

# **Chapter VI**

## **Bio Medical Waste (BMW)**

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### Bio Medical Waste (BMW)

According to the Bio-medical Waste (Management and Handling) Rules, 1998, Bio-Medical Waste (BMW) means any waste which is generated during the diagnosis, treatment or immunisation of human beings or animals or in research activities pertaining thereto.

Bio-Medical waste would, thus, include waste generated by Hospitals, other Health Care Establishments (HCEs), Veterinary Institutions and consists of discarded drugs, sharp waste, microbiological and biotechnological waste, human anatomical waste, animal wastes, etc.

#### 6.1 HCEs functioning without obtaining authorisation

As per Rule 8 of the BMW Rules, every HCE treating 1,000 or more patients in a month, has to obtain authorisation from the PCBA for generating, collecting, receiving, storing, treating, disposing or handling of biomedical waste. Accordingly, the Government of Assam fixed (November 2003) the authorisation fee under BMW Rules ranging between ₹ 40,000 and ₹ 2 lakh per HCE depending upon the number of beds/volume of BMW generation.

As per Annual Report submitted to CPCB by PCBA, the position of authorisation obtained by HCEs in Assam are shown in the following Table:

**Table No.: 6.1**  
**Number of HCEs requiring authorisation and obtained**

Year	No. of HCEs requiring authorisation	No. of HCEs which obtained authorisation	No. of HCEs functioning without authorisation
2010-11	1,007	114	893
2011-12	1,007	160	847
2012-13	1,011	294	717
2013-14	1,014	295	719
2014-15	1,014	178	836

*Source: Annual Report of PCBA submitted to CPCB*

Thus, 836 HCEs (82.44 per cent) were functioning without authorisation from PCBA in violation of BMW Rules, which, besides being in clear violation of the Rules also deprived the Exchequer of at least ₹ 3.34 crore<sup>52</sup> as fees not realised from the defaulters.

In reply, the PCBA stated (August 2015) that action had been taken in the form of issue of notices and directions to HCEs. The PCBA further stated (April 2016) that most of the HCEs that had not applied for authorisation are Government Primary

<sup>52</sup> Worked out on basis of minimum authorisation fee of ₹ 40,000 per HCE

Health Centres (PHCs) including dispensaries and clinics. However, PCBA assured that action had been initiated for detailed inventorisation of these units after which pending dues will be recovered.

## 6.2 HCEs functioning without BMW treatment facilities

Rule 5 (2) of the BMW Rules stipulate that every occupier shall set up, in accordance with the time-schedule in Schedule VI, requisite BMW treatment facilities like incinerator, autoclave, microwave system for the treatment of waste or ensure requisite treatment of waste by having a tie up with common BMW treatment facilities. Details are shown in the following table:

**Table No.: 6.2**  
**Time schedule for Waste Treatment Facilities**

<b>A</b>	<b>Hospitals and nursing homes in towns with population of 30 lakhs and above</b>	<b>By 30<sup>th</sup> June 2000 or earlier</b>
<b>B</b>	Hospitals and nursing homes in towns with population of below 30 lakhs	
	With 500 beds and above	By 30 <sup>th</sup> June 2000 or earlier
	With 200 beds and above but less than 500 bed	By 31 <sup>st</sup> December 2000 or earlier
	With 50 beds and above but less than 200 beds	By 31 <sup>st</sup> December 2001 or earlier
	With less than 50 beds	By 31 <sup>st</sup> December 2002 or earlier
<b>C</b>	All other institutions generating bio-medical waste not included in A and B above	By 31 <sup>st</sup> December 2002 or earlier

*Source: BMW Rules*

It was observed in Audit that:

- Despite mandatory provisions in the BMW Rules and lapse of more than 12 years, since 01 January 2003, 56 HCEs out of 183 HCEs in Guwahati neither had their own waste treatment facilities nor tied up with other Common Bio-Medical Waste Treatment Facilities. As per section 15 of the Environment (Protection) Act, 1986, whoever fails to comply with any provisions of the Act or the rules made thereunder, shall in respect of each such failure, be punishable with imprisonment for a term which may extend to five years or with fine which



*BMW laying in the open space in District Civil Hospital, Sonapur*

may extend to one lakh rupees or with both, and in case the failure continues, with additional fine which may extend to five thousand rupees for every day during such failure. The PCBA also had not taken any punitive action as per the Environment (Protection) Act for non-compliance with BMW Rules. This was despite the fact that 98.14 MT BMW was generated by 56 hospitals during the period of the Performance Audit.

- No discussion was held in any of the 12 PCBA Board Meetings between 2010 and 2015 regarding non-compliance with BMW rules by HCEs.
- The PCBA had also not carried out any study on impact of untreated BMW on health.

On being pointed out, the PCBA stated (August 2015) that the HCEs were under Government Sector and generate very little amount of BMW. However, the matter had been communicated to the Director of Health Services, Guwahati for immediate necessary action. The fact remained that as per BMW Rules all HCEs (either Govt. or private, big or small) shall set up BMW treatment facilities or ensure requisite treatment of waste by having a tie-up with common BMW treatment facilities.

### 6.3 Monitoring of Veterinary Institutions

As per Rule 7 (1) of the BMW Rules, the PCBA was the prescribed authority for enforcement of the provisions of BMW Rules in respect of all HCEs including hospitals, nursing homes, clinics, dispensaries, veterinary institutions, animal houses, pathological laboratories and blood banks.

Audit observed that PCBA did not have any information regarding the veterinary institutions and was not monitoring compliance with BMW Rules.

On being pointed out, the PCBA stated (August 2015) that the veterinary dispensaries were very tiny units and have no OT, etc. due to which these units do not come under purview of authorisation. However, detailed inventory of the units shall be carried out shortly.

The fact remained that the PCBA did not have any detailed inventory of the units and consequently, monitoring was not done. It is therefore, evident that their contention was not substantiated.

### 6.4 Monitoring of PCBA under BMW Rules

As per Rule 7 (1) of the BMW Rules, PCBA was the designated authority for enforcement of the provisions of the said Rules and for monitoring of compliance, thereof.

As per the information furnished by PCBA, number of occupiers<sup>53</sup> vis-a-vis checked is given in the following table.

<sup>53</sup> Any Institution generating bio-medical waste

**Table: No. : 6.3**  
**Occupiers in Guwahati vis-a-vis, Checked**

Year	No. of authorised occupiers	Nos. of occupiers Checked/inspected	Percentage
2010-11	97	2	2
2011-12	100	8	8
2012-13	105	6	6
2013-14	115	6	5
2014-15	123	11	9

This shows that PCBA carried out physical inspection of authorised occupiers of BMW varying from 2 per cent to 9 per cent only. This reflects poor monitoring by the PCBA despite the PCBA being the only prescribed authority for enforcement of the BMW Rules.

### 6.5 Quantity of BMW generated, treated and disposed off

Rule 5 of BMW Rules lays down the methodology and standards for treatment and disposal of bio-medical wastes such as incineration, deep burial, autoclaving, microwaving, disinfection, etc. for various categories of wastes *i. e.* human anatomical waste, animal waste, micro-biology and bio-technology waste.

The year wise position of BMW generated, treated and disposed off in Guwahati is given in the following table:

**Table No.: 6.4**

#### Quantity of BMW generated, treated and disposed off in Guwahati

Year	Estimated BMW generated (MT)	BMW collected & treated (MT)	BMW disposed of without treatment (MT)
2010-11	185.68	167.39	18.29
2011-12	210.51	191.81	18.70
2012-13	218.96	199.83	19.13
2013-14	234.43	213.61	20.82
2014-15	239.21	217.96	21.25
Total	<b>1,088.79</b>	<b>990.60 (91%)</b>	<b>98.19 (9%)</b>

*Source: Information furnished by PCBA*

It was noticed in Audit that though 98.19 MT or nine per cent BMW was disposed off without treatment in violation of BMW Rules, the PCBA had not taken any punitive action against the violators as stipulated under the Environment

(Protection) Act, section 15 of which provides that whoever fails to comply with any provisions of the Act or the rules made thereunder, shall in respect of each such failure, be punishable with imprisonment for a term which may extend to five years or with fine which may extend to one lakh rupees or with both, and in case the failure continues, with additional fine which may extend to five thousand rupees for every day during such failure.. Further, due to non-maintenance of records at the Common BMW treatment facility as discussed below, the veracity of statistics on collection and treatment of BMW could not be ascertained and verified in audit.

## 6.6 Common Bio Medical Waste Treatment Facilities

Fresh Air Waste Management Services Pvt. Ltd. situated at Panikhaiti, Guwahati, was the only Common Bio-Medical Waste Treatment Facility (CBWTF) in Assam. It provided services/facilities to 150 HCEs of Kamrup, Nalbari and Nagaon Districts. It had incinerator with auto loading, autoclave, shredder, sharp pit, Effluent Treatment Plant, chemical treatment bath, etc.

## 6.7 Segregation, packaging, transportation and storage of BMW at CBWTF

Schedules II, III & IV of Rule 6 of BMW Rules provide that bio-medical waste shall be segregated at the point of generation and kept in yellow, red, blue and black containers/bags prior to its storage, transportation, treatment and disposal.

The containers shall be labelled as Bio-hazards and carry/display Cytotoxic hazard symbol with the name of waste category, waste class, sender's name & address, contact no., receiver's name & address, contact no., etc.

Joint physical inspection (by the officials of Audit and the PCBA) revealed that:

- un-segregated BMW was collected and transported to CBWTF site. Un-segregated waste was dumped in an enclosure near the incineration unit.
- the containers/bags were not labelled as Bio-hazards and did not carry/display Cytotoxic hazard symbol.
- labels (regarding category of BMW, Sender's name & address, date, etc.) on containers/bags were not pasted.
- the log books of vehicles transporting BMW were not maintained at the CBWTF site.
- stock register regarding quantity of BMW receipt, treated and disposed was not being maintained at the site.



*Unsegregated BMW lying in the CBWTF*

It is therefore, evident that the Common Bio-medical Waste Treatment Facility was not complying with the BMW Rules properly and the PCBA was not monitoring compliance with the same on a regular basis.

## 6.8 Treatment of BMW at CBWTF

Rule 5 of BMW Rules provides that bio-medical waste shall be treated and disposed off in accordance with the provisions of Schedule I and in compliance with the standards prescribed in Schedule V.

During joint physical inspection with the officers of PCBA it was noticed that:

- the temperature at the Primary Chamber of incinerator was displayed as around  $747^{\circ}\text{C}$  against minimum requirement of  $800 \pm 50^{\circ}\text{C}$ ;
- the Secondary chamber of incinerator displayed only around  $170^{\circ}\text{C}$  against the requirement of  $1050 \pm 50^{\circ}\text{C}$ ;
- due to non-maintenance of proper temperature at the chamber there was possibility that the BMW may not be treated properly.

On query, it was stated by the operator of the facility that the display panel or the thermo-couple were not working properly.

Thus, faulty equipment deprived the operators the means of ensuring that the incinerator burns at prescribed temperature. It was further observed that log books for Incinerator and Autoclave were not being maintained at the site. Though PCBA should have done regular inspections, they had not conducted any inspection. Hence, treatment of actual quantity of BMW per day could not be ascertained.

## 6.9 Handling of BMW at CBWTF

Bio-Medical Waste includes variety of hazardous chemical agents which may cause acute poisoning, chemical accidents, damage to the respiratory system, chronic diseases, etc. The operator/worker may also suffer cuts and pricks from sharp tools, glass, etc. For their safety they should use Personal Protective Equipment (PPE) namely safety boots and goggles, chemical resistant clothing, gas masks, etc.

Joint physical inspection (August 2015) along with the officers of PCBA revealed that the workers at the unit were handling unused/expired medicines without PPEs thus exposing them to the risk of serious infections.



*Incinerator at CBWTF*



*Workers working without PPEs*

## 6.10 Physical Inspection of Health Care Establishments (HCEs)

Joint physical inspection (September 2015) along with the officer of PCBA in respect of 10 HCEs in Guwahati Region revealed that:

- As per Rule 6(3) of the BMW Rules, no untreated BMW should be kept stored beyond a period of 48 hours. It was observed in Audit that seven HCEs<sup>54</sup> were tied up with the CBWTF<sup>55</sup> for treatment of BMW and one HCE<sup>56</sup> was sending the BMW to another HCE<sup>57</sup> (being administered office) from where it was being sent to CBWTF. However, the BMW were not collected by the CBWTF centre on daily basis (weekly basis in respect of one HCE<sup>58</sup> and an interval of three to four days in respect of three HCEs<sup>59</sup>).
- the bags, through which BMW were sent to CBWTF centre, were not labelled as per Schedule III (Bio-hazards and Cytotoxic hazard symbol) & Schedule IV (name of waste category, waste class, sender's name & address, contact no., receiver's name & address, contact no.).
- in one HCE<sup>60</sup>, incinerator was installed (June 2014) which was not made operational. The entire BMW was kept in temporary pit, which was not as per the scientific method prescribed in BMW Rules. In another HCE<sup>61</sup>, incinerator was not operated on regular basis and the operator stated that the incinerator was started only when about 10 kg BMW accumulated in the Laboratory.
- as per Rule 6 of the BMW Rules, BMW shall not be mixed with other waste. BMW shall be segregated into containers/bags at the point of generation in accordance with Schedule II prior to its storage, transportation, treatment and disposal. It was seen in one HCE<sup>62</sup> that



*BMW mixed with MSW lying openly outside boundary of MMCH, Pan Bazar*



*ETP at MMCH, Pan Bazar*

<sup>54</sup> (i) Guwahati Medical College & Hospital (GMCH), Bhangagarh (ii) International Hospital, Christian Basti (iii) Maternity and Child Welfare Hospital, Dhirenpara (iv) Marwari Maternity Hospital, Athgaon (v) Arya Hospital, Rehabari, A. M. Road (vi) Hayat Hospital, Udalbakra (vii) Dispur Polyclinic and Nursing Home, Ganeshguri

<sup>55</sup> Fresh Air, Panikhaiti

<sup>56</sup> Mahendra Mohan Choudhury Hospital (MMCH), Pan Bazar

<sup>57</sup> Guwahati Medical College & Hospital (GMCH), Bhangagarh

<sup>58</sup> Maternity and Child Welfare Hospital, Dhirenpara

<sup>59</sup> (i) Arya Hospital (ii) Hayat Hospital (iii) Dispur Polyclinic and Nursing Home

<sup>60</sup> District Hospital, Sonapur

<sup>61</sup> Dr. B. Barua Cancer Institute, Gopinath Nagar, Birubari

<sup>62</sup> Mahendra Mohan Choudhury Hospital (MMCH), Pan Bazar

BMW were mixed with the Municipal Solid Waste (MSW) which were lying openly scattered outside the boundary wall in violation of BMW Rules.

- Liquid Waste & Chemical Waste such as waste generated from laboratory and washing, cleaning, house-keeping and disinfecting activities, chemicals used in biological production, disinfection as insecticides, etc. were required to be disinfected by chemical treatment and only then these should be discharged into drains.

There was no Effluent Treatment Plant (ETP) in respect of two HCEs<sup>63</sup>. In respect of two HCEs, though ETPs were installed, the same were not functioning since June 2013 in one case<sup>64</sup> and in the other<sup>65</sup> liquid waste pipe had not been connected to the ETP. In respect of two HCEs<sup>66</sup>, ETP was not working on regular basis and the entire liquid and chemical wastes were being discharged into the public drains without chemical treatment in violation of BMW Rules.

- In one HCE,<sup>67</sup> the syringe destroyers of the Hospital Emergency ward was found to be non-functional during joint inspection and syringe, etc. were found lying on the floor.

As per section 15 of the Environment (Protection) Act, 1986, whoever fails to comply with any provisions of the Act or the rules made thereunder, shall in respect of each such failure, be punishable with imprisonment for a term which may extend to five years or with fine which may extend to one lakh rupees or with both, and in case the failure continues, with additional fine which may extend to five thousand rupees for every day during such failure. PCBA however, did not take any punitive action in this regard as envisaged in the Environment (Protection) Act.

### 6.11 Advisory Committee on Bio-Medical Wastes

As per Rule 9 of BMW Rules, the Government of every State shall constitute an Advisory Committee including PCBA as a member, which shall advise the Government and the Prescribed Authority about matters related to the implementation of these rules.

The State Government constituted the Advisory Committee in June 2009 after a lapse of more than 11 years of framing the BMW Rules. However, it was stated that not a single meeting was held, rendering the Committee practically defunct.

<sup>63</sup> (i) Maternity and Child Welfare Hospital, Dhirenpara (ii) Dr. B. Barua Cancer Institute, Gopinath Nagar, Birubari

<sup>64</sup> Mahendra Mohan Choudhury Hospital (MMCH), Pan Bazar

<sup>65</sup> District Hospital, Sonapur

<sup>66</sup> (i) Arya Hospital (ii) Hayat Hospital

<sup>67</sup> Maternity and Child Welfare Hospital, Dhirenpara

## 6.12 Recommendations

- *The Government must ensure that no HCEs, Veterinary Institutions and Animal Houses operate without authorisation of the PCBA so that the lives and health of humans and animals are not endangered .*
- *The PCBA should take penal action against the violators under Environment (Protection) Act.*