BEFORE THE HONOURABLE NATIONAL GREEN TRIBUNAL

SOUTH ZONE CHENNAI BENCH

Original Application No. 439 of 2013(SZ)
(THC) (W.P. (C) No. 3637/2012)

&

Original Application No. 456 of 2013 (SZ)
(THC) (W.P. (C) No. 1367/2011)

Chandran Pillai, Kollam and Anr. ... Applicant(s)
Versus
Union of India and Ors. ...Respondent(s)

&

Manushyavakasha Paristhithi
Samarakshana Samithy ... Applicant(s)
Versus
Union of India and Ors. ... Respondents

REPORT FILED BY THE ENVIRONMENTAL ENGINEER, KERALA STATE POLLUTION CONTROL BOARD, DISTRICT OFFICE, KOLLAM, THE 3RD RESPONDENT IN APPLICATION NO. 439 of 2013(SZ)

BEFORE THE HONOURABLE NATIONAL GREEN TRIBUNAL
SOUTH ZONE CHENNAI BENCH

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Chandran Pillai, Kollam and Anr. ... Applicant(s)
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REPORT FILED BY THE ENVIRONMENTAL ENGINEER, KERALA STATE POLLUTION CONTROL BOARD, DISTRICT OFFICE, KOLLAM, THE 3RDRESPONDENTIN APPLICATION NO. 439/2013(SZ)

I, Simi P., aged 40 years, D/o. T.V. Baby residing at Anizham, Maithanam, Varkala P.O., Thiruvananthapuram- 695141, Environmental Engineer, Kerala State Pollution Control Board, District Office, Kollam, do solemnly affirm and state as follows:

The Hon'ble NGT as per Order dated 14.09.2021 had directed the Board to file periodical report regarding the progress of the bio-mining and also implementation of the Solid Waste Management Rule, 2016 within Kollam Corporation. It is most humbly submitted that the Kollam Corporation had awarded the work of biomining to M/s. Zigma Global Environ Solution Pvt. Ltd. The biomining site was inspected by this respondent on 01.12.2021. The vegetation over the legacy waste was found cleared. The machinery for biomining is installed inside the existing shed of the old solid waste management plant adjacent to the legacy waste area. The installation of machinery was nearing completion. The plot boundary was being enclosed using corrugated sheets. The site engineer of the biomining contactor informed that the anticipated date of commencement of biomining is 15.12.2021 and the legacy waste up to the road level is expected to be cleared in 3.5 months. The matter was discussed in the 11th meeting of the District Level Monitoring Committee (DLMC) convened on 03.12.2021 by the Additional District Magistrate. The Secretary, Kollam Corporation informed that the approval

of the Chief Technical Examiner (CTE) regarding the initial levels is being awaited. Also necessary approval of KSEB has been sought for a transformer.

As per the annual report submitted by the Kollam Corporation for the year 2020 the total waste generation is 123.39 tonnes per day. The total quantity of waste processed is 90.34 tonnes per day. The gap in waste management is 33.05 tonnes per day. The Corporation is submitting quarterly progress report on the implementation of Solid Waste Management Rules, 2016. The Board through routine surveillance is verifying the action taken by the Corporation for implementation of the SWM Rules. According to the latest progress report submitted by the Kollam Corporation Secretary, the service of 213 Haritha Karma Sena (HKS) members is available in the Corporation area. The HKS covers 53 divisions of the Corporation. The HKS is collecting only dry waste from households and establishments. As per the report of the Secretary, Kollam Corporation the HKS was able to visit 83% of the households and 70% of commercial establishments. The Secretary had reported that there are 192 mini MCFs in the Corporation. There are 2 nos of RRFs in the Corporation. Currently the Corporation had provided 27 aerobic composting units and 13 biogas plants at community level and 32129 units at house hold level for treatment of biodegradable waste. Informal waste collectors are handling 25 TPD of waste generated from hotels and chicken stalls. Currently around 42554 households are benefitted from the existing community and household level biodegradable waste management facilities. In the periodic inspection of the waste management facilities of the Corporation it was noticed that out of the 2 RRFs, the one at Anchalummodu alone is operational and there is space constraint at the same resulting in storage of the dry waste even outside the RRF building. The newly constructed RRF at Kureepuzha has not yet started operation. Hence, a majority of the mini MCFs are kept idle. It was also noticed that the community level composting units needs maintenance. To improve the waste management, an action plan was prepared by the Corporation and the same was approved by the Council as per resolution no.1 on 08.10.2021. The copy of the action plan submitted by the Corporation is produced herewith and marked as **Annexure R3(a)**. On implementation of the action plan the remaining 45778 households also will be benefitted.

The SPV constituted for setting up of the Waste to Energy Plant of Kollam Corporation, M/s. Venad Waste Management Private Limited had applied for

Consent to Establish on 09.09.2021. The proposed waste to energy plant is bio-methanation based and is having a capacity of 200 TPD. On scrutiny of the application it was noticed that Clearances/ NOC with respect to CRZ and wetland was not enclosed. As the proposed project site was near to Ashtamudi lake, the application was returned to attach the above documents. The application is not yet resubmitted.

The Corporation is currently holding Authorization under the Solid Waste Management Rules, 2016 valid up to 06.08.2026. The Board vide the same had authorized the Secretary, Kollam Corporation for setting up and operation of solid waste management facilities for biodegradable/ non biodegradable waste treatment and processing including MCFs, RRF, composting units, biogas plants and biomining of legacy waste. The copy of the Authorization no. KSPCB/RO/KLM/AUTH/R1/01/2021 dated 07.12.2021 is produced herewith and marked as **Annexure R3(b)**.

The Board is conducting periodic inspections of the various waste management facilities of the Corporation and the biomining site. Once the biomining is commenced, the Board will carry out frequent site visits and ensure that there are no pollution issues to the nearby residents.

All that stated above are true to the best of my knowledge information and belief.

Dated this the 14th day of December 2021

ENVIRONMENTAL ENGINEER

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Respondent

Solemnly affirmed and signed by the deponent who is known to me on this the 14th day of December 2021.

BEFORE THE HONOURABLE NATIONAL GREEN TRIBUNAL

SOUTHEN ZONE CHENNAI BENCH

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I N D E X

Dated this the 14th day of December 2021

Annexure R3(a)

Status Report of Bio mining of Legacy Waste at Kureepuzha (OA No: 439/2013 and OA No 456/2013)

Kollam Municipal Corporation has plotted tender for Bio-mining of the Legacy waste at Kureepuzha, Kollam. On 27/01/2021, technical bid was opened; three bidders participated. i.e., Zigma global environ solutions Pvt ltd., SIDCO, Socio Economic Unit Foundation. Based on the evaluation and report of the technical committee it was found that only one bidder was technically qualified. As per the PWD manual, if only one bidder is found eligible after technical evaluation then it is considered as a single bid; so, it has to be retendered. Before signing the Bio-mining agreement, Council has given approval to assess the actual quantity of Legacy Waste dumped in Kureepuzha with the technical support of NIT Calicut. On 11/02/2021 Kollam corporation has retendered the project. The Technical bid was opened on 25/02/2021; three bidders participated Viz, Zigma Global Environ solutions pvt ltd, Geethanjali environ solutions pvt ltd and socio-economic unit foundation were participated. On 01/03/2021, Technical Evaluation committee was held; the technical committee members evaluated the documents and the bidders had done a presentation before the committee members regarding their methodology. Based on the technical committee evaluation only one bidder i.e., (Zigma Global Environ Solutions Pvt Ltd) found technically qualified for the next stage. On 04/03/2021 financial bid of qualified bidder ie, Zigma Global Enviro solutions Pvt ltd was opened. Meanwhile, on 02/03/2021, a team from NIT Calicut has conducted the drone-based survey for assessing the entire quantity of legacy waste at Kureepuzha. As the quoted rate for the Bio-mining process by the lowest bidder is higher than the scheduled rate; a Negotiation meeting (17/3/2021) was called for by Kollam Municipal Corporation. Despite the negotiation, the negotiated rate is higher than the scheduled rate. On 22/3/21, based on the approval from council, this matter has been sent to Government for approval. In between, the survey report has been submitted by NIT Calicut and the total quantity of legacy waste at an extend of 5.5 acres is 104906m3 found accordingly.

On 7/6/2021, a letter from Government has received stating the approval of rate(1130/m3) negotiated by Zigma Global Environ Solutions Pvt Ltd and this matter was approved by the Council on 17/6/2021. Letter of acceptance has been issued on 28/6/2021 and the agreement was signed on 10/7/2021. Work order and site handing over has been done on 12/7/2021.

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On 2/8/2021, as a first step of starting of work, nearly 8acres of vegetative growth over the legacy waste dump site area and its boundaries were cleared and debris were removed for easy conveyance of machineries and setting up of equipments. On 3/08/2021, the contractor has conducted as drone based survey in the presence of KMC officials to ascertain the quantity assessed by NIT Calicut. On 14/08/2021, Excavator for windrowing the legacy waste reached the site. On 17/08/2021, entire area was cleared and readied for placing the heavy duty machineries and other equipments. A meeting was conducted on 17/08/2021 in the presence of Mayor Kollam Corporation to evaluate the progress of the project, in which Mayor has asked the contractor to finish the work as soon as possible regardless of the completion period stated in the bid. The contractor has assured that they will complete the entire process before the stipulated time schedule, unless the monsoon arrives unexpectedly. Instruments for environmental baseline study such as ambient air quality monitoring, noise pollution and water quality testing equipment has reached at the site on 28/8/2021 and samples collected for baseline environmental study. On 10/11/2021, Chief Technical Examiner visited the site and directed the officials to conduct a total station survey to check the accuracy of the quantity. Based on this, a total station survey was conducted on 22/11/2021. CTE approval will be provided based on this survey.

Installation of the bio-mining plant infrastructure has been completed and set for doing a bench test shortly. 80% of the Lake side fencing has been completed and the remaning work gets delayed due to continous rains. Application for a new transformer of 99Kva is submitted to KSEB which is under process. It is expected to start the windrowing (by 15th December 2021) after getting the initial level approval from CTE. Due to the recent unexpected rains and high moisture content of the legacy waste area, the project is getting delayed. Kollam Corporation guarantees that we will provide all support needed for the completion of the project by following the orders from the Hon'ble NGT.

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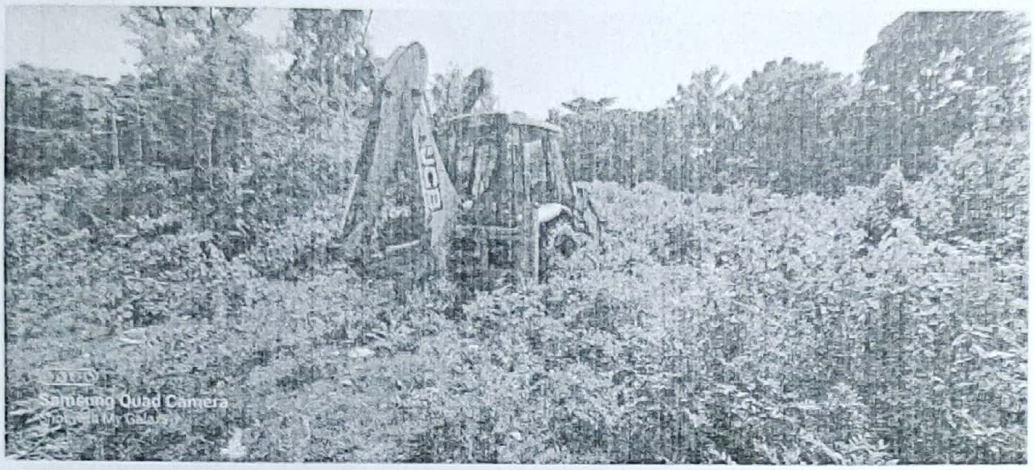
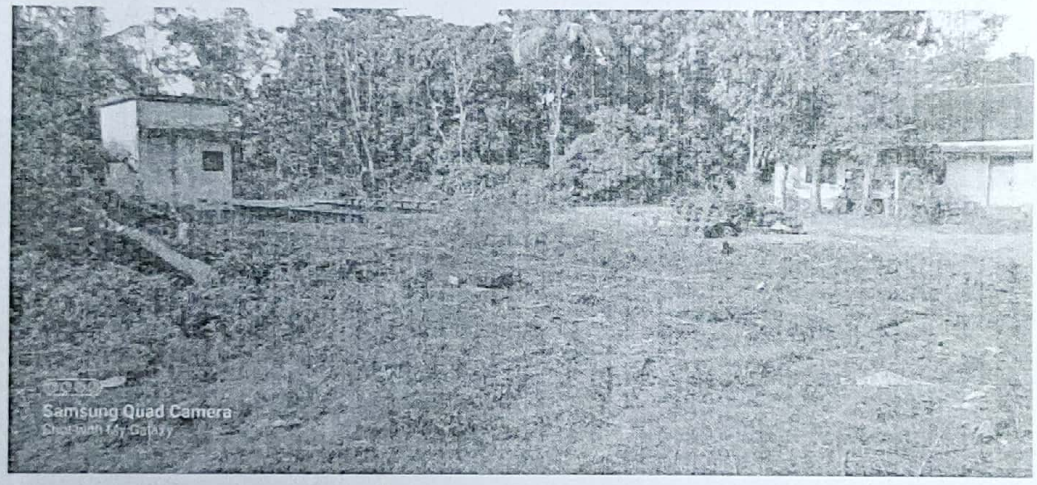
Progress of the Project with photographs





Removal of Vegetative Cover from the site

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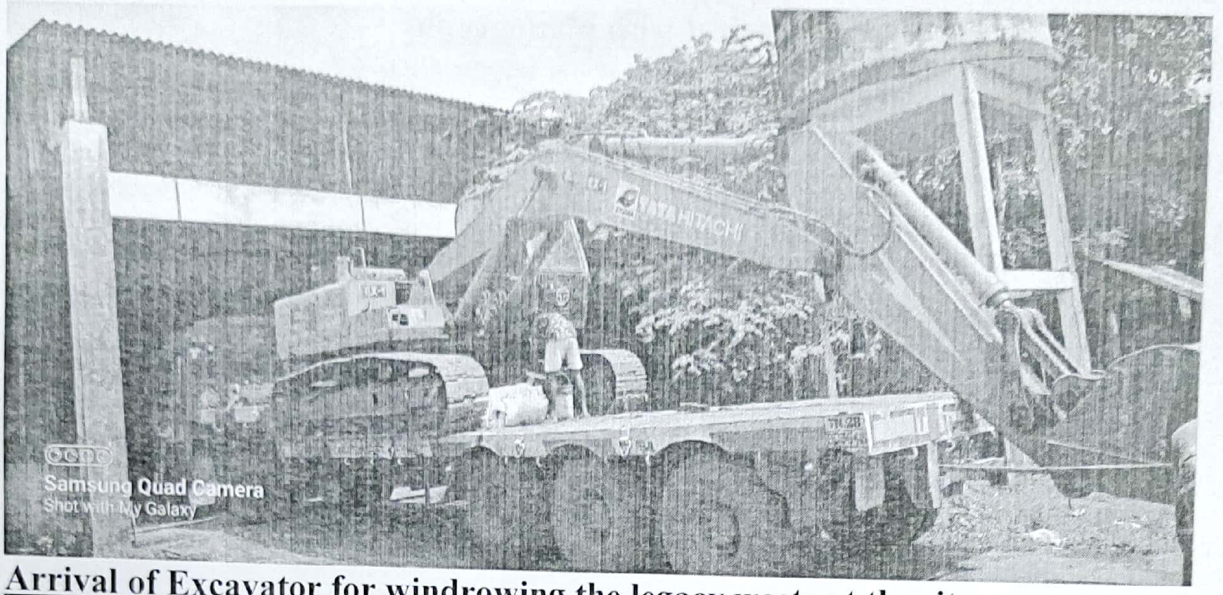

Arrival of Excavator for windrowing the legacy waste at the site

Instrument for baseline environmental study at the site.

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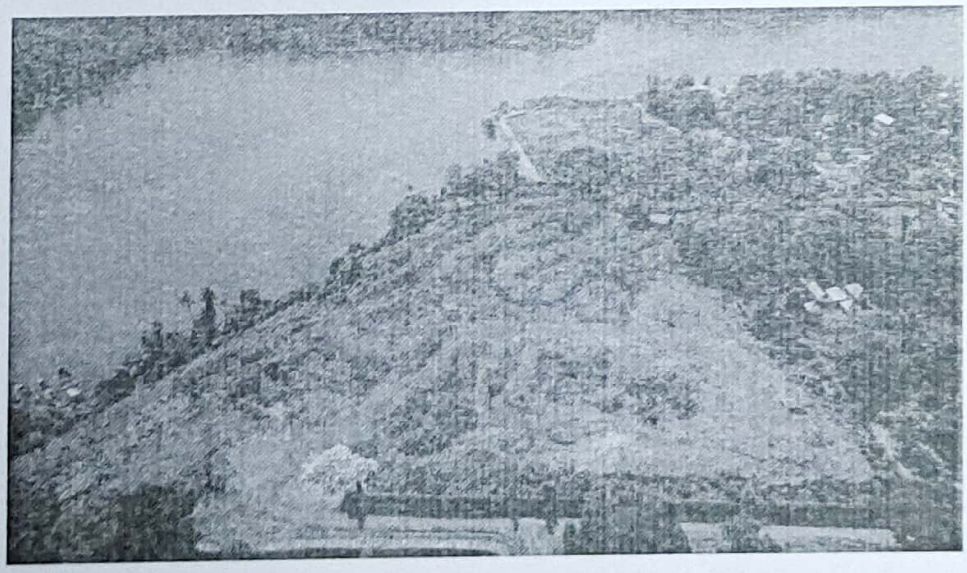
Before

Drone image of Kureepuzha dumpsite before removing vegetative cover

After



Drone image of Kureepuzha dumpsite after removing vegetative cover

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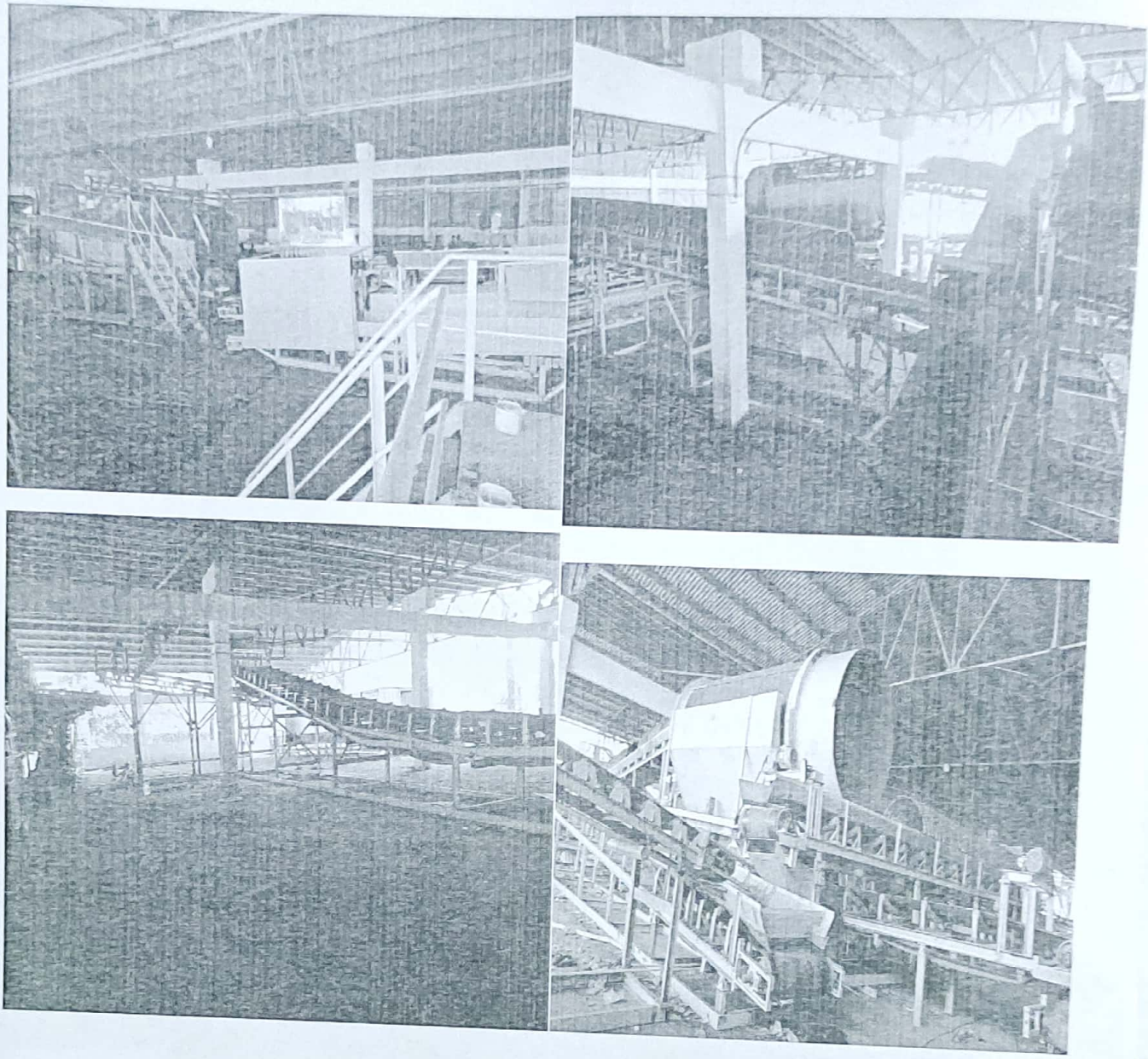

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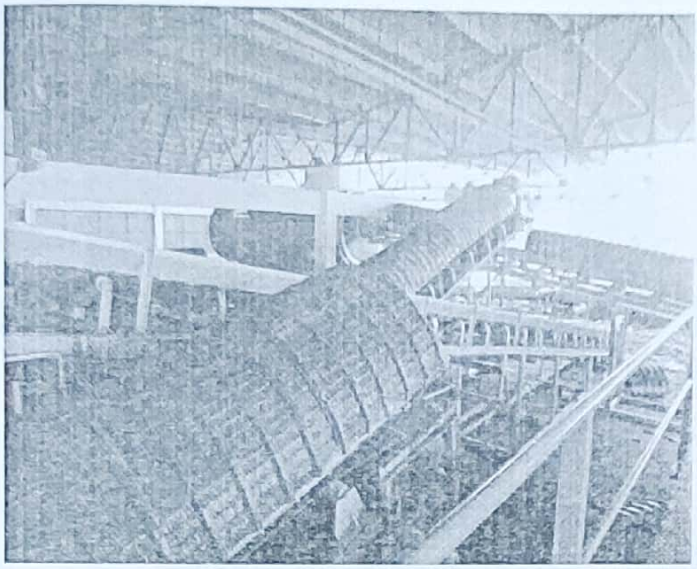

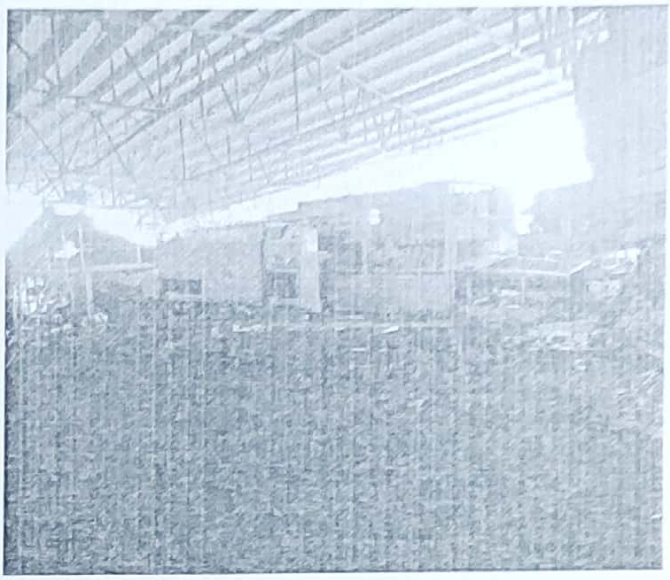

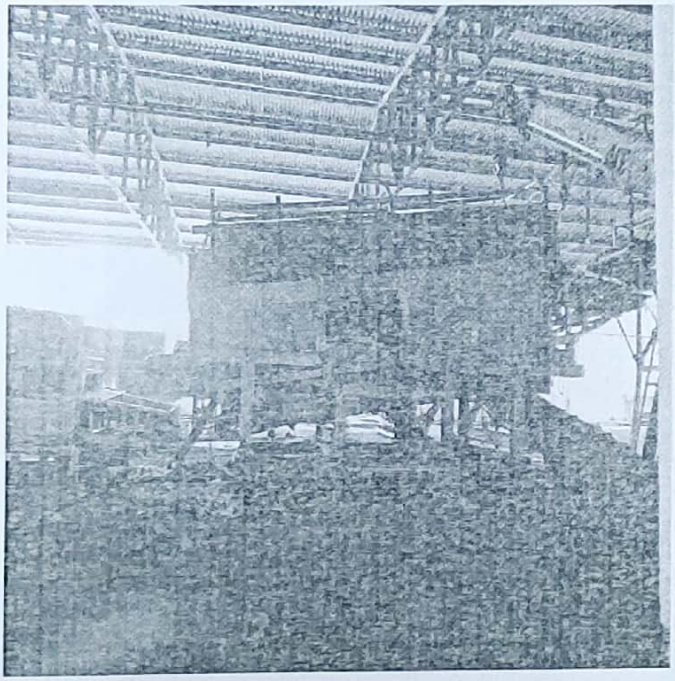

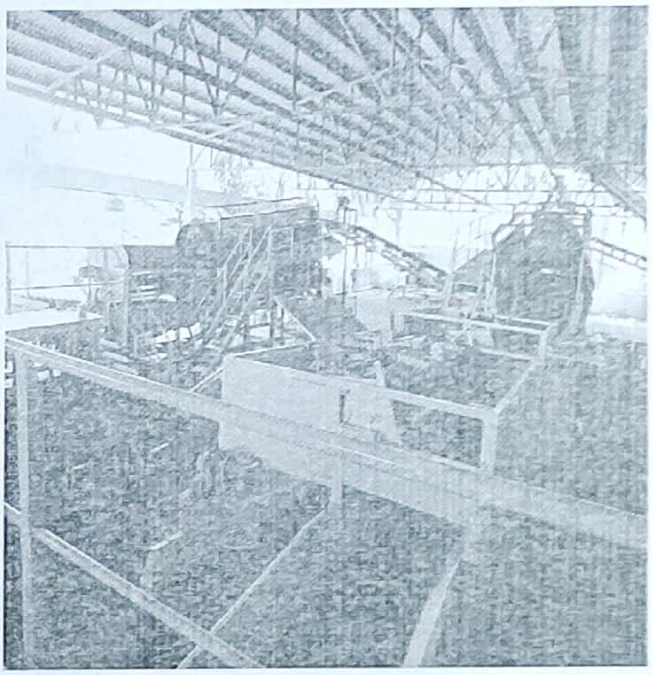

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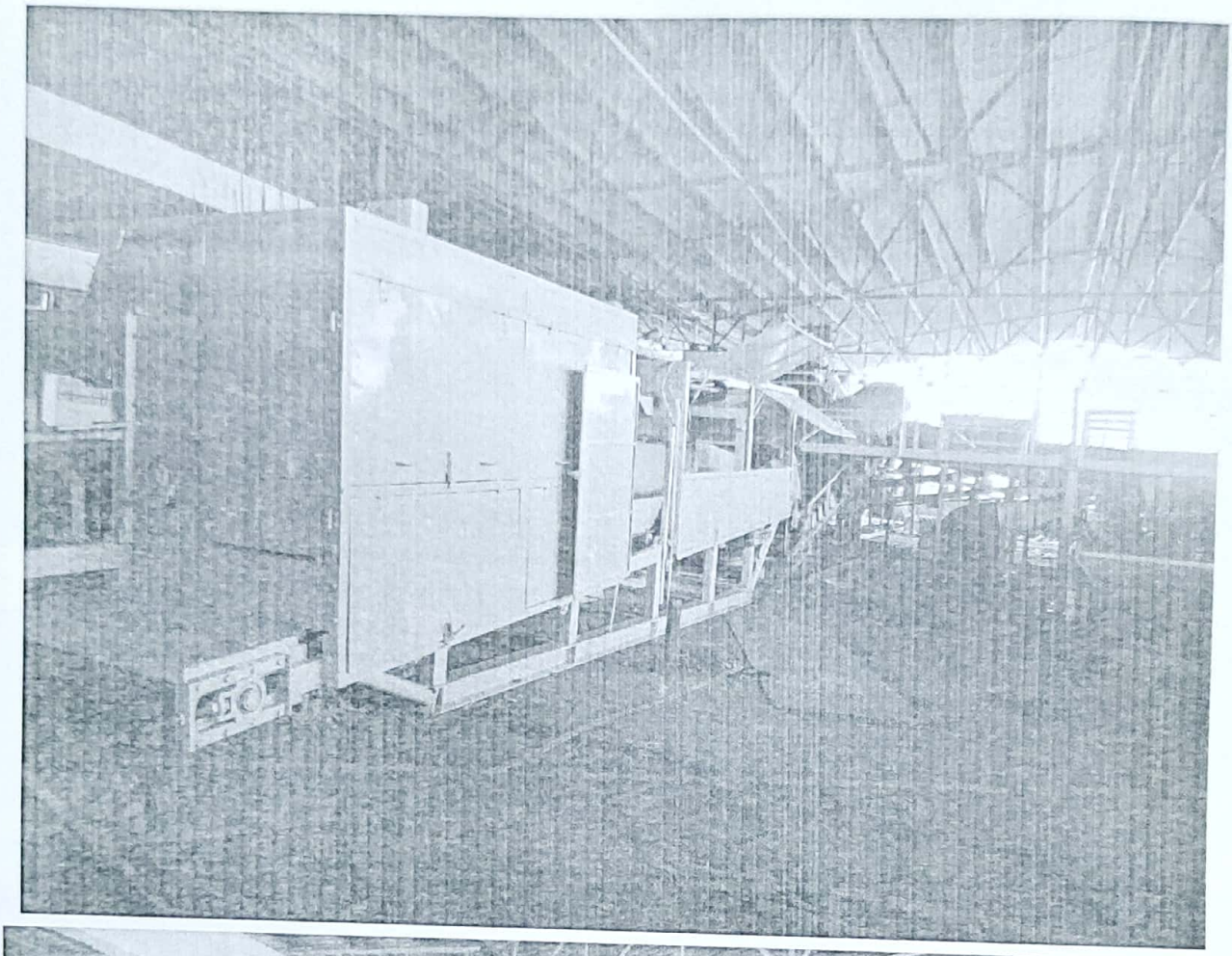

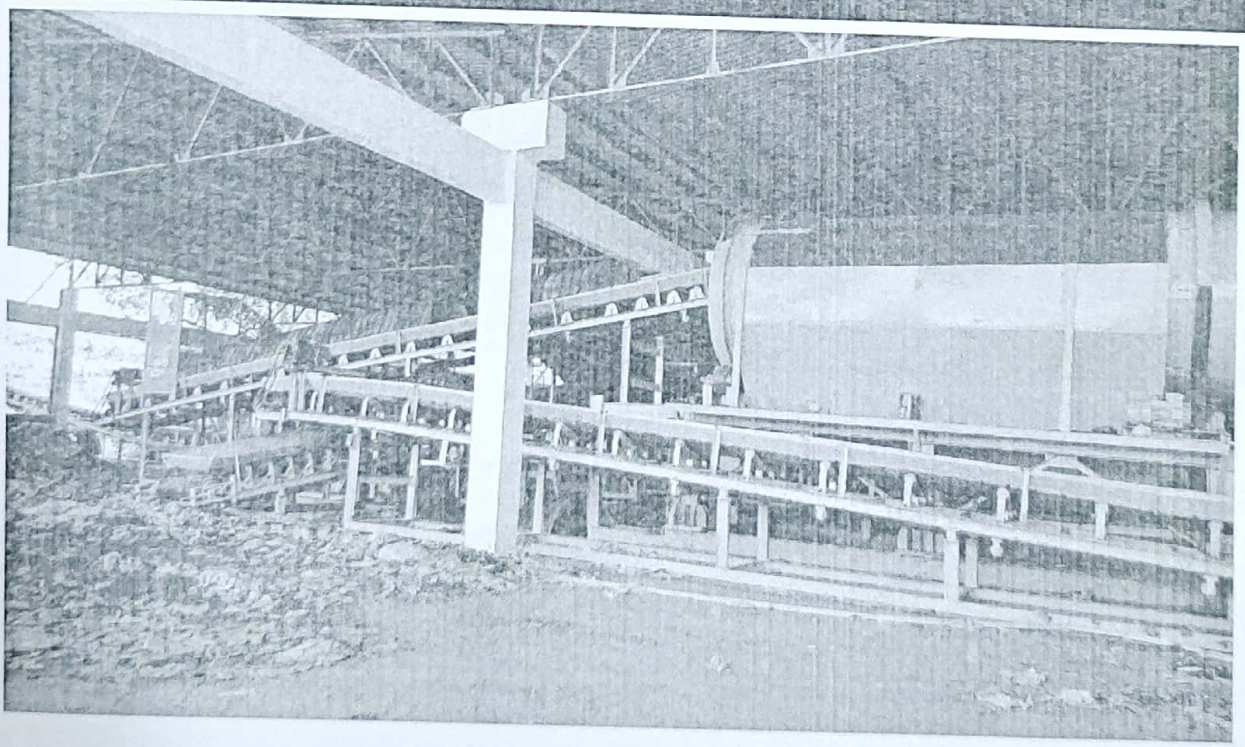

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STATUS OF SOLID WASTE MANAGEMENT IN KOLLAM CORPORATION

As per SWM Rule 22(1),(3),(7) & (8), Kollam Municipal Corporation (KMC) has taken imperative steps to facilitate door to door collection of non-biodegradable waste, segregation of bio-degradable and non-biodegradable waste at source, conversion of biodegradable waste into compost at source itself and proper recycle or utilisation of the non-biodegradable waste for commercial purposes.

NON-DEGRADABLE WASTE MANAGEMENT:

- **Facilities provided by Kollam Corporation for the effective management of non-degradable waste are as follows:**

Non-biodegradable waste collected from household and individual establishments by **Haritha Karma Sena (HKS)**, an initiative of Govt. of Kerala and LSGD. Currently 213 HKS members work across 53 wards of KMC. Number of members working per health circle ranges from 16- 24. Most of the HKS members follow a monthly schedule for visit to households, although the daily working 9 Am – 5 Pm. Households are visited once in a month and Commercial establishments are visited twice in a month. User fee collected is deposited in bank account (Micro enterprise group account) monthly, from which income is taken by HKS.

Till date, HKS status shows that they been able to visit 83% of households and 70% of commercial establishment in KMC. A cluster book is maintained by HKS in which the collection can be recorded. The households also have given a consumer card for their record. Micro-Enterprises groups of HKS have been registered under Kudumbasree. It can also serve as a point of sale for eco-friendly products. But it will not sustain for a long run as the quantity of NBW is reducing by the introduction of new Government policies. Hence other income generating activities is also planning which include biodegradable waste management, compost/fertilizer repack and selling, cloth/paper bag production, Nursery/ farming etc. must be carried out. Haritha Karma Sena is trained to repair idle biogas plants in households, there will be a separate fee for it. Bio composter bins as well as the composting medium at households are being distributed by HKS.

The collected non-biodegradable waste (NBW) is stored at the collection point i.e.: material collection facilities setup at each zone. Around 192 mini MCF is being installed in Kollam Corporation. Then it is transported to material recovery facilities at Anchalumood which is having a shredding machine and bailing machine. Shredding Unit and bailing unit run by HKS to segregate,

bale and shred non-biodegradable waste. Recyclable waste were segregated and sold to Clean Kerala Company, the agency under the State Government entrusted with the responsibility. Non-recyclable plastics were shredded in MRF and are used for LSGI's various road tarring works. Also scrap and other metals are sold out to local scrap dealers. Furthermore, 1 RRF (Resource Recovery Facility) is established which has a floor area of 5000sqft to facilitate the separation and preparation of recyclable materials for marketing to end-user manufacturers. Shredding machine, bailing machine, plastic washing and drying machines were purchased for the effective operation of RRF. Due to public protest, the functioning of RRF is stalled.

Till date, 38.31 of Bailed and non-bailed plastics were sold out to Clean Kerala Company for recycling and 28.3 Ton of scrap were sold out to local scrap dealers. Selling of non-degradable waste for recycling will create an extra revenue to HKS in addition to user-fee. After the introduction of Harita Karma Sena an amount of Rs.1,00,52,216 has been generated to KMC.

As per instruction given from Suchitwa Mission, non-biodegradable waste other than plastic waste like cloth, chappals, bags, glass wastes, E-waste etc. being collected as per calendar from 55 wards. Based on this, 16 ton of glass waste was collected via collection point and sent to Clean Kerala Company for recycling. Likewise as per calendar, other non-biodegradable waste will be collected throughout the year.

20Ton of Legacy waste which was illegally dumped on various points of Kollam Corporation has been collected and diverted to Clean Kerala Company for safe disposal. Night squad were constituted for continuously monitoring illegal waste dumping and spot fines were induced for the defaulters. Plastic squad of KMC has served notice to 135 numbers of shops for using banned plastics.

BIO-DEGRADABLE WASTE MANAGEMENT

Kollam Corporation has provided bio-degradable waste management facilities in source level like bio digesters, biogas plant, bio compost bins, pipe compost, ring compost) for treatment of biodegradable waste will be ensured at each household and commercial establishment. KMC has brought out provisions for availing subsidised bio compost bins for achieving 100% conversion of biodegradable waste at source itself. In community level Kollam Corporation has provided de-centralised treatment systems Viz, aerobic composting units, community based bio gas plants. An integrated solid waste

management with a waste to energy plant of 200Tpd capacity was proposed by Government of Kerala at Kureepuzha.

The details of the Solid Management Facilities provided by Kollam Corporation (Subsidised) as well as procured by Individuals are furnished in the table below

BIODEGRADABLE WASTE MANAGEMENT		
Treatment Facilities	**No's**	**Quantity (TPD)**
Household Level		
Biogas Plants(HH)	2100	4.2
Pipe Compost(HH)	1750	2.6
Bio-composter(HH)	17115	25.67
Vermicomposting(HH)	189	0.2
Ring compost(HH)	750	1.2
Compost pit(HH)	7025	10.50
Bucket compost(HH)	3200	4.8
Community Level(Decentralized Facility)		
Aerobic Composting Unit	27	1.30
Biogas Plants(Community Level)	13	5.60
Informal Waste Collectors (Hotels and Chicken Stall)		25.0
Total Quantity of Bio- degradable waste treated		**108TPD**

The total quantity of waste generated in Kollam Corporation is 112.45TPD. Of this 48.4 TPD is processed at source with the facilities provided by Kollam Corporation (Subsidized) as well as procured by Individuals; about 6.9 TPD is processed at community level(decentralized facility) ; this facility is utilized by households (especially in slum areas) who are not having enough space for installation of source level treatment facilities. 25TPD of chicken waste and hotel waste were collected by informal waste collectors. Tender procedure has started to select authorised agencies to

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collect, transport and treat chicken waste at rendering plant as per SWM rule. Hence, total 108TPD of biodegradable waste is treated out of 123.39 of solid waste.

An amount of Rs.8, 84,46,250/- has been allotted to Kollam Corporation for waste management projects from Swatch Bharat Mission (Urban). In the financial year 2021-22for increasing the source level treatment of bio-degradable waste, Kollam Corporation has allocated fund of Rs.4,95,00,000/- for 27500 bio composter in household level, biogas plants(2200no:s)- Rs.2,31,00,000/-; Ring compost (2750no's- BPL families) Rs.6875000/-. Now, the project is being in the stage of implementation.

At Community level, 27 Aerobic composting units, 192 Mini-Material Collection Facilities, one Resource recovery Facility of 5000 Sq. ft, 13 community based biogas plants were installed. Out of 27500 Bio composter 17115 no's were distributed; remaining 10385 no's will be distributed within March 2022. After the completion of the project out of 88332 households, 42554 households will be benefitted with the existing source level treatment facilities and decentralised treatment systems. For proper waste management, we had planned projects for filling the Gap of 45778 households. For that an action plan was prepared as part of implementation of solid waste management rule 2016 based on Hon'ble NGT order (OA 606/2018). The prepared action plan was approved by the Council as per resolution no 1, on 08/10/2021 .and the copy of the action plan is attached herewith.

Kollam Corporation has started a project to conserve the Ashtamudi Lake (Ramsar site) and restore its habitats. Various workshops were organized by Kollam Corporation with the participation of 12 Panchayats including people from various fields such as stakeholders, representatives of political parties, NCC and NSS volunteers, Volunteers from various schools and colleges, environmental experts, fishermen communities etc. On 2/10/2021, Kollam Corporation has carried out a massive 7 day clean-up drive with the participation of about 2000 people. Clean-up operations were carried out at 17 points of Ashtamudi Lake and in addition, the canals flowing into the lake were also cleaned. The Kollam Corporation has envisaged project of 1.25 Crore for the protection and conservation of Ashtamudi Lake. The project include setting up of STP at vulnerable points where canals flows into lake, beautification of Ashtamudi Lake, shoreline protection, floating garden, planting of mangroves etc. It is decided to constitute Ramsar site protection and conservation authority. A motto was introduced ***"Jeevanaanu Astamudi, Jeevikkanam Astamudi"*** meaning Ashtamudi lake the life of Kollam must cherish.

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Kollam Corporation will become a Zero Waste City with the implementation of the said projects and the planned project like integrated solid waste processing facility like waste to energy plant(as per Rule 22(1),(3),(7) and (8) of SWM Rule,2016. With the advent of integrated solid waste management – Waste to Energy plant, Kollam Corporation is aiming to achieve the 100% management of Municipal Solid Waste. For this, Government of Kerala has selected Kureepuzha in Kollam Corporation to setup a Waste to Energy plant of 200Tpd with a Bio-Methanisation plant, Refuse Derived Fuel. For that 7.05 acres of land in Kureepuzha were leased to KSIDC (nodal agency) and Kollam Corporation has signed the concession agreement for the same. Status of Waste to Energy Plant is given below:

STATUS OF WASTE TO ENERGY PROJECT

KSIDC has tendered for Waste to Energy Project (200tpd capacity) and on 3rd bidding process (26 Sep 2019), received bid from consortium of M/s Zonta Infratech P Ltd, M/s Zonta Bauer Pvt Ltd, M/s Ningbo Kaseen Ecology Technology Co Ltd, M/s Bauer GmBH. Financial bid of the Technically qualified bidder was opened and after 2 rounds of Financial Negotiation done. Concession Agreement signed on 14/10/2020 with M/s M/s Venad Waste Management Pvt Ltd, the SPV incorporated. DPR for the project approved by the Technical Committee on 30th November 2020. Processing capacity of the plant is 200 tonnes per day. Bio- degradable fraction in the MSW will be processed using bio-methanation technology and bio-gas thus generated will be sold to oil marketing companies. Inorganic fraction will be converted into RDF form and transported to nearest WtE plant.

The Concessionaire needs to obtain necessary statutory clearances prior to the construction of the plant. The Concessionaire has submitted the application to District Pollution Control Board, Department of Town and Country planning and Department of Factories and Boilers, through K-Swift portal. The District Pollution Control Board has advised to get NOC from Kerala Coastal Zone Management Authority (KCZMA) and State Wetland Authority, since the site is near to Ashtamudi lake.

The application was submitted to KCZMA through Kollam Corporation and on scrutiny of the proposed plan of the project, KCZMA has stated that the project location is at a distance of 100m from the HTL of the Ashtamudi lake which is outside CRZ area and 100 m away from the wetland

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boundary of the Ramsar wetland , prior approval from KCZMA is not required and that the Kollam Corporation can issue NOC themselves, subject to the satisfaction of general conditions to be followed for wetland and other relevant parameters. The application will be submitted to PCB within this week. The rest of the statutory clearances will be processed after obtaining CTE from Pollution Control Board.

MUNICIPAL CORPORATION OFFICE ★ KOLLAM ★

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ANNEXURE

ACTION PLAN ON SOLID WASTE MANAGEMENT

Name of LSGI: Kollam Corporation **District: Kollam**

Total population: 401328 **No. of HH :97165** **No. of Institutions:9842**

Sl No	Description	Current status	Gap	Action to be taken	TimelineforCompliance(Months)
1.100%DoortoDoorCollectionofWaste					
a.	Door to Door Collection from Households (%)	50%	50%	• Currently, there are 165 Haritha Karma Sena members engaged for collecting non- degradable waste from households. • In addition,57 HKS are being deployed to ensure 100% coverage on Households.	6 months
b.	Door to Door Collection from Institutions/Commercial Establishments (%)	50%	50%	• Currently, there are 165 Haritha Karma Sena members engaged for collecting non -degradable waste from commercial establishment • In addition, 57 HKS are being deployed to ensure 100% coverage on commercial establishment.	6 months
2.Material Collection Facility					
a.	No.of MCFs which are functional	185 Mini-MCF and 1 MCF	5nos	• As per DPR of SBM (U), 185 Mini-MCF installed out of total 220 no's. • The rest will be installed as soon as site becomes available.	One year
b.	Ensure quantification of incoming and out comingwaste at MCF	yes			
	i. Installation of weighing machine	4 yes	20	• Included in the financial year (2021-22) project. Plan is proposed to purchase 20 weighing machines in various wards/ to	3months

MUNICIPAL CORPORATION OFFICE * KOLLAM *

posting					
	No. of Household level composting units	30%	70%	• Of the 27500 biocomposter bin included in this financial year project, 17715 no:s has been distributed and remaining 9785 no:s will be distributed immediately. • Also beneficiary selection is under process for the distribution of 2750 ring compost. Thus a total of 12535 will be provided to all household within 6 months. • As part of filling up the gap, the following projects will also be included; • 22000 compost pit • 22000 biocomposter bin/kitchen bin/ring compost	12 months
b.	No. of Institutional level composting units(eg: Schools, hospitals etc.)	1			One year
c.	No. of Community Level composting units	27	7	7 aerobic composting units will be installed as soon as the site becomes available.	One year
d.	No. of Centralized composting units		0	Not required	One year

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methanation					
	No. of Household level Biogas plants	50%	50%	• In this financial year, this project was proposed. • Beneficiary identification is underway as part of it.	One year
b.	No. of Institutional level Biogas plants (eg: Schools,hospitals etc.)	50%	50%		One year
c.	No. of Community Level Biogas plants	100%	0	• Sufficient space is not required for the establishmentof community level biogas plant	Nil
d.	No. of Centralized Biogas plants	0%	100%	• Instead of this, Biomethanation plant of 200tpd will be set up at Kureepuzha, as part of the Govt Waste to Energy Project.	12 months
6. BiodegradableWasteprocessingbybulkwastegenerators					
a.	No. of agencies collecting and processing BiodegradableWastefrombulkwastegeneratorsinthe LSGI	3		• The Kollam Corporation will be asked them to provide the quantity of bio-waste they collect on a daily basis.	6 months
b.	No. of agencies certified/ authorized by the LSGI forthis purpose:	0		• Steps will be taken to authorize them immediately.	6 months
7.LegacyWasteManagement					
a.	No of legacy dump sites identified	1	0	• Site already identified	
b.	No of legacy dumpsites quantified	1	0	• Identified at Kureepuzha,Kollam	
c.	No. of legacy waste dumpsite in which remediationhas been initiated		0	• Bio-mining of legacy waste on at totalof 5.5 acres of landat Kureepuzha as per KSPCB Guidelines, CPHEE manual andSWM rule 2016. • A company called Zigma Global Enviro Tech Pvt Ltd has	

Annexure R3(b)

Form –II
〔 See rule 16 (1) (e) 〕
Format for issue of authorization

File No. PCB/RO/MSW/KLM/01/2019

Authorization No: KSPCB/RO/KLM/AUTH/R1/01/2021.

To

The Secretary
Kollam Municipal Corporation,
Kollam – 691001.

Ref: - 1) Application for Authorization under Solid Waste Management Rules, 2016 dated 09/08/2021.
2) Letter no.H1-53672/16 dated 05/08/2021 from Kollam Municipal Corporation received from Kollam District Office dated 22/10/2021.

The Kerala State Pollution Control Board after examining the above application hereby authorizes the Secretary, Kollam Municipal Corporation having Administrative Office at Corporation office, Kollam for setting up and operate Solid Waste Management facilities for Biodegradable/Non Biodegradable waste treatment and processing including MCF, RRF's, Composting units, Biogas plants and Bio- mining of legacy waste under Solid Waste Management Rules 2016.

The Authorization is subject to the terms and conditions stated below and such conditions as may be otherwise specified in these Rules and the standards laid down in schedules Ist & Schedules IInd under these rules.

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1) **The Corporation shall process/treat/recycle and/or reuse/dispose the entire waste generated in the jurisdiction.**
2) The Corporation shall provide facility for collection and disposal of all types of dry waste at regular intervals.
3) The Corporation shall submit monthly progress report on the action plan submitted for the treatment of the entire waste generated within the corporation area.
4) The legacy wastes if any shall be disposed of via bio mining and sanitary landfill.
5) All centralized and decentralized units shall function properly and continuously for which adequate monitoring shall be done and records shall be kept and made available for inspections/verifications.
6) The Kerala State Pollution Control Board may at any time revoke any of the conditions applicable under the Authorization in accordance with the prevailing Rules and shall communicate the same in writing.
7) This authorization shall be valid up to **06/08/2026**. For renewal of authorization application shall be submitted 3 months prior to expiry of validity.
8) Annual report as per Solid Waste Management Rules, 2016 shall be submitted on or before 31st May every year.

The corporation shall comply with all the provisions of the Solid Waste Management Rules 2016, failure of which will attract the penal provision under Section 29 of the Environment (Protection) Act 1986.

CHIEF ENVIRONMENTAL ENGINEER

Encl.:- 1) Schedule I & II of the Solid Waste Management Rules 2016.
2) Siting Criteria for landfills.

Date: 07.12.2021
Place: Thiruvananthapuram

Copy to: - The Environmental Engineer,
District Office, Kollam.

KERALA STATE POLLUTION CONTROL BOARD
REGIONAL OFFICE
THIRUVANANTHAPURAM

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SCHEDULE I

[see rule 15 (w), (zi), 16 (1) (b) (e), 16 (4)]

Specifications for Sanitary Landfills

(A) Criteria for site selection.-

(i) The department in the business allocation of land assignment shall provide suitable site for setting up of the solid waste processing and treatment facilities and notify such sites.

(ii) The sanitary landfill site shall be planned, designed and developed with proper documentation of construction plan as well as a closure planning a phased manner. In case a new landfill facility is being established adjoining an existing landfill site, the closure plan of existing landfill should form a part of the proposal of such new landfill.

(iii) The landfill sites shall be selected to make use of nearby wastes processing facilities. Otherwise, wastes processing facility shall be planned as an integral part of the landfill site.

(iv) Landfill sites shall be set up as per the guidelines of the Ministry of Urban Development, Government of India and Central Pollution Control Board.

(v) The existing landfill sites which are in use. for more than five years shall be improved in accordance with the specifications given in this Schedule.

(vi) The landfill site shall be large enough to last for at least 20-25 years and shall develop 'landfill cells' in a phased manner to avoid water logging and misuse.

(vii) The landfill site shall be 100 meter away from river, 200 meter from a pond, 200 meter from Highways, Habitations, Public Parks and water supply wells and 20 km away from Airports or Airbase. However in a special case, landfill site may be set up within a distance of 10 and 20 km away from the Airport/Airbase after obtaining no objection certificate from the civil aviation authority/ Air force as the case may be. The Landfill site shall not be permitted within the flood plains as recorded for the last 100 years, zone of coastal regulation, wetland, Critical habitat areas, sensitive eco-fragile areas.

(viii) The sites for landfill and processing and disposal of solid waste shall be incorporated in the Town Planning Department's land-use plans.

(ix) A buffer zone of no development shall be maintained around solid waste processing and disposal facility, exceeding five Tonnes per day of installed capacity. This will be maintained within the total area of the solid waste processing and disposal facility. The buffer zone shall be prescribed on case to case basis by the local body in consultation with concerned State Pollution Control Board.

(x) The biomedical waste shall be disposed of in accordance with the Bio-medical Waste Management Rules, 2016, as amended from time to time. The hazardous waste shall be managed in accordance with the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016, as amended from time to time. The E-waste shall be managed in accordance with the e-Waste (Management) Rules, 2016 as amended from time to time.

(xi) Temporary storage facility for solid waste shall be established in each landfill site to accommodate the waste in case of non- operation of waste processing and during emergency or natural calamities.

(B) Criteria for development of facilities at the sanitary landfills.-

(i) Landfill site shall be fenced or hedged and provided with proper gate to monitor incoming vehicles, to prevent entry of unauthorised persons and stray animals.

(ii) The approach and / internal roads shall be concreted or paved so as to avoid generation of dust particles due to vehicular movement and shall be so designed to ensure free movement of vehicles and other machinery.

(iii) The landfill site shall have waste inspection facility to monitor waste brought in for land filling h, office facility for record keeping and shelter for keeping equipment and machinery including pollution monitoring equipment. The operator of the facility shall maintain record of waste received, processed and disposed.

(iv) Provisions like weigh bridge to measure quantity of waste brought at landfill site, fire protection equipment and other facilities as may be required shall be provided.

(v) Utilities such as drinking water and sanitary facilities (preferably washing/bathing facilities for workers) and lighting arrangements for easy landfill operations during night hours shall be provided.

(vi) Safety provisions including health inspections of workers at landfill sites shall be carried out made.

(vii) Provisions for parking, cleaning, washing of transport vehicles carrying solid waste shall be provided. The wastewater so generated shall be treated to meet the prescribed standards.

(C) Criteria for specifications for land filling operations and closure on completion of land filling.-

(i) Waste for land filling shall be compacted in thin layers using heavy compactors to achieve high density of the waste. In high rainfall areas where heavy compactors cannot be used, alternative measures shall be adopted.

(ii) Till the time waste processing facilities for composting or recycling or energy recovery are set up, the waste shall be sent to the sanitary landfill. The landfill cell shall be covered at the end of each working day with minimum 10 cm of soil, inert debris or construction material.

(iii) Prior to the commencement of monsoon season, an intermediate cover of 40-65 cm thickness of soil shall be placed on the landfill with proper compaction and grading to prevent infiltration during monsoon. Proper drainage shall be constructed to divert run-off away from the active cell of the landfill.

(iv) After completion of landfill, a final cover shall be designed to minimise infiltration and erosion. The final cover shall meet the following specifications, namely :--

a) The final cover shall have a barrier soil layer comprising of 60 cm of clay or amended soil with permeability coefficient less than 1×10^{-7} cm/sec.

b) On top of the barrier soil layer, there shall be a drainage layer of 15 cm.

c) On top of the drainage layer, there shall be a vegetative layer of 45 cm to support natural plant growth and to minimise erosion.

(D) Criteria for pollution prevention.-In order to prevent pollution from landfill operations, the following provisions shall be made, namely:-

(i) The storm water drain shall be designed and constructed in such a way that the surface runoff water is diverted from the land filling site and leachates from solid waste locations do not get mixed with the surface runoff water. Provisions for diversion of storm water discharge drains shall be made to minimise leachate generation and prevent pollution of surface water and also for avoiding flooding and creation of marshy conditions.

(ii) Non-permeable lining system at the base and walls of waste disposal area. For landfill receiving residues of waste processing facilities or mixed waste or waste having contamination of hazardous materials (such as aerosols, bleaches, polishes, batteries, waste oils, paint products and pesticides) shall have liner of composite barrier of 1.5 mm thick high density polyethylene (HDPE) geo-membrane or geo-synthetic liners, or equivalent, overlying 90 cm of soil (clay or amended soil) having permeability coefficient not greater than 1 x 10-7 cm/sec. The highest level of water table shall be at least two meter below the base of clay or amended soil barrier layer provided at the bottom of landfills.

(iii) Provisions for management of leachates including its collection and treatment shall be made. The treated leachate shall be recycled or utilized as permitted, otherwise shall be released into the sewerage line, after meeting the standards specified in Schedule- II.. In no case, leachate shall be released into open environment.

(iv) Arrangement shall be made to prevent leachate runoff from landfill area entering any drain, stream, river, lake or pond. In case of mixing of runoff water with leachate or solid waste, the entire mixed water shall be treated by the concern authority.

(E) Criteria for water quality monitoring.-

(i) Before establishing any landfill site, baseline data of ground water quality in the area shall be collected and kept in record for future reference. The ground water quality within 50 meter of the periphery of landfill site shall be periodically monitored covering different seasons in a year that is, summer, monsoon and post-monsoon period to ensure that the ground water is not contaminated.

(ii) Usage of groundwater in and around landfill sites for any purpose (including drinking and irrigation) shall be considered only after ensuring its quality. The following specifications for drinking water quality shall apply for monitoring purpose, namely :-

Sl. No.	Parameters	IS 10500:2012, Edition 2.2(2003-09) Desirable limit (mg/l except for pH)
(1)	(2)`	(3)
	Arsenic	0.01
	Cadmium	0.01
	Chromium(as Cr^{6+})	0.05
	Copper	0.05
	Cyanide	0.05
	Lead	0.05
	Mercury	0.001
	Nickel	-
	Nitrate as NO_3	45.0
	pH	6.5-8.5
	Iron	0.3
	Total hardness (as $CaCO_3$)	300.0
	Chlorides	250
	Dissolved solids	500
	Phenolic Compounds (as C_6H_5OH)	0.001
	Zinc	5.0
	Sulphate (as SO_4)	200

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(F) Criteria for ambient air quality monitoring.-

(i) Landfill gas control system including gas collection system shall be installed at landfill site to minimize odour, prevent off-site migration of gases, to protect vegetation planted on the rehabilitated landfill surface. For enhancing landfill gas recovery, use of geomembranes in cover systems along with gas collection wells should be considered.

(ii) The concentration of methane gas generated at landfill site shall not exceed 25 per cent of the lower explosive limit (LEL).

(iii) The landfill gas from the collection facility at a landfill site shall be utilized for either direct thermal applications or power generation, as per viability. Otherwise, landfill gas shall be burnt (flared) and shall not be allowed to escape directly to the atmosphere or for illegal tapping. Passive venting shall be allowed in case if its utilisation or flaring is not possible.

(iv) Ambient air quality at the landfill site and at the vicinity shall be regularly monitored. Ambient air quality shall meet the standards prescribed by the Central Pollution Control Board for Industrial area.

(G) **Criteria for plantation at landfill Site.-** A vegetative cover shall be provided over the completed site in accordance with the following specifications, namely:-

(a) Locally adopted non-edible perennial plants that are resistant to drought and extreme temperatures shall be planted;

(b) The selection of plants should be of such variety that their roots do not penetrate more than 30 cms. This condition shall apply till the landfill is stabilized;

(c) Selected plants shall have ability to thrive on low-nutrient soil with minimum nutrient addition;

(d) Plantation to be made in sufficient density to minimise soil erosion.

(e) Green belts shall be developed all around the boundary of the landfill in consultation with State Pollution Control Boards or Pollution Control Committees.

(H) **Criteria for post-care of landfill site.- (1)** The post-closure care of landfill site shall be conducted for at least fifteen years and long term monitoring or care plan shall consist of the following, namely :-'

(a) Maintaining the integrity and effectiveness of final cover, making repairs and preventing run-on and run-off from eroding or otherwise damaging the final cover;

(b) Monitoring leachate collection system in accordance with the requirement;

(c) Monitoring of ground water in and around landfill;

(d) Maintaining and operating the landfill gas collection system to meet the standards.

(2) Use of closed landfill sites after fifteen years of post-closure monitoring can be considered for human settlement or otherwise only after ensuring that gaseous emission and leachate quality analysis complies with the specified standards and the soil stability is ensured.

(I) **Criteria for special provisions for hilly areas.**-Cities and towns located on hills shall have location-specific methods evolved for final disposal of solid waste by the local body with the approval of the concerned State Pollution Control Board or the Pollution Control Committee. The local body shall set up processing facilities for utilisation of biodegradable organic waste. The non-biodegradable recyclable materials shall be stored and sent for recycling periodically. The inert and non-biodegradable waste shall be used for building roads or filling-up of appropriate areas on hills. In case of constraints in finding adequate land in hilly areas, waste not suitable for road-laying or filling up shall be disposed of in regional landfills in plain areas.

(J) **Closure and Rehabilitation of Old Dumps-** Solid waste dumps which have reached their full capacity or those which will not receive additional waste after setting up of new and properly designed landfills should be closed and rehabilitated by examining the following options:

(i) Reduction of waste by bio mining and waste processing followed by placement of residues in new landfills or capping as in (ii) below.

(ii) Capping with solid waste cover or solid waste cover enhanced with geomembrane to enable collection and flaring / utilisation of greenhouse gases.

(iii) Capping as in (ii) above with additional measures (in alluvial and other coarse grained soils) such as cut-off walls and extraction wells for pumping and treating contaminated ground water.

(iv) Any other method suitable for reducing environmental impact to acceptable level.

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SCHEDULE II

[see rule 16 (1), (b), (e), 16 (4))

Standards of processing and treatment of solid waste

A. Standards for composting:- The waste processing facilities shall include composting as one of the technologies for processing of bio degradable waste. In order to prevent pollution from compost plant, the following shall be complied with namely :-

(a) The incoming organic waste at site shall be stored properly prior to further processing. To the extent possible, the waste storage area should be covered. If, such storage is done in an open area, it shall be provided with impermeable base with facility for collection of leachate and surface water run-off into lined drains leading to a leachate treatment and disposal facility;

(b) Necessary precaution shall be taken to minimise nuisance of odour, flies, rodents, bird menace and fire hazard;

(c) In case of breakdown or maintenance of plant, waste intake shall be stopped and arrangements be worked out for diversion of waste to the temporary processing site or temporary landfill sites which will be again reprocessed when plant is in order;

(d) Pre-process and post-process rejects shall be removed from the processing facility on regular basis and shall not be allowed to pile at the site. Recyclables shall be routed through appropriate vendors. The non-recyclable high calorific fractions to be segregated and sent to waste to energy or for RDF production, co-processing in cement plants or to thermal power plants. Only rejects from all processes shall be sent for sanitary landfill site(s).

(e) The windrow area shall be provided with impermeable base. Such a base shall be made of concrete or compacted clay of 50 cm thick having permeability coefficient less than 10^{-7} cm/sec. The base shall be provided with 1 to 2 per cent slope and circled by lined drains for collection of leachate or surface run-off;

(f) Ambient air quality monitoring shall be regularly carried out. Odour nuisance at down-wind direction on the boundary of processing plant shall also be checked regularly.

(g) Leachate shall be re-circulated in compost plant for moisture maintenance.

(h) The end product compost shall meet the standards prescribed under Fertilizer Control Order notified from time to time.

(i) In order to ensure safe application of compost, the following specifications for compost quality shall be met, namely:-

Parameters	Organic Compost (FCO 2009)	Phosphate Rich Organic Manure (FCO 2013)
(1)	(2)	(3)
Arsenic (mg/Kg)	10.00	10.00
Cadmium (mg/Kg)	5.00	5.00
Chromium (mg/Kg)	50.00	50.00
Copper (mg/Kg)	300.00	300.00
Lead (mg/Kg)	100.00	100.00
Mercury (mg/Kg)	0.15	0.15
Nickel (mg/Kg)	50.00	50.00
Zinc (mg/Kg)	1000.00	1000.00
C/N ratio	<20	Less than 20:1
pH	6.5-7.5	(1:5 solution) maximum 6.7
Moisture, percent by weight, maximum	15.0-25.0	25.0
Bulk density (g/cm^3)	<1.0	Less than 1.6
Total Organic Carbon, per cent by weight, minimum	12.0	7.9
Total Nitrogen (as N), per cent by weight, minimum	0.8	0.4
Total Phosphate (as P_2O_5) percent by weight, minimum	0.4	10.4
Total Potassium (as K_20), percent by weight, minimum	0.4	-
Colour	Dark brown to black	-
Odour	Absence of foul Odour	-
Particle size	Minimum 90% material should pass through 4.0 mm IS sieve	Minimum 90% material should pass through 4.0 mm IS sieve
Conductivity (as dsm-1), not more than	4.0	8.2

* Compost (final product) exceeding the above stated concentration limits shall not be used for food crops. However, it may be utilized for purposes other than growing food crops.

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B. Standards for treated leachates.-The disposal of treated leachates shall meet the following standards, namely:-

Sl. No	Parameter	Standards (Mode of Disposal)		
		Inland surface water	Public sewers	Land disposal
(1)	(2)	(3)	(4)	(5)
1.	Suspended solids, mg/l, max	100	600	200
2.	Dissolved solids (inorganic) mg/l, max.	2100	2100	2100
3	pH value	5.5 to 9.0	5.5 to 9.0	5.5 to 9.0
4	Ammonical nitrogen (as N), mg/l, max.	50	50	-
5	Total Kjeldahl nitrogen (as N), mg/l, max.	100	-	-
6	Biochemical oxygen demand (3 days at 27^0 C) max (mg/l)	30	350	100
7	Chemical oxygen demand, mg/l, max.	250	-	-
8	Arsenic (as As), mg/l, max	0.2	0.2	0.2
9	Mercury (as Hg), mg/l, max	0.01	0.01	-
10	Lead (as Pb), mg/l, max	0.1	1.0	-
11	Cadmium (as Cd), mg/l, max	2.0	1.0	-
12	Total Chromium (as Cr), mg/l, max.	2.0	2.0	-
13	Copper (as Cu), mg/l, max.	3.0	3.0	-
14	Zinc (as Zn), mg/l, max.	5.0	15	-
15	Nickel (as Ni), mg/l, max	3.0	3.0	-
16	Cyanide (as CN), mg/l, max.	0.2	2.0	0.2
17	Chloride (as Cl), mg/l, max.	1000	1000	600
18	Fluoride (as F), mg/l, max	2.0	1.5	-
19	Phenolic compounds (as C_6H_5OH) mg/l, max.	1.0	5.0	-

Note : While discharging treated leachates into inland surface waters, quantity of leachates being discharged and the quantity of dilution water available in the receiving water body shall be given due consideration.

C. **Standards for incineration:** The Emission from incinerators /thermal **technologies** in Solid Waste treatment/disposal facility shall meet the following standards, namely:-

Parameter	**Emission standard**	
(1)	**(2)**	**(3)**
Particulates	50 mg/Nm^3	Standard refers to half hourly average value
HCl	50 mg/Nm^3	Standard refers to half hourly average value
SO2	200 mg/Nm^3	Standard refers to half hourly average value
CO	100 mg/Nm^3	Standard refers to half hourly average value
	50 mg/Nm^3	Standard refers to daily average value
Total Organic Carbon	20 mg/Nm^3	Standard refers to half hourly average value
HF	4 mg/Nm^3	Standard refers to half hourly average value
NOx (NO and NO2 expressed as NO2)	400 mg/Nm^3	Standard refers to half hourly average value
Total dioxins and furans	0.1 ng TEQ/Nm^3	Standard refers to 6-8 hours sampling. Please refer guidelines for 17 concerned congeners for toxic equivalence values to arrive at total toxic equivalence.
Cd + Th + their compounds	0.05 mg/Nm^3	Standard refers to sampling time anywhere between 30 minutes and 8 hours.
Hg and its compounds	0.05 mg/Nm^3	Standard refers to sampling time anywhere between 30 minutes and 8 hours.
Sb + As + Pb + Cr + Co + Cu +Mn + Ni + V + their compounds	0.5 mg/Nm^3	standard refers to sampling time anywhere between 30 minutes and 8 hours.

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NOTE.- All values corrected to 11% oxygen on a dry basis.

Note:

(a) Suitably designed pollution control devices shall be installed or retrofitted with the incinerator to achieve the above emission limits.

(b) Waste to be incinerated shall not be chemically treated with any chlorinated disinfectants.

(c) Incineration of chlorinated plastics shall be phased out within two years.

(d) If the concentration of toxic metals in incineration ash exceeds the limits specified in the Hazardous Waste (Management, Handling and Trans boundary Movement) Rules, 2008, as amended from time to time, the ash shall be sent to the hazardous waste treatment, storage and disposal facility.

(e) Only low sulphur fuel like LDO, LSHS, Diesel, bio-mass, coal, LNG, CNG, RDF and bio-gas shall be used as fuel in the incinerator.

(f) The CO2 concentration in tail gas shall not be more than 7%.

(g) All the facilities in twin chamber incinerators shall be designed to achieve a minimum temperature of 950^0C in secondary combustion chamber and with a gas residence time in secondary combustion chamber not less than 2 (two) seconds.

(h) Incineration plants shall be operated (combustion chambers) with such temperature, retention time and turbulence, as to achieve total Organic Carbon (TOC) content in the slag and bottom ash less than 3%, or the loss on ignition is less than 5% of the dry weight.

(i) Odour from sites shall be managed as per guidelines of CPCB issued from time to time.