

**EXECUTIVE SUMMARY**  
**OF**  
**ENVIRONMENTAL IMPACT ASSESSMENT**  
**FOR**  
**INTEGRATED MUNICIPAL SOLID WASTE**  
**PROCESSING COMPLEX**  
**GHAZIPUR, DELHI**

**Submitted to:**  
**Delhi Pollution Control Committee**

**Submitted by:**  
**East Delhi Waste Processing Company Pvt. Ltd.**

**January 2008**

# **EXECUTIVE SUMMARY**

## **1.0 INTRODUCTION**

M/s Infrastructure Leasing & Financial Services (IL&FS) has initiated development of Municipal Solid Waste (MSW) processing complex in the country, with an objective of waste reduction and ultimately effective management.

East Delhi Waste Processing Company Private Limited (EDWPCL) has been set up as a special purpose company, for developing projects for processing and disposing off municipal wastes and also to produce by-products, inter-alia, fluff and Refuse Derived Fuel which results in power generation which is an incidental source of revenue.

The proposed facility is proposed at an abandoned site adjacent to Ghazipur Landfill site spread over 5.728 acres with an investment over of Rs.100 crores. The proposed plant at Ghazipur dumpsite will be designed to process 1300 TPD (Tons per Day) of MSW. The proposed solid waste management facility shall involve conversion of waste to Refuse Derived Fuel (RDF) which will ultimately results in power generation. A RDF plant based on DST-TIFAC Technology will be designed to process 1300 TPD of MSW to generate around 433 TPD of RDF in the form of fluff and a power plant of 10 MW capacity based on RDF will be provided.. Non biodegradable products such as stones, sand ceramics and metal components will be separated from biodegradable and other organic matter waste.

The proposed project falls under Item 7 (i) (Common Municipal Solid Waste Management Facilities) as per Environmental Impact Assessment Notification dated September 14, 2006. The project will fall under Category A due to the application of general conditions i.e. interstate boundary, and will require environmental clearance from Ministry of Environment and Forests. M/s EDWPCL has retained the services of SENES Consultants India Private Limited (SENES) for carrying out a Rapid Environmental Impact Assessment (REIA) study and preparation of an EIA report, incorporating Environmental Management Plan (EMP) and Disaster Management Plan (DMP) for the proposed project. The EIA study has been done as per the approved Terms of Reference (TOR) provided by MoEF vide letter No.10-74/2007-IA.III dated 6th September 2007.

A REIA study report has been prepared for this project based on Post-Monsoon season (September-November, 2007) baseline environmental quality data in the study area. Identification & prediction of significant environmental impacts due to the proposed integrated waste processing facility with an Environmental Impact Statement followed by delineation of appropriate impact mitigation measures in an Environmental Management Plan are included in the REIA Report. M/s EDWPCL has retained SENES Consultants India Pvt. Ltd. to conduct a Rapid Environmental Impact Assessment study for the proposed project.

The purpose of this Environmental Impact Assessment (EIA) study is to provide information on the nature and extent of environmental impacts arising from the construction and operation of the proposed project.

The solid waste at project site shall be provided by Municipal Corporation of Delhi. The proposed integrated waste processing facility will have a section for processing Municipal Solid Waste (MSW) which will involve manual segregation, shredding, screening to separate both fine inerts and some percentage of bio-degradable matter, fines screening, ballistic separation etc which will finally result in the production of RDF as byproduct. RDF, thus produced will be utilized for the generation of electricity.

## 2.0 SALIENT FEATURES OF PROJECT

The Salient features of the project are provided below:

- Total Project Cost: ~Rs.100 Crores
- Land area: 5.728 acres or 23180.22 sq.m
- MSW processing capacity 1300 TPD
- Power generation capacity 10 MW
- Water Requirement: 471 m<sup>3</sup>/day
- Wastewater Generation ~ 172 m<sup>3</sup>/day
- Source of water: Kondli sewage treatment plant augmented by Municipal supply

## 3.0 SITE LOCATION & DESCRIPTION

The proposed site is accessible from National Highway -24 via Kondli road running parallel to Ghazipur drain. The Kondli road is connected to 7.0 meter wide road facing the proposed site and Ghazipur Dairy farm. The coordinates of the proposed site are:

Latitude : 28<sup>0</sup> 37' 22.4'' N  
Longitude : 77<sup>0</sup> 19' 25.7'' E  
Site Elevation : 204 m above MSL

The site is bounded on the four sides in the near vicinity by the following:

**East:** On the eastern boundary of the proposed site is the Ghazipur landfill site. The Hindon cut canal flows at a distance of about 0.1 km and River Hindon flows at a distance of 6.9 km.

**West:** On the western side of site is the Ghazipur Dairy farm and DDA colony. River Yamuna flows at a distance of 5.5 km.

**North:** On northern boundary of the project site is a veterinary hospital. Further on the northern side of project site are settlements such as Hasanpur Bhuapur village within 1.8 km. Sahibabad Industrial area is at a distance of about 4.0 km.

**South:** Immediate southern boundary of project site is a Masjid. Few settlements such as Khichripur and Makanpur lie at a distance of 1.2 km and 3.4 km respectively.

#### **4.0 PROJECT UTILITIES/AMENITIES**

##### ***Fuel***

The proposed integrated waste management facility will have a capacity to process 1300 TPD of MSW to generate about 433 MT of RDF. The mixed MSW shall be supplied to the facility by MCD. The boiler for the proposed power plant consume about 16.27 TPH of RDF Fluff for power generation

##### ***Water***

The proposed power plant will be provided with air cooled condenser for condensing the exhaust steam from turbo generator. The usage of air cooled condenser reduces water requirement to a large extent. The water requirement for the proposed project would be around 471 m<sup>3</sup>/day and would be met from Kondli Sewage Treatment Plant. It is proposed to have a water treatment plant of capacity 500m<sup>3</sup> /day for the tertiary treatment of the water received from Kondli Sewage Treatment Plant. The domestic water requirements will be met through municipal water supply.

##### ***Power***

The total RDF used will be about 16.27 tonnes per hour in boiler for the generation of 10 MW of power. The boiler will generate about 50 TPH of steam. The total power generated after in house power use will be stepped up to 66 kV through 12.5 MVA generator transformer to 66 kV bus at Kondli substation of BSES located at a distance of about 1.5 km from project site.

##### ***Fire Fighting Facilities***

Fire protection system will be provided as per LPA (Loss Prevention Association) norms. For every 100 m<sup>2</sup> area of plant, one DCP type and one CO<sub>2</sub> type fire extinguisher will be provided. "No Smoking" and hazard / danger warning stickers will be put up at appropriate places. All personnel deployed for the construction, erection and operation of the plant will be given proper training for fire drill. Emergency numbers will also be put up at appropriate places. Empty fuel drums / tanks and other inflammable material will be stored in earmarked place and removed from the premises as soon as possible. Storage yard for chemicals and fuel lubricants will also be provided with fire extinguishers and sand bucket racks.

### ***Road & site drainage***

All roads in the plant area will be well-designed bitumen roads and will be of 4 m wide with 1m wide berm on each side. For effective storm water drainage, final finished road will have a camber of 1 in 60 and water bound macadam surface will have a camber of 1 in 40.

Surface drainage will be designed based on the maximum rainfall intensity prevalent in the area. All the building would be provided with a plinth protection all round, sloped towards the side drain. The side drain will be connected to the main drain on either side of the road.

MSW storage area will be provided with a slope to drain the water collected to a sump from where it will be pumped to the Effluent Treatment Plant.

## **5.0 ENVIRONMENTAL SETTING OF THE STUDY AREA**

The baseline environmental status was assessed based on primary and secondary data collected through on-site field observations and obtained from agencies such as IMD, Geological Survey of India, State Ground Water Department, Central Ground Water Board, State Pollution Control Board, Census of India and Local Forest Department. The following environmental components were focused at during this study:

- Air Environment (Meteorology, Ambient Air Quality, Noise Levels, Traffic Pattern, etc.)
- Water Environment (Quality and Quantity of Surface and Groundwater sources)
- Land Environment (Geology, Hydrogeology, Landuse, Solid Waste generation and characteristics)
- Ecological Environment (Terrestrial and Aquatic Flora & Fauna)
- Socio-Economic Environment (Demographic profile, Occupational structure, Educational status, Literacy status, etc.)

The baseline status collated from analysis of secondary and primary data is summarized in the **Table E-1** below.

**Table E-1: BASELINE ENVIRONMENTAL STATUS**

Attribute	Baseline status
Meteorology	A meteorological station was set up on site. The minimum temperature recorded was 11 °C and maximum temperature was found to be 32 °C during the study period (i.e. September to November). The average wind speed was observed to be 1.5 m/s and the predominant wind direction was observed to be west.
Ambient Air Quality	Ambient air quality was monitored at 5 locations within a 5 km radius of the project site. The observed SPM levels were in range of 158 to 460 µg/m <sup>3</sup> , while RSPM was in range of 56 to 134 µg/m <sup>3</sup> . The range of SO <sub>2</sub> and NO <sub>x</sub> was 5 to 21 µg/m <sup>3</sup> and 10 to 26 µg/m <sup>3</sup> respectively. Observed SPM levels at all locations and RSPM levels at 3 locations exceeded NAAQS whereas concentrations of SO <sub>2</sub> , NO <sub>x</sub> were well within the prescribed limits. CO levels exceeded prescribed limits at project site.
Noise Levels	Noise monitoring was carried out at five locations. The results of the monitoring program indicated that both the daytime and night time levels of noise exceed NAAQSRN at all the five locations monitored .
Water Quality	<p>10 Groundwater samples and 2 surface water samples were analyzed. Total Dissolved Solids (TDS) in groundwater samples exceeds the desired limit as per IS: 10500 at 6 locations (Project site, Arthala, Khora, Pasaunda, Raipurakhader and Kethwara) while Total Hardness exceeds the desired limit as per IS-10500 at 5 locations (Project site, Arthala, Makanpura, Parthala, Pasaunda and Raipurakhader). Chloride exceeds the desired limit at 4 locations (Project site, Pasaunda, Raipurakhader and Kethwara) while calcium exceeds the desired limit at 5 locations (Kinauni, Arthala, Khora, Raipurakhader and Kethwara)</p> <p>Surface water samples on analysis and comparison with CPCB class “C” water showed that DO of the samples is good and ranges form 3.8 to 4.1 whereas BOD is high in comparison to maximum 3 mg/l. Surface water samples also showed the presence of total Coliform and faecal Coliform indicating organic contamination.</p>
Ground water Availability	The project site is characterized by 30-40 m thick unconfined to semi confined aquifers and has large groundwater yield prospects in the range of 50-100 m <sup>3</sup> /hr.
Soil Quality	The proposed site is characterized by highly variable stratified soils. The result shows that the moisture retention capacity of the soil is 46 %, which is good. Soil of the area is slightly basic with a pH of 7.82. The CEC analysis of the soil sample is 12.14 meq /100 gm, which is low and it, can be concluded that the soil is sandy.
Biological Environment	Delhi falls under the biogeographic province 4A- Semi arid Punjab plains. No protected or reserve forest falls within 10 km radius of the proposed project site. Water bodies such as Yamuna and Hindon rivers and Hindon Cut are the three permanent water bodies flowing within 10 km from the proposed project site. The project site does not come within an existing or proposed ecological sensitive zone. No threatened or endangered plant or animal species are known to exist in and around the site.

<b>Attribute</b>	<b>Baseline status</b>
Socio-economy	The baseline study focuses on East zone {Ward 218-Mandawali [Gazipur Dairy] and Ward 227-IP Extension [Gazipur Village] of Delhi. The complete study area falls under Municipal Corporation of Delhi (MCD). Literacy rate for east zone is 84.9% as against the literacy rate of Delhi at 81.7% in census 2001. The sex ratio for east zone of Delhi is 843, as against the state average of 822. In the study area maximum number of people are found to be engaged as “other workers” in economic activity like Government/Private service, teachers, factory workers, commerce etc. negligible population is involved in agricultural activities.

## **6.0 ENVIRONMENTAL IMPACT ASSESSMENT & ENVIRONMENTAL MANAGEMENT PLAN**

Environmental impact due to the construction and operation stages of the project were predicted quantitatively using models such as ISCST3 for air dispersion calculations, DHAWANI for noise impacts. Impacts were also evaluated qualitatively using engineering judgment and best management practices.

Adequate environmental management measures will be incorporated during the entire planning, construction and operation stages of the project to minimize the adverse environmental impacts and assure sustainable development of the area.

The impacts during the construction phase will be temporary in nature. This summary details the pollution sources and mitigation measures proposed for the project.

### **6.1 AIR ENVIRONMENT**

During the construction phase, operation of construction equipments and vehicles will be the main sources of pollution. A dust control plan will be implemented and regular maintenance of vehicles and equipment will be carried out.

During the operation phase, the main sources of pollution shall be boiler stack emissions, emissions from RDF plant, fugitive dust and odor emissions from waste handling and processing and emissions due to vehicular movement. Adequate mitigation measures shall be implemented. Emissions from waste handling areas shall be controlled by provision of covered areas, proper ventilation and by maintaining negative pressure. Herbicides will be sprayed to discourage further decomposition of MSW. The RDF plant shall be provided with adequate dust control systems such as cyclones, bag filters to control the dust emissions. The boiler will be provided with adequate stack height of 65 m and an ESP shall be provided to reduce the PM emissions. NOx emissions shall be controlled by admission of secondary air and maintaining temperature balance. A gas recirculation system shall be provided to reduce CO formation. Dioxins and Furans shall be controlled by extensive segregation to ensure complete removal of plastic and other chlorinated compounds, controlling PM emissions and appropriate furnace

design. In addition to this, a High Performance dioxin removal device (Activated Carbon Packed Column) shall be provided.

## **6.2 NOISE ENVIRONMENT**

During the construction phase, adequate mitigative measures such as controlled time of construction, job rotation etc. will be implemented.

During the operation phase, the sources of noise emissions shall be equipments such as shredders, boilers, generator etc and vehicular movement. Noise enclosures shall be provided wherever possible and workers shall be provided with ear plugs.

## **6.3 WATER ENVIRONMENT**

During the construction phase, a septic tank shall be provided to treat the domestic wastewater generated due to labor settlements.

During the operation phase, approximately 471 m<sup>3</sup>/day of treated wastewater from Kondli STP will be utilized for plant operation. The main source of process water available for the project will be treated sewage water. City water supply from Delhi Jal Board (DJB) would be used for drinking water and other service requirement. Effluent generated from the process will be recirculated back to the RDF plant. Spill over from the process would be collected and treated prior disposal.

The effluent generated from the RO rejects, MB unit regeneration waste and boiler blow down will be discharged into sewer after suitable treatment. Filter backwash water and cooling tower blow down will be discharged into public sewer after treatment. The small quantities of leachate generated will be collected in the sump and treated in Effluent Treatment Plant.

## **6.4 LAND ENVIRONMENT**

During operation phase of the project, the rejects from waste segregation system/RDF plant. The organic waste shall be used as fuel for HAG and the other wastes shall be sold for recycling. The fly ash generated will be supplied to the brick manufacturing units. The bottom ash from the power plant shall be supplied to Zakhira to be used as soleing material in low cost housing units.

## **6.5 ECOLOGICAL ENVIRONMENT**

There is no ecologically sensitive area within a 10 km radial distance of the project site. No wildlife sanctuary or national park is present within the study area. A peripheral greenbelt will be provided.

## **6.6 SOCIO ECONOMIC ENVIRONMENT**

The proposed project will lead to employment generation and will have a positive impact on the socio economic environment. Preference to local population shall be given and adequate mitigation measures will be ensured to reduce odor emissions and disease vectors from proposed site.

## **8.0 ENVIRONMENTAL MANAGEMENT SYSTEM**

For the effective implementation of the EMP, an Environmental Management System (EMS) will be established at the proposed project. The EMS will include the following:

1. An Environmental Management cell
2. Environmental Monitoring Program
3. Personnel Training
4. Regular Environmental Audits and Corrective Action
5. Documentation – Standard operating procedures Environmental Management Plans and other records.

## **9.0 CONCLUSION**

All possible environment aspects have been adequately assessed and necessary control measures have been formulated to meet statutory requirements. Thus implementing this project will not have any appreciable negative impacts. Moreover, the landfill area requirement at Ghazipur and other landfill sites will progressively reduce significantly as the solid waste will be converted to stable form (inerts) before being sent for disposal at landfill site. This would save upon the future requirements of area for land filling. Power generation would be an added advantage.