



**7.1.3 Describe the facilities in the institution for the management of the following types of degradable and non degradable waste (within 500 words)**



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**7.1.3 Describe the facilities in the institution for the management of the following types of degradable and non degradable waste (within 500 words)**

- **Solid waste management**
- **Liquid waste management**
- **Biomedical waste management**
- **E-waste management**
- **Waste recycling system**
- **Hazardous chemical and radioactive waste management**

**Answer:**

Invertis University Bareilly is committed to “zero waste” and reducing the environmental impact of its activities through its philosophy of “reduce-reuse-recycle”. A prudent budgeting approach is adopted in what we purchase as a first step towards reducing waste. Over the years, the University’s recycling scheme has included office stationery, electronics, laboratory material and furniture.

- **Solid waste:** The entire plantation of on the campus is organically nurtured from the Solid waste management produced from the bio waste from the Invertis University campus. Invertis University is produced at the campus from the bio waste matter of the University as organic nutrients for the plantations with the firm endeavour of promoting recycling of waste and dissemination of the practice of organic farming. The eco-friendly waste management system involves a magnetic flux created with controlled oxygen presence which ensures the complete combustion of waste decomposing municipal solid waste material. During the destruction process there is no odour, flies or leaching of contaminants.
- **Liquid waste:** The University adheres to a strict protocol of liquid waste disposal in its laboratories. Any glassware used in the laboratory is rinsed with minimum water and placed in the liquid waste container. The liquid waste is segregated into organic and inorganic waste. Inorganic waste such as concentrated acidic or alkaline solutions are neutralized before disposal. Sodium bi-carbonate or Calcium oxide (lime) is used for the neutralization process so that the neutralized liquid contains no harmful substance. The organic waste yield of the University is limited till date and therefore treated with cow dung for decomposition due to the action of micro-organisms.
- **E-waste:** The University has optimized its inventory of all computers through reassembling, modification and up gradation by the University’s own team of IT Administrator, faculty members and students of Computer Science Engineering and

Information Technology. This has been a critical endeavour towards E-waste management ensuring that no discarded computers or printers are lying idle in the office premises. Flip flops, memory chips, motherboard, compact discs, cartridges etc generated by electronic equipments such as Computers, Radio, TV, Phones, Printers, Fax and Photocopy machines are recycled properly. Instead of buying a new machine buyback option is taken for technology up gradation. The e-waste generated from hardware which cannot be reused or recycled is being disposed off

- **Solid Liquid Management**

The waste water from the RO plant is discharged back into the environment which is effectively utilized to water the lawns sapling and trees into university by sprinkling irrigation.





Liquid recycling system







## BIOCHEMICAL WASTE DISPOSAL:



Chances are, if you have to get rid of biomedical waste, you don't know what happens to that waste once it's out of your hands. Your [biomedical waste Disposal](#) team is given the task of safely and effectively removing this waste from the environment. Waste disposal is particularly important when it comes to medical supplies, because some waste can be contaminated with diseases or dangerous pathogens. All biomedical waste is not disposed in the same way, and different disposal companies follow different methods.

### **1. Autoclaving:**

The process of autoclaving involves steam sterilization. Instead of incineration, which can be expensive, autoclaving simply introduces very hot steam for a determined amount of time. At the end of the process, microorganisms have been completely destroyed. This process is particularly effective because it costs much less than other methods, and doesn't present any personal health risks. While some biomedical waste isn't able to be disposed of via autoclaving, around 90% of materials are sanitized this way before being sent on to a landfill.

### **2. Incineration:**

The major benefits of incineration are that it is quick, easy, and simple. It effectively removes the waste entirely, and safely removes any microorganisms. However, when burning hazardous materials, emissions can be particularly dangerous. Some states prefer for waste disposal companies to look towards incineration as their first choice, but materials must be reviewed and determined as safe to burn.

### **3. Chemicals:**

When it comes to liquid waste, a common biomedical waste disposal method can be chemical disinfection. Chlorine is a regular choice for this process, and is introduced to the liquid waste in order to kill microorganisms and pathogens. Chemical disposal can also be used for solid wastes, but it is recommended that they be grinded first to ensure maximum decontamination. Liquid waste, once decontaminated, is then disposed into the sewer system.

### **4. Microwaving:**

During this process, waste is shredded, mixed with water, and then internally heated to kill microorganisms and other harmful elements. One of the main benefits of this process is the shredding aspect; it lowers the volume of biomedical waste, and it is reportedly more energy efficient to use this method than to incinerate. While it can't be used for all biomedical wastes, it can be utilized for a good 90% of it, just like autoclaving.



## **E-Waste**

The University has optimized its inventory of all computers through reassembling, modification and up gradation by the University's own team of IT Administrator, faculty members and students of Computer Science Engineering and Information Technology. This has been a critical endeavour towards E-waste management ensuring that no discarded computers or printers are lying idle in the office premises. Flip flops, memory chips, motherboard, compact discs, cartridges etc generated by electronic equipments such as Computers, Radio, TV, Phones, Printers, Fax and Photocopy machines are recycled properly. Instead of buying a new machine buyback option is taken for technology up gradation. The e-waste generated from hardware which cannot be reused or recycled is being disposed off



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- **Hazardous CHEMICAL WASTE DISPOSAL**

Environmental Health and Safety provides a chemical waste disposal service to the Invertis community. Disposal of chemical waste is free of charge to internal departments, provided the

waste is presented properly. Due to the nature of this material, respecting all disposal procedures is mandatory in order to collect and dispose of chemical waste safely and efficiently.

- **Chemical Waste Containers:**

Chemical waste containers are provided free of charge to Invertis labs, studios, and workshops. To obtain waste containers contact central store. Liquid Waste Containers are available in 4L, 10L, and 20L sizes. Always allow at least 10% free space for solvent expansion. Sharps contaminated with chemicals must be collected in puncture-proof solid chemical waste containers. Needles should not be bent, sheared, recapped, removed from the syringe or placed in regular garbage.

- **Chemical Waste Storage Areas:**

Chemical waste containers should be stored separately from laboratory stock, at a designated waste station. For ease of pickup, it's preferable to locate the waste station not too far from the exit door. All waste containers must be properly closed when not in use.

Secondary containment in the form of a spill tray or other container must be provided for all waste containers in order to control any spills or leaks resulting from waste transfer. For liquid waste, the secondary containment must be large enough to hold the total volume of the waste container. For example: a 20L waste container requires 20L of secondary containment.

- **Chemical Waste Labels:**



Chemical waste labels are available at the Central Chemical Store in SP 132.02 at Loyola or directly provided by EHS at SGW.

- **Filling Out Chemical Waste Labels**

All chemical waste containers must be fully identified at all times, including when they are only partially filled. Mandatory information is as follows:

- Chemical names: All chemicals added to the container must be listed on the label, including those considered non-hazardous (e.g.: water). Do not use abbreviations; use full chemical names (e.g.: “sodium hydroxide”, rather than “NaOH”).
- Percentages: For mixed waste, the amount of each chemical added to the container should be tracked so that final percentages can be provided. This includes percentages of non-hazardous components such as water.
- Laboratory information: Fill out the lab number, contact phone number, and the date the container was filled and sealed.
- Hazards: Check off all hazard boxes which apply to the contents of the waste container.
- Hazardous Waste Collection

Full chemical waste containers are collected by EHS upon request. In order to request a waste pickup:

1. Ensure that the waste containers are properly closed and sealed.
2. Make sure that the waste is identified. If using a waste label, check that the information is legible and includes all chemical names, hazards, lab information, and percentages (for mixtures). Unidentified or unknown chemical waste cannot be accepted for disposal. If you are unable to identify your waste, an analysis will be performed at your PI's or department's expense.
3. Place the waste container at the laboratory's designated waste storage area, with the waste label facing outwards and clearly visible.
4. Complete the Hazardous Waste Disposal Request Form, including both full chemical and user information.
5. Email the completed form to [hazardouswaste@invertis.org](mailto:hazardouswaste@invertis.org) or place it with the waste containers for pickup.