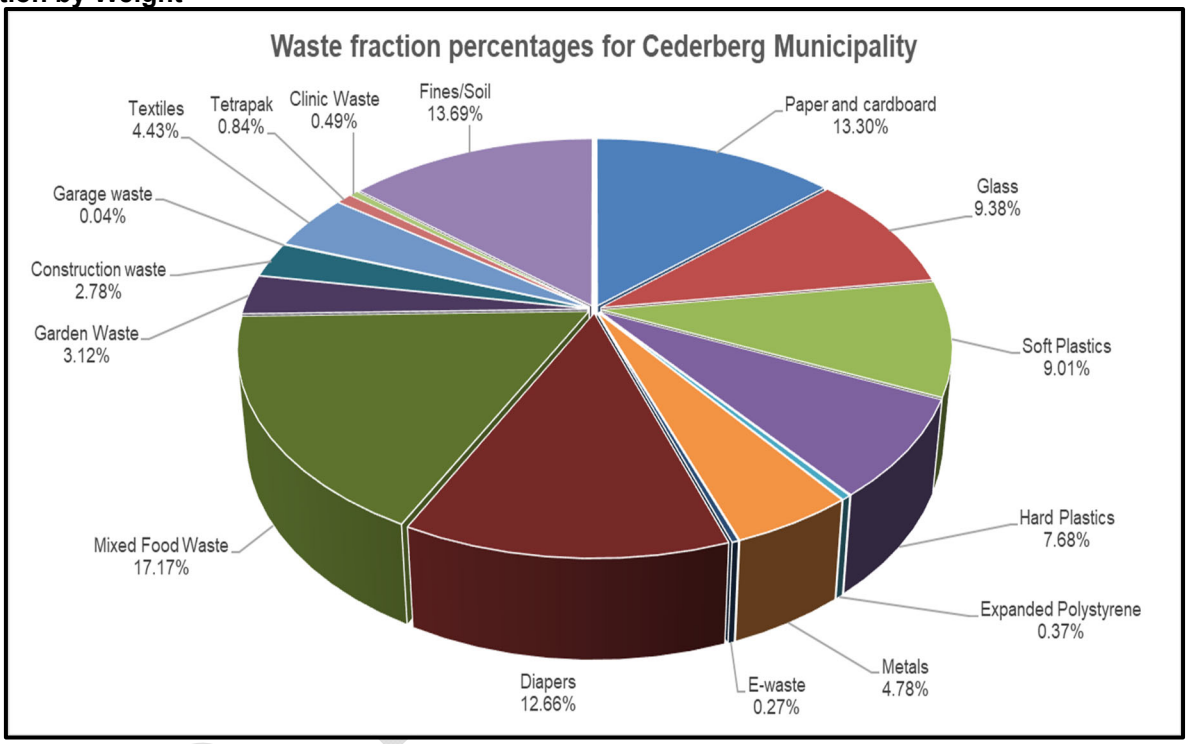

Figure 2-8: Combined Cederberg Waste Characterisation Study Results by Weight

2.3.6.2 Waste Characterisation Study Observations

The following observations is important to note following the waste characterisation study for Cederberg:

- Large quantities of diaper waste were observed during the waste characterisation exercise. Adult diapers were also observed, especially in Leipoldtville.
- The local clinics send large quantities of recyclable waste to the landfills. This included items such as provincial department branded courier bags. A small quantity of expired and unopened pharmaceuticals were observed.
- Little food waste was observed from the areas characterised which were mostly low income areas. The one higher income area characterised (Elands Bay South) does not have many permanent residents so the waste characterised from there cannot be seen as a true representation of that area as it was done outside season. However, the waste fraction was noticeably different from a visual perspective, i.e. included wine bottles, fewer Tetrapak, different packaging types etc.
- Small quantities of construction and bulky waste items were mixed in with residential waste and collected by the compactor vehicle in Lamberts Bay. This should not be allowed as such waste items may damage the machinery.
- Although some e-waste was observed, in most cases the items had already had the metal components stripped and only the plastic outer casings remained.
- The following waste fractions were collected by pickers on site and are of value in Cederberg Municipality:

    1. Metals (heavy and light steel; aluminium cans; any other metal-containing items)
    2. Although scrap metal and aluminium cans were recovered, aerosol and steel food cans were not seen as a priority item for the pickers
    3. K4-cardboard
    4. White paper
    5. PET bottles (included non-alcoholic and alcoholic)
    6. Clothing and textiles, clean and in good condition – not for recycling but for own use

- The following waste fractions were NOT collected by pickers on site and are not of value in Cederberg Municipality:

    1. Any plastics other than PET
    2. Glass
    3. Soiled clothing and textiles

Programmes should be developed in conjunction with the communities, PRO's and other role players to encourage the collection of these items to ensure diversion from landfill, and grow the recycling streams from these areas. Separation at source or collection points for used and clean clothing should be considered. Clothing mixed into the waste stream is damaged and soiled beyond repair and therefore lowers the recovery rate.

There is a very high level of poverty amongst the waste pickers and although they are part of an informal recycling economy, their potential to divert materials from landfill is limited by what recyclers are prepared to pay for and transport (i.e. largely PET bottles, aluminium and cardboard). The informal recycling sector has potential for growth with the right support from the recycling sector and this should be enabled by the Municipality.

2.3.7 General Waste quantities

2.3.7.1 Landfilled Waste

The CM uses the Citrusdal, Clanwilliam, Lambert's Bay and Eland's Bay landfills for waste disposal. None of these facilities have weighbridges for the recording of waste data so the gate controllers use the IPWIS form to manually record waste tonnages. The waste tonnages as reported to IPWIS by the Municipality for the calendar years 2020 and 2021 is shown in **Table 2-12** to **Table 2-16.**

Table 2-12: General Municipal Waste Tonnages Accepted at Cederberg Landfill sites

Landfilled General Municipal Waste (Tonnes)					
Month	**Clanwilliam**	**Lambert's Bay**	**Citrusdal**	**Eland's Bay**	**Total**
Jan-20	207.2	42.7	122.2	16.7	388.8
Feb-20	219.8	17.9	155.7	31.0	424.4
Mar-20	10.7	14.7	167.5	24.7	217.5
Apr-20	14.9	11.9	0.0	5.5	32.2
May-20	75.2	17.4	99.0	9.5	201.1
Jun-20	44.4	20.9	88.0	18.3	171.6
Jul-20	187.7	26.3	108.8	54.1	376.8
Aug-20	211.9	16.4	119.2	22.3	369.7
Sep-20	254.9	28.9	127.1	40.5	451.4
Oct-20	255.1	16.3	119.5	28.2	419.1
Nov-20	234.0	21.6	150.8	35.6	442.0
Dec-20	234.0	12.7	69.0	33.0	348.7
Jan-21	219.2	11.9	37.5	7.5	276.0
Feb-21	290.6	11.4	75.3	27.4	404.7
Mar-21	308.9	20.8	78.2	32.6	440.5
Apr-21	190.7	29.1	49.4	23.5	292.7
May-21	274.8	13.9	128.4	26.0	443.1
Jun-21	249.6	18.7	117.9	13.8	400.0
Jul-21	236.9	13.3	93.5	27.7	371.4
Aug-21	248.4	14.6	79.3	12.8	355.1
Sep-21	238.5	13.4	108.4	31.4	391.7
Oct-21	251.6	33.4	166.1	16.7	467.8
Nov-21	228.9	32.2	170.4	19.4	450.9
Dec-21	194.3	31.9	120.2	18.9	365.3
Monthly Average	**203.4**	**20.5**	**106.3**	**24.0**	**354.3**
2020 Annual	1949.7	247.6	1326.8	319.2	3843.2
2021 Annual	2932.4	244.6	1224.5	257.6	4659.1

Table 2-13: Construction and Demolition Waste tonnages accepted at Cederberg Landfill Sites

Landfilled Construction and Demolition Waste (Tonnes)					
Month	**Clanwilliam**	**Lambert's Bay**	**Citrusdal**	**Eland's Bay**	**Total**
Jan-20	0.2	9.4	13.3	1.1	23.9
Feb-20	0.1	9.2	47.8	3.0	60.1
Mar-20	0.0	9.0	32.2	0.4	41.5
Apr-20	1.7	0.0	0.0	0.0	1.7
May-20	4.0	0.0	10.5	0.0	14.5
Jun-20	2.2	7.1	23.8	1.5	34.6
Jul-20	0.0	6.0	0.6	5.6	12.2
Aug-20	0.6	4.3	46.6	1.9	53.4
Sep-20	0.2	5.4	29.6	0.8	36.0
Oct-20	0.4	19.5	0.2	0.0	20.0
Nov-20	0.4	17.4	11.7	0.0	29.6
Dec-20	13.1	13.9	27.8	0.0	54.7
Jan-21	32.5	0.0	17.6	0.0	50.1
Feb-21	57.2	21.8	39.1	0.0	118.1
Mar-21	22.8	14.7	32.3	0.0	69.8
Apr-21	22.8	21.8	13.2	0.8	58.6

Landfilled Construction and Demolition Waste (Tonnes)					
Month	**Clanwilliam**	**Lambert's Bay**	**Citrusdal**	**Eland's Bay**	**Total**
May-21	36.2	4.9	19.1	0.0	60.2
Jun-21	27.9	3.6	13.3	0.0	44.8
Jul-21	23.5	7.9	8.1	0.8	40.3
Aug-21	34.5	9.3	19.6	5.3	68.7
Sep-21	34.3	24.9	31.2	1.6	92.0
Oct-21	25.1	20.2	18.7	3.2	67.2
Nov-21	47.3	27.4	22.6	6.2	103.5
Dec-21	33.8	21.4	26.6	3.0	84.8
Monthly Average	**17.5**	**11.6**	**21.1**	**1.5**	**51.7**
2020 Annual	22.8	101.3	244.0	14.1	382.1
2021 Annual	397.9	177.9	261.4	20.8	858.0

Table 2-14: Organic Waste Tonnages Accepted at Cederberg Landfill Sites

Landfilled Organic Waste (Tonnes)					
Month	**Clanwilliam**	**Lambert's Bay**	**Citrusdal**	**Eland's Bay**	**Total**
Jan-20	21.9	23.1	20.9	9.8	75.7
Feb-20	20.7	14.8	48.0	10.6	94.0
Mar-20	0.2	15.3	30.5	5.2	51.2
Apr-20	5.9	0.0	0.0	1.6	7.5
May-20	14.8	0.0	17.9	3.2	35.9
Jun-20	16.8	9.1	17.3	5.4	48.6
Jul-20	11.8	12.8	18.7	10.6	53.8
Aug-20	23.2	13.9	19.0	6.2	62.3
Sep-20	20.6	18.4	20.1	14.4	73.5
Oct-20	16.8	26.3	29.5	5.4	77.9
Nov-20	20.2	24.2	36.3	9.8	90.5
Dec-20	20.2	15.2	9.3	7.0	51.6
Jan-21	12.5	4.6	4.8	3.6	25.5
Feb-21	25.4	20.6	13.6	12.8	72.4
Mar-21	24.2	20.8	13.1	10.4	68.5
Apr-21	18.3	15.3	7.6	5.2	46.4
May-21	18.9	0.6	14.6	7.0	41.1
Jun-21	18.2	4.8	11.1	1.4	35.5
Jul-21	18.3	5.9	6.4	4.4	35.0
Aug-21	12.8	6.0	8.3	7.7	34.8
Sep-21	20.4	18.8	16.6	8.3	64.1
Oct-21	12.5	22.2	20.8	7.8	63.3
Nov-21	21.7	15.4	31.8	8.0	76.9
Dec-21	13.5	17.2	20.1	4.2	55.0
Monthly Average	**17.1**	**13.6**	**18.2**	**7.1**	**55.9**
2020 Annual	192.9	173.1	267.2	89.2	722.4
2021 Annual	216.7	152.2	168.7	80.8	618.4

Table 2-15: Commercial and Industrial Waste Tonnages Accepted at the Cederberg Landfills

Landfilled Commercial and Industrial Waste (Tonnes)					
Month	**Clanwilliam**	**Lambert's Bay**	**Citrusdal**	**Eland's Bay**	**Total**
Jan-20	3.6	5.4	18.9	0.0	27.9
Feb-20	2.3	5.3	29.9	0.0	37.4
Mar-20	11.3	5.0	16.4	0.0	32.6
Apr-20	15.8	0.0	0.0	0.0	15.8
May-20	18.8	0.0	26.4	0.0	45.1
Jun-20	9.8	0.7	37.4	0.0	47.8
Jul-20	25.7	3.1	29.7	0.0	58.5
Aug-20	30.8	1.6	29.5	0.0	61.8
Sep-20	27.2	7.4	27.6	0.0	62.2
Oct-20	13.1	9.9	1.0	0.0	23.9
Nov-20	0.4	11.1	5.5	0.0	17.0
Dec-20	0.0	8.8	12.0	0.0	20.8
Jan-21	0.9	0.4	4.8	0.0	6.1
Feb-21	0.6	4.6	12.8	0.0	18.0
Mar-21	0.5	7.9	17.0	0.2	25.6
Apr-21	0.0	4.4	8.8	0.0	13.2
May-21	0.0	0.0	14.7	0.0	14.7
Jun-21	0.0	2.4	16.9	0.0	19.3
Jul-21	0.0	0.0	9.2	0.0	9.2
Aug-21	0.0	13.2	6.4	0.0	19.6
Sep-21	25.1	2.8	3.3	0.2	31.4
Oct-21	0.0	0.9	18.7	0.0	19.6
Nov-21	0.2	1.4	15.4	0.0	17.0
Dec-21	0.0	0.8	9.4	0.3	10.5
Monthly Average	**7.7**	**4.0**	**15.5**	**0.0**	**27.3**
2020 Annual	158.5	58.1	234.2	0.0	450.8
2021 Annual	27.3	38.8	137.4	0.6	204.1

Table 2-16: Monthly landfilled averages (Tonnes) since January 2020

Waste Type (Values in Tonnes)	Clanwilliam	Lambert's Bay	Citrusdal	Eland's Bay	% of Total
General Municipal	203.4	20.5	106.3	24.0	72.3%
Construction & Demolition	17.5	11.6	21.1	1.5	10.5%
Organics	17.1	13.6	18.2	7.1	11.4%
Commercial & Industrial	8.5	4.0	15.5	0.0	5.7%
Total	246.5	49.7	161.0	32.6	**100%**
% of Total	50.3%	10.2%	32.9%	6.7%	

The data in the above tables are reflected graphically in **Figure 2-9** to **Figure 2-11** below which shows that the Cederberg landfills on average about 490 tonnes per month (about 5,870 tonnes per annum) according to reports to IPWIS, which is made up of mostly general municipal waste and sent mostly to the Citrusdal and Clanwilliam landfills. The monthly average data was taken from reported figures for the calendar years of 2020 and 2021.

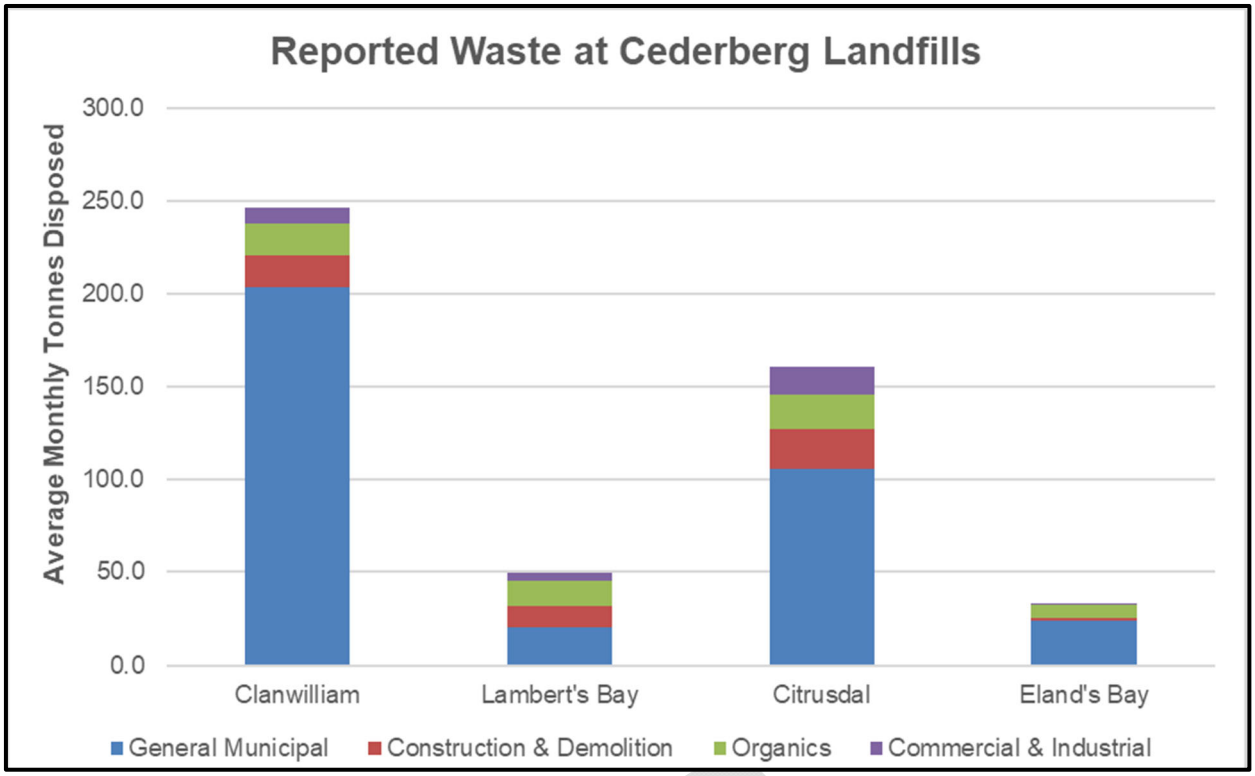

Figure 2-9: Monthly average tonnes reported at Cederberg Landfills

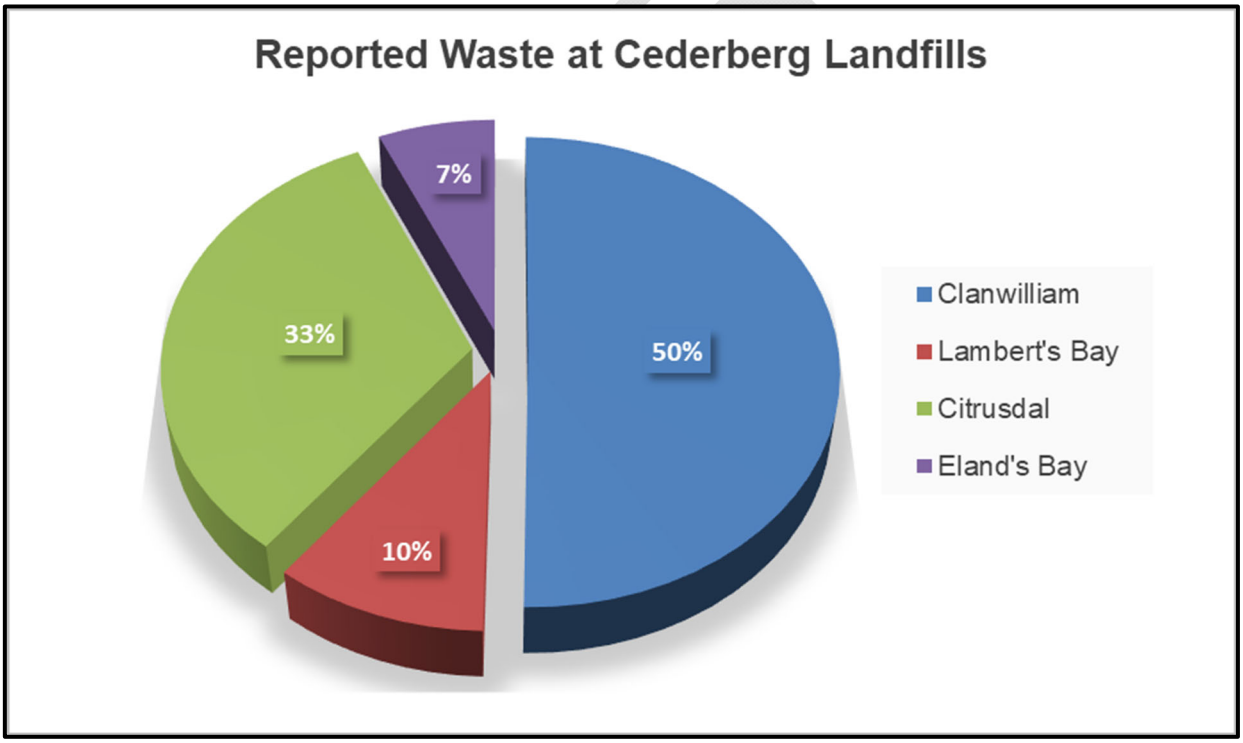

Figure 2-10: Average Landfilled Tonnes per site

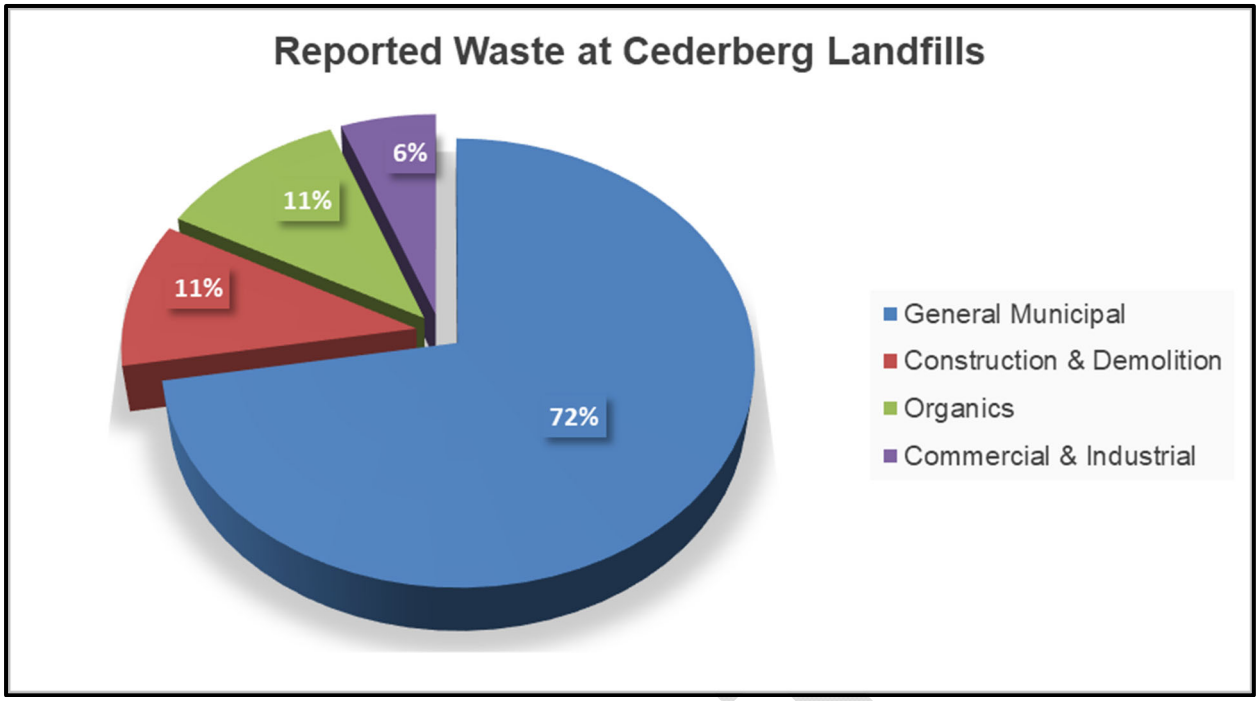

Figure 2-11: Breakdown of Landfilled Waste Types

2.3.7.2 Waste Generated by the Public

When determining municipal waste generation quantities, assumed waste generation rates of 0.41kg per person per day was used for low-income groups, 0.74kg per person per day for middle income groups and 1.10kg per person per day for high income groups. These are in line with findings from the DEA 2006 State of the Environmental Report and adapted for a low population municipality like CM. Using the available data from the population and income group statistics discussed under previous headings, the estimated current and future quantities of general waste for the Cederberg Municipality was calculated as per **Table** 2-17.

The current and future estimated waste quantities can then be shown as per **Table 2-17** below. The difference in tonnages between the landfilled waste of about 5,900 tonnes per annum and the approximately 7,300 tonnes per annum reported in **Table 2-17** is mostly made up of the waste portion that gets recycled, re-used, composted etc. post consumption and pre-disposal.

Table 2-17: Current and Projected Waste Quantities for Cederberg

Sub-area	Population (2022)	Waste Generated in Tonnes/ year (2022)	Population (2023)	Waste Generated in Tonnes/ year (2023)	Population (2024)	Waste Generated in Tonnes/year (2024)	Population (2025)	Waste Generated in Tonnes/year (2025)	Population (2026)	Waste Generated in Tonnes/year (2026)	Average Waste Generation Factor for Area in kg/p/d
Lamberts Bay	7 316	1 735	7 426	1 761	7 539	1 788	7 653	1 815	7 768	1 843	0.65
Malkopbaai	210	57	213	58	217	59	220	60	223	61	0.75
Cederberg (Rural)	30 376	6 475	30 835	6 573	31 302	6 672	31 775	6 773	32 256	6 876	0.58
Graafwater	2 780	667	2 822	677	2 865	687	2 908	698	2 952	708	0.66
Hopland	1 442	289	1 464	293	1 486	298	1 508	302	1 531	307	0.55
Clanwilliam	7 990	1 831	8 111	1 858	8 234	1 886	8 358	1 915	8 485	1 944	0.63
Leipoldtville	365	80	371	81	376	83	382	84	388	85	0.60
Elands Bay	1 873	359	1 901	364	1 930	370	1 959	376	1 989	381	0.53
Citrusdal	7 105	1 870	7 213	1 898	7 322	1 927	7 433	1 956	7 545	1 985	0.72
Oranjeville	1 718	452	1 744	459	1 771	466	1 797	473	1 825	480	0.72
Total	**61 176**	**13 814**	**62 101**	**14 023**	**63 040**	**14 236**	**63 994**	**14 451**	**64 962**	**14 669**	**0.62**
Excluding Rural	**30 800**	**7 339**	**31 266**	**7 450**	**31 739**	**7 563**	**32 219**	**7 677**	**32 706**	**7 794**	**0.65**

2.3.8 Hazardous waste

A Hazardous and Health Care Risk Waste (H&HCRW) Survey was conducted in June 2022 in Cederberg Local Municipality. The survey found that H&HCRW generated in the study area could be categorised under four of the potential seventeen Industrial Groups listed in Schedule 3 of the National Environmental Management: Waste Amendment Act (NEM:WAA) (Act No. 26 of 2014). The study found that 12 400 litres of waste oils are generated in the study area per annum. It is estimated that at least 2 000 units of waste tyre waste is generated per annum.

The quantity of Health Care Risk Waste generated in the study area per annum is approximately 7 tons. The study found that the majority of businesses generating H&HCRW have adequate systems in place to deal with such waste in a responsible manner. A full hazardous waste survey report is included in **Appendix D.**

2.3.8.1 NEMWA Schedule 3: Defined Wastes

Category A: Hazardous Waste

Table 2-18: Hazardous waste quantitative data collation summary

Industrial Group (NEM: WAA Schedule 3)	**Waste fraction** (NEM: WAA Schedule 3)	**Generator and notes**	**Number of generators surveyed in study area:**	**Quantity generated per annum**
6	Wastes from organic chemical processes	**Pharmacies, clinics and hospitals:** (e) Pharmaceuticals Included in HCRW results	Refer to HCRW Results	Refer to HCRW Results
12	Oil wastes and wastes of liquid fuels (except edible oils)	**Service centres:** (a) waste hydraulic oils (b) waste engine, gear and lubricating oils (c) waste insulating and heat transmission oils (d) oil/water separator contents (e) wastes of liquid fuels (f) hazardous portion of other oil waste	8	12 400 litres/a
14	Other wastes not specified in the list	**Retailers/service centres selling batteries:** (e) wastes from discarded batteries	2	> 50 units/a
16	Wastes from human or animal health care and/or related research	**Hospitals, Clinics, Medical practitioners, Pharmacies, Veterinarians, Beauty Salons, Mortuaries:** Included in HCRW results	Refer to HCRW results	Refer to HCRW results
Other	Waste tyres	**Retailers/service centres selling tyres:** Waste tyres	5	> 2 000 units/a

Table 2-19: HCRW generated within the study area

Industrial Group (NEM: WAA Schedule 3)	**Waste fraction** (G.N. No. R. 375 of May 2014)	**Generator and notes**	**Number of generators surveyed in study area:**	**Kilograms generated per annum**
16	(i) Chemical waste	**Laboratories and Pathologists:** Figures included in Hazardous Waste results.	Refer to Hazardous Waste Results	Refer to Hazardous Waste Results
16	(ii) Infectious waste	**Hospitals, Clinics, Medical practitioners (including general practitioners, physiotherapists, dentists etc.), pathologists, pharmacies, veterinarians:** Includes Medical Disposables such as cotton swabs, used bandages, gauze, plaster and syringes and could also include pathological waste from small surgeries (e.g. moles, extracted teeth, etc.) as well as isolation waste.	26	4 428 kg/a
16	(iii) Isolation waste	**Hospitals and Clinics:** COVID-19 related but included in infectious waste quantities	2	150 kg/a
16	(iv) Laboratory waste	**Laboratories and Pathologists:** Figures included in Hazardous Waste results.	Refer to Hazardous Waste Results	Refer to Hazardous Waste Results
16	(v) Pathological waste	**Hospitals, Clinics and Medical practitioners:** Also referred to as anatomical waste and includes removed organs, tissues and body parts from humans and animals.	5	523 kg/a
6	(vi) Pharmaceutical waste	**Hospitals, Clinics, Medical practitioners and pharmacies:** Expired and redundant pharmaceuticals.	7	432 kg/a
16	(vii) Sharps waste	**Hospitals, Clinics, Medical practitioners, Pharmacies, Veterinarians, Beauty Salons, Mortuaries:** Consists mostly of needles but also blades. Average weights: **Hospitals, Clinics, Medical Practitioners and Pharmacies:** 5 - 8g/needle **Dentists and Beauty Salons:** 3 – 5g/needle **Veterinarians:** 8 – 10g/needle	23	1 343 kg/a
			TOTAL H&HCRW:	**6 876 kg/a**

2.3.8.2 Household hazardous waste

Household Hazardous Waste (HHW) is not a priority identified by the municipality. The public is probably also not requesting a special service for HHW.

2.4 EXISTING WASTE MANAGEMENT STRUCTURE, SYSTEMS AND PRACTICES

This section discusses the current solid waste management system in the Cederberg Municipality. This includes the organisational structure of the Municipality, solid waste collection methods and vehicles, collection schedules, diversion, treatment and disposal.

2.4.1 Organisational structure

Waste Management falls under the responsibility of the Operational Services Directorate in CM and the Director: Operational Services position is currently vacant. Similarly, the position of Solid Waste Manager, who needs to be appointed as per the requirements of the Waste Act, is also vacant.

Chapter 3 of the Waste Act states that:

"*10.(3) Each municipality authorised to carry out waste management services by the Municipal Structures Act, 1998 (Act No. 117 of 1998), must designate in writing a waste management officer from its administration to be responsible for co-ordinating matters pertaining to waste management in that municipality.*

(4) A power delegated or a duty assigned to a waste management officer by virtue of subsection (3) may be sub-delegated of further assigned by that officer to another official in the service of the same administration, subject to such limitations or conditions as may be determined by the municipality.

(5) Waste management officers must co-ordinate their activities with other waste management activities in the manner set out in the national waste management strategy established in terms of section 6 or determined by the Minister by notice in the Gazette."

There are three civil engineering services teams which are each led by a senior foreman, based in Lamberts Bay, Citrusdal and Clanwilliam. The foreman is responsible for overseeing the operations of solid waste management.

The waste management teams report to the supervisors but are led by a refuse team leader or supervisor. The teams consist of truck and tractor drivers, WMF operators and general workers The Waste Management Department organogram is presented in **Figure 2-12**. Although the organisational structure is sufficient to effectively deliver the current required solid waste services in Cederberg, there are a number of vacancies that need to be filled. There are three small plant operator vacancies, three general worker vacancies, two driver vacancies, one attendant, one internship and one team leader vacancy for a total of 11 vacancies in the waste department that needs to be filled.

It must be noted that once the regional landfill starts operation there will be a review of the organogram in order to ensure that updated roles are assigned.

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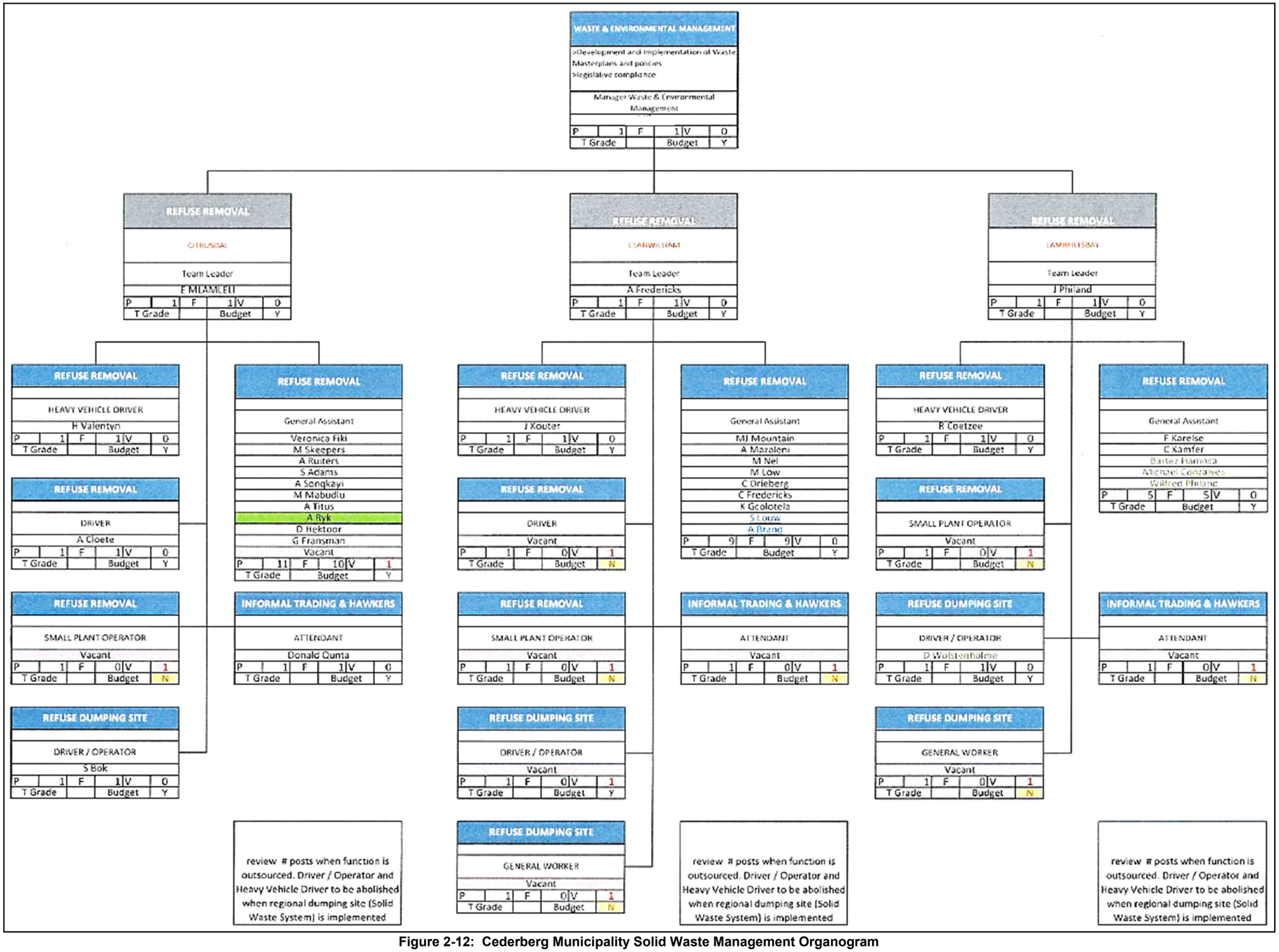


Figure 2-12: Cederberg Municipality Solid Waste Management Organogram

2.4.2 Waste Collection

The collections are split into three teams as mentioned in the waste organogram. Collections are done for all towns, but the three teams are based in Lamberts Bay, Citrusdal and Clanwilliam. The Lamberts Bay team also collects waste in Graafwater and Elands Bay. The waste collection schedule is shown in **Table 2-20.** The CM uses wheelie bins in most areas with black bags being distributed to informal settlements for collection. In the towns of Wupperthal and Eselsbank waste gets collected by the local church group and taken to the town landfill.

Street cleaning is divided into two teams: one in Citrusdal comprising four full time street cleaners and the other four full time street cleaners are responsible for Clanwilliam. Both street cleaning teams are overseen by the refuse team leader or supervisor of each town. The main method of collection is via road transport. Black bin bags and bins are provided in urban areas and collected by rear end loading (REL) compactor vehicles whilst garden greens are collected by tractor trailers.

Table 2-20: Waste Collection Schedule

Team	Collection Day	Collection Area	Final Disposal
CLANWILLIAM	Monday	Businesses & Residential Developments	Clanwilliam Landfill Site
	Tuesday	Residential Areas	
	Wednesday	Residential Areas	
	Thursday	Businesses, Khayelitsha	
	Friday	Businesses, Schools	
CITRUSDAL	Monday	Businesses Riverview	Citrusdal Landfill Site
	Tuesday	Residential Areas	
	Wednesday	Residential Areas, Oranjeville, Heuwelsig	
	Thursday	Businesses	
	Friday	Businesses, Elandskloof & Proefplaas	
LAMBERTS BAY	Monday	Residential Areas, Businesses	Lamberts Bay Landfill Site
	Tuesday	Town Cleaning	
	Wednesday	Town Cleaning & Garden Waste and Graafwater Town	
	Thursday	Residential Areas, South	
	Friday	Businesses	
	Tuesday	Elands Bay & Leipoldtville Residential & Businesses	Elands Bay Landfill Site

CM has four refuse compactors which collect domestic waste and transport these to the operational facilities in Citrusdal, Clanwilliam, Lamberts Bay and Elands Bay. Garden greens waste is collected from the towns via tractor trailers and also taken to these WMFs.The Cederberg solid waste collection fleet is shown in **Table 2-21.** The Municipality keeps record of the maintenance on the service vehicles although they do not have a formal maintenance pan in place. The Nissan A450 Compactor was a donation from the Saldanha Municipality and was reportedly not in working order. They also received a donation of a 16 tonne skip truck from the DEFF which is used for skip collection.

Table 2-21: Waste collection fleet

Make	Model	Registration	Year Model	Function	Condition
Nissan Compactor	UD 35	CAR 5026	2011	Municipal Waste Collection	Fair
Nissan Compactor	UD 80	CAR 6489	2007	Municipal Waste Collection	Fair
Nissan Compactor	UD 80	CAR 6075	2007	Municipal Waste Collection	Poor
Nissan Compactor	A450	CAR 19120	2007	Municipal Waste Collection	Very Poor
Tractor Trailer		CAR 13289		Garden Waste Collection	
Tractor Trailer		CAR 13288		Garden Waste Collection	

There are a reported 6,157 municipal waste collection points in the Municipality which is made up mostly of residential collection points as shown in **Figure 2-13** below. A reported 33% of the collection points are marked as indigent households that receive a free weekly collection service.

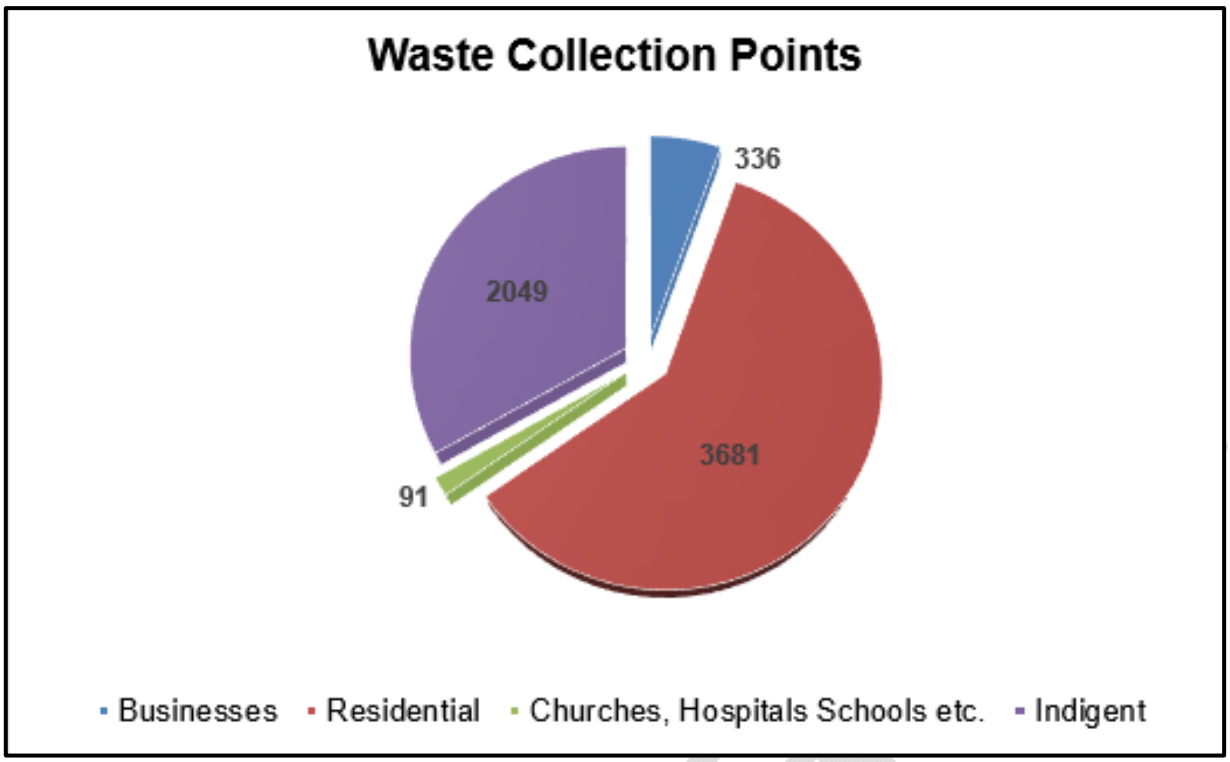


Figure 2-13: Cederberg Municipality Waste Collection Points

2.4.3 Levels of service

The Census 2011 data for Cederberg Municipality showed that only about 58% of people received a weekly refuse collection service. In the latest Municipal IDP (2017-2022) document it was reported that this percentage had increased to almost 70% in 2017, and currently the Municipality reports that all people in urban areas have access to a weekly solid waste removal service. Considering that more than 47% of the total population of the Municipality lives in rural areas, as discussed earlier in this reported under Heading 2.2.1, it is clear that many if not most people in rural suburban areas also receive a waste collection service. It is unclear how many of the population reported as rural are housed on farms and smallholdings, but farms and smallholdings do not receive a weekly refuse collection service, and the people in these areas take their waste to the nearest drop-off or landfill facility or manage it themselves.

Included in the above are the services rendered to indigent households. There are a total of 2,049 registered indigent households in the Municipality and 100% of these also receive waste collection services as reported in **Figure 2-13**.

2.4.4 Waste related complaints

All solid waste related complaints are recorded. The Municipality's main line can be called to register complaints at (022) 482 8000. When calls come in, they are recorded at the help desk and the responsible person is informed who then addresses the matter. The complaints are mostly related to waste collection and illegal dumping. A total of 10 complaints were recorded for March 2022 and 9 for February 2022. All complaints are addressed as soon as possible.

2.4.5 Waste minimisation, re-use, recycling initiatives

2.4.5.1 Recyclers

The Municipality has a list of private recycling companies as shown in **Table 2-22**. It is not clear if this is an exhaustive list, and the Municipality needs to ensure that this list is updated regularly. These companies collect from businesses and some households in the towns that they operate but the volumes or tonnages of the recyclables collected by them are not reported. Some of these companies also have staff at the landfills sites where recyclable materials are then recovered with permission from the Municipality using a permit or coupon system.

In order to provide accurate information towards waste management planning it is recommended that these private companies report their recycling statistics to the Municipality regularly.

Table 2-22: Cederberg Private Recycling Companies

Company	Town	Contact Name	Contact Number
General trading & wige recycling	Eland's Bay	Gert Titus	072 287 3852
Cleangreen trading	Clanwilliam	Eldon Newat	073 308 6535
Natalie Recycling (Pty) Ltd	Citrusdal	Farao Jan	076 196 7806
Khumalo recycling (Pty) Ltd	Citrusdal	Khumalo Sipho	060 455 7018
Citrusdal Enterprises (Pty) Ltd	Citrusdal	Rhode Titus	076 883 2453
Joburg scrap metal	Citrusdal	Elma Oewies	079 145 5234
Elands Bay Recycling	Eland's Bay & Lambert's Bay	Edwin Pieterson	073 589 1600
Boeta Joe's Scrap	Clanwilliam	Jomon Viljoen	076 329 6427

2.4.5.2 Recycling and Waste Recovery

The information in the below table shows the wastes diverted from landfill as reported to IPWIS at the various landfill sites. These diversion numbers are as a result of municipal separation at source initiatives, garden waste and composting projects, swop shops, inputs by the private sector, buy back centres etc.

Table 2-23: Reported Waste Tonnages Diverted from Landfill

	Recovered (Tonnes)						
Month	Paper	PET	Plastics	NF Metals	Ferrous Metals	WEE	Glass
Jan-20	0	0	0	0	0	0	0
Feb-20	5.9	0.3	0.7	0.2	0	0	1.8
Mar-20	0	0	0	0	0	0	0
Apr-20	0	0	0	0	0	0	0
May-20	0	0	0	0	0	0	0
Jun-20	0	0	0	0	0	0	0
Jul-20	9.6	0	0	0	0	0	0
Aug-20	6.7	0	1.3	0	0	0	5.5
Sep-20	15.6	0	0	0	0	0	0
Oct-20	0	0	0	0	0	0	0
Nov-20	8.1	0.2	2.7	0	0	0	0
Dec-20	7.7		0	0	0	0	0
Jan-21	8	0.2	0	0.2	5.3	0	0
Feb-21	14.7	1.4	0	0	0	0	0
Mar-21	19.3	1.6	1.5	2.6	0	0	1.8
Apr-21	21.6	1.6	0.6	3.2	0	0	0.6
May-21	18	1.3	1.8	0.2	8.2	0	0
Jun-21	3.3	0.8	1.8	0.3	0.1	0	0
Jul-21	20.2	0.3	0.9	0.2	0.7	0.3	0

Recovered (Tonnes)							
Month	**Paper**	**PET**	**Plastics**	**NF Metals**	**Ferrous Metals**	**WEE**	**Glass**
Aug-21	16.1	0.2		0.2	0.4	0	0
Sep-21	14.8	1.4	2.5	0.8	0.3	0	0
Oct-21	35.9	1.2	1.9	0	0	0	0
Nov-21	15.8	0.8	2.2	1.4	0	0	0
Dec-21	4.1	0.8	1.2	0.8	0	0	
Monthly Average	**10.2**	**0.5**	**0.8**	**0.4**	**0.6**	**0.0**	**0.4**
2020 Annual	53.7	0.5	4.7	0.2	0.0	0.0	7.3
2021 Annual	191.8	11.6	14.4	9.9	15.0	0.3	2.4

The information in the above table shows that the waste recovery in the Cederberg Municipality needs to improve in order to divert more waste from landfill since only a reported 1% of the generated waste stream shown in **Table 2-17** gets recovered and or diverted.

The prices received for recovered materials differ as the market fluctuates but the opportunity for generating an income from the recycling of solid waste is always there. The most recent prices as reported in the IWMP of another WCDM for recycled material as delivered to Cape Town are shown in **Table 2-24**.

Table 2-24: Prices of Recovered Materials

MATERIAL	PRICE IN RAND / TON FOR BALED MATERIAL
Cardboard	2,000
White Paper	2,500
Newsprint	800
Mixed Paper	750
Metals (Mainly cans)	1,300
Glass (All colours, Crushed)	400
Plastic (PET, No 1, White, Blue)	6,500
Green PET	5,500
Plastic (PET, No 1, Brown & other colours)	4,500
Plastic (HDPE, No 2)	5,000
Plastic (LDPE)	2,000
Plastic (Polypropylene, No 5)	3,500
Plastic (Polystyrene, No 6)	0 – current cost to recycle too high

2.4.5.3 Organic waste diversion

The CM does not currently divert any organic waste from its landfills and garden and food waste get taken to the Clanwilliam, Cederberg, Elands Bay and Lamberts Bay Landfills through municipal collection of wheelie bins, and dropped off in bulk by members of the public.

The Municipality is aware that they have a responsibility to divert organic waste from landfill, and although the CM waste will in future be taken to the soon to be developed regional landfill, the CM needs to proactively manage organic waste diversion.

The Western Cape D:EA&DP made it a condition in most of the provincial waste licences that organic waste diversion plans (OWDP) be developed for landfills in the province. This also holds true for landfills issued with closure licenses that typically only receive garden waste and builder's rubble, as is the case with some of the landfills in the CM. The CM developed an OWDP during March 2021 which is included as **Annexure B** to this IWMP.

The OWDP concluded that through implementation of a home composting system CM can greatly assist the organic waste diversion from the regional landfill which will also be required to provide an OWDP as part of its waste licence conditions. Large portions of garden waste is taken to landfill with the municipal waste through a wheelie bin collection system and it is also recommended that the CM implement a separate collection system for residential and commercial garden waste to ensure sustainable diversion of organic waste from landfills.

The garden waste diversion targets as required by the waste licences of the CM Landfills can be met through chipping and composting the garden waste fractions and when considering the cost implications of undertaking this work in-house, it is recommended that both the collection and treatment (chipping and composting) of garden waste be outsourced to a private party at a cost of approximately R1.1 to R1.7 Million per annum.

2.4.6 Awareness & Education

The Cederberg Municipality understands the importance of awareness and education when it comes to waste management, and they conduct regular campaigns to reinforce this with the community. Examples of the types of campaigns conducted are:

- Street Clean-ups.
- Door-to-door campaigns to share information
- Provisions of wheelie bins for recycling to schools
- Recycling awareness campaigns at schools
- Awareness and educational site visits to businesses
- Providing tools and equipment to schools

The Municipality reports on these campaigns on a monthly basis and some photos of education and awareness campaigns are shown in **Annexure C.**

Through a partnership with the changemakers hub (www.changemakershub.org), the Municipality was also involved in an eco-brick project during September 2021. Eco-Bricks use plastic that would have alternatively ended up in landfill, as a building material to create sustainable structures. Further collaborations between the CM and the changemakers hub is also planned.

2.4.7 Waste disposal facilities

The operational and closed waste disposal facilities in the Cederberg Municipality are discussed below. All of the Cederberg disposal facilities that require licences are licensed.

2.4.7.1 Operating landfills

The operating landfills in the Cederberg Municipality are the Citrusdal Landfill, the Clanwilliam Landfill, the Lambert's Bay Landfill and the Eland's Bay Landfill.

2.4.7.1.1 Citrusdal Landfill

The Citrusdal landfill is the only landfill in the Municipality with a valid operational waste licence (not a closure licence) which was issued in 2018 with reference 19/2/5/4/F2/3/WL0038/18. The landfill footprint is 26,505m^2 and it is located to the East of town (**Figure** 2-14).

The site is internally and externally audited in terms of operational compliance and has a number of challenges relating to windblown litter, access control, burning of waste etc. This site was issued with a Pre-Compliance notice from the D:EA&DP in April 2022 with reference 14/1/1/E1/10/2/1/0710/21 listing a number of non-compliances with the waste licence and requesting an action plan for clarification from the Municipality.

Figure 2-14: Aerial image of the Citrusdal Landfill

The site is operated by the municipality and the following table provides a summary of the non- and partial compliances identified during the latest external audit on 6 August 2021. The external audits are carried out based on the licence conditions of the facility waste license.

Table 2-25: External audit summary Citrusdal Landfill

Condition Nr.	Partial / Non-compliance	Proposed Actions	Due Date
2.3 to 2.5	Waste loads not checked at gate and unauthorised waste on site	In past audits the site was manned by municipal officials who confirmed waste loads and recorded it on the documents to be added to the IPWIS system. No staff was on site at the time of this audit and the Municipality needs to revert to compliance on this matter.	As soon as possible
4.5	Buffer zone not maintained	The options to comply are the following: Appoint specialists to conduct the required investigations to determine if a relaxed buffer can be implemented or apply to have the borders of the facility varied to effectively establish the 350m buffer zone. The portion of the facility that currently falls within the buffer will then become inactive and must be temporarily capped until final rehabilitation.	As soon as the municipality has decided on the action to take. This action item has been outstanding since the 2019 external audit.
4.6 to 4.11	Runoff control	Existing channels need to be upgraded and cleared of waste. Additional channels and/or berms are required to effectively manage external and internal runoff.	As soon as budget has been made available. This action item has been outstanding since the 2019 external audit.
4.14	Erosion control	The side slopes of the facility need to be maintained in such a manner that little to no erosion occurs.	As soon as possible.

Condition Nr.	Partial / Non-compliance	Proposed Actions	Due Date
4.15	No sanitation facilities	Make adequate sanitation facilities available.	As soon as possible. This action item has been outstanding since the 2019 external audit.
5.1 - 5.4 & 6.3 & 6.5	Notice Boards, Fencing, access control and burning of waste	The stolen notice boards need to be replaced and the entire fence needs to be replaced in order to implement access control. With proper access control the burning of waste can be prevented.	As soon as budget has been made available.
6.1, 6.2 & 6.9	Exposed waste and nuisance conditions observed	Source adequate cover material and cover waste as required.	November 2021. This action item has been outstanding since the 2019 external audit.
6.6	No Emergency Response Plan (ERP) on site	an Emergency Response Plan (ERP) was developed for all sites but was not present on site at the term of audit.	September 2021.
6.9	Covering of waste	The Municipality needs to deploy machinery on site at regular intervals to level the waste and cover non active working faces with soil.	As soon as possible.
6.10	Copy of permit not available on site	Provide site personnel with a copy of the permit to be kept on site. Request personnel to clean site container office so that documents can be safely stored.	September 2021.
8	Water monitoring not being done	Establish groundwater monitoring boreholes. Conduct the required groundwater and surface water monitoring.	By next external audit. This action item has been outstanding since the 2019 external audit.
9.3 & 12.2	Recovered volumes not recorded and no air quality monitoring	Cease informal salvaging as it is prohibited by the permit and conduct air quality monitoring.	By next external audit. This action item has been outstanding since the 2019 external audit.
11	No monitoring committee established	Efforts have been made to establish this committee with no success. The Municipality needs to continue with establishment of the required monitoring committee.	By next external audit. This action item has been outstanding since the 2019 external audit.
12 & 13.5	No records available on site	Records of disposal on site are available but the accuracy of these records are questionable since staff were not on site to record was on the day of the audit. Staff need to be on site during all operating site hours.	September 2021

An overall compliance rating of **49.06%** was achieved during the external audit according to the DEA&DP's latest weighted auditing system which indicates a non-compliant facility in need of major improvements.

Figure 2-15: Citrusdal Landfill during 2021 External Audit

Accurate disposal quantities are not available for this site as there is no weighbridge. Quantities are reported in terms of the D:EA&DP waste calculator. The remaining available disposal airspace and airspace usage are measured with annual topographical surveys. The topographical surveys (July 2020 and August 2021) were used to calculate the average monthly airspace consumption. The total volume of airspace consumed between the two surveys equals 2,236m^3, which translates to an average of 180m^3/month (including cover material). Given that the site reportedly accepts an average of 161 tonnes per month with little to no compaction, one would expect a higher airspace consumption rate which indicates that waste is being removed from site through informal recycling and or burning.

Table 2-26: Citrusdal Landfill Summary

Type of facility	Waste Disposal Facility
Licensed/Permitted?	Yes
License/Permit Number	Latest amendment: 19/2/5/4/F2/3/WL0038/18
Classification	G:S:B-, Class B
Location	S32°34'40.33''; E19°0'50.83''
Estimated Remaining Lifetime	Unclear (estimated by 2037 or sooner)
Access Control and signage?	No
Externally audited?	Yes
Waste Types Received	Municipal Waste, Garden Waste and Builder's Rubble
Method of measurement	D:EA&DP Waste Calculator
Registered and reported to IPWIS?	Yes

2.4.7.1.2 Clanwilliam Landfill

The Clanwilliam landfill has a valid closure waste licence which was issued in 2019 with reference 19/2/5/4/F2/4/WL0007/18. The landfill footprint is 23,616m^2 and it is located about 6.5km to the South-East of town (**Figure 2-16**).

The site is internally and externally audited in terms of licence compliance and has a number of challenges relating to windblown litter, access control, burning of waste etc.

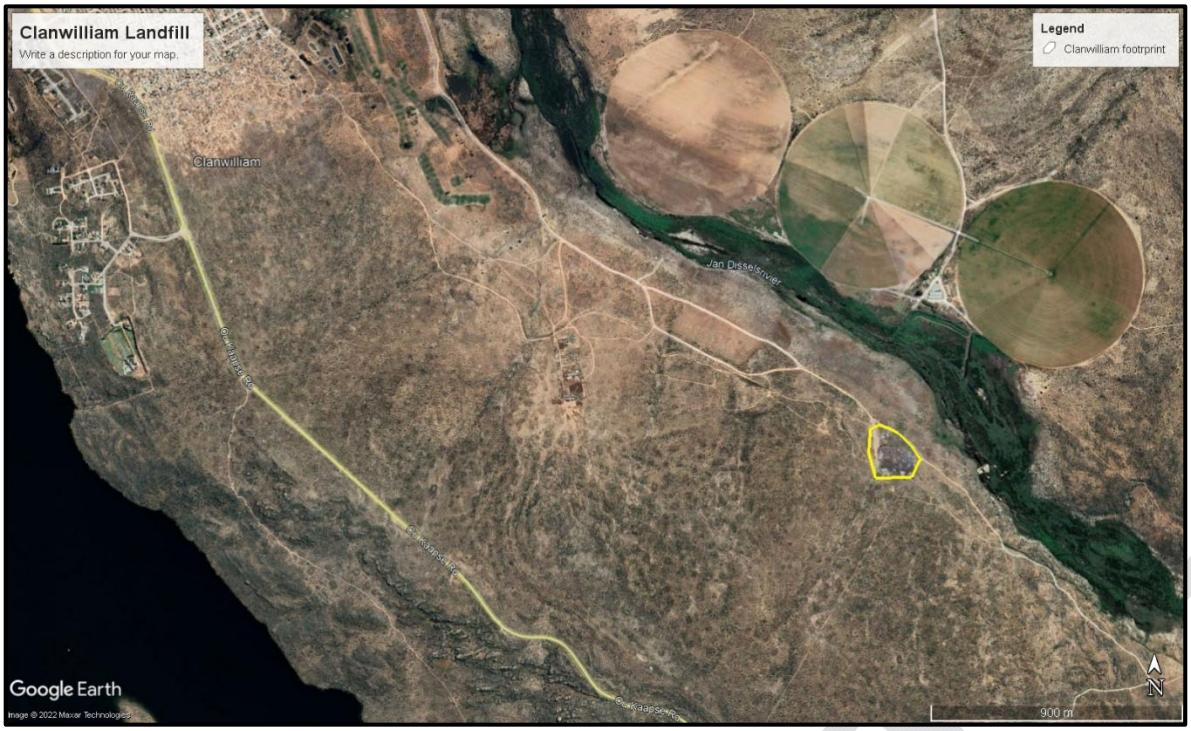


Figure 2-16: Aerial image of the Clanwilliam Landfill

The site is operated by the municipality and the following table provides a summary of the non- and partial compliances identified during the latest external audit on 6 August 2021. The external audits are carried out based on the licence conditions of the facility waste license.

Table 2-27: External audit summary Clanwilliam landfill

Condition Nr.	Partial / Non-compliance	Action	Due date	Notes
4.1, 6.1, 6.2, 6.5	No daily cover and compaction, nuisance conditions, waste outside boundary.	Improve operational actions and ensure all waste is adequately covered and that waste outside the boundary is moved to the facility for disposal. Institute a fly management system.	Immediately and as part of daily operations.	Roll-over action item requested in 2019 and 2020 external audit reports.
6.3	No running water or working ablutions on site.	Ensure that there is adequate water and ablution available at the facility.	31 October 2021.	This has been a concern for the past three external audit reports and requires urgent attention.
6.4, 16.5, 16.6	Incidents and complaints register	Provide feedback on resolved incidents	As soon as possible	The register is available on site but needs to include information on whether the recorded incidents have been addressed.

Condition Nr.	Partial / Non-compliance	Action	Due date	Notes
6.6, 6.7	Reclamation of waste not conducted in line with licence conditions.	Create space for reclaimers on site to operate, away from the main working face. Provide reclaimers with adequate PPE. If these actions cannot be met, reclaimers may not be allowed on site.	As soon as possible but no later than 30 September 2021.	This was also requested during the 2020 audit and still not addressed.
6.8	Emergency Response Plan.	Train staff to implement it.	31 October 2021.	Staff training needs to be an ongoing municipal function.
8	Inadequate runoff control.	Construct the required infrastructure.	When budget has been made available.	Roll-over action item requested in 2019 and 2020 external audit report.
9	The required boreholes for groundwater monitoring are not installed.	Install boreholes and conduct monitoring as required.	As soon as budget has been made available.	Roll-over action item requested in 2019 and 2020 external audit report.
10.3.3	No air quality monitoring results.	Conduct air quality monitoring.	Next external audit.	Roll-over action item requested in 2019 and 2020 external audit report.
13	Monitoring committee.	Establish the required committee.	Next external audit.	Efforts have been made to establish the committee and the Municipality needs to persist in its establishment.
14	Not all required records are available.	In compliance with the other required activities, the necessary records can be kept and submitted.	Next external audit.	Roll-over action item requested in 2019 and 2020 external audit report.

An overall compliance rating of **68.11%** was achieved during the external audit according to the DEA&DP's latest weighted auditing system which indicates a partially compliant facility in need of improvements.

Figure 2-17: Clanwilliam Landfill daily operations

Accurate disposal quantities are not available for this site as there is no weighbridge. Quantities are reported in terms of the D:EA&DP waste calculator. The remaining available disposal airspace and airspace usage are measured with annual topographical surveys. The two latest topographical surveys (July 2020 and August 2021) were used during the last external audit to calculate the average monthly airspace consumption. By comparing these surveys, the actual airspace usage could be determined. The total volume used between these dates = 180.3m^3. This translates to an average of 15m^3/month of airspace usage, which is unrealistic given the waste tonnages of just under 250 tonnes per month reported on the IPWIS system, and the 280.5m^3/month reported in the 2020 external audit.

Comparisons between the 2020 and 2021 topographical surveys does show differences in cut and fill throughout the site so the only logical explanation for the low airspace usage over the last year is that significant waste burning took place during that time. If waste was covered and compacted between July 2020 and this audit, it could also provide some explanation as to the low airspace usage, but waste was not covered regularly resulting in waste burning being most likely.

The licence restricts the operational lifetime of the facility and requires decommissioning to commence by 29 August 2028. If decommissioning does not occur within that period, the validity of the Licence lapses and a new application for Licence must be made in order for the activity to be undertaken. If the Municipality anticipates that commencement of the activity would not occur by 29 August 2028, they must apply and show good cause for extension of the commencement date in the Licence 6 (six) months prior to its expiry date. It is planned for all the Cederberg landfills to be closed and rehabilitated when the regional landfill becomes operational.

Table 2-28: Clanwilliam Landfill Summary

Type of Facility	Waste Disposal Facility
Licensed/Permitted?	Yes
License/Permit Number	19/2/5/4/F2/4/WL0054/19
Classification	G:C:B-, Class B
Location	32°12'22.08"S, 18°55'17.70"E
Estimated Remaining Lifetime	2028
Access Control and signage?	Yes
Externally audited?	Yes
Waste Types Received	Household waste, garden waste and building rubble.
Method of measurement	D:EA&DP Waste Calculator
Registered and reported to IPWIS?	Yes

2.4.7.1.3 Lambert's Bay Landfill

The Lambert's Bay landfill has a valid closure waste licence which was issued in 2019 with reference 19/2/5/4/F2/10/WL0055/19. The landfill footprint is 17 580m^2 and it is located about 2.2km to the East of town (**Figure 2-18**) between the R364 and the Jakkals River.

The site is internally and externally audited in terms of licence compliance and has a number of challenges relating to windblown litter, steep side slopes, covering of waste etc.

Figure 2-18: Aerial image of the Lambert's Bay Landfill

The site is operated by the municipality and the following table provides a summary of the non- and partial compliances identified during the latest external audit on 6 August 2021. The external audits are carried out based on the licence conditions of the facility waste license.

Table 2-29: External audit summary Lambert's Bay Landfill

Licence Nr.	Partial / Non-compliance	Proposed Actions	Due Date	Notes
2.3, 5.5 & 5.6	No gate controller present over weekends.	Lock gates when no supervisory personnel are on site to prohibit unauthorised access, or prevent disposal over weekends.	Immediately	A similar request was included in the 2020 external audit.
4.1	Meeting EMPr conditions	Ensure staff are aware of EMPr conditions and implement them were applicable.	As soon as possible	A similar request was included in the 2020 external audit.
5.2	Fencing	Repair areas where fence is damaged, removed.	Before the end of 2021	This requires urgent attention to prevent unauthorised access.
6.1, 6.2, 6.5, 6.11	Waste not compacted, covered, and shaped as required.	Appoint a contractor to operate the site and apply the necessary shaping, compaction and covering. Remove waste from outside the facility and dispose of responsibly.	As soon as possible.	A similar request was included in the 2020 external audit.
6.4	Complaints register	The complaints register is present, but records need to eb kept of how complaints have been addressed.	End of 2021	All paperwork to be in order.
6.6 + 6.7	Formal salvaging on site	Ensure that formal salvaging on site is in line with Norms and Standards	Immediately	A similar request was included in the 2020 external audit
6.8	Training in ERP	Develop a training plan for staff on the Emergency Response Plan	End of 2021	Proof to be included in next internal audit.
6.10, 6.12	Cover material	Ensure that cover material is available on site	As soon as the dozer is operational	
8.1, 8.2	No runoff management infrastructure is on site.	Construct the required runoff control infrastructure.	As soon as budget has been made available.	A similar request was included in the 2020 external audit.
9.1.1, 9.1.2	No groundwater monitoring boreholes established.	Install the required boreholes and conduct monitoring.	As soon as budget has been made available.	A similar request was included in the 2020 external audit.
9.1.3	No surface water monitoring was conducted.	Conduct surface water monitoring and keep record.	As soon as budget has been made available.	A similar request was included in the 2020 external audit.
10.3.3	No air quality monitoring done.	Conduct air quality monitoring and keep record.	As soon as possible.	A similar request was included in the 2020 external audit.

Licence Nr.	Partial / Non-compliance	Proposed Actions	Due Date	Notes
13.1 - 13.4	No monitoring committee established.	Establish the required monitoring committee. Attempts have been made to establish, with no responses. Keep trying.	Next external audit.	A similar request was included in the 2020 external audit with action required by August 2020.

An overall compliance rating of **64.96%** was achieved during the external audit according to the DEA&DP's latest weighted auditing system which indicates a partially compliant site that requires improvements.

Figure 2-19: Lambert's Bay Landfill problematic steep side slope

The waste disposed at the Lambert's Bay Landfill consists of general waste only. Building rubble, garden waste and general household waste are offloaded at different areas of the landfill. Building rubble is occasionally used as cover material, but green waste is not yet further utilised or beneficiated. A recently completed Organic Waste Diversion Plan recommended that the garden waste portion be beneficiated through chipping and composting.

The two latest topographical surveys (July 2020 and August 2021) were used to calculate the average monthly airspace consumption. By comparing these surveys, the actual airspace usage could be determined. The total volume used between these dates = 2,746m^3. This translates to an average of 220.4m^3/month of airspace usage, which includes waste and cover material. This is not in line with the reported 50 tonnes per month of waste on the IPWIS system suggesting that there is significant recovery of waste from the landfill and that waste burning is not common practise at the facility.

Note that this facility needs to be closed and rehabilitated as soon as possible, with drop-off and transfer infrastructure to be put in place for final disposal of waste at another site.

Table 2-30: Lambert's Bay Landfill Summary

Type of facility	Waste Disposal Facility
Licensed/Permitted?	Yes
License/Permit Number	19/2/5/4/F2/10/WL0055/19
Classification	G:C:B-, Class B
Location	32°05'26.89"S, 18°20'24.61"E
Estimated Remaining Lifetime	Zero – Needs to close
Access Control and signage?	Yes
Externally audited?	Yes
Waste Types Received	Household waste, garden waste and building rubble.
Method of measurement	D:EA&DP Waste Calculator
Registered and reported to IPWIS?	Yes

2.4.7.1.4 Eland's Bay Landfill

The Eland's Bay landfill has a valid closure waste licence which was issued in 2019 with reference 19/2/5/4/F2/5/WL0111/17. The landfill footprint is 5,060m^2 and it is located about 1.2km to the East of town (**Figure 2-20**) on a dirt road north from the R366.

The site is internally and externally audited in terms of licence compliance and has a number of challenges relating to windblown litter, access control and covering.

Figure 2-20: Aerial image of the Eland's Bay Landfill

The site is operated by the municipality and the following table provides a summary of the non- and partial compliances identified during the latest external audit on 6 August 2021. The external audits are carried out based on the licence conditions of the facility waste license.

Table 2-31: External audit summary Eland's Bay Landfill

License Nr.	Partial / Non-compliance	Action	Due date	Note
2.3, 4.6, 6.5, 6.6, 7.3, 16	Site staff, Record Keeping and site documentation	No staff on site during the external audit, so no documentation could be observed.	As soon as possible	This has not been reported as a concern during past audits, so the Municipality needs to revert back to compliance.
4.1, 7.1, 7.5	Operations, exposed waste, nuisance conditions and waste outside the boundary	Improve daily operations to ensure waste is covered, contained within the fenced area.	Daily operations.	This request was made during the 2019 and 2020 external audit.
6.2	Breach in fence.	Repair damage to fence as soon as possible.	As soon as possible, no later than 30 November 2020.	The affected portion of the fence is still usable, so budget constraints should not be a factor.
7.8	Emergency Response Plan	Train staff on the details of the ERP.	As soon as possible, no later than 31 January 2022.	A Plan has been developed to cover all sites but staff needs to be trained in the use of it.
9	There are no current works which can prevent external runoff from entering the site and possibly diluting leachate.	Construct runoff management infrastructure.	As soon as budget has been made available.	This request was made during the 2019 and 2020 external audit.
10 & 11	No groundwater monitoring boreholes have been established.	Install boreholes and conduct monitoring as required.	As soon as budget has been made available.	This request was made during the 2019 and 2020 external audit.
14	Monitoring committee.	Establish the monitoring committee.	Next external audit.	Adverts did go out for membership on the committee with no responses. The Municipality needs to place adverts again.
15	Not all required records are available.	In compliance with the other required activities, the necessary records can be kept and submitted.	Next external audit.	This request was made during past audits.

An overall compliance rating of **52.65%** was achieved during the external audit according to the DEA&DP's latest weighted auditing system which indicates a non-compliant site that requires Major improvements.

Figure 2-21: Eland's Bay Landfill operations

The waste disposed at the Elandsbaai Landfill consists of general waste. Building rubble, green waste and general household waste are occasionally offloaded at different areas of the landfill, but also mixed. As there is no formal beneficiation system for garden waste or builder's rubble in place yet, all waste is compacted and covered together as and when possible.

Note that this facility needs to be closed and rehabilitated as soon as possible, with drop-off and transfer infrastructure to be put in place for final disposal of waste at another site.

Table 2-32: Eland's Bay Landfill Summary

Type of facility	Waste Disposal Facility
Licensed/Permitted?	Yes
License/Permit Number	19/2/5/4/F2/10/WL0055/19
Classification	G:C:B-, Class B
Location	32º18'33.05"S; 18º21'37.17"E
Estimated Remaining Lifetime	Zero – Needs to close
Access Control and signage?	Yes
Externally audited?	Yes
Waste Types Received	Household waste, garden waste and building rubble.
Method of measurement	D:EA&DP Waste Calculator
Registered and reported to IPWIS?	Yes

2.4.7.2 Closed landfills/Contaminated land

There are closed unused landfills in the small towns of Graafwater, Algeria, Leipoldtsville, Wupperthal and Eselsbank. Their information status is summarized in **Table 2-33** .

Table 2-33: Cederberg Closed and Unused Landfills

Town	Waste License Reference	Licence Issue Date	Licence Validity	Site location	Site Status
Graafwater	19/2/5/1/F2/6/WL0052/14	Closure Licence issued in November 2014	Licence Valid. Commencement has started and needs to be completed by November 2024 when licence lapses.	32°07'57.15" S, 18°36'01.20" E About 2.3km North of town	Not used by Municipality since collected waste is taken to Lambert's Bay landfill. Site needs to be closed and rehabilitated as soon as possible.
Algeria	19/2/5/4/F2/1/WL0124/17	Amended Closure Licence issued in February 2018	License lapsed in November 2019 since commencement of closure had not started.	32°21'12.54"S, 19°02'19.93" E Near Algeria township on Farm 355 in the Cederberg Mountains	Not used by Municipality. Site needs to be closed and rehabilitated as soon as possible. A new closure licence needs to be applied for.
Wupperthal	19/2/5/1/F2/12/WL0009/18	Amended Closure Licence issued in September 2018	Licence Valid. Decommissioning must commence by November 2024.	32°16'06.38"S, 19°13'39.00"E Near Wupperthal township on Farm 168 east of the Cederberg Mountains	Not used by Municipality. The site is used by the local church community who does collections in town. Site needs to be closed and rehabilitated as soon as possible.
Leipoldtsville	19/2/5/4/F2/10/WL0008/18	Amended Closure Licence issued in February 2018	License lapsed in November 2019 since commencement of closure had not started.	32°13'17.97" S, 18°27'03.99" E 2km West of Leipoldtville township on Farm Spioenkop, 15km Northeast of Eland's Bay	Not used by Municipality since collected waste is taken to Eland's Bay landfill. Site needs to be closed and rehabilitated as soon as possible. A new closure licence needs to be applied for.
Eselsbank	19/2/5/4/F2/12/WL0011/18	Amended Closure Licence issued in February 2018	License lapsed in November 2019 since commencement of closure had not started.	32°20'37.08"S, 19°13'13.81" Near Eselsbank township in the Cederberg Mountains	Not used by Municipality. The site is used by the local church community who does collections in town. Site needs to be closed and rehabilitated as soon as possible. A new closure licence needs to be applied for.

All of the closure licences issued for the sites in the above table have lapsed since commencement of the decommissioning and closure process had not taken place by the dates stipulated in the licences.

This was confirmed with D:EA&DP and formal communication between the Department and the Municipality is required to determine the required process to follow.

2.4.7.3 Public Waste Drop-Offs

The Municipality currently has no waste drop off infrastructure in place and this needs to be developed and operational preferably before the regional landfill is operational.

Drop-off facilities can be in the form of fenced of areas equipped with 6 m^3 skips that can be emptied into the tailgate of a double rear axle Rear-End Loader (19m^3 REL) collection vehicle so that the collection vehicle can service the full skips when collecting in the relevant town.

The Municipality need to plan and budge for the development of these drop-offs at each town within the Cederberg area, so they are accessible to the general public.

2.4.7.4 Waste Transfer Facilities

There is currently no waste transfer station in the Municipal area since all the collected waste is taken directly to the landfills mentioned. During the business case for the development of the regional landfill that was presented to the Cederberg Municipality since 2014, the development of a solid waste transfer station in the town of Clanwilliam was put forward as a required development.

This Waste Transfer Station in Clanwilliam would be facility where the waste collected throughout the Cederberg municipal area can be transferred onto long haul vehicles for transport to the new regional waste disposal facility.

This transfer station is crucial to Cederberg for the business case of the regional landfill, and the associated costs for its development and operations are included in the proposed household tariff increase for the project proposed to Council.

2.4.7.5 Material Recovery Facilities

A Material Recovery Facility (MRF) is a facility where source separated municipal waste can be taken for recovery of recyclable waste which is then baled or isolated for purchase by industry or public in order to use it in the development of new materials. There are currently no formal municipal MRFs and all the individual private recycling companies operate their own facilities and collect recyclables from business and certain high income areas through contracts with the Municipality.

2.5 ECONOMICS AND FINANCING OF SOLID WASTE MANAGEMENT PRACTICES

2.5.1 Current Solid Waste Management System Costs & Budget

Below are costs and budgets for the Cederberg solid waste department. **Table 2-34** shows the Municipal waste management operating budget for the next three years, **Table 2-35** shows the Municipal waste management capital budget for the next three years and **Table 2-36** shows the Municipal waste management income budget for the next three years.

Table 2-34: Waste Management planned Operating Budget for next three years

Description (OPERATING BUDGET)	Budget (Rand) 2022/2023	Budget (Rand) 2023/2024	Budget (Rand) 2024/2025
BONUSES	535 264.00	572 197.00	612 251.00
OVERTIME (NON-STRUCTURED)	434 470.00	464 448.00	496 959.00
SALARIES	6 569 362.00	7 022 648.00	7 514 233.00
TRAVEL ALLOWANCES	144 000.00	153 936.00	164 712.00
CELLPHONE ALLOWANCE	15 444.00	16 510.00	17 666.00
BARGAINING COUNCIL LEVIES	6 011.00	6 425.00	6 875.00
GROUP INSURANCE	147 226.00	157 384.00	168 401.00
MEDICAL AID CONTRIBUTIONS	475 600.00	508 417.00	544 006.00

Description (OPERATING BUDGET)	Budget (Rand) 2022/2023	Budget (Rand) 2023/2024	Budget (Rand) 2024/2025
PENSION/RETIRE/PROVIDENT	1 091 901.00	1 167 242.00	1 248 949.00
SDL CONTRIBUTIONS	81 322.00	86 933.00	93 018.00
UIF CONTRIBUTIONS	87 298.00	93 322.00	99 854.00
Summary for Salary Related Expenditure	9 587 898.00	10 249 462.00	10 966 924.00
DEPRECIATION (SOLID WASTE)	2 149 000.00	2 149 000.00	1 550 000.00
DEPRECIATION (COMPUTER EQUIPMENT)	5 000.00	6 000.00	7 000.00
DEPRECIATION (FURNITURE, EQUIPMENT)	1 000.00	2 000.00	3 000.00
DEPRECIATION (MACHINERY, EQUIPMENT)	118 000.00	123 000.00	129 000.00
DEPRECIATION (TRANSPORT ASSETS)	157 000.00	164 000.00	171 000.00
Summary for Depreciation	2 430 000.00	2 444 000.00	1 860 000.00
MAINTAINING (SMALL TOOLS)	13 500.00	13 500.00	13 500.00
MAINTAINING - CONSUMABLES	18 900.00	19 184.00	19 472.00
HIRE CHARGES - LBAY	76 320.00	76 320.00	76 320.00
MAINTAINING (SMALL TOOLS - CDAL)	4 500.00	4 500.00	4 500.00
CAPPING - LANDFILL SITE (LBAY)	74 800.00	73 304.00	74 038.00
CAPPING - LANDFILL SITE (CLANW)	44 472.00	43 583.00	44 019.00
HIRE CHARGES - CLANWILLIAM	270 000.00	270 000.00	270 000.00
HIRE CHARGES - CITRUSDAL	90 000.00	90 000.00	90 000.00
MAINTENANCE CONTRACTED SERVICES	55 347.00	54 241.00	54 783.00
VEHICLES (CONTRACTED SERVICES)	297 500.00	291 550.00	294 466.00
VEHICLES - CONSUMABLES	27 000.00	27 405.00	27 817.00
Summary for Repairs & Maintenance	972 339.00	963 587.00	968 915.00
PROTECTIVE CLOTHING	82 260.00	82 260.00	82 260.00
FUEL AND OIL	450 000.00	456 750.00	463 602.00
CONSULTANT FEES	34 000.00	33 320.00	33 654.00
EXTERNAL AUDIT	136 000.00	133 280.00	134 613.00
SIGNAGE - DUMPING SITES CLANW	4 500.00	4 500.00	4 500.00
SIGNAGE - DUMPING SITES CITR	1 800.00	1 800.00	1 800.00
SIGNAGE - DUMPING SITES LBAY AND EBAY	4 500.00	4 500.00	4 500.00
CLEANING MATERIALS	9 000.00	9 135.00	9 273.00
REFUSE BAGS AND WHEELIE BINS CLANW	38 340.00	38 916.00	39 499.00
REFUSE BAGS AND WHEELIE BINS CDAL	95 850.00	97 288.00	98 748.00
REFUSE BAGS AND WHEELIE BINS LBAY / EBAY	63 900.00	64 859.00	65 832.00
REFUSE BAGS AND WHEELIE BINS GRAAFWATER	25 560.00	25 944.00	26 333.00
PUBLICATIONS GOVERNMENT GAZETTE	11 700.00	11 700.00	11 700.00
Summary for General Expenses	957 410.00	964 252.00	976 314.00
BAD DEBT PROVISION - REFUSE	2 007 000.00	2 107 000.00	2 213 000.00
INTERNAL WATER USAGE	1 600.00	1 600.00	1 600.00
TOTALS for Operating Budget	**15 956 247.00**	**16 729 901.00**	**16 986 753.00**

Table 2-35: Waste Management Planned Capital Budget for next three years

Description (CAPITAL BUDGET)	Budget (Rand) 2022/2023	Budget (Rand) 2023/2024	Budget (Rand) 2024/2025
REFUSE: EQUIPMENT	205 000.00		
VEHICLES (3x BAKKIES LDV)	900 000.00		
TOTALS for Capital Budget	**1 105 000.00**		

Table 2-36: Waste Management planned income budget for the next three years

Description (BUDGET INCOME)	Budget (Rand) 2022/2023	Budget (Rand) 2023/2024	Budget (Rand) 2024/2025
BUSINESS INFRASTRUCTURE LEVY (BASIC)	-776 942.00	-815 789.00	-856 578.00
REFUSE DISPOSALS (REMOVAL)	-13 469 637.00	-14 143 119.00	-14 850 275.00
BUILDING RUBBLE REMOVAL	-1 290.00	-1 360.00	-1 435.00
REFUSE REMOVAL (EQUITABLE SHARE)	-10 213 795.00	-10 531 198.00	-11 350 279.00
DIREKTE DEERNIS SUBSIDIE	452 174.00	474 782.00	498 522.00
TOTALS for Budgeted Income	**-24 009 490.00**	**-25 016 684.00**	**-26 560 045.00**

The following tables show the current (2021/2022) budgets for the solid waste management department of the Cederberg Municipality with **Table 2-37** showing the year to date operational expenditure versus the planned budget, **Table 2-38** shows the year to date capital expenditure versus budget and **Table** 2-39 shows the year to date income versus budget. The actuals are up to end of May 2022 so only the June 2022 values are still to be included before the end of the existing financial year.

Table 2-37: Current waste management operational expenditure versus budget

Description (Operational Budget)	Budget (Rand) Current 2021/2022	Actuals for year to date ending 31 May 2022
HOUSING SUBSIDY (ALLOWANCE)	970.00	964.51
BONUSES	528 300.00	528 291.31
OVERTIME (NON-STRUCTURED)	849 010.00	749 032.36
SALARIES	6 832 650.00	6 325 467.70
TRAVEL ALLOWANCES	305 740.00	244 549.50
CELLPHONE ALLOWANCE	26 580.00	24 386.00
BARGAINING COUNCIL LEVIES	5 350.00	4 880.10
GROUP INSURANCE	147 860.00	135 345.42
MEDICAL AID CONTRIBUTIONS	490 810.00	448 713.12
PENSION/RETIRE/PROVIDENT	1 115 580.00	1 022 828.27
SDL CONTRIBUTIONS	87 190.00	79 951.36
UIF CONTRIBUTIONS	81 290.00	74 747.83
BAD DEBT PROVISION - REFUSE	2 331 000.00	1 537 287.00
DEPRECIATION (SOLID WASTE)	1 600 000.00	1 383 013.00
DEPRECIATION (COMPUTER EQUIPMENT)	5 000.00	4 622.00
DEPRECIATION (FURNITURE & EQUIPMENT)	1 000.00	932.00
DEPRECIATION (MACHINERY & EQUIPMENT)	213 000.00	196 747.00
DEPRECIATION (TRANSPORT ASSETS)	147 000.00	124 888.00
MAINTAINING (SMALL TOOLS)	27 640.00	12 294.01
MAINTAINING - CONSUMABLES	-	-
MAINTENANCE SMALL TOOLS GWATER	-	-
HIRE CHARGES - LBAY	80 400.00	72 944.13
MAINTAINING (SMALL TOOLS - CDAL)	-	34.77
CAPPING - LANDFILL SITE (LBAY)	88 700.00	197.70
MAINTAINING - CONSUMABLES CLANW	25 500.00	9 964.10
CAPPING - LANDFILL SITE (CLANW)	37 320.00	21 600.00
MAINTAINING - CONSUMABLES LBAY	29 700.00	3 727.72
HIRE CHARGES - CLANWILLIAM	306 780.00	219 377.26

Description (Operational Budget)	Budget (Rand) Current 2021/2022	Actuals for year to date ending 31 May 2022
CAPPING - LANDFILL SITE (CDAL)	72 400.00	50 880.00
MAINTAINING - CONSUMABLES CDAL	-	-
HIRE CHARGES - CITRUSDAL	52 600.00	45 981.96
MAINTENANCE CONTRACTED SERVICES	65 114.00	38 017.58
VEHICLES (CONTRACTED SERVICES)	1 330 820.00	1 174 036.01
VEHICLES - CONSUMABLES	137 490.00	107 506.08
INTERNAL USAGE - WATER	2 500.00	1 449.20
PROTECTIVE CLOTHING	69 850.00	46 970.42
FUEL AND OIL	696 400.00	601 782.20
CONSULTANT FEES	350 000.00	-
EXTERNAL AUDIT	133 800.00	133 800.00
SIGNAGE - DUMPING SITES CLANW	-	-
SIGNAGE - DUMPING SITES CITR	-	-
SIGNAGE - DUMPING SITES LBAY AND EBAY	-	-
CLEANING MATERIALS	20 000.00	14 472.65
SOLID WASTE DISPOSAL - CONSUMABLES	7 500.00	3 589.88
AWARENESS CAMPAIGN RECYCLING - CLANW	-	-
AWARENESS CAMPAIGN RECYCLING - CDAL	-	-
AWARENESS CAMPAIGN RECYCLING - GWATER	-	-
AWARENESS CAMPAIGN RECYCLING - LBAY	-	-
REFUSE BAGS AND WHEELIE BINS CLANW	128 900.00	128 756.81
REFUSE BAGS AND WHEELIE BINS CDAL	33 150.00	32 950.55
REFUSE BAGS AND WHEELIE BINS LBAY / EBAY	51 000.00	45 630.79
REFUSE BAGS AND WHEELIE BINS GRAAFWATER	3 100.00	2 560.00
PUBLICATIONS GOVERNMENT GAZETTE	13 000.00	12 213.20
LGPESG: SALARIES	1 000 000.00	829 569.60
LGPESG: UIF	10 000.00	8 370.47
LGPESG: SDL	10 000.00	9 410.06
LGPESG: SMALL TOOLS	30 000.00	-
LGPESG: PROTECTIVE CLOTHING	50 000.00	9 262.70
TOTAL for Operational Budget	**19 631 994.00**	**16 523 996.33**

Table 2-38: Current capital waste management expenditure versus budget

Description (Capital Budget)	Budget (Rand) Current 2021/2022	Actuals for year to date ending 31 May 2022
REFUSE: EQUIPMENT	-	-
REFUSE: EQUIPMENT	-	-
VEHICLES	2 000 000.00	-
VEHICLES	2 849 050.00	2 849 049.05
TOTAL for Capital Budget	**4 849 050.00**	**2 849 049.05**

Table 2-39: Current waste management income versus budget

Description (Income Budget)	Budget (Rand) Current 2021/2022	Actuals for year to date ending 31 May 2022
INFRASTRUCTURE LEVY (RESEDENTIAL BASIC)	-	-
BUSINESS INFRASTRUCTURE LEVY (BASIC)	-728 000.00	-666 257.26
REFUSE DISPOSALS (REMOVAL)	-12 484 000.00	-11 494 368.13
BUILDING RUBBLE REMOVAL	-1 000.00	-814.57

Description (Income Budget)	Budget (Rand) Current 2021/2022	Actuals for year to date ending 31 May 2022
REFUSE REMOVAL (EQUITABLE SHARE)	-9 227 943.00	-9 227 943.00
LOCAL GOVERNMENT PUBLIC EMPLOYMENT SUPPORT GRA	-1 100 000.00	-858 002.24
CONTRIBUTED ASSETS	-2 849 050.00	-2 849 049.05
DIREKTE DEERNIS SUBSIDIE	535 000.00	483 950.35
TOTALS for Income Budget	**-25 854 993.00**	**-24 612 483.90**

The budget information shows that the expenditures align well with the expected income and that the solid waste management department budgets to make a profit. The information in **Table 2-40** shows that the solid waste department budgeted for a profit of about R1.3 Million in this existing financial year and that they are budgeting for a profit of R6.9 Million in the next financial year.

Table 2-40: Income versus expenditures for the current and previous year

Description	Budget (Rand) 2022/2023	Budget (Rand) 2021/2022 (Current)	Year to Date (Rand) 2021/2022
Income	-24 009 490.00	-25 854 993.00	-24 612 483.90
Capital Expenses	1 105 000.00	4 849 050.00	2 849 049.05
Operational Expenses	15 956 247.00	19 631 994.00	16 523 996.33
Profit	-6 948 243.00	-1 373 949.00	-5 239 438.52

2.5.2 Tariffs and billing

The solid waste tariffs are as per **Table 2-41** below. The annual increase is 9% year on year, all amounts are excluding Vat and tariffs for users outside the municipal boundaries are the same as those charged to businesses. The tariffs given here have not been adjusted to allow for development of infrastructure and payments to the WCDM for development of the regional landfill site.

Table 2-41: Levies & Tariffs

Cederberg Municipality Refuse Tariffs				
REFUSE REMOVAL RATES	**2020-2021**	**2021-2022**	**2022-2023**	**2023-2024**
Basic Charge (Indigent clients excluded) (Infrastructure levy Households)	R25.40	R27.69	R30.18	R32.90
Basic Charge (Businesses) (Infrastructure levy Business)	R199.69	R217.66	R237.25	R258.60
Households: once per week	R105.87	R115.39	R125.78	R137.10
Businesses: once per week	R117.96	R128.57	R140.14	R152.75
2 times per week	R216.53	R236.02	R257.26	R280.41
3 times per week	R330.06	R359.77	R392.15	R427.44
4 times per week	R447.63	R487.91	R531.82	R579.68
More than 4 times per week	R569.26	R620.49	R676.34	R737.21
Special Rates				
Schools	R201.33	R219.81	R239.60	R261.16
School residences	R301.70	R328.86	R358.45	R390.71
Church and halls	R101.64	R110.79	R120.76	R131.63
Nursery schools	R101.64	R110.79	R120.76	R131.63
Hospital	R301.70	R328.86	R3 358.45	R3 660.71
Old age homes	R596.95	R650.67	R709.24	R773.07
Refuse removal of businesses where business requires refuse to be removed more than once a week and no black bags provided				
All businesses	R5 058.00	R5 513.59	R6 009.80	R6 550.68
Construction rubble per cart	R747.00	R814.56	R887.87	R967.78

Cederberg Municipality Refuse Tariffs				
REFUSE REMOVAL RATES	**2020-2021**	**2021-2022**	**2022-2023**	**2023-2024**
Garden rubble per cart	R373.00	R406.70	R443.30	R483.20
Residential rubble/ refuse dumped at municipal Landfill sites - per cart	R159.00	R173.30	R188.90	R205.90
Businesses rubble/ refuse dumped at municipal Landfill sites - per cart	R594.00	R647.02	R705.25	R768.72
Cleaning of plots (where the municipality clean a plot on request from owner or where the municipality must do it to prevent a fire or health risk. Will be charged to owners acc.)	R810.00	R882.73	R962.18	R1 048.77
Waste removal outside municipal area: KM rate.	R9.80	R10.69	R11.65	R12.70
Per Removal (per wheelie bin, per month regardless of number of removals) outside municipal area	R457.00	R497.74	R542.54	R591.36
Rate per km outside municipal area	R9.33	R10.17	R11.09	R12.08
Residents Refuse Removal Elandskloof: 4 x R25 per household per month	R112.36	R122.47	R133.49	R145.51

3. GAPS AND NEEDS ASSESSMENT

From the status quo evaluation the gaps and needs were identified and are discussed below.

3.1 LEGISLATION

In terms of international, national and local municipal legislation, the legislation itself is not identified as a gap. The municipal by-laws are comprehensive and have recently been revised.

Awareness of legislation has been identified as a gap and was apparent with the generators of special and hazardous wastes. These wastes have either not been classified as per the Waste Classification Regulations by some of the generators or are not handled in compliant ways. Not all waste types and quantities are being reported as required by the municipal by-laws. It appears that the generators and transporters are not fully aware of the national and local legislative requirements.

The non-compliances at municipal solid waste facilities are not specifically identified here as gaps, because the municipality is aware of these and regularly conduct external audits. The restriction in addressing these non-compliances in the short term is affordability which is discussed below.

Disposal facilities that have been issued with closure licences require rehabilitation to commence before the dates specified in the licences in order to achieve compliance. In addition, facilities where the closure licences have lapsed need to obtain new closure licenses in order for the facilities to be closed and rehabilitated as soon as possible. Where these sites are located on land not owned by the Municipality, arrangements need to be made with land owners on the way forward.

3.2 WASTE GENERATION QUANTITIES

In terms of general waste generation quantities, the Cederberg Municipality keep accurate records and make use of the waste calculator since weighbridges are not available. Quantities are reported to IPWIS as well. General waste record keeping is sufficient and not identified as a gap. It has been noted on some of the external audits though that access control at the Citrusdal and Eland's Bay facilities have not always been present and the Municipality needs to ensure that record keeping at the landfills are done for all loads arriving during operating hours.

In terms of hazardous waste (including HCRW), not all generated quantities are being reported. Some generators of these waste types comply, but there remains a gap in information on the total and types of hazardous wastes generated.

3.3 COLLECTION NEEDS

The Municipality has two collection vehicles in fair condition and one in a poor condition with an additional vehicle not in working order which was donated by Saldanha Bay. The vehicles are currently sufficient to meet the existing and future collection needs of the Municipality but given the condition of the fleet it is recommended that they budget for a new 19m^3 REL collection vehicle to be acquired within the next two years.

3.4 WASTE TRANSPORTATION AND WASTE TRANSFER NEEDS

In order to facilitate transfer of waste from Cederberg to the planned new regional landfill site, it will be essential that a solid waste transfer station be developed in the town of Clanwilliam. This facility needs to be operational before the landfill site is commissioned and planning for construction of this transfer facility thus needs to happen as soon as possible.

3.5 WASTE MINIMISATION, RECYCLING AND RE-USE INITIATIVES

Waste minimisation must continually be promoted throughout the Cederberg Municipality. The CM does well with their waste awareness and education campaigns and this needs to continue and grow to educate the population on the importance of waste minimisation.

Recycling is currently severely lacking in the CM, and private recyclers need to work with the CM even more, and report there tonnages recovered, in order to improve this. It must be noted that even with the successful recycling, the total diversion from landfill needs to be increased in order to achieve targets. With the volumes of garden waste in the generated waste stream, diversion options such as chipping and/or composting must be explored as put forward int eh Organic Waste Diversion Plan. The crushing of building rubble for alternative uses must also be explored.

Not all private recyclers report recycling statistics to the Municipality. This needs to be addressed so that recycling statistics throughout the municipality can be determined and reported.

3.6 LANDFILL LICENCE COMPLIANCES

The Cederberg landfills that receive annual external audits all had a significant number of improvements required in order to make them compliant with their waste licenses. The Municipality needs to address these non-compliances in an action plan to the D:EA&DP highlighting which actions will be taken and when.

3.7 AIRSPACE REQUIREMENTS

Landfill airspace is an immediate concern for the Municipality. This has been well established and is one of the main reasons for the development of the new regional landfill between Vanrhynsdorp and Vredendal which will be shared by the Cederberg and Matzikama Municipalities. The Cederberg landfill sites are not well managed and are in most cases already past capacity. All the landfills in the Municipality need to close and rehabilitee as soon as possible with Citrusdal and Clanwilliam landfills to close as soon as the new regional landfill is commissioned.

3.8 INSTITUTIONAL AND ORGANISATIONAL NEEDS

The personnel and vehicles currently cope with the requirements of the waste management duties but will soon require re-evaluation when the new regional landfill is developed. There are currently 11 vacancies in the department which need to be filled.

3.9 IDENTIFICATION OF ALTERNATIVES

As mentioned above, alternative options to the disposal of garden waste and building rubble must be sought to minimise disposal and improve diversion. This is very important in order to achieve the diversion targes and the proposed ban of organics to landfill by 2027.

3.10 FUNDING MECHANISMS

Funding mechanisms need to be continuously explored to improve investment in waste management infrastructure. The cost requirements of many of the proposed projects cannot be funded by the solid waste department itself, even if it is operating with a profit. The amount of capital is simply too much without alternative sources of funds.

Waste minimisation will require financial support and continual public awareness and education (which is on-going and very important) is also a continuous expense.

The Municipality must make provision for the rehabilitation of closed landfills. With the requirements set in the latest issued licences (which take into account that some sites were not constructed with impermeable base liners), the rehabilitation costs have become unaffordable in the short to medium term.

The WCDM will fund the development of the new regional landfill and the transfer station in Clanwilliam, and the loan paid back through an increase in the waste tariffs charged to the public. The required waste tariff of R186.36 by 2024 needs to be communicated to the residents of the municipality.

4. STRATEGY AND IMPLEMENTATION

Based on the gaps and needs identified, aligned goals of the IWMP and planned projects by the municipality, this section contains the objectives, timeline and required resources for implementation of the IMWP.

Goal 1: Strengthened education, capacity and advocacy towards Integrated Waste Management							
Objectives		**2022**	**2023**	**2024**	**2025**	**2026 and on**	**Priority**
Strategic Objective 1:	Facilitate consumer and industry responsibility in integrated waste management	Create a permanent position in the solid waste department or appoint a person that will address and co-ordinate the requirements of awareness. This person will co-ordinate the follow-up visits to the special and hazardous waste generators in the Swartland municipality to ensure that all these generators are aware of applicable legislation and are following steps to become compliant if required. This person will also oversee the information gathering as per the by-laws, in other words, ensure that generators and transporters report to the municipality as required. General public awareness and feedback on recycling issues and information will also fall under the duties of this person. If this role can be assigned to an existing person with adequate skill and capacity, this needs to be done. A focused campaign addressing illegal dumping must be executed. In addition, it is crucial that the implications of the existing airspace challenge and the resulting need to develop a new regional landfill and waste transfer infrastructure, be explained tot the public through a number of workshops.					Mild
Strategic Objective 2:	Promote and ensure awareness and education of integrated waste management						High
	Costs & Human Resources	Clean-up & Awareness campaigns: R200,000 per annum					
Strategic Objective 3:	Build and strengthen waste management capacity	Fill all vacant posts as needed. Municipal solid waste employees to attend education seminars and waste forums as is appropriate for their specific responsibility levels. Capacity training and education must be conducted within the municipality where needed. It must be ensured that the solid waste management employees are informed regarding the latest legislation and how to appropriately handle and identify various waste types. Law enforcement departments must also be approached and receive education in solid waste legislation and management to enable them to identify issues and act when required. The South African Institute of Waste Management (www.iwmsa.co.za) is a voluntary organization that provides training on the management of waste. The Cederberg Municipality is encouraged to have their staff become members of this institute and to attend the training sessions that is available on their website. The Waste Management Officer attends the Western Cape Provincial Waste Forum and The Western Cape Recycling Action Group.					High
	Costs & Human Resources	Costs to be determined (OPEX). One to two persons in the municipality required, or a consultant can be appointed for public awareness and education. Additional costs are dependent on the number of employees attending educational and capacity building events.					

Goal 2: Improved integrated waste management planning and implementation for efficient waste services and infrastructure							
Objectives		**2022**	**2023**	**2024**	**2025**	**2026 and on**	**Priority**
Strategic Objective 1:	Facilitate municipal waste management planning	Finalise 4th generation IWMP	Review IWMP and submit IWMP annual report along with implementation projects update and additional implementation	Review IWMP and submit IWMP annual report along with implementation projects update and additional implementation	Review IWMP and submit IWMP annual report along with implementation projects update and additional implementation	Start IWMP 5th generation development.	High and under way
	Costs & Human Resources	R400,000. Appointed consultants and specialists	R160,000. Appointed consultants	R160,000. Appointed consultants	R170,000. Appointed consultants	R170,000. Appointed consultants	
	Facilitate municipal waste management planning	Waste Management Masterplan annual update	Waste Management Masterplan annual update	Waste Management Masterplan annual update	Waste Management Masterplan annual update	Waste Management Masterplan annual update	High
	Costs & Human Resources	R150,000. In-house and consultants	R150,000. In-house and consultants	R150,000. In-house and consultants	R150,000. In-house and consultants	R150,000. In-house and consultants	
Strategic Objective 2:	Promote industry waste management planning	This objective is coupled with Goal 1, where the appointed persons will liaise with industry to ensure that they are aware of the relevant legislation. Follow-up meetings and on-going communication will ensure that industry sufficiently plans and implements actions in order to be compliant and reduce waste generation along with responsible handling/treatment/transport/disposal.					High
Strategic Objective 3:	Promote the establishment of integrated waste management infrastructure and services	Continued Collection Service Review: The municipality must ensure that all residents receive an affordable waste service at an acceptable level at all times. The Solid Waste departments must liaise with the town planning department to stay up to date with new areas that require or will require services. The complaints registry and service requests must be reviewed monthly by the Waste Management Officer. The older Municipal collection vehicles currently in the Municipal fleet aged above 7 to 8 years, must be assessed in terms of running cost and effectivity. Where vehicles are operating beyond their effective economic lifetimes or are not the most efficient vehicles for their functions, they must be replaced. It must also be ensured that each vehicle's function is thoroughly assessed in order to replace the old vehicles with the most efficient and cost-effective ones. The Waste Management Officer will be responsible for planning and coordinating with the Operations department, who will be responsible for vehicle assessment.					High
		New chipper & trailer	19m^3 REL Collection vehicle		Additional Collection vehicles		
	Costs & Human Resources	R1,000,000	R2,500,000.00		To be determined during 2024 Annual Report		

Goal 2: Improved integrated waste management planning and implementation for efficient waste services and infrastructure							
Objectives		**2022**	**2023**	**2024**	**2025**	**2026 and on**	**Priority**
	Promote the establishment of integrated waste management infrastructure and services	Replace sign boards, access gates and fences at existing landfill sites as per external audit outcomes.	Work with WCDM for development of Transfer Station in Clanwilliam as per regional landfill business case	Develop solid waste public drop-off facilities in all towns except Clanwilliam.			High
	Costs & Human Resources	R500,000	R24 Million (financed by WCDM)	R3.5 Million (Lambert's Bay), R2.2 Million (Graafwater), R3.3 Million (Citrusdal), R2.2 Million (Eland's Bay)			
	Promote the establishment of integrated waste management infrastructure and services	Equipment: Refuse bins, traps, skips, general					Medium
	Costs & Human Resources	R100,000	R120,000	R140,000	R160,000	R180,000	
Strategic Objective 4:	Ensure effective and efficient waste information management	Improve the detail with which the waste data is recorded, both for generation and transportation. Continue recording at landfill gates and reporting to IPWIS by the Waste Management Officer.					High

Goal 3: Effective and efficient utilisation of resources							
Objectives		**2022**	**2023**	**2024**	**2025**	**2026 and on**	**Priority**
Strategic Objective 1:	Minimise the consumption of natural resources	This also ties in with Goal 1 to promote waste minimisation and recycling, which will in turn reduce pressure on natural resources by re-using materials efficiently. New facility designs must take cognisance of natural resource protection. For example, a rehabilitated disposal site must be covered with indigenous vegetation suited to the climate so as not to require additional watering to thrive. Awareness and education should place additional focus on waste avoidance, reducing the need for diversion methods and disposal.					High
Strategic Objective 2:	Stimulate job creation within the waste economy	Assess job creation opportunities, both permanent and temporary in the waste management field and upcoming projects. Job creation remains a top need in the community.					High
Strategic Objective 3:	Increase waste diversion through reuse, recovery and recycling	Initiate OWDP implementation	Conduct organic waste detail study to inform and update the OWDP and direct implementation for achieving targets.				Very high
	Costs & Human Resources	TBD	TBD	TBD	TBD	TBD	

Goal 4: Improved compliance with environmental regulatory framework							
Objectives		**2022**	**2023**	**2024**	**2025**	**2026 and on**	**Priority**
Strategic Objective 1:	Strengthen compliance monitoring and enforcement	Conduct required internal and external compliance audits at all waste management facilities as required according to licences and legislation. Findings must be communicated to the D:EA&DP as required.					High
	Costs & Human Resources	Appoint independent external auditors. R150,000 per annum (increasing with inflation) which includes Clanwilliam, Citrusdal, Lambert's Bay and Eland's Bay. Costs to increase if other sites are added.					
	Strengthen compliance monitoring and enforcement	Ties in with Goal 1: Illegal Dumping Committee to enforce action on illegal dumpers.					High
Strategic Objective 2:	Remediate and rehabilitate contaminated land	Apply for Closure Licences For Algeria, Eselsbank & Leipoldtville sites	Close and rehabilitate the Lambert's Bay Graafwater and Wupperthal landfills		Close and rehabilitate the Eland's Bay, Citrusdal and Clanwilliam landfills		High
	Costs & Human Resources	R180,000 per site	R4 Million each for Graafwater and Wupperthal. R16 Million for Lambert's Bay		R22 Million for Citrusdal, 18 Million for Clanwilliam and 5.6 Million for Eland's Bay		
Strategic Objective 3:	Facilitate the development of waste policy instruments			Update by-laws		Update by-laws	Low
	Costs & Human Resources					TBD	
Strategic Objective 4:	Promote self/co-regulatory measures	Ties in with Goal 1. Person responsible to liaise with industry should promote the implementation of these measure e.g. through reviewing industry waste management plans. Ensure annual IWMP review and reporting.					Medium

5. MONITORING AND REVIEW

5.1 ESTABLISHMENT OF AN IWMP MONITORING ADVISORY COMMITTEE

To ensure that the IWMP remains up to date as far as practically possible and stays relevant, it must go through a review process. This process will be initiated and followed by the IWMP advisory committee.

The committee will review the proposed projects and implementation items contained in the IWMP. The committee should consist of at least the following persons:

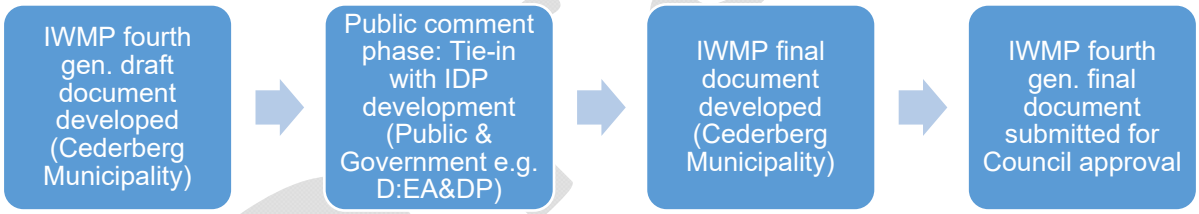
- The Cederberg Waste Management Officer with assistance from the Solid Waste Department's Supervisors and Foremen.
- The Cederberg Technical Services Director
- The Cederberg Municipality's appointed consultant, but only if required.

The members of the Committee, responsible for their separate tasks, will ensure that projects are followed, reported on and the IWMP and its schedule are up to date.

5.2 MONITORING SCHEDULE OR PROGRAMME

For the IWMP to be an effective and relevant tool and guide for integrated waste management in the Cederberg Municipality, it will need to be monitored and reviewed. Monitoring relates to the goals and targets set out in the IWMP and whether they are being achieved or pursued. Reviewing relates to the document and the projects themselves which will require regular updates to stay up-to-date, specifically the implementation items of Section 5. The proposed implementation schedule as well as allocated budget may change at any time and these changes, if any, need to be reflected in the reviewed IWMP to avoid confusion.

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



The implementation of the fourth generation IWMP will start following Council approval. Apart from the continuous project implementation and goal tracking, which must be done by each individual project team as and when each project is running and report to Mr Marais, an annual IWMP report must be submitted along with the other Municipal annual reports and a copy sent to D:EA&DP as well.

As per the Waste Act, the IWMP annual report must reflect the following:

a. the extent to which the plan has been implemented during the period;
b. the waste management initiatives that have been undertaken during the reporting period;
c. the delivery of waste management services and measures taken to secure the efficient delivery of waste management services, if applicable;
d. the level of compliance with the plan and any applicable waste management standards;
e. the measures taken to secure compliance with waste management standards;
f. the waste management monitoring activities;
g. the actual budget expended on implementing the plan;
h. the measures that have been taken to make any necessary amendments to the plan;
i. in the case of a province, the extent to which municipalities comply with the plan and, in the event of any non-compliance with the plan, the reasons for such non-compliance: and
j. Any other requirements as may be prescribed by the Minister.

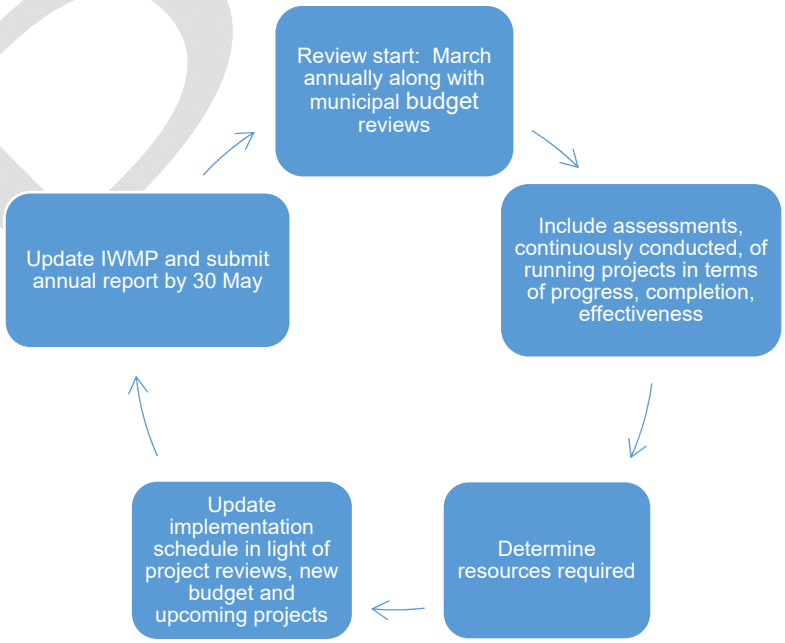
The annual implementation reports will be submitted by the Cederberg Municipality and will be compiled by the Waste Manager, or to whom the task is delegated by him. The annual report must contain the approved implementation items and dates of the IWMP and the progress thereof of the past year. Based 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 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. This does not infer that the implementation items themselves are only reviewed once per year. Each item and progress must be continually evaluated by the persons 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 process.

The report must further discuss the effectiveness of completed projects. For example, when a new recording system 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. The way in which projects are tracked for review are not prescribed, as long as it is done in order to measure the success of addressing the identified gaps and requirements and to identify and plan for new gaps and needs.

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 and amendment procedure of the IWMP and its projects:



6. CONCLUSIONS AND RECOMMENDATIONS

Through this 4th generation IWMP development, the current solid waste management system of the Cederberg Municipality has been assessed in order to determine the adequacy, shortcomings and possible improvements.

The Municipality does well with the resources to its disposal and is aware of the importance that sustainable waste management plays in the wellbeing of the people. There is a definite need for improvements int eh management of landfill sites and the diversion of organic waste and recyclable waste from the these facilities.

During the process of the implementation of the municipality's IWMP, and arising from the public consultation process, further input and/or corrections to the report may come to light that will then be added as a revision to the report.

The strategic objectives for integrated waste management in Cederberg Municipality can be summarised as follows:

- To ensure that Waste Management in the Cederberg Municipal Area complies with South African and International environmental standards so that it is beneficial to industrial and agricultural growth and the public's right to a clean and healthy environment.
- To minimise the entrance of material of value into the waste stream.
- To reduce all waste so that nothing of value nor anything that can decompose, gets disposed.
- To store, dispose or treat all waste that cannot be avoided nor reduced at licensed facilities with regular operational and environmental monitoring and in accordance with regulatory requirements.

For these strategic objectives to be met, a series of implementation instruments (action plans) will need to be implemented. These implementation instruments as well as time framework within which it should be addressed are described in this report but need to be fully detailed at a later stage. The instruments are the following:

- Strengthened education, capacity and advocacy towards Integrated Waste Management
- Improved integrated waste management planning and implementation for efficient waste services and infrastructure
- Effective and efficient utilisation of resources
- Improved compliance with environmental regulatory framework

The above instruments, through implementation via their action plans, will ensure that waste management in Cederberg focusses on avoidance and reduction rather than collection and disposal, but simultaneously maintaining the practical balance between the various waste management functions.

The analyses of the current waste management system has led to the identification of gaps and needs (Chapter 4) and these are addressed with the overarching goals and implementation (Chapter 5).

Legislation & Compliance

Legislation itself was found adequate. It is recommended to increase public awareness regarding legislation, especially generators of hazardous waste. It is also recommended to improve the enforcement of legislation.

Municipal waste management facilities are audited for compliance and have generally received unfavourable audit scores. The municipality is in the process of addressing the identified non-compliances. This is made difficult in the short term due to funding. It is recommended that planning is in place to address compliance as soon as it becomes possible.

Not all facilities that require licensing are in possession of valid licenses. All facilities need to be licensed and it is recommended to make provision to rehabilitate the closed disposal facilities according to their issued licences.

Waste Quantities & Data

The data collection and general waste information adequate but needs to improve to accurately record all waste going to the municipal facilities. A waste characterisation study was conducted and gives a good representation of the waste in the low-income areas of the Municipality. The information on hazardous waste is limited as identified during the hazardous waste survey. It is recommended that generators of hazardous waste register and report to the municipality. Information from private recyclers also need to be obtained.

Waste Collection, Transfer and Transport

Collection is up to the required standard and continually reviewed. Some vehicles will require replacement and are being planned for. Most health care risk wastes are managed by private contractors.

The development of a waste transfer station in Clanwilliam is crucial and needs to be planned and budgeted for so that construction can commence as soon as possible. Once the regional landfill is in operation the transfer station will facilitate transport of waste from the Cederberg Municipal area to the landfill.

Once the transfer station is in place the Municipality needs to focus on establishing municipal solid waste public drop-off facilities in the towns for use by the public.

Waste diversion

Waste diversion is an area where more attention will be required. Existing education and awareness campaigns are good and needs to continue but an even greater effort must be made to ensure that the public understands the importance of diverting waste from landfill. Once the regional landfill is in place the costs of collecting and transporting the waste to the new landfill be borne by the residents and where the waste to be transported can reduce, the cost reduction will filter down to the consumers.

Regional Landfill

The design and planning for the new regional landfill is complete. Construction will start soon pending final agreements between the Cederberg and Matzikama municipalities. The District Municipality will fund the approximately R82 Million required to build the landfill, and this will be repaid by the two municipalities based on the respective use of the facility in future. To make this happen there will have to be an increase to the levy currently paid by the public, and the increased levy is well in line with what other municipalities in the Western Cape are paying. The communication on the future planning, and the required increase in levy needs to be properly communicated toe the residents of the Municipality.

7. REFERENCES

- Government Gazette (10 March 2009). National Environmental Management: Waste Act (Act no. 59 of 2008)
- Department: Environmental Affairs & Development Planning (October 2021). Comment on the draft 4th generation IWMP report submitted by the Cederberg Municipality
- Department: Environmental Affairs 2020. National Waste Management Strategy
- Cederberg Municipality. Integrated Development Plan for 2017 – 2022
- Department: Environmental Affairs & Development Planning (March 2014). Western Cape Provincial Spatial Development Framework
- PwC (March 2014). Western Cape Population Projections 2011 – 2040
- National Planning Commission. Executive Summary of the National Development Plan 2030
- Selected information from the West Coast District Municipal website
- Statistics South Africa. Census 2011
- JPCE (PTY) Ltd – Various external audit reports and site visit information for the Cederberg Municipality
- Western Cape Government. Green is Smart; Western Cape Green Economy Strategy Framework 2013
- Western Cape Government. Provincial Strategic Plan 2014 – 2019.
- Western Cape Government. OneCape 2040.

ANNEXURE A

D:EA&DP COMMENT ON DRAFT IWMP SUBMITTED BY CEDERBERG

Department of Environmental Affairs and Development Planning
August Hoon
Waste Management Planning
August.Hoon@westerncape.gov.za | Tel: 021 483 2712

Reference number: 19/2/1/2/4 BC3

Mr Jacob Klaase
Waste Management Officer
Cederberg Municipality
PO Box X2
Clanwilliam
8135

E-mail: JacobK@cederbergraad.co.za
Tel.: 027 482 2236

Dear Mr Jacob Klaase

COMMENT ON THE DRAFT INTEGRATED WASTE MANAGEMENT PLAN FOR CEDERBERG MUNICIPALITY 2021-2025

1. The draft Cederberg Municipality Integrated Waste Management Plan (IWMP) received by this Department on 19 August 2021, refers.

2. Please note the following comments, which need to be addressed prior to submitting the final IWMP to the Department for endorsement:

Executive summary

2.1 Section: Compliance and Enforcement (page 6) -

- This section of the IWMP contains limited information on compliance of facilities and challenges. The information on the compliance levels of each Waste Disposal Facility, including challenges faced and implementation of mitigation measures, must be included.

- It is stated that the Cederberg Local Municipality (CLM) has the following landfill sites:
  - *Elandsbay landfill (operational)*
  - *Lamberts bay (operational)*
  - *Graafwater (non-operational)*
  - *Clanwilliam (operational)*
  - *Eselbank (operational and private land)*
  - *Wupperthal (operational and private land)"*

However, the sites listed are incomplete, the Citrusdal landfill needs to be added to the list.

- It is stated that: "*the CLM has operating licences for 6 landfills. The CLM's general waste is disposed of at the different landfill sites. None of these sites are equipped with a weighbridge but have a gate controller using IPWIS sign in sheets to monitor waste.*" This statement should be amended as follows:

  "*Landfill sites make use of the Gate Control sheet to record waste entering the landfill. This information is subsequently captured onto the Waste Calculator where it calculates the estimated weight based on the waste type, density, loads and volume. These values are later captured on the IPWIS.*"

Situational analysis

2.2 The Introduction and Background covers the legislative background supporting the Integrated Waste Management Planning process, strategic objectives of the municipality and overview of the geographical area of study. Section 5.3 and Table 5.1 (pages 11 and 12) contains outdated information with respect to the methodology undertaken e.g. reference is made to the Cederberg Municipality's Integrated Development Plan (IDP) 2013/2014. To ensure strategic alignment, kindly ensure that all the latest plans and strategic documents are utilised and referenced. Table 5-1 must be updated to support the 2021 – 2025 IWMP timeframes.

2.3 Table 5.2 (page 12) lists the activities that were undertaken during the inception phase of the document. Please note activities listed refer to 2014. Please ensure that the actual method undertaken during the development of the IWMP, and corresponding dates are listed, which pertain to this current review of the Plan.

2.4 Section 5.4.2 (page 12) lists several legislation and strategic plans; this list needs to be updated to reflect the latest applicable plans and legislation e.g. reference is made to the National Waste Management Strategy (NWMS), 2011, Provincial Spatial Development Framework (PSDF) 2009, the Western Cape IWMP, 2011 and the Cederberg Municipality's IDP 2013/2014, which is outdated. Kindly ensure that all the latest plans and strategic documents are utilised and referenced.

2.5 Table 5-3 (page 13) outlines the methodology undertaken during the different phases of development of the Plan. Phase 2: Situational Analysis refers to the review of the progress towards the objectives of Cederberg Municipality's IWMP 2011 and not the municipality's latest IWMP. Please update accordingly.

2.6 Section 5.5.3 (page 14) lists the national, provincial, district and local strategic objectives. The section should also refer to the Provincial Government's Vision-Inspired Priorities (VIPs) of the Provincial Strategic Plan 2019-2024. The VIPs include:

- Safe and cohesive communities
- Growth and jobs
- Empowering people
- Mobility and spatial transformation

- Innovation and culture

2.7 As per the comments, Section 5.5.3.5 (page 15) Summary of Objectives must be updated to include the latest relevant policies e.g., NWMS, 2020

2.8 Section 6.1 (page 18) details legislation applicable to the IWMP. This section must be revised to include updated legislation e.g. "Section: 6.1.1.4 Environmental Conservation Act No. 73 of 1989, page 20" – It must be noted that the Environmental Conservation Act No. 73 of 1989 (ECA) has been repealed. The Waste Management Licensing processes now resides under the National Environmental Management: Waste Act No. 59 of 2008. (NEM:WA). This section therefore needs to be deleted from the document.

2.9 "Section: Western Cape Diversion Targets for Organic Waste Management (pages 21&22)- This section requires updating as the draft Organic Waste Diversion Plan (OWDP) was submitted in March 2021. The section must also elaborate on which implementation plans will be followed as per the OWDP.

2.10 Section 6.2. (page 25) discusses the demographics to a limited extent, please update to include the following:

- Population profile (past and present).
- Socio-economic groups and income distribution.
- Employment status & education levels.
- Economic performance.
- Development profiles (housing types, housing demand and delivery).

2.11 Section: Access to housing and basic services (page 25) must be updated to include:

- Levels of services provided on a day-to-day basis (formal residential house, informal settlements, commerce & industry, farms).
- Free basic refuse removal levels of services.
- Areas not receiving services.

2.12 Table 4-4 (page 25) refers to the breakdown of operational and capital budget but is lacking information. The table/section should be updated to include:

- Detailed breakdown of current operational and capital budget.
- Detailed breakdown of current operational and capital expenditure (to include provision for closure and rehabilitation of waste disposal facilities).
- Current tariff structure.
- Free basic services (according to the National Framework for Municipal Indigent Policies).
- The budget must also include the costs of implementing the OWDP in the Municipality. The landfill operational budget must make provision for costs required in order to make the facilities compliant.

2.13 Waste categories and generation rates (page 26): This section should include the following:

- Waste generation quantities (past, current and future).
- Waste composition for general and hazardous waste (i.e. households, business and industry, farms). Waste characterisation data should be included to indicate the composition of municipal waste.
- Waste composition for healthcare risk waste.
- Other waste types (i.e. agriculture, sewage sludge, abattoirs, tyres).

2.14 Waste Management By-law: No information is included in the IWMP. The Department is aware that the By-law is being updated. The public participation process has been completed and the Cederberg Municipality is in the process of preparing to place the final draft before Council at the next Council meeting. Kindly update the IWMP to include progress on the waste management By-law.

2.15 Waste Minimisation initiatives: The IWMP is lacking information and is incomplete. From what was provided, it was found that waste ambassadors are used for waste minimisation, but only for clean-ups and awareness campaigns. They also have allowed recyclers / SMMEs in the area to collect recyclables to divert material from landfill. Although it was noted that recyclers report on monthly collections, it was not presented in the report. It is important that diversion figures are presented in the IWMP and should be included in the final document. From the Plan, it is unclear if any waste minimisation campaigns have been run or are ongoing. It would be useful for the municipality to document campaigns with dates and successes/challenges in order to better identify gaps and needs going forward.

2.16 Organogram/ staff structure: A section must be included providing the following:

- The designated Waste Management Officer.
- The Department responsible for Waste Management.
- The organogram including vacancies for each waste management function e.g. collections; cleansing; drivers; landfill operators and administrative staff etc.

2.17 Compliance and enforcement in terms of waste management is considered a key issue within the municipality. Although Compliance and Enforcement is briefly discussed in the Executive Summary, little detail is provided in the Plan. Please ensure that a section detailing compliance and enforcement is included in the Situational Analysis. The following detail must be included:

- The number and type of waste-related complaints;
- Illegal dumping and costs associated with clean-up efforts;
- A list of all operational Waste Management Facilities with the following details:
  - All GPS locations must be provided for each Facility.
  - The Licence details must be provided together with a description of the activities.
  - Please elaborate on the general management of facilities.
  - Include updated information regarding the remaining landfill airspace and lifespan of facilities.
  - Update on informal salvaging at landfill sites.

- Internal and external audits (are they being done; how frequent; level of compliance; do they identify the main issues)? Action plans to improve conditions. Are they being submitted and implemented?
- All facilities have significant non-compliances. These are however not mentioned in this plan. Updated information must be supplied on all non-compliances.

- Closed and decommissioned Waste Management Facilities:
  - Please provide detail on any illegal activities taking place at these facilities.
  - Internal and external audits (are they being done; how frequent; level of compliance; do they identify the main issues)? Action plans to improve conditions. Are they being submitted and implemented?

Gaps and needs Assessment

2.18 Section: Organic Waste Management Gaps identified (page 28, 29), it must be noted that even though the OWDP was submitted, it lacked a status quo and implementation plan. The OWDP must be updated and a clear implementation plan developed for different diversion options.

2.19 "Section: Waste Management Facilities: Gaps identified – Page 29" - It must be noted that none of the facilities are fully compliant in terms of their Waste Management Licence conditions. This gap must be added to the section for focus to be placed on ensuring compliance.

2.20 There are no solid plans in place to deal with any illegal disposal or in order to get Waste Disposal Facilities compliant. There are also no implementation plans for the OWDPs.

2.21 The Wupperthal and Eselbank landfills are not registered on the IPWIS system. The Municipality is mandated to register and report on waste that enters the site. Currently the Cederberg Municipality is in noncompliance with the National Waste Information Regulations. Furthermore, these registrations need to be listed as a gap within the Gaps and Needs analyses.

2.22 It has recently come to the attention of the Department that the Wupperthal and Eselbank landfills are unmanned and thus are not recording waste entering the site. The Cederberg Municipality should consider employing people to record the amount of waste entering the landfills.

2.23 The workers that will be placed at the Wupperthal and Eselbank landfills must be capacitated and trained on how to record and make use of the Gate Controller sheets so that they can adequately record waste information entering the landfills.

Goals, Objectives and Target Assessment

2.24 Table: Objectives and Targets for the Municipality (page 33,34) Goals 3, 5 and 7 are indicated, however no activities have been identified, which align with the goals. The activities indicated for the other goals have not been allocated timeframes. The Municipality should prioritize various activities (high, medium, low) and add timelines to the implementation table. In addition, financial

resources and human resources required for the effective implementation of the plan should be provided.

2.25 With very limited resources, the Municipality has not been able to implement any waste minimisation interventions. It is recommended that the Municipality prioritises waste minimisation initiatives. For minimisation, a focus on diverting organic waste - specifically separating organic waste at source - may be most beneficial, allowing the municipality to divert waste, save airspace, produce a product (compost), and increase recovery of cleaner recyclable waste. It is also recommended that the Municipality play a supportive role in developing and mentoring local small and micro- waste entrepreneurs to improve diversion efficiencies within the municipality. Furthermore, an awareness strategy is required to enhance minimisation. It is suggested that this be worked into the recycling contracts where service providers could include waste awareness initiatives in their operations – this would benefit the municipality and the recyclers who want more material.

2.26 Although many gaps have been responded to, what would realistically be implementable is probably limited. A major challenge is that there are very limited funds. The current waste management budget is only R300 000, therefore please ensure that all activities included are realistic so that all waste minimisation initiatives indicated are actioned and implemented.

2.27 Activities to address waste registration of landfill sites in terms of the IPWIS and the recording of waste quantities entering Wupperthal and Eselbank landfills must be prioritised in the implementation plan. These activities link to Goal 5, which refers to achieving integrated waste management planning.

2.28 Ensuring waste management compliance and the implementation of the Organic Waste Diversion Plan must be prioritised and included as activities in the implementation plan.

Monitoring and review

1. A monitoring and review plan has not been included in the IWMP. This will ensure that targets are met. The implementation plan needs to be monitored and reviewed at least on an annual basis, and submitted to this Department for review via Dean Gilbert: Dean.Gilbert@westerncape.gov.za and August Hoon: August.Hoon@westerncape.gov.za. The relevant officials and departments from the Municipality involved in the review of the IWMP must be clearly stated. The relevant officials and departments involved in the annual review of the IWMP must be clearly stated. Section 13 (3) of the Waste Act notes the requirement in Section 46 of the Municipal Systems Act (32 of 2000) for municipalities to compile annual performance reports. Section 13 also specifically requires that progress reports must consider implementation of the IWMP including:

    a. the extent to which the Plan has been implemented during the period;

    b. the waste management initiatives that have been undertaken during the reporting period;

c. the delivery of waste management services and measures taken to secure the efficient delivery of waste management services, if applicable;

d. the level of compliance with the Plan and any applicable waste management standards;

e. the measures taken to secure compliance with waste management standards;

f. the waste management monitoring activities;

g. the actual budget expended on implementing the Plan;

h. the measures that have been taken to make any necessary amendments to the Plan;

i. annual reviews of the IWMP are to be incorporated in the municipality's Integrated Annual Report and sent to Local Government which DEA&DP will source. This is as per chapter 3(13) (3) of NEMWA. The IWMP report should detail the Department(s) and responsible person(s) from the Municipality who will assign the task of complying with these requirements.

Public participation

2.29 During the development and implementation of the IWMP, public consultation will be required. Two levels of consultation need to be undertaken: (1) Consultation with Authorities (district, provincial) and (2) Public and other interested and affected parties. Please include in the Plan notifications (i.e. newsletters, public notices, website, public announcements, etc.) and comments received from stakeholders and additional proof of public participation (i.e. newsletters, attendance registers, etc.). **Please note that public participation is a critical part of the IWMP process; only Plans that have incorporated public participation will be considered for endorsement.**

General

2.30 Please ensure that pages, tables and any figures presented in the IWMP are numbered for ease of reference and please ensure that the final document submitted is provided in PDF format.

2.31 Please contact the Directorate: Waste Management should you have any enquiries regarding these comments.

Yours faithfully

August Hoon
Deputy Director: Waste Management Planning
Date: 27 October 2021

Cc: (1) Belinda Langenhoven
(2) Lance McBain-Charles

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ANNEXURE B

ORGANIC WASTE DIVERSION PLAN

CEDERBERG MUNICIPALITY

ORGANIC WASTE DIVERSION PLAN

COMPILED BY:

JPCE

(Specialist Consulting Engineers)

MARCH 2021

REPORT: CEDERBERG MUNICIPALITY - ORGANIC WASTE DIVERSION PLAN

JPCE Project Number: A297

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DEPARTMENT OF ENVIRONMENTAL AFFAIRS AND DEVELOPMENT PLANNING PRIVATE BAG X9086 CAPE TOWN 8000	Lance McBain-Charles	2	03/2021	JG PALM
JPCE (PTY) LTD P O Box 931 BRACKENFELL 7561	Project File	3	03/2021	JG PALM

CEDERBERG MUNICIPALITY

ORGANIC WASTE DIVERSION PLAN

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ABBREVIATIONS

CM	Cederberg Municipality
D:EA&DP	The Department: Environmental Affairs and Development Planning
IWMP	Integrated Waste Management Plan
IPWIS	Integrated Pollutant and Waste Information System
NWMS	National Waste Management Strategy
MBT	Mechanical Biological Treatment
RTS	Refuse Transfer Station

CEDERBERG MUNICIPALITY

ORGANIC WASTE DIVERSION PLAN

1. INTRODUCTION

1.1 TERMS OF REFERENCE

JPCE (Pty) Ltd has been appointed by the Cederberg Municipality (CM) in the West Coast District of the Western Cape Province to assist in developing an Organic Waste Diversion Plan (OWDP) for the CM.

The Western Cape Department of Environmental Affairs and Development Planning (D:EA&DP) is the licensing authority for municipal waste management, and have included the requirement for OWDPs in the waste licenses they issued. The following requirement was included in the licences of the CM Landfills:

> *"The Licence Holder must submit an Organic Waste Diversion Plan to the Director 90 days after the date of issue of this Licence and annually thereafter. The information within the Organic Waste Diversion Plan must:*
>
> *Provide a status quo of organic waste sources and volumes disposed at municipal WDFs, and current rates and procedures of organic waste diversion from the facility; and*
>
> *set annual targets and identify procedures from 2018 that will be implemented to meet these targets for the diversion of organic waste from municipal WDFs, in order to reach a 50% diversion by the year 2022 and 100% diversion by the year 2027."*

This report will not focus on diversion from only one site and will be a Municipality wide document. The plan will be focussed on providing the CM with options on how to divert organic waste from landfill through separation initiatives such as separate collection of garden waste and providing home composting units to households to separate their organic green and food waste through composting.

The Cederberg and Matzikama Municipalities have an agreement in place with the West Coast District Municipality for the development of a regional landfill facility to serve both municipalities. The facility is to be located between Vredendal and Vanrhynsdorp in the Matzikama municipal area and is expected to receive its first waste in mid to end 2022. When this facility is operational it will be required to provide its own OWDP and this document will thus only focus on the possible source separated garden waste and home composting in the CM.

For the purpose of this report organic waste will be defined as food waste and garden waste (kitchen scraps, grass cuttings, leaves, branches, tree stumps etc.)

1.2 LEGISLATIVE FRAMEWORK

The development of the National Waste Management Strategy (NWMS) in 2011 was an important milestone in facilitating the implementation of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008). The Waste Act promotes diversion of waste from landfill and various strategies and regulations have since followed. The Department of Environmental Affairs (DEA) for instance developed a National Organic Waste Composting Strategy in 2013 to assist with the diversion of organic waste from landfill through composting and although this has given rise to many successful composting projects, more can still be done in the field of organic waste diversion.

The 2019 draft National Norms and Standards for Organic Waste Composting (Government Gazette No. 1135) states that "*the diversion of organic waste from landfills promotes the achievement of comprehensive and sustainable management of environmental resources and contributes to upholding of the constitutional rights of all South Africans to an environment that is not harmful to human health and wellbeing*". Even though the norms and standards for composting have not yet been finalised, composting facilities only need to comply with the requirements of these norms and standards if they have the capacity to process compostable organic waste, in excess of 10 tonnes per day.

D:EA&DP thus decided to incorporate targets for organic waste diversion into the waste license of landfill facilities in the Western Cape. The targets are to divert 50% by the year 2022 and 100% by the year 2027. In the draft composting norms and standards, Organic Waste is defined as "*waste of biological origin which can be broken down, in a reasonable amount of time, into its base compounds by micro-organisms and other living and/or by other forms of treatment".*

These plans need to provide a status quo of current organic waste sources and volumes disposed, and the current rates and procedures of organic waste diversion from the facility in question. These plans also need to set annual targets and identify procedures that will be implemented to meet these targets for the diversion of organic waste from the municipal facilities.

2. STATUS QUO OF ORGANIC WASTE IN CEDERBERG

2.1 LANDFILLS OR TREATMENT FACILITIES

There are nine landfill sites within the CB namely Citrusdal, Clanwilliam, Elandsbaai, Graafwater, Algeria, Eselbank, Leipoldtville, Wupperthal and Lambertsbaai Landfills. The Citrusdal Landfill has a waste licence for operation, and all the other sites have received closure licences from the provincial department although some of the smaller ones are located on private land. The latest Municipal Integrated Development Plan (IDP) stated that all the sites would be closed and rehabilitated, with all but the Citrusdal or Clanwilliam Landfills requiring immediate rehabilitation. The Citrusdal and Clanwilliam sites are planned for closure and rehabilitation once the regional landfill facility is open and operational.

All municipal household waste collected from kerbsides and businesses gets taken to either the Citrusdal, Clanwilliam, Elandsbaai or Lambertsbaai Landfills. Dedicated garden waste disposal areas are present at most of the receiving landfills but currently the garden waste areas at these facilities are not maintained and no chipping or composting is taking place.

2.2 VOLUMES AND COMPOSITION

2.2.1 Waste Characterisation

The latest CM Integrated Waste Management Plan (IWMP) was developed in 2015 by Mott Macdonald. The plan expired in 2020 and the Municipality is busy developing the next generation IWMP. In this 2015 report the results of the 2014 Departmental Waste Characterization Study (WCS) were provided, and the information in Error! Reference source not found. shows the municipal waste composition by weight. The WCS was undertaken at all the towns and the percentage of food/greens waste varied from 44% to 52% for an average of 48%.

Although the sample size and frequency were insufficient to establish statistical confidence, the results provide an indication of the composition of the waste stream. Due to the sampling method that was mainly focussed on the domestic waste stream, it does not reflect the wastes disposed apart from the collected waste, i.e. the wastes disposed directly by the public and businesses.

The WCS also did not differentiate between food waste and garden waste, but data from other WCSs undertaken at local municipalities in the Western Cape shows that the food waste portion of the organic waste in the municipal black bags varies between 50% and 80%. This depends on whether the municipality provides a separate collection service for residential garden waste. If a separate garden waste collection service is provided, the organic fraction in the municipal waste stream will be predominantly food waste.

The CM officials indicated that they do not have a separate collection system for garden waste, but that garden waste can be collected from residents upon request. They also collect the municipal residential waste in wheelie bins, which can increase the garden waste fraction of the waste, since people tend to fill the bin with grass clippings etc. if not filled with the black bags. The expectation is thus that the organic waste fraction in the municipal waste stream of CM is made up of about 63% food waste and 37% garden waste.

The information in **Figure 2-1** was thus adapted from the 2014 WCS to reflect the expected food waste and garden waste percentages for the CM residential waste.

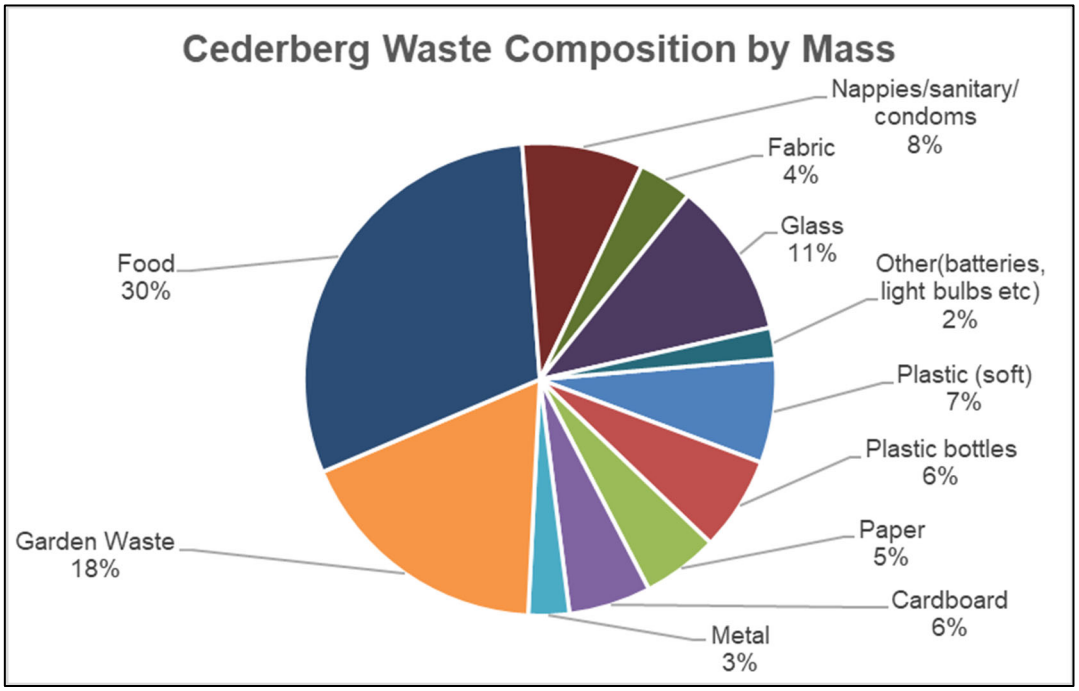

Figure 2-1: Cederberg Waste Composition adapted from 2014 D:EA&DP WCS

2.2.2 Expected Organic Waste Volumes

None of the CM Landfills have weighbridges to record the tonnages of waste disposed at the facility. The municipal officials at the entrances of these facilities make use of the D:EA&DP Integrated Pollutant and Waste Information System (IPWIS) to record waste entering the facility. This consists of manual sheets completed and converted to electronic data that gets provided to the Department.

IPWIS information for the year 2020 as provided by the CM, is summarized in **Table 2-1** below and is given in average tonnes per month. The information shows that according to the record keeping at the gates, around 13.5% of all waste disposed of at the CM Landfills is organic waste.

Table 2-1: Monthly average tonnages disposed at landfills

Landfill	Municipal waste	Commercial and industrial waste	Organic waste	Construction and demolition waste	Total (t/month)	Organics as % of Total
Clanwilliam	158.2	1.1	16.3	14.6	**190.2**	8.6%
Citrusdal	103.5	19.5	21.7	20.1	**164.8**	13.1%
Elandsbaai	25.1	0.0	7.1	1.2	**33.4**	21.3%
Lambertsbaai	21.3	4.7	13.8	9.7	**49.5**	27.9%
Total (month)	**308.2**	**25.3**	**58.9**	**45.5**	**438.0**	**13.5%**
Total (year)	**3,698.0**	**304.0**	**707.0**	**547.4**	**5,255.4**	**13.5%**

The organic fractions in the above table is made up almost completely of garden waste brought in by the public, although it will contain some portions of fruit or vegetable waste brought in by industry or farmers. Organic waste collected form kerbside in the wheelie bins would be recorded as Municipal Waste at the gates and is therefore excluded from the organic waste volumes quoted to IPWIS.

To obtain a clearer view of the organic waste volumes generated and disposed in the CM, the calculation of waste streams using population figures and per capita waste generation rates can be used. The 2011 Census indicated a CM population of 49,773 people of which 47% resided in rural areas like farms and smallholdings. Due to the large distances between towns in the CM, most residents in rural areas do not receive a weekly municipal collection service. Only 58% of the CM receives a weekly collection service according to the 2015 IWMP. This indicates that almost all rural areas are responsible for their own waste management.

In March 2014, PWC completed a report on the population projections for the Western Cape province from 2011 to 2040. This report was commissioned by the Department of Social Development and shows a CM population growth rate of 0.84% on average for this period. For the CM the 2021 population was estimated to be 54,116 with the assumption that the percentage residing in rural areas would remain constant.

From information in the census and the latest IWMP, the percentage of people per economic category can be illustrated as in **Figure 2-2** below. This indicates that 58% of the CM population falls into the low-income category, and this drops to 54% if the population residing in rural areas are not considered.

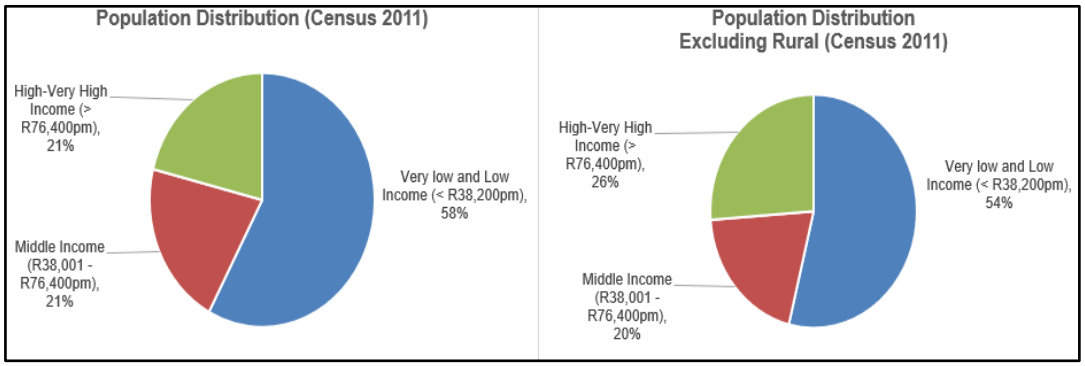

Figure 2-2: Population distribution per income category

Although the 2015 IWMP provided per capita waste generation rates, they are considered high when compared to other similar municipalities in the Western Cape. Findings from the 2009 study by Oelofse & Godfrey conducted for the Department of Environmental Affairs (DEA) was thus used for the calculations since they are comparable to values used in the IWMPs of other Western Cape municipalities. See **Table 2-2** below.

Table 2-2: Waste Generation Rates in kg/person/day

Income Group	From IWMP (kg/p/day)	From DEA study (kg/p/day) used in calculations
Low Income	1.85	1.10
Middle Income	1.15	0.74
High Income	0.58	0.40

Using the results from the WCS (**Figure 2-1**), the population projections, the economic distribution (**Figure 2-2)** and the above waste generation rates it would then be possible to determine what the expected organic waste generation would be across the income groups of the CM for the next number of years. The calculations were done excluding the population in rural areas since, as discussed, most rural residents do not make use of municipal collection or disposal services.

This information is shown in **Table 2-3** and indicates that an expected 3,219 tonnes of organic waste was generated by the public of CM in 2020.

The information in **Table 2-1** shows 50.9 tonnes/month (707 tonnes/annum) garden waste disposed on the CM Landfills in 2020 and the predictions in **Table 2-3** shows 1,194 tonnes/annum for the same year. To some extent the accuracy of the waste generation rate assumptions and the exclusion of some rural areas can be responsible for this difference, but the main difference in the values is due the garden waste portion in the wheelie bins, and the garden waste mixed in with any other nonhomogeneous loads arriving at the gates of the landfills and being recorded as general municipal waste.

Table 2-3: Total Garden and Food Waste generation expectations for Cederberg Municipality (tonnes per annum)

Total Garden Waste expected in Wheelie bin (Tonnes per Annum)							Total Food Waste expected in Wheelie bin (Tonnes per Annum)				
Year	Population	Very Low and Low Income	Middle Income	High and Very High Income	Total per Annum		Very Low and Low Income	Middle Income	High and Very High Income	Total per Annum	Grand Total Organic Waste collected per Annum
2017	27517	385	264	515	**1,164**		654	448	873	**1,975**	3,139
2018	27748	388	266	519	**1,174**		659	452	881	**1,991**	3,165
2019	27981	392	268	523	**1,184**		665	456	888	**2,008**	3,192
2020	28216	395	271	528	**1,194**		670	459	895	**2,025**	3,219
2021	28453	398	273	532	**1,204**		676	463	903	**2,042**	3,246
2022	28692	402	275	537	**1,214**		681	467	911	**2,059**	3,273
2023	28933	405	278	541	**1,224**		687	471	918	**2,076**	3,300
2024	29176	408	280	546	**1,234**		693	475	926	**2,094**	3,328
2025	29422	412	282	550	**1,245**		699	479	934	**2,112**	3,356
2026	29669	415	285	555	**1,255**		705	483	942	**2,129**	3,384
2027	29918	419	287	560	**1,266**		711	487	949	**2,147**	3,413
2028	30169	422	289	564	**1,276**		717	491	957	**2,165**	3,441
2029	30423	426	292	569	**1,287**		723	495	965	**2,183**	3,470
2030	30678	429	294	574	**1,298**		729	499	974	**2,202**	3,499
2031	30936	433	297	579	**1,309**		735	504	982	**2,220**	3,529
2032	31196	437	299	584	**1,320**		741	508	990	**2,239**	3,558
2033	31458	440	302	588	**1,331**		747	512	998	**2,258**	3,588
2034	31722	444	304	593	**1,342**		753	516	1,007	**2,277**	3,618
2035	31988	448	307	598	**1,353**		760	521	1,015	**2,296**	3,649
2036	32257	452	310	603	**1,364**		766	525	1,024	**2,315**	3,679
2037	32528	455	312	608	**1,376**		773	530	1,032	**2,334**	3,710
2038	32801	459	315	614	**1,387**		779	534	1,041	**2,354**	3,742
2039	33077	463	317	619	**1,399**		786	538	1,050	**2,374**	3,773
2040	33355	467	320	624	**1,411**		792	543	1,059	**2,394**	3,805

2.3 DIVERSION

The 2015 IWMP did not report any existing organic waste diversion activities on the landfills within the CM, and this status quo was confirmed by the CM officials.

Dedicated garden waste disposal areas can be identified at some of the active landfill facilities, but no active diversion is taking place. Stockpiles of garden waste is thus expected to be present on the sites.

The CM have reported that some of the restaurants and industries in the larger towns have agreement with local piggeries to collect food waste from them, but the nature and volumes of this diversion process is not known.

3. ORGANIC WASTE DIVERTION OPTIONS

3.1 GREEN BAG SYSTEM

An effective method of reducing organic waste, and specifically garden waste, in the residential waste stream destined from landfill, is by separate collection of garden waste from residents and businesses.

With this system, residents are given a separate bag in which to place their household organic waste and this gets collected by the Municipality. The collected bags would then be taken to the designated area for treatment and this is normally at the existing landfill site. The bags are normally green in order to differentiate them once at the landfill or composting facility. Cooperation from the public is key in the success of this diversion option and the Municipality may decide to procure vehicles and provide the service in house or to outsource the activity to a private party through a public tender process.

3.2 CHIPPING AND COMPOSTING

Composting is the most widely used treatment method for source separated garden and food waste, and would be the preferred treatment method for a municipality the size of CM.

Composting involves the aerobic (in the presence of oxygen) decomposition of organic matter and although carbon dioxide is also produced during this decomposition process, no methane is produced. Composting of organic material is therefore environmentally more beneficial than direct landfilling, even if the compost is afterwards landfilled.

Composting of organic waste at a centralised Municipal composting facility would require a minimum of 350 tonnes of garden waste per month (4,200 per annum) to achieve financial sustainability. Although this is an approximate number that depends on a range of factors, the bottom line is that looking at the expected generation volumes in the previous chapter, CM does not have the required volumes to justify the capital contribution required to develop a central composting plant. It is therefore recommended that the garden waste arriving at the CM facilities be mechanically chipped and composted at the landfill sites.

Effective composting requires garden waste to ideally be chipped within one week of being off-loaded to reduce the abrasiveness of the dry garden waste on the chipper's mechanicals, thereby reducing maintenance costs and to produce chipped material that can still be composted. Although the dry materials are important carbon contributors for compost, it is equally important to include enough freshly chipped green material to provide the nitrogen required for organism growth to oxidize the carbon and produce quality compost.

Composting through chipping of garden waste is the recommended organic waste diversion option for the CM. Where material is too dry and not enough green material is available to mix in with it, the material needs to be chipped and stockpiled separately as wood chips or mulch for collection by the public.

3.3 HOUSEHOLD COMPOSTERS

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.

Composting at home reduces the amount of waste in the residential waste stream and 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 according to the latest CM IWMP.

Home composting bins are available in a range of sizes and are easily accessible. By budgeting for and providing home composting bins to the interested households, the CM can encourage households to use kitchen scraps and household organic wastes to make compost at home, which will further assist in the diverting of food and garden waste from landfills. The manufactures of a certain home composting unit has undertaken a similar project with the City of Cape Town and has reported that a diversion of approximately 16kg of organic waste per household per month has been achieved.

3.4 MECHANICAL BIOLOGICAL TREATMENT

Mechanical Biological Treatment (MBT) is a well proven method internationally for removing organics from the municipal waste stream. An MBT process essentially separates all the various material types of a mixed waste stream by using a combination of mechanical equipment and manual labour. It has many possibilities and associated technologies but due to the relatively low volume of organic waste generated within the CM, this option would not be viable for the Municipality.

4. CEDERBERG STRATEGY

4.1 ANNUAL TARGETS

The departmental target for organic waste diversion from landfill is 50% by 2022 and 100% by 2027 as discussed. Food waste, and a large portion of garden waste is collected co-mingled with black bag waste and landfilled at Clanwilliam, Citrusdal, Elandsbaai and Lambertsbaai Landfills as discussed. The information in **Table 2-3** indicates an expected 1,194 tonnes of garden waste and 2,025 tonnes of food waste (3,219 tonnes total) landfilled in 2020, and this effectively represents a basis from which diversion needs to be calculated since no formal organic waste diversion was practised at these sites historically.

As discussed, the focus of this OWDP will be on the garden waste portion of the municipal organic waste fraction since food waste collected with the black bag waste will be taken to the regional landfill once developed, and will thus form part of the OWDP of this new facility. The CM does, however, have a responsibility towards food waste diversion as part of its mandate, and by rolling out a home composting campaign that allows each participating household to divert approximately 16kg of food waste each month, the CM will divert an average of around 800tonnes of food waste from landfill from now until 2027 if a 50% participation rate is assumed.

Since the piggeries near the towns of Citrusdal and Clanwilliam have shown interest in the collection of certain food wastes from the towns to use as pig feed, the CM needs to explore this collaboration and work with the restaurants and hospitality industries in these towns, to increase the footprint of this project. The success of these food waste initiatives will then in turn assist the licence holder of the regional landfill in fulfilling its organic waste diversion targets. It would be important for the CM to obtain volumes and/or tonnages of food waste diverted through this process to report it as diversion.

In order to then ensure the diversion of the garden waste portion from the landfill sites, the CM would firstly have to reduce the garden waste portion contained in the wheelie bins to ensure that only the minimum amount of garden waste gets taken to the regional landfill with the black bag waste. There are ways to possibly achieve this, and the success relies on the communication from the CM to the public that no garden waste may be placed in the wheelie bins on kerbside. This will have to be undertaken through a targeted awareness campaign and monitored.

Waste collectors do not have the time to open each bag in the wheelie bin to determine if they contain garden waste, but they can be given the mandate to not remove the wheelie bin at all if it contains obvious volumes of loose garden waste. Although this will not remove all garden waste fractions, it will create an awareness with the residents. The next option would be for the CM to budget for, and implement, a separate collection service for garden waste using a green bag system as discussed.

As documented in the most recent IDP and IWMP documents, the development of the regional landfill site would require the CM to develop a solid waste transfer station in Clanwilliam to facilitate long distance transport for final disposal at the regional landfill. If the CM decides not to implement a separate collection system for garden waste, the transfers station and public drop-offs that are to be provided in the smaller towns, can be so designed to identify and isolate garden waste as it gets offloaded at these facilities. This method will only remove a portion of the garden waste stream since mixing and compaction in the collection vehicle will hamper the efforts of isolating the garden waste portions.

The most effective way of removing garden waste from the waste stream is through separation at source and separate collection before chipping and composting, which would be the recommended method to achieve the targets as set out in **Table 4-1** below.

Table 4-1: Cederberg Organic Waste Diversion Targets

Year	Garden Waste Generation (t/a)	Required Diversion	Diversion target	Required Diversion target (t/a)
2020	1,193.6			
2021	1,203.6			
2022	1,213.7	50%	50%	606.8
2023	1,223.9		60%	734.3
2024	1,234.2		70%	863.9
2025	1,244.5		80%	995.6
2026	1,255.0		90%	1,129.5
2027	1,265.5	100%	100%	1,265.5

4.2 CHIPPING EQUIPMENT AND COST IMPLICATIONS

The CM requires chipping equipment to chip the existing and incoming garden waste at the landfills in question. They can do this by either procuring the equipment and staff internally or through outsourcing the chipping and composting to a private party. A typical mobile chipper machine as used by the neighbouring Bergrivier Municipality has an opening of 43.18cm x 24.13cm with a feed rate of 27.43m/min. Theoretically this would result in a throughput rate of 2.8m^3/min but given the makeup of the garden waste at the CM sites, and the realistic speed of feeding, a throughput rate of about 1.0m^3/min is more realistic.

Using a 6-hour shift with operations 5 days a week and 4 weeks per month, this would result in a chipping capacity of more than 2,000 tonnes per month if a density of 0.3tonne/m^3 is assumed. This is significantly more than the annual garden waste generation in the CM so a single mobile chipper would easily be able to accommodate the chipping of all garden waste in the CM by spending a week or two on each site as and when required.

4.2.1 Internal Procurement

Mobile woodchippers meeting the CM requirements can be bought for approximately R500,000. Should the CM wish to undertake the work themselves they would thus have to budget for this capital expenditure and to make sure that the chipper remains equipped to process the waste on site, the CM needs to develop and maintain a maintenance plan for each machine, which includes timelines for servicing, parts replacement etc. This can be done by adding the machine to the maintenance contract for other municipal fleet if in place.

The chipping of garden waste will be most effective if responsibility of the chipping operation is given to dedicated personnel. This includes responsibility of throughput, quality, size, and location of chipped material as well as general upkeep of the machine in general. These staff members should also be responsible for the accurate record keeping of chipped waste and waste removed from site.

Dedicated chipping managers need to be appointed per machine with a responsibility of reporting to the waste managers in the individual towns to formalise the system and increase productivity. The chipper is to be assigned four personnel per day with one chipping manager and three general workers. The typical annual cost of employment to Municipalities for one labourer would be about R107,000.00, with the chipping manager in the order of R200,000.00 per annum. The Municipality would thus have to create 5 new positions and budget for salaries of at least R630,000.00 per annum to undertake the chipping and composting work in-house. The CM may decide to roll out this collection service in phases but ultimately provision of at least one garden waste bag per household per week would also have to be budgeted for, and excluding the rural households this would cost the CM in the order of R500,000.00 per annum. If a dedicated vehicle is not available to transport the chipper and staff to and from the sites, this would need to be included at a capital cost of at least R400,000.00.

The potential costs for the CM to undertake the chipping and composting in-house would thus be in the range of R900,000.00 capital and R1,130,000.00 annual operational cost.

4.2.2 Outsourcing

The abrasive nature of the chipping operations means the chipping equipment would require regular maintenance to ensure sustainability. Municipal procurement procedures can delay this process resulting in a garden waste backlog on site. The cost of labour to the private sector is much lower than government, and even with the recent increase of minimum wage to R21.69 per hour, the cost of a labourer is less than half of what he/she would cost the Municipality.

Recent tender rates for chipping of garden waste at municipalities in the Western Cape indicates an anticipated cost to the CM of about R580 per tonne and for composting around R20 per tonne. Using the expected garden waste generation for 2021 of 1,204 tonnes per annum as per **Table 2-3** means the CM can pay a private service provider in the order of R730,000.00 per annum to chip and compost all the garden waste in the CM. With the possible existing backlog on site and considering the targets given in **Table 4-1** the CM should thus plan to enter into such a contract by the next financial year and preferably structure it to be a 3-year contract with set targets of quality and throughput.

A similar solution can be argued for the provision of a separate collection system for garden waste from the residents and source separated collection costs are in the order of R500 per tonne for other municipalities. If outsourcing both the collection and treatment (chipping and composting) of the garden waste to private contractors, it would cost the CM between R1.1 Million and R1.7 Million per annum.

Since record keeping of organic waste volumes entering and exiting the facilities is a challenge, this could be included in the contractual obligations of the private party to comply with the departmental requirements in this regard.

4.3 IMPLEMENTATION AND AWARENESS

Once the recommendations in this plan is adopted by the CM, it would be crucial to inform the public of the plans to divert organic waste from landfills, and to provide information on the possible negative impact on the environment if waste is not diverted. This can be accomplished through information sessions and discussions at ward committee meetings, flyers, web notices etc.

This plan would then also need to be included into the IWMP annual report and ultimately the IDP.

5. CONCLUSION

The CM does not currently divert any organic waste from its landfills and garden and food waste get taken to the Clanwilliam, Cederberg, Elandsbaai and Lambertsbaai Landfills through municipal collection of wheelie bins, and dropped off in bulk by members of the public.

The Western Cape D:EA&DP made it a condition in most of the provincial waste licences that organic waste diversion plans be developed for landfills in the province. This also holds true for landfills issued with closure licenses that typically only receive garden waste and builder's rubble, as is the case with some of the landfills in the CM.

The Municipality is aware that they have a responsibility to divert organic waste from landfill, and although the CM waste will in future be taken to the soon to be developed regional landfill, the CM needs to proactively manage organic waste diversion.

Through implementation of a home composting system CM can greatly assist the organic waste diversion from the regional landfill which will also be required to provide an OWDP as part of its waste licence conditions.

Large portions of garden waste is taken to landfill with the municipal waste through a wheelie bin collection system and it is recommended that the CM implement a separate collection system for residential and commercial garden waste to ensure sustainable diversion of organic waste from landfills.

The garden waste diversion targets as required by the waste licences of the CM Landfills can be met through chipping and composting the garden waste fractions and when considering the cost implications of undertaking this work in-house, it is recommended that both the collection and treatment (chipping and composting) of garden waste be outsourced to a private party at a cost of approximately R1.1 to R1.7 Million per annum.

ANNEXURE C

EDUCATION AND AWARENESS CAMPAIGNS

Cederberg Municipality (2022 IWMP)
Waste Management Education and Awareness

Ou Kaapse Weg Clean-up July 2021

Clanwilliam Khayelitsha informal settlement-

Door to door awareness- 06 October 2021

Grootkloof primary school- 13 October 2021

Sederberg primary school- 22 October 2021

Clanwilliam Denne street- 12 October 2021

Before and After clean-up

Distribution of wheelie bins- Citrusdal Primary school – 18 November 2021

Clanwilliam secondary school – 19 November 2021

Lamontanara private school – 19 November 2021

Food gardening tools handover Sederberg primary school – 11 November 2021

Food garden- Sederberg primary school -12 November 2021

Kleinbegin bewaarskool – 19 November 2021

ANNEXURE D

HAZARDOUS WASTE SURVEY

CEDERBERG MUNICIPALITY

HAZARDOUS AND HEALTH CARE RISK WASTE SURVEY

JUNE 2022

Completed by:

Aquila Environmental (Pty) Ltd
Waste Management Consultants
50 Long Street
Cape Town CBD
Cape Town, 8001

Table of Contents

Executive Summary

A Hazardous and Health Care Risk Waste (H&HCRW) Survey was conducted in June 2022 in Cederberg Local Municipality. The survey found that H&HCRW generated in the study area could be categorised under four of the potential seventeen Industrial Groups listed in Schedule 3 of the National Environmental Management: Waste Amendment Act (NEM:WAA) (Act No. 26 of 2014). The study found that 12 400 litres of waste oils are generated in the study area per annum. It is estimated that at least 2 000 units of waste tyre waste is generated per annum. The quantity of Health Care Risk Waste generated in the study area per annum is approximately 7 tons. The study found that the majority of businesses generating H&HCRW have adequate systems in place to deal with such waste in a responsible manner.

1 Introduction

In May 2022, JPCE (Pty) Ltd was appointed by Cederberg Municipality to update their existing Integrated Waste Management Plan (IWMP) according to the National Environmental Management: Waste Act of 2008 and requirements as stipulated by the Department: Environmental Affairs and Development Planning. Aquila Environmental (Pty) Ltd was appointed by JPCE as sub-consultant to conduct a survey on types and quantities of hazardous and health care risk waste (H&HCRW) generated within the Cederberg Local Municipality. This which forms part of the IWMP.

Aquila Environmental's scope included the identification of hazardous and health care risk waste generators as well as acquiring the available information of these waste types from the generators such as the volumes generated, treatment methods, transport methods, transporters and final disposal.

The H&HCRW Survey was undertaken in June 2022 by identifying and listing all businesses and facilities potentially generating either hazardous or health care risk waste. Each entity contributing data to this report was contacted telephonically or via e-mail.

This report details the findings of the survey and discusses H&HCRW generated within the study area separately. Quantities of the various waste fractions contributing to both these waste streams were estimated, and are reported in Table 2 and **Error! Reference source not found.** respectively.

2 H&HCRW generated in Cederberg Local Municipality

The data contained in this survey was obtained from owners/employees at the various places of business directly. For the purposes of this study, Schedule 3 of the National Environmental Management: Waste Amendment Act (NEM:WAA) (Act No. 26 of 2014), was used to determine the various industrial groups potentially generating H&HCRW waste. Schedule 3 identifies 17 industrial groups, sub-divided into 86 waste fractions (as set out in Appendix A to this report). This study has determined that businesses and industry in Cederberg Municipality generate H&HCRW categorised under 4 out of the potential 17 industrial groups listed in Schedule 3. These are:

Industrial Group 6:	Wastes from organic chemical processes
Industrial Group 12:	Oil wastes and wastes of liquid fuels (except edible oils)
Industrial Group 14:	Other wastes not specified in the list
Industrial Group 16:	Wastes from human or animal health care and/or related research (except kitchen and restaurant wastes not arising from immediate health care)

It can be expected that hazardous portions of waste from the following industrial groups could potentially be generated within the study area, in addition to those listed above. Unfortunately, no data on these types of waste could be obtained during the survey, and therefore it cannot be stated with certainty whether such waste fractions are, in fact, generated. The industrial groups under question is as follows:

Industrial Group 1:	Wastes from agriculture, horticulture, aquaculture, forestry, hunting and fishing, food preparation and processing
Industrial Group 8:	Wastes from the photographic industry
Industrial Group 10:	Wastes from chemical surface treatment and coating of metals and other materials; non-ferrous hydrometallurgy
Industrial Group 15:	Construction wastes

It is not expected/unlikely that hazardous portions waste from the following industrial groups is generated in the study:

Industrial Group 2:	Wastes from wood processing and the production of panels and furniture, pulp, paper and cardboard
Industrial Group 3:	Wastes from the leather, fur and textile industries
Industrial Group 4:	Wastes from the leather, fur and textile industries
Industrial Group 5:	Wastes from inorganic chemical processes
Industrial Group 7:	Wastes from thermal processes
Industrial Group 9:	Wastes from the manufacture, formulation, supply and use (MFSU) of coatings (paints, varnishes and vitreous enamels), adhesives, sealants and printing inks
Industrial Group 11:	Wastes from shaping and physical and mechanical surface treatment of metals and plastics
Industrial Group 13:	Waste organic solvents, refrigerants and propellants
Industrial Group 17:	Wastes from waste management facilities

3 Hazardous Waste

To fully understand the importance of proper handling and disposal of Hazardous Waste in South Africa, the legislative context will first be described.

3.1 Legislative context for Hazardous Waste in South Africa

3.1.1 **The National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)**

The first waste specific legislation published in South Africa was the National Environmental Management: Waste Act (NEM:WA). It provided the mechanism to regulate the waste value chain aiming to minimise adverse effects on human health and the environment. The National Department of Environmental Affairs (DEA) is the regulatory body for the licensing of Hazardous Waste Facilities, according to NEM:WA's Chapter 5. In addition, the management of hazardous waste is included in the concurrent legislative competence of both National and Provincial Government assigned by the South African Constitution with respect to environment and pollution control.

3.1.2 The National Environmental Management: Waste Amendment Act, 2014 (Act No. 26 of 2014)

On 02 June 2014 an amendment of Section 1 of the NEM:WA, as amended by the National Environmental Management: Waste Amendment Act (NEM:WAA), was enacted whereby "Schedule 3: Defined Wastes" was inserted. The purpose of Schedule 3 is to define all types of waste and to categorise them in order to assist with the identification of wastes. This Schedule is divided into Category A: Hazardous Waste and Category B: General Waste. Schedule 3, Category A defines Hazardous Waste as follows:

> *"'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."*

For the purposes of this study, Schedule 3, Category A of NEM:WAA was used to determine the various industrial groups potentially generating hazardous waste in the study area and is set out in **Table 4**: Schedule 3 of the National Environmental Management: Waste Amendment Act, 2014 Act No. 26 of 2014: Category A: Hazardous Waste below.

3.1.3 Waste Classification and Management Regulations (G.N. No. R. 634 of August 2013)

These regulations support and implement the provisions of the NEM:WA and, amongst others, establishes a procedure and mechanism for the listing of waste management activities that do not require a Waste Management Licence. It also states that waste must be classified according to the South African National Standard Globally Harmonized System of Classification and Labelling of Chemicals (SANS 10234:2008).

SANS 10234:2008 is a standard that classifies waste according to the physical and health hazards specific substances could potentially pose (including hazards to the aquatic environment).

GN. No. R. 634 also talks to the requirements for disposal, record keeping and re-classification. For example, it is stated that:

> *"Waste must be classified within 180 days of generation and should be re-used, recycled, recovered, treated and/or disposed of within 18 months of generation."*

Based on physical and chemical characteristics hazardous waste can be grouped according to the South African National Standards 10234 (SANS 10234:2008) into the following classes:

Table 1: Hazardous Waste Classes

Hazardous Waste Class (SANS 10234:2008)	
Classes	**Description**
9.1	Explosives
9.2	Flammable gases
9.3	Flammable aerosols
9.4	Oxidising gases
9.5	Gases under pressure
9.6	Flammable liquids
9.7	Flammable solids
9.8	Self-reactive substances and mixtures
9.9	Pyrophoric substances
9.10	Self-heating substances and mixtures
9.11	Substances and mixtures that, on contact with water, emit flammable gases

9.12 Oxidizing substances and mixtures
9.13 Organic peroxides
9.14 Corrosive to metals

3.1.4 Norms & Standard for the Assessment of Waste for Landfill Disposal (G.N. No. R. 635 of August 2013)

This piece of legislation covers the assessment of waste prior to landfilling and prescribes limits relating to chemical composition of waste from laboratory testing such as Leachable Concentration Threshold (LCT).

3.2 Hazardous waste data collation summary

Entities identified as potential hazardous waste generators were interviewed in June 2022. **Table** 2: Hazardous waste quantitative data collation summary below indicates a summary of all quantitative information gathered during the survey on hazardous waste produced in the study area.

Table 2: Hazardous waste quantitative data collation summary

Industrial Group (NEM:WAA Schedule 3)	**Waste fraction** (NEM:WAA Schedule 3)	**Generator and notes**	**Number of generators surveyed in study area:**	**Quantity generated per annum**
6	Wastes from organic chemical processes	**Pharmacies, clinics and hospitals:** (e) Pharmaceuticals Included in HCRW results	Refer to HCRW Results	Refer to HCRW Results
12	Oil wastes and wastes of liquid fuels (except edible oils)	**Service centres:** (a) waste hydraulic oils (b) waste engine, gear and lubricating oils (c) waste insulating and heat transmission oils (d) oil/water separator contents (e) wastes of liquid fuels (f) hazardous portion of other oil waste	8	12 400 litres/a
14	Other wastes not specified in the list	**Retailers/service centres selling batteries:** (e) wastes from discarded batteries	2	> 50 units/a
16	Wastes from human or animal health care and/or related research	**Hospitals, Clinics, Medical practitioners, Pharmacies, Veterinarians, Beauty Salons, Mortuaries:** Included in HCRW results	Refer to HCRW results	Refer to HCRW results
Other	Waste tyres	**Retailers/service centres selling tyres:** Waste tyres	5	> 2 000 units/a

4 Health Care Risk Waste

4.1 Legislative context for Health Care Risk Waste in South Africa

4.1.1 The National Health Act, 2003 (Act No. 61 of 2003) as amended

This Act regulates national health and provides uniformity in respect of health services. This is done by aiming to establish a national health system which encompasses public and private providers of health services. It further aims to provide the population of South Africa with the best possible health services that available resources can afford. It sets out the rights and duties of healthcare providers, health workers, health establishments and users.

4.1.2 Regulations Relating to Health Care Waste Management in Health Establishments (G.N. No. R. 375 of May 2014)

The following section highlights key principles contained within these Regulations, relevant to this study:

Section (3)(1) maintains that all health establishments that generate Health Care Waste:
(a) have a duty to dispose of the waste safely;
(b) are legally and financially responsible for the safe handling and environment sound disposal of the waste they produce;
(c) must always assume that the waste is hazardous until shown to be safe; and
(d) have a responsibility of the waste from the point of generation until its final treatment and disposal.

Section (4) further indicates that the Scope of the Regulations are applicable to all private and public health establishments; that the regulations shall regulate the handling, storage, collection, transportation, treatment and disposal of health care waste; and that it does not apply to radioactive, electronic and animal wastes.

These Regulations also provide a formal definition of "Health Care Risk Waste". It refers to waste "capable of producing any disease". It includes, but is not limited to, the following:

(i) Chemical waste
Means solid, liquid and gaseous products that are to be discarded and that contain dangerous or polluting chemicals that pose a threat to humans, animals or the environment, when improperly disposed of.

(ii) Cytotoxic waste
Means waste that is toxic to cells and that can lead to cell death.

(iii) Genotoxic waste
Means waste capable of interacting with living cells and causing genetic damage.

(iv) Infectious waste
Means materials suspected to contain pathogens (bacteria, viruses, parasites or fungi) in sufficient concentrations or quantity to cause disease in susceptible hosts.

(v) Isolation waste
Means waste containing discarded materials contaminated with excretion, exudates, or secretions from humans or animals who or which are required to be isolated in order to protect others from highly communicable or zoonotic diseases.

(vi) Laboratory waste
Means human or animal specimen cultures from healthcare and pathological laboratories; cultures and stocks of infectious agents from research and industrial laboratories; wastes from the production of bacteria, viruses, or the use of spores, discarded, live and attenuated vaccines, and culture dishes and devices used to transfer, inoculate and mix cultures; and waste containing any microbiological specimen sent to a laboratory for analysis.

(vii) Pathological waste
Means tissues, organs, body parts, blood, body fluids, human foetuses, infected animal carcasses and other waste from surgery and autopsies on patients with infectious diseases.

(viii) Pharmaceutical waste
Means unused medicines, medications and residues of medicines that are no longer usable as medication.

(ix) Radioactive waste
Means liquid, solid or gaseous materials that contain, or are contaminated with, radionuclides at concentrations or activities greater than the clearance levels and for which no use is foreseen.

(x) Sharps waste
Means items that could cause cuts or puncture wounds, including needles, hypodermic needles, scalpels and other blades, knives, infusion sets, saws, broken glass and pipettes.

4.2 Health Care Risk Waste generated in the Cederberg Local Municipality

Based on the results obtained during the 2022 HCRW survey, the following table shows which of the waste fractions defined above are generated in the study area. All such wastes form part of Industrial Group 16 listed in Schedule 3 of NEM:WAA.

Assumptions and Limitations:

1. The following conversion ratios were used if information was provided in litres:
    a. For Sharps: 1litre = 0.33kg
    b. For Infectious waste: 1 litre = 0.10kg
    c. For Pharmaceutical waste: 1 litre = 0.35kg
2. If ranges were given for collection times (e.g. "(name of service provider) collects once every 2-3 months") the longer timeframe was consistently chosen for quantity calculation purposes (in this example, a collection every 3 months would be assumed). Results therefore indicate the minimum expected quantity of HCRW generated in study area.
3. To fully verify results, site visits will need to be undertaken. This desktop survey is fully reliant on the honesty, knowledge and transparency of person being interviewed telephonically.

Table 3: HCRW generated within the study area

Industrial Group (NEM:WAA Schedule 3)	**Waste fraction** (G.N. No. R. 375 of May 2014)	**Generator and notes**	**Number of generators surveyed in study area:**	**Kilograms generated per annum**
16	(i) Chemical waste	**Laboratories and Pathologists:** Figures included in Hazardous Waste results.	Refer to Hazardous Waste Results	Refer to Hazardous Waste Results
16	(ii) Infectious waste	**Hospitals, Clinics, Medical practitioners (including general practitioners, physiotherapists, dentists etc.), pathologists, pharmacies, veterinarians:** Includes Medical Disposables such as cotton swabs, used bandages, gauze, plaster and syringes and could also include pathological waste from small surgeries (e.g. moles, extracted teeth, etc.) as well as isolation waste.	26	4 428 kg/a
16	(iii) Isolation waste	**Hospitals and Clinics:** COVID-19 related but included in infectious waste quantities	2	150 kg/a
16	(iv) Laboratory waste	**Laboratories and Pathologists:** Figures included in Hazardous Waste results.	Refer to Hazardous Waste Results	Refer to Hazardous Waste Results
16	(v) Pathological waste	**Hospitals, Clinics and Medical practitioners:** Also referred to as anatomical waste and includes removed organs, tissues and body parts from humans and animals.	5	523 kg/a
6	(vi) Pharmaceutical waste	**Hospitals, Clinics, Medical practitioners and pharmacies:** Expired and redundant pharmaceuticals.	7	432 kg/a
16	(vii) Sharps waste	**Hospitals, Clinics, Medical practitioners, Pharmacies, Veterinarians, Beauty Salons, Mortuaries:** Consists mostly of needles but also blades. Average weights: **Hospitals, Clinics, Medical Practitioners and Pharmacies:** 5 - 8g/needle **Dentists and Beauty Salons:** 3 – 5g/needle **Veterinarians:** 8 – 10g/needle	23	1 343 kg/a
			TOTAL H&HCRW:	**6 876 kg/a**

5 Conclusion and Recommendations

Results from the H&HCRW Survey conducted in June 2022 within the Cederberg Local Municipality shows that the majority of waste generators have systems and processes in place able to adequately and responsibly deal with the waste generated. However, the following risks have been identified during the 2022 H&HCRW survey:

1. Some smaller medical practices (e.g. single physiotherapists) have indicated that they struggle to find a service provider willing to accept their low quantities of sharps waste generated per annum. Services offered are usually on a monthly contract basis, and not on a once-off basis. Monthly contracts are usually too expensive for these small practices.
2. Generation of household hazardous waste is not included in the scope of the study but the disposal thereof via the municipal system can still cause harm. A system aimed at collecting household hazardous waste is advised. This includes all lighting waste.
3. The collection or removal of waste tyres has been flagged as a major struggle in the study area due to unreliable systems in place. Farmers often collect waste tyres from retailers for use on farms, which assist them with the management of this problematic waste fraction.
4. All fruit packaging houses, citrus and rooibos farms, breweries and food processing facilites indicated that they do not generate any hazardous waste during their on-site processes. This will need to be verified through site visits.

No major breaches of hazardous of health care risk waste management was uncovered during this desktop study that Cederberg Municipality needs to act upon.

Appendix A

Table 4: Schedule 3 of the National Environmental Management: Waste Amendment Act, 2014 Act No. 26 of 2014: Category A: Hazardous Waste

Industrial Group	Waste Fractions
1. **Wastes from agriculture, horticulture, aquaculture, forestry, hunting and fishing, food preparation and processing**	(a) hazardous portion of wastes from agriculture, horticulture, aquaculture, forestry, hunting and fishing
2. **Wastes from wood processing and the production of panels and furniture, pulp, paper and cardboard**	(a) hazardous portion of wastes from wood processing and the production of panels and furniture (b) hazardous portion of wastes from wood preservation (c) hazardous portion of wastes from pulp, paper and cardboard production and processing
3. **Wastes from the leather, fur and textile industries**	(a) hazardous portion of wastes from the leather and fur industry (b) hazardous portion of wastes from the textile industry
4. **Wastes from petroleum refining, natural gas purification and pyrolytic treatment of coal**	(a) wastes from petroleum refining (b) wastes from the pyrolytic treatment of coal (c) wastes from natural gas purification and transportation
5. **Wastes from inorganic chemical processes**	(a) wastes from the manufacture, formulation, supply and use (MFSU) of acids (b) wastes from the MFSU of bases (c) wastes from the MFSU of salts and their solutions and metallic oxides (d) metal-containing wastes (e) wastes from the MFSU of sulphur chemicals, sulphur chemical processes and desulphurisation processes (f) wastes from the MFSU of halogens and halogen chemical processes (g) wastes from the MFSU of silicon and silicon derivatives (h) wastes from the MSFU of phosphorous chemicals and phosphorous chemical processes (i) wastes from the MFSU of nitrogen chemicals, nitrogen chemical processes and fertiliser manufacture (j) wastes from the manufacture of inorganic pigments (k) other wastes from inorganic chemical processes
6. **Wastes from organic chemical processes**	(a) wastes from the manufacture, formulation, supply and use (MFSU) of basic organic chemicals (b) wastes from the MFSU of plastics, synthetic rubber and man-made fibres (c) wastes from the MFSU of organic dyes and pigments (d) wastes from the MFSU of organic plant protection products, wood preserving agents and other biocides (e) wastes from the MFSU of pharmaceuticals (f) wastes from the MFSU of fats, grease, soaps, detergents, disinfectants and cosmetics (g) other wastes from the MFSU of fine chemicals and chemical products

7. **Wastes from thermal processes**	(a) hazardous portion of wastes from power stations and other combustion plants (b) hazardous portion of wastes from the iron and steel industry (c) wastes from aluminium thermal metallurgy (d) wastes from lead thermal metallurgy (e) wastes from zinc thermal metallurgy (f) wastes from copper thermal metallurgy (g) wastes from silver, gold and platinum thermal metallurgy (h) wastes from other non-ferrous thermal metallurgy (i) hazardous portion of wastes from casting of ferrous pieces (j) hazardous portion of wastes from casting of non-ferrous pieces (k) hazardous portion of wastes from manufacture of glass and glass products (l) hazardous portion of wastes from manufacture of ceramic goods, bricks, tiles and construction products (m) hazardous portion of wastes from manufacture of cement, lime and plaster and articles and products made from them
8. **Waste from the photographic industry**	(a) hazardous portion of waste from the photographic industry
9. **Wastes from the manufacture, formulation, supply and use (MFSU) of coatings (paints, varnishes and vitreous enamels), adhesives, sealants and printing inks**	(a) wastes from MFSU and removal of paint and varnish (b) wastes from MFSU of other coatings (including ceramic materials) (c) wastes from MFSU of printing inks (d) wastes from MFSU of adhesives and sealants (including waterproofing products)
10. **Wastes from chemical surface treatment and coating of metals and other materials; non-ferrous hydrometallurgy**	(a) wastes from chemical surface treatment and coating of metals and other materials (for example galvanic processes, zinc coating processes, pickling processes, etching, phosphating, alkaline degreasing, anodising) (b) wastes from non-ferrous hydrometallurgical processes (c) wastes from sludges and solids from tempering processes (d) wastes from hot galvanising processes
11. **Wastes from shaping and physical and mechanical sur- face treatment of metals and plastics**	(a) hazardous portion of wastes from shaping and physical and mechanical surface treatment of metals and plastics (b) wastes from water and steam degreasing processes
12. **Oil wastes and wastes of liquid fuels (except edible oils)**	(a) waste hydraulic oils (b) waste engine, gear and lubricating oils (c) waste insulating and heat transmission oils (d) oil/water separator contents (e) wastes of liquid fuels (f) hazardous portion of other oil waste
13. **Waste organic solvents, refrigerants and propellants**	(a) waste organic solvents, refrigerants and foam/aerosol propellants
14. **Other wastes not specified in the list**	a) hazardous portion of wastes from end-of-life vehicles from different means of transport (including off-road machinery) and wastes from dismantling of end-of-life vehicles and vehicle maintenance (b) hazardous portion of wastes from electrical and electronic equipment (c) hazardous portion of wastes from off-specification batches and unused products

	(d) wastes from discarded gases in pressure containers and discarded chemicals (e) wastes from discarded batteries and accumulators (f) wastes from transport tank, storage tank and barrel cleaning (g) spent catalysts wastes (h) oxidising substances wastes (i) aqueous liquid wastes destined for off-site treatment (j) waste linings and refractories
15. **Construction wastes**	(a) wastes from bituminous mixtures, coal tar and tarred products (b) discarded metals (including their alloys) (c) waste soil (including excavated soil from contaminated sites), stones and dredging spoil (d) wastes from insulation materials and asbestos-containing construction materials (e) wastes from gypsum-based construction material (f) wastes from other construction and demolition wastes
16. **Wastes from human or animal health care and/or related research (except kitchen and restaurant wastes not arising from immediate health care)**	(a) wastes from natal care, diagnosis, treatment (b) wastes from research, diagnosis, treatment or prevention of disease in humans prevention of disease involving animals
17. **Wastes from waste management facilities**	(a) hazardous portion of wastes from incineration or pyrolysis of waste (b) hazardous portion of wastes from physico / chemical treatments of waste (c) hazardous portion of stabilised/solidified wastes (d) hazardous portion of wastes from aerobic treatment of solid wastes (e) hazardous portion of wastes from anaerobic treatment of waste (f) landfill leachate wastes (g) wastes from shredding of metal-containing wastes (h) wastes from oil regeneration (i) wastes from soil remediation