



HAZARDOUS WASTE MANAGEMENT

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ABSTRACT

Many of the materials used or produced in chemical processes possess hazardous properties. As such they require appropriate management throughout their life cycle so as to minimize adverse effects on public health and safety or to the environment generally. For the purposes of this discussion the life cycle of a hazardous substance can be regarded as covering all stages from its recovery from natural resources through to its final disposal as a waste. Hazardous waste is any unwanted material the disposal of which poses a threat to the environment, i.e. it is explosive, flammable, oxidising, poisonous/infectious, radioactive, corrosive and/or toxic/ecotoxic.

MANAGING HAZARDOUS WASTE

The Waste Management Hierarchy

In deciding on the best method for managing any waste there is a hierarchy for decision making which addresses issues such as sustainability, cleaner production, health, safety, and environmental protection. It is applied to existing or proposed practices, examining and testing these at each level, starting at the top of the hierarchy. For hazardous waste the hierarchy is as follows:

- Eliminate the production of hazardous waste
- Where elimination is not possible apply methods to reduce the quantity or hazard involved
- Minimise amount of waste for disposal by recycling, reuse and/or recovery. This includes the recovery of energy which may be available from the waste.
- Treat waste to stabilise, immobilise, contain or destroy hazardous properties.
- Dispose of residues with a minimum of environmental impact.



- Appropriately contain, isolate and store hazardous waste for which no acceptable treatment or disposal option is currently available.

Cleaner Production

Cleaner production refers to a precautionary approach which includes the goal of preventing the generation of hazardous waste. Minimising the amount of hazardous waste produced would be one of the objectives of a cleaner production programme. In many cases the introduction of cleaner production measures brings economic benefits in addition to savings in waste disposal costs.

Waste Minimisation

Examples of ways in which waste minimisation can be achieved include:

- substituting a hazardous material used in a process with a non-hazardous material
- process changes
- reducing the amount of hazardous materials used
- recovering and reusing materials

TREATMENT OF HAZARDOUS WASTES

The purpose of treating hazardous waste is to convert it into nonhazardous substances or to stabilise or encapsulate the waste so that it will not migrate and present a hazard when released into the environment. Stabilisation or encapsulating techniques are particularly necessary for inorganic wastes such as those containing toxic heavy metals. Treatment methods can be generally classified as chemical, physical and/or biological.

The hazardous waste facilities consist of double composite liner landfills with a leachate collection system. Waste received in these facilities is disposed off by three modes:

1. Direct Land Filling (DLF)
2. Land filling After Treatment (LAT)
3. Incineration (INC)



CONCLUSION

Some of the waste currently produced by industrial chemical processes possess hazardous properties and require special attention in respect to disposal. Concern relating to these wastes has resulted in the development of international conventions aimed at controlling their inter country movement. These conventions also assist in the management of this waste by providing listings that can be used as the basis for a identification and classification scheme. A hierarchy to assist decision making is available to promote sustainability from waste management and this places emphasis on the elimination or minimisation of the production of hazardous waste.