



# **ENVIRONMENTAL CODES OF PRACTICE - 6**

## **DISPOSAL OF WASTE WATER, EMPTY BAGS/CONTAINERS AND BIO-MEDICAL WASTES**

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## Document Revision and Approval History

*(All revisions must be approved. Revision and Approval can be internal source or the client)*

<b>VERSION</b>	<b>DATE</b>	<b>REVIEWER &amp; APPROVER</b>	<b>REMARKS</b>
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## Document Distribution List

<b>#</b>	<b>NAME/ COMPANY</b>	<b>PURPOSE</b>

# **ECOP 6 - DISPOSAL OF WASTE WATER, EMPTY BAGS/CONTAINERS AND BIO-MEDICAL WASTES**

## **1 INTRODUCTION**

The vector control practices under the National Vector Borne Disease Control Programme (NVBDCP) involves

- Indoor Residual Spraying (IRS) in rural areas
- Distribution of Long-Lasting Insecticide Treated Bed Nets (LLINs)
- Larviciding in urban areas
- Thermal Fogging in urban areas
- Integrated Vector Management (IVM).

### **1.1 DETECTION AND TREATMENT OF MALARIA IN RURAL AREAS OF WASTE GENERATION**

The two significant points of waste generation in the process of IRS are:

- Wash water generated from washing and rinsing of the spray equipment after a day's work
- Empty bags/containers contaminated with insecticides after its use.

In addition to the above wastes, bio-medical wastes are generated during treatment.

- For diagnosis of malaria/kala-azar, health service functionaries at the grass-root level (like the Multipurpose Workers and the Auxiliary Nurse & Midwife (ANM)/ Accredited Social Health Activist (ASHA)) use Rapid Diagnostic Kits (RDKs).
- Blood smeared slides are generated for microscopic testing to confirm the diseases.

## **2 PURPOSE AND SCOPE**

This Code provides guidance for those personnel involved in management and disposal of waste, wash water and bio-medical waste generated from project activities.

## **3 STATUS OF THE CODE**

The Insecticides Rules, 1971 has a provision (Rule 44) that sets clear cut guidelines for disposal of used packages, surplus materials and washings of insecticides. FAO/WHO recommends that the practice of disposal of insecticide packaging at the place of use by burying or burning be prohibited.

The Indian regulation also provides for specific guidance for the handling and disposal of the Bio-Medical waste under the Bio-Medical Waste (Management & Handling) Rules, 1998. The guidance provided under these rules has been used for the development of the guidelines for handling of Biomedical Waste under the National Rural Health Mission (NRHM).

#### **4 DUTIES AND RESPONSIBILITIES**

The types of waste generated from the IRS activities have been sequentially presented in the following sections.

The responsibilities of the different health functionaries are presented below:

- The squad supervisor would be responsible for decontamination and storage of empty containers and bags. He would also be responsible for transfer of these waste materials to the PHC.
- At the PHC, it would be the responsibility of the kala-azar Technical Support/Malaria Technical Support to arrange for the storage and disposal of these wastes. The MoIC would have the responsibility to supervise and ensure that the wastes are properly disposed.
- The ASHA/ANM/AWW would be responsible for the disposal of RDK.
- The Lab technicians would be responsible for the disposal of the blood smeared slides after testing.

#### **5 GUIDANCE NOTES**

This Code of Practice describes the guidelines for the disposal; the guidelines contain three sections as follows:

- Section I: Guidelines for disposal of wash water from IRS,
- Section II: Disposal guidelines for bags/containers contaminated with insecticides
- Section III: Guidelines for disposal of bio-medical waste.

##### **5.1 SECTION I: GUIDELINES FOR WASH WATER DISPOSAL**

Wash water is generated out of the washing of the buckets used for making solution and stirrup pumps.

Progressive triple rinsing is suggested for washing of the buckets. The washing of the pump and nozzle would be as per specifications mentioned in the technical manuals.

The washing of buckets is recommended to take place near the soak pit. The methodology for the progressive triple rinsing is as follows:

- **STEP 1:** Three buckets have to be washed. Two litres of fresh water is poured in the 1<sup>st</sup> bucket and washed. The washed water is collected in the 3<sup>rd</sup> bucket.

- **STEP 2:** Again two litres of fresh water is added to the 1<sup>st</sup> bucket and washed. The rinsate is collected in the 2<sup>nd</sup> bucket.
- **STEP 3:** The 2<sup>nd</sup> bucket is rinsed and the water is collected in the 3<sup>rd</sup> bucket.
- **STEP 4:** Again 2 litres of water is added to 1<sup>st</sup> bucket and the bucket is washed. The rinsate of the 3<sup>rd</sup> wash of the 1<sup>st</sup> bucket should almost be clean and is collected in the 2<sup>nd</sup> bucket.
- **STEP 5:** The 2<sup>nd</sup> bucket is rinsed with the 3<sup>rd</sup> wash rinsate of the 1<sup>st</sup> bucket and the contents are poured in the 3<sup>rd</sup> bucket.
- **STEP 6:** The contents of the 3<sup>rd</sup> bucket are emptied into the soak pit.
- **STEP 7:** Again 2 litres of fresh water is added to the 2<sup>nd</sup> bucket. The third rinsate of the second bucket is almost clean and is used for the 1<sup>st</sup> rinsing of the 3<sup>rd</sup> bucket.
- **STEP 8:** The 3<sup>rd</sup> bucket is rinsed twice with 2 litres of water each time and the water is finally disposed of into the soak pit.

The rinsate collected needs to be disposed off in the soak pit<sup>1</sup> of the sub-center.

## 5.2 DESIGN GUIDELINES FOR THE SOAK PITS

A soak pit is a specially designed hole in the ground for disposing of insecticide remnant after the day's IRS activities. A properly sited and constructed soak pit protects the environment from getting contaminated with insecticides.

## 5.3 SITING OF THE SOAK PIT

### 5.3.1 Siting of the Soak Pit

The soak pit should preferably be located within the unused areas of Sub-Centre/ Panchayat/government offices of a village. However, such pits should not be within 100m of any water body or drinking water source. The soak pit should be constructed only in areas where ground water table is at a depth of more than 5m below ground level.

### 5.3.2 Construction of the Soak Pit

A soak pit measuring 1m by 1m by 1m is usually sufficient to absorb the

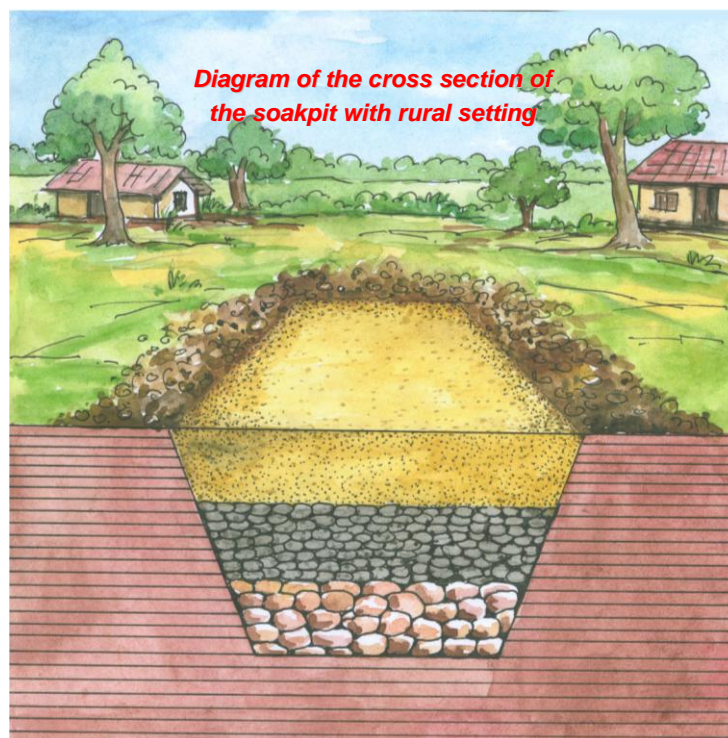
**FIGURE 1. SITING OF SOAK PIT**



<sup>1</sup> This is being tried on a pilot case in four districts of Orissa.

effluent produced from one round of spraying operation. The bottom of the pit is lined with a layer of coarse gravel followed by a layer of stone aggregate. It is then filled with 1.5 to 2 bags of charcoal (where feasible) and 1.0 to 1.5 bags of sawdust/sand/morrum/coarse soil. This would create a filter one meter in depth. As the effluent percolates through this filter medium, the insecticides filter out.

**FIGURE 2. CONSTRUCTION OF SOAK PITS**



### **5.3.3 Disposal of the residue**

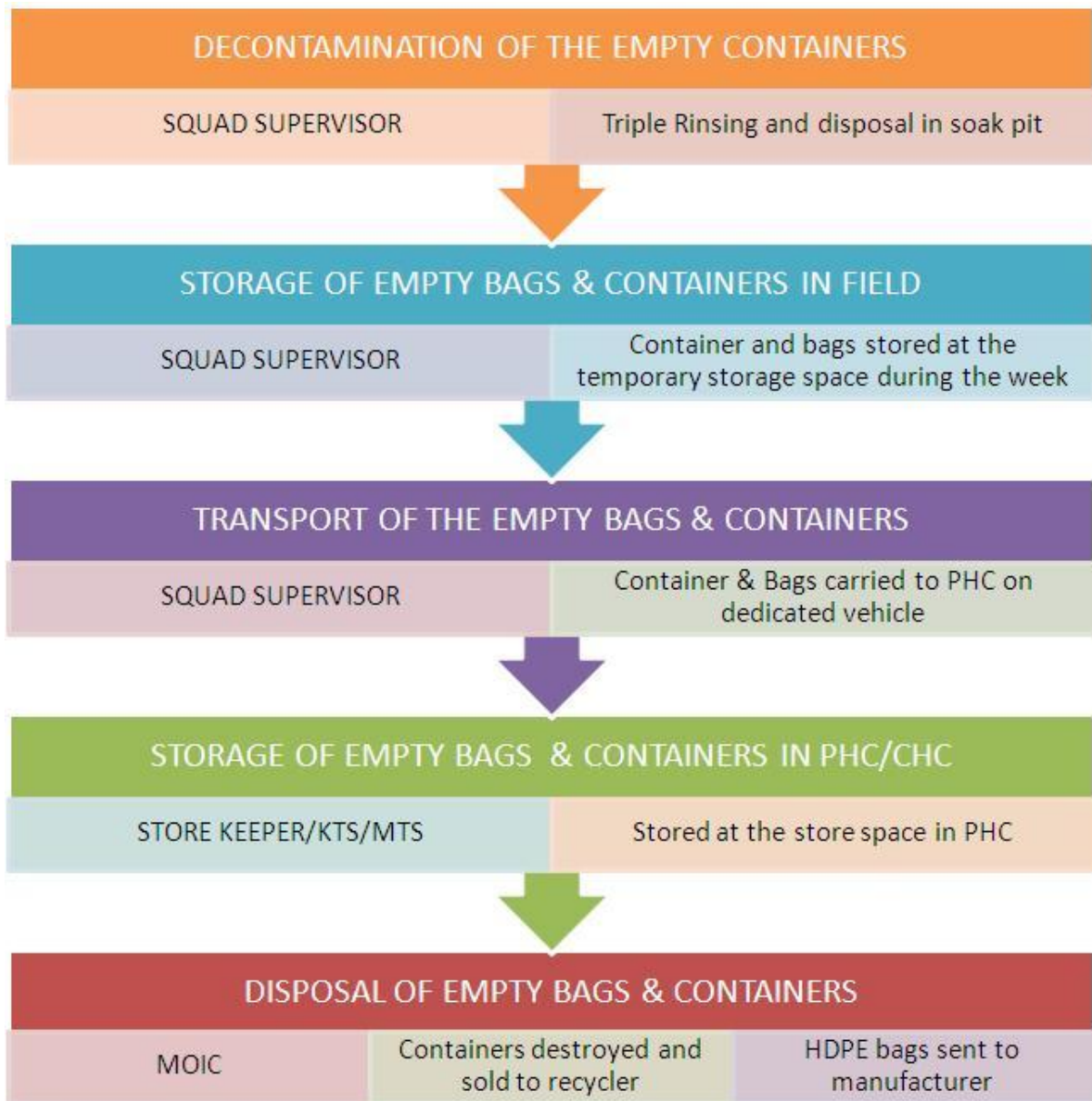
At the end of a spraying round, the residue of chemicals left on the surface of the pit should be scrapped by the spraying squad and disposed of into the waste pit of the PHC.

## **5.4 SECTION II: GUIDELINES FOR DISPOSAL OF BAGS/CONTAINERS**

Empty bags or containers used for packing insecticide are contaminated with insecticides and have to be disposed properly. These wastes are generated in the field during IRS spray and, thus, needs to be collected and decontaminated before they are disposed. However, type and size of containers varies depending upon the insecticide used in a particular area and manufacturer of the insecticide.

The process of decontamination, collection and storage disposal is provided in **Figure** below:

**FIGURE 3. SCHEMATIC DIAGRAM OF HANDLING AND DISPOSAL OF EMPTY BAGS AND CONTAINERS**



**5.4.1 Collection and transportation to the PHCs**

The Spray Supervisor would be responsible for collecting the empty bags and containers generated from the week’s operations and would carry it back to the PHC. Empty containers should be rinsed (triple-rinsing) before they are transported to the PHC. The container wash water should be disposed of in the soak pit designed for disposal of waste water. A dedicated transport, e.g. cycle rickshaw, van rickshaw/ auto rickshaw, should be used for transporting the bags/containers of insecticides. During transportation of the contaminated bags and containers, the load should be covered up with polythene sheets and tied up so that they are securely fixed. The vehicle should not be overloaded at the time of transportation.



The empty bags and containers have to be deposited to the storekeeper. The storekeeper should verify the quantity and also maintain an account of the bags and containers returned. The empty bags and containers would be stored along with the insecticides before it is disposed. The following precautions should be adopted while handling empty bags/containers:

- The personnel handling the empty bags and containers should wear their PPEs (consisting of gloves, mask, apron and goggles and shoes).
- The empty containers and bags should be stacked properly and should not be strewn in the storage area.
- Any spill of the remaining insecticide should be contained and subsequently cleaned.

#### **5.4.2 Disposal of the bags and containers at the PHCs**

The following guidelines should be followed for proper disposal of bags and containers from the PHC. Since jute bags, HDPE bags, HDPE containers and MS Containers are used for the packing of insecticides, the guidelines for disposal of each of these have been specified separately.

- **Gunny bags:** Gunny bags used for the packing of insecticides are usually double ply jute cloth lined with an impermeable liner. There is an LDPE bag inside the double ply jute bag in which the insecticides are packed. The LDPE bag is extracted and the jute bag can be allowed to decompose. The LDPE bags should be disposed in the deep burial pit at the PHC.
- **HDPE bags:** The bags should be returned to the PHC by the spray supervisor after being cut into two pieces. The store in-charge should maintain record of the bags which have been returned. The bags can then be disposed of to a hazardous waste recycler. Alternatively, The HDPE can either be sent back to the district during cycle/year in the vehicle which supplies the insecticides to the PHC. These bags can subsequently be sent back to the manufacturer.
- **Containers:** The containers once rinsed can be used for as collection containers for hazardous wastes. Alternatively, PWD crushers (like JCB)/bulldozers could be used at each PHC to crush these containers. The crushed containers can be sold off to an authorised recycler.

### **5.5 SECTION III: GUIDELINES FOR DISPOSAL OF BIO-MEDICAL WASTE**

For diagnosis of malaria, Rapid Diagnostic Kits (RDks) are used. Additionally, blood smear slides are also prepared for testing under a microscope. The waste generated from these activities involve biologicals (blood samples), biotechnological waste (waste generated from the kit), sharp waste (glass slides), solid wastes (like cotton, tissue paper contaminated with blood) and liquid waste (generated in the laboratory while testing, cleaning and disinfecting activities). These are treated as bio-medical waste and should be disposed in accordance with the provisions of the Bio-Medical

Waste Management Rules 2000. For proper waste disposal, best management practice for the RD kits and blood smear slides are presented below.

#### **5.5.1 Disposal of RD Kits**

- The ASHA and other health workers use RD kits for testing. The other wastes, i.e. packing labels, should be segregated and the used kits and the pricking needles should only be returned to the ANM at the end of each week.
- The ANM should carry these kits to the sub-centre and dispose RD Kits into the yellow plastic bags at the PHC.
- The ANM should destroy the pricking needles in the needle destroyer/cutter at the sub-centre.

#### **5.5.2 Disposal of Blood Smear Slides**

- The MPW male would collect all the blood smear slides from the ASHA, ANM and other health workers. Slides that are broken should also be handed over to MPWs by the grass root level workers.
- The MPW would hand over all the blood smeared slides to the laboratory technician at the PHC.
- MPW's should dispose broken slides in the yellow bags dedicated for collection of sharps.
- The laboratory technician testing the slides should dispose of the slide as per the guidelines for Disposal of Bio-Medical Waste prepared by NRHM.
- The bio-medical wastes, especially sharps collected at the PHC, should also be disposed of as per the guidelines for Disposal of Bio-Medical Waste prepared by NRHM.

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### **The ECoP series also Contain:**

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5. Indoor Residual Spraying (IRS)



## **National Vector Borne Disease Control Programme (NVBDCP)**

Directorate General of Health Services

Ministry of Health & Family Welfare

22, Sham Nath Marg, Delhi - 110054