EXECUTIVE SUMMARY

Of

PROPOSED DEVELOPMENT OF 600TPD WASTE-TO-ENERGY (WTE) PROJECT TO GENERATE ABOUT 4 MW OF POWER AT DEONAR, MUMBAI

PROJECT PROPONENT

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Executive Summary

Establishment of 600 TPD Waste to Energy Project to generate from 4 MW of Power at Deonar, Mumbai by MCGM.

Introduction

Waste to Energy (WtE) project is proposed in the existing Deonar dumpsite. The Deonar dumping ground is a waste dumping ground or landfill in the city of Mumbai located in Deonar, an eastern suburb of the city, it is India's oldest and largest dumping ground, set up in 1927. Currently, the waste dumpsite at Deonar receives approximately 2000 TPD of waste from Mumbai which includes approximately 800 tonnes of MSW and 1,200 TPD of construction and demolition (C&D) waste. Entire waste is being dumped in an unorganized way, this causes environmental damage, which makes the surrounding residents like Chembur, Govandi and Mankhrud are unfit for habitation.

The propose project mainly emphasizes to be an Environmental Management Plan (EMP) for the existing pollution levels and to provide a suitable mitigation measures to drastically reduce the present air emissions from the dumpsite as well as pollution in the surrounding area of the project site. The project also aims to utilize around 600 TPD of waste, thus minimizing the dumping activity at site as presently practicing. The proposed project also aims to reduce all the pollution levels of all environmental components (Air, Water, Noise, Soil, etc.,) within the stipulated environmental standards.

As part of this endeavour, the Municipal Corporation of Greater Mumbai (MCGM) has decided to Construct and Operate a Waste-to- Energy (WtE) Project along with SMW Processing units like Composting / Anerobic Digestion for bio degradable waste, Harvesting of combustable waste (RDF) and Waste to Energy Plant to utilize the RDF for power Generation and Secured Landfill for disposal of residues / inert arising out of the processing of MSW. in existing Deonar Dump site, Mumbai. The plant is proposed to design to handle 600 TPD with 10% upper margin. MCGM has plans to expand further upto1800 TPD to treat the MSW which is receiving at Deonar Dump site. The Project is compliant with SWM Rules 2016 and all other applicable rules.

This EIA report is limited for the aforementioned 600 TPD MSW processing facility and a Waste to Energy Plant for generating from 4 MW which can be further enhanced upto a maximum of 8 MW power by providing advanced technologies with 600 TPD of MSW waste.Vide MoEF&CCnotification , 2nd Jan 2014, as amendment to EIA notification, thermal power plants utilizating non Hazardous solid waste upto 15 MW capacity are exempt from the purview of prior environmental clearance. Therefore , the proposed plant capacity of power generation unit utilizing the dry segregated fraction of solid waste can be optimally sized during the course of detailed engineering and after duly examining the prospects of utilization

of Biogas if any, and in any case shall not exceed 15 MW. Further, vide letter DO no. 22-19/2017/IA – III dated 3rd July 2017, the secretary, MoEF& CC Govt. of India as clarified as under.

Methodology

The municipal solid waste management involves various steps like door to door door collection, segregation, composting, refuse derived fuel (RDF) making, waste to energy generation through waste to energy plants and disposal in scientific landfills. **The above activities, except landfill site, if proposed as standalone activities are not covered under item 7(i) of EIA Notification, 2006, hence do not require prior environmental clearance**. In case the activities of composting, RDF making and waste to Energy plant (upto capacity of 15 MW) are proposed at an existing landfill site, they do not attract the provisions of the EIA notification 2006.

It is becomes clear from the above narrative that under the present EIA regime , the proposed 600 TPD MSW plant can be sized upto 15 MW capacity without requiring prior EC. Because of the location of the Sanitary Lanfill in adjoining 2 ha area to receive the inerts and Ashes from the project upto 4 year period from date of commencement, this project requires EC.

It is planned to dispose the ash generated from WTE plant &Inerts from pre-processing / Compost plants to SLF & exploring the Opportunities also to recycle the Ash Generated from the WTE plant. as a subbase for road construction and low strength aggregate in the construction. The ash can also be used as cover material for the secured landfill operations. The secured landfill for the 600 TPD project under review is expected to be lasting upto 4 years from the time of commissioning and MCGM will find suitable land parcel for meeting the future needs of Secured Landfill.

Deonar dumping ground is situated at the M/East ward in eastern suburb of the city of Mumbai. The proposed WtE site is the part of existing Deonar dumpsite. The area of 12.19 ha land is earmarked for the proposed projectof 600 TPD capacity. The North- east side of the site is surrounded by Creek with mangrove vegetation, whereas, South-west side is habituated area, mostly slums.

The estimated water requirement is 480 KLD which complies with the MoEF notification dated 7th December 2015 stipulating 2.5 cum / MWHr as the specific Water consumption for the new plants constructed after 2017.MCGM has proposed to install the pipe line conveying & pumping system for securing the allotment of 4.5 MLD to the Deonar site to meet the present and future requirements

The proposed power generation capacity is from 4 MW to 8 MW with advance technologies. The generation voltage is 11 KV whichwill be stepped up to 33 KV level andproposed to connect at nearest substation. The energy requirement for operating the proposed Facility is about 20% of the total power generated in the facility. The Energy after inhouse consumption will be exported to Grid by connecting it to nearest substation Sufficient capacity DG Set to cater Emergency needs 750 KVA) are proposed for power backup**.** In the proposed facility, about 100 full time employees and 80 contractual employees will be employed for project operation. The cost of the project is Rs. 504 Crores and Capital cost allotted for EMP is Rs. 815 lakhs and recurring cost is Rs 96 lakhs per annum.

Baseline Environmental Status

Field investigations were undertaken for collecting the existing baseline environment for air, water, noise, soil, ecological and socio-economic conditions. A study area of 10 Km radius from the project site is identified to establish the present environmental conditions. The main aim of the EIA study is to identify the critical environmental attributes which will be affected and have adverse impacts on the surrounding environment due to the proposed project. The field data generation is undertaken during the post monsoon season of September 2020 to November 2020.

The metrological data is collected from the IMD station at Mumbai (Santa Cruz). The pre dominant wind direction recorded is from North West (NW). Calm conditions prevailed for 22.92% of the total time. Average wind speed observed for the season is around 2.18 m/s.

Ambient Air Quality

The locations for ambient air quality monitoring study were selected within the 10 km radius of the proposed project. Ambient air quality was monitored on 8 locations to generate representative ambient air quality data. The common air pollutants namely Particulate matter (PM_{10} & $PM_{2.5}$), Sulphur dioxide (SO_2), the oxides of nitrogen (NO_X), Carbon Monoxide (CO), Methane (CH_4), Hydrogen Sulfide (H_2S).

Particulate Matter (PM_{10}): The average value of PM_{10} recorded at site was 68.1 µg/m^3.The maximum value was 78 µg/m^3 at project site and minimum 47.2 µg/m^3 were recorded at RamabaiAmbedkar Nagar.

Particulate Matter ($PM_{2.5}$): The maximum value of $PM_{2.5}$ was 55 µg/m^3 at project site which is exceeding the NAAQSwas 60 µg/m^3 for Industrial, Residential, Rural and Other Areas and a minimum 22.5 µg/m^3 were recorded at Project site and Maheshwar Nagar respectively. The average value of 42.2 µg/m^3 was observed within study area.

Sulphur Dioxide (SO_2): The average value of the SO_2 within study observed was 17.8 µg/m^3. The maximum average value SO_2 was 21.5 µg/m^3 at project site and minimum of 14.7 µg/m^3 near Laxmi Nagar, Vikroli. The SO_2 values are below permissible level of 80µg/m^3.

Oxides of Nitrogen (NO_X): The average value of the NO_X within study observed was 32.5 µg/m^3. The maximum average value of NO_X was 35.2 µg/m^3 at Project Site and minimum of 20.4 µg/m^3 near Maheshwar Nagar, Ghatkopar. The NOx values are below permissible level 80µg/m^3.

Carbon Monoxide (CO): The average value of CO recorded at site was 0.5 mg/m^3.The maximum value of 1.4 mg/m^3 at project site and a minimum 0.3 mg/m^3 were recorded at Dattaguru Society, Govandi West.

Ambient Noise Monitoring

The baseline noise scenario, results of noise level monitoring carried out during the study period at 8 locations in the study area have been considered.The day levels of noise have been monitored during 6 AM to 10 PM and the night levels during 10 PM to 6 AM. The noise levels were monitored as per the Ambient Air Quality Standards in respect of Noise. The day equivalents during the study period are range between 62.6 to 48.4 dB (A), whereas the night equivalents were in the range of 56.2 to 40.3 dB (A). Noise levels at the existing Dumpsite site is recorded the day average of 62.6 which is higher than the permissible limit of residential area and below permissible limit of industrial area and all other areas studied shows that the levels of noise are lower than the permissible limits both during the day as well as at night time

Ground Water and Surface Water

- Chembur is located at approximate aerial distance of 5 km from project site. In Chembur, groundwater quality was observed to be poor as most of the parameters exceeded the limits of Indian Drinking Water Standards BIS-IS 10500: 2012.
- The reported values of Total Dissolved Solids (TDS) in the groundwater were in the range of 252 mg/l and 1346mg/l. Results indicate contamination by the surface pollutants.
- The total hardness varied between 53 mg/l and 329 mg/l, Alkalinity varied between 102 mg/l and 970mg/l. The reason for high alkalinity in the Ground water may be due to the percolation of alkaline surface pollutants.
- The reported Chloride ranged between 23mg/l and 320mg/l. The reported values of Sulphate varied between 18mg/l and 239mg/l.
- The conductivity ranged between 310µmhos/cm and 1780µmhos/cm, indicating contamination from surface pollutants.
- The reported values of fluoride were within the limit of 1.0 mg/l.
- The counts of Total Coliforms and Fecal Coliforms were very high at open dug well.

- Surface water samples were collected from Thane creek and analysed for physicochemical and biological parameters
- Thane creek is polluted and values of parameters like TDS - 569 mg/l, Sulphate – 236 mg/l, Chlorides – 95.9 mg/l, Magnesium – 2.03 mg/l, Calcium – 35 mg/l, F. Coli – 48 MPN/100ml and Total Coli – 166mg/l are exceeding than that of permissible limits.
- The visual observation of the creek water appears polluted, however, the mangroves around it is still in good health.
- This can be attributed to very high resilience of mangroves for pollution and contamination.
- The source of pollution to the creek water is partly due to leachate from present dump as well as from discharge of oily and other contaminants of recycling activities across the creek.

Ecological Environment

The project is proposed in existing deonar dumpsite, near site the vegetation is domitated by mangroves trees. The list of species of plants and animals generated during the survey were processed and compared with the IUCN red data list and Maharashtra state protected species listings and it was observed that no species encountered during the survey in areas between 0-5 km of the project site represented rare, endangered, critically endangered or legally protected status. Four species (Alexandrine Parakeet, Painted stork, lesser Flemingo, Black tailed Godwit) were classified as **Near Threaten** as per the IUCN red data book has been reported in the study area. However, in the 10 km range there may be faunal species like Atlas moth. The project seems to raise no adverse impact to these species.

The majority of the vegetated site within 1-3 km radius from the project is Mangroves vegetation. The diversity is low and all of the plant species are common, widespread and typical of weeds and disturbed habitats. Necessary mitigation measure shall undertaken to reduce the impact of the project to the nearby forest areas and overallecology.

Anticipated Environmental Impacts and Mitigation Measures

The potential impacts on the environment from the proposed project are identified based on the nature of the various activities associated with the project implementation and projects operation (impacts during construction phase and operation phase).

Impacts during Construction Phase

Construction phase works include site site clearance, site formation, building works, infrastructure provision and any other infrastructure activities. The impacts due to construction activities are short term and are limited to the construction phase. The impacts will be mainly on air quality, water quality, soil quality.

Measures such as regular water sprinkling, erection of temporary tin sheets of sufficient height (minimum 3 m) around the site etc. shall be adopted to ensure minimum dust

generation/air pollution. Domestic sewage generated during construction phase shall be treated in portable sewage treatment plant.

Impacts during Operation Phase

During the operation phase of the proposed project there would be impacts on the air environment, water environment, Land environment and socio-economic aspects. but the proposed project shall aims to reduce the present air emission from the existing dumpsite as well as the surrounding areas. The proposed project also aims to utilize around 600 TPD of waste thus minimize the dumping activity at the site as is presently practicing. The proposed project also aims to reduce the pollution levels of all environmental components (Air, Water, Noise, Soil, etc.,) within the stipulated environmental standards.

Environment Management Plan

The Environmental Management Plan (EMP) is required to ensure a sustainable development of the plant area and the surrounding areas of the plant. The EMP will be integrated in all the major activities of the project, with clearly defined policies, to ensure that the ecological balance of the area is maintained and the adverse effects are minimized. EMP requires multidisciplinary approach with mitigation, management, monitoring and institutional measures to be taken during implementation and operation, to eliminate adverse environmental impacts or reduce them to acceptable levels. In order to ensure sustainable development in the study area; it needs to be an all-encompassing plan for which the plant authorities, government, regulating agencies, and the population of the study area need to extend their cooperation and contribution.

The mitigation measures are planned for construction and operation phases and the overall management plan helps to improve the supportive capacity of the receiving bodies. The EMP aims to control pollution at the source level to the possible extent with the available and affordable technology followed by the standard treatments before getting discharged. The recommended mitigation measures will synchronize the economic development of the study area with the environmental protection of the region. The budget allocated for implementation of EMP is Rs 815 Lakhs with a recurring cost of Rs. 96 Lakhs per annum.

Environment Monitoring Program

Environmental monitoring program describes the processes and activities that need to take place to characterize and monitor the quality of the environment. Environmental monitoring is used in the preparation of environmental impact assessments, as well as in many circumstances in which human activities carry a risk of harmful effects on the natural environment. Different activities involved in the proposed project and their impact on various environmental attributes have been taken into account while designing a detailed environmental monitoring program. Environmental monitoring program has been prepared for the proposed project for assessing the efficiency of implementation of Environment

Management Plan and to take corrective measures in case of any degradation in the surrounding environment.

All monitoring strategies and program have reasons and justifications which are often designed to establish the current status of an environment or to establish trends in environmental parameters. In all cases the results of monitoring will be reviewed, analyzed statistically and submitted to concerned authorities. The design of a monitoring program must therefore have regard to the final use of the data before monitoring starts. The monitoring program will have three phases: construction phase, operations phase, and post operations phase.

Project Benefits

The proposed project shall have several benefits by considering the present condition of the existing dumpsite, the proposed Waste to Energy may reduce the present landfill waste volume by 90%. Considering the life cycle of 25 years, it will save landfill area requirement by more than 80 Ha. Besides the compost production would add to the revenue to the operator of the landfill. The production of compost shall also enhance the crop productivity and improvement in the soil texture and enhancement of soil nutrients. The proposed project will also have direct and indirect economic benefits in form of employment, development of ancillaries, establishment of service facilities, development of telecom and transportation facilities.

Environmental Benefits

- Prevention of frequent fire due to methane gas generated from the anaerobic condition at existing Deonar dump site, spillage of waste to CRZ areas
- Prevention of smoke and fugitive emission to the nearby areas. The project will reduce spreading diseases within the study area.
- Due to the proposed project there will be prevention of pollution to surface and ground water.
- The proposed project will ensure that there should not be any odor or noise problem in the area.
- Using waste for production of energy will save on fossil fuel and in turn reduce GHG emission.
- It is estimated that implementation of WtE plant for Mumbai will save more than 8 million tons of CO_2 equivalent GHGs in 20 years period.
- Natural resources are finite and it should be used efficiently.
- The proposed project will conserve the natural resources by processing and management of municipal solid waste generated in Mumbai surrounding. Further, production of green products (compost, energy, materials from C&D waste, etc.) will reduce the usage of virgin materials.
- Generation of compost in bulk will reduce the demand for chemical fertilizers.

Social Benefit

- The project may have multiple health benefits to the people of nearby areas and will improvetheoverallhealthbenefitstoentirecitybywayofachievingbetterairquality.
- It is expected that many diseases like respiratory, tuberculosis etc. will comedown.
- The rag-picking menace, child labour and other hazardous recycling activities can also be prevented by implementation of proposed project.