Pre-Feasibility Report

Of

Proposed Expansion of “Integrated Municipal Waste Processing Complex Waste to Energy” Plant at Okhla and Timarpur”

S. No 1(d) Thermal Power Plants (Waste to Energy) of Schedule of EIA Notification, 2006

Existing Capacity: 16 MW
Proposed Capacity: 24 MW
Total after Expansion: 40 MW

at

NDMC Compost Plant Site
Near Okhla STP, Okhla, New Delhi

Developed by:
M/s Timarpur Okhla Waste Management Company Pvt. Ltd.
OLD NDMC Compost Plant, Behind CRRI, Mathura Road, New Delhi

Prepared By:
M/S PERFECT ENVIROSOLUTIONS PVT. LTD.

(NABET REGISTERED WIDE LIST OF ACCREDITED CONSULTANTS ORGANIZATIONS/ REV
66/ 5TH June 2018/ S.NO-114)
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Phone: 011-49281360
1.1 EXECUTIVE SUMMARY OF THE PROJECT

2.1. EXECUTIVE SUMMARY

Timarpur Okhla Waste Management Company Private Limited proposes to expand its existing waste to energy plant from 16MW to 40MW with a view to reduce the problem associated with disposal of unprocessed waste at landfill, thereby complying with the various regulations as well as the objective and goal set for the country under the Swachh Bharat Mission (SBM).

The proposed project falls under Item 1(d) (Thermal Power Plant, Thermal Sector) as per EIA Notification dated September 14, 2006 and its subsequent amendments. The project falls in Category ‘A’ (increase of Capacity from 16 MW to 40 MW) which is more than 25 MW and general conditions also apply, hence will require appraisal from Environmental Appraisal Committee of Ministry of Environment and Forest and Climate Change (MoEF&CC), New Delhi for Environmental Clearance.

Table 1: Project Details

<table>
<thead>
<tr>
<th>DETAILS</th>
<th>EXISTING DETAILS</th>
<th>PROPOSED DETAILS</th>
<th>TOTAL DETAILS (AFTER EXPANSION)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plot Area (in sqm)</td>
<td>60702.86</td>
<td>-</td>
<td>60702.86</td>
</tr>
<tr>
<td>Plant Area (in sqm)</td>
<td>24444.00</td>
<td>6000.00</td>
<td>30444.00</td>
</tr>
<tr>
<td>Green Area (in sqm)</td>
<td>12000.00</td>
<td>-</td>
<td>12000.00</td>
</tr>
<tr>
<td>Road/Parking Area (in sqm)</td>
<td>9720.00</td>
<td>-</td>
<td>9720.00</td>
</tr>
<tr>
<td>Office and Utilities (in sqm)</td>
<td>8538.86</td>
<td>-</td>
<td>8538.86</td>
</tr>
<tr>
<td>Open area</td>
<td>6000.00</td>
<td>Will be used as project area</td>
<td>0</td>
</tr>
<tr>
<td>Capacity of Plant (in TPD)</td>
<td>1950</td>
<td>1000</td>
<td>2950</td>
</tr>
<tr>
<td>Power generation (in MW)</td>
<td>16</td>
<td>24</td>
<td>40</td>
</tr>
<tr>
<td>Manpower</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Staff: 86 No Contractual Labor: 176</td>
<td></td>
<td>Staff: 13 Nos Contractual Labor: 24</td>
<td>Staff: 99 No Contractual Labor: 200</td>
</tr>
<tr>
<td>Total Water Requirement</td>
<td>500 KLD</td>
<td>875 KLD</td>
<td>1375 KLD</td>
</tr>
<tr>
<td>WTP capacity</td>
<td>1000 KLD</td>
<td>Existing RO and DM plant shall be expanded</td>
<td>1000 KLD (RO and DM plant shall be expanded)</td>
</tr>
<tr>
<td>Leachate treatment Plant</td>
<td>200 KLD</td>
<td>150 KLD</td>
<td>350 KLD</td>
</tr>
<tr>
<td>Solid Waste Generation within the project premises</td>
<td>40 kg/day</td>
<td>5 Kg/day</td>
<td>45 Kg/day</td>
</tr>
<tr>
<td>Method of collection of waste (proposed)</td>
<td>SDMC</td>
<td>SDMC</td>
<td>SDMC</td>
</tr>
<tr>
<td>Solid waste collected</td>
<td>1950 TPD</td>
<td>1000 TPD</td>
<td>2950 TPD</td>
</tr>
<tr>
<td>Electrical load</td>
<td>240 KW</td>
<td>360 KW</td>
<td>600 KW</td>
</tr>
<tr>
<td>Power Backup</td>
<td>1X320 KVA</td>
<td>1X320 KVA</td>
<td>2x320 KVA</td>
</tr>
</tbody>
</table>
### Introduction of the Project / Background Information

#### Identification of Project and Project Proponent:

This “Waste to Energy plant” has been housed in a Special Purpose Vehicle in the name of Timarpur-Okhla Waste Management Company Private Limited (TOWMCPL). Ownership of this company had been transferred to the selected Bidder Jindal Urban Infrastructure Limited for implementation of the project. The project Integrated Municipal Waste Processing Complex has waste handling capacity of 1950 TPD and generation of waste to energy for 16 MW/Day.

Delhi is generating about 14,100 MT of municipal solid waste at the rate of 0.50 kg/capita/day. Out of this, nearly 8,500 MT of waste remains untreated and has to be dumped at one site or the other. The landfill/dumping sites have already exceeded the prescribed limit and height. The dumps have attained the height of over 40m against the permissible limit of 20m. South Delhi Municipal Corporation (SDMC) is currently collecting about 5250 TPD of waste and is managing the waste disposal in the following manner:

- Supply of about 1950 TPD to the TOWML WtE project
- Supply of about 150 TPD to the Okhla composting plant
- Balance 3150 TPD to landfill site

Waste to Energy plant is one of the most sustainable waste management program & most economical and environment friendly solution for tackling this problem. Timarpur Okhla Waste Management Company Private Limited proposes to develop “Proposed Expansion Waste to Energy Plant at Okhla 16 MW to 40MW” with a view to reduce the problem associated with disposal of unprocessed waste as landfill, thereby complying with the various regulations as well as the objective and goal set for the country under the Swachh Bharat Mission (SBM).

Capacity expansion is feasible from 16 MW to 40 MW from existing facility by considering the following aspects:

- With improved collection methodology by Municipal Corporation, the quality of waste reaching the plant has improved considerably. The caloric value which used to be 1000-1100 Kcal/kg has now improved to 1500-1650 Kcal/kg and is likely to improve further.
The Okhla plant was first plant to be the first successful “Waste to Energy” along with Integrated Solid Waste Management Facility and over the years a lot of experience have been gained thereby, improving plant efficiency and increasing the power generation from existing facility.

The proposal falls under Schedule 1 (d), Category ‘A’ as general condition is applied on the project because of interstate boundary of Uttar Pradesh which falls within 10 Km of project site, Okhla Bird Sanctuary ESZ boundary falls at 2.36 Km, East and Asola Bhati Sanctuary ESZ falls at 4.77 SW

1.2.2 Brief description and nature of the Project:

MCD & NDMC generates about 14100 tonnes per day of garbage. Garbage generation is increasing at the rate of 3-4% annually. Immediate requirement of Municipal Solid Waste processing and treatment facilities in Delhi stems from the rising trend of garbage and unavailability of the MSW disposal load in Delhi will decrease by 973500 tons annually, after implementation of this Waste to Energy. Besides recovery of substantial energy, the project would reduce the land required for disposal of 973500 tons garbage. Finally, the project will reduce emission of greenhouse gas, namely methane into the atmosphere, thereby reducing the global warming and climate change.

The proposed project relates to the waste Energy production. The total capacity is 40 MW Refused derived fuel is prepared from MSW with reciprocating grate technology by installing Boilers [2no.s X 500 TPD (+/- 20%)] for additional generation of 24 MW, totalling generation of 40 MW.

2.2.3. Need for the project and its importance to the country or region

The percentage of India's population living in cities and urban areas has increased over the years since independence, showing the rapid pace of urbanization. This will accelerate even further and by the year 2021 over 40% of Indians are expected to reside in the urban area. This has been fueled by rapid growth in industrialization, commercialization, development of secondary and tertiary sectors of economy and mass migration. The progressively improving standards of living, rapid urbanization and the wasteful consumer attitudes have resulted in the increase of quantities of municipal wastes to be-handled.

The problem of municipal solid waste management is a major economic burden on local Government & furthermore, open burning of MSW adversely affects the environment by emitting pollutants to the atmosphere. Similar is the case in South Delhi metropolitan city
which has witnessed rapid urbanization in the past decade & has become a commercial & educational hub. With an approximate population of about 2.73 million the waste generation is about 5250 TPD for efficient management of this waste the Timarpur Okhla Waste Management Company Ltd has proposed to expansion of Existing 16 MW to 40 MW WtE Plant at, Okhla which is the good step towards sustainable waste management program and most economical and environment friendly solution for Municipal Solid Waste problem.

The proposed project will help to cater the need of ever increasing municipal waste, since the proposed project will be built taking into considerations of the initiatives taken by the SDMC that would meet the city’s needs for the future.

2.2.4. Demand supply Gap.

Rapid growth of industries and commerce in India necessitates uninterrupted power supply. Therefore, all options need to be explored to generate power from conventional and non-conventional sources. MSW provides an opportunity of tapping potential energy to meet part of the energy demand of the country.

2.2.5. Imports vs. Indigenous Production

At present there are no plans of importing the MSW, only indigenously produced MSW will be used for proposed WTE power plant. However, in future if any MSW is taken from long distance the same will be informed to the concerned authorities.

2.2.6. Export Possibility

At present there are no plans of exporting the MSW to other countries as it is not techno economically feasible, however in future if it is economically viable the same will be informed to the concerned authorities.

2.2.7. Domestic/Export Markets

The power generated from the proposed waste to energy plant will be used for captive requirement the excess will be connected to the grid.

2.2.8. Employment Generation (Direct and Indirect) due to the Project

Around 99 people will get direct employment by the proposed project and around 100 people will get indirect employment.
1.3 PROJECT DESCRIPTION

1.3.1 Type of Project including Interlinked and Independent Projects, if any

The proposed project is a municipal solid waste-based waste to energy power plant which is a part of the integrated municipal solid waste management project, which obtained EC for processing of 1300 TPD of municipal solid waste.

2.3.2. Location (Map showing general location, specific location, project boundary and project site layout) with coordinates

The site is located at 28°33'8.85"N latitude and 77°16'46.73"E longitude in Mathura road, Behind CRRI, NDMC old compost Plant South Delhi. The location map of the site is shown in Figure 1.
Site layout is shown in Figure 2.

2.3.3. Details of alternate sites considered and the basis of selecting the proposed site, particularly the environmental considerations gone into should be highlighted.

No alternative sites were considered. The proposed expansion project will be developed / operated within the existing facility only.

2.3.4. Size or Magnitude of Operation

The proposed expansion MSW based power plant is in exhibiting 15 acres. No additional area is required. The capacity of the power plant is 40 MW (16 MW Existing and 24 MW Proposed). The proposed expansion project is sized for an additional capacity of processing of 1000 TPD MSW with two (2) boilers of 500(+-20%) TPD capacity and one (1) units’ turbo generator,
with 20 MW to be implemented in phased manner. The proposed expansion waste-based power plant is designed to combust 1000-1200 TPD of MSW with the gross calorific value (GCV) 1650 kcal/kg.

2.3.5. Project Description with Process Details

<table>
<thead>
<tr>
<th>Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSW to be processed every day at Okhla plant</td>
<td>2950 Tonnes</td>
</tr>
<tr>
<td>Average working days in a year</td>
<td>330 days</td>
</tr>
<tr>
<td>Annual MSW@ that can be processed</td>
<td>973500 Tonnes</td>
</tr>
</tbody>
</table>

**Table: Annual MSW processing capability**

Mixed MSW received at WtE facility has high level of moisture content and composition is also heterogeneous in terms of content and size. Raw waste also contains metals and inert in various sizes in addition to finer organic matter. The processing of MSW involves segregation of material into following components:

- ♦ Inert material for disposal to landfills;
- ♦ Recyclable including metals for disposal by sale;
- ♦ Fine compostable material converted into stable compost for sale; and
- ♦ Processed MSW for use in Boilers of Power Plant for generation of energy.

**Combustion & Steam Generation**

Processed MSW will be used for steam generation by incineration in boilers. Reverse Reciprocating with forward feed inclined grate has performed most successfully in WtE projects under different fuel conditions all over the world. MSW is slowly propelled through the combustion chamber (furnace) by a hydro-mechanically actuated grate. Fuel continuously enters one end of the furnace and ash is continuously discharged at the other after going through several to and fro movement within the chamber. The plant is configured to enable complete combustion as MSW moves through the furnace. Primary combustion air is preheated to dry the fuel and then allow complete combustion. Process conditions are controlled to optimize the feed moisture by steam heated air pre-heaters and control the residence time of the fuel in the furnace for complete combustion. Boilers are provided with sophisticated instrument, control and monitoring system to ensure stable operation of the furnace all the time. These include cameras for flame monitoring and temperature gauges for the various sections in the boiler.

The cost of this technology is high. But until other cheaper alternatives are technically proven under Indian operating conditions, this remains the best option for sustainable performance of WtE projects.
**Power Generation**

Rankine Steam Cycle is used for power generation. Efficiency of the Rankine cycle depends upon the pressure and temperature of the superheated steam. With a view to contain the corrosion impact at higher temperatures, steam temperature for MSW power plants is maintained at around 400°C and consequently the pressure at around 42 kgf/cm²(a).

Air Cooled Condensers will be used for condensing steam exhaust from the turbine. Power will be generated in Alternator at 11 kV. Additional switch yard will be installed for export of power to DISCOM grid.

16 MW WtE project based on reciprocating forward feed grate and Rankine technology is already installed at Okhla plant. The project has been operating at more than 90% PLF level. Upgradation of Material Recovery Facility already implemented has resulted in better fuel (Processed MSW) quality available for combustion in boilers using bio drying resulting in efficient operation as well as better availability of plant for power generation.

<table>
<thead>
<tr>
<th>S.No</th>
<th>Item</th>
<th>Okhla</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Existing</td>
</tr>
<tr>
<td>1</td>
<td>Weigh Bridges</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>Grab Cranes</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>MRF Streams</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>Compost Plant</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>Leachate Treatment</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>Boilers with auxiliaries</td>
<td>3X450 TPD</td>
</tr>
<tr>
<td>7</td>
<td>Flue Gas Cleaning</td>
<td>3</td>
</tr>
<tr>
<td>8</td>
<td>Design capacity of Steam Turbine Generator with auxiliaries and ACC</td>
<td>1x21 MW</td>
</tr>
</tbody>
</table>

Flue gases are maintained at temperature of more than 950 °C for more than 2 seconds as per MSW 2016 Rules in order to destroy dioxins and furans and keep Total Organic Content (TOC) in ash below 5% limit. Steam generated in the boiler is sent to Turbo-Generator set where power generation takes place. Electricity generated is stepped up before being sent to the nearest grid sub-station for power evacuation.

Exhaust steam from turbine is being cooled inside air cooled condenser and condensate is sent to deaerator and pumped again into boiler using Boiler Feed Pumps. The boiler is equipped with Selective Non-Catalytic Reactor (SNCR) system in which urea solution is being pumped inside furnace in order to limit NOx emissions below prescribed limit. Flue gases from exhaust of economizer section are sent to semi-wet reactor where lime slurry and activated
carbon are dozed in order to limit acidic gases such as SOx, HCl, HF etc., dioxins & furans and heavy metals below prescribed limit. Flue gases are then passed through bag filter where particulate matter along with heavy metals are being trapped and clean flue gas as per emissions limit prescribed by DPCC are sent to chimney with help of ID fans. Fly as generated is converted into fly ash bricks.

**Table 6: Existing Specifications of Boiler and TG Set**

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Unit</th>
<th>Value/Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boiler grate</td>
<td>No.</td>
<td>Reciprocating forward feed-air cooled</td>
</tr>
<tr>
<td>Boiler type</td>
<td>-</td>
<td>Vertical</td>
</tr>
<tr>
<td>Boiler steam capacity (MCR)</td>
<td>t/h</td>
<td>40 (Excluding steam for SCAPH)</td>
</tr>
<tr>
<td>Superheated steam pressure</td>
<td>Kgf/cm² (a)</td>
<td>42</td>
</tr>
<tr>
<td>Superheated steam temperature</td>
<td>°C</td>
<td>400</td>
</tr>
<tr>
<td>Feed water temperature economizer inlet</td>
<td>°C</td>
<td>130</td>
</tr>
<tr>
<td>Fuel Rate</td>
<td>T/day</td>
<td>450</td>
</tr>
<tr>
<td>MSW processed fuel GCV limit-operational stability &amp; safety</td>
<td>Kcal/kg</td>
<td>1100-2100</td>
</tr>
<tr>
<td>Excess air</td>
<td>%</td>
<td>30%-70%</td>
</tr>
<tr>
<td>Primary air temperature</td>
<td>°C</td>
<td>220-240</td>
</tr>
<tr>
<td>Secondary air temperature</td>
<td>°C</td>
<td>150</td>
</tr>
<tr>
<td>Efficiency</td>
<td>%</td>
<td>80-83</td>
</tr>
<tr>
<td>Exit flue gas temperature economizer</td>
<td>°C</td>
<td>190</td>
</tr>
<tr>
<td>Peak Capacity</td>
<td>%</td>
<td>110 MCR</td>
</tr>
<tr>
<td>Conductivity measured at 25° C</td>
<td>µS/cm</td>
<td>&lt;0.2</td>
</tr>
<tr>
<td>Silica as SiO₂</td>
<td>ppm</td>
<td>&lt;0.02</td>
</tr>
<tr>
<td>Hardness as CaCO₃</td>
<td>ppm</td>
<td>Nil</td>
</tr>
<tr>
<td>Bottom ash (Grate ash, Bank, Economizer)</td>
<td>-</td>
<td>Water cooled</td>
</tr>
<tr>
<td>Fly ash</td>
<td>-</td>
<td>Dense Phase Pneumatic Conveyor</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Unit</th>
<th>Value/Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>STG</td>
<td>1x20 MW</td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>Impulse + Reaction</td>
<td></td>
</tr>
<tr>
<td>Steam pressure inlet</td>
<td>Kgf/cm²</td>
<td>39</td>
</tr>
<tr>
<td>Description</td>
<td>Before Processing</td>
<td>Type of Processing</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>-------------------</td>
<td>--------------------</td>
</tr>
<tr>
<td><strong>Incoming Waste</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Incoming MSW</td>
<td>1950</td>
<td>1000</td>
</tr>
<tr>
<td>Segregation of waste is done using Magnetic separators, Ballistic separators and shredders.</td>
<td>Same day</td>
<td>--</td>
</tr>
<tr>
<td><strong>After Segregation of waste</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bio-Degradable fines</td>
<td>59</td>
<td>30</td>
</tr>
<tr>
<td>Converted to Compost</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other recyclable items (plastic, copper, Brass, Alloy, Iron etc.)</td>
<td>20</td>
<td>10</td>
</tr>
<tr>
<td>Available for sale</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inert Waste</td>
<td>390</td>
<td>200</td>
</tr>
<tr>
<td>Disposed off at Landfill site</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leachate</td>
<td>232</td>
<td>119</td>
</tr>
<tr>
<td>Processed and recycled within the project</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moisture evaporated</td>
<td>20</td>
<td>10</td>
</tr>
<tr>
<td>Loss</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Balance processed MSW</td>
<td>1230</td>
<td>631</td>
</tr>
<tr>
<td>Used as fuel for</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16-25 MW</td>
<td>15 MW</td>
<td>40 MW</td>
</tr>
</tbody>
</table>
1.3.2 AIR ENVIRONMENT

Total power requirement in the complex will be 600 kW.

<table>
<thead>
<tr>
<th>SL No.</th>
<th>Sources</th>
<th>Capacity</th>
<th>Pollution control measures</th>
<th>Chimney height</th>
<th>Fuel requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Boiler I (Existing)</td>
<td>1x450 TPD</td>
<td>Stack &amp; FGCS consisting of semi dry scrubber and bag filter house and SNCR to limit Nox emissions.</td>
<td>60 Mts stack Above Ground Level</td>
<td>Segregated MSW</td>
</tr>
<tr>
<td>3.</td>
<td>Boiler II (Existing)</td>
<td>1x450 TPD</td>
<td>Stack &amp; FGCS consisting of semi dry scrubber and bag filter house and SNCR to limit Nox emissions.</td>
<td>60 Mts stack Above Ground Level</td>
<td>Segregated MSW</td>
</tr>
</tbody>
</table>
Boiler III (Existing) | 1x450 TPD | Stack & FGCS consisting of semi dry scrubber and bag filter house and SNCR to limit NOx emissions. | 60 Mts stack Above Ground Level | Segregated MSW
---|---|---|---|---
Boiler (Proposed) | Suitable no of boiler to handle extra 1000 TPD of waste | Stack & FGCS consisting of semi dry scrubber and bag filter house and SNCR to limit NOx emissions. | 60 Mts stack Above Ground Level | Segregated MSW
DG SET (Existing) | 1X320 KVA | Stack | 6 Mts stack Above Roof Level at Surface | LDO
DG SET (Proposed) | 1x320 KVA | Stack | 6 Mts stack, Above Roof Level at Surface | LDO

**Flue gas treatment system**

Pollution from WtE projects remain an area of high concern both for the regulators and society at large. There is high level of dissatisfaction with the current status of waste management in India. At the same time, there are also apprehensions about likely environmental fallout from the better alternative of WtE projects. Combustion based projects are considered one of the most environment friendly technology provided due care is taken for control of air pollution. Air pollution control technology has been developed to take care of all concerns through elaborate arrangement of multi stage treatment and control and monitoring system.

Provisions are made in the design of the combustion system of boilers to minimize the level of pollutants present in the flue gas coming out of the boiler. Further treatment is required to bring the levels below the prescribed values as per SWM Rules and CPCB norms. Since norms become stringent over a period of time, care is to be taken to select treatment section so that future requirements are also met without much modification.

The flue gas treatment system consisting of lime and activated carbon injection system, quenching chamber and reaction tower followed by bag filters ensure total compliance with the most stringent regulation anywhere in the world. Process control for the flue gas treatment facility consists of three loops, in which the first loop continuously controls the flow of re-circulated absorbent to the reactor by continuously monitoring the quantity of flue gas. The second loop is controlled by a temperature measurement of the outlet gas, which ensures that the flue gas is cooled down by controlling the quantity of water sprayed. The third loop is used to control the adding quantity of fresh slaked lime powder through acid gases (HCl, SO2) of the outlet loop. Flue gas flowing out from the reactor then goes into the bag filter
removal of micro particles including hazardous substances. The purified flue gas is discharged by ID fan and vented into the atmosphere through stack of 60 m stack height above ground level. The number of components and their footprints and quite large, requiring large amount of land area. Both capital and operating costs are fairly high and have to be specifically factored for financial viability analysis of such project

**Air Pollution Control System**
2.3.6. Raw material required along with estimated quantity, likely source, marketing area of final products, mode of transport of raw material and finished product.

The raw material for the proposed expansion project is municipal solid waste, which is having the certain calorific value suitable for power generation. The total MSW of the proposed project surrounding areas is getting scientifically segregated, treated and disposed at the site.

2.3.7. Resource optimization/recycling and reuse envisaged in the project, if any, should be briefly outlined.

The proposed Expansion project is based on the reuse of the municipal solid waste (RDF) which is having certain calorific value generated in SDMC area.

2.3.8. Availability of water its source, Energy/power requirement and source should be given

The process water requirement for the proposed expansion project is 875 KLD. Detail Water Balance given in Below Table:
<table>
<thead>
<tr>
<th>S.No</th>
<th>Activity</th>
<th>Water Requirement</th>
<th>Source of water</th>
<th>Waste water generation</th>
<th>Reuse/treatment of waste water</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Fly ash Brick plant</td>
<td>20</td>
<td>Primary Treated Water from DJB STP</td>
<td>10</td>
<td>reuse in Dust Suppression</td>
</tr>
<tr>
<td>2</td>
<td>Tapping Devices</td>
<td>46</td>
<td>Primary Treated Water from DJB STP</td>
<td>28</td>
<td>reuse in Dust Suppression</td>
</tr>
<tr>
<td>3</td>
<td>Water requirement to meet losses during further treatment</td>
<td>45</td>
<td>Primary Treated Water from DJB STP</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>Fire Fighting</td>
<td>10</td>
<td>Primary Treated Water from DJB STP and then further treated (FAB &amp; Tube Settler)</td>
<td>Nil</td>
<td>-</td>
</tr>
<tr>
<td>5</td>
<td>Cooling Tower &amp; SNCR</td>
<td>186</td>
<td>Primary Treated Water from DJB STP and then further treated (FAB, Tube Settler &amp; DMF-1)</td>
<td>15</td>
<td>Reuse in ash quenching directly</td>
</tr>
<tr>
<td>6</td>
<td>Boiler</td>
<td>228</td>
<td>Primary Treated Water from DJB STP and then further treated (FAB, Tube Settler, DMF-1, DMF-2, U.F., R.O. &amp; DM )</td>
<td>11</td>
<td>Reuse in ash quenching directly</td>
</tr>
<tr>
<td>7</td>
<td>Dust Suppression</td>
<td>48</td>
<td>Reject generated from Brick Plant &amp; Tapping devices</td>
<td>Nil</td>
<td>-</td>
</tr>
<tr>
<td>8</td>
<td>Ash Quenching</td>
<td>360</td>
<td>1. Primary Treated Water from DJB STP and then further treated (FAB, Tube Settler, DMF-1, DMF-2, U.F., R.O. &amp; DM) 2. Blow down of Boiler &amp; Cooling Tower &amp; SNCR 3. Treated water from Leachate treatment plant, R.O. &amp; MEE</td>
<td>Nil</td>
<td>-</td>
</tr>
<tr>
<td>9</td>
<td>Gardening</td>
<td>200</td>
<td>Treated water from Leachate treatment plant &amp; R.O.</td>
<td>Nil</td>
<td>-</td>
</tr>
<tr>
<td>10</td>
<td>Housekeeping, road washing &amp; Flushing</td>
<td>230</td>
<td>1. Primary Treated Water from DJB STP and then further treated (FAB, Tube Settler) 2. Treated water from Leachate treatment plant, R.O. &amp; MEE</td>
<td>116</td>
<td>Treatment (FAB &amp; Tube Settler)</td>
</tr>
</tbody>
</table>
2.3.9. **Quantity of wastes to be generated (liquid and solid) and scheme for their management / disposal.**

The wastewater of 530 KLD will be generated which includes 15 KLD from cooling tower blow down 11 KLD from boiler blow down.

**Leachate Treatment.**

Estimated total generation of leachate will be about 350 KLD on an average for proposed + existing facility which shall be treated in 350 KLD of Leachate Treatment Plant.

Primary treatment unit will be provided to reduce the suspended solids and part BOD, COD by suitable process. Process will include biological treatment, pH correction, coagulation, settling, filtration. Sludge recirculation system with sludge treatment shall be provided. Sludge recovered is proposed to be mixed with boiler fuel.

Secondary treatment will aim at reducing BOD and COD levels. Anaerobic and Aerobic processes with nitrification/ de nitrification as required to sustain the biological process need to be provided followed by settling and filtration. Sludge will be mixed with boiler fuel.

After treatment in Leachate Treatment plant, the treated water shall be further treated in R.O.

Recovered water from R.O. shall be reused in gardening. Secondary Treatment process designed to convert the R.O. reject to slurry. Multi effect evaporation system is proposed for this stage. It is expected that slurry will have concentrated organic matter which can be injected in to boiler furnace for heat recovery. Recovered condensed water shall be utilized for ash quenching and other process requirements.
Leachate Treatment Plant Schematic Diagram
Water Balance

Water requirement from external source (862 KLD)
- Primary Treated Water from DJB STP 860 KLD
  - Fly-ash Brick Plant (20 KLD)
    - Reject (10 KLD)
  - Tapping Devices 46 KLD
  - Treatment (FAB & Tube settler) 910 KLD (116 KLD)
  - Ash Quenching 360 KLD
  - Drinking Water from Tanker 2 KLD
  - Reusable Water 780 KLD
    - Gardening 200 KLD
    - Waste water (Nil)
    - Waste water (116 KLD)
    - House keeping, road washing 230 KLD
      - Generated Leachate 350 KLD
        - Leachate Treatment Plant - Biological treatment
        - Treatment 333 KLD
        - Reverse Osmosis
        - Treated water 200 KLD
      - RO treated water 155 KLD
      - RO reject 133 KLD
        - MEE 32 KLD
    - Waste water (116 KLD)

- 38 KLD + 10 KLD
  - 38 KLD + 10 KLD
  - 38 KLD + 10 KLD
  - 38 KLD + 10 KLD
  - 38 KLD + 10 KLD

- Fire-Fighting 10 KLD
  - Fire-Fighting 10 KLD
  - Fire-Fighting 10 KLD
  - Fire-Fighting 10 KLD

- Treated Water 865 KLD
  - DMF (1) 650 KLD
  - Remaining Water 205 KLD

- CMB

- Treated Water 598 KLD
  - DMF-1 Backwash (52 KLD)
  - DMF-2 Backwash (32 KLD)

- Treated Water 380 KLD
  - Ultrafiltration
  - Treated Water 340 KLD
  - RO Plant
  - Treated Water 240 KLD
  - Reject 40 KLD
  - Treated Water 228 KLD
  - Reject 40 KLD
  - DM
  - Treated Water 228 KLD

- Boiler
- Blow Down 11 KLD
- Treatment 186 KLD
- Blow Down 15 KLD
1.3.10 NOISE ENVIRONMENT
To reduce Ambient Noise level the following measures will be adopted --

➢ Existing DG set has been bought acoustically enclosed & placed inside a acoustically treated room as per CPCB guidelines and same shall be followed for additional DG set.

➢ Noise generating units like machinery area, canteen etc. are well insulated with enclosed doors. Earmuffs are being used while in high noise areas.

➢ Maintenance of vehicles and machinery will be done in a sustainable manner to ensure best performance and less loss.

➢ Vehicle and people flow during shift changes shall be regulated by allowing exits in a phased manner.

➢ The green belt will help in reducing noise levels in the complex as a result of attenuation of noise generated due to plant operations and transportation.

Environmental Standards for Liquid Effluents and Emission Standards:

1) Thermal Power Plant: Standards for Liquid Effluents

<table>
<thead>
<tr>
<th>Source</th>
<th>Parameter</th>
<th>Concentration not to exceed, mg/l (except for pH &amp; Temp)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Condenser Cooling Water</td>
<td>pH</td>
<td>6.5 to 8.5</td>
</tr>
<tr>
<td>(once through higher cooling system)</td>
<td>Temperature</td>
<td>More than 10°C than the intake water temperature</td>
</tr>
<tr>
<td>Boiler Blowdown</td>
<td>Free available Chlorine</td>
<td>0.5 mg/l</td>
</tr>
<tr>
<td></td>
<td>Suspended Solids</td>
<td>100 mg/l</td>
</tr>
<tr>
<td></td>
<td>Oil &amp; grease</td>
<td>20 mg/l</td>
</tr>
<tr>
<td></td>
<td>Copper (Total)</td>
<td>1.0 mg/l</td>
</tr>
<tr>
<td></td>
<td>Iron (Total)</td>
<td>1.0 mg/l</td>
</tr>
<tr>
<td>Cooling Tower Blowdown</td>
<td>Free available Chlorine</td>
<td>0.5 mg/l</td>
</tr>
<tr>
<td></td>
<td>Zinc</td>
<td>1.0 mg/l</td>
</tr>
<tr>
<td></td>
<td>Chromium (Total)</td>
<td>0.2 mg/l</td>
</tr>
<tr>
<td></td>
<td>Phosphate</td>
<td>5.0 mg/l</td>
</tr>
<tr>
<td></td>
<td>Other corrosion inhibiting material</td>
<td>Limit to be established on case by case basis by Central Board in case of Union Territories and State Boards in case of States</td>
</tr>
<tr>
<td>Ash pond Effluent</td>
<td>pH</td>
<td>6.5 to 8.5</td>
</tr>
<tr>
<td></td>
<td>Suspended Solids</td>
<td>100 mg/l</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>------------------</td>
<td>----------</td>
</tr>
<tr>
<td></td>
<td>Oil &amp; grease</td>
<td>20 mg/l</td>
</tr>
</tbody>
</table>

2) **Limit for emission of NOx**
   a) For existing units 150 ppm (v/v) at 15% excess oxygen.
   b) For new units with effect from 1-6-99.

<table>
<thead>
<tr>
<th>S. No</th>
<th>Total generation of gas turbine</th>
<th>Limit for stack NOx emission (v/v) at 15% excess oxygen</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Less than 100 MW</td>
<td>100 ppm for units burning natural gas or naphtha as fuel.</td>
</tr>
<tr>
<td>2</td>
<td>For the plants burning gas in a conventional boiler</td>
<td>100 ppm</td>
</tr>
</tbody>
</table>

2.4. Site Analysis

2.4.1. Connectivity
The site is well connected with all the transportation facilities from the nearby places. Table is showing the site connectivity.

<table>
<thead>
<tr>
<th>S. No</th>
<th>Accessibility</th>
<th>Description</th>
<th>Distance &amp; Direction</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Highway/ Road</td>
<td>NH-2 MP Marg Delhi Noida Direct Flyway</td>
<td>0.56 km SWW 0.92 Km NNW 2.56 Km NE</td>
</tr>
<tr>
<td>2</td>
<td>Railway Station</td>
<td>Okhla Railway Station</td>
<td>1.59 km NW</td>
</tr>
<tr>
<td>3</td>
<td>Airport</td>
<td>Safdarjung Airport Indira Gandhi International Airport</td>
<td>7.54 km NE 17.60 km W</td>
</tr>
</tbody>
</table>

2.4.2. Land form, Land use and land ownership
The land use after expansion at the site is given in Table & Figure below.

<table>
<thead>
<tr>
<th>S. No</th>
<th>Land use</th>
<th>Area required(Sqm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Plant Area</td>
<td>30444</td>
</tr>
<tr>
<td>2</td>
<td>Road Area/Parking Area</td>
<td>9720</td>
</tr>
<tr>
<td>3</td>
<td>Green Area</td>
<td>12000</td>
</tr>
<tr>
<td>4</td>
<td>Office and Utilities</td>
<td>8538.86</td>
</tr>
<tr>
<td>5</td>
<td>Total Plot Area</td>
<td>60702.86</td>
</tr>
</tbody>
</table>
2.4.3. Topography (along with map)
Topography of the site is highly uneven and undulating due to barren rocky outcrops. The
2.4.4. Existing land use pattern

<table>
<thead>
<tr>
<th>Areas</th>
<th>Name/Identity</th>
<th>Aerial distance (within 15 km.) from Proposed project location boundary</th>
</tr>
</thead>
</table>
Areas which are important or sensitive for ecological reasons - Wetlands, watercourses or other water bodies, coastal zone, biospheres, mountains, forests

<table>
<thead>
<tr>
<th>Water Body</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Yamuna River</td>
<td></td>
<td>1.81 km NE</td>
<td>4.86 km SW</td>
</tr>
<tr>
<td>NTPC Water Treatment Plant</td>
<td></td>
<td>7.09 km NE</td>
<td>8.41 km W</td>
</tr>
<tr>
<td>Sanjay Lake</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hauz Khas Tank</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Forest</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Pusa Hill forest</td>
<td></td>
<td>12.94 km NW</td>
<td></td>
</tr>
<tr>
<td>Central Ridge Reserve Forest</td>
<td></td>
<td>12.08 km NW</td>
<td></td>
</tr>
<tr>
<td>Jahanpanah City Forest</td>
<td></td>
<td>4.66 km SW</td>
<td></td>
</tr>
<tr>
<td>Asola Bhatti Wildlife Sanctuary</td>
<td></td>
<td>4.77 Km SW (ESZ boundary)</td>
<td></td>
</tr>
<tr>
<td>City Forest Hauzrani</td>
<td></td>
<td>7.87 Km SW</td>
<td></td>
</tr>
<tr>
<td>Okhla Bird Sanctuary</td>
<td></td>
<td>2.36 Km E</td>
<td></td>
</tr>
<tr>
<td>Restricted Forest</td>
<td></td>
<td>7.40 Km N</td>
<td></td>
</tr>
</tbody>
</table>

Areas used by protected, important or sensitive species of flora or fauna for breeding, nesting, foraging, resting, over wintering, migration

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Okhla Bird Sanctuary</td>
<td></td>
<td>2.36 Km E</td>
<td></td>
</tr>
<tr>
<td>Asola Bhatti Wildlife Sanctuary</td>
<td></td>
<td>4.77 Km SW (ESZ boundary)</td>
<td></td>
</tr>
</tbody>
</table>

2.4.5. Existing infrastructure
The site is well equipped with all the infrastructure facilities like security room, administrative building, R&D building, vehicle maintenance shed, weigh bridge, electrical utility area, toilet block, etc., are present within the existing facility and the same will be used for the proposed MSW based waste to energy power plant.

2.4.6. Soil classification
Geologically the area around MSW site falls under seismic zone-iv.

<table>
<thead>
<tr>
<th>Latitude</th>
<th>Longitude</th>
<th>Elevation</th>
</tr>
</thead>
<tbody>
<tr>
<td>28°33'8.85&quot;N</td>
<td>77°16'46.73&quot;E</td>
<td>214 m</td>
</tr>
</tbody>
</table>

2.4.7. Climatic data from secondary sources

Climatologically data from (1971-2000) [source: IMD station at Delhi (Safdarjung)]

<table>
<thead>
<tr>
<th>MONTH</th>
<th>STATION LEVEL PRESSURE</th>
<th>MEAN</th>
<th>EXTREMES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>hPa</td>
<td>DRY BULB</td>
<td>WET BULB</td>
</tr>
<tr>
<td>JAN</td>
<td>992.2</td>
<td>9.7°C</td>
<td>18.7°C</td>
</tr>
<tr>
<td>FEB</td>
<td>990.1</td>
<td>12.7°C</td>
<td>21.8°C</td>
</tr>
<tr>
<td></td>
<td>MAR</td>
<td>APR</td>
<td>MAY</td>
</tr>
<tr>
<td>-------</td>
<td>-------</td>
<td>-------</td>
<td>-------</td>
</tr>
<tr>
<td>MONTH</td>
<td>987.3</td>
<td>983.2</td>
<td>979.3</td>
</tr>
<tr>
<td></td>
<td>984.7</td>
<td>979.3</td>
<td>975.5</td>
</tr>
<tr>
<td></td>
<td>18.9</td>
<td>26.2</td>
<td>30.6</td>
</tr>
<tr>
<td></td>
<td>27.4</td>
<td>34.6</td>
<td>37.9</td>
</tr>
<tr>
<td></td>
<td>17.3</td>
<td>20.1</td>
<td>22.1</td>
</tr>
<tr>
<td></td>
<td>29.2</td>
<td>36.0</td>
<td>39.0</td>
</tr>
<tr>
<td></td>
<td>15.3</td>
<td>21.3</td>
<td>27.9</td>
</tr>
<tr>
<td></td>
<td>35.0</td>
<td>40.9</td>
<td>43.4</td>
</tr>
<tr>
<td></td>
<td>10.1</td>
<td>15.9</td>
<td>21.1</td>
</tr>
<tr>
<td></td>
<td>40.6</td>
<td>45.6</td>
<td>47.2</td>
</tr>
<tr>
<td></td>
<td>4.4</td>
<td>10.7</td>
<td>15.2</td>
</tr>
</tbody>
</table>

**Annual Wind Rose**

[Image of Annual Wind Rose]

Source: IMD, Safdarjung
### 2.4.8. Social infrastructure available

Social infrastructure facilities like Hospital, School, College, Temple, etc., are available within the nearby project.

<table>
<thead>
<tr>
<th><strong>Hospital</strong></th>
<th>Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>City Hospital</td>
<td>0.75 Km E</td>
</tr>
<tr>
<td>Fortis Escorts Hospital</td>
<td>0.84 Km NNW</td>
</tr>
<tr>
<td>Holy Family Hospital</td>
<td>1.12 km NNW</td>
</tr>
<tr>
<td>Jeewan Jyoti Hospital</td>
<td>1.62 Km SW</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Places of worship</strong></th>
<th>Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shiv Shakti Mandir</td>
<td>1.06 Km W</td>
</tr>
<tr>
<td>Old Kalkaji Temple</td>
<td>1.34 Km SW</td>
</tr>
<tr>
<td>Ravidas Mandir</td>
<td>0.87 Km SW</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>School/College</strong></th>
<th>Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>K.C. Vishwakarma School</td>
<td>0.83 km SW</td>
</tr>
<tr>
<td>Shiv Shakti Public School</td>
<td>0.97 Km SW</td>
</tr>
<tr>
<td>Govt boys/girls school</td>
<td>0.95 Km SSW</td>
</tr>
<tr>
<td>Indraprastha School of Technology</td>
<td>1.01 Km SW</td>
</tr>
<tr>
<td>G.B. Pant School of Technology</td>
<td>1.19 km SW</td>
</tr>
</tbody>
</table>
2.5. Planning Brief

2.5.1. Planning concept (type of industries, facilities, transportation, etc.) Town and country planning/ Development authority classification
The proposed expansion waste to energy power plant based on MSW will be developed within the existing facility. The project area falls within the SDMC limits having all required infrastructure (power, roads, water lines, etc.).

2.5.2. Population projection
There will be an influx of 99 to 150 people to the area due to the proposed project.

2.5.3. Land use planning
The total area allocated for MSW based waste to energy power plant is 15 acres. The detailed land breakup of total area is given in Table

<table>
<thead>
<tr>
<th>S. No</th>
<th>Land use</th>
<th>Area required(Sqm)</th>
<th>% of plot area</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Plant Area</td>
<td>30444</td>
<td>50.15%</td>
</tr>
<tr>
<td>2</td>
<td>Road Area/Parking Area</td>
<td>9720</td>
<td>16%</td>
</tr>
<tr>
<td>3</td>
<td>Green Area</td>
<td>12000</td>
<td>20%</td>
</tr>
<tr>
<td>4</td>
<td>Office and Utilities</td>
<td>8538.86</td>
<td>14.07%</td>
</tr>
<tr>
<td>5</td>
<td>Total Plot Area</td>
<td>60702.86</td>
<td>100%</td>
</tr>
</tbody>
</table>

2.5.4. Assessment of Infrastructure demand (physical & social)
There will be a minimum influx of people to the area due to the proposed project, as the major manpower will be employed from the nearby locality. Hence the infrastructure available is sufficient to accommodate the demand.

2.5.5. Amenities/Facilities
All the amenities/facilities like security room, administrative building, toilet block, etc., are present within the existing facility and the same will be used for the proposed MSW based waste to energy power plant.

2.6. Proposed Infrastructure

2.6.1. Industrial area (processing area)
The site is well established with all the facilities as it is an existing facility operating from last few years.
2.6.2. Residential area (non-processing area)
No residential area is proposed within the project site.

2.6.3. Greenbelt
A thick greenbelt was developed all around the existing facility and the total area allocated for greenbelt development is 12000 sqm out of 60702.86 sqm.

2.6.4. Social infrastructure
No Social infrastructure is proposed within the project site.

2.6.5. Connectivity (traffic and transportation Road/Rail/Metro/Water ways etc.)
The site is well connected with all the transportation facilities from the nearby places. No further road or metro network is proposed.

2.6.6. Drinking water management (Source & Supply of water)
The drinking water required for the proposed project will be taken from DJB.

2.6.7. Sewerage system
The domestic waste water generated from the proposed project will be sent to septic tank followed by soak pit. The process water will be treated and reused for various other uses.

2.6.8. Industrial Waste Management
The total fly ash generated from the boiler will be 40 TPD to 50 TPD, Dry fly ash collected from the bag filter hoppers and the economizer hoppers and the ash collected from the furnace bottom, Evaporator / super heater bottom hoppers can be used for brick manufacturing. The MSW ash contains non-combustibles such as metals, glass, concrete, brick, etc.

2.6.9. Solid waste management
Domestic solid waste of 80 kg/day generated from the admin building and workshops will be utilized in existing plant after proper segregation.

Hazardous Waste Management:
Approximately 12 ltr/month of used oil shall be generated from the DG Sets. It Shall be disposed in leak proof containers & disposed only to authorized re-processors/ authorized common collection centre provided the oil meets the standards as per schedule -5 Part A rules WTP Sludge will be generated, which will be used as fuel in the boiler itself.

2.6.10. Power requirement & supply/ source.
The total power required for operations is 600 kW and the source is from existing facility. Once the power plant will be fully operational the power requirement will be met from the same and excess will be interconnected to grid of Delhi Transco substation

2.7. Rehabilitation and Resettlement (R&R) Plan

2.7.1. Policy to be adopted (Central/State) in respect of the project affected persons including home out sees and landless laborers (a brief outline to be given)
The proposed Expansion project is developing within the existing facility and hence there is no rehabilitation and resettlement is envisaged.

2.8. Project Schedule & Cost Estimates

2.8.1. Likely date of start of construction and likely date of completion (Time schedule for the project should be given).
The project will be started after getting all the necessary approvals from the regulatory authorities viz., MoEFCC, DPCC, etc.

2.8.2. Estimated project cost along with analysis in terms of economic viability of the project.
The estimated cost of the project is Rs.54300 lacs.
The proposed project expansion project is developing within the existing facility and hence there is no rehabilitation and resettlement is envisaged.

2.9. Analysis of Proposal (Final recommendations)

2.9.1. Financial and social benefits with special emphasis on the benefit to the local people including tribal population if any, in the area.
Overall the proposed expansion project will have a positive impact on the people and surroundings.
Incineration of MSW allows huge savings at the landfill as the volume of MSW is reduced almost to 20% in the form of ashes and slag as compared to the original waste volume.
ENCLOSURE 3.   LAND PAPERS
LAND LICENCE AGREEMENT

This LICENCE DEED made on the 24th day of January in the year Two Thousand and Eight

BETWEEN

The New Delhi Municipal Council, a municipal body established under the New Delhi Municipal Council Act and having its offices at Palika Kendra Building, Opposite Jantar Mantar, Parliament Street, New Delhi – 110 001, acting through its Director (Projects) (hereinafter referred to as “the Licenser” which expression shall wherein the context or subject to implies include his successors in Office)

AND

TIMARPUR-OKHLA Waste Management Company Private Limited (TOWMCL), a company incorporated under the Companies Act, 1956 and having its registered office at Core 4B, 4th Floor, India Habitat Center, Lodhi Road, New Delhi-110 003 (hereinafter referred to as “Licenee” which expression shall unless it be repugnant to the subject or context be deemed to include its successors and permitted assigns);

WHEREAS

A. The New Delhi Municipal Council is desirous of improving its municipal solid waste management and disposal capabilities in order to enable the due discharge of its functions under the New Delhi Municipal Corporation Act and for that purpose has approved the establishment of an integrated waste processing plant by the Licensee at
Okhla Compost Plant Site ("Project"). In order to implement the Project the Licensor has entered into a concession agreement ("Concession Agreement"), on the same date as this Agreement, under which it has authorized the Licensee to implement the Project.

B. The New Delhi Municipal Council in order to enable the due implementation of the Project and to discharge its obligations under the Concession Agreement is hereby providing the Licensee, by way of this License agreement ("this Agreement"), the Demised Premises (as defined below) for the purposes of implementing the Project and constructing, operating and maintaining the integrated waste processing plant on the Demised Premises, on the terms and conditions and subject to the covenants and stipulations hereinafter contained.

NOW THIS INDENTURE OF LICENSE WITNESSETH AS FOLLOWS:-

1. This Agreement shall be co-terminus with the Concession Agreement and is to be read, for any interpretation, together with the provisions of the Concession Agreement.

2. The capitalized terms that are used but not defined in this Agreement shall have the same meaning as given to them in the Concession Agreement.

3. In consideration of the Licensee undertaking to implement the Project in accordance with the provisions of the Concession Agreement and undertaking to pay the License rental stipulated in Clause 4 below; the Licensor hereby demise to the Licensee, all the land which is described, delineated and shown in the Schedule A hereto (hereinafter "Demised Premises"), to hold the said Demised Premises, without interruption or interference together with the full and free right and liberty of way and passage and other rights in relation thereto, for as long as the Concession Agreement does not lapse due to expiry of its Term or is not terminated earlier in accordance with
the provisions thereof. The Term of this Agreement shall be co-terminus with the Concession Agreement. The Licensor further hereby agrees and authorizes the construction, operation and maintenance of the Plant and each of the Project Facilities on the Demised Premises, in accordance with the terms of the Concession Agreement.

4. In consideration of the transfer of the Demised Premises under this Agreement, the Licensor shall, after the Effective Date of the Concession Agreement has been achieved, receive a rent equal to the lease rental payable by NDMC for DDA for the Site. The present lease rental payable by NDMC to DDA for the site is [Rupees Seven Lakhs Fifty Thousand Only] per annum, for the Term payable on or before the 10th day of the first calendar month in each year provided however, the License rental can be paid in advance for such period of time as the Licensee may deem fit. The Licensor undertakes and assures the Licensee that the License rental for the Demised Premises shall remain fixed for the entire period that this Agreement remains valid and binding.

5. The Demised Premises are being vested with the Licensee, under this Agreement, free from any legal Encumbrances. If TOWMCL notifies that it will not require the existing superstructure and thus requests NDMC to clear the site and the superstructure, then TOWMCL shall have to remit a payment of Rs. One Crore (Rs.1,00,00,000/-) to NDMC within a period of 60 days from the date of issue of LoL. Under such condition, NDMC will clear the Site and give vacant possession thereof. Under such scenario, at any time during the term of this Agreement if the Licensee discovers any Encumbrances upon or under the Demised Premises which materially adversely effect the rights in relation to the Demised Premises, it shall notify the Licensor, which shall, within twenty one (21) days from the receipt of the notice, either remove or cause to be removed such encumbrances at its own cost. In the event that the Licensor fails to remove such encumbrances within twenty one (21) days from the notice thereof, the Licensee may remove or cause to be removed such encumbrance and the costs and expenses or consequential liabilities incurred in respect thereof shall be reimbursed to the Licensee by the Licensor.

6. Alternatively, if TOWMCL notifies that it would require the existing superstructure and/or it would like to clear the land on its own, then TOWMCL shall have the entire responsibility of removing the garbage and transporting it to MCD's Okhla landfill site (in line with DERC order dated 08.11.2007). Under such circumstances, TOWMCL shall have complete rights over existing super-structure on the Site.

7. The Demised Premises are being vested with the Licensee, under this Agreement only for the purposes of the Project including for the purposes of developing, establishing, designing, constructing, operating the maintaining the Plant which the Licensor is desirous of being constructed, operated and maintained on the Demised Premises for the purposes of enabling the processing the Municipal Solid Waste in accordance with the Concession Agreement. Furthermore the Licensee expressly and unconditionally agrees and undertakes to the Licensor that it shall under no circumstances construct or allow to be constructed or cause to be constructed in the Demised Premises by itself or by its representatives/ workers/ agents/ contractors or any other person claiming under him to construct any residential units or dwellings and the same shall not be construed or interpreted as forming part of the Project facilities directly or indirectly. The Licensor hereby authorizes and consents to the receipt of consignments of
Municipal Waste, the storage and processing of Municipal Waste and the resulting Residual Inert Matter, and/or Sludge as well as to the receipt and storage of any waste (including Rejected Waste) that may have been received by the Licensee in any consignment of Municipal Solid Waste.

8. The Licensor hereby authorizes the Licensee, to construct, erect, and own, operate and maintain any superstructure, facility or any movable or immovable structures constituting the Plant (including each of the Project Facilities) on the Demised Premises and for that purpose also remove, renovate, use or demolish any structures that may be existing on the Demised Premises as of the date of this Agreement. The Licensor hereby agrees and acknowledges that it shall not own or have any rights to any superstructure, facility or any moveable or immovable structures constituting the Plant that are constructed or erected or placed on the Demised Premises and further that the same shall be owned by the Licensee. The Licensor hereby agrees that the construction, operation and maintenance of the Plant at the Demised Premises and the receipt, storage and processing of Municipal Waste at the Demised Premises is being undertaken pursuant to the Concession Agreement granted by it and for the purposes of enabling the Licensor to discharge its functions of managing, processing and disposing Municipal Waste.

9. The Licensee shall have the right to, without requiring any prior permission from the Licensor in this regard, transfer for use, assign or otherwise encumber the Demised Premises and any or all of its rights and interest in relation thereto or to otherwise create a security interest in favour of the Lenders over the Demised Premises for the purposes of enabling financing of the Project. Provided, however, the Licensor shall be informed as to the creation of any Encumbrance in favour of the Lenders in the Demised Premises, within a period of 14 days from the date such Encumbrance comes into existence.

10. The Licensee shall have the right to, without requiring any prior permission of the Licensor, vest with the Lenders, the power to take over the control, possession and all rights and interests in relation to the Demised Premises by appointing a person to replace the Licensee and undertake the construction, operation and maintenance of the Plant upon the occurrence of an event of default by the Licensee, as the case may be, under any of the Financing Agreements. The Licensor shall novate this Agreement in favour of the substitute entity and shall constitute an agreement between the substitute entity and the Licensor on the terms and conditions of this Agreement as existing at the time of such novation. The Licensor hereby agrees that the dues payable to the Lenders shall have priority over any amount payable to the Licensor under this Agreement.

11. The Licensor hereby authorises the Licensee to create any Encumbrance over the Demised Premises and this Agreement in favor of the Lenders for enabling financing of the construction, operation and maintenance of the Project. The Licensor agrees that it shall provide such undertakings as may be reasonably required by the Lenders to enable financing of the Project and creation of the Encumbrance required by the Lenders. Without prejudice to the terms of this Agreement, the Licensor shall be governed by the terms of any agreement that the Lenders may have entered into with
the Licensor in respect of the Encumbrance over the Demised Premises and this Agreement, created in favour of the Lenders.

12. The Licensor hereby covenants and assures the Licensee that:

a) all the land comprising the Site is of non-agricultural status and is permitted and duly authorized and earmarked for purposes of establishment, construction, operation and maintenance of the Plant and the Project Facilities, and that it shall obtain any additional Applicable Approvals that may be required for the development, construction, operation and maintenance of the Project Facilities.

b) the Site is free from any encroachment or Encumbrances whatsoever and is not subject to any acquisition or other legal proceedings by any authority, body or government nor is any claim of any third party subsisting in respect thereof or relating thereto.

c) Licensor is the Lease Holder of the lands constituting the Demised Premises and it shall, in that capacity, defend or satisfy all actions or claims against the use of the Demised Premises for the Project.

d) it shall not demand or in any manner claim or seek to recover the rent prior to the Effective Date of the Concession Agreement or increase the rent due and payable by the Licensee under the provisions of this Agreement;

e) it shall not interfere the or impede in any manner or otherwise limit, restrict or impose any conditions or restrictions on the complete, free and full enjoyment and use of the Demised Premises and all rights in relation thereto, including the creation of security, interest in the Demised Premises in favour of the Lenders;

f) it shall not interfere in or impede in any manner or otherwise limit, restrict or impose conditions in relation: (i) to the construction, operation and maintenance of the Plant; (ii) the implementation of the Project by the Licensee and (iii) the possession, control and use, by the Licensee of the Demised Premises and the Plant;

g) It shall enter into appropriate further documentation or additional writings as the Licensee or the Lenders may reasonably require to give effect to the provisions of this Agreement and the Financing Agreements;

h) there are no litigation, claim, demand or any proceedings (whether administrative, legal or quasi judicial) pending before any authority in respect of the Demised Premises or its use for the purposes of managing, processing and disposing MW; and

i) the Licensee shall have complete, lawful and uninterrupted, possession, control and use of the Demised Premises.

13. The Licensee hereby covenants with the Licensor as follows:

a) That it shall implement the Project in accordance with the Concession Agreement; and

b) that it shall observe and perform all terms, covenants, conditions and stipulations of this Agreement.

14. Licensor has lawful title, possession and control of all the lands constituting the Site and has the requisite right and authority to License the same to Licensee for the Term for the purposes of the Project on the terms and conditions of this Agreement and
further that Licensee shall have full, free and uninterrupted peaceful Vacant Possession, enjoyment/occupation and use of the Demised Premises throughout the Term, without any obstruction interference or disturbance or claim whatsoever from the Licensor or from any person claiming through under or in trust for Licensor or from any third person whomsoever. Licensor shall keep Licensee fully indemnified and harmless against any claims or demands from any Person claiming right, title or interest to or in the Demised Premises or any part thereof or challenging the validity of the usage of the Demised Premises for the Project or challenging the validity of this Agreement, as also against any actions, proceedings, damages, losses and expenses caused to Licensee as a result or in consequence of any such claims or demands as aforesaid.

15. (a) Subject to Sub-Clause (b) and (c) below, no assignment of this Agreement or any rights or duties hereunder shall be made in whole or in part by any Party without the written consent of the other Party and in the event of any assignment the assignee shall assume the duties and liabilities of the assignor.

(b) It is hereby specifically agreed that the Licensee shall, in the event of forming a limited company either as subsidiary company or jointly along with any other company or otherwise, be at liberty to assign and transfer the Plant, the Demised Premises and this Agreement or the rights and benefits hereof or duties hereunder to such newly formed limited company or in favour of such subsidiary company of the Licensee or any of its holding company for the time being. The Licensee, shall, however, in such event obtain formal consent from the Licensor, which consent shall not be withheld by Licensor. Any assignment by the Licensee shall be subject to the condition that the assignee shall assume the duties and liabilities of the Licensee.

(c) The Licensor hereby agrees that the Licensee shall not require any prior approval of the Licensor for creating any Encumbrance, right, title, or interest over the Demised Premises and the Project Facilities and the other assets of the Project, in favour of the Lenders.

(d) Licensor confirms that the Financing Documents may include suitable rights in favour of the lenders for taking over the Demised Premises and the Plant for management or for sale, in enforcement of their security upon the happening of an event of default thereunder on the part of the Licensee, provided however, the Demised Premises shall not be subject to sale.

16. The Licensor hereby assures and represents to the Licensee that the vesting of the Demised Premises under this Agreement shall be irrevocable for as long as the Concession Agreement remains in force and the Licensor shall not terminate or seek to terminate this Agreement except upon the expiry or early termination of the Concession Agreement. The Parties hereby agree that on the expiry or termination of the Concession Agreement, the Demised Premises shall be handed back to the Licensor in accordance with the provisions of the Concession Agreement and that this Agreement shall terminate only on the handing over of the Plant and the Site to the Licensor in accordance with the terms of the Concession Agreement.
17. The Licensor, during the term of the License, shall have a right at its option to appoint and nominate its representative as a Director on the Board of the Licensee ("Licensor's Nominee Director"). The said Licensor's Nominee Director shall not be required to hold any qualification shares, if any required, and shall not be considered while computing the Directors eligible for retirement by rotation as per the applicable provisions of Companies Act 1956. The Licensee shall also ensure that the enabling provisions in this regard are suitably incorporated in the Articles of Association of the Licensee to give effect to the provisions of this Clause.

18. The Licensee also agrees that the demised Premises shall be used only for the purposes as defined in this License Agreement and any deviation there from without the prior written permission of the Licensor shall be deemed to be a breach of this License Agreement as well as the Concession Agreement dated 24th January 2008 signed between New Delhi Municipal Council (NDMC) and Timarpur-Okhla Waste Management Company Private limited (TOWMCL) and would entitle the Licensor to forthwith revoke this License Agreement and re-enter and re-possess the Demised Premises at the cost, risk and consequences of the Licensee.

19. Any disputes and/or differences arising between the Parties, in relation to or under this Agreement will be resolved through arbitration to be conducted by a panel of three arbitrators, two of whom shall be appointed by each of the Parties and the third will be appointed by the two arbitrators so selected. The venue of the arbitration shall be in New Delhi. The arbitration shall be held in accordance with and be governed by the provisions of the Arbitration and Conciliation Act, 1996. The governing law of the arbitration shall be Indian law.

20. The Licensor hereby recognizes that this is a commercial act being undertaken by the Licensor and that it hereby unconditionally and irrevocably waives any right of immunity, sovereign or otherwise from legal proceedings that may be initiated to enforce any provisions of this Agreement.

IN WITNESS WHEREOF the Parties have affixed therein and sealed to this License Agreement the day and year first hereinabove written:

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<tr>
<th>SIGNATURE, SEALED AND DELIVERED IN THE NAME AND ON BEHALF OF THE LICENSOR THROUGH:</th>
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<td>SIGNED, SEALED AND DELIVERED BY LICENSEE THROUGH ITS AUTHORISED SIGNATORY IN PRESENCE OF:</td>
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New Delhi
IN PRESENCE OF

A. 

NAME: AJAY GUPTA
ADDRESS: AE (Projects), NWC,
NEW DELHI

B. 

NAME: DEEPAK GUPTA
ADDRESS: LICFS ITC Ltd., Cor 4B, 4th Floor,
India Habitat Centre, Lodhi Road,
NEW DELHI - 110003
AGREEMENT FOR CDM REVENUE SHARING

BETWEEN

TIMARPUR-OKHLA Waste Management Company Private Limited
(“TOWMCL”)

AND

UNIQUE WASTE PROCESSING COMPANY
(“UWPC”)

S. Balakrishnan
New Delhi
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THIS AGREEMENT made on this 24th day of January, 2008 at Delhi

BETWEEN

TIMARPUR-OKHLA Waste Management Company Private Limited, a Company incorporated under the Companies Act, 1956 and having its registered office at Core 4B, 4th Floor, India Habitat Center, Lodhi Road, New Delhi-110 003, hereinafter referred to as “TOWMCL” (which expression shall, unless repugnant to the context or meaning thereof, mean and include its successors and assigns) of the ONE PART;

AND

UNIQUE WASTE PROCESSING COMPANY, a Company incorporated under Section 25 of the Companies Act, 1956 and having its registered office at Core 4B, 4th Floor, India Habitat Center, Lodhi Road, New Delhi-110 003, hereinafter referred to as “UWPC” (which expression shall, unless repugnant to the context or meaning thereof, mean and include its affiliates, associate/group companies, successors and assigns) of the OTHER PART;
TOWMCL and UWPC are hereinafter referred to individually as the “Party” and collectively as the “Parties”.

WHEREAS

1. TOWMCL is implementing a Project, pursuant to the Concession Agreement(s) entered into in respect thereof with the Municipal Corporation of Delhi (“MCD”) and New Delhi Municipal Council (“NDMC”) for development, operation and maintenance of an integrated facility jointly at Timarpur and Okhla in Delhi, that will process and dispose Municipal Solid Waste (the “Project”).

2. UWPC has developed know-how and technology for the development and operation of an integrated waste processing facility that would comprise combination of Refuse Derived Fuel (RDF) plant, a Bio-methanation Plant, a water treatment facility and a Power Plant (“Technology”).

3. UWPC has also developed the Project by taking the project from conception to ground reality by working in close co-ordination with technical experts, financial experts and waste management consultants and also obtained various statutory as well as non-statutory clearances for the Project.
4. The Project is also qualified for and has been registered under “Clean Development Mechanism” a mechanism established pursuant to Article 12 of the Kyoto Protocol (“CDM Project”) thereby entitling TOWMCL, as the developer of a CDM Project, to be issued corresponding units of Certified Emission Reduction (“CERs”) that it can thereafter undertake to sell to a third party (“Purchaser”).

5. In consideration of UWPC having developed the Concept and the Project and agreeing to share its experience with TOWMCL for the development and betterment of the Project and also towards providing assistance in enabling the Project to qualify as a CDM Project, TOWMCL has agreed to share the revenues generated from sale of CERs with UWPC in terms of and in accordance with the provisions of this Agreement.

6. The parties are desirous of recording the terms and conditions of their continued co-operation for betterment of technology and the Project, intended to be co-terminus with the Concession Agreement(s), as mutually agreed between them and hereinafter appearing.

NOW THIS AGREEMENT WITNESSETH AND IT IS HEREBY AGREED BY AND BETWEEN THE PARTIES AS FOLLOWS:

1. DEFINITIONS

1.1 “Affiliate” means, in relation to any Person, any entity controlled, directly or indirectly, by that Person, any entity that controls, directly or indirectly, that Person, or any entity under common control with that Person or, in the case of a natural Person, any Relative of such Person. Without limiting the generality of the above, a holding or subsidiary company of any entity shall be deemed to be an Affiliate of that entity.

1.2 “Agreement” means this agreement between TOWMCL and UWPC, including its Schedules and Annexes and includes any amendments made hereto in accordance with the provisions hereof.

1.3 “Concession Agreement” means “Concession Agreement-MCD” and “Concession Agreement-NDMC” including their Schedules and Annexure and includes any amendments made hereto wherein MCD/NDMC has granted all the rights to TOWMCL with respect to developing, implementing, constructing, operating and maintaining the
Project for the management, and processing of the Municipal Solid Waste generated from within the MW Supply Area, subject to all the terms, conditions, covenants and obligations of the Concession Agreement(s).

1.4 “Concession Agreement-MCD” means Agreement dated 29/01/2007 between MCD and TOWMCL, by which the Concession has been granted to TOWMCL by MCD.

1.5 “Concession Agreement-NDMC” means the Agreement dated 24/01/2008 between NDMC and TOWMCL by which the Concession has been granted to TOWMCL by NDMC.

1.6 “CDM Project” has the meaning given to it in Recital 4 above.

1.7 “CERs” means the total certified emission reduction of 262,790 units that has been issued by the CDM Executive Board to TOWMCL as the Developer and implementer of the Project.

1.8 “CDM Benefits” means the revenue to be obtained by TOWMCL from sale of CERS, by Carbon Trading under the Kyoto Protocol, as the developer/implementer of the Project for contributing to emission reductions and mitigation of climate change.

1.9 “Carbon Trading” means any sale or transfer or creation of rights (in any manner or under any arrangement) by TOWMCL in favour of any Third Party, pursuant to any scheme or mechanism or in any relevant market under any Jurisdiction, in relation to: (i) TOWMCL’s right to CERs or (ii) the CERs that are either already issued or expected to be issued to TOWMCL in relation to the Project, or (iii) any benefit that TOWMCL may derive or is expected to derive as a Developer/implementer of a Project that has or is expected to be classified as a CDM Project.

1.10 “ERPA” means an Emission Reduction Purchase Agreement that may be entered between TOWMCL and any Third Party for the sale and purchase of CERs.

1.11 “Intellectual Property Rights” means patent rights (including patent applications and disclosures), copyrights, trade secret rights, technology rights, know-how and any other Intellectual Property Rights recognized in any country or jurisdiction in the world.
1.12 “Project” means the integrated Municipal Waste processing facility comprising the RDF Plant, the Bio-Methanation Plant, Water Treatment facility and the Power Plant to be designed, constructed, operated and maintained by TOWMCL in accordance with the terms and provisions of the Concession Agreement(s) and in the event TOWMCL decides to design, construct, operate and maintain a Compost Plant, such facility shall also be part of the Project.

1.13 “Project Design Document” or “PDD” means the description of the Project prepared for Validation and Registration in accordance with the International Rules and guidelines of the CDM Executive Board (EB).

1.14 “Promote” means to advertise, market, display or communicate or to agree to do any of the foregoing in such a way that may suggest, either expressly or impliedly, that the CERs created by the Project are, or at some future time may be, available for purchase and includes written and oral representations to that effect.

1.15 “Registration” means the formal acceptance of the validated Project as a CDM project activity by the CDM Executive Board.

1.16 “Technology” has the meaning given to the term in Recital 2.

1.17 “Validation” means the process of independent evaluation of the Project by a Designated Operational Entity against the requirements of the CDM on the basis of the Project Design Document and other information required to be assessed under International Rules.

All other capitalized words and expressions, that are used but not defined in this Agreement, will carry the meaning assigned to them under the Concession Agreement(s).

2. **SCOPE AND TERM OF THIS AGREEMENT**

This Agreement establishes the framework agreed to and binding between TOWMCL and UWPC in respect of use of Technology for the Project and the sharing of the revenues
obtained by TOWMCL from sale of CER(s), in consideration thereof. This Agreement shall be co-extensive and co-terminus with the Concession Agreement(s).

3. **USE OF TECHNOLOGY**

3.1 **Use of Technology:** Subject to the terms and conditions of this Agreement, UWPC having developed the Technology, grants to TOWMCL a limited, non-exclusive, non-sub-licensable, and non-transferable license to use the Technology for the purposes of developing, constructing, operating and maintaining the waste management and processing facilities at Timarpur & Okhla Sites in Delhi.

3.2 **Scope of Use:** The rights in this Clause 3 are granted solely for the benefit of TOWMCL and can be used only for the waste treatment, management and processing facility at Okhla & Timarpur Site(s) in Delhi, and not, by implication or otherwise, for any other waste treatment plant or at any other location.

3.3 **Access:** TOWMCL will allow UWPC to physically access the waste treatment facility it develops at Okhla & Timarpur site(s).

3.4 **Restrictions:** The rights granted in this Clause 3 do not authorize TOWMCL (nor can TOWMCL allow or enable any Third Party) to:

(a) copy, distribute, reproduce, use or allow Third Party access to the Technology except with the prior written agreement of UWPC;

(b) decompile, disassemble, reverse engineer, translate, convert or apply any procedure or process to the Technology;

(c) modify, incorporate into or with other technology, or create a derivative work of any part of the Technology;

(d) use, access or allow access to the Technology in any manner to Third Parties;

(e) use the Technology or any part thereof for developing any other technology (whether competing or not), without the prior written consent of UWPC; or

(f) provide access to Technology to any Third Party or provide services or consultation of any nature (for a fee or otherwise) to any other Third Party based on the use of the Technology or

(g) resell or syndicate in any manner the use of the Technology or

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(h) allow the use of the Technology at any other location other than for developing the plant at Okhla & Timarpur Site(s) in Delhi.

3.5 **Ownership of Technology:** UWPC owns and will continue to own all right, title, and interest in and to the Technology and all worldwide Intellectual Property Rights therein. TOWMCL will provide UWPC with timely access to waste treatment facility it develops at Okhla & Timarpur Site(s) in Delhi, at reasonable times and upon reasonable notice, to verify TOWMCL’s compliance with the terms of this Agreement. The Technology is for particular use by TOWMCL and is not sold. TOWMCL or its agents or contractors shall not infringe the Intellectual Property Rights of UWPC (existing at any time) in the Technology or any part thereof and shall not challenge or establish or support a claim challenging UWPC’s Intellectual Property Rights to the Technology or any part thereof.

3.6 **Confidentiality:** TOWMCL hereby agrees that the Technology and the know-how comprising the same is secret, confidential and proprietary knowledge of UWPC and hereby undertakes that it shall not disclose to any Third Party or allow access to any Third Party to the Technology, in any manner and that it shall keep the Technology and all information relating thereto as confidential and secret.

3.7 **Further Agreement:** TOWMCL agrees to enter into such additional formal and/or further Agreement with UWPC as and when so required by UWPC in respect of the use of the Technology or any part thereof.

4. **PROCURING OF CDM BENEFITS (CERs)**

4.1.1 TOWMCL hereby approves and authorizes unconditionally UWPC to undertake all steps that have been taken or may be required in order to enable the Project to be classified as a CDM Project and obtain CERs in accordance with the mechanism established pursuant to the Kyoto Protocol, which includes but is not limited to obtaining the approval of the National Clean Development Mechanism Authority established by India for this purpose; Validation by Designated Operational Entity (“DoE”); obtaining the approval of CDM Executive Board, as may be required, pursuant to the Kyoto Protocol.
4.1.2 However, during the Project implementation and operational phase, the responsibility of completing monitoring and verification process (as desired by DoE and/or EB) lies with TOWMCL and TOWMCL is solely responsible for the same.

4.1.3 TOWMCL shall also be responsible to Promote the Project, negotiate, sell, and enter into Emission Reductions Purchase Agreement (ERPA) with buyers for the CERs.

4.2 UWPC hereby agrees to extend full assistance and support to TOWMCL for the activities spelt out in Clause 4.1.2 and 4.1.3.

4.3 TOWMCL shall however reimburse all the expenses actually incurred by UWPC for providing assistance (if any) under Clause 4.2.

5. SHARING OF REVENUE FROM CDM BENEFITS

5.1 TOWMCL hereby agrees and undertakes that all monies accrued to it by way of Sale of Carbon Credits (CERs) shall be subject to sharing between TOWMCL and UWPC.

5.2 In pursuance with Clause 5.1 above, TOWMCL shall share with UWPC Ten Percent (10%) of all the monies accruing by the way of sale of CERs. Such amount shall be transferred to UWPC immediately upon receipt of funds by TOWMCL.

5.3 TOWMCL hereby agrees that it shall provide UWPC with appropriate information of the CDM Benefits received, the UWPC share of the CDM Benefits together with all supporting documentation required for verification of the amount determined as UWPC’s share of the CDM Benefits pursuant to Clause 5.2.

5.4 The sharing as indicated in Clause 5.2 is irrespective of any other CDM sharing arrangements as may be mutually agreed between TOWMCL and any other Party including MCD, NDMC, or any other Agency involved with the Project.
6. APPOINTMENT OF ENTITY TO VERIFY IMPACT & OPERATIONS OF THE PROJECT

6.1 TOWMCL hereby agrees that TOWMCL shall appoint appropriate Agency for the purpose of:
(a) monitoring the environmental impact of the activities carried out in and by the Project and
(b) monitoring the operation and maintenance of the Project
(c) monitoring & verification for generation of CERs from the Project.

6.2 If UWPC and TOWMCL may so desire, TOWMCL may appoint and UWPC may agree to get appointed for the activities mentioned under Clause 6.1

6.3 If UWPC is appointed as per provisions under Clause 6.1 and 6.2 above, TOWMCL shall pay UWPC or the relevant agency appointed by UWPC, a mutually agreed monthly fee in consideration of UWPC undertaking the monitoring services specified in this Clause 6.1. It is also understood and agreed that UWPC shall bear any costs as shall accrue as a result of such appointment, which shall be covered by the mutually agreed monthly fees.

6.4 TOWMCL hereby agrees that the monitoring of the impact and operation of the Project pursuant to Clause 6.1 above, is critical for enabling the Project to achieve and thereafter maintain the status of a CDM Project and TOWMCL hereby undertakes that UWPC shall have the right at its sole discretion, without being under any obligation to do so, to inspect and/or to collect information, from the records of TOWMCL for monitoring performance and improvements in the Plant irrespective of UWPC’s appointment or non-appointment as the monitoring Agency.

TOWMCL hereby undertakes that it shall not hinder or in any way prevent UWPC and/or the relevant person from exercising its rights under this Clause 6.4.

6.5 TOWMCL hereby agrees that the monthly fees that are to be paid by TOWMCL under Clause 6.3 above to UWPC shall be duly paid in advance by 5th day of the month.
7. UTILIZATION OF MONIES BY UWPC

UWPC undertakes that all monies so received by UWPC as per Clause 5.2 above shall be utilized by it for one or more of the following purposes:

(a) To facilitate approvals of CERs under Kyoto Protocol for other Municipal Waste Utilization Projects in India or abroad and its verification as per the requirements of Kyoto Protocol.
(b) To take up project development of Municipal Waste Utilization Projects in India and/or abroad under Public Private Partnership
(c) To take up project development of renewable energy projects in India and/or abroad under Public-Private Partnership
(d) To support segregated door-to-door collection and/or transportation of garbage in India to implement MSW Rules, 2000.

Any other support received by UWPC from any other sources may also form a part of this Fund.

8. ARBITRATION

8.1 If any dispute, difference or question, whatsoever, shall arise between the parties arising out of or in connection with this Agreement ("Dispute"), the Parties hereto shall use their best efforts to settle such Dispute amicably by mutual negotiations. Should agreement not be reached in respect therewith within a period of fourteen days from the notice by a Party of such Dispute, either Party may, by giving to the other a notice in writing of the existence of such question, dispute or difference, refer the matter for Arbitration in accordance with Clause 8.2 below.

8.2 Any Dispute that is not settled under Clause 8.1 above, shall be referred to the arbitration of a sole Arbitrator to be appointed by consent of the Parties and if the Parties are not able to agree to a sole arbitrator within a period of seven (7) days from the date of notice for arbitration given by a party under Clause 8.1 above, then the arbitration shall be conducted by a panel of three arbitrators, one appointed by each party and the third arbitrator being appointed by the two arbitrators appointed by the Parties. The Award of the sole arbitrator or the panel of arbitrators, as the case may be, shall be final and binding...
on the Parties. Such Arbitration shall take place in accordance with and subject to the provisions of the Arbitration and Conciliation Act, 1996 or any statutory modification or reenactment thereof for the time being in force. Costs of the arbitration proceedings and any fees payable to the arbitrator(s) shall be equally borne by the parties hereto unless otherwise directed by the Arbitral Award. The venue of the arbitration shall be New Delhi.

8.3 Notwithstanding the provisions of Clauses 8.1 and 8.2 above, the Parties hereby agree that UWPC shall have the right to seek an injunction or other suitable remedy from a court of law in order to prevent a breach of this Agreement by TOWMCL.

9. JURISDICTION

Subject to Clause 8 above, only the courts in Delhi shall have jurisdiction to try all Disputes and matters arising out of and under this Agreement.

10. NO WAIVER OF RIGHTS AND CLAIMS

Any forbearance, toleration or delay in invoking any of the rights or claims accruing in favour of any Party under the terms of this Agreement shown or made by such a Party in whose favour such rights or claims might have vested by virtue of this Agreement shall neither constitute nor be construed to be a waiver of such rights or claims accruing in respect of such a Party.

11. NOTICES

Unless otherwise stated, notices to be given under this Agreement shall be in writing and shall be given by hand delivery/ recognized international courier, mail, telex or facsimile and delivered or transmitted to the Parties at their respective addresses set forth below:

If to TOWMCL:
TIMARPUR-OKHLA Waste Management Company Private Limited
(Attn: The Director)
Core 4B, 4th Floor, India Habitat Center, Lodhi Road,
New Delhi-110 003
If to UWPC:
UNIQUE WASTE PROCESSING COMPANY
(Attn: The Director)
Core 4B, 4th Floor, India Habitat Center, Lodhi Road,
New Delhi-110 003

Or at such address, telex number, or facsimile number as may be duly notified by the respective Parties from time to time and shall be deemed to have been made or delivered:

A. in the case of any communication made by letter, when delivered by hand, by recognized international courier or by mail (registered, return receipt requested) at that address, and
B. in the case of any communication made by telex or facsimile, when transmitted properly addressed to such telex number or facsimile number.

12. ASSIGNMENT

No assignment of this Agreement or any rights or duties hereunder shall be made in whole or in part by any Party without the written consent of the other Party and in the event of any Assignment the Assignee shall assume the duties and liabilities of the Assignor.

13. NO PARTNERSHIP

Nothing herein contained shall be construed to constitute a partnership between TOWMCL and UWPC, or to constitute either Party as the agent of the other and neither Party shall hold itself out as such.

14. SEVERABILITY

If any provision of this Agreement shall be declared illegal, void or unenforceable, the same shall not affect the other provisions herein which shall be considered severable from such provision and shall remain in full force and effect.
IN WITNESS WHEREOF the Parties hereto have placed their respective hands and seals hereto on the day and year first herein above mentioned.

SIGNED, SEALED AND DELIVERED BY:
FOR TIMARPUR-OKHLA Waste Management Company Private Limited

[Signature]
(Director)
(Duly authorized by the resolution of the Board of Directors passed at its meeting held on October 3, 2013)

FOR UNIQUE WASTE PROCESSING COMPANY

[Signature]
(Director)
(Duly authorized by the resolution of the Board of Directors passed at its meeting held on October 3, 2013)

IN PRESENCE OF:

1. NAME: DEEPAK GOPAL
   ADDRESS: 114F5 1DC Ltd., Conr 4B, 9th Floor, India Habitat Centre, Lodhi Road, N. Delhi 110003

   [Signature] Deepak

2. NAME: Mr. KAMNA DWARKA
   ADDRESS: 114F3, Conr 4B, 4th Floor, India Habitat Centre, Lodhi Road, New Delhi

   [Signature] Kamna
ENCLOSURE 4. LAYOUT PLAN
ENCLOSURE 5.    Copy of Earlier EC
No.23-1/2006-IA-III
Government of India
Ministry of Environment and forest
(IA-III Division)

Paryavaran Bhavan,
CGO Complex, Lodhi Road,
New Delhi – 110003.

Dated the 9th May, 2007

AMENDMENT


This has reference to our earlier letter of even number dated 21.3.2007 regarding the subject mentioned above.

In para 2 “to produce 15 MW power” shall be substituted with “to produce 16 MW power”.

All other conditions shall remain unchanged.

(Dr. A. Senthil Vel)
Additional Director

To
Shri D. K. Mittal,
Managing Director, IL&FS,
Infrastructure Development Corporation Limited,
Core 4B, 4th Floor, India Habitat Centre,
Lodhi Road, New Delhi-110003

Copy for information to:-

2. The Chairman, Central Pollution Control Board, Parivesh Bhavan, CBD-cum-Office Complex, East Arjun Nagar, Delhi – 110032.
3. Member Secretary, Delhi Pollution Control Committee, 4th Floor, I.S.B.T. Building, Kashmere Gate, Delhi-110006
4. DIG (SU), Regional Office Cell, Ministry of Environment & Forests, New Delhi.
5. Guard File.
6. Monitoring Cell
7. Director (El), Ministry of Environment & Forests, New Delhi.

(Dr. A. Senthil Vel)
Additional Director
No.23-1/2006-IA.III
Government of India
Ministry of Environment and Forests
(IA-III Division)

Paryavaran Bhavan,
CGO Complex, Lodhi Road,
New Delhi – 110003.

Dated the 21st March, 2007


****


The project pertains to setting up of an integrated municipal waste processing complex at Okhla. The project at Okhla site will be designed to process 1300 TPD (650 X 2) of mixed garbage and 100 TPD of green waste, and the plant at Timarpur will be designed to process 650 TPD (650 X 1) of garbage. The plant will have two identical process streams, each handling, 650 MT of MSW/day to produce 225 MT of RDF from each of the streams. The fluff produced from both the plants will be used at Okhla project to feed power plant. The power plant would be able to produce 15 MW Power (Gross) at generator terminals. Power plant will have single boiler/single turbine configuration. Power plant will have RDF fluffs as the main fuel. There will be a provision in the plant for firing Methane gas produced from bio-methanation plant. Methane gas generated from green waste (100 TPD) in the biomethanation plant will be about 6000 cum/day with the gross calorific value of 4500 kcal/N.cum. RDF fluff requirement to produce 15 MW power would be about 25 to 30 TPH (600 to 720 TPD). RDF Fluff production at Okhla is estimated to be around 450 TPD and at Timarpur around 225 TPD. MSW to RDF plant will accordingly have a capacity of processing 1300 TPD of MSW at Okhla and 650 TPD of MSW at Timarpur. The size of the RDF fluff should be minus 100 mm, edge to edge and its density should be around 80-100 kg/m³. RDF plant will have dust collection and disposal facility and will have provision for suitable ventilation system to reduce smell inside the plant. There will be a 4.0 TPH capacity pelletising facility to produce RDF pellets from RDF, biomass and horticultural waste. The pellets will be 20 mm to 25 mm dia and 20 mm to 40 mm long with a bulk density of 650 kg/cum. Ash coming out of HAG and power pant boiler (both bottom ash and fly ash) will be disposed to landfill site located at Jaitpur/Bhatti mines (20 km distance from project site). Depending on many factors, the CV of the fuel should be about 2600kca/kg ± 100 kcal/kg. During screening of MSW through (-) 15mm size the smaller fraction will be separated out and sold as soil enricher, especially to nearby coal based power plant as an organic cover for fly ash damper.

NDMC and MCD will supply MSW as per agreement to TOWMCL sites in tipper trucks in two or three shifts as per regulations. After weighment and inspection, trucks will be brought to MSW storage area and the material shall be unloaded into the pits. After unloading the pits immediately the MSW shall be sprayed with herbal pesticide to restrict its decomposition. EOT cranes will pick up this material from the pits through Grab buckets and deposit it on to a main conveyor through vibrator regulatory feeders. The main conveyor shall discharge the MSW to a manual inspection conveyor at elevated level of about 7 elevation. The plant water is required for the complex for bio-methanation plant, RDF plant, power plant and for general purposes for drinking, buildings, wash water etc. For the bio-methanation plant, the requirement is 150 cu m/day of sewage water. The treated sewage effluent from the plant is also 150 cum/day. The RDF plants require a maximum of about 100 cm/day for washing and other industrial purposes. The treated sewage could be used for this purpose. The power plant requires water for cooling tower make up and for boiler cycle make up. The power plant cooling capacity is 5400 cum/hr. The cooling tower make up water required is 135 cu m/hr, which works to 3240 cu m/day. The boiler make up water is expected to be 3 cu /hr totalling to 72 cu m/day.
The proposal has been examined and environmental clearance to this project is hereby accorded under Environment Impact Assessment Notification, 2006 subject to effective implementation of the following environmental safeguards and conditions:

A. SPECIFIC CONDITIONS:

(i) To minimize odour and aesthetics, it should be ensured that the waste will be directly unloaded into specifically designed pits. The air contained in the complex should be suitably treated with wet scrubbing method before letting out in the atmosphere.

(ii) For reducing moisture in the municipal solid waste provision for drying suing hot air generator should be provided.

(iii) Ballistic separator in place of conventional air density separator should be provided.

(iv) For odour management during transportation, provisions of MSW Rules, 2000 should be adhered to. Herbal insecticide should be spread on the MSW to control odour during transportation. During processing of the MSW slight negative pressure should be applied so that no bad odour eminent out of the processing plant.

(v) The effluent generated from the plant should be treated at the facilities provided by Delhi Jal Board and discharged as per the norms laid down by for further treatment.

(vi) To prevent spillage during transportation it should be ensured that the trucks are covered.

(vii) Final disposal of the inert waste should be transported to the landfill site of the MCD.

(viii) No groundwater should be tapped for the project within the project premises.

(ix) The MSW should not be spread on the vacant land. Necessary lining on the floor should be provided so that the leachates from the solid waste do not percolate to the groundwater during rainy season.

(x) No Objection Certificate from the Delhi Pollution Control Committee should be obtained before initiating the project.

B. GENERAL CONDITIONS:

(i) Construction of the proposed structures should be undertaken meticulously confirming to the existing Central/local rules and regulations. All the construction designs/drawings relating to the proposed construction activities must have approvals of the concerned State Government Department/Agencies.

(ii) To meet any emergency situation, appropriate fire-fighting system should be installed. Appropriate arrangements for uninterrupted power supply to the environment protection equipment and continuous water supply for the fire fighting system should be made.

(iii) A separate Environment Management Cell with suitably qualified staff to carry out various environment related functions should be set up under the charge of a Senior Executive who will report directly to the Chief Executive of the Company.

(iv) The funds earmarked for environment protection measures should be maintained in a separate account and there should be no diversion of these funds for any other purpose. A year-wise expenditure on environmental safeguards should be reported to this Ministry’s Regional Office at Chandigarh.

(v) Full support should be extended to the officers of this Ministry’s Regional Office at Chandigarh and the officers of the Central and Pollution Control Committee by the project proponents during their
inspection for monitoring purposes, by furnishing full details and action plans including the action taken reports in respect of mitigative measures and other environmental protection activities.

(vi) In case of deviation or alteration in the project including the implementing agency, a fresh reference should be made to this Ministry for modification in the clearance conditions or imposition of new one for ensuring environmental protection. The project proponents should be responsible for implementing the suggested safeguard measures.

(vii) This Ministry reserves the right to revoke this clearance, if any of the conditions stipulated are not complied with to the satisfaction of this Ministry.

(viii) This Ministry or any other competent authority may stipulate any other additional conditions subsequently, if deemed necessary, for environmental protection, which shall be complied with.

(ix) A copy of the clearance letter shall be marked to the concerned Panchayat/local NGO, if any, from whom any suggestion/representation has been received while processing the proposal.

(x) Pollution Control Committee/Committee should display a copy of the clearance letter at the District Industries Center and Collector's Office/Tehsildar's Office for 30 days.

(xi) The project proponent should advertise at least in two local newspapers widely circulated in the region around the project, one of which shall be in the vernacular language of the locality concerned informing that the project has been accorded environmental clearance and copies of clearance letters are available with the Delhi Pollution Control Committee and may also be seen at website of the Ministry of Environment & Forests at http://www.envfor.nic.in/.

(xii) The project proponents should inform Regional Office Chandigarh as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date of start of work.

(xiii) The project proponent will obtain the Forest clearance for the land passing through the Reserved Forest area before commencement of the project activities in forest area.

(xiv) Budgetary break up for Environmental Management Plan for the project to be mentioned.

The above mentioned stipulations will be enforced among others under the Water (Prevention and Control of Pollution) Act, 1974, the Air (Prevention and Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, the Hazardous Chemicals (Manufacture, Storage and Import) Rules, 1989, and its subsequent amendments and the Public Liability Insurance Act, 1991 and the Rules made thereunder from time to time.

[Signature]
(Dr. A. Senthil Vel)
Additional Director

To
Shri D. K. Mittal,
Managing Director, IL&FS,
Infrastructure Development Corporation Limited,
Core 4B, 4th Floor, India Habitat Centre,
Lodhi Road, New Delhi-110003
Copy for information to:

2. The Chairman, Central Pollution Control Board, Parivesh Bhavan, CBD-cum-Office Complex, East Arjun Nagar, Delhi – 110032.
3. Member Secretary, Delhi Pollution Control Committee, 4th Floor, I.S.B.T. Building, Kashmere Gate, Delhi-110006
4. DIG (SU), Regional Office Cell, Ministry of Environment & Forests, New Delhi.
5. Guard File.
6. Monitoring Cell
7. Director (EI), Ministry of Environment & Forests, New Delhi.

(Dr. A. Senthil Vel)
Additional Director
ENCLOSURE 6. TEST REPORTS
TEST CERTIFICATE

Issued To:
Client Code: (NDLS0110054)
TIMARPUR OKHLA WASTE MANAGEMENT COMPANY PVT. LTD.
OLD NDMC COMPOST PLANT, ADJACENT OKHLA SEWAGE TREATMENT PLANT, MATHURA ROAD, OKHLA, GATE NO.1,
NEW DELHI
DELHI-110025
Kind Attn: MR. VIRAT CHOUDHARY

Date: 09-03-2018
Job No.: 14011718/1/12
Booking No.: PJ1718/1/12
Booking Date: 06-04-2017
Customer Ref. No.: W. O. NO. 43000013255
Customer Ref. Dt.: 05-08-2017

Sample Particulars:
Ambient Noise monitoring conducted by our representatives as per details given below was received.

1. Name & address of the Plant: M/s. Timarpur Okhla Waste Management Co. Pvt. Ltd.
   Old NDMC Compost Plant,
   Adjacent to Okhla Sewage Treatment Plant
   Mathura Road, New Delhi-110025

   a) Plant Representative: Mr. Sandip Dutt, Plant Head

2. Monitoring Location: Near main gate

3. Date of Monitoring: 22.02.2018 to 23.02.2018

Result Table

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Time (Hrs.)</th>
<th>Noise Level dB (A)</th>
<th>Requirements (As per MoEF)</th>
<th>Protocol/Method Followed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Cum. Leq.</td>
<td>Industrial area</td>
<td>SOP No. SRI/EPD/AIR</td>
</tr>
<tr>
<td>1.</td>
<td>12:00 to 13:00</td>
<td>65.6</td>
<td>75 dB(A) during Day time</td>
<td>LAB/NV/02 dt.13.04.16,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>70 dB(A) during Night time</td>
<td>IS: 9989-1981</td>
</tr>
<tr>
<td>2.</td>
<td>13:00 to 14:00</td>
<td>64.9</td>
<td>Commercial area</td>
<td>(Reaffirmed - 2001)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>65 dB(A) during Day time</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>14:00 to 15:00</td>
<td>63.4</td>
<td>55 dB(A) during Night time</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>15:00 to 16:00</td>
<td>64.8</td>
<td>Residential area</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>16:00 to 17:00</td>
<td>61.3</td>
<td>55 dB(A) during Day time</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>17:00 to 18:00</td>
<td>68.3</td>
<td>45 dB(A) during Night time</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>18:00 to 19:00</td>
<td>68.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>19:00 to 20:00</td>
<td>64.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>20:00 to 21:00</td>
<td>61.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>21:00 to 22:00</td>
<td>62.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>22:00 to 23:00</td>
<td>60.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>23:00 to 00:00</td>
<td>58.1</td>
<td></td>
<td></td>
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AUTHORIZED SIGNATORY
EMPLOYEE CODE: (695)
# TEST CERTIFICATE

**NO : C1/0000118404**

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<th>S.No.</th>
<th>Time (Hrs.)</th>
<th>Noise Level dB (A)</th>
<th>Requirements (As per MoEF)</th>
<th>Protocol/ Method Followed</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>00:00 to 01:00</td>
<td>59.3</td>
<td><strong>Industrial area</strong></td>
<td>SOP No. SRI/EPD/AIR</td>
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<td>14</td>
<td>01:00 to 02:00</td>
<td>58.2</td>
<td>75 dB(A) during Day time</td>
<td>LAB/NV/02 dt.15.04.16,</td>
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<tr>
<td>15</td>
<td>02:00 to 03:00</td>
<td>56.1</td>
<td>70 dB(A) during Night time</td>
<td>IS: 9989 -1981</td>
</tr>
<tr>
<td>16</td>
<td>03:00 to 04:00</td>
<td>57.3</td>
<td><strong>Commercial area</strong></td>
<td>(Reaffirmed - 2001)</td>
</tr>
<tr>
<td>17</td>
<td>04:00 to 05:00</td>
<td>59.3</td>
<td>65 dB(A) during Day time</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>05:00 to 06:00</td>
<td>58.1</td>
<td>55 dB(A) during Night time</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>06:00 to 07:00</td>
<td>60.3</td>
<td>Residential area</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>07:00 to 08:00</td>
<td>61.1</td>
<td>55 dB(A) during Day time</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>08:00 to 09:00</td>
<td>62.8</td>
<td>45 dB(A) during Night time</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>09:00 to 10:00</td>
<td>63.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>10:00 to 11:00</td>
<td>62.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>11:00 to 12:00</td>
<td>61.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>L_day (6AM-10PM)</td>
<td>63.4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L_night (10PM-6AM)</td>
<td>58.3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:**
(i) Digital Sound Level Meter, Cirrus CR-272 was used for noise level monitoring.
(ii) Noise level meter was calibrated at 94.0 dB (A)
(iii) Ambient Noise standards notified by the MoEF vide gazette notification dated 26th December 1989 based on the A weighted equivalent noise level (L eq).

D.O.R.: 23.02.2018

D.O.C.: 09.03.2018

---

**AUTHORISED SIGNATORY**

**EMPLOYEE CODE:** (6075)
**TEST CERTIFICATE**

**NO : C1/0000119418**

**Issued To:**
Client Code : (NDLS01T0053)
TIMARPUR OKHLA WASTE MANAGEMENT COMPANY PVT. LTD.
OLD NDMC COMPOST PLANT, ADJACENT OKHLA SEWAGE TREATMENT PLANT, MATHURA ROAD, OKHLA, GATE NO.1,
NEW DELHI
DELHI-110025
Kind Attn: MR. VIRAT CHOUDHARY

**Sample Particulars:**
Stuck gas emission sampling was carried out by our representative as per details given below.
('The plant data details provided in test certificate is based on declaration by the sponsor).

**PLANT DATA:**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Name &amp; address of the plant</td>
</tr>
<tr>
<td></td>
<td>M/s. Timarpur Okhla Waste Management Co. (P) Ltd.</td>
</tr>
<tr>
<td></td>
<td>Old NDMC Compost Plant,</td>
</tr>
<tr>
<td></td>
<td>Adjacent Okhla Sewage Treatment Plant</td>
</tr>
<tr>
<td></td>
<td>Mathura Road, New Delhi-110025</td>
</tr>
<tr>
<td>2.</td>
<td>Date of sampling</td>
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<tr>
<td></td>
<td>22.02.2018</td>
</tr>
<tr>
<td>3.</td>
<td>Name of the plant/section</td>
</tr>
<tr>
<td></td>
<td>Power Plant</td>
</tr>
<tr>
<td>4.</td>
<td>Normal operating schedule of the plant</td>
</tr>
<tr>
<td></td>
<td>Power Plant</td>
</tr>
<tr>
<td>5.</td>
<td>Name of the emission source monitored</td>
</tr>
<tr>
<td></td>
<td>24 hra/day</td>
</tr>
<tr>
<td></td>
<td>Boiler No. # 1 &amp; 2 (Make: HBG)</td>
</tr>
<tr>
<td></td>
<td>26 TPH x 2-Steam generation; Rated working pressure: 40 Kg/cm²</td>
</tr>
<tr>
<td></td>
<td>26 Ton/hr; operating pressure: 40 Kg/cm² (Boiler No.-1)</td>
</tr>
<tr>
<td></td>
<td>26 Ton/hr; operating pressure: 40 Kg/cm² (Boiler No.-2)</td>
</tr>
<tr>
<td></td>
<td>MSW, 25 Ton/hr. (Boiler No.-1); 25 Ton/hr (Boiler No.-2)</td>
</tr>
<tr>
<td></td>
<td>Stuck attached to Boiler No.1 &amp; 2, identified as Stuck No.1</td>
</tr>
<tr>
<td></td>
<td>RCC (Circular)</td>
</tr>
<tr>
<td></td>
<td>20 Mtr. above from ground level</td>
</tr>
<tr>
<td>6.</td>
<td>Type of fuel used and its consumption</td>
</tr>
<tr>
<td>7.</td>
<td>Stack identification</td>
</tr>
<tr>
<td>8.</td>
<td>Type of chimney</td>
</tr>
<tr>
<td>9.</td>
<td>Location of the sampling point</td>
</tr>
<tr>
<td>10.</td>
<td>Stack height (m)</td>
</tr>
<tr>
<td>a)</td>
<td>From ground level</td>
</tr>
<tr>
<td>b)</td>
<td>From bend/disturbance</td>
</tr>
<tr>
<td>c)</td>
<td>Above roof level</td>
</tr>
<tr>
<td>d)</td>
<td>From source of emission</td>
</tr>
<tr>
<td>11.</td>
<td>Internal diameter of the stack (cm)</td>
</tr>
<tr>
<td></td>
<td>60</td>
</tr>
<tr>
<td>12.</td>
<td>Parameter required</td>
</tr>
<tr>
<td></td>
<td>PM, NOx, SO2, CO, CO2, O2, Cd, Hg, As, Pb, Cr, Co, Cu, Mn, Ni,</td>
</tr>
<tr>
<td></td>
<td>V, HCl, HF &amp; TOC</td>
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</table>

**AUTHORISED SIGNATORY**

**EMPLOYEE CODE:**

GC-01(Rev-05)
# TEST CERTIFICATE 
NO: C1/0000119418

13. **Purpose of monitoring**: To assess the pollution load
14. **Air Pollution control measures**
   a) **Status**: Turbo Reactor with lime & activated carbon, Bag house filter
   b) **Recovery of material**: Nil
15. **Fugitive emissions, if any**: Nil

## OBSERVATIONS

<table>
<thead>
<tr>
<th>No.</th>
<th>Parameter</th>
<th>Unit</th>
<th>Test Result</th>
<th>Emission Limits</th>
<th>Protocol / Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Particulate matter (PM)</td>
<td>mg/Nm³</td>
<td>17</td>
<td>50</td>
<td>IS:11255 (Pt-1) 1985 (Reaffirmed - 2014)</td>
</tr>
<tr>
<td>2</td>
<td>Nitrogen oxides (as NOx)</td>
<td>mg/Nm³</td>
<td>81</td>
<td>400</td>
<td>IS:11255 (Pt-6) 2005 (Reaffirmed - 2012)</td>
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<tr>
<td>3</td>
<td>Sulphur dioxide (SO₂)</td>
<td>mg/Nm³</td>
<td>47</td>
<td>200</td>
<td>IS:11465 (Pt-2) 1985 (Reaffirmed - 2009)</td>
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<tr>
<td>4</td>
<td>Carbon monoxide (CO)</td>
<td>mg/Nm³</td>
<td>26</td>
<td>100</td>
<td>US EPA Method No.10</td>
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<tr>
<td>5</td>
<td>Oxygen (O₂), % V/V</td>
<td></td>
<td>1.6</td>
<td>50</td>
<td>US EPA Method No.26</td>
</tr>
<tr>
<td>6</td>
<td>Hydrogen chloride (HCl)</td>
<td>mg/Nm³</td>
<td>Not Detected</td>
<td></td>
<td>US EPA Method No.26</td>
</tr>
<tr>
<td>7</td>
<td>Total Organic Compounds (as C)</td>
<td>mg/Nm³</td>
<td>2.6</td>
<td>0.050</td>
<td>By FID based analyser</td>
</tr>
<tr>
<td>8</td>
<td>Cadmium (Cd)</td>
<td>mg/Nm³</td>
<td>BDL</td>
<td></td>
<td>US EPA Method No.29</td>
</tr>
<tr>
<td>9</td>
<td>Thorium (Th)</td>
<td>mg/Nm³</td>
<td>0.001</td>
<td></td>
<td>US EPA Method No.29</td>
</tr>
<tr>
<td>10</td>
<td>Tolu Mercury (Hg)</td>
<td>mg/Nm³</td>
<td>0.002</td>
<td></td>
<td>(Hg + its compounds)</td>
</tr>
<tr>
<td>11</td>
<td>Antimony (Sb)</td>
<td>mg/Nm³</td>
<td>0.023</td>
<td></td>
<td>0.50</td>
</tr>
<tr>
<td>12</td>
<td>Arsenic (As)</td>
<td>mg/Nm³</td>
<td>BDL</td>
<td></td>
<td>(Sb+As+Pb+Cr+Cu+Mn+Ni+V+V+ their compounds)</td>
</tr>
<tr>
<td>13</td>
<td>Lead (Pb)</td>
<td>mg/Nm³</td>
<td>0.002</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Chromium (Cr)</td>
<td>mg/Nm³</td>
<td>0.003</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Cobalt (Co)</td>
<td>mg/Nm³</td>
<td>BDL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Copper (Cu)</td>
<td>mg/Nm³</td>
<td>0.001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Manganese (Mn)</td>
<td>mg/Nm³</td>
<td>0.003</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Nickel (Ni)</td>
<td>mg/Nm³</td>
<td>0.001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Vanadium (V)</td>
<td>mg/Nm³</td>
<td>Not Detected</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#BDL - Below Detection Limit: Detection Limit of HI²CH² = 0.1 mg/Nm³, Cd, Co & V = 0.001 mg/Nm³, As = 0.0002 mg/Nm³

Note:
1. All test values corrected to 11 % oxygen on a dry basis.
2. Emission limits mentioned above as per MoEF Notification dated 8th April 2016 for emission.
3. The Parameter marked with an * is not covered in NABL scope.

D.O.R.: 22.02.2018
D.O.C.: 14.03.2018

AUTHORISED SIGNATORY
EMPLOYEE CODE: (695)

---

1. **Purpose of monitoring**: To assess the pollution load
2. **Air Pollution control measures**
   a) **Status**: Turbo Reactor with lime & activated carbon, Bag house filter
   b) **Recovery of material**: Nil
3. **Fugitive emissions, if any**: Nil

## OBSERVATIONS

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<td></td>
<td></td>
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<td></td>
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<td></td>
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<td></td>
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BDL - Below Detection Limit: Detection Limit of HI²CH² = 0.1 mg/Nm³, Cd, Co & V = 0.001 mg/Nm³, As = 0.0002 mg/Nm³

Note:
1. All test values corrected to 11 % oxygen on a dry basis.
2. Emission limits mentioned above as per MoEF Notification dated 8th April 2016 for emission.
3. The Parameter marked with an * is not covered in NABL scope.

D.O.R.: 22.02.2018
D.O.C.: 14.03.2018

AUTHORISED SIGNATORY
EMPLOYEE CODE: (695)
TEST CERTIFICATE

NO : C1/0000127760

Issued To :
Client Code : (NDLS01T0053)
TIMARPUR OKHLA WASTE MANAGEMENT
COMPANY PVT. LTD.
OLD NDMC COMPOST PLANT, ADJACENT OKHLA
SEWAGE TREATMENT PLANT, MATHURA
ROAD, OKHLA, GATE NO. 1,
NEW DELHI
DELHI-110025

Kind Attn: -

Sample Particulars:
Stack gas emission sampling was carried out by our representative as per details given below.
(The plant data details provided in test certificate is based on declaration by the sponsor)

PLANT DATA:

1. Name & address of the plant

   M/s. Timarpur Okhla Waste Management Co, (P) Ltd.
   Old NDMC Compost Plant,
   Adjacent Okhla Sewage Treatment Plant
   Mathura Road, New Delhi-110025

2. Date of sampling

   08.05.2018

3. Name of the plant/section

   Power Plant

4. Normal operating schedule of the plant

   24 hrs/day

5. Name of the emission source monitored

   a) Rated capacity
   b) Capacity on the sampling time, Avg.
   c) Type of fuel used and its consumption
   d) Stack identification
   e) Stack height (m)
      a) From ground level
      b) From bend/disturbance
      c) Above roof level
      d) From source of emission

   Boiler No. # 1 & 2
   (Make: HBG)
   26 TPH x 2- Steam generation; Rated working pressure: 40 Kg/cm²
   26 Ton/hr; operating pressure: 40 Kg/cm² (Boiler No.-1)
   26 Ton/hr; operating pressure: 40 Kg/cm² (Boiler No.-2)
   MSW, 24 Ton/hr. (Boiler No.-1); 23 Ton/hr (Boiler No.-2)
   Stack attached to Boiler No.1 & 2, Identified as Stack No.1
   RCC (Circular)
   20 Mtr. above from ground level

   Date : 29-05-2018
   Job No : 14011819/1/1
   Booking No : PJ1819/1/1
   Booking Date : 02-04-2018
   Customer Ref No : WO NO 4500015809
   Customer Ref Dt : 20-03-2018

Authorised Signatory
Employee Code : (6095)
**TEST CERTIFICATE**

NO: C1/0000127760

10. Internal diameter of the stack (cm) : 202
11. Sampling duration : 420 min.
12. Parameter required : Dioxin & Furans
13. Purpose of monitoring : To assess the pollution load
14. Air Pollution control measures a) Status : Working
b) Recovery of material : Nil
15. Fugitive emissions, if any : Nil

**OBSERVATIONS**

1. Ambient air temperature (°C) : 31
2. Stack gas temperature (°C), average : 193
3. Stack gas velocity (m/s), average : 31.8
4. Volumetric flow rate (Nm³/hr.) : 166316

**Results Table**

(Protocol Followed: USEPA Method No.-23)

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Compound Name</th>
<th>Concentration (pg)</th>
<th>I-TEF</th>
<th>ngTEQ/Nm³</th>
<th>Emission Standard (as per MoEF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2,3,7,8-TetraCDD</td>
<td>0.00</td>
<td>1.0</td>
<td>0.000000</td>
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<tr>
<td>2</td>
<td>1,2,3,7,8-PentaCDD</td>
<td>13.8</td>
<td>0.5</td>
<td>0.000016</td>
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<tr>
<td>3</td>
<td>1,2,3,4,7,8-HexaCDD</td>
<td>11.8</td>
<td>0.1</td>
<td>0.000016</td>
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<tr>
<td>4</td>
<td>1,2,3,6,7,8-HexaCDD</td>
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<td>7</td>
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<td>5.03</td>
<td>0.1</td>
<td>0.000045</td>
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<td>9</td>
<td>1,2,3,7,8-PentaCDD</td>
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<td>24.1</td>
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<tr>
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<td>155</td>
<td>0.01</td>
<td>0.000138</td>
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<tr>
<td>16</td>
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<td>5.5</td>
<td>0.01</td>
<td>0.000005</td>
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</tr>
<tr>
<td>17</td>
<td>Octa CDF</td>
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<td>0.001</td>
<td>0.000012</td>
<td></td>
</tr>
</tbody>
</table>

Total Polychlorinated Dibenzo-dioxins and Furans (PCDDs & PCDFs)
Total Polychlorinated Dibenzo-dioxins and Furans (PCDDs & PCDFs) at 1% O₂

Remark: I-TEF: International Toxic Equivalency Factor, ng: nanogram; TEQ: Toxic Equivalent Quotient
Note: Oxygen was observed to be 7.4 % during the monitoring.

D.O.R.: 08.05.2018
D.O.C.: 28.05.2018

**AUTHORISED SIGNATORY**

**EMPLOYEE CODE:** 6095

---

This document was reviewed by [Reviewer Name] on [Review Date].
TEST CERTIFICATE

NO : C1/0000119419

Issued To:
Client Code : (NDLS01T0053)
TIMARPUR OKHLA WASTE MANAGEMENT COMPANY PVT. LTD.
OLD NDMC COMPOST PLANT, ADJACENT OKHLA SEWAGE TREATMENT PLANT, MATHURA ROAD, OKHLA, GATE NO.1,
NEW DELHI
DELHI-110025
Kind Attn: MR. VIRAT CHoudhary

Sample Particulars:
Stack gas emission sampling was carried out by our representative as per details given below.
(The plant data details provided in test certificate is based on declaration by the sponsor).

PLANT DATA:
1. Name & address of the plant:
   M/s. Timarpur Okhla Waste Management Co. (P) Ltd.
   Old NDMC Compost Plant,
   Adjacent Okhla Sewage Treatment Plant
   Mathura Road, New Delhi-110025

2. Date of sampling:
   19-03-2018

3. Name of the plant/section:
   Power Plant

4. Normal operating schedule of the plant (hrs/day):
   24

5. Name of the emission source monitored:
   Boiler No. #3
   (Make: HBG)

6. Rated capacity:
   26 TPH Steam generation; Rated working pressure: 40.0 Kg/cm²

7. Capacity on the sampling time, Avg.
   26 Ton/hr; operating pressure: 40 Kg/cm²

8. Type of fuel used and its consumption:
   MSW, 25 Ton/hr.

9. Stack Identification:
   Stack attached to Boiler No. #3, identified as Stack No.2

10. Type of chimney:
    RCC (Circular)

11. Location of the sampling point:
    20 Mtr. above from ground level

12. Stack height (m):
    a) 60
    b) 50
    c) --
    d) 50

13. Internal diameter of the stack (cm):
    202

14. Sampling duration:
    120 min

15. Parameter required:
    PM, NOx, SO2, CO, CO2, O2, Cd, Th, Hg, Sb, As, Pb, Cr, Co, Cu, Mn, Ni,
    V, HCl, HF & TOC

AUTHORISED SIGNATORY
EMPLOYEE CODE: 6095

Phone: 91-11-27667267, 27667983, 27667860
Fax: 91-11-27667676, 77667207
TEST CERTIFICATE
NO: C1/0000119419

Purpose of monitoring
To assess the pollution load

Air Pollution control measures
Turbo Runitor with lime & activated carbon, Bag house filter

a) Status
Working

b) Recovery of material
Nil

Fugitive emissions, if any
Nil

1. Ambient air temperature (°C)
25

2. Stack gas temperature (°C), average
170

3. Stack gas velocity (m/s), average
21.3

4. Volumetric flow rate (Nm³/hr.)
115465

5. Carbon dioxide (as CO₂), % V/V
11.4

6. Oxygen (O₂), % V/V
8.4

OBSERVATIONS

Results Table

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<td>mg/Nm³</td>
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<td>400</td>
<td>IS:11755 (Pr-7) 2005 (Reaffirmed - 2012)</td>
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<td>3.</td>
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<td>IS:11255 (Pr-2) 1985 (Reaffirmed - 2009)</td>
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<td>4.</td>
<td>Carbon monoxide (CO)</td>
<td>mg/Nm³</td>
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<td>100</td>
<td>US EPA Method No.10</td>
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<td>5.</td>
<td>Hydrogen chloride (HCl)</td>
<td>mg/Nm³</td>
<td>0.7</td>
<td>50</td>
<td>US EPA Method No.26</td>
</tr>
<tr>
<td>6.</td>
<td>Hydrogen Fluoride (HF)</td>
<td>mg/Nm³</td>
<td>Not Detected</td>
<td></td>
<td>US EPA Method No.26</td>
</tr>
<tr>
<td>7.</td>
<td>*Total Organic Compounds (as C)</td>
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<td>8.</td>
<td>Cadmium (Cd)</td>
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<td>BDL</td>
<td>0.050</td>
<td>US EPA Method No.29</td>
</tr>
<tr>
<td>9.</td>
<td>*Thorium (Th)</td>
<td>mg/Nm³</td>
<td>0.012</td>
<td>(Cd + Th + their compounds)</td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Total Mercury (Hg)</td>
<td>mg/Nm³</td>
<td>0.0004</td>
<td>0.050</td>
<td>(Hg + its compounds)</td>
</tr>
<tr>
<td>11.</td>
<td>Antimony (Sb)</td>
<td>mg/Nm³</td>
<td>0.028</td>
<td>0.50</td>
<td>(Sb+As+Pb+Cu+Co+Cu+Mn+Ni+V+their compounds)</td>
</tr>
<tr>
<td>12.</td>
<td>Arsenic (As)</td>
<td>mg/Nm³</td>
<td>BDL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td>Lead (Pb)</td>
<td>mg/Nm³</td>
<td>0.003</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14.</td>
<td>Chromium (Cr)</td>
<td>mg/Nm³</td>
<td>0.004</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15.</td>
<td>Cobalt (Co)</td>
<td>mg/Nm³</td>
<td>Not Detected</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16.</td>
<td>Copper (Cu)</td>
<td>mg/Nm³</td>
<td>0.003</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17.</td>
<td>Manganese (Mn)</td>
<td>mg/Nm³</td>
<td>0.003</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18.</td>
<td>Nickel (Ni)</td>
<td>mg/Nm³</td>
<td>0.003</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19.</td>
<td>*Vanadium (V)</td>
<td>mg/Nm³</td>
<td>Not Detected</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#BDL - Below Detection Limit; Detection Limit of HF = 0.1 mg/Nm³, Cd, Co & V = 0.001 mg/Nm³ & As = 0.0002 mg/Nm³

Note: 1. All test values corrected to 11% oxygen on a dry basis.
2. Emission limits mentioned above as per MoEF Notification dated 8th April 2016 for emission.
3. The Parameter marked with an * is not covered in NABL scope.

D.O.R.: 22.02.2018
D.O.C.: 14.03.2018

AUTHORISED SIGNATORY

EMPLOYEE CODE: (695)
TEST CERTIFICATE

NO : C1/0000127762

Issued To :
Client Code : (NDLS01T0053)
TIMARPUR OKHLA WASTE MANAGEMENT
COMPANY PVT. LTD.
OLD NDMC COMPOST PLANT, ADJACENT OKHLA
SEWAGE TREATMENT PLANT, MATHURA
ROAD, OKHLA, GATE NO.1,
NEW DELHI
DELHI-110025
Kind Attn: -

Date : 13-06-2018
Job No : 14011819\1/1
Booking No : PJ1819\1/1
Booking Date : 02-04-2018
Customer Ref No. : WO NO 4500015809
Customer Ref Dt. : 20-03-2018

Sample Particulars:
Stack gas emission sampling was carried out by our representative as per details given below.
(The plant data details provided in test certificate is based on declaration by the sponsor).
{Revised Report to Report No.: C1/0000127762 Dated: 29.05.2018}

PLANT DATA:

1. Name & address of the plant : M/s. Timarpur Okhla Waste Management Co. (P) Ltd.
   Old NDMC Compost Plant,
   Adjacent Okhla Sewage Treatment Plant
   Mathura Road, New Delhi-110025
   a) Plant Representative : Mr. Sandip Dutt, Plant Head
   b) Product Manufactured : Power Generation by processing MSW
   c) Production Capacity : 16 MW

2. Date of sampling : 08-09.05.2018

3. Name of the plant/section : Power Plant

4. Normal operating schedule of the plant (hrs/day) : 24

5. Name of the emission source monitored : Boiler No. #3
   (Make: HBG)
   a) Rated capacity : 26 TPH Steam generation; Rated working pressure: 40.0 Kg/cm²
   b) Capacity on the sampling time, Avg. : 26 Ton/hr; operating pressure: 40 Kg/cm²
   c) Type of fuel used and its consumption : MSW, 22 Ton/hr.

6. Stack identification : Stack attached to Boiler No. #3, identified as Stack No.2

7. Type of chimney : RCC (Circular)

8. Location of the sampling point : 20 Mtr. above from ground level

9. Stack height (m) :
   a) From ground level : 60
   b) From hind/disturbance : 50
   c) Above roof level : --
   d) From source of emission : 50

[Signature]

AUTHORISED SIGNATORY
EMPLOYEE CODE: 6945
TEST CERTIFICATE  

NO : C1/0000127762

10. Internal diameter of the stack (cm) : 202
11. Sampling duration : 480 min.
12. Parameter required : Dioxin & Furans
13. Purpose of monitoring : To assess the pollution load
14. Air Pollution control measures
   a) Status : Working
   b) Recovery of material : Nil
15. Fugitive emissions, if any : Nil

OBSERVATIONS

1. Ambient air temperature (°C) : 28
2. Stack gas temperature (°C), average : 176
3. Stack gas velocity (m/s), average : 22.6
4. Volumetric flow rate (Nm³/hr.) : 127000

Results Table

(Protocol Followed: USEPA Method No.-23)

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Compound Name</th>
<th>Concentration (pg)</th>
<th>I-TEF</th>
<th>ngTEQ/Nm³</th>
<th>Emission Standard (as per MoEF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2,3,7,8-TetraCDD</td>
<td>0.0</td>
<td>1.0</td>
<td>0.000000</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>1,2,3,7,8-PentaCDD</td>
<td>8.7</td>
<td>0.5</td>
<td>0.00439</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>1,2,3,4,7,8-HexaCDD</td>
<td>9.7</td>
<td>0.1</td>
<td>0.000098</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>1,2,3,6,7,8-HexaCDD</td>
<td>30.8</td>
<td>0.1</td>
<td>0.00311</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>1,2,3,4,7,8,9-HexaCDD</td>
<td>11.8</td>
<td>0.1</td>
<td>0.000119</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>1,2,3,4,6,7,8-HeptaCDD</td>
<td>319</td>
<td>0.01</td>
<td>0.000322</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Octa CDD</td>
<td>468</td>
<td>0.001</td>
<td>0.000047</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>2,3,7,8-TetraCDF</td>
<td>6.7</td>
<td>0.1</td>
<td>0.000068</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>1,2,3,7,8-PentaCDF</td>
<td>8.6</td>
<td>0.05</td>
<td>0.000043</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>2,3,4,7,8-PentaCDF</td>
<td>23.8</td>
<td>0.5</td>
<td>0.001201</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>1,2,3,4,7,8-HeptaCDF</td>
<td>38.5</td>
<td>0.1</td>
<td>0.000187</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>1,2,3,6,7,8-HexaCDF</td>
<td>6.0</td>
<td>0.1</td>
<td>0.000262</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>2,3,4,6,7,8,HexaCDF</td>
<td>16.1</td>
<td>0.1</td>
<td>0.000162</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>1,2,3,7,8,9-HeptaCDF</td>
<td>145</td>
<td>0.01</td>
<td>0.000146</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>1,2,3,4,6,7,8-HeptaCDF</td>
<td>140</td>
<td>0.001</td>
<td>0.000014</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>1,2,3,4,7,8,9-HeptaCDF</td>
<td>6.0</td>
<td>0.01</td>
<td>0.000007</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Octa CDF</td>
<td>140</td>
<td>0.001</td>
<td>0.000014</td>
<td></td>
</tr>
</tbody>
</table>

Total Polychlorinated Dibenzodioxins and Furans (PCDDs & PCDFs) at 11 % O₂: 0.0038
Total Polychlorinated Dibenzodioxins and Furans (PCDDs & PCDFs): 0.1 ng TEQ/Nm³

Remark: I-TEF: International Toxic Equivalency Factor; ng: nanogram; TEQ: Toxic Equivalent Quotient
Note: Oxygen was observed to be 8.2% during the monitoring.

D.O.R.: 09.05.2018
D.O.C.: 28.05.2018

AUTHORISED SIGNATORY
EMPLOYEE CODE: (CA75)
TEST CERTIFICATE

NO : CI/0000124338

Date : 25-04-2018
Job No : 14011819/1/1
Booking No : PI1819/1/1
Booking Date : 02-04-2018
Customer Ref No. : WO NO 4500015809
Customer Ref Dr. : 20-03-2018

Issued To :
Code : (NDLS01T0053)
Timarpur Okhla Waste Management
Company Pvt. Ltd.
Old NDMC Compost Plant, Adjacent Okhla
Sewage Treatment Plant, Mathura Road, Okhla, Gate No.1,
New Delhi
Delhi-110025
Kind Attn: -

Sample Particulars:
Ambient air sampling was carried out by our representative as per details given below.

1. Name & address of the premises : M/s. Timarpur Okhla Waste Management Co. Pvt. Ltd,
Old NDMC Compost Plant,
Adjacent Okhla Sewage Treatment Plant
Mathura Road, New Delhi-110025

   a) Plant Representative : Mr. Sandip Dutt, Plant Head
   b) Product Manufactured : Power Generation by processing MSW
   c) Production Capacity : 16 MW

2. Sampling Location : Centre of park, near canteen

3. Date of Monitoring : 17.04.2018 to 18.04.2018

4. Sampling started at (Hrs.) : 12:15 on 17.04.2018

5. Sampling completed at (Hrs.) : 12:20 on 18.04.2018

6. Actual duration of sampling (minutes) : 1441

[Signature]

AUTHORISED SIGNATORY
EMPLOYEE CODE:( 6095 )
## TEST CERTIFICATE

**NO**: C1/0000124338

### Results Table

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Parameter</th>
<th>Unit</th>
<th>Test Value</th>
<th>MoEP's NAAQ Standards</th>
<th>Protocol / Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Sulphur dioxide (as SO₂)</td>
<td>μg/m³</td>
<td>6</td>
<td>Max. 80 μg/m³ (24-hr.)</td>
<td>IS: 5182 (Pt-2) 2001</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(Reaffirmed - 2012)</td>
</tr>
<tr>
<td>2.</td>
<td>Nitrogen oxides (as NO₂)</td>
<td>μg/m³</td>
<td>42</td>
<td>Max. 80 μg/m³ (24-hr.)</td>
<td>IS: 5182 (Pt-6) 2006</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(Reaffirmed - 2012)</td>
</tr>
<tr>
<td>3.</td>
<td>Respirable particulate matter (PM₁₀)</td>
<td>μg/m³</td>
<td>123</td>
<td>Max. 100 μg/m³ (24-hr.)</td>
<td>5182 (Pt-23) 2006</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(Reaffirmed - 2009)</td>
</tr>
<tr>
<td>4.</td>
<td>Fine particulate matter (PM₂.₅)</td>
<td>μg/m³</td>
<td>68</td>
<td>Max. 60 μg/m³ (24-hr.)</td>
<td>SOP No.SRI/EPD/Air Lab/01 dt.01.04.2014</td>
</tr>
<tr>
<td>5.</td>
<td>Ozone (O₃), μg/m³ [8 hr-avg.]</td>
<td>μg/m³</td>
<td>151</td>
<td>Max. 100 μg/m³ (8-hr.)</td>
<td>ISC, Method No. 417, ASTM:D5156-2008</td>
</tr>
<tr>
<td>6.</td>
<td>Particulate Lead content (as Pb)</td>
<td>μg/m³</td>
<td>0.1</td>
<td>Max. 1 μg/m³ (24-hr.)</td>
<td>IS: 5182 (Pt-27) 2004 (Reaffirmed - 2009)</td>
</tr>
<tr>
<td>7.</td>
<td>Carbon monoxide (as CO) [8 hr-avg.]</td>
<td>mg/m³</td>
<td>1.6</td>
<td>Max. 2 mg/m³ (8-hr.)</td>
<td>IS: 5182 (Pt-10) 1999 (Reaffirmed - 2009)</td>
</tr>
<tr>
<td>8.</td>
<td>Ammonia (NH₃)</td>
<td>μg/m³</td>
<td>23</td>
<td>Max. 400 μg/m³ (24-hr.)</td>
<td>ISC Method -401</td>
</tr>
<tr>
<td>9.</td>
<td>Benzene (C₆H₆)</td>
<td>μg/m³</td>
<td>3.5</td>
<td>5 μg/m³, (Annual Avg.)</td>
<td>IS: 5182 (Pt-11) 2006 (Reaffirmed - 2009)</td>
</tr>
<tr>
<td>10.</td>
<td>Benzo (a) Pyrene (BaP)</td>
<td>ng/m³</td>
<td>0.3</td>
<td>1 ng/m³, (Annual Avg.)</td>
<td>IS: 5182 (Pt-12), By GC</td>
</tr>
<tr>
<td>11.</td>
<td>Arsenic (As)</td>
<td>ng/m³</td>
<td>0.3</td>
<td>6 ng/m³, (Annual Avg.)</td>
<td>ASTM:D4185-2006 (2011)</td>
</tr>
<tr>
<td>12.</td>
<td>Nickel (Ni)</td>
<td>ng/m³</td>
<td>3.0</td>
<td>20 ng/m³, (Annual Avg.)</td>
<td>ASTM:D4185-2006 (2011)</td>
</tr>
</tbody>
</table>

---

**D.O.R.**: 18.04.2018  
**D.O.C.**: 24.04.2018

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**AUTHORISED SIGNATORY**  
**EMPLOYEE CODE**: (6095)
ENCLOSURE 7. PROPOSED TOR
1(d): STANDARD TERMS OF REFERENCE FOR CONDUCTING ENVIRONMENT IMPACT ASSESSMENT STUDY FOR THERMAL POWER PLANTS PROJECTS AND INFORMATION TO BE INCLUDED IN EIA/EMP REPORT

1) The proposed project shall be given a unique name in consonance with the name submitted to other Government Departments etc. for its better identification and reference.

2) Vision document specifying prospective long term plan of the project shall be formulated and submitted.

3) Latest compliance report duly certified by the Regional Office of MoEF&CC for the conditions stipulated in the environmental and CRZ clearances of the previous phase(s) for the expansion projects shall be submitted.

4) The project proponent needs to identify minimum three potential sites based on environmental, ecological and economic considerations, and choose one appropriate site having minimum impacts on ecology and environment. A detailed comparison of the sites in this regard shall be submitted.

5) Executive summary of the project indicating relevant details along with recent photographs of the proposed site(s) shall be provided. Response to the issues raised during Public Hearing and the written representations (if any), along with a time bound Action Plan and budgetary allocations to address the same, shall be provided in a tabular form, against each action proposed.

6) Harnessing solar power within the premises of the plant particularly at available roof tops and other available areas shall be formulated and for expansion projects, status of implementation shall also be submitted.

7) The geographical coordinates (WGS 84) of the proposed site (plant boundary), including location of ash pond along with topo sheet (1:50,000 scale) and IRS satellite map of the area, shall be submitted. Elevation of plant site and ash pond with respect to HFL of water body/nallah/River and high tide level from the sea shall be specified, if the site is located in proximity to them.

8) Layout plan indicating break-up of plant area, ash pond, green belt, infrastructure, roads etc. shall be provided.

9) Land requirement for the project shall be optimized and in any case not more than what has been specified by CEA from time to time. Item wise break up of land requirement shall be provided.

10) Present land use (including land class/kism) as per the revenue records and State Govt. records of the proposed site shall be furnished. Information on land to be acquired including coal transportation system, laying of pipeline, ROW, transmission lines etc. shall be specifically submitted. Status of land acquisition and litigation, if any, should be provided.

11) If the project involves forest land, details of application, including date of application, area applied for, and application registration number, for diversion under FCA and its status should be provided along with copies of relevant documents.
12) The land acquisition and R&R scheme with a time bound Action Plan should be formulated and addressed in the EIA report.

13) Satellite imagery and authenticated toposheet indicating drainage, cropping pattern, water bodies (wetland, river system, stream, nallahs, ponds etc.), location of nearest habitations (villages), creeks, mangroves, rivers, reservoirs etc. in the study area shall be provided.

14) Location of any National Park, Sanctuary, Elephant/Tiger Reserve (existing as well as proposed), migratory routes / wildlife corridor, if any, within 10 km of the project site shall be specified and marked on the map duly authenticated by the Chief Wildlife Warden of the State or an officer authorized by him.

15) Topography of the study area supported by toposheet on 1:50,000 scale of Survey of India, along with a large scale map preferably of 1:25,000 scale and the specific information whether the site requires any filling shall be provided. In that case, details of filling, quantity of required fill material; its source, transportation etc. shall be submitted.

16) A detailed study on land use pattern in the study area shall be carried out including identification of common property resources (such as grazing and community land, water resources etc.) available and Action Plan for its protection and management shall be formulated. If acquisition of grazing land is involved, it shall be ensured that an equal area of grazing land be acquired and developed and detailed plan submitted.

17) A mineralogical map of the proposed site (including soil type) and information (if available) that the site is not located on potentially mineable mineral deposit shall be submitted.

18) Details of fly ash utilization plan as per the latest fly ash Utilization Notification of GOI along with firm agreements / MoU with contracting parties including other usages etc. shall be submitted. The plan shall also include disposal method / mechanism of bottom ash.

19) The water requirement shall be optimized (by adopting measures such as dry fly ash and dry bottom ash disposal system, air cooled condenser, concept of zero discharge) and in any case not more than that stipulated by CEA from time to time, to be submitted along with details of source of water and water balance diagram. Details of water balance calculated shall take into account reuse and re-circulation of effluents.

20) Water body/Nallah (if any) passing across the site should not be disturbed as far as possible. In case any Nallah / drain is proposed to be diverted, it shall be ensured that the diversion does not disturb the natural drainage pattern of the area. Details of proposed diversion shall be furnished duly approved by the concerned Department of the State.

21) It shall also be ensured that a minimum of 500 m distance of plant boundary is kept from the HFL of river system / streams etc. and the boundary of site should also be located 500 m away from railway track and National Highways.

22) Hydro-geological study of the area shall be carried out through an institute/ organization of repute to assess the impact on ground and surface water regimes. Specific mitigation measures shall be spelt out and time bound Action Plan for its implementation shall be submitted.
23) Detailed Studies on the impacts of the ecology including fisheries of the River/Estuary/Sea due to the proposed withdrawal of water / discharge of treated wastewater into the River/Sea etc shall be carried out and submitted along with the EIA Report. In case of requirement of marine impact assessment study, the location of intake and outfall shall be clearly specified along with depth of water drawl and discharge into open sea.

24) Source of water and its sustainability even in lean season shall be provided along with details of ecological impacts arising out of withdrawal of water and taking into account inter-state shares (if any). Information on other competing sources downstream of the proposed project and commitment regarding availability of requisite quantity of water from the Competent Authority shall be provided along with letter / document stating firm allocation of water.

25) Detailed plan for rainwater harvesting and its proposed utilization in the plant shall be furnished.

26) Feasibility of near zero discharge concept shall be critically examined and its details submitted.

27) Optimization of Cycles of Concentration (COC) along with other water conservation measures in the project shall be specified.

28) Plan for recirculation of ash pond water and its implementation shall be submitted.

29) Detailed plan for conducting monitoring of water quality regularly with proper maintenance of records shall be formulated. Detail of methodology and identification of monitoring points (between the plant and drainage in the direction of flow of surface / ground water) shall be submitted. It shall be ensured that parameter to be monitored also include heavy metals. A provision for long-term monitoring of ground water table using Piezometer shall be incorporated in EIA, particularly from the study area.

30) Socio-economic study of the study area comprising of 10 km from the plant site shall be carried out through a reputed institute / agency which shall consist of detail assessment of the impact on livelihood of the local communities.

31) Action Plan for identification of local employable youth for training in skills, relevant to the project, for eventual employment in the project itself shall be formulated and numbers specified during construction & operation phases of the Project.

32) If the area has tribal population it shall be ensured that the rights of tribals are well protected. The project proponent shall accordingly identify tribal issues under various provisions of the law of the land.

33) A detailed CSR plan along with activities wise break up of financial commitment shall be prepared. CSR component shall be identified considering need based assessment study and Public Hearing issues. Sustainable income generating measures which can help in upliftment of affected section of society, which is consistent with the traditional skills of the people shall be identified. Separate budget for community development activities and income generating programmes shall be specified.

34) While formulating CSR schemes it shall be ensured that an in-built monitoring mechanism for the schemes identified are in place and mechanism for conducting annual social audit from the nearest
government institute of repute in the region shall be prepared. The project proponent shall also provide Action Plan for the status of implementation of the scheme from time to time and dovetail the same with any Govt. scheme(s). CSR details done in the past should be clearly spelt out in case of expansion projects.

35) R&R plan, as applicable, shall be formulated wherein mechanism for protecting the rights and livelihood of the people in the region who are likely to be impacted, is taken into consideration. R&R plan shall be formulated after a detailed census of population based on socio economic surveys who were dependant on land falling in the project, as well as, population who were dependant on land not owned by them.

36) Assessment of occupational health and endemic diseases of environmental origin in the study area shall be carried out and Action Plan to mitigate the same shall be prepared.

37) Occupational health and safety measures for the workers including identification of work related health hazards shall be formulated. The company shall engage full time qualified doctors who are trained in occupational health. Health monitoring of the workers shall be conducted at periodic intervals and health records maintained. Awareness programme for workers due to likely adverse impact on their health due to working in non-conducive environment shall be carried out and precautionary measures like use of personal equipments etc. shall be provided. Review of impact of various health measures undertaken at intervals of two to three years shall be conducted with an excellent follow up plan of action wherever required.

38) One complete season site specific meteorological and AAQ data (except monsoon season) as per latest MoEF&CC Notification shall be collected and the dates of monitoring shall be recorded. The parameters to be covered for AAQ shall include PM 10, PM 2.5, SO2, NOx, CO and Hg. The location of the monitoring stations should be so decided so as to take into consideration the upwind direction, pre-dominant downwind direction, other dominant directions, habitation and sensitive receptors. There should be at least one monitoring station each in the upwind and in the pre - dominant downwind direction at a location where maximum ground level concentration is likely to occur.

39) In case of expansion project, air quality monitoring data of 104 observations a year for relevant parameters at air quality monitoring stations as identified/stipulated shall be submitted to assess for compliance of AAQ Standards (annual average as well as 24 hrs).

40) A list of industries existing and proposed in the study area shall be furnished.

41) Cumulative impacts of all sources of emissions including handling and transportation of existing and proposed projects on the environment of the area shall be assessed in detail. Details of the Model used and the input data used for modeling shall also be provided. The air quality contours should be plotted on a location map showing the location of project site, habitation nearby, sensitive receptors, if any. The windrose and isopleths should also be shown on the location map. The cumulative study should also include impacts on water, soil and socio-economics.

42) Radio activity and heavy metal contents of coal to be sourced shall be examined and submitted along with laboratory reports.
43) Fuel analysis shall be provided. Details of auxiliary fuel, if any, including its quantity, quality, storage etc should also be furnished.

44) Quantity of fuel required, its source and characteristics and documentary evidence to substantiate confirmed fuel linkage shall be furnished. The Ministry’s Notification dated 02.01.2014 regarding ash content in coal shall be complied. For the expansion projects, the compliance of the existing units to the said Notification shall also be submitted.

45) Details of transportation of fuel from the source (including port handling) to the proposed plant and its impact on ambient AAQ shall be suitably assessed and submitted. If transportation entails a long distance it shall be ensured that rail transportation to the site shall be first assessed. Wagon loading at source shall preferably be through silo/conveyor belt.

46) For proposals based on imported coal, inland transportation and port handling and rail movement shall be examined and details furnished. The approval of the Port and Rail Authorities shall be submitted.

47) Details regarding infrastructure facilities such as sanitation, fuel, restrooms, medical facilities, safety during construction phase etc. to be provided to the labour force during construction as well as to the casual workers including truck drivers during operation phase should be adequately catered for and details furnished.

48) EMP to mitigate the adverse impacts due to the project along with item-wise cost of its implementation in a time bound manner shall be specified.

49) A Disaster Management Plan (DMP) along with risk assessment study including fire and explosion issues due to storage and use of fuel should be carried out. It should take into account the maximum inventory of storage at site at any point of time. The risk contours should be plotted on the plant layout map clearly showing which of the proposed activities would be affected in case of an accident taking place. Based on the same, proposed safeguard measures should be provided. Measures to guard against fire hazards should also be invariably provided. Mock drills shall be suitably carried out from time to time to check the efficiency of the plans drawn.

50) The DMP so formulated shall include measures against likely Fires/Tsunami/Cyclones/Storm Surges/Earthquakes etc, as applicable. It shall be ensured that DMP consists of both On-site and Off-site plans, complete with details of containing likely disaster and shall specifically mention personnel identified for the task. Smaller version of the plan for different possible disasters shall be prepared both in English and local languages and circulated widely.

51) Detailed scheme for raising green belt of native species of appropriate width (50 to 100 m) and consisting of at least 3 tiers around plant boundary with tree density of 2000 to 2500 trees per ha with a good survival rate of around 80% shall be submitted. Photographic evidence must be created and submitted periodically including NRSA reports in case of expansion projects. A shrub layer beneath tree layer would serve as an effective sieve for dust and sink for CO2 and other gaseous pollutants and hence a stratified green belt should be developed.
52) Over and above the green belt, as carbon sink, plan for additional plantation shall be drawn by identifying blocks of degraded forests, in close consultation with the District Forests Department. In pursuance to this the project proponent shall formulate time bound Action Plans along with financial allocation and shall submit status of implementation to the Ministry every six months.

53) Corporate Environment Policy
   a. Does the company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be detailed in the EIA report.
   b. Does the Environment Policy prescribe for standard operating process / procedures to bring into focus any infringement / deviation / violation of the environmental or forest norms / conditions? If so, it may be detailed in the EIA.
   c. What is the hierarchical system or Administrative order of the company to deal with the environmental issues and for ensuring compliance with the environmental clearance conditions. Details of this system may be given.
   d. Does the company has compliance management system in place wherein compliance status along with compliances / violations of environmental norms are reported to the CMD and the Board of Directors of the company and / or shareholders or stakeholders at large? This reporting mechanism should be detailed in the EIA report.

All the above details should be adequately brought out in the EIA report and in the presentation to the Committee.

54) Details of litigation pending or otherwise with respect to project in any Court, Tribunal etc. shall invariably be furnished.

Additional TOR for Coastal Based Thermal Power Plants Projects (TPPs):

Over and above the TOR mentioned in Thermal Power Plants Projects, the following shall be strictly followed (as applicable):

a) Low lying areas fulfilling the definition wetland as per Ramsar Convention shall be identified and clearly demarcated w.r.t the proposed site.

b) If the site includes or is located close to marshy areas and backwaters, these areas must be excluded from the site and the project boundary should be away from the CRZ line. Authenticated CRZ map from any of the authorized agencies shall be submitted.

c) The soil leveling should be minimum with no or minimal disturbance to the natural drainage of the area. If the minor canals (if any) have to be diverted, the design for diversion should be such that the diverted canals not only drains the plant area but also collect the volume of flood water from the surrounding areas and discharge into marshy areas/major canals that enter into creek. Major canals should not be altered but their embankments should be strengthened and desilted.

d) Additional soil required for leveling of the sites should as far as possible be generated within the site itself in such a manner that the natural drainage system of the area is protected and improved.
STANDARD TERMS OF REFERENCE (TOR) FOR EIA/EMP REPORT FOR PROJECTS/ACTIVITIES REQUIRING ENVIRONMENT CLEARANCE

e) Marshy areas which hold large quantities of flood water to be identified and shall not be disturbed.

f) No waste should be discharged into Creek, Canal systems, Backwaters, Marshy areas and seas without appropriate treatment. Wherever feasible, the outfall should be first treated in a Guard Pond and then only discharged into deep sea (10 to 15 m depth). Similarly, the Intake should be from deep sea to avoid aggregation of fish and in no case shall be from the estuarine zone. The brine that comes out from Desalination Plants (if any) should not be discharged into sea without adequate dilution.

g) Mangrove conservation and regeneration plan shall be formulated and Action Plan with details of time bound implementation shall be specified, if mangroves are present in Study Area.

h) A common Green Endowment Fund should be created by the project proponents out of EMP budgets. The interest earned out of it should be used for the development and management of green cover of the area.

i) Impact on fisheries at various socio economic level shall be assessed.

j) An endowment Fishermen Welfare Fund should be created out of CSR grants not only to enhance their quality of life by creation of facilities for Fish Landing Platforms / Fishing Harbour / cold storage, but also to provide relief in case of emergency situations such as missing of fishermen on duty due to rough seas, tropical cyclones and storms etc.

k) Tsunami Emergency Management Plan shall be prepared wherever applicable and Plan submitted prior to the commencement of construction work.

l) There should not be any contamination of soil, ground and surface waters (canals & village pond) with sea water in and around the project sites. In other words necessary preventive measures for spillage from pipelines, such as lining of Guard Pond used for the treatment of outfall before discharging into the sea and surface RCC channels along the pipelines of outfall and intake should be adopted. This is just because the areas around the projects boundaries could be fertile agricultural land used for paddy cultivation.