

# KOCHI MUNICIPAL CORPORATION

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## BEFORE THE HONB'LE NATIONAL GREEN TRIBUNAL (SOUTH ZONE), CHENNAI

OA.442/2013, OA.20/2017, OA.276/2017 & OA.7/2021

20.12.2022

### PROGRESS REPORT OF BIOMINING OF LEGACY WASTE:

Pursuant to the directions of the Honb'le National Green Tribunal (South Zone) dated 21.11.2022, the following progress and action have been taken/ progressing at the Brahmapuram Waste Dump Site with regard to the rehabilitation of the said Site by way of Bio-mining and Remediation of the Legacy waste accumulated at the site over the prior years, is submitted.

### DETAILED ACTION PLAN WITH SPECIFIC TIME FRAME AND QUANTITY OF WASTE BIO-MINED AS ON 20.12.2022

- Kochi Municipal Corporation (KMC) has taken up the rehabilitation of the existing dumpsite at Brahmapuram by adopting bio-mining and site remediation including capping of rejects methods to scientifically handle the existing legacy wastespread over 40.24 acres at Brahmapuram as per prevailing SWM Rules, 2016. It shall be noted that the said project was initiated directly by a State Level Advisory Committee (SLAC) headed by Chief Secretary of the State vide GO (Ms) No. 6/2020/DMD dated 05/03/2020 and the Project was promulgated under Section 24 (e) of Disaster Management Act, 2005 as an urgent measure. To assess the extent of the waste at the site, National Institute of Technology (NIT), Kozhikode is brought in as quantity surveyor and assessor.
- The legacy waste at Brahmapuram site is divided into Seven (7) sub-sectors. As stated herein above, the quantification of waste was conducted by the National Institute of Technology (NIT), Kozhikode on the 8<sup>th</sup> and 9<sup>th</sup> of February 2021 through a drone based survey. The total legacy waste spread area in the Brahmapuram site was found to be 40.25 Acres and the total quantity of the waste assessed is around 5, 51, 903 cum.
- As per the progress report submitted by the assigned Contractor, Sector 4, 5, 6 & 7 areas are already cleared i.e., ~28 % of the Area is completed. The works at the remaining areas are progressing. Among this, Sector 2 & 3 are already earmarked for capping of rejects from the bio-mining works. Hence the main focus currently is to finish the bio-mining at Sector 1 area. A detailed description of the works are given subsequently.
- Initially sample of the Residual Derived Fuel (RDF) generated was sent to M/s. Dalmia Cement Plant

  
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at Ariyalur near Tiruchirappalli, Tamil Nadu, which is the nearest end user that can accept the RDF for co-firing. However, due to the distance and the huge cost of transportation as well as excess quantity of RDF now available at the Cement Plants, this plan is modified in consultation with the authorities. Accordingly, upon deliberations held under the chairmanship of Chief Secretary of the State, the Kerala State Industrial Development Corporation (KSIDC), the nodal agency for the upcoming Waste to Energy Plant at Kochi has consented to allow the assigned Contractor to stock and keep the RDF at their site located close to the bio-mined area. A heavy duty bailing machine is installed at the site to bail the RDF so produced.

- As all know, Kerala is prone to heavy rains and due to this incessant rain showers and a prolonged monsoon season, the bio-mining works gets affected during rainy season. A review meeting was held under the Chairmanship of Chief Secretary on 15<sup>th</sup> December 2022 and it was decided to speed up the works at site and complete the bio-mining works by June 2023, before the next monsoon season.
- The revised implementation plan submitted by the Contractor and progress of bio-mining and site rehabilitation from 06-11-2022 to 18-12-2022 is enclosed herewith for kind reference and perusal.

**(A) Current Status of Legacy Waste Clearance as of 18.12.2022 is as below:**

Sector	Volume of Legacy Waste in m <sup>3</sup>	Area in Acres	Area Cleared as on 20.12.2022	Remarks
Sector 1	3,71,823	24.00	Works are under Progress	Bio-mining, Excavation, andheaping of waste are in progress. 12802 m <sup>3</sup> is bio- mined in the period from 06.11.2022 till 20.12.2022, out of which 10714m <sup>3</sup> is RDF, 1588.9 m <sup>3</sup> is Rejects and 475.78m <sup>3</sup> isgood earth. Quantity of legacy waste heaped is 44276m <sup>3</sup> .
Sector 2	17,436	1.88	-	Legacy waste is full of rejectsand earmarked for Scientific Closure/Capping. This area is site of an earlier capping projects and hence it is suitable under the SWM Rules, 2016 for capping works.
Sector 3	65,133	4.52	-	Legacy waste is full ofrejects and earmarkedfor Scientific Closure/Capping. As above, this area was formerly

				capped and adequate measures are taken to enhance the capacity of capping area in line with SWM Rules, 2016.
<b>Sector 4</b>	30,132	3.47	100%	<b>Completed</b>
<b>Sector 5</b>	41,303	4.40	100%	<b>Completed</b>
<b>Sector 6</b>	16,257	1.28	100%	<b>Completed</b>
<b>Sector 7</b>	9,818	0.70	100%	<b>Completed</b>
<b>TOTAL</b>	<b>5,51,903</b>	<b>40.25</b>	<b>~28%</b>	

**(B) Details of Machinery and Manpower Deployed**

The Project commenced on 21.01.2022 and the following machineries were deployed:

Sl. No	Machinery	Quantity
1	Automated High-End Mobile Screening Machines with Conveyors, Screeners of Capacity: 100 tons per hour - Screen sizes include a 100 mm screen, 42 mm screen, and 16 mm Screen	1 No
2	Excavators	3 Nos
3	Dumpers/ Tippers	4 Nos

- **Additional line of bio-mining is commissioned on 12<sup>th</sup> December 2022 by adding a screening machine and additional machineries. The details of same are provided subsequently.**
- **Also, as stated earlier, a Baling Machine line has been deployed to bale the RDF generated from the Bio-mining. The Current Machinery & Manpower Details at the site are as below:**

Sl. No	Machinery	Make	Quantity at Site
1	Automated High-End Mobile Screening Machines with Conveyors, Screeners of Capacity: 100 tons per hour - Screen sizes include a 100 mm screen, 42 mm screen, and 16 mm screen	Kleeman (Germany)	1 No
2	Automated High-End Mobile Screening Machines with Conveyors, Screeners of Capacity: 120 tons per hour - Screen sizes include a 100 mm screen, 50/60 mm screen, and 16/20 mm screen	Keestack (Belgium)	1 No
3	Excavator 1 (140)	JCB	1 No
4	Excavator 2 (110)	JCB	1 No
5	Excavator 3 (110)	Hitachi	1 No
6	Excavator 4 & 5 (110)	Hitachi	2 No
7	Power Generator for Night Shift	-	1 No

8	Tipper No 16 (14 CUM)	Tata Motors	1 No
9	Tipper No 19 (14 CUM)	Tata Motors	1 No
10	Tipper No 21 (14 CUM) RDF shifting from shed	Mahindra	1 No
11	Tipper ( 14 CUM )	Tata Motors	1 No
12	Forklift	Manitou	1 No
13	Baling Machine	Baler Boy	1 No

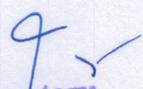
Further, pursuant to the direction of the Review Meeting held at site, 3 shift working is adopted at site including night work.

**Site Photographs**



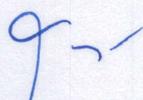
**KEESTRACK –BIO-MINING MACHINE 1**



  
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**BALER BOY- BALING MACHINE**



  
Secretary  
Wachi Municipal Corporation



**Segregated RDF & Good Earth**



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**Machineries at Work**



**Site Photographs on the Current Status**

**Sector 6 before**



**Sector 6 after**



**Sector 7 before**



**Sector 7 after**



**Sector 5 Before**



**Sector 5 After**



**Sector 4 Before**



**Sector 4 After**



#### **(A) Environmental Monitoring Plan during Rehabilitation Project**

In addition to the various works, M/s. ERM (Formerly Environment Resource Management), New Delhi, a global environment monitoring consultancy company, who is being appointed by the project contractor to conduct a site Environment & Social Assessment (ESA) & Environment & Social Impact Assessment (ESIA) at Brahmapuram. The draft reports are being made available by the said consulting organization for review. Environmental Monitoring includes monitoring of the quality of Surface Water, Ground Water, and Ambient

Air and the said parameters are being monitored as per the standards stipulated in SWM Rules, 2016. The frequency of monitoring is as below:

<b>Sl. No.</b>	<b>Description</b>	<b>Frequency</b>
<b>During Bio-mining &amp; Construction of Landfill Closure Period</b>		
1	Quality of Water in wells within the site	Once in 3 months
2	Groundwater Quality – Outside the Site	Once in 3 months
3	Air Quality	Once in 3 months
<b>During Post Closure Period</b>		
1	Groundwater Quality – Outside the site	Once in 6 months
2	Air Quality	Once in 6

		months
3	Gas Quality	Once in 6 months

The various water samples are being tested for fixing the present level of contamination. The said samples are picked from the same locations which are downstream of the dumpsite in every six months. A similar procedure will be adopted for checking the air quality. Subsequently, water and air samples would be taken every six months to monitor the effect of closure.

The Contractor also has adopted a detailed Health & Safety Plan including:

- Identification of key personnel, site-entry procedures and control, personal protective equipment and monitoring, communication procedures, emergency medical procedures, and standard operating procedures.
- Masks, gloves, helmets, etc.
- Normal work clothes and construction gear.
- Training requirements, including, Fire safety training supervisor training, and medical surveillance.
- Regular monitoring of the entire site for any fire incidents
- There is an existing Fire Hydrant system at the site which is maintained by the Kochi Municipal Corporation.

### (B) Action Plan for Completion and Time Schedule

The Contractor has provided the indicated mass balance from the bio-mining of the legacy waste at Brahmaputra.

Sl. No	Particulars	Percentage	Quantity (m <sup>3</sup> )
1	Quantity of legacy waste		5,51,903
2	Quantity of RDF expected	48.14 %	2,65,661
3	Quantity of Recyclables expected	0.96 %	5283
3	Quantity of Rejects expected	27.24%	1,50,346
4	Quantity of Good Earth expected	23.67%	1,30,613
5	Quantity of waste to be Landfilled		1,51,000

The rejects from the bio-mining process will be scientifically capped and provided with a cover system as per SWM Rules, 2016. The detailed design parameters are as follows:

Detailed Design Parameters for Capping			
<b>1.0 Volume Calculations</b>			
1	Volume of waste to be capped	Cum	1,51,000
<b>2.0 Proposed Design</b>			
1	Total height of the waste mound	M	15
2	Side Slopes proposed		1:3.5

  
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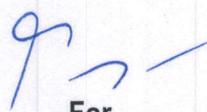
3	No. of Stages	Nos	3
5	<b>Footprint Area</b>	Sqm	32,400
6	<b>Gas collection units</b>	<b>Nos.</b>	<b>42</b>
7	<b>Surface area of Liners</b>	Sqm	30,860
8	<b>Walkway –Top</b>		
(i)	Length	M	180
(ii)	Width	M	3
9	<b>Steps to the top of the Closure area</b>		
(i)	Length	M	55
(ii)	Width	M	1.5
10	<b>Drains</b>		
(i)	RCC Strom water drain at Footprint of capping mound	M	724
(ii)	Semi-circular ( Half Cut) RCC Pipe drain of 500mm Dia	M	1900

Accordingly, Bio-mining and Landfill closure activities are targeted to be completed within the stipulated timelines. It shall be noted that the first priority is to complete the bio-mining so that the capping activities can be completed post the bio-mining process for the rejects that are being emanated from the bio-mining works. Kochi Municipal Corporation is monitoring the daily/weekly progress of the works at site and accordingly taken steps to submit the monthly progress report.

In addition to handling the legacy waste, State of Kerala has also taken steps to handle the fresh waste coming at Brahmapuram site. Accordingly an Energy from Waste Project (EfW) is being promulgated under a master plan monitored by a State Level Advisory Committee headed by Chief Secretary of the State of Kerala. Accordingly, Kerala State Industrial Development Corporation (KSIDC) is being nominated as the nodal agency to get the EfW Project implemented at Brahmapuram. This project will take off upon approval of the council of the Kochi Municipal Corporation.

These are the various initiatives and steps taken by Kochi Municipal Corporation with regard to the Rehabilitation Project at the Brahmapuram site, by way of, bio-mining and site rehabilitation works of Legacy Waste. **The Corporation is following up the day to day progress of the activities at the site and shall file Monthly Progress Reports, if so directed by the Honb'le NGT (SZ). Further there are regular reviews are being held at state level as directed by Honb'le NGT (SZ).**

Date: 20.12.2022

  
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**KOCHI MUNICIPAL CORPORATION**  
 Secretary  
 Kochi Municipal Corporation