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Saldanha Bay Municipality

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Household Hazardous Waste Plan

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Signatures

Originator	Reviewer	Approver
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Disclaimer

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Abbreviations

DEA&DP	Department of Environmental Affairs and Development Planning
DFFE	Department of Forestry, Fisheries and Environment
E-waste	Electronic waste
HHW	Household Hazardous Waste
IWMP	Integrated Waste Management Plan
NEMWA	National Environmental Management Waste Act
PRO	Producer Responsibility Organisation
SBM	Saldanha Bay Municipality
WEEE	Waste Electrical and Electronic Equipment
WDF	Waste Disposal Facility

1. Introduction

Saldanha Bay Municipality (SBM) (WC014) is a local municipality located on the West Coast of South Africa, approximately 140 kilometres north of Cape Town. It forms part of the West Coast District Municipality (WCDM) (DC1), situated in the Western Cape Province. It abuts on the Bergrivier Municipality to the north and the Swartland Municipality to the east and south.

The SBM covers an area of 2 015 km² and has a coastline of 238 km. In total 6.5% of the geographical land is urban land and 93.5% rural land. Overall SBM constitutes 6.4% of the entire West Coast geographical land making it the smallest municipal area in the district. Saldanha Bay has the largest natural port in Africa and the area is earmarked as a regional develop node for industrial and economic development of the Western Cape Province and the west coast.

The main municipal office is located in Vredenburg, with satellite offices in Hopefield, St Helena Bay, Paternoster, Saldanha and Langebaan.

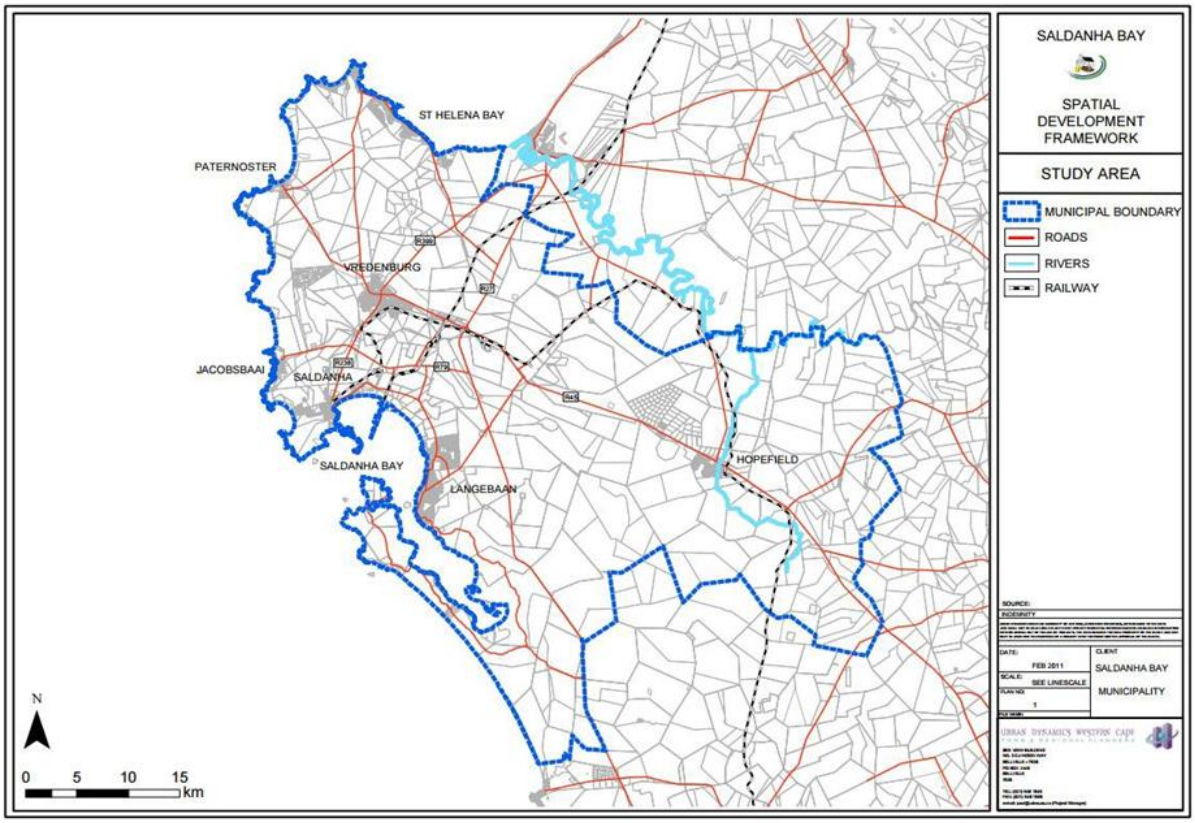

Figure 1 - Saldanha Bay Municipality - Study Area

The SBM is currently undertaking its 4th generation Integrated Waste Management Plan (IWMP) to update and replace the 2017 IWMP. As part of this process, household hazardous waste (HHW) is also being considered to ensure there are effective mechanisms in place to facilitate better management and provision of facilities for such waste materials. This will ensure that this waste is correctly handled, disposed and treated, and where possible recycled, upcycled or re-used.

If not disposed of correctly, household hazardous waste can negatively impact the environment if it is released (e.g., down stormwater drains, sewers or onto natural ground), and as such suitable facilities should be provided to limit negative environmental impacts.

1.1. Demographics

1.1.1. Population

The population of SBM is estimated at 121 939 in 2020, making it the second most populated municipal area in the WCDM. Population is expected to grow to 132 483 by 2024, equating to an average annual growth rate of 2.1 %.

1.1.2. Household sizes

Household size refers to the number of people per household. The actual size of households is on a downward trend from 3.4 people per household in 2020 to 3.2 in 2024. Contributing factors to a stagnation in household size growth could include, but are not limited to, lower fertility rates, occurrences of divorce, ageing population, etc.

1.1.3. Population density

Amidst rapid urbanisation across the Western Cape, population density figures will aid public sector decision makers to mitigate environmental, individual health and service delivery risks. In 2020, the population density of the West Coast District (WCD) was 15 persons per square kilometre with Saldanha Bay is the most densely populated municipal area at 61 people/km^2.

1.2. Overview of towns

The area of SBM includes a number of large rural areas, as well as the following towns:

1.2.1. St Helena Bay

St. Helena Bay is one of the world's principal fishing centres. The cold Benguela current surges upwards along this part of the coast and bring to the surface large concentrations of nutrient salt. Huge shoals of anchovies and pilchards (before they were depleted by overfishing) fed in the area on the plankton which flourished on the nutrient salts.

The Southern Right whales come annually from the Sub-Antarctic regions to calve and mate during the months of June to November. Humpback whales may be sighted during the months of October and November as these animals migrate south from their breeding grounds in tropical West Africa to their feeding grounds in the Antarctic. The bay is also popular for the dolphins; schools of over 1 000 have been sighted at times. The bay also hosts a variety of marine birds, penguins and large colonies of seals.

1.2.2. Jacobsbaai

Jacobsbaai is an isolated bay a few kilometres north of Saldanha Bay with a sea frontage of about 2 km. Its interesting coastline has peninsulas, rocky and sandy bays with cosy beaches and an abundance of seafood, crayfish, fish, mussels and abalone. The residential development at Jacobsbaai is taking place according to strict architectural guidelines in an effort to create a typical West Coast town character.

1.2.3. Paternoster

Life in Paternoster is still very much associated with the sea and fishing industry (Paternoster Fisheries). The town is a popular weekend destination for tourists from Cape Town and boast several rebound restaurants and bars.

1.2.4. Saldanha

Saldanha Bay is an important seaport, and the prominent iron ore terminal and quay extends into the bay and regularly hosts foreign bulk cargo vessels docked to onload iron ore and other minerals transport to the ore terminal from the North Cape mines. The bay is home to a large variety of fishing

vessels, a busy fishing harbour and several aquaculture industries. Saldanha Bay is the largest natural bay in South Africa. Its sheltered harbour plays an important part in the Sishen- Saldanha iron ore project. The flagship project, the Arcelor Mittal steel mill was however closed in 2020. The development of the Saldanha Bay Industrial Development Zone is progressing well and is expected to bring relief to the subdued economy of the region.

1.2.5. Hopefield

The town, 120 km north from Cape Town, is situated on the R45 and can be reached by either the West Coast R27 or N7 highways. Today the town serves the grain, dairy, meat, honey and “waterblommetjie” farmers of the area. It also boasts excellent education facilities and a modern retirement centre.

1.2.6. Vredenburg

Vredenburg is the largest administrative and commercial centre on the West Coast. In 1975, by government decree, Vredenburg and Saldanha were united as the Vredenburg-Saldanha Municipality.

1.2.7. Langebaan

Just over 100 kilometres from Cape Town, next to the scenic Langebaan Lagoon, lies the town of Langebaan, often described as the jewel of the West Coast. The town hosts various resorts including the Langebaan Country Estate with its internationally recognized 18-hole golf course and Mykonos with its marina, casino, restaurants and conference facilities.

Langebaan lies directly adjacent to the 30 000 ha West Coast National Park, well known for its birding and spring flower display, both attracting domestic and international tourists. The town has of late also become one of the preferred destinations for the wind and kite surfing fraternity, also drawing visitors from abroad, all contributing to the local economy.

1.3. Climate

The SBM area experiences a Mediterranean Climate with mild wet winters and warm dry summers. The monthly average air temperature and monthly rainfall distribution, monthly median rainfall and evaporation distribution for the Saldanha area (Schulze, 2009) is shown below. The long term (1950 – 2000) mean annual precipitation for the Saldanha area is 324 mm/a. The rainfall only exceeds evaporation in the winter months of May to June, during which groundwater recharge is expected to be most prevalent.

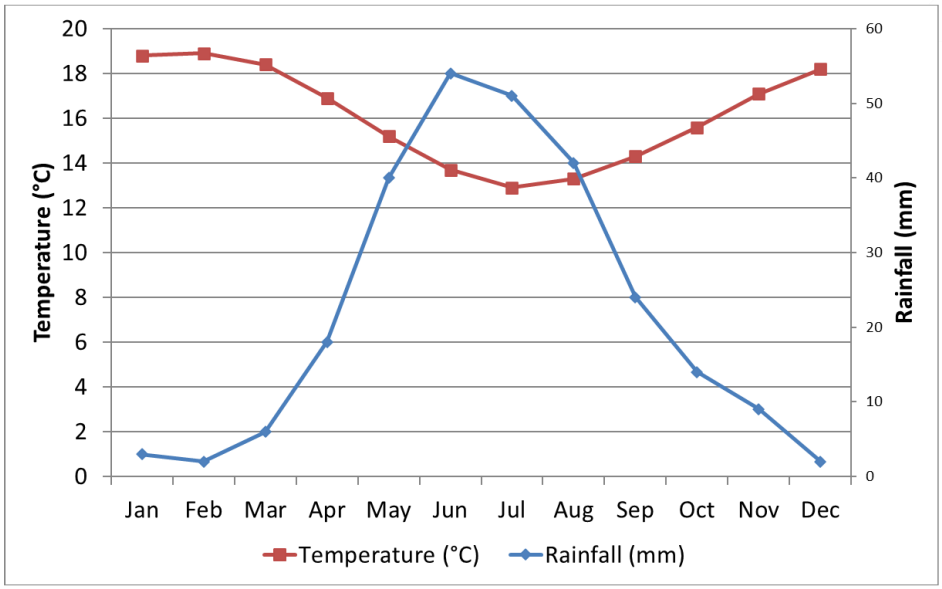

Figure 2 - Monthly average rainfall and temperature

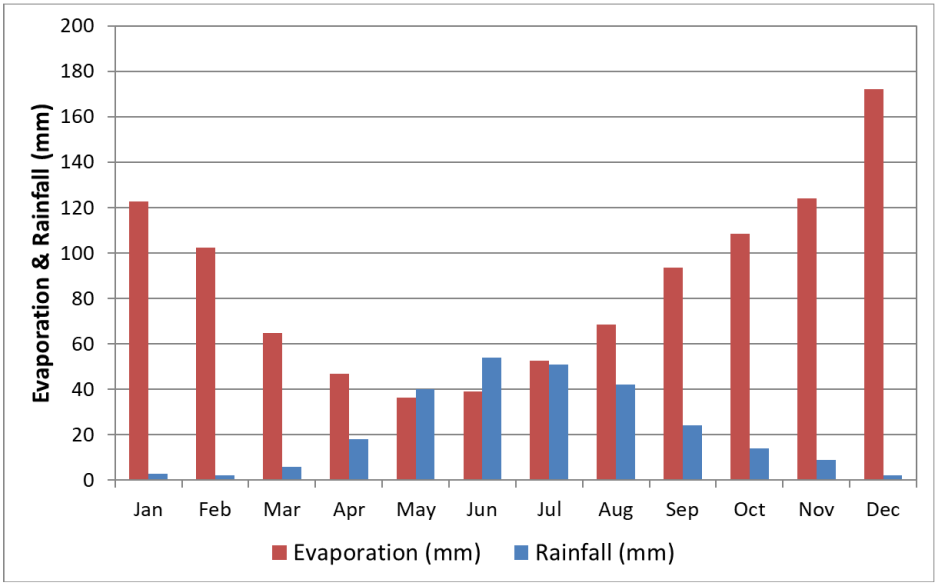

Figure 3 - Monthly median rainfall and evaporation

2. Legislative requirements

The Provincial Department of Environmental Affairs and Development Planning (DEADP) issued Household Hazardous Waste Management; Guideline for Municipalities in January 2020. The guideline tables legislation relating to HHW management are detailed below:

2.1. Municipal Systems Act (Act No. 32 of 2000)

Municipalities are expected to promote appropriate disposal of HHW and facilitate collection as best possible. Examples of this can be HHW collection days and drop off facilities that accept HHW. This requires awareness, collection and promotion of safe disposal.

2.2. National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)

Defines hazardous waste based on which many household items would be deemed hazardous however, there is no specific definition of household hazardous waste in the Act.

2.3. Hazardous Substances Act, 1973 (Act No 15 of 1973)

Covers a broad range of substances as it aims to regulate items that can cause harm to human, due to their potential hazardous properties. There are items/substances which originate from households which under certain conditions, fall under the Act.

2.4. Waste Classification and Management Regulations (GN. No. R. 634, 2013)

Prescribe requirements for the disposal of waste to landfill and timeframes for the management of certain wastes.

2.5. National Waste Information Regulations, 2012

Reporting of disposal of HHW e.g., chemicals

2.6. Occupational Health & Safety Act (85 of 1993)

Aims to prevent work-related injuries and illness by regulating health and safety in all organisations and will apply to the operation of a waste disposal facility (WDF), transfer station, collection event.

2.7. National Road Traffic Act 93 of 1996

Chapter VIII Dangerous Goods of this act details the requirements for transportation of HHW

2.8. Norms and Standards

Waste is managed in terms of the National Environmental Management Waste Act (No. 59 of 2008) (NEMWA) and includes general and hazardous waste. As part of the umbrella of waste-related legislation there are various Norms and Standards for the management of waste that fall below the thresholds of the List of Waste Management Activities in respect of which a Waste Management Licence is required in accordance with Section 20(b) of the NEMWA (Government Notice No. 921, 29 November 2013).

2.8.1. National Norms and Standards for Storage of Waste: GN No. 926, 2013.

The purpose of the National Norms and Standards for Storage of Waste is to:

- Provide uniform national approach relating to the management of waste storage facilities.
- Ensure best practices in the management of waste storage facilities.
- Provide minimum standards for the design and operation of new and existing waste storage facilities.

These norms and standards apply to any person who stores general or hazardous waste in a waste storage facility. These facilities are required to comply with the norms and standards without a need to conduct a Basic Assessment and obtain a Waste Management Licence as required by Government Notice No.718 of 3 July 2009.

"Hazardous waste storage facility" means a storage facility that has a capacity to store in excess of $80m^3$ of hazardous waste continuously.

The Norms and Standards stipulate the following requirements for waste storage facilities:

- Registration of the facility with the Competent Authority
- The following to be in accordance with the Norms and Standards
  - Location and Construction of the facility
  - Management of waste storage facilities
  - General provisions relating to training, emergency preparedness, monitoring, auditing and reporting
  - Minimum requirements for decommissioning of waste storage facilities

As such, should the storage capacity of household hazardous waste exceed $80m^3$ SBM will be required to comply with the above-mentioned Norms and Standards. It is however considered best practice to still comply with / be guided by the provisions of the Norms and Standards if the total storage volume does not exceed $80m^3$.

2.8.2. Norms & Standards for the Assessment of Waste for Landfill Disposal (GN. No. R. 635, 2013)

These norms and standards are not directly applicable to household hazardous waste at its source however these may be applicable where HHW is collected in bulk e.g., a Waste Drop Off Facility or transfer station. These standards must be used in conjunction with the National Norms and Standards for the Disposal of Waste to Landfill.

2.8.3. National Norms and Standards for the Disposal of Waste to Landfill (GN. No. R. 635, 2013)

Lighting lamps and Waste Electrical and Electronic Equipment (WEEE) are two examples of HHW which under these norms and standard are prohibited from landfill disposal. HHW other than those prohibited or restricted must be disposed of at certain classes of landfills depending on their type. Each class of landfill has its own containment barrier design. These standards must be used in conjunction with the Norms & Standards for the Assessment of Waste for Landfill Disposal.

2.9. Extended Producer Responsibility (EPR) Regulations

The Department of Forestry, Fisheries and Environment (DFFE) published the National Environmental Management: Waste Act (Act No. 59 of 2008) Extended Producer Responsibility (EPR) Regulations and notices for the identified waste streams of paper and packaging, electrical and electronic equipment (EEE) and lighting on 5 November 2020 for implementation. Further to this, the draft amendments to the regulations and notices regarding extended producer responsibility, 2020 were published for comment on 19 March 2021.

The purpose of the Regulations regarding extended producer responsibility, is to:

- Provide the framework for the development; implementation, monitoring and evaluation of EPR schemes by producers in terms of S18 of the NEMWA.
- Ensure the effective and efficient management of the identified end-of-life products.
- Encourage and enable the implementation of the circular economy initiatives.

In terms of the regulations, all producers of identified products and producer responsibility organisations (PRO's) must register with the department. The EPR system provides a means for relevant producers and PROs to register with the department and be issued with a unique registration number.

Although a number of producers and PRO's (more than 1 000) have indeed registered or submitted applications, it is not yet clear what strategies have been put in place and how these can be used by consumers. In addition (and within the context of this HHWMP) the department reports that there is little evidence of PRO's collaborating with Municipalities. Accordingly, the utilisation of these strategies by Municipalities to manage the HHW that falls in these sectors, is not yet easy to plan and implement

3. Waste generation, quantities and characteristics

A waste characterisation study for SBM was undertaken in 2021 for waste generated by households and commercial establishments from seven sample towns within the municipality. The intention of the waste characterisation was to understand the composition of waste generated by households and businesses to assist with effective waste management planning.

Household Hazardous Waste (HHW) consists of the following typical waste types (please note that this list is not exhaustive and provides examples of typical HHW types):

- Batteries
- Medication
- Fertilizers and pesticides
- Household cleaning products, aerosol sprays
- Pool chemicals
- Paint, thinners, varnish
- Fuel, used oil
- Fluorescent tubes, light bulbs
- Ink cartridges
- E-waste

The waste characterisation included the following categories relating to HHW and E-waste but did not specifically separate this waste type further:

- **Hazardous:** Waste paints, resin, glues, fluorescent tubes, batteries, pesticides, asbestos.
- **E-waste:** Any electrical or battery-operated objects.

The waste characterisation report[1] notes that the Department of Environmental Affairs and Development Planning (DEA&DP) *Waste Characterisation Guideline for Municipalities (March 2017)* determines the volume of waste by estimating the volume percentage occupied by the sorted waste types per basin. However, this was not practical due to the size of samples and the type of containers used for characterisation. The volume was therefore determined by converting the mass to volume into cubic metres (m^3) using material densities adopted for waste characterisation studies undertaken in the Garden Route municipalities as follows;

- E-Waste 120 kg/m^3
- Hazardous 348 kg/m^3

The findings of the waste characterisation study for HHW are summarised below.

Waste Type	Mass (kg)	Volume (m^3)	% of total waste
E-Waste	87.95	0,73	1.01%
Hazardous	64.65	0.19	0.74%

Table 1 – Characterisation of HHW and eWaste in SBM

The waste characterisation concluded that E-waste constituted a mere 1% of the total waste sampled by mass and 1.7% by volume. E-waste is however classified as hazardous waste but contains recyclable materials that can be recovered. The remaining hazardous components of the E-waste should be disposed of at an appropriate facility.

[1] Saldanha Bay Municipality Waste Characterisation Study 2021

Hazardous Waste constituted some 0.74% of the total waste sampled by mass and 0.43% by volume. Although minimal, hazardous waste is not permitted to be disposed with household general waste.

The average monthly municipal waste generation rate for the 12 months, May 2021 to April 2022 was calculated to be some 2,260 tons (SBM IWMP 2022) and applying the percentages in Table 1 the quantity of E-Waste and HHW generated in SBM is presented in Table 2.

Waste Type	% Total MSW generated	Tons/month	Tons/annum	m^3/annum
E-waste	1.01%	22.8	274.0	2,284
Household Hazardous	0.74%	16.7	200.8	577
Total		**39.6**	**474.8**	**2,860.6**

Table 2 - Estimated quantities of E-waste and HHW generated in SBM

Town	E-Waste	HHW	Total
Jacobs Bay	0%	0%	0%
Paternoster	2%	5%	3%
Hopefield	3%	6%	4%
St Helena Bay	7%	9%	8%
Langebaan	9%	17%	13%
Saldanha Bay	29%	27%	28%
Vredenburg	49%	36%	44%

Table 3 – Estimated distribution of E-waste and HHW generation per town

Table 3 above indicates that some 44% of all E-waste and HHW generated in SBM is from Vredenburg followed by Saldanha Bay and Langebaan at 28% and 13% respectively. The remaining smaller town account for some 15% of waste generated.

4. Status quo

The SBM reports that they do not collect or handle any hazardous wastes within the Municipal area, and all hazardous waste that is collected, is done so by registered private contractors and transported and disposed of at appropriately licenced disposal sites, primarily at the private Vissershok Landfill in Cape Town[2].

The current waste collection services offered by the municipality includes the following:

- Households receive a weekly refuse collection service.
- Informal areas are provided with skips in 11 strategic locations, which are collected once a week.
- Weekly waste collection services are also provided to schools, flats, hospitals, etc., from service points.
- Private waste service provider contracted by SBM (currently Waste-Gro) collects recyclables from 26 000 service points once a week. Two bags are provided, and two bags are collected. Recyclables from certain schools is also collected by Waste-Gro as a free service.

The SBM operates one Waste Disposal Facility (landfill), one Transfer Station and 6 Drop-Off facilities where businesses and private individuals can drop off municipal waste and or recyclables free of charge if under 1 ton. Provision is also made for small quantities of hazardous waste to be dropped off at the Langebaan Transfer Station and at the Vredenburg Materials Recovery Facility.

The areas that have no facilities are:

- Saldanha Bay (comprising Kalkrug and Diazville)
- St Helena Bay (comprising Stompneus Bay and Laingville)
- Hopefield
- Paternoster
- Jacobs Bay

4.1. Langebaan Transfer Station

Provision is made for the following:

- Containers for e-waste and oil waste in a locked room
- 240ℓ wheelie bin for fluorescent tubes in the same, locked room
- Locked containers for asbestos

The fluorescent tubes are transferred from the bin to a purpose-built box for transport and disposal.

When e-wastes accumulate, they are transferred to temporary storage until they are transported to Cape Town. Due to the high costs of transport, a load is made up of various waste types in order to justify a trip. These tasks are undertaken by a service provider contracted to the Municipality.

Anecdotal information indicates that the registration and access control associated with hazardous and household hazardous wastes, could be improved as some of these wastes enter the general stream.

Containers are placed outside the main facility, to cater for wastes arriving out of working hours and while this is a practical approach, it could attract hazardous wastes.

[2] Saldanha Bay IWMP, Draft Status Quo, April 2022

4.2. Vredenburg Landfill site and Materials Recovery Facility

Provision is made for the following:

- Containers for e-waste and oil waste
- 240ℓ wheelie bin for fluorescent tubes
- Locked containers for asbestos

The fluorescent tubes are transferred from the bin to a purpose-built box for transport and disposal

When e-wastes accumulate, they are transferred to temporary storage until a they are transported to Cape Town. Due the high costs of transport, a load is made up of various waste types in order to justify a trip. These tasks are undertaken by a service provider contracted to the Municipality.

The operator of the Materials Recycling Facility also assists in the management of containers.

4.3. Quantities

Role players at both facilities report that incoming HHW quantities are small – hence the practice of accumulation until a full load is achieved. See **Section 3** for discussion of waste quantities.

4.4. Downstream uses of HHW

The e-waste is potentially, the most readily recyclable fraction of the HHW stream. However, according to the current service providers of waste management services to SBM, there is very little uptake/use of this stream. This is due to the small quantities being generated, as well as the erratic tempo of generation. In addition, it appears that the labour and time cost in dissembling items and then separating valuable components, is costly.

5. Gaps and needs analysis

5.1. Gaps

- As outlined above, the SBM does not provide any services for the collection of HHW but does provide limited disposal options. These are insufficient and require users to travel great distances. In addition, there is too little information provided to residents.

  On the other hand, the Municipality (along with certain private entities) does provide services that facilitates recycling and allows many residents to support these initiatives with relative ease. However, it has been recognised that the support of waste management initiatives, does not always enjoy sustained participation by residents. This is also true with regard to HHW the limited HHW disposal options available to residents, could contribute to their support and commitment, reducing.

- At present, there is little to no data on HHW that can be used to inform planning.

- Most of the smaller Drop Off centres do not have facilities for the storage of HHW. In addition, they have little, to no, security. Upgrades will be necessary.

5.2. Needs

Although HHW does not account for significant volumes, it is clear that the service needs to be broadened by adding further sites for the disposal of HHW. This has to be coupled with an extended Public Awareness Campaign – which, in turn, must be aligned with similar initiatives contained in the latest Integrated Waste Management Plan.

In order to inform strategies, data on HHW must be collected at the various sites.

6. Objectives and goals

The objective of this HHWP is to provide an overview of how HHW could be managed within the SBM.

The goals to achieve this objective are as follows:

- Ensure separation at source of household hazardous waste out of the general waste stream.
- To provide every town with a drop-off facility, whether mobile or permanent.
- Provide education and awareness – public, schools, shopping centres
- Protect the environment from pollution.
- Form public and private partnerships to help SBM keep HHW out of the general waste stream.
- Collect HHW data to inform future planning.

7. Research

Salient points from various sources are summarised below.

7.1. Household Hazardous Waste Management Guideline for Municipalities – DEA&DP

- Few Municipalities provide HHW services
- There is little, to no, separation of these wastes from other household wastes
- Finances are a challenge
- There is a shortage of information relating to HHW characteristics, quantities and sources
- The document recommends that Municipalities:
    - Embark on a characterisation study
    - Identify potential collection/storage
    - Investigate education and awareness campaigns
    - Establish what resources are required, as well as training
    - Investigate partnerships with the private sector
- Drop Off points are few and are situated at distances requiring transport
- Delivery by the public and collection by the Municipality, or a combination, is the common model
- Permanent facilities are an option
- Stellenbosch Municipality embarked upon an awareness campaign in 2017
    - Two, HHW collection days were hosted
    - Pamphlets, posters and the website were used to create an awareness
    - Challenges experienced included:
        - Wastes not clearly identified by users
        - Wastes were mixed
- Overstrand Municipality's HHW programme
    - HHW bins are provided at their four Transfer Stations
    - E-waste is mixed but a number of HHW bins, for different categories, are provided
    - Gaps identified:
        - Public awareness was identified as being of critical importance
        - The need for a Waste Characterisation Study was recognised
        - As general points, illegal dumping and shortage of staff, were identified
        - The collected wastes were unfortunately stored for an extended period
- Mossel Bay Municipality's HHW programme
    - Facilities are provided at their two Transfer Stations and Municipal offices
    - Quarterly collection days are hosted
    - Awareness was via website, posters and newspapers
    - The public is showing increasing interest and there has been consistent growth
    - Waste is collected by private service providers
    - The lack of identification of the HHW types, is a challenge

7.2. Other sources

The common information from a number of sources is:

- Public awareness and education are critically important to alert residents to the needs for HHW management, as well as any strategies that the Municipality is embarking on
- Public apathy is a challenge
- Distances that need to be travelled to the nearest drop off point, are a disincentive
- Volumes are generally small – facilities and collection services must be geared appropriately
- The disproportionate cost to a Municipality for the collection/transport of HHW is a major obstacle. High disposal costs further aggravate this.

7.3. Engagements with DEA&DP

The concept of disposing so-called “low hazard waste” in a General waste landfill, has been discussed in waste management groupings.

Recent discussions with DEA&DP officials during the compilation of this HHW Plan, has yielded the guidance that Type 2 wastes and delisted hazardous wastes may be disposed in a Class B Landfill (Vredenburg). This is in accordance with the Norms and Standards for Disposal of Waste to Landfill.

However, the waste intended for disposal, must be assessed to demonstrate that it is indeed Type 2.

The Norms and Standards for the Assessment of Waste for Landfill Disposal prescribes the requirements for the assessment of wastes. In order to determine the waste type, sampling and analysis to determine the total concentration (TC) and leachable concentrations (LC) of the elements and chemical substances must be undertaken by an accredited laboratory and compared with threshold limits specified in the Norms and Standards.

Testing can be expensive, and it is likely to be impractical to assess the small quantities of HHW that arrive at the landfill.

8. Waste management plan principles

8.1. Waste hierarchy

Household Hazardous Waste management within SBM should be guided by the principles of the waste hierarchy as well as a Circular Economy approach (where possible).

The waste hierarchy is adopted by the *National Environmental Management: Waste Act 59 of 2008 as amended* as an approach to addressing waste management issues in South Africa.

The waste hierarchy places importance on managing waste by first reducing the generation of waste, re- using what can be re-used, if it cannot be reused it should be recycled. What cannot be recycled should be recovered, leaving the last available option as disposal to landfill. **Figure 4** illustrates the waste hierarchy.

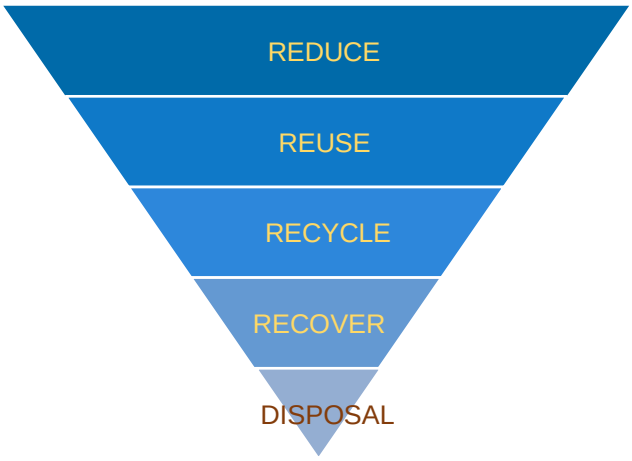

Figure 4 : Waste hierarchy. Reduction is the most favourable option and disposal the least favourable.

8.2. Circular Economy

A Circular Economy approach refers to trading and using products and services in closed cycles. The system is based on three principles: Designing waste and pollution out of the system; keeping products and materials in use; and regenerating natural systems[3]. In this regard a Circular Economy approach is aimed at reducing the negative impacts of the linear economy and facilitates long-term resilience, generated business and economic opportunities, and provides environmental and social benefits (Ellen Macarthur Foundation). **Figure 5** depicts the circular economy system diagram.

A Circular Economy Approach must be applied, as best as possible, when managing HHW within SBM to enable a closed loop system of resources.

- A closed loop system aims to minimise the amount of waste produced.
- A closed loop system also prevents material leakage by keeping products, equipment and infrastructure in use for longer.
- In addition to waste reduction, a closed loop system presents financial benefits.

[3] https://www.ellenmacarthurfoundation.org/circular-economy/concept

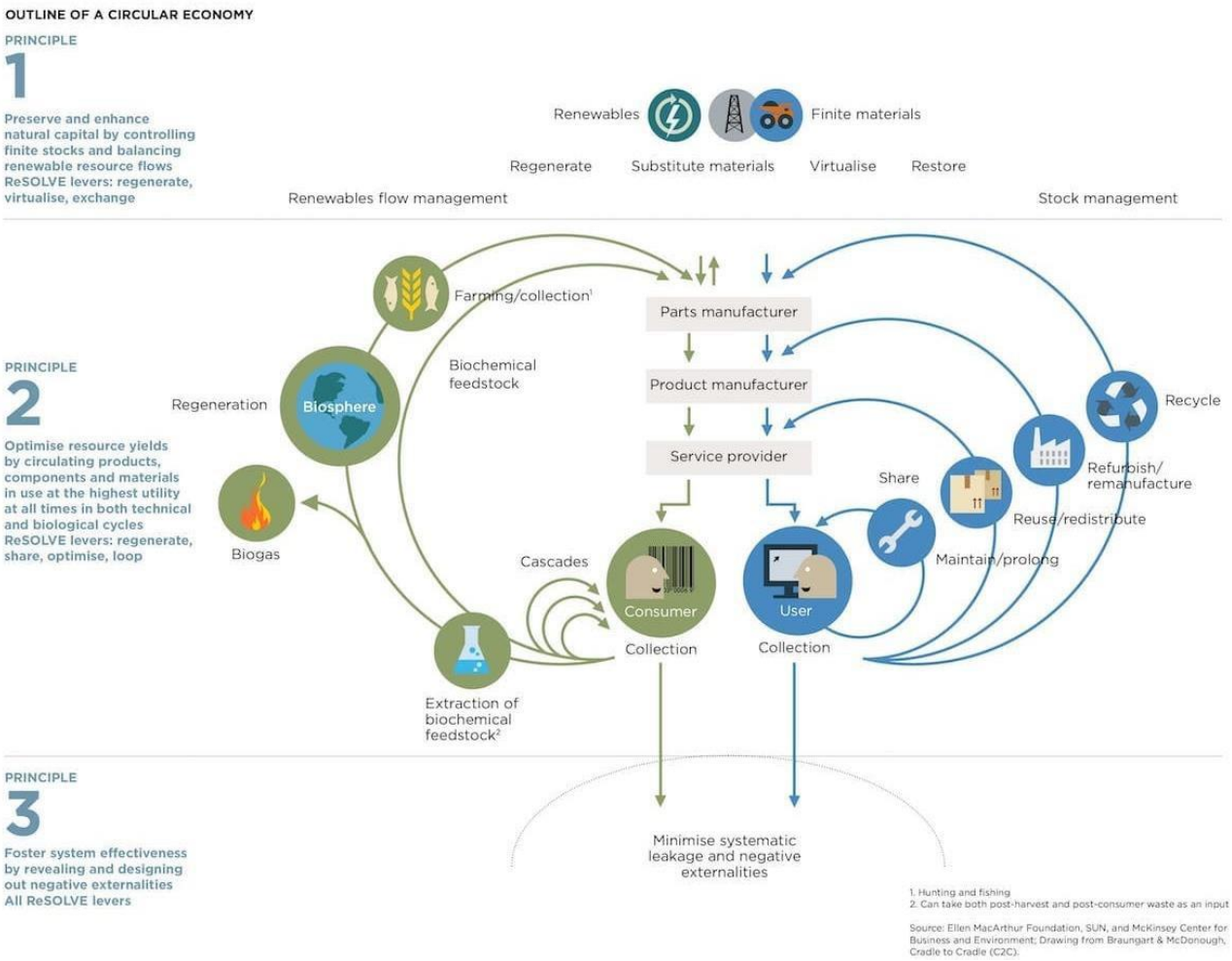

Figure 5: Circular Economy System Diagram.

Source: https://www.ellenmacarthurfoundation.org/circular- economy/concept

8.3. Accessibility and information

Once again, with the small volumes of HHW in mind, all measures implemented must be readily accessible to residents. This must be underpinned by providing residents with information on waste types and strategies.

8.4. Practicality

Strategies must be practical with regards to balance between costs and efficacy.

9. Management actions

This section discusses some challenges faced by the Municipality and also details the fundamental HHW management actions that must be implemented by SBM based on the principles of the waste hierarchy and circular economy approach.

9.1. Challenges specific to the Saldanha Bay Municipality

9.1.1. Distances

The areas of high population density are far apart. A round trip (such as would be travelled for collection) is in excess of 110km. In addition, the distance to be travelled by residents, from the average business or home, requires the use of transport.

9.1.2. Waste quantities

The quantities of HHW are small and the generation tempo is erratic.

9.1.3. Public awareness

The average resident is not fully aware of the need for waste management, nor the specific challenges associated with HHW. In addition, apathy remains an obstacle because for many residents, waste management is a concept that is overshadowed by the basic needs of daily life.

9.1.4. Costs

The management of the small quantities of HHW, as well as the excessive distances that need to be travelled, attract disproportionate costs. Added to this, is the high cost of disposal plus the fact that this service must be provided by private entities.

Limited budgets and the competition for available funds, aggravates this.

9.1.5. Waste stream characteristics

Typically, HHW is mixed with other waste types and the quantities are generally small. At a landfill site (Vissershok in this case) the waste needs to be classified in order to determine disposal methods and cost. If a mixed waste stream is presented for disposal, it will either be rejected based upon its mixed nature, or the classification could possibly be conservative and focussed on the most problematic waste in that load. This will inflate costs and in the case of rejection of the load, would require the transporter to make alternative arrangements.

The sorting of the waste, at source, appears to be a solution here, but in practice it is impractical and excessively costly.

9.2. Principles of the waste hierarchy

- Apply principles of the waste hierarchy when managing HHW.
- Ensure that all possible waste **minimisation** interventions are implemented. This can be achieved through education and awareness.
- Identify ways in which waste products can be **reused**. Encourage reuse of items such as electronics. Encourage refurbishment and second-hand markets.
- Identify waste streams that can be **recovered** and ensure the various streams are recovered.
- Thereafter, consider all potential recyclable materials, and ensure the materials are **recycled**.
- **Disposal** of material should only be considered as the last resort. If disposal is necessary, ensure that responsible disposal of waste is practiced.

9.3. Waste separation

- Encourage separation of HHW through constant education and awareness.
- All potential recyclable HHW materials must be identified and stipulated.
- Hazardous waste must be stored separately from general waste to avoid contamination.

9.4. Waste storage

9.4.1. Risks associated with hazardous waste storage:

- Soil contamination from leaks.
- Risk of water pollution if hazardous waste enters waterways.
- Risks of fire if flammable substances are not handled/stored correctly.
- Risk of corrosion to infrastructure / equipment if corrosive substances are not stored correctly e.g., battery acid.
- Risk to human health as some hazardous substances may be corrosive, toxic, flammable and can cause irritation to human skin.
- Health risk to humans (e.g., staff) if they come in contact with hazardous substances.

9.4.2. Management actions to reduce risks

- An area for the storage of various HHW types and their sorting must be dedicated and signposted/clearly marked.
- All waste storage areas must be kept neat and clear of litter and other waste types.
- An adequate number of containers/bins must be provided for the storage of HHW waste at the various storage locations and/or drop-off sites.
- The following is recommended for each drop-off site:
    - One 5 / 6m^3 skip for asbestos (with a lockable cover)
    - Four lockable 240ℓ wheelie bins for the storage of CFL bulbs, batteries, pesticides, chemical bottles etc
    - Appropriate storage boxes/containers for fluorescent tubes.
- The total storage volume shall not exceed 80m^3
- Bins must have labels / signage indicating which HHW types are to be disposed of in the respective bins to prevent:
    - Contamination
    - Mixing of chemicals
    - Breakage of light bulbs / tubes
    - Leakage of chemicals
- Waste storage areas and bins must be cleaned and maintained regularly.
    - Ensure that wastewater generated from cleaning storage areas is captured to prevent contaminated water from being washed into stormwater drains or entering the environment.

- Set-up a contaminated wastewater management system, if wastewater is generated.
- Wastewater shall be removed to a licensed disposal site.

- Areas for the storage of used oil and other flammable materials shall comply with standard fire safety regulations.
- All containers containing used oil and other flammable materials shall be sealed and stored on a waterproof/impermeable surface or bunded area.
- Store waste in a cool area.
- Store medication/pharmaceutical waste in lockable containers where they cannot be accessed.

Figure 4 below and Figure 5 over show conceptual design considerations for the storage of household hazardous wastes with and without recyclables.

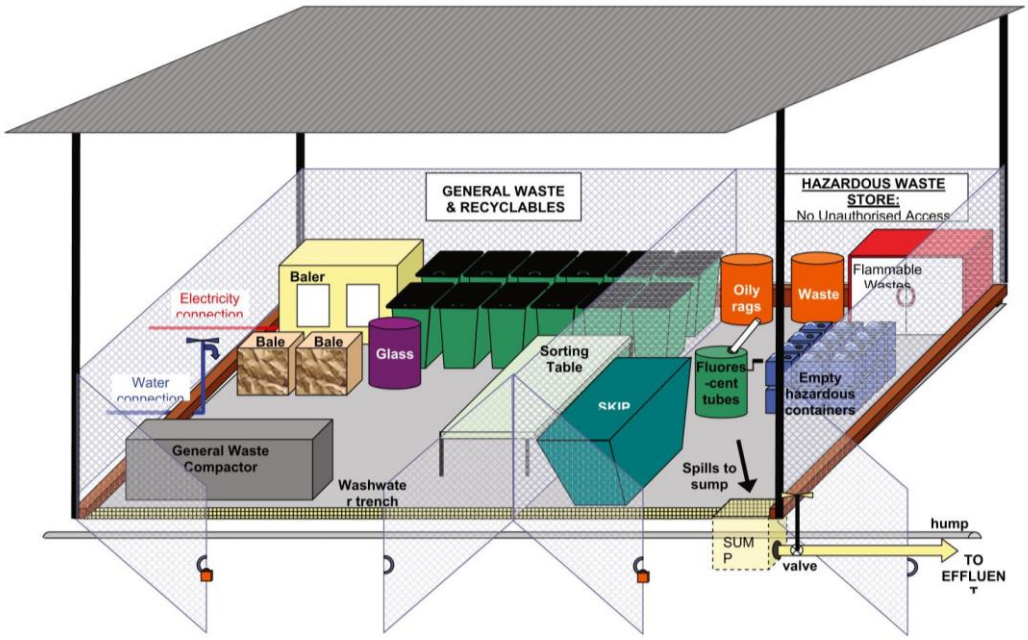

Figure 6: Conceptual general and household hazardous waste store design considerations

(Guidance for the Classification, Rating and Disposal of Common Hazardous Waste Streams WRC Report No 1548/1/06, December 2006)

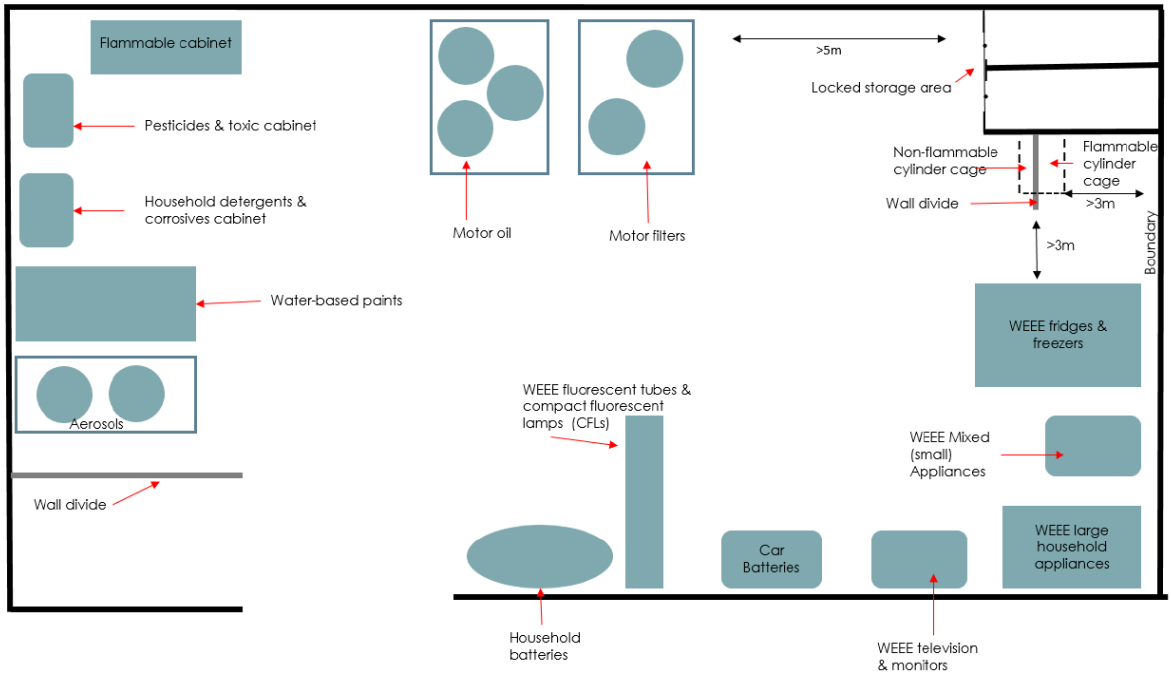

Figure 7: Sample site layout plan

(Household Hazardous Waste Management Guideline for Municipalities – DEA&DP)

9.5. Reduce waste transportation and disposal costs

- Ensure that Contractors are appointed to transport full loads of waste, in order to minimise transportation costs. Transporting half loads will require more loads to be transported resulting in more loads being paid for. Transport costs are usually paid per load and not volume or weight of waste.
- Identify recyclable/recoverable HHW types and arrange for waste to be collected or delivered to recyclers, once full loads have been collected at the various drop-off sites.
- HHW shall be transported to Vissershok Private Landfill Site every 90 days for disposal.

9.6. Hazardous waste disposal

- Hazardous waste items that cannot be reused / recovered / refurbished / recycled must be disposed of at licenced hazardous waste management facilities. Safe disposal slips must be retained on site for record keeping purposes.
- All waste disposed of/collected for reuse or recycling must be collected by an accredited waste service provider.
- Waste service providers and recyclers collecting waste must provide a waste manifest indicating the volume, type and date of waste removed from site.

9.7. Monitoring and Data collection

A record of all waste types and quantities must be retained for planning and reporting purposes.

- The mass/volumes of all collected HHW types must be recorded at each storage facility prior to disposal / recycling.
- The mass/volumes of HHW being disposed of must be recorded.

- The mass/volume of HHW being recycled must be recorded.
- The mass/number and types of electronics being refurbished must be recorded.
- Duration of HHW storage at each storage facility must be recorded.
- Proof of disposal/reuse/recycling/recovery method of each waste type must also be retained.

9.8. Training and Emergency Preparedness

- Training and awareness on HHW management must be incorporated into existing training and Health and Safety procedures and systems. Training must be provided to all staff involved in the implementation and operations of the HHW plan. The purpose behind the HHW plan should also be communicated.
- It is recommended that it be included as an agenda item at Health and Safety meetings held at existing waste facilities where HHW drop-offs will be located.
- Ensure that all staff who come into contact with hazardous waste are supplied with the required / appropriate personal protective equipment.
- Prepare an emergency preparedness plan to include procedures to follow in case of various emergencies (e.g., fire, spills, human contact with hazardous substances etc.).
- All staff shall be informed of procedures to follow in case of an emergency. A staff member should be nominated as a person responsible for managing any emergency at each collection site / facility.

10. Household hazardous waste plan

10.1. Options and methodology

10.1.1. Methodology and approach

The overall approach is to provide disposal facilities at all Drop Off centres. In parallel, it is recommended that the Municipality provides containers at the Municipal offices and depot, as well as to form partnerships with private entities for the provision of further containers.

In **Section 3** the quantities of HHW were discussed. Based on this information (viz. the amount of HHW generated per area per month) an assessment of the volume of E-waste and HHW generated in SBM has been calculated for each town. Clearly a large portion of this waste, in particular HHW will not be separated in the short to medium term and the suggested approach would be to provide a number of 240ℓ wheelie bins and other receptacles at each drop-off facility and to monitor usage. Saldanha Bay and Vredenburg may require additional bins.

E-waste ideally should continue to be collected by private operators but the provision of a skip or cage at the larger towns should be considered.

Town	E-waste	HHW	E-waste	HHW	E-waste	HHW
	% of total generated		tons/month		m^3/month	
Jacobs Bay	0%	0%	-	-	-	-
Paternoster	2%	5%	0.5	0.9	4.1	2.5
Hopefield	3%	6%	0.7	1.0	6.0	2.9
St Helena Bay	7%	9%	1.6	1.6	13.4	4.5
Langebaan	9%	17%	2.1	2.8	17.7	8.2
Saldanha	29%	27%	6.6	4.5	55.0	12.9
Vredenburg	49%	36%	11.3	6.0	94.1	17.1
TOTALS			**22.8**	**16.7**	**190.3**	**48.1**

Table 4 – Estimated tonnage and volume of e-waste and HHW generated in SBM

Extending the approach set out above, the table below shows the suggested distribution of bins at each centre, based upon a single collection per month. Note that Diazville and Kalkrug, as well as St. Helena and Laingville, have been expanded from Saldanha Bay and St Helena respectively. In addition, Jacobs Bay has been allocated some bins.

Town	Facility currently in place	Bin distribution based on once-a-month collection	
		E-Waste	Hazardous
Jacobs Bay	Nothing	1	1
Paternoster	Drop Off	2	4
Hopefield	Drop Off	2	2
Langebaan	Transfer Stn	2	2
Vredenburg	Landfill/MRF	8	4
Diazville	Drop Off	2	2
Kalkrug	Drop Off	2	1
St Helena	Drop Off	1	1
Laingville	Drop Off	1	1
TOTALS		**21**	**18**

Table 5 – Bin distribution in towns and facilities in SBM

The intention of the above approach is to provide a reference point - that is based upon the expectation of monthly HHW quantities, as extrapolated from the waste characterisation study data. Furthermore, applying the logic that suggests that if 240ℓ bins are used as containers, 39 bins are needed to

accommodate the incoming waste and must be deployed at the various centres and that these will need to be collected and emptied, once a month.

10.1.2. Options

A number of options are explored below, with indicative costs included. As is the case with any strategy, comprehensive monitoring and information gathering must take place in order to measure efficacy and to bring about necessary changes.

10.1.2.1. Bins deployed at all centres, monthly collections

Option 1	Quantity	Cost:	Amount
No. bins deployed at main centres	39		
Bins purchased (39 duty, 39 replacements for full bins removed)	78	(R655.50 incl VAT each)	R 51 129
Allocation of space at existing Drop Off centres	8	R 25,000	R 200,000
Preparation of space at Jacobs Bay	1	R 50 000	R 50,000
Awareness and education campaign	(using existing Municipal systems)		
Once a month collection (100km round trip)	1/month:	R5 000	R 5,000
Management – use existing staff		In-house	
Transport and disposal of HHW (1 tonne, 350km round trip)	Disposal approx. R 900 per ton		R 8 000

Table 6 - Option 1 cost parameters

It is clear that apart from the purchase of the bins, the costs of transport (collection and disposal) are a major contributor to monthly costs.

10.1.2.2. Bins deployed at existing Drop Off centres only, monthly collections

Option 2	Quantity	Cost:	Amount
No. bins deployed at main centres	37		
bins purchased (37 duty, 37 replacements for full bins removed)	74	(R655.50 incl VAT each)	R 48 507
Allocation of space at existing Drop Off centres	8	R 25,000	R 200,000
Awareness and education campaign	(using existing Municipal systems)		
Once month collection (100km round trip)	1/month:	R5 000	R 5,000
Management – use existing staff		In-house	
Transport and disposal of HHW (1 tonne, 350km round trip)	Disposal approx.. R 900 per ton		R 8 000

Table 7 – Option 2 cost parameters

Again, transport costs (collection and disposal) are major contributors.

10.1.2.3. Bins deployed at existing Drop Off centres, partnerships with local businesses, monthly collections

	Quantity	Cost:	Amount
No. bins deployed at main centres	37		
74 bins purchased (37 duty, 37 replacements for full bins removed)	74	(R655.50 incl VAT each)	R 48 507
Allocation of space at existing Drop Off centres	Cost:		R 200 000
Awareness and education campaign	(using existing Municipal systems)		
Once month collection (100km round trip)	1/month:	R5 000	R 5,000
Management – use existing staff		In-house	
Transport and disposal of HHW (1 tonne, 350km round trip)	Disposal approx. R 900 per ton		R 8 000

Table 8 - Option 3 cost parameters

Once again, transport costs (collection and disposal) are major contributors. Even with the support from local business, transport is an issue.

10.1.2.4. Pilot scheme – deploy two bins each at Drop Off centres where there is supervision

	Quantity	Cost:	Amount
No. bins deployed at centres (Paternoster, Laingville, St Helena, Diazville, Kalkrug, Hopefield)	12		
bins purchased (12 duty, 12 replacements for full bins removed)	24	(R655.50 incl VAT each)	R 15 732
Awareness and education campaign	(using existing Municipal systems)		
Once month collection (100km round trip)	1/month:	R5 000	R 5,000
Management – use existing staff		In-house	
Transport and disposal of HHW (1 tonne, 350km round trip)	Disposal approx. R 900 per ton		R 8 000

Table 9 - Pilot Scheme cost parameters

10.2. Discussion

10.2.1. Costs:

As can be seen above, there appears to be no significant costs difference between the options discussed. Apart from the initial cost of the provision of bins, transport remains the variable with the most financial impact. Even with the participation of all residents in HHW management, the waste still has to be collected and transported to a disposal point. Vissershok is the only Hazardous disposal facility, and its distance is a challenge.

It is clear that the reduction in the quantity of HHW, has the most significant, positive impact on costs – collections and disposal can be less frequent. Although education and awareness are the foundation of any potential change, the Municipality will have to provide alternatives – a major one being for the

recycling of E-wastes. In this regard, further collaboration with local businesses and waste service providers, will have to form part of this process.

10.2.2. Extended Producer Responsibility:

While it is not the responsibility of the Municipality to enforce the implementation of the Extended Producer Responsibility Regulations, it is advantageous to engage with business and enforcing authorities, in order to help accelerate implementation, as well as to establish which local producers fall within the ambit of these regulations. At this stage, these regulations are emerging from the phase where manufacturers of products that result in waste streams of paper and packaging, electrical and electronic equipment (EEE) and lighting, were required to have registered with the authorities i.e., the regulations are in a very early stage of implementation.

10.3. Suggested strategy

Based on the discussions above, it is suggested that the following takes place:

- Implement a far-reaching Education and Awareness campaign. This must be coupled with other campaigns as recommended by the current IWMP – this is in order to take advantage of the momentum gained by the greater campaign
- Enter into discussions with local business (shopping centres, small shops) in order to encourage collaboration and the provision of containers on their premises, as well as to explore EPR options
- Enter into discussions with and particularly local waste service providers – these entities are exposed to the various processes on a regular basis. These discussions are with a view to examining the options of recycling E-waste
- Place 2 bins each, at existing Drop Off centres where there is supervision (1 bin E-waste, 1 bin other HH waste = 12 x 2 = 24)
- Plan on collection and transport only once every 2 months
- Monitor the usage of all bins and containers and thereby track waste volumes, collection frequency and disposal frequency.
- Maintain comprehensive records
- Based upon uptake and volumes, prepare Drop Off centres on an on-going basis

10.4. Summary of estimated costs

Proposed Option/Strategy	Fixed cost to establish	Annual cost
Bins deployed at all centres, monthly collections	R 301 129	R 156 000
Bins deployed at existing Drop Off centres, monthly collections	R 248 507	R 156 000
Bins deployed at existing Drop Off centres, monthly collections, partnerships	R 248 507	R 156 000
Initial strategy/pilot (no site preparation)	R 15 732	R 78 000

Table 10 – Cost estimate of options/strategy

10.5. Implementation guidelines

The HHW Plan shall be implemented as per the following guidelines:

Table 11 – Implementation guidelines

Phase	Guidelines
1. Initiation	• The drafting of this HHW plan falls within the initiation phase. The HHW plan outlines the various HHW collection and treatment options being considered by the SBM. • A team to oversee and manage the implementation of the HHW Plan will then be put together. Relevant internal personnel / external consultants to be identified.
2. Planning	The implementation team will then undertake to develop a detailed implementation plan - this will include consideration of the following elements and requirements: • Infrastructure (including budget allocation and factoring procurement lead times) • Logistics (storage; transportation and collection mechanisms) • HHW treatment options • Viable communication channels to communicate the implementation of the HHW plan to residents • Phasing of pilot project and roll out within the Municipality
3. Preparing	During the preparation phase the team will prepare for the operational aspects required for successful implementation: • Staffing • Collaboration between national, provincial and local government; the private sector and Producer Responsibility Organisations (PROs) • Knowledge building (i.e., training of staff) • Equipment • Measuring, monitoring and reporting methods
4. Executing	Execution of the project: • Rolling out communications plan • Handing over the project to the operations team • During the execution phase SBM must keep a record of lessons learned and use these lessons to plan for expansion

10.5.1. HHW Collection schemes

SBM will develop a HHW collection model / strategy which may consist of a combination of the three collection schemes described below.

In order to assess and prove the viability of the collection schemes below, it is recommended that the schemes are initially piloted / rolled out on a small scale prior to full implementation or development of permanent infrastructure.

10.5.1.1. Permanent Collection Points (PCPs) (i.e., drop-off facilities):

Making drop-off facilities available for the public to drop-off their HHW. This may not necessarily require construction of permanent infrastructure but could be a permanent service provided at existing suitable infrastructure e.g., wheelie bins at existing drop-offs or suitable collection containers/receptacles at Municipal Offices. Should the volumes or demand dictate the need for permanent or larger scale infrastructure such as containers or storage areas then this must be considered.

PCP's need to be placed in controlled areas which are locked/secured after hours and where scavenging/waste picking cannot take place.

10.5.1.2. Events:

HHW collection events where residents are invited to drop off their HHW at a specific venue (schools, parks, churches etc. may be used as collection venues for events).

a. Events may also be used as a platform for education and awareness. The public can be educated about:
    i. The environmental risks associated with HHW.
    ii. The various types of HHW.
    iii. Responsible and safe disposal / recycling of HHW.
    iv. This will also be an opportunity for SBM to raise awareness on where the HHW drop-offs are located within the municipality; and
    v. To encourage residents to drop HHW off at convenient points that SBM has partnered with, such as local retailers, clinics, hospitals and pharmacies.

Events may be more suitable in areas where population size and expected volume of HHW would not justify PCPs and could be combined with a mobile collection service.

10.5.1.3. Mobile collection

Scheduled mobile collection of HHW from residential areas within a fixed weekly / monthly schedule. A schedule would be communicated to residents.

10.5.2. Collaboration

10.5.2.1. Government: Saldanha Bay Municipality plans to collaborate with national, provincial and local government on implementation of the HHW.

a. Knowledge sharing amongst local municipalities.
b. Guidance and provision of training from provincial government.
c. Guidance and potential for grant funding from national government.

10.5.2.2. Private sector

a. Collaboration with private consultants for technical support / services where required.
b. Collaboration with PROs to play a municipal support function.
c. Collaborate with retailers who place collection bins at their stores, this should include hardware stores, pharmacies as well as grocery stores.

***Note that collaborations and partnerships are yet to be explored and initiated by SBM.**

10.6. Household Hazardous Waste Plan

Table 12 - HHW Types and Recommendations for collection, recovery, reuse, recycling or disposal

HHW Type	Recommendations for collection, recovery, reuse, recycling or disposal
Flammable substances and chemicals • **Used oil/grease** • **Paint, thinners varnish** • **Household cleaning products** • **Fertiliser and pesticides**	• Old oil to be collected for recycling by a service provider. • Source a service provider to collect and clean oily rags. e.g., ROSE foundation. • Dried and solidified water-based paint can be landfilled at a non-hazardous landfill. • Solvent / oil-based paint must be disposed of at a hazardous landfill site. • Empty paint metal and plastic containers must be recycled. • The disposal of pesticides and fertiliser must be in accordance with the waste disposal restrictions as per the National Norms and Standards for disposal of waste to landfill (Government Notice No. 636, 23 August 2013). Refer to Section 5 of the Norms and Standards. • Source a service provider to collect and treat fertiliser and pesticides where possible.
Batteries • **Batteries used in devices e.g., cell phones, flashlights, TV remotes, etc.** • **Car batteries**	• Partner with local retailers to accept household batteries for disposal and recycling. Collection of batteries from the local retailers to remain the responsibility of SBM (i.e., collection by SBM / service provider on behalf of SBM).
Electronic waste / E-waste • **Cell phones, computers, monitors, etc.** • **Appliances**	• Partner with local E-waste refurbishers to refurbish collected E-waste where possible in order to establish a second-hand electronics market. Repair and refurbishment and assist in job creation. • Encourage residents to re-sell, refurbish E-waste before considering disposal. • Partner with E-waste recyclers to collect E-waste from drop-off facilities for recycling. • Data security of electronic devices, such as computers and cell phones, is a key concern. SBM must assure residents that confidential data on electronic devices is not leaked and will be removed or destroyed prior to disposal. • An E-waste recycler / collector must be asked to provide options as to how sensitive data will be protected.
Old / expired medication	• Partner with local pharmacies / clinics / hospitals to accept old / expired medicine for disposal. • Encourage residents to return old / expired medication to local pharmacies for safe disposal and destruction of medicines and scheduled substances as per the Medicines and Related Substances Control Act (Act 101 of 1965): Rules relating to good pharmacy practice. • If pharmacies are not equipped to take responsibility for disposal and destruction of medicines, SBM is to

HHW Type	Recommendations for collection, recovery, reuse, recycling or disposal
	remain responsible for collection (i.e., SBM / service provider on behalf of SBM) and disposal. • Ensure that old / expired medicine is disposed of at a waste facility in possession of a certificate specifically to dispose of medical waste, in line with Section 51 (1)(a) of the National Environmental Management Act 59 of 2008.
Fluorescent tubes and light bulbs	• Partner with local retailers to accept compact fluorescent light bulbs for disposal and recycling. Collection of light bulbs from the retailers is to remain the responsibility to SBM (i.e., SBM / service provider on behalf of SBM).
Ink cartridges and toners	• Encourage residents to return used ink cartridges and toners to suppliers for refill / recycling. • Partner with recyclers to collect ink cartridges and toners.

10.7. Implementation Plan

The implementation plan is presented over in a table format. A timeline and priority have been assigned to each task. These tasks should be reviewed annually by the SBM and amended or adjusted accordingly.

List of activities for the implementation and prioritisation of the HOUSEHOLD HAZARDOUS WASTE PLAN

IMPLEMENTATION AND PRIORITISATION PLAN

No.	*Activity*								*Priority*
		23/24	24/25	25/26	26/27	27/28	28/29	29/30	High (H) Medium (M) or Low (L)
1	Training municipal employees and making them aware of HHW and how it is to be managed								H
2	Develop and implement an Education and Awareness program for HHW								H
3	Engage with local businesses								M
4	Initiate and operate a 2 bins pilot project.								H
5	Upgrade Drop Offs to accommodate HHW collection facilities.	Diazville	Kalkrug	Stompneus	Paternoster	Hopefield	Laingville	Langebaan & Vredenburg	H-M
6	Include HHW in operation/collection tenders								H
7	Increase number of bins								M
8	Monitor and review compliance of the HHWP and revise as and when required.								M