

Solid Waste Management

Industrial Waste management

Industrial waste

- **Industrial waste** is the waste produced by industrial activity which includes any material that is rendered useless during a manufacturing process such as that of factories, mills and mines. It has existed since the outset of the industrial revolution (wikipedia)

Industrial Waste

Example

- chemical solvents,
- paints,
- sand paper
- paper products
- industrial by-products
- metals, and
- radioactive wastes

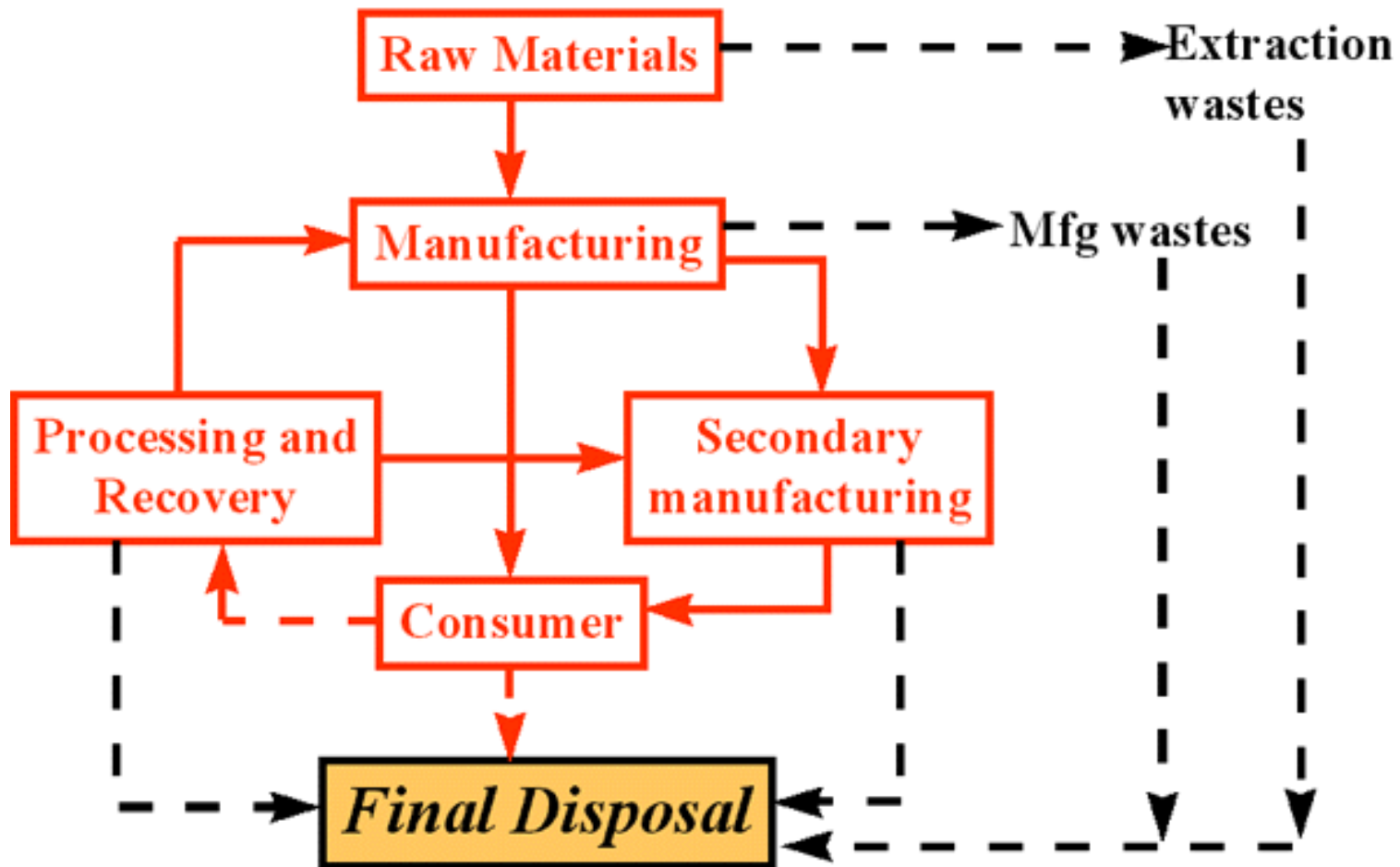
Industrial Waste Treatment

Sewage treatment plants can treat some industrial wastes, i.e. those consisting of conventional pollutants such as biochemical oxygen demand (BOD).

Industrial wastes containing toxic pollutants require specialized treatment systems.

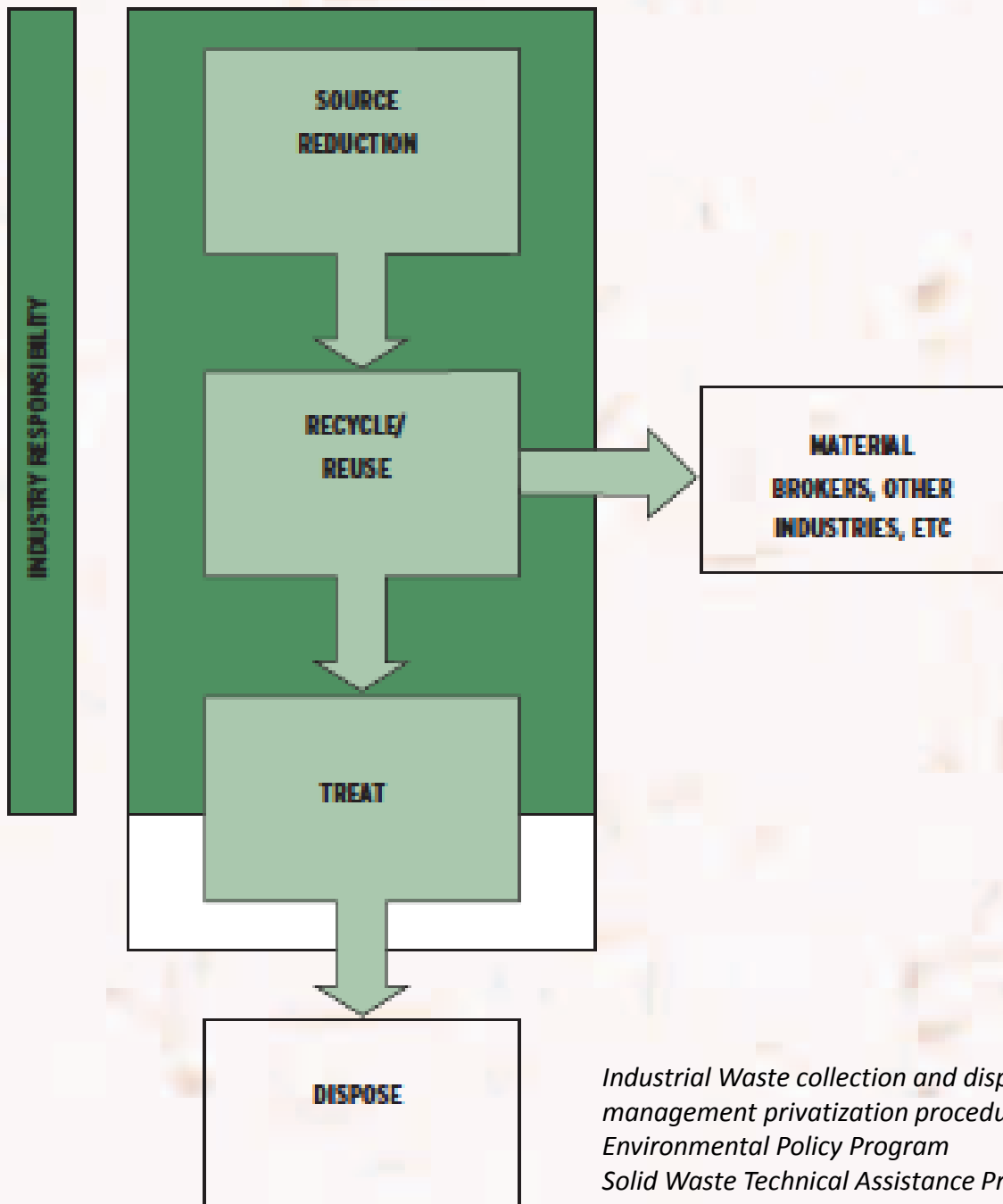
Flow diagram of Industrial SWM

Solid Waste Flow Diagram



Industrial SWM model

- The higher the cost of disposal, the greater the incentive for an industry to reduce the amount of waste that they send to disposal facilities.



Industrial Waste collection and disposal, Solid waste management privatization procedural manual, Egyptian Environmental Policy Program Solid Waste Technical Assistance Program

Industrial Waste Recycle and Reuse

1. Reducing the quantity of solid waste generated through source reduction often improves the efficiency and profitability of an industrial plant.
2. One industry's waste material may be feedstock for another industry. The ability to sell or "give away" industrial solid waste can also aid in the profitability of either industry.
3. In regions where industrial solid waste disposal costs are high, the ability to recycle or reuse derived waste products can significantly decrease costs.

Industrial Waste Collection

1. Collection points will need to be accessible for the contractor's collection equipment. Accessibility will need to include the ability of a collection vehicle to be maneuvered sufficiently to pick up filled bins and transport them to the treatment or disposal location.
2. Collection points should be sheltered so as to prevent industrial waste from being scattered during high winds.
3. Collection points should be actively managed and isolated from scavengers. They should not be located on public streets where anyone can access them.
4. Sufficient space should be available at the collection point to place an empty bin prior to the pick-up of a full one in the case where roll-off containers are used.

Industrial Waste Disposal

1. Some forms of industrial waste will require special procedures for placement at the disposal area to prevent environmental or health related impacts. This may include industrial waste forms with high liquid content, dry waste forms that may cause excessive airborne dust, etc.
2. Some forms of industrial solid waste may be used for beneficial purposes at disposal sites such as daily cover use to isolate other waste forms. Foundry waste may be a good example of waste that can be used for this purpose.
3. The success of implementing hazardous and non-hazardous solid waste segregation at each industry will determine if additional precautions should be taken at the disposal location in receiving industrial waste.
4. Certain industrial waste forms that may cause odor or attract vectors (rodents, insects, birds, etc.) should be covered as soon as possible after receipt at the disposal area.

Resource Recovery

- **Recovery by Materials Separation**

- Sorting of the groups of materials contained in the waste stream without changing their physical and chemical properties
- It can be done either through separation at the source or through separating the waste at some central location

Resource Recovery

- **Recovery by Materials Conversion**
 - Recovery of products for transformation and their use as raw materials or sources of energy, as well as harnessing of the energy released during transformation

Resource Recovery

- **Options for Utilization of recovered resources**
 - Re-use of usable items in household wastes eg. Glass bottles, plastic bottles, metal containers etc.
 - Direct application of wastes on land
 - Recycling through materials recovery processes
 - Energy recovery through thermal combustion, incineration etc.
 - Composting or other chemical or biological processes

Life Cycle Assessment

the term 'life cycle' refers to the notion that a fair, holistic assessment requires the assessment of raw material production, manufacture, distribution, use and disposal, including all intervening transportation steps necessary or caused by the product's existence. The sum of all those steps – or phases – is the life cycle of the product

Life Cycle Assessment

Lifecycle assessment, then, is an emerging environmental management tool that allows prediction of the likely environmental impacts associated with a product or service over the whole life cycle – from 'cradle to grave'. This technique can be usefully applied to waste management to assess environmental sustainability. Meanwhile, a parallel economic life cycle assessment can determine the economic sustainability of waste management systems, a criterion equally crucial to their successful implementation.

Life Cycle Assessment

- The procedures of life cycle assessment (LCA) are part of the International Organization for Standardization (ISO 140000 environmental management standards: in ISO 14040:2006 and 14044:2006).
- Therefore, in order to incorporate the concept of life cycle inventory (LCI) into the integrated waste management stream, it is obviously necessary to depict clearly the source as well as the final disposal system for integrated waste management (EPA, 2008).

Life Cycle Inventory

A life cycle assessment comprises four stages: goal definition, inventory, impact analysis and valuation

The goal definition and inventory stages (which together comprise a life cycle inventory study) are routinely carried out in various applications; however, impact analysis and valuation still present significant challenges

Concept of Cradle-to-grave in LCI

Inventories usually go back to the source of raw materials, mining, for example, to define the product's 'cradle'. Waste only becomes waste at the point at which it is thrown away, i.e. when it ceases to have any value to the owner. Thus, the 'cradle' of waste, in households at least, is usually the dustbin

The 'grave' is the final disposal of the product, often back into the earth as landfill.