RADIOACTIVE WASTE HANDLING, STORAGE AND DISPOSAL

Dr.S.Umamaheswari

STORAGE OF RADIOACTIVE WASTE

- Store waste in only approved bags and containers.
- *Bags* (item #12788 or 11237), *Boxes* (item #17775) and *Carboys* (item# 65863W) are available from Lab Safety Supply (www.labsafety.com)
- *Do NOT use anything that can be mistaken for a ordinary trash container*

WASTE CONTAINERS

WASTE CONTAINERS

This is a Violation.

STORAGE OF RADIOACTIVE WASTE

- Do not mix aqueous and organic liquid waste.
- Do not mix liquid and dry waste, i.e., do not dispose of such items as pipette tips in liquid waste nor vials with liquid in dry waste
- Segregate dry waste by half-lives equal to or less than 100 days and that with half-lives greater than 100 days.

STORAGE OF RADIOACTIVE WASTE

- Do not mix scintillation vials that contain different radionuclides.
- Do not use coke bottles, milk bottles, etc. for liquid waste.

LEGAL METHODS OF DISPOSING OF RADIOACTIVE WASTE

- Hold for Decay
- Dump to Sanitary Sewer
- Incineration
- Ship to Disposal Site
- Dispose of as if not radioactive

LEGAL METHODS OF DISPOSING OF RADIOACTIVE WASTE

Hold for Decay

- You can store waste in the laboratory if the half-life is no greater than 36 days.

- The Radiation Safety Office can hold waste with half-lives up to 100 days.

LEGAL METHODS OF DISPOSING OF RADIOACTIVE WASTE

Dump to Sanitary Sewer

- Must be water soluble or a readily dispersible biological material in water.
- Concentration is limited by regulations - check with the Radiation Safety Office.
- *Must obtain permission* from the Radiation Safety Office *prior to dumping*

LEGAL METHODS OF DISPOSING OF RADIOACTIVE WASTE

Incineration

- Preferred method of disposing of combustibles.
- Generator pays for the disposal cost.

LEGAL METHODS OF DISPOSING OF RADIOACTIVE WASTE

Ship to an approved disposal site

- Sealed sources in gauges, detectors or counters and check sources are sent to approved disposal site for disposal

- Generator pays for the disposal cost.

LEGAL METHODS OF DISPOSING OF RADIOACTIVE WASTE

Dispose of as if it not Radioactive

- Scintillation Cocktail containing no more than 0.05 microcuries per ml of H-3 or C-14 may be discarded as if it is not radioactive. If chemicals are disposed of properly, the radioactivity will not pose a problem.

LEGAL METHODS OF DISPOSING OF RADIOACTIVE WASTE

Dispose of as if it not Radioactive (cont.)

- Animal Tissue containing no more than 0.05 microcuries per ml of H-3, or C-14 may be discarded as if it is not radioactive. If animal tissue is disposed of properly, the radioactivity will not pose a problem.

STORAGE OF RADIOACTIVE WASTE

- Store waste in only approved bags and containers.
- *Bags* (item #12788 or 11237), *Boxes* (item #17775) and *Carboys* (item# 65863W) are available from Lab Safety Supply (www.labsafety.com)

WASTE DISPOSAL TAG

- Every waste bottle, bag or box must have a completed waste disposal tag attached, with isotope, activity, volume, date, PI and lab #
- For dry waste, estimate volume in cubic feet
- For liquid waste, estimate volume in liters
- Waste will not be picked up without a completed waste tag

e-Waste

What is E-waste?

Electronic Waste (e-Waste) comprises of waste electronic/electrical goods which are not fit for their originally intended use. These include items such as computers, cellular phones, stereos, refrigerators, air conditioners, other consumer durables, etc.

Is e-Waste Hazardous?

E-waste is not hazardous waste per-se. However, the hazardous constituents present in the e-waste render it hazardous when such wastes are dismantled and processed, since it is only at this stage that they pose hazard to health and environment.

TOXIC CONSTITUENTS IN E-WASTE

COMPONENTS	CONSTITUENTS
➢ Printed circuit boards	Lead & cadmium
➢ Cathode ray tubes (CRTs)	Lead oxide & Cadmium
➢ Switches & flat screen monitors	Mercury
➢ Computer batteries	Cadmium
➢ Capacitors and transformers	Poly Chlorinated Bi-phenyls (PCB)
➢ Printed circuit boards, plastic casings cable	Brominated Flame Retardant
➢ Cable insulation/coating	Poly Vinyl Chloride (PVC)

GROWING EEE INDUSTRY IN INDIA

- Information and telecom fastest growing industry verticals
- PC sales crossed 7.3 million units in 2007-08 growing 16%; installed base of over 25 million units
- Consumer electronics market growing at 13-15% annually ; 120 million installed base of TVS
- Cellular subscriber up by 96.86% over last year; Indtalled base to cross 300 million by 2010

...fast growing consumption of EEE is leading to creation of e-waste

RECYCLING SCENARIO IN INDIA

- E-waste recycling is presently concentrated in the informal (unorganized) sector
  - No organized collection system prevails
  - Operations are mostly illegal
  - Processes are highly polluting
  - Recycling operations engage in:
    - dismantling
    - sale of dismantled parts
    - valuable resource recovery
    - export of processed waste for precious metal recovery

...expected to rapidly change with formal recyclers setting operations

CONCERNS: INFORMAL RECYCLING

- High-risk backyard operation
- Non- efficient and Non-environmentally sound technologies
- Occupational and environmental hazards
- Loss of resources due to inefficient processes
- Impacts vulnerable social groups- Women, children and mmigrant labourers

Noise pollution Thermal pollution Nuclear pollution

Noise pollution refers to undesirable levels of noises caused by human activity that disrupt the standard of living in the affected area.

Noise pollution can come from:

- Traffic
- Airports
- Railroads
- Manufacturing plants
- Construction or demolition
- Concerts

Some noise pollution may be temporary while other sources are more permanent. Effects may include hearing loss,

Radioactive Pollution

Radioactive pollution is rare but extremely detrimental, and even deadly, when it occurs. Because of its intensity and the difficulty of reversing damage, there are strict government regulations to control radioactive pollution.

Sources of radioactive contamination include:

- Nuclear power plant accidents or leakage
- Improper nuclear waste disposal
- Uranium mining operations

Radiation pollution can cause birth defects, cancer, sterilization, and other health problems for human and wildlife populations. It can also sterilize the soil and contribute to water and air pollution.

Thermal pollution is excess heat that creates undesirable effects over long periods of time. The earth has a natural thermal cycle, but excessive temperature increases can be considered a rare type of pollution with long term effects. Many types of thermal pollution are confined to areas near their source, but multiple sources can have wider impacts over a greater geographic area.

Thermal pollution may be caused by:

- Power plants
- Urban sprawl
- Air pollution particulates that trap heat
- Deforestation

Loss of temperature moderating water supplies

As temperatures increase, mild climatic changes may be observed, and wildlife populations may be unable to recover from swift changes.