

## **EXECUTIVE SUMMARY**

Of

### **PROPOSED COMMON BIO-MEDICAL WASTE TREATMENT FACILITY “ENVIRON BIOWASTE SYSTEMS (I) PVT LTD”**

at

**S.No. 553/1B, 553/2A & 553/2B of Meyyur Village,  
Uthukottai Taluk, Thiruvallur District, Tamil Nadu.**

**Being Established by:**

**M/s. ENVIRON BIOWASTE SYSTEMS (I) PVT LTD  
5-7/1, Codissia Tower, Coimbatore – 641 018**

**ENVIRONMENTAL CONSULTANT**

**M/s. Perfact Enviro Solutions Pvt. Ltd.**

**(NABET Registered vide list of accredited consultants organizations/ 5<sup>th</sup> Sep 2020 at S.No-118)  
(An ISO 9001:2008 &ISO 14001:2004 Certified Company)  
5<sup>th</sup> Floor, NN Mall, Sector 3, Rohini, New Delhi-110085**

**OCTOBER 2020**

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**Environmental Impact Assessment for Establishment of Common Bio-Medical Waste Management and Treatment Facility at Meyyur Village, Thiruvallur District, Tamil Nadu by M/s. Environ Bio-waste Systems India Pvt. Ltd.**

**EXECUTIVE SUMMARY**

**1. INTRODUCTION**

Healthcare facilities in and around Thiruvallur District has increased gradually in recent years. It is practically and economically not viable for every healthcare unit to have its own facilities for safe handling of biomedical waste. Hence, a demand has raised for a Common Bio-medical Waste Management Facility to handle the biomedical waste generated from the healthcare establishments in environmentally safe manner. Considering the need, M/s. Environ Bio-waste Systems India Pvt. Ltd. came forward to Establish a Common Bio-Medical Waste Management and Treatment Facility at Meyyur Village, Thiruvallur District, Tamil Nadu. This facility would cater biomedical waste management services to predominantly Thiruvallur District and also covers the areas of Kancheepuram & Chennai Districts.

**2. BIO-MEDICAL WASTE GENERATION AND MANAGEMENT**

- Bio Medical Waste Management rules
- Sources of Bio Medical Waste Management generation
- Types of Bio Medical Waste Management
- Responsibilities
  - Health Care Establishment
  - CBWTF's
- Bio Medical Waste Management categories
- COLLECTION OF Bio Medical Waste from HCE's
  - Barcoded Non-Chlorinated and Colored bags
  - Barcode scanning and uploading of data to CPCB / TNPCB servers
  - Schedule – III
- Treatment & Disposal at site
  - Incineration

- Autoclave
- Shredder
- Compactor
- ETP
- Vehicles
- Ash storage and disposal
- Treated plastics storage
- Needle pits
- Disinfected Glass bottles storage

#### **I. BIO MEDICAL WASTE MANAGEMENT RULES, 2016**

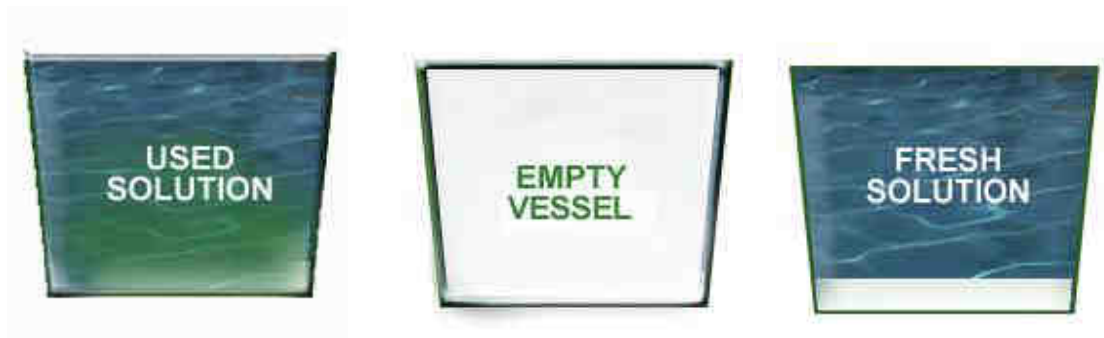
- Formulated in 1998 by MoEF & CC – Gol.
- Amended in 2000
- Modified & Notified in 2016

Makes the Occupier (Health Care Establishment) & Operator (Common BMW Treatment & Disposal Facility) responsible for protecting the environment from Bio-Hazard, monitored by the State and Central Pollution Control Board.

- Metal sharps must be dipped minimum of 30 minutes in Hypo Solution to ensure disinfection. After disinfection drain the solution and transfer sharps to puncture proof container



- The bleach solution should be changed after each shift



- Sharps should not be left casually on counter tops food trays on beds and floors
- Do not incinerate plastic Reduce use of PVC Disposables



- Provide protective gears to all the persons handling, managing Bio Medical Waste and immunize all waste handlers



- Radioactive waste generated should be stored carefully. Label the container (Glass container) to distinguish from others and prevent introduction of non-corrosive items into waste.

- Liquid waste generated from Labs, Pathological waste, Washing, Cleaning, Housekeeping should be neutralized with chemical disinfectants / reagent before flushed into sewage.
- General waste from kitchen canteen package material to be collected separately.
- Infectious waste should not be mixed with non-infectious waste and if mixed to be treated as infectious waste
- Spillage during loading transport and unloading should be totally avoided

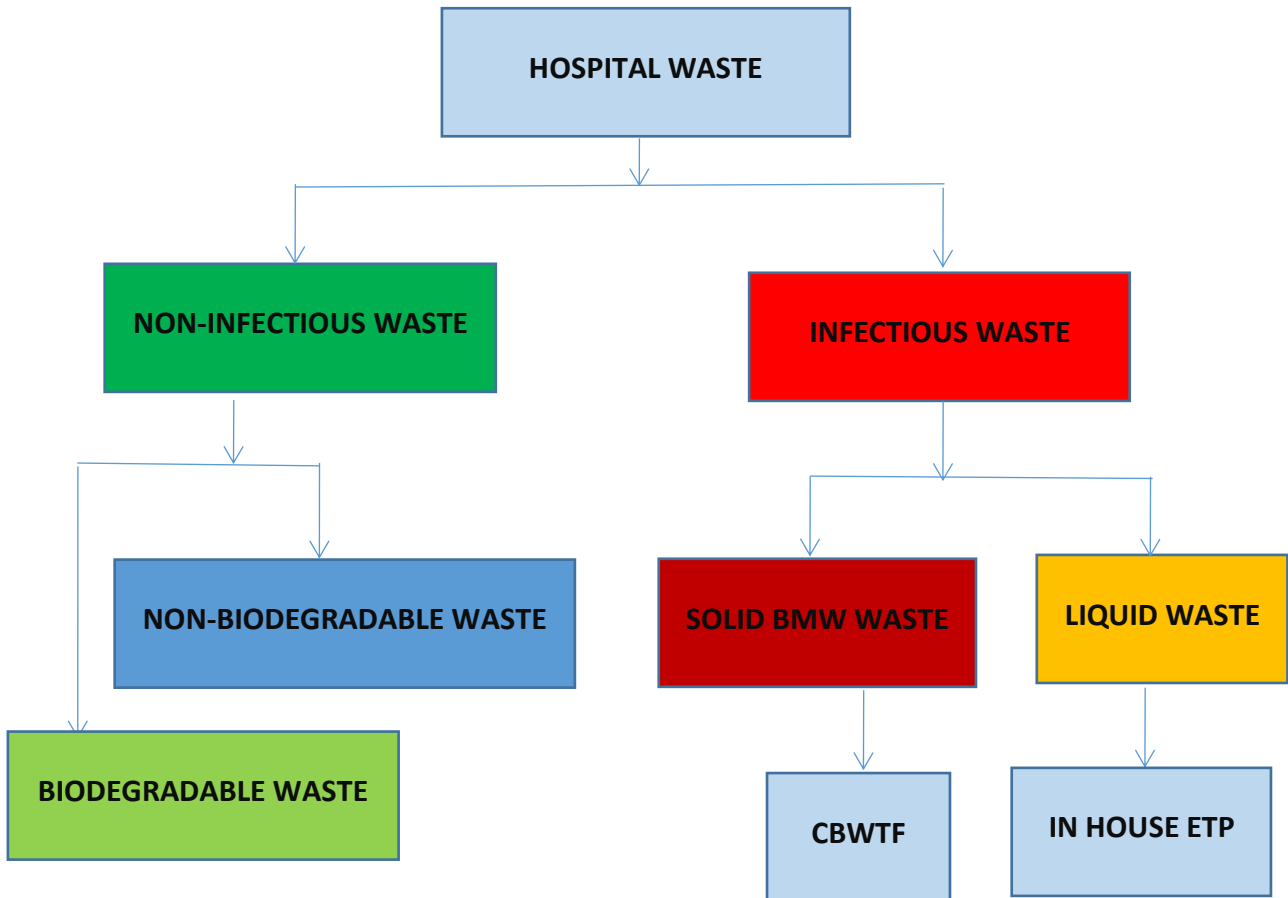


- Bio Medical Waste management shall be reviewed at regular intervals and Hospitals should be prepared for unexpected hazardous, accidents, equipment failures accidental spills that require rapid decision makings.
- Waste Audit should be conducted at regular interval to evaluate type & quantity of waste generated for further planning

## **II. Sources of Bio Medical waste generation**

- **Health care Establishments**
- **Veterinary Hospitals**
- **Research organizations**
- **Industrial Institutions**
- **Medical camps**
- **Pharmaceutical companies/distributors**

### III. TYPES OF WASTE GENERATED IN AN HEALTH CARE ESTABLISHMENT



### IV. RESPONSIBILITIES

#### OCCUPIER – HEALTH CARE ESTABLISHMENTS

- Segregation – Categories Specified in Rule
- Collection – From Each Point
- Transportation - To the Final Storage Point
- Storage – Final Storage Room

#### CBWTF – COMMON TREATMENT FACILITY

- Transportation - Final Storage Point of Occupier to Facility
- Treatment – Incineration, Autoclaving
- Disposal – Secured Landfilling / Recycling

### V. BIO MEDICAL WASTE CATEGORIES

- Category 1 – **YELLOW**

- Category 2 – **RED**
- Category 3 – **WHITE**
- Category 4 – **BLUE**

**YELLOW COLOUR BINS / BAGS**

- ✓ HUMAN ANATOMICAL PARTS
- ✓ BODY PARTS
- ✓ ANIMAL PARTS
- ✓ BODY PARTS & BLOOD
- ✓ VACCINES, CELL CULTURES,
- ✓ BIOLOGICAL NOXINS,
- ✓ BIOPSY SPECIMENS
- ✓ BLOOD SOAKED COTTON
- ✓ DRESSINGS. PLASTERS



**RED COLOUR BINS / BAGS**

- ✓ I. V. SALINE BOTTLES
- ✓ SYRINGES (WITHOUT NEEDLES)
- ✓ TUBING
- ✓ GLOVES (SEPARATE)
- ✓ MASK & CAPS
- ✓ DISPOSABLE CLOTH (SEPARATE – WITHOUT BLOOD)





**BLUE COLOR BINS / BAGS**

- ✓ GLASSES
- ✓ BOTTLES
- ✓ AMPOULES
- ✓ MEDICINE BOTTLES



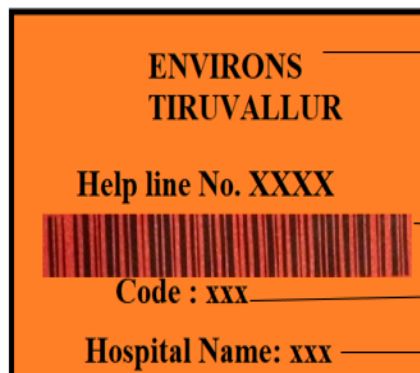
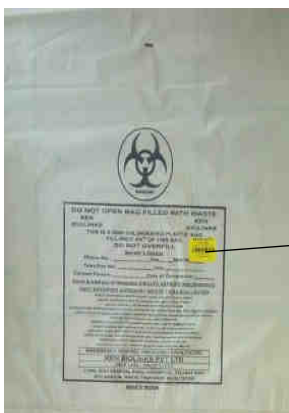
**WHITE COLOR BINS / PUNCTURE PROOF**

- ✓ Used & Discarded Scalpels, Needles, and Blades
- ✓ Knives and Blades
- ✓ Sharp metal items, glass wares
- ✓ Fistula Needles



**VI. COLLECTION OF BMW FROM HEALTH CARE ESTABLISHMENT**

- Bar Coded Non-Chlorinated and Colored Bags



Bio Medical Waste Treatment Facility Name, Address, Phone Number.

Bar Codes

Bar Code Reference Number

Hospital Name

- Barcode Scanning and Uploading of Data to CPCB / TNPCB Servers



- SCHEDULE III

#### LABEL FOR BIOMEDICAL WASTE CONTAINERS/BAGS

The bins and bags should carry the biohazard symbol indicating the nature of waste to the patients and public.



**HANDLE WITH CARE**

Note : Label shall be non-washable and prominently visible

## VII. TREATMENT & DISPOSAL AT SITE

INCINERATION	-	Combustion at High Temperature with the combusted gases cleaned
AUTOCLAVING	-	Sterilization at high Pressure & Temperature
SHREDDER	-	Shreds and Physically deforms the disinfected plastics for secondary recycling
COMPACTOR	-	Reduce the size of the material
ETP	-	Treats the Effluent generated during Treatment of BMW
VEHICLES	-	Specially designed vehicles to collect and transport BMW to site of disposal from respective HCE's in the coverage area
ASH STORAGE AND DISPOSAL	-	Ash will be stored in separate area inside the facility. Hazardous waste Authorization will be secured. Ash will be disposed to common hazardous Landfill
TREATED PLASTICS STORAGE	-	Treated plastics will be temporarily stored and send for secondary recycling
NEEDLE PITS	-	Needle pits will be provided inside the facility and the needles collected will be either mutilated with hypo disinfection or will be send for secondary recycling to foundries
DISINFECTED GLASS BOTTLES STORAGE	-	Disinfected glass bottles will be temporarily stored and send for secondary recycling

### 3. DETAILS TO BE SPECIFIED FOR EXECUTIVE SUMMARY AS PER ToR

S.No	DESCRIPTION IN ToR	REMARKS	
1	Project name and location (Village, District, State, and industrial Estate (If applicable))	Proposed Common Bio-Medical Waste Treatment Facility "Environ Biowaste Systems (I) Pvt. Ltd."	
		Village	Meyyur
		Taluk	Uthukottai
		District	Thiruvallur
		State	Tamil Nadu
2		No product is produced. It is a Waste treatment facility	

	Products and capacities. if expansion proposal then existing products with capacities and reference to earlier EC	<b>Waste Category</b>	<b>Treatment &amp; Disposal</b>
		Human Anatomical Waste	Incineration /deep burial
		Animal Waste	Incineration/deep burial
		Microbiology & Biotechnology Waste	Local autoclaving / microwaving/ incineration
		Waste Sharps	Disinfection (chemical treatment)/ autoclaving / microwaving and mutilation/ shredding
		Soiled Waste	Incineration/ autoclaving/ microwaving
		Solid Waste	Disinfection by chemical treatment/ autoclaving/ microwaving and mutilation/shredding
		Liquid Waste	Disinfection by chemical treatment and discharge into drains
		Incineration Ash	Disposal in municipal landfill/Common hazardous landfill
Chemical Waste	Chemical treatment and discharge into drains for liquids and secured landfill for solids		
3	Requirement of land, raw material, water, power, fuel, with source of supply( Quantitative)	Land	13350 Sq.m (3.3 acres)
		Raw Material	8.1 T/Day of Bio medical waste
		Water	28 KLD
		Power	120 KW ; DG Set 1 x 125 KVA and 1 x 62.5 KVA
		Fuel	Diesel; D.G. – 50 Lt/day Incinerators - 800 Lt/day
		Water supply	28 KLD from Meyyur Panchayat

4	Process description in brief specifically indicating the gaseous emission, liquid effluent and solid and hazardous wastes	Gaseous emission	<b>Incinerators:</b> To control emissions from incinerators with Rotary kiln of 750 kg/hr and static bed @ 250 Kg/hr, Common stack of dia 0.6 m and height of 30 m above ground level, Quencher followed by Venturi Scrubber with droplet separator and then Packed bed scrubber followed by mist eliminator shall be provided as Air Pollution Control System.
		Liquid effluent	The source of water supply for proposed facility shall be sourced from Meyyur Panchayat. The total water requirement will be 28 KLD. The water will be required mainly for Domestic (2 KLD) and for process related requirements (13 KLD) (for scrubbing, floor & vehicle washing & Boiler) & for gardening (13 KLD). The amount of wastewater generated out of proposed CBMWTF is 14.4 KLD which shall be treated in 20 KLD ETP
		Solid waste	A total of 7 kg/day Municipal solid waste will be generated. Out of which 5 Kg/day of Biodegradable waste will be treated in an in-house Organic Waste

			Converter – the resultant manure will be used for green belt development & excess will be distributed to nearby farmers, 2 Kg/day of Recyclable Waste shall be given to Authorized Recycler.
		Hazardous waste	ETP sludge of 0.25 Kg/day, Incineration Ash of 400 Kg/day and used oil of 4 liters/month will be generated.
5	Measures for mitigating the impact on the environment and mode of discharge or disposal	Impact during construction phase	The impacts due to construction activities are short term and are limited to construction phase. Proper construction activities shall be followed and briefed in page No. 22
		Impact during Operational phase	
		Air	The incinerators shall be provided with a combined stack 0.6 m & height of 30 m above ground level
		Water	Total wastewater generated in the project will be 14.4 KLD which will be treated in 20 KLD ETP plant
		Noise Level	The major source of noise DG sets, and Machineries. Equipment will be properly enclosed by enclosures will be provided with dampeners for minimizing noise
		Land	All the waste will be collected and kept in separate rooms.

			No disposal of waste will be done on soil	
		Ecology	Installing proper air pollution control system and by developing green belt (as per CPCB guidelines) for proposed facility the impact on ecology will be minimal	
		Socio Economics	To minimize the impact on nearby population preventive measures will be carried out and pollution check on periodic basis	
6	Capital cost of the project, estimated time of completion	Capital Cost : 4.82 crore and estimated time of completion Oct 2021		
7	Site selected for the project- Nature of land-Agricultural(Single/double crop), barren, Govt/Private land, status of is acquisition, nearby (in 2-3 km), water body,, population, with in 10km other industries, forest, eco-sensitive zones, accessibility,(note-I case of industrial estate this information may not be necessary)	Nature of land	It falls under unclassified area of Thiruvallur District as declared by DTCP; vide its planning permission, DTCP has permitted the land use for establishing CBMWM , and also planning permit issued for establishment of Biomedical Waste Management Facility	
		Govt/Private land & status of its acquisition	Private land & patta copy enclosed	
		Water body (3 km)	Telgu Ganga Canal (Sathya Sai Canal)	1.29 Km
			Arani River	3.6 Km
Kusasthalai River	3.19 Km			
	Mamandur	–	1152	
		2.54 Km		

		Population (3 km) Source: Census data, 2011	Velagapauram – 3.18 Km Gerugambakka m – 1.25 Km Meyyur Devandavakkam – 2.21 Km Mylapore- Tiruvallur - 3.14 Km Melandur – 3.26 Km	2372 615 2357 637 442 1886
		Industries (10 km)	MARKS-B Industries – 7.12 Km	
		Forest	Meyyur reserve forest Mylapore reserve forest	2.8 Km 4.0 Km
		Eco- sensitive Zone		-
		Accessibility	Through Uthukottai – Tiruvallur road and site is 1 Km south from Seethanchery – Vengal road near Gerugambakkam	
8	Baseline environmental data-air quality, surface and ground water quality, soil characteristic, flora and fauna, socio-economic condition of the nearby population	Details given in page No. 18		
9	Identification of hazards in handling, processing and storage of hazardous material and safety system provided to mitigate the risk	Storage & handling area will be readily accessible with safety showers, fire extinguishers and other fire-fighting equipment, water hydrants with spray		



		nozzle and other emergency equipment such as chemical proof suits and respiratory apparatus.	
10	Likely impact of the project, on air, water, land, flora-fauna and nearby population	Impact will be minimal	
		Air	The incinerators shall be provided with a combined stack 0.6 m & height of 30 m above ground level
		Water	The source of water supply for proposed facility shall be sourced from Meyyur Panchayat. The total water requirement will be 28 KLD. The water will be required mainly for Domestic (2 KLD) and for process related requirements (13 KLD) (for scrubbing, floor & vehicle washing & Boiler) & for gardening (13 KLD). The amount of wastewater generated out of proposed CBMWTF is 14.4 KLD which shall be treated in 20 KLD ETP
		Land	All the waste will be collected and kept in separate rooms. No disposal of waste will be done on soil
		Flora & Fauna	No trees will be cut for this project

		Population	It will provide employment opportunities for the people nearby villages
11	Emergency preparedness plan in case of natural or in plant emergencies	<p>There will be Emergency Control Room.</p> <p>GPS enabled tracking system will be installed in vehicles to track their movement and in case of emergency , to render help as well.</p> <p>The vehicles will be provided with the first aid kit to handle emergency situations.</p> <p>A sheet listing the materials shall be available in the vehicle and the emergency phone numbers shall also be listed.</p> <p>Spills will be absorbed with inert material (e.g. vermiculite, sand, or earth), then place in suitable container. All sources of ignition will be removed, and a spark-proof tool used. Ventilation will be provided and a vapour suppressing foam used to reduce vapours.</p> <p>Emergency plan shall be prepared, and mock drill of the on-site emergency should be conducted</p>	
12	Issues raised during public hearing (if applicable) and response given	-	
13	CSR plan with proposed expenditure	<p>As the project cost is Rs. 4.82 Cr. i.e. less than Rs. 100 Crores and is a greenfield project hence, the company will spend about 2% of project cost i.e. 9.64 Lacs for Corporate Environment Responsibility (CER) which would be under Company CSR as per Companies Act, 2013. Under CER, welfare</p>	

		activities will be taken up focusing on health care, education, skill development, infrastructure and green belt/ plantation in nearby areas.
14	Occupational Health Measures	Details given in page No. 25
15	Post project monitoring plan	Details given in page No. 25

#### 4. PROJECT DETAILS

The proposed Common Bio-Medical Waste Management and Treatment Facility (CBMWMTF) will be established in an area of about 13350 sq. m. (3.3 acres) at S.No.553/1B, 553/2A & 553/2B, Meyyur Village, Uthukottai Taluk, Thiruvallur District, Tamil Nadu. No. of biomedical units to be catered is estimated to be around 2500 units. The Facility intends to handle Biomedical Waste up to 8.1 T/Day of biomedical waste with the following components:

DESCRIPTION	PRE-OPERATIVE	OPERATIVE	CAPACITY	DISPOSAL
<b>INCINERATION</b>				
Rotatory Kiln (750 kg/hr capacity)	2 hr	6 hr	1000 kg	6 tons/ day/shift
Static Bed Type (250 kg/hr capacity)				
<b>AUTOCLAVE</b>				
Autoclave with steam generator (1000 liters/capacity batch)	1 hr	7hr	400 kgs/batch cycle	3 tons /day/shift
<b>DISINFECTION</b>				
Disinfection by soaking with hypo chlorine solution (250 liters – Barrell – 12 Nos. or 3000 liters capacity tank)	-	8 hr	250 kgs/ hour disinfection	2 tons/day /shift
<b>SHREDDER</b>				
Shredding (250 kgs/hr)	-	-	-	2.5 tons/shift
<b>EFFLUENT TREATMENT PLANT</b>				

ETP (50 KLD capacity)	-	-	-	50 KLD/day
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The total water requirement for the proposed CBMWMT facility is estimated to be around 28 KLD and the water requirement will be sourced from Meyyur panchayat through authorized water tankers. The power requirement for the facility is about 120 KW and it will be sourced from Tamil Nadu Generation Distribution Corporation Limited (TANGEDCO). DG set capacity of 1 × 125 kVA and 1 X 62.5 kVA is proposed as a power backup in case of power failure. The cost estimated for the proposed facility is about INR 4.82 Crores.

As per laid down procedure, the application for ToR was considered in 128th SEAC appraisal meeting held on 14.04.2019 ; TOR was issued vide letter no. F.No. SEIAA-TN/F.No 6456/2019/7(da)TOR-616/ 2019 / dated 03.05.2019.

## 5. BASELINE ENVIRONMENTAL STATUS

The main aim of the EIA study is to identify the critical environmental attributes which may be affected and have adverse impacts on the surrounding environment due to the proposed common biomedical waste facility. Field investigations were undertaken for collecting the existing baseline environment for air, water, noise, soil, ecological and socio-economic conditions. A study area of 10 Km radius from the project site is identified to establish the present environmental conditions for the above environmental components. The field data generation is undertaken during the summer season of March 2019 to May 2019.

The proposed project area is located in Meyyur Village, Thiruvallur District, Tamil Nadu. The metrological data is collected from the IMD station at Chennai. The predominant wind direction recorded is from North North West (NNW).

### a. Ambient Air Quality

The ambient air quality monitoring has been carried out at seven different locations. The locations were selected in downwind, cross wind and up wind of the proposed project location. The selected sites are located within the core zone and buffer zone (10 km radius). The common air pollutants namely Particulate matter (PM<sub>10</sub> & PM<sub>2.5</sub>), Sulphur dioxide (SO<sub>2</sub>), oxides of nitrogen (NO<sub>x</sub>), Carbon Monoxide (CO) and Total Volatile Organic Compounds (TVOC) were sampled and compared with the standards stipulated by CPCB.

The minimum and maximum levels of Particulate Matter < 2.5 microns are recorded in the range of 28.3 to 60.5  $\mu\text{g}/\text{m}^3$ , whereas the particulate matter < 10 microns are in the range of 53.1 to 98.5  $\mu\text{g}/\text{m}^3$ . The Sulphur dioxide concentrations within the study area are in the range of 6.4 to 12.6  $\mu\text{g}/\text{m}^3$  and the oxides of nitrogen observed are in the range of 14.7 to 27.5  $\mu\text{g}/\text{m}^3$ . Carbon Monoxides observed are in the range of 0.44 to 0.82  $\text{mg}/\text{m}^3$ , whereas TVOC is below detectable limit. The observed pollutant levels were compared with CPCB Standards and found to be within the limits. The Air Quality Index shows the area is in 'Moderate' Category.

#### **b. Water Quality Monitoring**

In the study area, ground and surface water samples were collected from different sources and analyzed for all important physio-chemical and biological parameters to identify the quality of water prevailing in the project surroundings. A total of 6 ground water and 7 surface water samples were collected.

The surface water samples were drawn from ponds, reservoir and rivers. The pH of ground water observed ranges from 6.5 to 7.6 and in surface water it is from 6.3 to 7.9, the TDS level of ground water is from 65.9 to 2140  $\text{mg}/\text{l}$ , whereas in surface water the levels are 40.3 to 441.6  $\text{mg}/\text{l}$ . The chloride concentrations in ground water is between 12 to 470  $\text{mg}/\text{l}$ , whereas the surface water has a chloride values of 11 to 114  $\text{mg}/\text{l}$ . The hardness observed in ground water is 8 to 1089  $\text{mg}/\text{l}$  and in surface water the hardness found to be between 12 to 120  $\text{mg}/\text{l}$ . Overall, all the ground water samples collected from the study area were found to be fit for human consumption; however, the hardness in some of the ground water samples seem to be above permissible limit.

#### **c. Noise Monitoring**

The noise levels are monitored in nine different locations within core and buffer zone, using noise monitoring device as suggested by CPCB. Three type of location that were selected are: Industrial area, commercial area and residential area. The day levels of noise and the night levels were monitored as per the AAQ Standards in respect of noise for residential, commercial and industrial area standards. The influence of ambient air noise is more in nearby sites, so study was conducted within 5 km radius of the project location. The day equivalentents during the study period are range between 49.9 to 67.2 dB (A), whereas the night

equivalents were in the range of 45.6 to 60.3 dB (A). From the results the day equivalents and the Night equivalents were within the Ambient Noise standards with respect to their area.

#### **d. Traffic Study**

Carrying capacity of Thiruvallur to Uthukottai road =32400 PCU/hr Existing traffic density at MDR M-740 Thiruvallur to Uthukottai road =833 PCU /hr. Existing traffic density at Approach road is 165 PCU /hr. Proposed traffic from site is 8 PCU/hr. since carrying capacity of MDR M-740 Thiruvallur to Uthukottai road is much higher than proposed traffic volume, ie 1500 pcu/hr the traffic to & form of proposed facility will not create any traffic congestion.

On the other route from Gerukambakkam to Redhills approach Road, Total Traffic density at SH-50 Gerukambakkam is 173 PCU /hr. Hence it is concluded that since carrying capacity of SH-50 Gerugambakkam - Red Hills Road is much higher than proposed traffic volume, ie 600 pcu/hr the traffic to & form of proposed will not create any traffic congestion.

#### **e. Soil Quality**

To assess the soil quality, six locations were identified within the study area of the project site. The sampling locations were selected to assess the existing soil conditions representing various land use conditions and geological features. The physical and chemical parameter concentrations were determined for the collected samples.

The pH values in the study area are varying from 5.2 to 6.5, the electrical conductivity is varying from 29.6 to 216.8  $\mu\text{s}/\text{cm}$ , the available Nitrogen is varying from 36.4 to 78.4 mg/kg, the available Phosphorous is varying from 10.6 to 15.0 mg/kg, and the available potassium is varying between 3.0 to 28.3 mg/kg.

#### **f. Ecological Environment**

As the core zone is in industrial area, it is devoid of vegetation, patches of grass (*Rumex hastatus*), (*Cynodon dactylon*) are seen with 2-3 small trees of *Ziziphus mauritiana*. Buffer Zone mainly comprises habitation and it is a populated area. The buffer zone is characterized by some trees and shrubs which are common in occurrence. In core zone few reptiles and Avifauna were found. No threatened, rare, endangered or endemic species were observed

during the survey in core zone. There is no protected wetlands or other ecologically sensitive wetlands within the 10 km radius of the study area.

**g. Socio – Economic Environment**

The Socio-Economic study has been conducted through data collection, namely, review of published secondary data and analysis of primary data. The primary data was collected through a transect walk, administering structured questionnaire, focus group discussions, observations, and key stakeholder interactions in the project area villages. Secondary data was collected from district census statistics of 2011, which includes demography, occupational structure, literacy profile and social structure etc.

The demographic profile shows that the total population of the study area is 131284 (Rural 29005 and Urban 102279) which constitute 33709 (Rural 7531 and Urban 26178) households. The average sex ratio of the study area is 992. The average SC population is 36.31% and ST population of the study area is 1.97 %. According to the census data 2011, the overall literacy rate of the study area is 70.93 % with male literacy rate is 80.66% and female literacy rate is 61.21%. The average percentage of total workers in the project area is 49.87 % with total male and female workers percentage is 60.66 % and 39.34% respectively.

It can be concluded from the table that most of the population depends on agricultural activities for their livelihood. About 28.4 % of the total population depends on agriculture and about 19.6 % of the total population are engaged in private jobs. Almost every household having electricity connections and toilet facilities with supply water from respective panchayats as a source of drinking water. Most of the villages having developed infrastructure for education facility and connected with roadways having transportation facilities like cars, tempo and truck but some villages are devoid of the same. The economic status of villagers justify that about 23 % of total population lies above poverty level and rest 77 % lies below the poverty level.

## 6. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

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

### A. Impacts during Construction Phase

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

Regular water sprinkling shall be done to reduce the dust generation, soil will be compacted well to avoid soil erosion. Proper construction practices shall be followed. Debris generated during construction phase shall be disposed as per Construction and Demolition Waste management Rules, 2016.

### B. Impacts during Operation Phase

During the operation phase of the proposed project, there would be impacts on the air environment, water environment, land environment and socio-economic aspects.

- I. **Air Quality:** The main sources of air pollution include incinerators, DG sets, and vehicular emissions. The incinerators shall be provided with a combined stack of 0.6 m dia & height of 30 m above ground level. Also, Quencher followed by Venturi Scrubber with droplet separator and then Packed bed scrubber followed by mist eliminator shall be provided as Air Pollution Control System. The SPM, SO<sub>2</sub>, NO<sub>x</sub>, HCl, Dioxins & Furans emission reduced by scrubber. A lean concentration of NaOH Solution and water will be used to neutralize the flue-gasses/solutions. To control or prevent fugitive emission regular maintenance of pollution control devices will be carried out. Good housekeeping shall be done. Total 4450.50 Sqm (33%) will be developed as green area. All the vehicles will be regularly serviced and maintained properly to minimize emissions.



- II. **Water Quality:** Total water requirement of the project is 28 KLD out of which freshwater demand is 14.5KLD which will be sourced through Meyyur Panchayat Provisions through tankers and rest shall be in house treated water. Total wastewater generated in the project will be 14.4 KLD which will be treated in ETP. All the treated wastewater will be recycled, no untreated/treated water will be discharged. The facility will be developed as Zero Liquid Discharge System. Collection of effluent will be done properly and safely. All the standards of effluent given in GSR. 446 (E) dated 13.06.2011 will be maintained. Accidental spillage during loading, unloading & storage will be collected separately and disposed of properly. The loading unloading activity will be done with a safe zone defined and in a marked safe area. All systems and connections shall be maintained and checked regularly so that connections are leak proof.
- III. **Noise Level:** The major source of noise in proposed project will be from unloading of waste, DG sets, pumps, motors etc. Machineries of the reputed make and less noise producing will be purchased. Stationary machineries and equipment will be properly enclosed by enclosures and will be provided with dampeners for minimizing noise generated due to vibration of machineries. It will be re-checked and assured that mufflers systems are installed in engines of machineries which will help in reducing noise. Silencers of all the machineries and equipment will be checked and old worn out machineries will be replaced by new and less noisy machineries/equipment. Sufficient oiling and lubrication will be done to all the parts of the machineries to ensure that minimal noise is generated. Greenbelt will be developed all along the site boundary and in the open areas.
- IV. **Land Environment:** All the waste will be collected and kept in separate rooms. No disposal of waste will be done on soil. Procedures for maintenance of equipment would ensure that this risk is minimized, and clean-up response is rapid if any spill occurs. The tankers, drums etc. would be ISO approved and as per the specifications of internationally approved vendor so as to minimize any spillage, etc. therefore there would be no impact on soil after this precaution is ensured. -ump shall be made and proper channelization of spillage shall be made. ETP sludge shall be stored in a separate room and sent to TSDF for proper disposal.

- V. **Ecology:** There are no ecological and sensitive areas viz. wildlife sanctuary, national parks, archeological important areas within 10 km radius of the project site. There are no reports of occurrence of any Rare Endangered Endemic Threatened (REET) fauna in the study area. Installing proper air pollution control system and by developing green belt (as per CPCB guidelines) in 33% area of the proposed facility, the impact on ecology will be minimal.
- VI. **Socio Economics:** To minimize the impact on nearby population. Flexible dust suppression systems (water spray) will be used as per requirement. Preventive maintenance will be carried out for vehicles and pollution check on periodic basis. Materials will be fully covered during transportation to the project site by road. A sheet listing the materials shall be available in the vehicle and the emergency phone numbers shall also be listed. Workers/ driver will be trained for handling of these bio-medical waste. Proper First Aid facility shall be provided within the transportation vehicle in case of any accidental release.

## **7. ENVIRONMENT MANAGEMENT PLAN**

The Environment Management Plan (EMP) is a site-specific plan developed to ensure that the project is implemented in an environmentally sustainable manner where all stakeholders including the project proponents, contractors and subcontractors, including consultants, understand the potential environmental risks arising from the proposed project and take appropriate actions to properly manage that risk. Adequate environment management measures need to be incorporated during the entire planning, installation and operating stages of the project to minimize any adverse environmental impact and assure sustainable development of the area.

The mitigation measures are planned for construction and operation phases and the overall management plan helps to improve the supportive capacity of the receiving bodies. The EMP aims to control pollution at the source level to the possible extent with the available and affordable technology followed by the standard treatments before getting discharged. The recommended mitigation measures will synchronize the economic development of the study area with the environmental protection of the region. The budget allocated for implementation of EMP is Rs. 61 Lakhs with a recurring cost of Rs. 27.4 lakhs per annum.

## **8. ENVIRONMENT MONITORING PROGRAM**

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

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

## **9. OCCUPATIONAL HEALTH AND SAFETY**

- ✓ Occupational health surveillance programme shall be done six monthly & and their records shall be maintained.
- ✓ Company will take reasonable steps to reduce the risk of exposure to infection by establishing written policies and procedures based upon the most currently accepted clinical and occupational health and safety information in consultation with workers, handling and disposing of biomedical waste. These policies and procedures will be reviewed and updated regularly, with compliance to their requirements verified as necessary.
- ✓ Regular assessment of waste management procedures shall be done to assure compliance with applicable standards
- ✓ A written procedure to handle and report needle stick injuries and other waste-

handling incidents shall be there. Injuries caused by needle sticks and sharp instruments will be documented, reviewed, and changes implemented to prevent similar incidents in the future.

- ✓ Type and quality of waste containers will be reviewed regularly, if necessary, it will be upgraded to more suitable container
- ✓ Handling practices will be reviewed regularly to determine problems of inappropriate handling. If so, modify the handling techniques. At project site in case of emergency First Aid facility shall be provided.
- ✓ Health check-up camps shall be organized on a regular basis at company dispensary / nearby locations.
- ✓ Prior to working with bio-medical, workers shall be trained on its proper handling & storage.
- ✓ To educate/ train the workers for MSDS & handling of chemicals.
- ✓ Proper medical facility arrangements shall be provided in case of any accidental release.
- ✓ ESI facility shall be made available.
- ✓ Proper fire-fighting measures like buckets & portable fire extinguishers shall be provided at strategic locations.

## **10. CORPORATE ENVIRONMENTAL RESPONSIBILITY**

As the project cost is Rs. 4.82 Cr. i.e. less than Rs. 100 Crores and is a greenfield project hence, the company will spend about 2% of project cost i.e. 9.64 Lacs for Corporate Environment Responsibility (CER) which would be under Company CSR as per Companies Act, 2013. Under CER, welfare activities will be taken up focusing on health care, education, skill development, infrastructure and green belt/ plantation in nearby areas.

## **11. PROJECT BENEFITS**

### **a) Environmental Benefits:**

- Organized methods for Bio-medical Waste Treatment i.e. Incineration, autoclaving & shredding shall be adopted. A complete bio medical waste disposal solution using the best technology methods shall be provided.
- The Government of India (notification, 1998) specifies that Hospital Waste Management is a part of hospital hygiene and maintenance activities. With proposed

Common Biomedical Waste Treatment Facility Three districts (Thiruvallur, Kancheepuram and Chennai Districts) will get cleaner and healthier environment.

- It will be an environmentally sustainable project.

**b) Financial Benefits:**

- The project will create direct and indirect employment for local people for which skilled and unskilled manpower will be needed. About 25 people will be deployed temporarily during construction/installation of the project and about 45 people will be employed during the operational stage of the project.
- The waste product obtained from shredder shall be sold to authorized recyclers which shall be reused.

**c) Social Benefits:**

- M/s. Environ Bio-Wastes Systems Pvt. Ltd. will provide services to more than 2500 healthcare units.
- Installation of individual treatment facilities by small healthcare establishments requires comparatively high capital investment. In addition, it requires separate manpower and infrastructure development for the proper operations and maintenance of treatment systems. The Centralized system of waste management is the best method in terms of cost reduction and minimizes legal and ethical hassles of health care staff authority
- It will augment organized common Biomedical Waste Treatment in the state

## **12. CONCLUSION**

The EIA study has made an overall assessment of the potential environmental impacts likely to arise from the proposed Common Bio-Medical Waste Management and Treatment Facility. Baseline data was collected for various environmental attributes so as to compute the impacts that are likely to arise due to proposed developmental activity.

Thus, it can be concluded on a positive note that after the implementation of the mitigation measures and Environmental Management Plan, the normal operation of the project will have negligible impact on environment and will benefit the healthcare establishments and local people.