Title: WASTE MANAGEMENT.

1 Purpose

1.1. To provide a guideline for waste segregation at source, handling and its disposal in an effective and sasffe manner.

1.2. To protect the health of employees and environment from hazards of waste produced at different levels in order to maintain a safe, healthy and productive work environment.

2 Scope

2.1. This procedure applies to all divisions, departments & laboratories of the institute.

3 Responsibility

3.1. The Chiefs and officer incharges of all divisions and departments are responsible for the compliance of whole process.

3.2. All section in-charges are responsible to prepare the SOP for the waste material generated in their section as per guidelines given in this SOP and maintenance of log book / data form for the same along with the implementation and execution of departmental SOP.

3.3. Arrangement of incineration / shredder and maintenance of log book for incinerated waste is the responsibility of designated Incinerator operator.

4 Materials and Equipment:

4.1 Waste required to be disposed off

4.2 Autoclave

4.3 Incinerator

4.4 Shredder

4.5 Color coded containers for waste collection

4.6 Personal protective equipment like gloves, face mask etc.

4.7. First Aid Box

4.8 Waste Disposal bags

4.9 Sharp disposal box

4.10 Waste transportation trolleys

4.11 Training module and certificates

5 Procedure

5.1 Waste

5.1.1 A material, substance or by product eliminated or discarded as no longer useful or required after the completion of the primary process.

5.2 Waste Management

5.2.1 Waste management is a collection, transportation and disposal in an

environment friendly manner.

5.3 Waste Minimization

5.3.1 Significant reduction of waste generated is encouraged by the implementation of certain policies and practices including the following:

- **Source Reduction:**
  - Take measures in purchasing. Ensure the selection of methods or supplies that are less wasteful or generate less hazardous waste.
  - Less packaging
  - Designing products
  - Use of physical rather chemical cleaning methods (e.g. steam disinfection instead of chemical disinfection).
- **Good Housekeeping / Good Microbiological / Management and control Practices**
  - Apply particularly to purchase and use of chemicals, reagents, cultures and pharmaceuticals
  - Careful management of stores to prevent the accumulation of large quantities of chemicals used in smaller amount
  - Use of oldest batch of product, starting material and components first (FIFO)
  - Use of all contents of a container
  - Checking of the expiry date of all products at the time of delivery and use.
  - Purchase of relatively small quantities rather than large amounts at a time (applicable in particular to unstable chemicals)
- **Waste Segregation**
  - Careful segregation of waste matter into different categories (step 5.3) helps to minimize quantities of hazardous waste.

5.4 Waste Container Management

5.4.1 Do not store waste containers where they have the potential to freeze or are exposed to high heat.

5.4.2 Waste containers should be in good condition, not rusted or dented.

5.4.3 Train laboratory personnel on safe procedures to transfer chemicals to waste containers.

5.4.4 Make sure waste containers are compatible with the waste type they are expected to contain.

5.4.4 Do not roll waste containers on their side or edge.

5.5 Precautionary Measures

5.5.1 There is no substitute for applying **GLP, GMP and using "common sense"** during handling of the waste material including potentially harmful waste.

5.5.2 Consult material safety data sheet provided with the chemicals (where applicable); take maximum care with the highly combustible or explosive

materials to avoid direct contact

5.5.3 Do not mix chemical wastes as unexpected reactions can occur

5.5.4 In order to protect, prevent or minimize the damages through the potential routes of exposures i.e. inhalation and dermal contacts wear (PPE) such as respirators (where necessary)

5.5.5 Engineering control devices i.e. exhaust fan ventilation; fume hoods etc must be in working condition before handling the chemical

5.5.6 Segregate the waste to avoid mixing

5.5.7 **Occupational Health & Safety**

- Immunize waste handlers with Tetanus Toxoid and Hepatitis –B vaccine
- Rabies vaccine handlers must be vaccinated against Rabies in addition to Tetanus Toxoid and Hepatitis –B vaccine
- The location of emergency shower and first aid box must be known before handling the waste
- Do not store infectious waste for long periods in the generating area and under refrigeration
- Where ever possible avoid discharging waste in sewerage and drain system

5.5.8 **Do not incinerate the following**

- Pressurized gas containers
- Large amount of reactive chemical waste
- Halogenated plastics like PVC (Poly vinyl chloride)
- Sealed ampoules or ampoules containing heavy metals
- Waste with high mercury or cadmium content such as broken thermometers, used batteries and lead –lined wooden panels

5.5.9 **In case of Accidental spills**

- Employees must inform the O/I quickly for advice regarding the spill.
- O/I must ensure the safe evacuation of all lab personnel in case of accidental spill (if needed)
  - ❖ Isolate the spill area
  - ❖ Adopt necessary precautionary measures
  - ❖ Cleanup the area & document it with complete history
  - ❖ Investigate the incident, identify the cause and implement the remedial action to prevent similar incidents in the future
- For cleaning up the spills of hazardous material wear eye protectors and masks in addition to gloves and overalls
- Enter the details in Spill log book to avoid repetition of such incidence

5.5.10 **In case of Animal waste/waste animal**

- The collected material should be inaccessible to animals, insects and birds
- The collected material should not be placed in the proximity of food

and feed of the animals

5.6 Types of wastes

5.6.1 Hazardous waste

Any waste generated from direct contact with the product / raw material is termed as hazardous. Hazardous waste can be

- Injectables, Raw material, Expired reference/standard material, Chemical/ reagents /solvents, Microbial cultures, Culture media, Silica gel, Animal wastes/waste animals/ animal carcasses, Sharps (Glass implements, needles, syringes, blades etc), Used filters, used membrane filters, Used disposable gloves, masks, Used cotton plugs etc.

5.6.2 Non - Hazardous waste

Waste which has no direct contact with the product / raw material. The non-hazardous waste can be

- Packing material, food scraps, PVC, Aluminum Foil, Glass bottles, Paper, card board, Used laboratory slippers / chappals etc

5.7 Color Code for segregation of waste material

5.7.1 Yellow - Puncture proof container for Glassware/sharps
5.7.2 Red - Infectious/biological material
5.7.3 Black - Non-infectious dry waste (paper, cartons etc)
5.7.3 Blue - Chemical/pharmaceutical material
5.7.4 Green - Non-infectious wet waste (kitchen, dietary etc)

5.8. Disposal of Waste

5.8.1 Sharps (Syringes/Needles/Scalpels/Glassware Waste)

- Collect the material in a **yellow** colored rigid, impact resistant, puncture proof and sealable container of appropriate size
- Design of container must protect handlers from being injured during collection and transport
- Sharps containers may be single use which is disposed of with the waste inside, or reusable which are robotically emptied and sterilized before being returned for re-use
- Decontaminate in an autoclave
- Drain the decontaminated material after diluting with water
- Crush the empty vials using eye, face and hand protection (gloves) and send the empty glassware to the area, designated for scrap near incinerator
- Maintain records in the relevant logbook accordingly

5.8.2 Infectious/Biological Waste (Laboratory)

- Place all Biological waste materials in the appropriate **Red** colored container.
- Decontaminate the material in an autoclave for an appropriate period according to the type of material and container
- Drain decontaminated liquid material in the diluted form

- Maintain records in relevant logbook accordingly

5.8.3 Packing Materials/papers waste etc

- Collect the material in specified **Black** colored container
- Tear/slit the paper waste into small pieces
- Store the torn material in the designated area for scrap in Room near incinerator
- Maintain records in the relevant logbook accordingly

5.8.4 Chemical Waste

- Collect all chemicals waste in a labeled, leak proof and non-reactive **Blue** colored container
- Do not mix two chemicals
- No harmful quantity of chemical waste shall adhere to the outside of the container
- Treat or neutralize the chemical waste (if required)
- Dispose off as per requirement
- Maintain records in the relevant logbook accordingly

5.9 Writing of SOPs

5.9.1 General Description

- The SOPs are written by the technical person / the officer of relevant section / department
- SOPs for production units are reviewed by relevant technical officer, SOP for equipments by the engineers and relevant technical officers for SOPs of other departments.
- Technical approval is given by respective department head for the SOPs of the relevant section / unit
- Authorization of documents
  - ❖ Manager Quality Assurance authorizes the SOPs for all departments
  - ❖ ED, NIH authorizes SOPs for QA department
- The heading for major information like purpose, scope etc is given in bold letters. Sub heading is also made in bold letters if required
- Any alteration made to a document are signed and dated by all the persons who are authorized to do so
- Font for writing of SOP is Arial and size is 11

5.9.2 Cover Page

The cover page serves as the approval page,it contains the effective date for the implementation of SOP along with history and reason for revision. Space is provided for signature of the originator, the person who reviews the document, technical approval of departmental head and authorization of the document by Division Head or Executive Director for regulatory compliance

- The cover page is attached ahead of page 1 at the time of final approval of the original or any revised document. This page is not numbered . If the cover page requires more than one page, each page of the "cover page" is alphabetically identified
- The cover page contains
  - Logo of NIH
  - Name of the Department for which SOP is written
  - Title of the SOP
  - SOP No
  - Effective Date
  - Review Date
  - No. of Pages
  - Signatures, Name, Designation of the personnel who write, review, approve and authorize the SOP with dates
  - Reason for revision
  - Document history
- Example of the Cover page is as per format of the cover page for this SOP

5.9.3 Other Pages

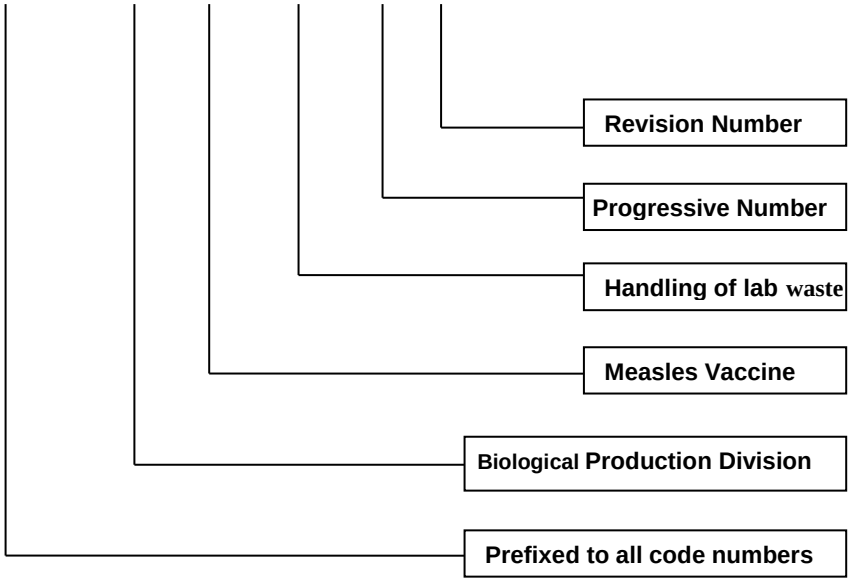
- Each page is divided into two main boxes and a separate box is made for major information
- Spacing - Vertical
  - Single-Spacing is used for the text
  - Each step from the text has a space in between
- Spacing - Horizontal
  - Single space is used for the text
- Leave one inch space for margins on all sides of each page
- Leave 6 point space from top and bottom of each box except first box
- Leave 4 point space between sub steps and 2 point space between additional sub steps
- The first box of each page has the following
  - Name of the Facility is located at the left upper end
  - Page Number is located at the right upper end
  - SOP No. is located just below the name of facility on the left hand side
  - The Explanation of Code number for SOP is as follows

    Example for abbreviation for all concerned departments

    BPD - Biological Production Division
    PHD - Public Health Division
    DCTMD - Drug Control & Traditional Medicine Div
    ND - Nutrition Division
    AC - Allergy Centre
    VFM - Veterinary & Farm Management Sub-Div
    QAD - Quality Assurance Department

- Give a space by adding a dash (-)
- Example of the code number of a SOP is as follows

SOP . #. BPD- 02 - HLW- 001/ 01



6 Reporting

6.1 Each section maintains log books for waste material produced in their respective area

6.2 Enter data in the log book/data sheet and prepare a monthly report within the first week of the every month and send it to Waste Management Committee through Chief Division

6.3 If any emergency arises during handling of waste material, report to O/I immediately

6.4. The focal person to be contacted in case of an emergency is Director Administration. 051-9255076

6.5 Hand over waste material according to the requirement i.e. for shredder, incineration or storage as scrap

6.6 Non hazardous waste is stored in designated area alongside the incinerator and further disposes through auction

7 Reference Documents:

7.1 Medical waste management: ICRC, 2011

7.2 Laboratory waste disposal management strategy procedure, RMIT (Royal Melbourne Institute of Technology) University, Australia, 2009

7.3 Section D2: Biological waste handling, Environmental Health and Safety Guide, Princeton University. USA, 2009

7.4 Laboratory waste disposal, Department of Chemistry, University of Kentucky.

May 2008

7.5 Good manufacturing practices and Inspection, Quality Assurance of pharmaceutical – volume2 WHO Guideline 1999

7.6 WHO (1997). Action plan for the development of national programme for sound management of hospital wastes. An outcome of the Regional Consultation on Sound Management of Hospital Waste, Chiang Mai, Thailand, 28–29 November 1996. New Delhi, World Health Organization Regional Office for SouthEast Asia.

Sample Data Sheet for Waste Handling

Division : _____ **Month:** _____

Date	Waste Collection Deptt/Lab/Sec	Waste Category Specify: Gen, Infectious, Chem, Pharma etc	Quantity of Waste Generated Per Day (weight & Volume)		Waste collected by	Waste received by
			Kg	Litre		

Data Verified By: _____ **O/I:** _____

QUALITY ASSURANCE DEPARTMENT
NATIONAL INSTITUTE OF HEALTH
ISLAMABAD

WASTE MANAGEMENT

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