Central Bio-Medical Waste Treatment Facility

Central Biomedical Waste Treatment Facility, Swami Ram Cancer Institute and Research Centre Campus, Government Medical College, Rampur Road, Haldwani is the facility to treat the Bio-Medical Waste generated at Dr. Sushila Tiwari Government Hospital and other associated teaching hospitals of the Government Medical College, Haldwani.

Facilities Provided by the Unit

1. Storage
2. Incineration
3. Microwaving
4. Shredding

Storage
- Well ventilated
- Designed as per CPCB Guidelines for storing BMW
- Separate for Incinerable and Non-Incinerable BMW

Incinerable waste Treatment

Incineration
- Equipped with THERMAX Pyrolytic 2 Chamber Incinerator
- Capacity of 100 Kg per Hour
- Equipped with Venturi Scrubber

Non-Incinerable waste Treatment
- Microwave
- Shredder

Microwave
- The Disinfection of BMW is done using the microwave.
• Most microorganisms are destroyed by the action of microwaves
• BMW of Category 4 and 7 to be disinfected using the microwave technology
• Machine is as per CPCB norms

**Shredder**

• The Disinfected BMW is then treated on Shredder machine
• BMW of Category 4 and 7 to be shredded into small pieces
• Machine is as per CPCB norms

**Effluent Treatment Plant (ETP)**

Wastewater generated from the air pollution control device (Venturi Scrubber) attached to incinerator is being properly handled by the ETP, so as to avoid any non-compliance of the regulatory requirements.
Treatment of In-House Generated BMW

- Specially Designed Dressing / Medicine Trolleys compatible for segregation of BMW at the point of generation
- Master bins are installed in each ward / Generation area
- Master Transportation Trolleys for transporting waste from Master Bins to Store Room at BMW Unit

➤ Segregation of BMW at the point of Generation:

Dressing / Medicine Trolleys

➤ Colour Coded Bins

Yellow Bin for
- Human Anatomical Waste, Animal Waste,
- Microbiological & Bio Technological Waste,
- Discarded Medicine and Cytotoxic Drugs and
- Soiled waste (items contaminated with body fluids and blood i.e. cotton dressings, gauges, plaster caste, linen, beddings etc)

Blue Bins:
- Waste Sharps
- Needles, Syringes, scalpels, blades, glass etc.
- Solid waste
- Waste generated from disposal items other than the sharps such as tunings, catheters, I.V. sets etc.
- **Master Bins: Ward Area**
  - Cluster of Wards are equipped with 3 Bins
  - Yellow for Incinerable waste
  - Blue for Non Incinerable waste
  - Black for General waste

- **Nursing Station**
  - Needle Burner and Syringe Destroyer
  - Puncture proof Box with Sodium Hypochloride is used for collecting the destroyed syringe and burned needles.

- **Weighing of BMW**
  - Weighing of Collected Waste at Collection Center of BMW Treatment Unit
  - Recorded in the Registers
  - Sent for treatment and Final Disposal

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### Treatment Process

- **Red Bags**
  - Microwaving
  - Shredding
  - Recycling

- **White Bags**
  - Incineration
  - Ash for Landfill

- **Blue Bags**
  - Municipal Landfills / Municipal Dumping Area

- **Yellow Bags**
  - Municipal Landfills / Municipal Dumping Area
### SCHEDULE I

[See rules 3 (e), 4(b), 7(1), 7(2), 7(5), 7 (6) and 8(2)] Part-1

**Biomedical wastes categories and their segregation, collection, treatment, processing and disposal options**

<table>
<thead>
<tr>
<th>Category</th>
<th>Type of Waste</th>
<th>Type of Bag or Container to be used</th>
<th>Treatment and Disposal options</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
</tr>
<tr>
<td>Yellow</td>
<td>(a) Human Anatomical Waste: Human tissues, organs, body parts and fetus below the viability period (as per the Medical Termination of Pregnancy Act 1971, amended from time to time).</td>
<td>Yellow coloured non-chlorinated plastic bags</td>
<td>Incineration or Plasma Pyrolysis or deep burial</td>
</tr>
<tr>
<td>(b) Animal Anatomical Waste: Experimental animal carcasses, body parts, organs, tissues, including the waste generated from animals used in experiments or testing in veterinary hospitals or colleges or</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(c) Soiled Waste: Items contaminated with blood, body fluids like dressings, plaster casts, cotton swabs and bags containing residual or discarded blood and blood</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(d) Expired or Discarded Medicines: Pharmaceutical waste like antibiotics, cytotoxic drugs including all items contaminated with cytotoxic drugs along with glass or plastic ampoules, vials etc.</td>
<td>Yellow coloured non-chlorinated plastic bags or containers</td>
<td>Expired cytotoxic drugs and items contaminated with cytotoxic drugs to be returned back to the manufacturer or supplier for incineration at temperature &gt;1200 °C or to common bio-medical waste treatment facility or hazardous waste treatment, storage and disposal facility for incineration at &gt;1200°C Or Encapsulation or Plasma Pyrolysis at &gt;1200°C. All other discarded medicines shall be either sent back to manufacturer or disposed by incineration.</td>
<td></td>
</tr>
<tr>
<td>(e) Chemical Waste: Chemicals used in production of biological and used or discarded disinfectants.</td>
<td>Yellow coloured containers or non-chlorinated plastic bags</td>
<td>Disposed of by incineration or Plasma Pyrolysis or Encapsulation in hazardous waste treatment, storage and disposal facility.</td>
<td></td>
</tr>
<tr>
<td><strong>(f) Chemical Liquid Waste:</strong></td>
<td>Separate collection system leading to effluent treatment system</td>
<td>After resource recovery, the chemical liquid waste shall be pre-treated before mixing with other wastewater. The combined discharge shall conform to the discharge norms given in Schedule- III.</td>
<td></td>
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<tr>
<td>-----------------------------</td>
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<td></td>
</tr>
<tr>
<td>Liquid waste generated due to use of chemicals in production of biological and used or discarded disinfectants, Silver X-ray film developing liquid, discarded Formalin, <strong>infected secretions, aspirated body fluids</strong>, liquid from <strong>laboratories</strong> and floor washings, cleaning, housekeeping and disinfecting activities etc.</td>
<td>Non-chlorinated yellow plastic bags or suitable packing material</td>
<td>Non-chlorinated chemical disinfection followed by incineration or Plasma Pyrolysis or for energy recovery. In absence of above facilities, shredding or mutilation or combination of sterilization and shredding. Treated waste to be sent for energy recovery or incineration or Plasma Pyrolysis.</td>
<td></td>
</tr>
<tr>
<td><strong>(g) Discarded linen, mattresses, beddings contaminated with blood or body fluid.</strong></td>
<td><strong>(h) Microbiology, Biotechnology and other clinical laboratory waste:</strong></td>
<td><strong>Autoclave safe plastic bags or containers</strong></td>
<td>Pre-treat to sterilize with non-chlorinated chemicals on-site as per National AIDS Control Organisation or World Health Organisation guidelines thereafter for Incineration.</td>
</tr>
<tr>
<td>Blood bags, Laboratory cultures, stocks or specimens of micro-organisms, live or attenuated vaccines, human and animal cell cultures used in research, industrial laboratories, production of biological, residual toxins, dishes and devices used for cultures.</td>
<td><strong>Red</strong></td>
<td><strong>Red coloured non-chlorinated plastic bags or containers</strong></td>
<td>Autoclaving or micro-waving/hydroclaving followed by shredding or mutilation or combination of sterilization and shredding. Treated waste to be sent to registered or authorized recyclers or for energy recovery or plastics to diesel or fuel oil or for road making, whichever is possible. Plastic waste should not be sent to landfill sites.</td>
</tr>
<tr>
<td><strong>(Recyclable)</strong></td>
<td><strong>Waste sharps including Metals:</strong></td>
<td><strong>Puncture proof, Leak proof, tamper proof containers</strong></td>
<td>Autoclaving or Dry Heat Sterilization followed by shredding or mutilation or encapsulation in metal container or cement concrete; combination of shredding cum autoclaving; and sent for final disposal to iron foundries (having consent to operate from the State Pollution Control Boards or Pollution Control Committees) or sanitary landfill or designated concrete waste sharp pit.</td>
</tr>
<tr>
<td>(a) Wastes generated from disposable items such as tubing, bottles, intravenous tubes and sets, catheters, urine bags, syringes (without needles and fixed needle syringes) and vaccinators with their needles cut) and gloves.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Color</td>
<td>Category</td>
<td>Description</td>
<td>Disposal Method</td>
</tr>
<tr>
<td>--------</td>
<td>-------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Blue</td>
<td>(a) Glassware:</td>
<td>Broken or discarded and contaminated glass including medicine vials and ampoules except those contaminated with cytotoxic wastes.</td>
<td>Disinfection (by soaking the washed glass waste after cleaning with detergent and Sodium Hypochlorite treatment) or through autoclaving or microwaving or hydroclaving and then sent for recycling.</td>
</tr>
<tr>
<td></td>
<td>(b) Metallic Body Implants</td>
<td></td>
<td>Cardboard boxes with blue colored marking</td>
</tr>
</tbody>
</table>
Mode of Treatment

The mode of treatment available at the CBWTF unit is as per the schedule I and schedule II of the Bio Medical Waste (Management & Handling) Rules, 2016 as amended thereafter.

Bio Medical Waste

Category yellow
(Incinerable Bio Medical Waste)

Incineration

Produce Ash from Incineration: Municipal Landfill

Category RED, WHITE & BLUE
(Non-Incinerable Bio Medical Waste)

For Disinfection:
Chemical Treatment or Microwaving

Disinfected Bio Medical Waste:
Shredding

Shredded Material:
Recycling