Hazardous Waste Management

Hazardous waste

Hazardous waste is waste that is dangerous or potentially harmful to our health or the environment. Hazardous wastes can be liquids, solids, gases, sludge‘s, discarded commercial products (e.g., cleaning fluids or pesticides), or the by-products of manufacturing processes.

Characteristics of hazardous waste

1. Ignitability

A waste is considered to be an ignitable hazardous waste if its flash point is less than 60°C. Ex: Naphtha, lacquer thinner, epoxy resins, adhesives, and oil based paints etc.

2. Corrosivity

Any type of liquid waste whose pH is less than or equal to 2 or greater than or equal to 12.5 is considered to be corrosive hazardous waste. Sodium hydroxide (High pH) and hydrochloric acid (Low pH) is often used in many industries to clean or degrease metal parts..

3. Reactivity

A material is considered as reactive hazardous waste, if it is unstable, reacts violently with water, and generates toxic gases when exposed to water or corrosive materials, or explodes when exposed to heat or a flame. Examples of reactive wastes would be waste gunpowder, sodium metal or wastes containing cyanides or sulphides.

4. Toxicity

Toxicity of a hazardous waste can be determined by taking a representative sample of the material and subjected to a test conducted in a certified laboratory and toxic characteristics can be determined.

Categories of hazardous wastes

1. Radioactive substance

Radioactive waste is the type of hazardous waste that contains radioactive material. Radioactive waste is a by-product of various nuclear technology processes, industries based on nuclear medicine, nuclear research, nuclear power, manufacturing, construction, coal and rare-earth mining and nuclear weapons reprocessing.

2. Chemicals

The hazardous chemical wastes can be categorized into five group‘s namely synthetic organics, inorganic metals, salts, acids and bases, and flammables and explosives.

3. Bio-medical wastes

The main sources of hazardous biological wastes are from hospitals and biological research facilities. The biological waste has the capability of infecting other living organisms and has the ability to produce toxins.

4. Flammable wastes

Examples of flammable waste include organic solvents, oils, plasticizers and organic sludge‘s.

5. Explosives

Explosive hazardous wastes are mainly ordnance (artillery) materials. Explosives also involve high potential for hazard in case of storage, collection and disposal. These types of wastes may exist in solid, liquid or gaseous form.

Methods of hazardous waste management

Steps involved in hazardous waste disposal.

Handling of hazardous wastes

Persons handling hazardous wastes are advised to have protective precautions to protect themselves from health effects. Exposure of hazardous waste leads to dermatitis in the skin, asthma on long exposure, eye irritation and also tightening of the chest.

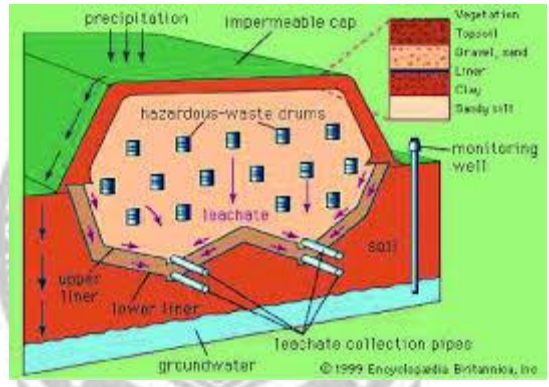
Transport of hazardous waste

Hazardous waste generated often requires transport to a particular site for an approved treatment, storage, or disposal facility (TSDF). Because of potential threats to public safety and the environment, transport is given special attention by governmental agencies to avoid any occasional accidental spill.

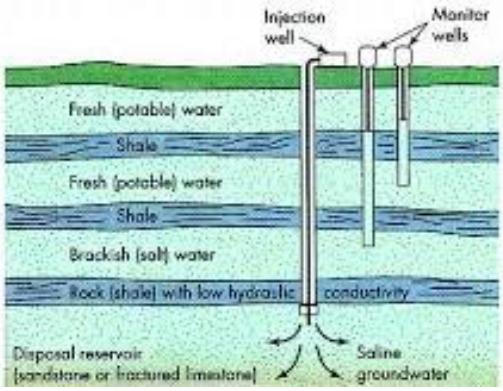
Disposal

Disposal of hazardous waste is the final stage of a hazardous waste management system. The different waste disposal methods includes secure landfill, deep well and bedrock disposal.

Secure land fill method.



Deep well disposal method.



Bedrock disposal method