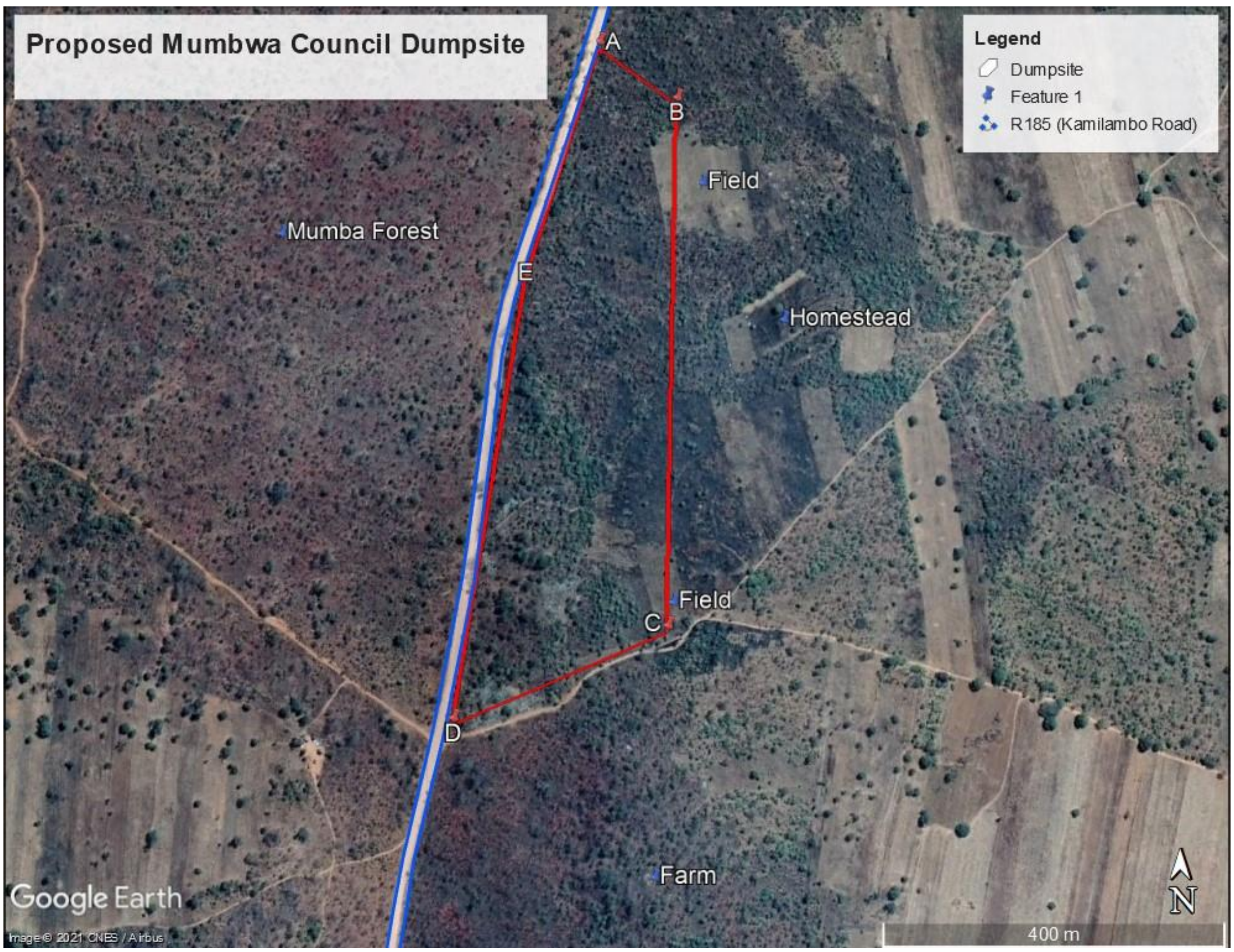
MUMBWA TOWN COUNCIL DUMP SITE PROFILE – 2023

Mumbwa Town Council **(MTC),** also referred to as the Council or Local Authority, is a body corporate established as a Town Council under the Ministry of Local Government and Rural Development in Central Province of the Republic of Zambia.

The council is mandated by law (Environmental Management Act No 12 of 2011, among many others) to operate and manage one or more waste disposal sites within the waste control area. This may include; landfill, dump site or any other waste disposal facility.

In this regard, MTC is currently operating an open air dump site sitting on a 12 Hectare piece of land in Shilimatanga Village, Chief Mumba of Mumbwa District in Central Province of Zambia. It is situated approximately 18 km North-West of Mumbwa Central Business District (CBD) on Kamilambo Road.

Fig 1. Location Google earth map



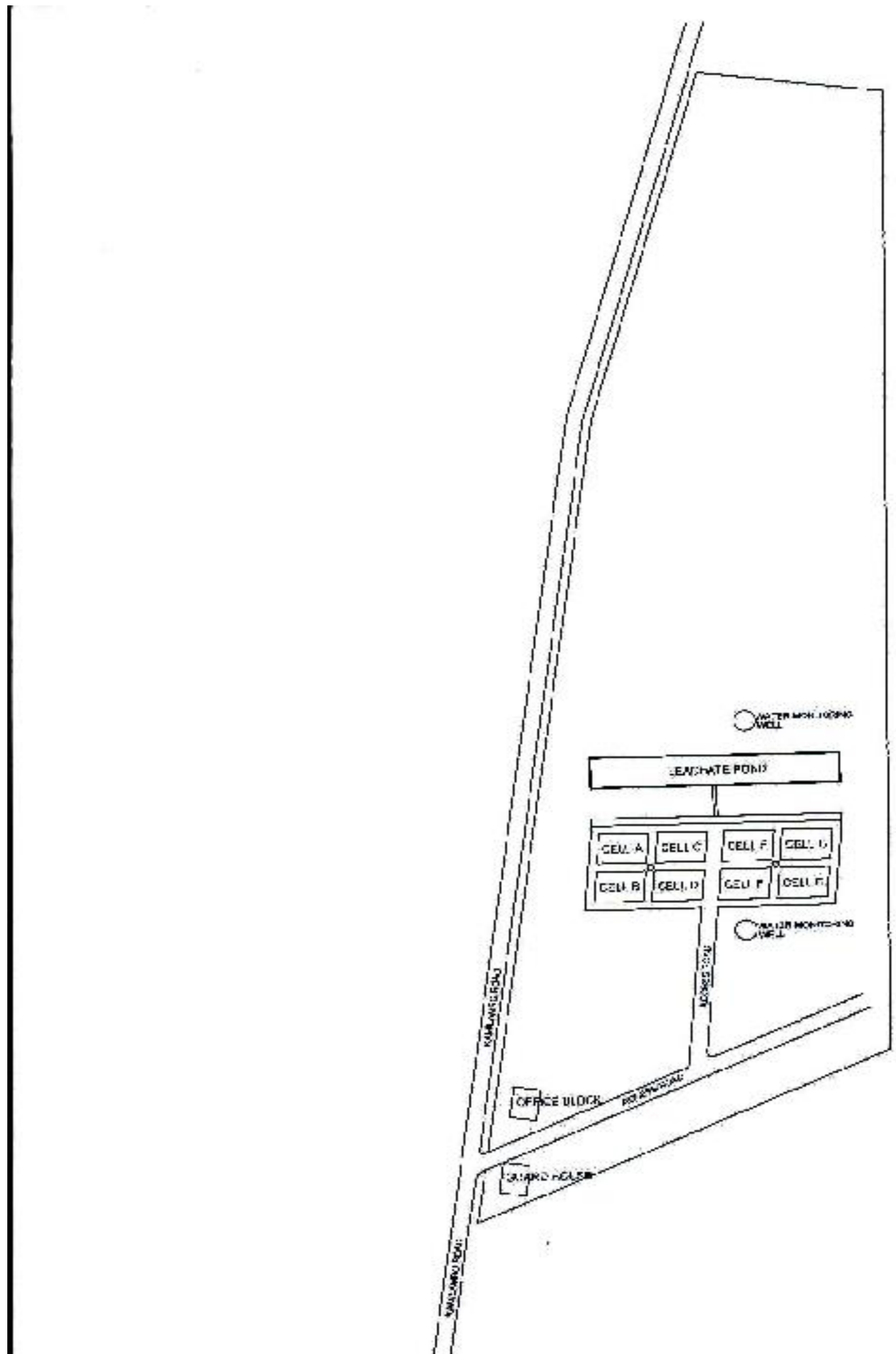


Fig 2. The proposed site lay out for the dump site and other ancillary facilities

Brief description of the existing dump site

The current solid waste disposal site could best be described as an **'Open air dumping site'** with the following challenges;

1. **Facility is not fenced**
   Currently the facility does not have any security fence to restrict entry or access by both humans and animals alike. Therefore, there is not any protection to the environment with the wastes being susceptible to open burning and are exposed to different elements, such as wind, rain or heat. Vermin and scavengers are a common sight.
2. **There is no waste segregation compartments**
   We are practicing indiscriminate dumping of mixed categories of solid waste without proper or controlled dumping.
3. **General poor management of the waste within the dump area.**
   The heaps of garbage is piling up indiscriminately in uncontrolled manner in various spots of the site, leaving empty spaces that make it difficult to tell the current dump area in use. This seems to take up too much space for a small amount of garbage and may create an environmental nuisance.

The above scenario could be attributed to lack of adequate and appropriate equipment necessary to properly manage the facility

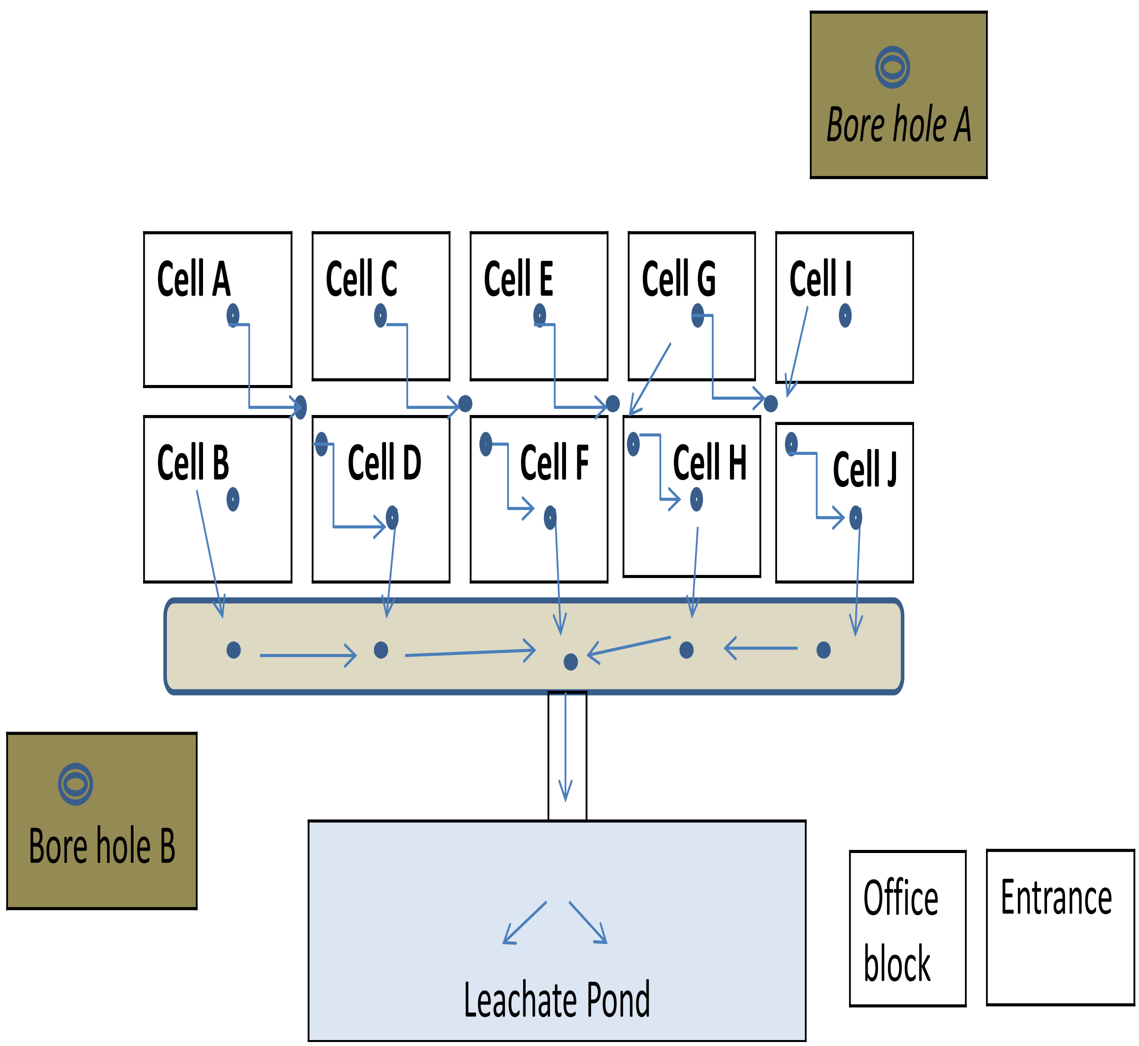
In order to try and address the above challenges, we propose to convert the existing dump site into a properly engineered Landfill and operate it in a three phased approach, described as;

i. Short Term
ii. Medium Term and
iii. Long term phases

Short Term (0-10 years)	**Medium Term (10- 30 years)**	**Long term (30-50 years)**
1. **Preparation Phase** • Site Identification • Preparation of relevant documentations and • Seek approvals from relevant institutions 2. **Operation phase** a. **Continue using the indiscriminate dumping method** This will continue but with some limited control measures put in place, including construction of waste segregation sections at designated primary and secondary collection points.	**Commencement of Full-fledged construction of phase of engineered landfill.** ➢ Land clearing ➢ Excavation of individual cells measuring approximately 100m x 100m and actual civil works for a properly engineered landfill. ➢ Completely secure the facility with boundary fencing. ➢ The process of use will include; dumping, compact and cover the waste with soil to form several layers until it is fully utilized before proceeding to the next cell until all the cells are completed and completely covered with soil. Other features proposed to be constructed include, but not limited to the following;	During this phase, it is estimated that most of the available space in the facility will have been fully utilized and properly covered. The leachate ponds, filled to near capacity with possible high levels of ground water contamination. The project shall

b. **Fence off the entire or part of the facility** with either; - Concrete blocks - Game fence - Diamond mesh wire fence - Barbed wire fence or - A combination of any of the above proposed types. This is in order to prevent unauthorized entry to the facility by both humans and animals. It will further prevent encroachment of the property by would be developers. We propose to use concrete block works to fence the stretch from the main entrance westwards on Kamilambo road frontage. This is expected to discourage unauthorized dumping as well as fend off scavengers who constantly rummage through the waste to try and salvage anything they may consider to be of some value and are ready to risk their personal health and safety. There will periodical spreading of waste using the grader and drive over for compaction purposes and cover compacted waste with a thin layer of soil. This activity will bind the garbage together and compact it to help reduce the volumes. It is further expected to prevent the waste from being blown away by air to cause pollution and nuisance to the immediate environment. At the end of this phase, the used up area will be closed and completely covered with soil. This is perceived to be a more practicable method of waste management in the short term considering the current low capacity of the MTC.	**a. Leachate ponds,** - These will be used to collect and store all the leachates resulting from several chemical reactions between solid and liquid wastes without contaminating the surrounding environment. **b. Network of breather pipes.** It is anticipated that, during this phase, there will be a considerable aerobic and anaerobic activities in the covered cells that will promote production of methane and other potentially explosive gases. In order to provide mitigation against this possibility, the facility will be serviced by a network of UPVC pipes which will serve as breathers to the Facility. This is in order to prevent potential hazards that could be as a result of explosive gas reactions - such as methane etc. **c. Guard House** - This will be used to provide physical security to the facility during day and night so that there will be no unauthorised access. - The security office will regulate both entry and exit to the facility to ensure only authorized individuals have access to the facility. **d. Revenue office** - This will be the revenue collection point where all revenue generated from the facility will be collected from. These revenues will include; fees levied to any individual or corporate entity that will be duly authorized to use the facility for private garbage disposal, collection of recyclable materials and any other fees as may be necessary from time to time. **e. Ablution block** - It is anticipated that the area will be serviced by an ablution block that will provide water borne sanitation facilities to both the members of staff and the general public who visit the facility. **f. Two water quality monitoring boreholes** - These will be used for water quality analysis to help determine the levels of contamination for both surface and ground water.	be decommissioned; the land reclaimed and vegetated with gardens to give it aesthetic beauty and fresh environment.

PROPOSED MUMBWA TOWN COUNCIL LANDFILL



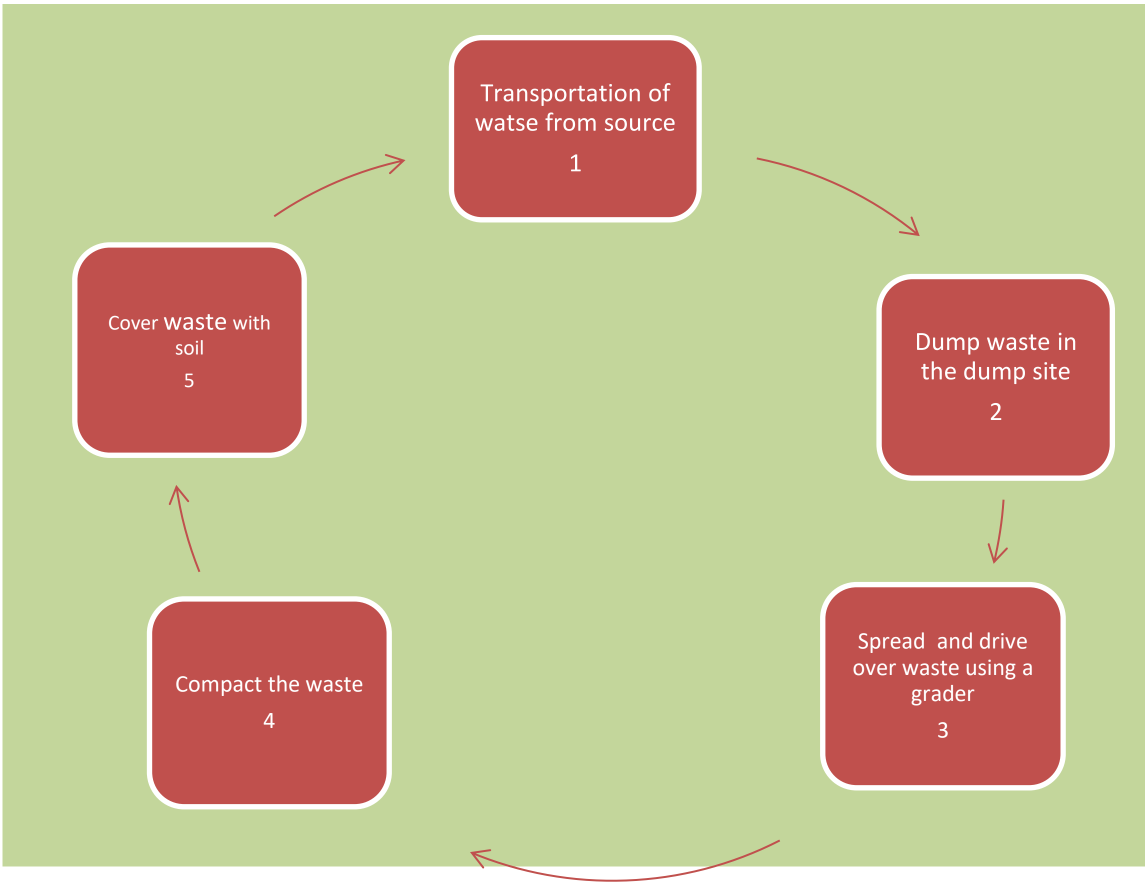


Fig 3. Anticipated process of managing the waste in an individual cell

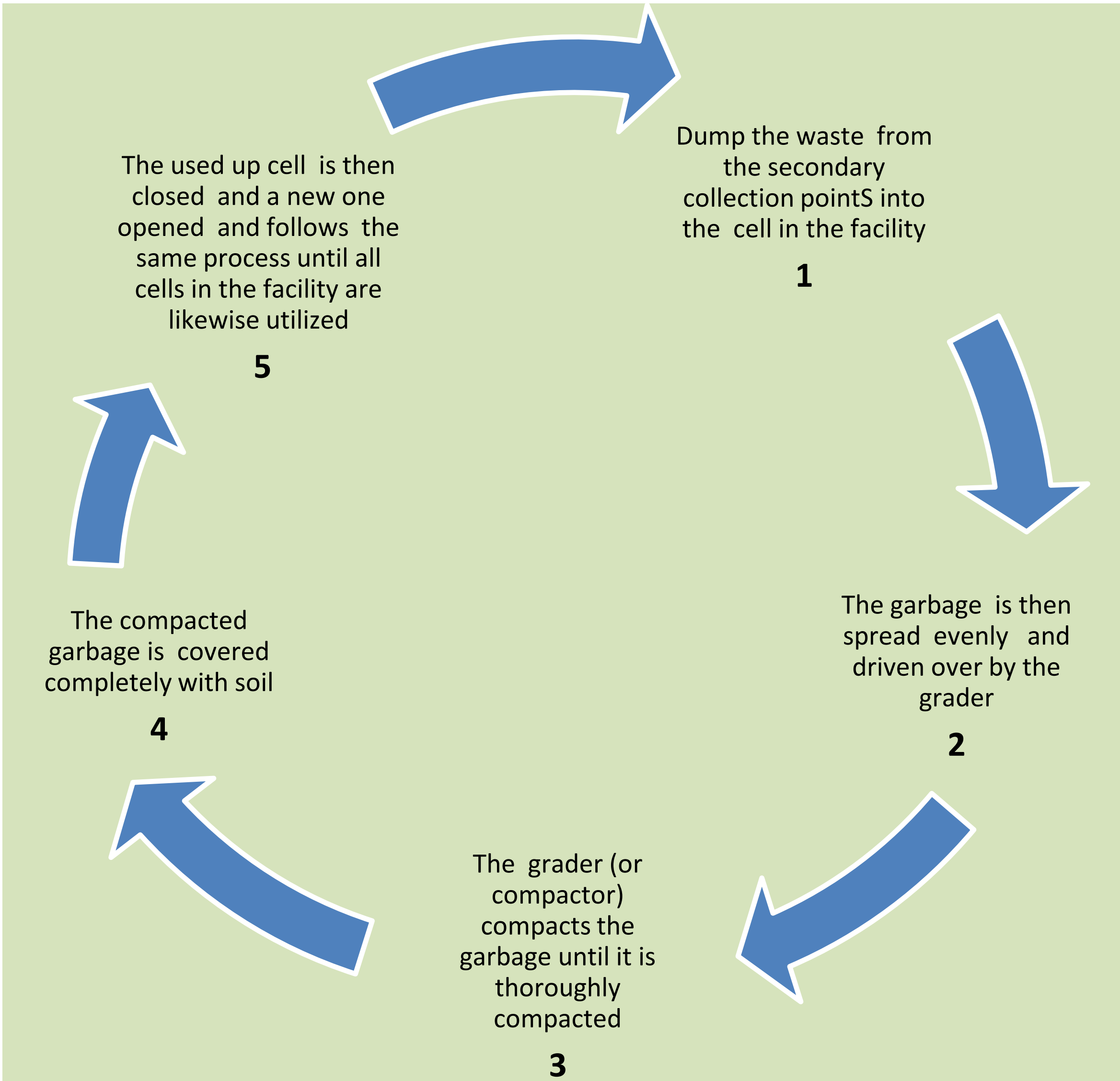


Fig 4. Flow chart of anticipated activities in each individual cell

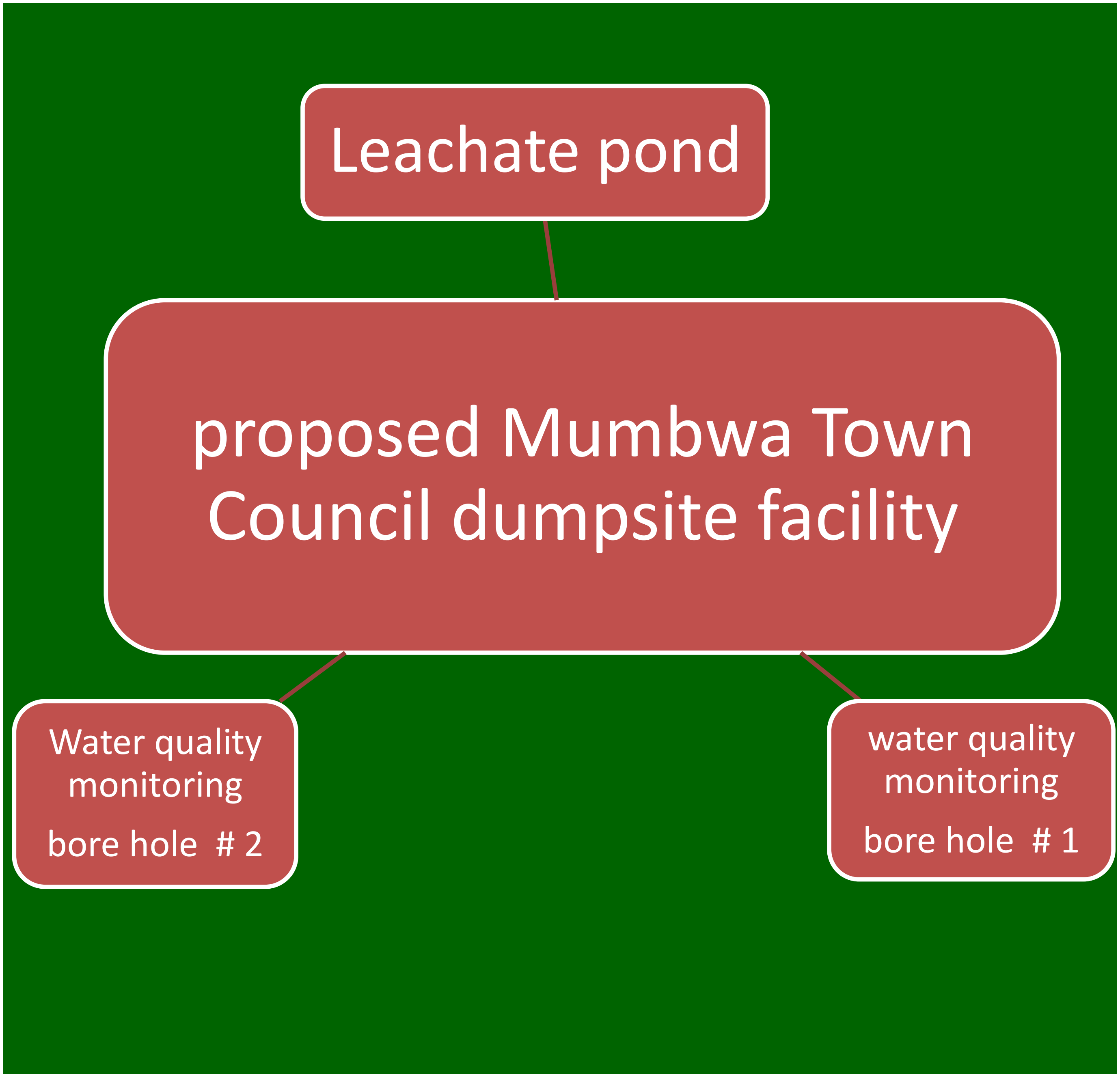


Fig 5. General concept of the landfill

A summary of the requirements for effective management of the dump site in its current state to the next proposed state

Table 1. TOOLS AND EQUIPMENT

S/N	Name of equipment/ activity required	Estimated average unit cost (K)	Estimated total cost (K)	Available quantity (2023)	Proposed quantity	shortfall
1	Fencing of the dump site facility *	300,000	300,000	0	1	1
2	TLB/Front end loader/ excavator*	2,000,000	2000,000	0	1	1
3	Compactor/Roller*	3,000,000	3000,000	0	1	1
4	Construction of waste segregation at source bays*	100,000	200,000	2	4	2
5	**Estimated total cost**		**5,500,000**			
	Tipper/Garbage haulage truck #	4,000,000	4,000,000	0	1	1
	Bulldozer **#**	3,000,000	3,000,000	0	1	1
	Grader #	20,000	80,000	0	4	4

Key

* Priority **-** Required immediately

Required, but may wait

N.B.

The above prices are pure estimates not based on any empirical evidence

1. CAPACITY BUILDING

Currently, the Public Health Section (Waste management falls under this section) is run by four officers as follows;

a. Senior Health Inspector (Section Head)
b. Health Inspector
c. Health Inspector
d. Assistant Health Inspector

All the above do possess general academic qualifications with years of experience ranging from 1 – 5 years.

Recommendations:

We recommend the following strategies and interventions;

1. **Sponsor staff in charge of waste management for**;
    i. A 1-3 months attachment to any successful council/institution, (locally or abroad) that has a proven record of successful waste management services. This will motivate and expose staff and help them appreciate how successful councils manage their dump sites or Landfills using modern technology and good practices.
    ii. Short term training programs in waste management at any reputable institution in order to equip staff with knowledge and skills to effectively manage waste in the council.
    iii. Refresher course in Waste management to acquire new skills in methods of waste management using modern technology.