

Question: #1

The population of the area is approximately 8000 each generating 0.12kg/day of solid waste. Moreover, there are 500 houses each generating 50kg/day. The volume of waste generated from the dispensary is estimated to be 2tons/month. Find the waste (assume) generated from the restaurants. Keeping these parameters in consideration, suggest the area required by for dumping the waste with allowable waste depth not exceeding more than 0.5m.

Question:-

Given data:-

Population of the area is approximately
= 8000

each generating solid waste = 0.12kg/day.

500 house generating = 50kg/day

waste generated from dispensary = 2TON/month

DEPTH = D = 0.5m

Required data:-

Area for dumping the waste
A = ?

Solution :-

① Assume waste generated from
restaurant dispensary = 3.2TON/month.

$$\frac{3.2 \times 1000}{30} = 106 \text{ kg/day.}$$

② waste of solid waste = $8000 \times 0.12 \text{ kg/day}$
= 960 kg/day.

③ $500 \times 50 = 2500 \text{ kg/day.}$

④ waste generated from dispensary
= 2TON/month = $\frac{2 \times 1000}{30} =$
66.66 kg/day.

Total waste = 2632.66 kg/day

Assume density = 125 kg/m^3

$$\text{Volume} = \frac{\text{Mass}}{\text{density}}$$

$$= \frac{26132766 \text{ kg/day}}{125 \text{ kg/m}^3}$$

$$= 209 \text{ m}^3$$

= Finding Area for dumping

$$A = \frac{Vd}{D} = \frac{209}{0.5}$$

$$= 418 \text{ m}^2$$

$$418 \text{ m}^2 \text{ Ans}$$

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Summary

This summary report examines the waste management .in this report begins with the statistics on the trends of population growth, urbanization, and economic growth in each of the Asian countries, which is then followed by an overview of the waste generation, collection, treatment& disposal statistics associated environmental governance (institution, policy, regulations) factors in the waste sector. The report also identifies the existing waste management challenges and gapes therein and sets out recommendation

Introduction — all about waste.

Residents of the university town have launched a complaint about the waste in their area. University town is majorly residential area along with some small scale chemical manufacturing units at its periphery along with some restaurants and a dispensary. We are directed to inspect the area and generate a report which should classify the waste generated, effects of waste and waste treatment methods and we will find advantages and disadvantages of these methods. After the study we will be decide an effective method which is most suitable for the area.

Waste has been a major environmental issue everywhere since the industrial revolution. Besides the waste we create at home, school and other public places, there are also those from hospitals, industries, farms and other sources.

What is waste

- ◆ It can be in a solid, liquid or in a gaseous form.
- ◆ A product, material or container is not considered waste until someone throws it away.

Types of waste

generally, waste could be liquid or solid waste. Both of them could be hazardous. Liquid and solid waste types can also be grouped into organic, re-usable and recyclable waste. Let us see some details below:

● Liquid type:

Waste can come in non-solid form. Some solid waste can also be converted to a liquid waste form for disposal. It includes point source and non-point source discharges such as storm water and wastewater. Examples of liquid waste include wash water from homes, liquids used for cleaning in industries and waste detergents.

- Liquid waste is any form of liquid residue that is hazardous for people or the environment.
- It can be bulky or sludgy, or even purely liquid such as with laboratories' waste.

● Solid type:

Solid waste predominantly, is any garbage, refuse or rubbish that we make in our homes and other places. These include old car tires, old newspapers, broken furniture and even food waste. They may include any waste that is non-liquid.

- Any unwanted or discarded materials resulting from residential, commercial, agricultural and household is considered as solid waste

● Hazardous type:

Hazardous or harmful waste are those that potentially threaten public health or the environment. Such waste could be **inflammable** (*can easily catch fire*), **reactive** (*can easily explode*), **corrosive** (*can easily eat through metal*) or **toxic** (*poisonous to human and animals*). In many countries, it is required by law to involve the appropriate authority to supervise the disposal of such hazardous waste. Examples include fire extinguishers, old propane tanks, pesticides, mercury-containing equipment (e.g, thermostats) and lamps (e.g. fluorescent bulbs) and batteries.

● **Organic type:**

Organic waste comes from plants or animals sources. Commonly, they include food waste, fruit and vegetable peels, flower trimmings and even dog poop can be classified as organic waste. They are biodegradable (this means they are easily broken down by other organisms over time and turned into manure). Many people turn their organic waste into compost and use them in their gardens.

● **Recyclable type:**

Recycling is processing used materials (waste) into new, useful products. This is done to reduce the use of raw materials that would have been used. Waste that can be potentially recycled is termed "Recyclable waste". Aluminum products (like soda, milk and tomato cans), Plastics (grocery shopping bags, plastic bottles), Glass products (like wine and beer bottles, broken glass), Paper products (used envelopes, newspapers and magazines, cardboard boxes) can be recycled and fall into this category

Classification of Wastes

Waste generate from residential area:

- ◆ **Solid waste-** vegetable waste, kitchen waste, household waste etc.
- ◆ **Plastic waste-** plastic bags, bottles, buckets etc.
- ◆ Domestic: Garbage, rubbish and occasional large waste from house.

Waste generate from chemical industries:

- ◆ A chemical waste is any solid, liquid, or gaseous waste material that, if improperly managed or disposed of, may pose substantial hazard to human health and the environment.
- ◆ Industrial: From manufacturing plants.
- ◆ **fertilizer and pesticide containers,**
- ◆ **paints, chemicals**
- ◆ **Liquid waste-** water used for different industries e.g., tanneries, distilleries, thermal power plants.

Waste generate from restaurant:

- ◆ Biodegradable waste: food and kitchen waste, green waste, paper.
- ◆ Light bulbs, bottles.
- ◆ **E-waste-** discarded electronic devices like computer, TV, music systems etc.

Waste generate from dispensary:

- ◆ Waste from hospital, clinics, research laboratories, animal husbandry facilities etc.
- ◆ Microbiology and biotechnological wastes (cell cultures, toxins, vaccines)

- ◆ Waste sharps (needles, syringes) Discarded medicines and drugs
- ◆ Soiled waste (contaminated with blood and body fluids including cotton dressings)
- ◆ Human anatomical wastes

EFFECTS OF WASTE...

- ◆ Affects our health
- ◆ Affects our socio-economic conditions
- ◆ Affects our coastal and marine environment
- ◆ Affects our climate, Foul smell
- ◆ Increase in disease transmitting vectors
- ◆ Global warming, Eutrophication
- ◆ Ground water contamination
- ◆ **Large quantities of solid waste are subjected to uncontrolled, unscientific and incomplete combustion which in turn results in release of no. of pollutants in atmosphere which cause air pollution.**
- ◆ **Large quantities of chemicals are quickly pushed into drains rivers causing immense damage to man health and ecology.**
- ◆ **Dumping of agricultural solid waste may pollute streams and waterways.**
- ◆ **Municipal workers are found to be infected due to intentional parasites.**
 - ◆ Mining solid waste is most dangerous particularly for the mine workers. They suffer from toxic reactions in the physiological process of human body. Bronchitis, throat blocking, lung cancer, headache diseases etc.
 - ◆ Solid waste produces foul smell, breeds insects and organisms besides aesthetic value of the land.
 - ◆ Solid waste changes the properties of air, soil and water.
 - ◆ Solid waste creates water pollution problems.

Solid Waste Treatment

- Waste Prevention and Minimisation
- Re-use
- Recycle
- Composting
- Land filling

COLLECTION OF WASTE

- ◆ **Waste collection** is the component of waste management which results in the passage of a waste material from the source of production to either the point of treatment final disposal. Waste collection also includes the kerb side collection of recyclable materials that technically are not waste, as part of a municipal landfill diversion program.

What should be done?

- Apply 3-R Principle
- Use waste as source of power generation

3-R Principle

REDUCE

- ◆ The amount of waste generated can be reduce through our small efforts
- ◆ Things that last longer, things that can be used more than once

REUSE

- ◆ We can reuse many things before we through them. Polythene bags, clothing, shoes, containers etc.

RECYCLE

- ☐ Many items such paper, cans and plastics bottle can be recycled to use again

◆ WHAT SHOULD BE DONE

◆ Reduce Waste

- Reduce office paper waste by implementing a formal policy to duplex all draft reports and by making training manuals and personnel information available electronically.
- Improve product design to use less materials.
- Redesign packaging to eliminate excess material while maintaining strength.
- Work with customers to design and implement a packaging return program.
- Switch to reusable transport containers.
- Purchase products in bulk.

◆ What should be done

Reuse

- Reuse corrugated moving boxes internally.

- Reuse office furniture and supplies, such as interoffice envelopes, file folders, and paper.
- Use durable towels, tablecloths, napkins, dishes, cups, and glasses.
- Use incoming packaging materials for outgoing shipments.
- Encourage employees to reuse office materials rather than purchase new ones.

Advantages of Reuse

- ◆ Energy and raw materials savings as replacing many single use products with one reusable one reduces the number that need to be manufactured.
- ◆ Reduced disposal needs and costs.
- ◆ Refurbishment can bring sophisticated, sustainable, well paid jobs to underdeveloped economies.
- ◆ Cost savings for business and consumers as a reusable product is often cheaper than the many single use products it replaces.
- ◆ Some older items were better handcrafted and appreciate in value.

Disadvantages of reuse:

- ◆ Reuse often requires cleaning or transport, which have environmental costs.
- ◆ Some items, such as Freon appliances or infant auto seats, could be hazardous or less energy efficient as they continue to be used.
- ◆ Sorting and preparing items for reuse takes time, which is inconvenient

Benefits of Recycling:

- ◆ Conserves resources for our children's future.
- ◆ Prevents emissions of many greenhouse gases and water pollutants.
- ◆ Saves energy.
- ◆ Supplies valuable raw materials to industry.
- ◆ Creates jobs.
- ◆ Stimulates the development of greener technologies.
- ◆ Reduces the need for new landfills and incinerators

Biological Waste Treatment

Composting is another most frequently used waste disposal or treatment method which is the controlled aerobic decomposition of organic waste materials by the action

of small invertebrates and microorganisms. The most common composting techniques include static pile composting, vermin-composting, windrow composting and in-vessel composting.

Anaerobic Digestion also uses biological processes to decompose organic materials. Anaerobic Digestion, however, uses an oxygen and bacteria-free environment to decompose the waste material where composting must have air to enable the growth of microbes.

5. Conclusion

The construction version is not only limited to beauty of the residential/industrial plans but is also environmental friendly.

Waste water treatment is an important initiative which has to be taken more seriously for the betterment of the society and our future

From the above discussion we will take for this area the solid waste treatment is more suitable and more acceptable because these method is used to more powerfully.