
Chapter V

Municipal Solid Waste (MSW)

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MSW Rules provides that every municipal authority shall be responsible for implementation of provisions of these Rules and for any infrastructure, development for collection, storage, segregate, transportation, processing and disposal of MSW, GMC is the implementing agency in Guwahati city.

Guwahati Municipal Corporation (GMC) was responsible for management of solid waste generated in Guwahati city. Municipal Solid Waste (Management and Handling) Rules 2000 envisaged mandatory setting up of infrastructure facility and servicing of Solid Waste Management (SWM) by 31 December 2003. The Pollution Control Board, Assam (PCBA) was responsible for monitoring the implementation of provisions of MSW Rules.

The PCBA was responsible for monitoring of implementing these Rules such as compliance of standards regarding groundwater, ambient air, leachate quality and the compost quality including incineration standards as prescribed. The PCBA shall issue the authorisation to Municipal authority or an operator (on receipt of application) stipulating compliance criteria and standards as specified including such other conditions as may be necessary. Further the Municipal Authority shall furnish copy of annual report to the PCBA on or before 30th June every year. The PCBA shall prepare and submit to CPCB an annual report with regard to the implementation of MSW Rules by 15th September every year.

5.1 Previous Audit Findings

Mention about Solid Waste Management in Guwahati was made in Para 1.3 of Report of the Comptroller and Auditor General of India (Civil) for the year 2010-11 (Performance Audit of Public Private Partnership in Solid Waste Management in Guwahati). The Performance Audit covered the period upto March 2011 and brought out the following major audit findings:

- The land provided for setting up of the SWM project did not comply fully with applicable parameters stipulated by Central Public Health and Environmental Engineering Organisation (CPHEEO).
- The SWM partner, Guwahati Waste Management Corporation Private Limited (GWMCP) failed to take appropriate measures against pollution of air, water and land.
- The Boragaon, Guwahati landfill site shares a common boundary with a national wetland, which has a linkage with 'Deepor Beel' a Ramsar site water body and pollution through seepage endangered the fish and migratory birds in the wetland. The future of SWM project was in jeopardy as the site was in close vicinity of a national wetland and was in violation of Wetland Rules, 2010.

On the basis of the audit findings, the following recommendations were made:

- Proper assessment of generation and characteristic of MSW should be made before proceeding towards implementation of the project.
- Waste processing should be made mandatory by the developer and it should be impressed upon the developer to improve the existing dumpsites to make them more sanitary and aesthetic.
- In view of the alarming possibility of contamination of surface water, groundwater and soil for setting up the project site in wetland in violation of MSW rules 2000 and Wetland Rules 2010, the State Government should consider remedial measures urgently.
- The PCBA should draw up comprehensive schedules for sustained monitoring of compost plants, landfill sites and other installations.

Verification of MSW management during the course of this performance audit revealed that a number of deficiencies were continuing despite being pointed out in 2011. These are mentioned in the succeeding paragraphs.

5.2 Quantity of MSW generated, collected, treated & disposed off

The quantity of MSW generated in Guwahati had been consistently rising over the years owing to rapid population growth, mass migration of population, floating population, increase in economic activities in the city and change in people's lifestyle.

A wide gap between the total quantity of MSW generated/collected, segregated, treated and disposed off during 2011-15⁴⁷ in Guwahati was noticed in Audit, as shown in the following Table:

Table No.: 5.1
Status of disposal of MSW in Guwahati

Year	Quantity of MSW generated/collected (MT)	Quantity of MSW segregated (MT)	Quantity of MSW treated/processed (MT)	Quantity of MSW disposed through landfills (MT)	Quantity of MSW dumped (MT)	Total expenditure incurred for management of MSW (₹ in crore)
2011-12	1,26,000	50,400	36,000	0	39,600	7.10
2012-13	1,49,760	59,904	36,000	0	53,856	7.42
2013-14	1,55,880	62,352	36,000	0	57,528	7.50
2014-15	1,80,000	72,000	36,000	0	72,000	7.83
Total	6,11,640	2,44,656 (40%)	1,44,000 (24%)	0	2,22,984 (36%)	29.85

Source: Information furnished by GMC

⁴⁷ As period upto March 2011 has been covered in earlier PA, this data is restricted from 2011 onwards.

It was further observed in Audit that:

- As per Rule 4 (2) of the MSW Rules, the municipal authority or an operator of a facility shall make an application for grant of authorisation by the PCBA for setting up waste processing and disposal facility including landfills in order to comply with the implementation schedule. Even after passage of more than 14 years since the Rules were made, Guwahati Municipal Corporation (GMC) had not obtained authorisation from the PCBA.
- Only 40 per cent of the total MSW was segregated into biodegradable and non-biodegradable wastes and only 24 per cent of the total MSW was treated/processed.
- Final disposal of MSW needed to be done through landfills, but no such disposal was done during 2011-15.
- During 2011-15, a total of 2,22,984 MT untreated MSW had been dumped in the open dumpsites/yards increasing the risk of environmental degradation and health hazards.
- Despite incurring a total expenditure of ₹29.85 crore during 2011-15, GMC had not complied with MSW Rules.
- As per MSW Rules, the PCBA was responsible for monitoring of compliance but did not take any action in this regard.



Untreated MSW dumped at Boragaon

In reply, the PCBA stated (April 2016) that the matter had been brought before GoA and also communicated to the Municipal Bodies. The fact remained that the matter was never discussed in any of the 12 Board Meetings of PCBA that were held between 2010 and 2015 although Secretary, Urban Development Department was a member of the Board.

5.3 Unhygienic collection and storage of MSW

As per Schedule II of MSW Rules, littering of municipal solid waste shall be prohibited in cities, towns and in urban areas notified by the State Governments. Municipal authorities were responsible for prohibiting littering and facilitating compliance with MSW Rules in such a manner that it does not create unhygienic and insanitary conditions.



Mixed MSW littering around bins near Wireless, Guwahati

Storage facilities shall be created and established by taking into account quantities of waste generated in a given area and the population densities. It shall be so designed that wastes stored are not exposed to open atmosphere and shall be aesthetically acceptable and user-friendly. Storage facilities or bins shall have 'easy to operate' design for handling, transfer and transportation of waste.



Mixed MSW littering around bins near Gitanagar, Guwahati

Bins for storage of bio-degradable wastes, recyclable waste and other wastes shall be painted in green, white and black colours respectively.

It was noticed in Audit that:

- Facilities for house to house collection of MSW were available only in some parts of the city. With available tricycles (500 nos.) and auto tippers (62), a maximum of 2.12 lakh households could be covered out of 2.50 lakh total households in the City.
- Single coloured (black) bins were placed on road side instead of three coloured bins *i.e.* green, white and black. Hence, all types of wastes *i.e.* bio-degradable wastes, recyclable waste and other wastes were mixed.
- Size and nos. of bins were placed without considering the quantities of wastes generated in an area and the population density. This resulted in littering after bins became full thus creating unhygienic and insanitary conditions around the site.
- The available Dumper Bins, Compactors, etc, had a total waste holding capacity of 207.3 tonnes whereas the estimated quantity of waste generation was 506 tonnes per day. Hence, numbers of Bins, compactors were not sufficient and these were also not being cleared regularly resulting in unhygienic and filthy conditions near the collection points.



Overflowing MSW littering out bins near Biruhari

In reply, the PCBA stated (April 2016) that correspondence with the Municipal authority was in progress regarding segregation of biodegradable, recyclable and inert part of MSW.

5.4 Transportation of MSW

As per Schedule II of MSW Rules, vehicles used for transportation of wastes shall be covered. Wastes should not be visible to public or exposed to open environment in order to prevent scattering. The storage facilities set up by the municipal authorities shall be attended daily for clearing of wastes. The bins or containers wherever placed shall be cleared before they start overflowing. Transportation vehicles shall be so designed that multiple handling of wastes, prior to final disposal, is avoided. It was observed in Audit that

- 200 dumper bins of 3.5 m³ capacity each were placed at the road sides of the city and 23 dumper placers were engaged to transport the bins. Considering the waste holding capacity of 200 dumper bins (*i.e.* 200 ton), at least 25 dumper placers were required for transporting.
- MSW was being transported in uncovered vehicles.

5.5 Partial treatment of MSW

As per MSW Rules, the municipal authorities shall adopt suitable technology or combination of such technologies to make use of wastes so as to minimise burden of landfill. The biodegradable wastes shall be processed by composting, vermin-composting, anaerobic digestion or any other appropriate biological processing for stabilization of wastes. It shall be ensured that compost or any other end product shall comply with standards as specified in Schedule IV of MSW Rules. Mixed waste shall follow the route of recycling. Incineration with or without energy recovery can also be used for processing wastes in specific cases.

It was observed in Audit that

- 1,44,000 MT MSW was treated during 2011-15, which was only 24 *per cent* of total actual quantity *i.e.* 6,11,640 MT MSW generated/collected during those periods.
- GMC installed (February 2011) Compost Plant with a capacity of 50 tonnes per day (TPD) at Boragaon dumping site for treatment of MSW and



Compost plant at Boragaon



Packed Compost lying in the plant at Boragaon

a meagre quantity of five TPD of manure was being produced. However, the compost produced was never tested by the PCBA and hence its quality could not be ascertained by audit.

- Recycling of the waste was not carried out and
- No incinerator had been installed.

5.6 Leachate at MSW Dumping Site

As per Schedule III of MSW Rules, diversion of storm water drains was necessary to minimize leachate⁴⁸ generation and prevent pollution of surface water and also for avoiding flooding and creation of marshy condition. Steps should be taken for prevention of run-off from landfill area entering any stream, river, lake or pond. Provision for management of leachate collection and treatment shall be made. The treated leachate should meet the standards specified in Schedule IV of the Rules.

Audit observed that

- Leachate Treatment Plant was commissioned in February 2011 but was not operational till date of audit (August 2015)
- Test Analysis Report⁴⁹ of 20 samples of Leachate at MSW Dumping Site at Boragaon for the period from 2009 to 2015 revealed the following:



Untreated Leachate pumped out at Boragaon

Table No.: 5.2

Parameters	Standards prescribed for inland surface water (Schedule IV)	Observation	Remarks
pH	5.5-9.0	4.2-5.9	It met the desired criteria only on six occasions
Chemical Oxygen Demand (COD) (mg/l) Max	250	5482-15288	COD did not meet the desired criteria on any occasion.
Bio-Chemical Oxygen Demand (BOD) (mg/l) Max	30	1600-6912	BOD did not meet the desired criteria on any occasion.
Total Dissolved	2100	920-2822	TDS met the desired criteria

⁴⁸ Leachate means liquid that seeps through solid wastes or other medium and has extracts of dissolved or suspended material from it.

⁴⁹ Conducted by the PCBA annually.

Solids (TDS) (mg/l) Max			on eight occasions.
Total suspended solids (TSS) (mg/l) Max	100	86-5444	TSS met the desired criteria on only one occasion.
Phenolic (mg/l) Max	1.0	0.36-1.86	It met the desired criteria on nine occasions.
Lead (as Pb) (mg/l) Max	0.1	0.09-2.15	Lead level was above the criteria on ten occasions.

No follow-up had been done by the Municipal Authority regarding potential threats and adverse reports. 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, had not taken any action in this regard.

5.7 Monitoring of Air Quality at MSW Dumping Site

As per Schedule III of MSW Rules, installation of landfill gas control system including gas collection system should be made at landfill site to minimize odour generation, prevent off-site migration of gases and protect vegetation planted on the rehabilitated landfill surface.

The ambient air quality monitoring shall also be carried out by the concerned authority at regular intervals based on the population of cities such as six times in a year for cities having population more than 50 lakh, four times in a year for cities having population between 10 to 50 lakh and two times in a year for cities having population below 10 lakh.

It was observed in Audit that:

- Landfill Gas Control System and Gas Collection System were not installed.
- Against the requirement of four tests per year⁵⁰, neither the GMC nor PCBA carried out any monitoring of the ambient air quality at the dumping site, except once in 2012 when it was conducted by a Private Lab⁵¹.

5.8 Ground Water Quality at MSW Dumping Site

As per Schedule III of MSW Rules, before establishing any landfill site, baseline data of ground water quality in the area shall be collected and kept on record for future reference. The ground water quality within 50 meters of the periphery of landfill site shall also be periodically monitored to ensure that the ground water was

⁵⁰ Population of Guwahati being about twelve lakh.

⁵¹ M/s Vision Labs, Hyderabad

not contaminated beyond acceptable limit. Such monitoring should be carried out to cover different seasons in a year *i. e.* summer, monsoon and post monsoon period.

Audit observed that

- Base Line Data of ground water quality was not made available by GMC to audit. It was stated that the Data was available with the Guwahati Waste Management Corporation Private Limited.
- The PCBA was monitoring the ground water quality at the dumping site at Boragaon. The values of DO level during the years from 2011 to 2014 were found less than the criteria which was corroborated by the findings of the physical verification of the water quality of Deepor Beel carried out by Audit as mentioned in Para 3.4.

5.9 Recommendations

- *The PCBA should ensure that GMC obtains proper authorisation from them for management of MSW.*
- *Awareness Campaigns should be initiated by the PCBA in schools and media to ensure that the general public is sensitised regarding scientific disposal of domestic waste.*