

Form -1
[see rules 4(2) & 6(2)]
Application for obtaining authorization

To

The Member Secretary
 Pollution Control Board, Assam
 Bamunimaidam, Guwahati.

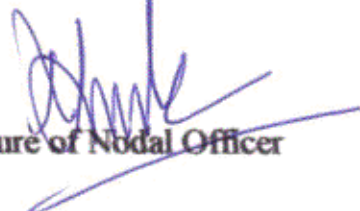
1	Name of the municipal authority / Name of the agency appointed by the municipal authority	GUWAHATI MUNICIPAL CORPORATION
2	Correspondence address Telephone No. Fax No.	OFFICE OF THE COMMISSIONER, GUWAHATI MUNICIPAL CORPORATION PANBAZAR, GUWAHATI - 781 001. 0361- 2540525 0361- 2631800
3	Nodal Officer & designation (Officer authorized by the Municipal authority or agency responsible for operation of processing or disposal facility)	SRI MANOJIT BUJARBORUAH Assistant Engineer, (Conservancy) Garage, Campus, Guwahati Municipal Corporation Dr. B. Baruah Road (Near Nehru Stadium)
4	Authorization applied for (Please tick mark) a) Setting up and operation of waste processing facility b) Setting up and operation of disposal facility	 <input checked="" type="checkbox"/> (The proposed facility is an integrated facility having both sanitary landfill and compost plant) <input checked="" type="checkbox"/>
5	Detailed proposal of waste processing/disposal facility (to be attached) to include	Explained in Annexure-1, Section 1.0 and Section 2.0. Layout scheme has been presented in the Drawing 1 & 2. Drawing 3 shows the proposed layout of Compost plant Drawing 4 shows the proposed layout of Sanitary landfill site,
5.1	Processing of Waste	
i)	Location of site	Badagaon
ii)	Name of waste processing technology	Aerobic windrow composting
iii)	Details of processing technology	Details of site and Composting technology along with the design details are presented in Annexure-1

iv)	Quantity of waste to be processed per day	MSW (organic) = 200 TPD
v)	Site clearance (from local authority)	N.A as Guwahati Municipal Corporation has applied for self
vi)	Details of agreement between municipal authority and operating agency	Detailed Project report has been approved and the agreement will be made once the operating agency is finalized.
vii)	Utilization programme for waste processed (Product utilization)	The compost produced from the plant would be sold in the market. The Consultants have finalized an off take agreement with one of the main fertilizer companies for the compost produced on the plant.
viii)	Methodology for disposal of waste processing rejects (quantity and quality)	The inerts generated after the waste processing would be transported to the adjoining landfill site. Around 40-50TPD of inerts will be transported to the landfill site
ix)	Measures to be taken for prevention and control of environmental pollution	Air Pollution, Water pollution and Solid waste pollution norms prescribed by CPCB, DPCC and MSW (handling & management) Rules 2000 would be adhered to by installing required Pollution Control equipments and measures and simultaneously NOC will be obtained from each of the concerned departments
x)	Investment on Project	<p>The project is Integrated MSW management System for Guwahati. It comprises of collection & transportation of MSW, processing in the compost plant and disposal of rejects and other inerts in the adjoining sanitary landfill (0 km lead distance). Cost of various components of the project (in Rs. Lakh) is:</p> <ul style="list-style-type: none"> • Collection & Transportation – 593.31 • Composting Facility (200TPD) – 854.88 • Sanitary Landfill – 487.18 • Common Facilities (weighbridge, parking etc.) – 84.26 • Pre Operative Cost – 132.35 • Interest during construction – 43.82 • Margin Money for working capital – 58.00 • Resource Mobilisation Cost – 22.43 • Contingencies – 71.32
	Expected returns	Project IRR : 28% ; The operator will be able to generate profits from the 4 th year of the project.
	Measures to be taken for safety of workers working in the plant.	<p>Industrial safety rules and norms will be followed Briefly:-</p> <ol style="list-style-type: none"> a) Safety of working personnel by using safety appliances like gloves, mask, helmet, shoes etc. b) Safety against fire hazards. c) Electrical safety requirements d) Using certified handling equipments e) Using skilled experienced certified technicians operators for mobile equipment operations

5.2	Disposal of Waste	
i)	Number of sites identified	One. Adjoining Sanitary Landfill site in the same area. This landfill site is the part of the proposed Integrated facility for MSW management comprising of Compost Plant and Sanitary Landfill
ii)	Layout maps of site	Drawing 1 & 2 attached
iii)	Quantity of waste to be disposed per day	i) 60 TPD rejects from the compost plant ii) Silt waste from drains, street sweepings etc. amounting to 12% of the MSW would be disposed directly in the landfill
iv)	Nature and composition of waste	Mainly Inert material; Street sweeping and drain silt of the Guwahati City.
v)	Details of methodology or criteria followed for site selection	Proposed site at Badagaon has been finalized by the State Government in the Guwahati Development Department in consultation with the Revenue Department and the Dy. Commissioner, Kamrup Distt. As most of the land in the Guwahati is low lying and prone to flooding, no other better plot of land is available for setting up of the proposed solid waste management facility for Guwahati city. The issue for allotment of more suitable alternative site was discussed with the Chief Minister of Assam. However, in view of the topographic and climatologically conditions of the city, the proposed site a Badagaon has been identified as the most suitable land for MSW processing and disposal facility.
vi)	Details of existing site under operation	Until recently, there is one open dumping site at Sachal which is now closed due to High court order. For the waste of proposed composting facility as well as for the other inerts of the city, there would be one sanitary landfill of 15.12 ha area, which is part of the proposed project. The life of this landfill is estimated to be around 20 years.
vii)	Methodology and operational details of land filling	Refer to Annexure-1, Section 3.0. Drawing 4 shows the proposed layout of Sanitary landfill site.
viii)	Measures taken to check environmental pollution.	Pollution Control Board Norms / MSW Handling Rules / Civil Aviation requirement etc., are taken care in design technology of the equipment installed.

Date:

Signature of Nodal Officer



Annexure-1

1.0 Description of the Site and its Development:

The selection of a site for developing landfill is one of the long pending issues with GMC. After considerable deliberations, the present site in Boragaon has been earmarked by the Government for the MSW disposal.

The proposed site for integrated facility development is located at Badagaon in GMC area with survey numbers 1112, 1113, 1117, 704 and part of 1114. The site is observed to be open land with seasonal agricultural activities. The site is within Brahmaputra flood plain. The site is located at a distance of around 15 km from the Guwahati City and is 1 km from the NH-37. Total land available for sanitary landfill and compost plant is 180 bigha (24.12 Ha). Drawings 1 present the details of land allocated for integrated facility development.

Salient features of the site are as follows:

- The site is located in a flood plain and it is observed that the flood is 6 m – 6.5 m above the ground level
- The ground water table is just few feet below the ground level and during monsoon it touches ground level.
- The proposed site is located in seismic zone IV.
- The proposed site remains water logged during a part of the year .

It is very clear that this site is not particularly suitable for MSW disposal. However, GMC indicated in several meetings that no other suitable site is available for this purpose. The land needs to be protected from the flood waters and adequate measures are to be adopted for a safe and environmentally sustainable disposal of MSW.

Main features of the site development for the integrated waste processing and disposal are as follows:

- 9 Ha of the land will be developed by filling the land upto 8m by soil with the slope of 1:3. This area will be used for development of compost plant of 200 TPD capacity in the first year and 300 TPD capacity plant in the eleventh year of the project.
- Remaining 15.12 Ha will be developed for sanitary landfill. This area will be developed by constructing 8m high retaining wall around the periphery of the landfill. There will be 2m soil filling at the bottom before laying the liner etc. The space enclosed within retaining wall shall be filled with inert waste and compost rejects and also a 15 m height landfill will be created above retaining wall height. Life of the landfill is estimated to be around 20 years with the total volume of 2412800 cum.

A schematic representation of the proposed layout is presented in Drawing 2.

2.0 Planning & Design of Compost Plant:

It is proposed to adapt the technology of aerobic composting which may be described as degradation of biodegradable waste matter into simple organic compounds by certain microorganisms in the presence of air. The process begins at ambient temperature by the activity of mesophilic bacteria which oxidize carbon to CO₂, thus liberating large amount of heat. Usually, the temperature of the waste piles reaches 50⁰C within two days, and this represents the limit of temperature tolerance of the mesophilic organisms. At this point the process is taken over by thermophilic bacteria and the temperature continues to rise. Most of the thermophilic phase, which lasts about two weeks, takes place in the temperature range 55⁰C – 65⁰C , should the temperature increase beyond 65⁰C , activity temporarily declines . The process is dependent of course, on the provision of a suitable environment for the

bacteria, in addition to the nutrients provided by the wastes. The main requirements are adequate supplies of air and moisture. Compared to anaerobic process, aerobic conversion process is preferable as it is fast, exothermic and free from odour. Aerobic process also helps to eliminate pathogenic bacteria weed seeds, larva etc. as a result of high temperature developed during the process.

Design Of Compost Plant : Total quantity of waste generated by the GMC areas is about 315 tons/day. Out of which around 50 tons/day is from drain cleaning and street sweeping and around 15 tons would be recycled by rag pickers. In the remaining 250 tons, it is assumed that 20 % of waste comprising of large objects (tyres, metal scrap), inerts (boulders, wood pieces), recyclables (glass, plastic, leather, rags), etc. would be segregated at tipping area before composting. Thus 200 tons/day of waste shall be composted in the plant everyday. The compost plant has been designed for a capacity of 200 tons/day. The infrastructure for the plant has been proposed in such a way so that the capacity of the plant in future can be increased up to 250-275 tons/day. The compost plant is based on the concepts for open windrow aerobic composting of organic (biodegradable) component of solid waste.

In the first year of the project, a 200 TPD plant will be commissioned. This plant will have some flexibility to treat up to 250-275 TPD of organic waste if required. In the 11th Year, one more additional compost plant (Phase-II) of 300 TPD will be commissioned. The life of the compost plants have been taken as 20 years. The land for the landfill will last for 20 years. That precisely means that an additional land will be required after 20 years of operation. The minimum land required for setting up of a compost plant of 200 TPD capacity has been estimated to be about 3 ha as specified by the Ministry of Urban Development (MoUD), GoI. Developed area for 200 TPD plant after soil filling has been taken as 3.2 Ha. In the remaining land, site development will be done in the 10th year of the project for the commissioning of another compost plant of 300 TPD capacity in the 11th year.

Layout of different components of the proposed compost plant of 200 TPD capacity is shown in Drawing 3. The complete process of MSW Composting can be summarized as follows:

1. Reception of raw MSW
2. Visual Inspection of waste
3. Weighing of Vehicle
4. Manual Sorting of Inert and removal of rejected material to landfill
5. Sorted material moved to Compost pad to form windrows
6. Yard Management activities
 - a. Periodic Turning of Windrows
 - b. Process Monitoring & Controlling activities
7. After two turnings, shifting of material to Monsoon Shed
8. After two weeks stabilization in the monsoon shed, feeding of material to coarse segregation section
9. Over sized rejects (+35 mm) to be sent to landfill
10. Over sized rejects (+16 mm) either sent to landfill or for windrow covering
11. Undersized material (-16 mm) stocked in Curing section godown
12. After two further weeks, cured material to be fed to refinement section
13. Over sized rejection (+ 6 mm) to be ground and mixed in curing section.

14. Under sized fine compost to be enriched with useful microbes, herbal extracts (optional)
15. Final Product (Compost) to be packed in 50 kg bags and stacked in finished goods godown.
16. Compost to be picked up by marketing agency for distribution in market.

3.0 Sanitary Landfill Planning & Design

Volume of the landfill site is estimated to be 24.12 lakh m³ with the design life of around 20 years (2006-2026). The landfill is being developed in the area of about 15.12 Ha . Since the HFL is about 6.5 m from the ground level it is proposed to construct the retaining wall of height 8 m around the landfill site to protect the sites from flood. The space with in retaining wall would be filled with inert waste and compost rejects up to 8 m and above 8 m a trapezoidal pyramid shape landfill shall be created. The slope of the landfill above 8 m shall be 1:5 with height of 15 m. The plan and cross-section of the landfill has been presented in Drawing 4.

Two leachate collection tanks (1640 m³ and 1298 m³ capacity) have been provided for the peak leachate generation rate of 1469 m³ per day. Leachate Collection Network comprising header pipe (260 mm diameter at a slope of 2 %) and feeder pipe/laterals (200 mm diameter at a spacing of 10 m centre to centre at a slope of 2%) has been proposed. The pipes shall be HDPE perforated pipes with sufficient strength (minimum 6 kgf) and should be safe from particulate and biological clogging and deflections. The generated leachate will be transported to Common Effluent Treatment Plant (CETP) which is under proposal for the Guwahati city.

For the landfill site composite liner of following specifications has been recommended complying Municipal Solid Waste (Management and Handling) Rules 2000:

- A 90cm thick compacted clay or amended soil (amended with bentonite) of permeability not greater than 1×10^{-7} cm/sec
- A HDPE geomembrane liner of thickness 1.5mm
- A drainage layer of 300 mm thick granular material of permeability not greater than 10^{-2} cm/sec.

Since landfill site at Guwahati is supported by compost plant, landfill gas generation is anticipated to be very less. An active gas venting system comprising of a gas-venting layer of 20 cm thick granular soil is proposed on the top of solid waste. The collected gas will be vented through gas vent pipes of 150 mm diameter perforated HDPE pipes. Total of 38 vents have been estimated for the landfill site.

The final cover system proposed for landfill site at Guwahati is based on the recommendations of MoEF and CPHHEO Manual. The final cover consists of the following components,

- Vegetative layer of 450 mm thick with good vegetation supporting soil
- Drainage layer of 150 mm thick granular material with permeability 1×10^{-2} cm/sec
- Barrier layer of 600 mm thick clay with permeability 1×10^{-7} cm/sec
- Gas venting layer of 200mm thick granular material with permeability 1×10^{-2} cm/sec