1.0 EXECUTIVE SUMMARY

Rapid growth in population, severe environmental degradation and increased awareness about the health care has created a need for a wide variety of medical facilities. Medical care is vital for our life and health, but the Bio-Medical Waste generated from medical activities and the hospitals represents a real problem of living nature and human world and that are incompatible with the environment.

Improper management of such waste generated in health care facilities causes a direct impact on health of the community, the health care workers and on the environment. Every day, relatively large amount of potentially infectious and hazardous waste are generated in the healthcare facilities around the world. Indiscriminate disposal of Bio Medical Waste and exposure to such waste possess serious threat to human health and environment at large. The Bio-Medical Waste requires specific treatment and management prior to its final disposal so as to minimize the environment impact optimally.

These wastes need professional attention for effective management as the infectious nature of the waste can cause irreparable damage to the human health and the environment. It has become imperative to monitor and control the management and handling of these wastes.

These wastes (bio-medical wastes generated from health care establishments) present a high risk of causing potential damage to the human health and the environment by way of spreading. To prevent the spread of such infectious wastes that finds its genesis in biomedical wastes (from hospitals, clinics, laboratories, dispensaries etc.) a scientific approach is required. From the beginning it is essential that professionally trained personnel should handle the wastes.

The production of waste and use of hazardous substances is affecting the quality of environment and human health as well; Bio medical waste is being one of the prime concerns. If the Bio-Medical Waste is managed indiscriminately, then major threats being:

i. Possible spread of Infectious Diseases

ii. Contamination of Water Bodies, Land and Air Pollution.
To enable effective management and handling of the bio-medical wastes the Ministry of Environment, Forests and Climate Change (MoEF&CC) has issued Rules for the management and handling of these wastes vis-à-vis Bio-Medical Wastes (Management and Handling) Rules 1998, under the aegis of Environment (Protection) Act, 1986. In response of which, the Government and Major Private Hospitals have made their own arrangements for treatment and disposal of biomedical wastes. However, the smaller nursing homes, clinics and other similar institutions which do not have or can afford such facilities need alternate modalities and arrangements to dispose their wastes, in accordance with the Rules. Keeping in view the difficulties faced by private Hospitals, Nursing Homes and Clinics that cannot make their own arrangements due to high cost involved in Treatment facilities, there was need for centralized system for treatment. Later on, in September 2003, the Central Pollution Control Board had made the guidelines for “Common Bio-Medical Waste Treatment Facility” in order to discourage the individual incineration facility by health care establishments and strengthening CBWTF system.

DEFINITION OF BIO-MEDICAL WASTE:

As per Bio-Medical Waste Management Rules, 2016 any waste, which is generated during the diagnosis, treatment or immunization of human beings or animals or in research activities pertaining there to or in the production of testing of biological and including categories mentioned in schedule 1 of the Rule, is the bio-medical waste.

COMMON BIO MEDICAL WASTE TREATMENT FACILITY (CBWTF)

CBWTF (Common Bio-Medical Waste Treatment Facility) is an infrastructural set up where Bio-Medical Waste is treated & disposed of in a most economical and viable method. It is a system that is designed to ensure Win-Win situation for all the Stake holders:

(i) General Public & the End User of Hospital Facilities - happens to gain in cleaner & infectious free environment.
(ii) Hospital Staff - Less of work load since bulk of the responsibilities are outsourced / transferred to well train Staff of Service Provider.
(iii) Hospital Management - Will be able to focus better on their Core Competence.
(iv) Service Providers - Eventually gains from Economies of Scale.
The concept of CBWTF not only addresses these problems but also prevents scattering of treatment equipment in the city/ area. Moreover, monitoring of these facilities is much easier rather than scattered captive Bio-Medical Waste Treatment Facility and one can be ensured of cleaner and safer environment.

**Major Sources:**
- Hospitals/Nursing Homes/Dispensaries/Clinics
- Pathological Laboratories/Blood Banks
- Medical Colleges/Research Centers
- Veterinary Institutions/Animal Houses

**ABOUT E TECH PROJECTS**
To redress this problem and provide the health care establishments with a solution to their waste disposal dilemma **M/s. E Tech Projects** has proposed a Common Bio-Medical Waste Treatment Facility in Nagaur, Rajasthan to provide cleaner and healthier environment by adhering to the provisions of per Bio-Medical Waste Management Rules, 2016 and making an contribution in protecting our environment.

The project is coming up at Khasra no. 1515/75 Balwa Road, Nagaur, Rajasthan over an area of 9000 sq. m. The project involves development of Common Bio Medical Waste Treatment Facility which is categorized under Item 7 (d) (a) of the Schedule-Gazette Notification dated 17th April 2015.

**Activities within the Common Bio-medical Waste Treatment Facility**
The prime activities of CBWTF comprises of collection, reception, storage, transport, treatment & disposal of Bio-Medical Waste collected from the Member Health Care Facilities of the area of operation.

1. **Collection:**
The Bio Medical Waste will be collected by dedicated vehicles of the company. The collection staff will collect the BMW from endpoint of healthcare units on daily basis and sign the Record Book to be maintained by the Healthcare unit in acknowledgement of waste collected. The collection staff will not accept the non-segregated waste and such incident will
be reported to the prescribed authority. The color coded bags handed over by the healthcare unit will be collected by our staff in color coded containers. Sharps will be collected separately in puncture proof containers. All the collection staff will be equipped with protective gears for handling of Bio Medical Waste.

2. **Transportation:**

The bio Medical Waste collected will be transported to CBWTF in a fully covered specially designated vehicle. The vehicle will be designed as per the guidelines of CPCB.

- Separate cabins will be provided for driver/staff and the bio medical waste cabin.
- The base of the waste cabin will be leak proof and will be easy to wash and disinfect.
- The inner surface of the waste cabin will be made of smooth surface to minimize water retention.
- The vehicle will be properly labelled with the symbol of Biohazard as per schedule IV of the Bio Rules and will display the name, address and telephone number of the Company.
- The waste cabin will have provision for sufficient opening from rear side so that Bio Medical Waste can be easily loaded and unloaded.
- The vehicles will be provided with the first aid kit to handle emergency situations.
- Mobile phones will be given at all the vehicles for effective supervision and monitoring the collection and transportation work.

3. **Treatment:**

The Bio-Medical waste consists 60-65% of incinerable waste and 35% - 40% autoclavable waste. Therefore, it is necessary that hospital waste is properly handled, segregated and stored by trained staff of health care establishments. The Health Care Facilities shall be advised to keep four colour coded containers as per Bio Medical Waste Management Rules 2016, 3 types of treatment options shall be provided in Common Biomedical Waste Treatment Facility (CBWTF).

- Incineration
- Autoclaving
- Shredding
Incineration unit is meant for the treatment of:
- Human anatomical waste (human tissue, organs, body parts).
- Animal anatomical waste (animal tissue, organs, body parts, bleedingparts, experimental animals used in research).
- Discarded medicines and toxic drugs (waste comprising of outdated, contaminated and discarded medicines).
- Soiled waste (item contaminated with blood and body fluids including cotton, dressing, soiled plaster casts, lines, bedding other material contaminated with blood).

Autoclave unit is meant for the treatment of:
- Microbiological waste (device used for transfer of medicines).
- Infected Plastic Waste, Gloves etc
- Broken Glass Bottles etc

Shredder Unit is meant for mutilation of treated Waste using Autoclave
- Waste duly treated by Autoclave unit.

Sharp pit is also been provisioned for the encapsulation of Sharps such as Needles, Scalpels etc

Effluent Treatment Unit: for the treatment of Effluent generated during the process of Bio-Medical waste Treatment, Floor Washing and Vehicle Washing etc.

4. Disposal:
The treated bio medical waste will be disposed as under:
- Plastic waste after disinfection and shredding will be handed over to authorized plastic waste recycler.
- Disinfected sharps will be encapsulated on site.
- An ash pit will be provided inside the CBWTF for storage of Incineration ash. Ash pit will be non-leachate and will be covered properly to avoid any rain water entry. If available, the ash will be sent to TSDF site or secured landfill as specified by the prescribed authority.
- Oil and grease will be incinerated.
- ETP Sludge will be incinerated
- Treated water will be used for gardening purpose.

**Table 1: Salient Features of the Project**

<table>
<thead>
<tr>
<th>Name of the project</th>
<th>Common Bio Medical Waste Treatment Facility (CBWTF), Nagaur, Rajasthan.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Promoter</td>
<td>M/s E Tech Projects</td>
</tr>
<tr>
<td>Location of Industry</td>
<td>Khasra No. 1515/75 Balwa Road, Nagaur (Rajasthan)</td>
</tr>
<tr>
<td>Total Plot Area</td>
<td>9,000 sq. m. (0.90 Ha)</td>
</tr>
<tr>
<td>Work shed</td>
<td>2520 sq. m. (28 %)</td>
</tr>
<tr>
<td>Paved Area/Open Surface</td>
<td>3510 sq. m. (39 %)</td>
</tr>
<tr>
<td>Green Area</td>
<td>2970 sq. m. (33 %)</td>
</tr>
</tbody>
</table>

**Capacity**

<table>
<thead>
<tr>
<th>Particular</th>
<th>Capacity</th>
<th>Nos.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incinerator</td>
<td>2.4 Ton per day</td>
<td>1</td>
</tr>
<tr>
<td>Autoclave</td>
<td>0.5 Ton per day</td>
<td>1</td>
</tr>
<tr>
<td>Shredder</td>
<td>0.5 Ton</td>
<td>1</td>
</tr>
<tr>
<td>Effluent Treatment Plant</td>
<td>12 KLD</td>
<td>1</td>
</tr>
</tbody>
</table>

**Water Requirement**

Total 10 KLD water is required for the proposed project. Water requirement is given as:-

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Utilisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.0 KLD</td>
<td>Floor washing, container washing, glass breaking</td>
</tr>
<tr>
<td>1.0 KLD</td>
<td>Domestic Use</td>
</tr>
<tr>
<td>3.0 KLD</td>
<td>Venturi Scrubber</td>
</tr>
<tr>
<td>4.0 KLD</td>
<td>Green Belt Development</td>
</tr>
<tr>
<td>10.0 KLD</td>
<td>Total</td>
</tr>
</tbody>
</table>

**Power Requirement**

Demand : 100 KW from AVVNLE, Nagaur
Source : Ajmer Vidhyut Vitran Nigam Limited

**Power Backup**

DG sets of 125 kVA (1 No.)

**Manpower Requirement**

15 persons

**Estimated Project Cost**

Rs. 3.30 Cr
Nearest Railway Station | • Nagaur Railway Station : 5.91 km towards SE direction.

Nearest Highway | • NH-89 : 3.15 km towards W
• NH-65 : 7.80 km towards SE
• SH-19 : 3.22 km towards W

Nearest Airport | • Jodhpur Airport : 126.2 km towards SW
• Bikaner Airport : 103.09 km towards NNW
• Jaipur Airport : 215.8 km towards ESE

2.0 INTRODUCTION OF THE PROJECT/BACKGROUND INFORMATION

(i) Identification of the Project

Common Bio-medical Waste Treatment Facility (CBWTF) is a set up where biomedical waste, generated from a number of healthcare units, is imparted necessary treatment to reduce adverse effects that this waste may pose. The treated waste may finally be sent for disposal in a landfill or for recycling purposes. Installation of individual treatment facilities by small healthcare units requires comparatively high capital investment. In addition, it requires separate manpower and infrastructure development for proper operation and maintenance of treatment systems. The concept of CBWTF not only addresses such problems but also prevents proliferation of treatment equipment in a city. In turn it reduces the monitoring pressure on regulatory agencies. By running the treatment equipment at CBWTF to its full capacity, the cost of treatment of per kilogram gets significantly reduced. Its considerable advantages have made CBWTF popular and proven concept in many developed countries.

E Tech Projects, Nagaur, Rajasthan is proposing a Common Bio Medical Waste Treatment Facility of capacity 3.4 TPD. The total plot area plant is 9000 sq. m.

| Transportation | Mobile van as per guidelines for transportation of Biomedical Waste.
| Incineration | Dual chambered rotary Incinerator (oil-fired), with air pollution control device
| Autoclaving & Shredding | Autoclaved plastic waste is shredded before final disposal to ensure prevention of reuse and also acts as identifier that the waste has been disinfected and is safe to dispose off
(ii) **Project Proponent**

E Tech Projects is headquartered in Bikaner, operates its Branch offices throughout India. Staffed with more than 100 employees, majority of which comprises of Engineers, each office is providing sales and after sales Support for all the product lines. Besides biomedical waste management services, the Company deals in Critical care, Cardiology, Imaging, emergency & disaster management, neonatal care, turnkey hospital projects & surgery as well. E Tech Projects also has a network of dealers to help its operations to enhance the reach.

The Company is led by committed & promising entrepreneurs – Mr. Manish Kumar, Mr. Gosiya Warsi, Mr. Javed Warsi with a vision to create awareness about Bio Medical Waste and offer standard world class services in the field of Bio-Medical Waste management to the society and to make a contribution in protecting our environment.

(iii) **Brief Description of Nature of Project**

As per the Gazette Notification dated 28th March, 2016 it is the duty of every operator (a person who owns or controls a Common Bio-medical Waste Treatment Facility (CBMWTF) for the collection, reception, storage, transport, treatment, disposal or any other form of handling of bio-medical waste) to:

- Take all necessary steps to ensure that the bio-medical waste collected from the occupier is transported, handled, stored, treated and disposed of, without any adverse effect to the human health and the environment, in accordance with these rules and guidelines issued by the Central Government or, as the case may be, the central pollution control board from time to time.
- Ensure timely collection of bio-medical waste from the occupier as prescribed under the rules.
- Establish bar coding and global positioning system for handling of bio-medical waste.
- Inform the prescribed authority immediately regarding the occupiers which are not handing over the segregated bio-medical waste in accordance with the rules.
• Provide training for all its workers involved in handling of bio-medical waste at the time of induction and at least once a year thereafter.

• Assist the occupier in training conducted by them for bio-medical waste management.

• Undertake appropriate medical examination at the time of induction and at least once in a year and immunize all its workers involved in handling of bio-medical waste for protection against diseases, including Hepatitis B and Tetanus, that are likely to be transmitted while handling bio-medical waste and maintain the records for the same.

• Ensure occupational safety of all its workers involved in handling of bio-medical waste by providing appropriate and adequate personal protective equipment.

• Report major accidents including accidents caused by fire hazards, blasts during handling of bio-medical waste and the remedial action taken and the records relevant thereto, (including nil report) in Form I to the prescribed authority and also along with the annual report.

• Maintain a log book for each of its treatment equipment according to weight of batch; categories of waste treated; time, date and duration of treatment cycle and total hours of operation.

Bio Medical Waste was defined under per Bio-Medical Waste Management Rules, 2016 and the main features of the rules are:

1. Segregation of Bio-Medical Waste from other waste
2. Untreated Bio-Medical waste should not be stored for beyond 48 hours
3. Waste shall be stored in following colour containers/ Bags:
   • Yellow : Incineration Waste
   • Red : Autoclave/ Microwave Chemical Treatment
   • Blue/White : Autoclave/ Microwave Chemical Treatment
   • Black : Disposal to landfill site

The Biomedical Waste generator will take authorization from State Pollution Control Board. Central Pollution Control Board (CPCB) has made guidelines for installation of Common Biomedical Waste Management facility (CBWTF) which has defined following criteria:

1. One CBWTF should at least cater to 10,000 beds and/ or 75Kms in radius from its location.
2. CBWTF will have following equipment for process/ Treatment of Bio-Medical Waste:
   - **Incinerator:** It is a controlled air combustion process where waste is completely oxidized and harmful microorganisms present in it are destroyed/denatured under high temperature.
   - **Autoclave:** Autoclaving is a low-heat thermal process where steam is brought into direct contact with waste in a controlled manner and for sufficient duration to disinfect the wastes.
   - **Shredder:** Shredding is a process by which waste are mutilated/de-shaped or cut into smaller pieces so as to make the wastes unrecognizable. It helps in prevention of reuse of bio-medical waste and also acts as identifier that the waste has been disinfected and is safe to be disposed of.
   - Sharp pit/Encapsulation
   - Vehicle/Container washing facility
   - Effluent Treatment Plant

3. CBWTF should have following infrastructure:
   - Treatment Equipment Room
   - Main Waste Storage Room
   - Treated Waste Storage Room
   - Administrative Room
     - D.G. Set Room
     - Site Security
     - Green Belt
     - Sign Board

4. CBWTF should have proper record keeping:
   - Waste quantum received and treated
   - Solid waste disposal
   - Logbook for equipment
   - Site records
5. CBWTF should have proper waste collection & transportation facility

6. In accordance with the EIA Notification, 2006 & subsequent amendment made by MoEF&CC vide S.O.1142(E) dated 17.04.2015 that the Common Bio-Medical Waste Treatment Facilities are included as under:

<table>
<thead>
<tr>
<th>(1)</th>
<th>(2)</th>
<th>(4)</th>
<th>(5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>7(d) (a)</td>
<td>Bio-Medical Waste Treatment Facilities</td>
<td>All projects</td>
<td>-</td>
</tr>
</tbody>
</table>

Table 2: Biomedical wastes categories and their segregation, collection, treatment, processing and disposal options

<table>
<thead>
<tr>
<th>Category</th>
<th>Type of Waste</th>
<th>Type of Bag or Container to be used</th>
<th>Treatment and Disposal options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellow</td>
<td>(a) Human Anatomical Waste: Human tissues, organs, body parts and fetus below the viability period (as per the Medical Termination of Pregnancy Act 1971, amended from time to time).</td>
<td>Yellow coloured non-chlorinated plastic bags</td>
<td>Incineration or Plasma Pyrolysis or deep burial*</td>
</tr>
<tr>
<td>(b) Animal Anatomical Waste: Experimental animal carcasses, body parts, organs, tissues, including the waste generated from animals used in experiments or testing in veterinary hospitals or colleges or animal houses.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(c) Soiled Waste: Items contaminated with blood, body fluids like dressings, plaster casts, cotton swabs and bags containing</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In absence of above facilities, autoclaving or micro-waving/ hydro claving followed by
<table>
<thead>
<tr>
<th><strong>(d) Expired or Discarded Medicines:</strong></th>
<th><strong>Yellow coloured non-chlorinated plastic bags or containers</strong></th>
<th><strong>Expired `cytotoxic drugs and items contaminated with cytotoxic drugs to be returned back to the manufacturer or supplier for incineration at temperature &gt;1200 °C or to common bio-medical waste treatment facility or hazardous waste treatment, storage and disposal facility for incineration at &gt;1200°C Or Encapsulation or Plasma Pyrolysis at &gt;1200°C. All other discarded medicines shall be either sent back to manufacturer or disposed by incineration.</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Pharmaceutical waste like antibiotics, cytotoxic drugs including all items contaminated with cytotoxic drugs along with glass or plastic ampoules, vials etc.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>(e) Chemical Waste:</strong></td>
<td><strong>Yellow coloured containers or non-chlorinated plastic bags</strong></td>
<td><strong>Disposed of by incineration or Plasma Pyrolysis or Encapsulation in hazardous waste treatment, storage and disposal facility.</strong></td>
</tr>
<tr>
<td>Chemicals used in production of biological and used or discarded disinfectants.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>(f) Chemical Liquid Waste:</strong></td>
<td><strong>Separate collection system leading to effluent treatment system</strong></td>
<td><strong>After resource recovery, the chemical liquid waste shall be pre-treated before mixing with other waste water. The combined discharge shall conform to the discharge norms given in Schedule- III.</strong></td>
</tr>
<tr>
<td>Liquid waste generated due to use of chemicals in production of biological and used or discarded disinfectants, Silver X-ray film developing liquid, discarded Formalin, infected secretions, aspirated body</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Project</td>
<td>Common Bio Medical Waste Treatment Facility (CBWTF), Nagaur, Rajasthan</td>
<td></td>
</tr>
<tr>
<td>---------</td>
<td>-----------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Pre-Feasibility Report</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Promoter</td>
<td>M/s. E Tech Projects</td>
<td></td>
</tr>
</tbody>
</table>

- **Fluids, liquid from laboratories and floor washings, cleaning, housekeeping and disinfecting activities etc.**
  - Non-chlorinated yellow plastic bags or suitable packing material
  - Non-chlorinated chemical disinfection followed by incineration or Plasma Pyrolysis or for energy recovery. In absence of above facilities, shredding or mutilation or combination of sterilization and shredding. Treated waste to be sent for energy recovery or incineration or Plasma Pyrolysis.

- **(g) Discarded linen, mattresses, beddings contaminated with blood or body fluid.**
  - Autoclave safe plastic bags or containers
  - Pre-treat to sterilize with nonchlorinated chemicals on-site as per National AIDS Control Organization or World Health Organization guidelines thereafter for Incineration.

- **(h) Microbiology, Biotechnology and other clinical laboratory waste:**
  - Blood bags, Laboratory cultures, stocks or specimens of microorganism, live or attenuated vaccines, human and animal cell cultures used in research, industrial laboratories, production of biological, residual toxins, dishes and devices used for cultures.
  - Red coloured non-chlorinated plastic bags or containers
  - Autoclaving or micro-waving/hydro claving followed by shredding or mutilation or combination of sterilization and shredding. Treated waste
tubes and sets, catheters, urine bags, syringes (without needles and fixed needle syringes) and vaccutainers with their needles cut) and gloves. to be sent to registered or authorized recyclers or for energy recovery or plastics to diesel or fuel oil or for road making, whichever is possible. Plastic waste should not be sent to landfill sites.

White (Translucent) Waste sharps including Metals:
Needles, syringes with fixed needles, needles from needle tip cutter or burner, scalpels, blades, or any other contaminated sharp object that may cause puncture and cuts. This includes both used, discarded and contaminated metal sharps

Puncture proof, Leak proof, tamper proof containers

Autoclaving or Dry Heat Sterilization followed by shredding or mutilation or encapsulation in metal container or cement concrete; combination of shredding cum autoclaving; and sent for final disposal to iron foundries (having consent to operate from the State Pollution Control Boards or Pollution Control Committees) or sanitary landfill or designated concrete waste sharp pit.

Blue (a) Glassware:
Broken or discarded and contaminated glass including medicine vials and ampoules except those contaminated with cytotoxic wastes.

Cardboard boxes with blue colored marking

Disinfection (by soaking the washed glass waste after cleaning with detergent and Sodium Hypochlorite treatment) or through autoclaving or microwaving or hydroclaving and then sent for recycling.

(b) Metallic Body Implants

(iv) Need for the project and its importance to the Country and or Region
Biomedical waste is generated from Biological and Medical sources and other associated activities, such as diagnosis, prevention, or treatment of diseases. Common generators (or producers) of Biomedical Waste include hospitals, health clinics, nursing homes, medical
research laboratories, dentists, and veterinarians, home health care etc. Disposal of this waste is an environmental concern, as Biomedical Waste is classified as infectious or biohazard and could potentially lead to the spread of infectious disease. Biomedical waste must be properly managed and disposed of to protect the environment, general public and workers, especially healthcare and sanitation workers who are at risk of exposure to Biomedical Waste as an occupational health hazard. Steps in the management of Biomedical Waste include generation, collection, storage, transport, treatment and disposal.

(v) Demand and Supply Gap
The project will cater the bio-medical waste of Nagaur district having approximately 1093 healthcare Units.

(vi) Imports v/s Indigenous Production
No import is needed as the Bio-Medical Waste is generated by the local Health Care hospital and units of the area of operation of CBWTF. Hence the question of any import does not arise.

(vii) Export Possibility
No export activity takes place due to the project.

(viii) Domestic/Exports Markets
There is no product or bye product which can be exported or sold out in domestic market other than the duly disinfected, treated and mutilated plastic scrap which can be sold out to local recycler.

(ix) Employment generation (Direct & Indirect) due to the project
Direct and indirect employment has been generated due to the proposed project. 15 persons will be employed in the plant.
3.0 PROJECT DESCRIPTION

(i) Type of Project including interlinked and interdependent projects, if any.
This project is neither interlinked nor interdependent with any other project. This project is promoted by M/s. E Tech Projects.

(ii) Location detail.
The Project is coming up at Survey no. 1515/75 Balwa Road, Nagaur (Rajasthan).

(iii) Details of alternate sites considered and the basis of selecting the proposed site, particularly the environmental considerations gone into should be highlighted.
No alternative site has been examined for setting up of Common Bio-Medical Waste Treatment Facility. The land with an area of 9000 sq. m. has been leased by the Municipal Council Nagaur for establishment of common biomedical waste treatment facility (CBWTF) for a period of 20 years. The project is located about 1.15 km NNW from village Balwa. The project site is well connected with road network and power supply. All necessary amenities are easily available at the site.

(iv) Size and Magnitude of Operation
The capacity of different divisions is as under:-

<table>
<thead>
<tr>
<th>Particular</th>
<th>Capacity</th>
<th>Nos</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incinerator</td>
<td>2.4 Ton per day</td>
<td>1</td>
</tr>
<tr>
<td>Autoclave</td>
<td>0.5 Ton per day</td>
<td>1</td>
</tr>
<tr>
<td>Shredder</td>
<td>0.5 Ton</td>
<td>1</td>
</tr>
<tr>
<td>Effluent Treatment Plant</td>
<td>12 KLD</td>
<td>1</td>
</tr>
</tbody>
</table>

The project site is over an area of 9000 sq.m.at Nagaur, Rajasthan for CBWTF. The internal land use breakup of the project will be as under:

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Particulars</th>
<th>Area (sq.m)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Work shed</td>
<td>2520</td>
<td>28  %</td>
</tr>
</tbody>
</table>
Project: Common Bio Medical Waste Treatment Facility (CBWTF), Nagaur, Rajasthan
Pre-Feasibility Report
Promoter: M/s. E Tech Projects

<table>
<thead>
<tr>
<th></th>
<th>Particular</th>
<th>Quantity</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Green Belt</td>
<td>2970</td>
<td>33%</td>
</tr>
<tr>
<td>3</td>
<td>Staff Rooms &amp; Open Surface</td>
<td>3510</td>
<td>39%</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>9000</td>
<td>100%</td>
</tr>
</tbody>
</table>

(v) Project description with process details (a schematic diagram/flow chart showing the project layout, components of the project etc. should be given)

A Common Bio-medical Waste Treatment Facility (CBWTF) is a set up where biomedical waste, generated from a number of healthcare units, is imparted necessary treatment to reduce adverse effects that this waste may pose. The treated waste may finally be sent for disposal in a landfill or for recycling purposes.

**Process Diagram:**

Fig 1: Bio Medical Waste Treatment Process

(vi) Raw material required:

This project involves treatment of bio medical waste and the raw material for the process is collected from various hospitals, health care sector nursing homes, clinical laboratories etc.

The Details and the quantity of raw material are as under:-

**Table: 6 Raw material quantity**

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Particular</th>
<th>Source</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Raw Material/Item</td>
<td>Supplier</td>
<td>Quantity</td>
</tr>
<tr>
<td>---</td>
<td>-----------------------------------</td>
<td>---------------------</td>
<td>-----------------------------------</td>
</tr>
<tr>
<td>1</td>
<td>Biomedical Waste</td>
<td>Various health care</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>units</td>
<td>----</td>
</tr>
<tr>
<td>2</td>
<td>Colour coded Trolleys</td>
<td>Local Vendor</td>
<td>as per requirement</td>
</tr>
<tr>
<td>3</td>
<td>Non Chlorinated Colour coded bags</td>
<td>Local Vendor</td>
<td>as per requirement</td>
</tr>
<tr>
<td>4</td>
<td>Diesel</td>
<td>Nearby Petrol Pump</td>
<td>4500 ltr/month or As per requirement</td>
</tr>
<tr>
<td>5</td>
<td>Spares</td>
<td>Local Vendor</td>
<td>As per requirement</td>
</tr>
<tr>
<td>6</td>
<td>Chemicals:</td>
<td>Local Vendor</td>
<td>As per requirement</td>
</tr>
<tr>
<td></td>
<td>• Sodium Hypochlorite</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Caustic soda</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Lime</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Alum</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Disinfectant</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Personal Protection Equipment (PPE)</td>
<td>Local Vendor</td>
<td>As per requirement</td>
</tr>
</tbody>
</table>

**Mode of transport of raw materials and finished products**

Bio-Medical Waste is collected and transported to CBWTF in a fully covered specially designed and dedicated vehicle (as per the guidelines of CPCB). Number of vehicles used will be as per requirement.

**Vehicle Specifications:-**

- A fleet of 05 dedicated vehicles designed as per the specification and guidelines of CPCB/ RSPCB.
- Separate cabins for driver/staff and the bio medical waste.
- The inner surface of the waste cabin will be smooth to minimize water retention, easy to wash and disinfect.
- The waste cabin will have provision for sufficient opening from rear side so that BMW can be easily loaded and unloaded.
- Each vehicle will be fabricated so as to carry BMW without any spillage, leakage and meeting the other statutory requirements.
The vehicles will be properly labelled with the symbol of Biohazard as per schedule IV of the Rules and will display the name, address and telephone number of the Company.

The vehicles will be provided with the first aid kit to handle emergency situations. Vehicles will be equipped with communication equipments and safety gadgets.

Apart from above, the GPS Tracking system will be installed in vehicles to monitor the movement of vehicles.

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

Since the project involves the development of Bio-Medical Waste treatment plant, therefore there is nothing to be recycled but only the water used in the process of treatment of Biomedical Waste shall be reused after treatment using ETP and other solid waste viz. glass bottle/plastic waste shall be handed over to authorize recycler there by insuring resource optimization.

(viii) Availability of water its source, energy/power requirement and source should be given.

About 10 KLD water will be used for the proposed project which is source from ground water.

(ix) Power and fuel requirement

The estimated power requirement for the proposed project is 100KW which will be sourced from AVVNL, Nagaur (Ajmer Vidyut Vitran Nigam Limited). DG Set (1 No.) of 125 KVA will be also used as power backup resource.Diesel (HSD) requirement for the project will be 4500Ltrs /month

Source: Nearest diesel pump

(x) Manpower Requirement

The manpower for the proposed project is as under:-
Table: 7 Manpower Requirements

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Particulars</th>
<th>Nos</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Manager(Operation &amp; Admin)</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Accounts</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>Supervisor (Plant &amp; Transportation)</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>Operator for incinerator</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>Operator for Autoclave</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>Driver</td>
<td>4</td>
</tr>
<tr>
<td>7</td>
<td>Helper</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>15</strong></td>
</tr>
</tbody>
</table>

(xi) Quantity of wastes to be generated (liquid and solid) and scheme for their management/disposal.

Solid and liquid waste is generated due to the project which is responsibly managed. Approximately 8 KLD water effluents will be generated from all sources such as Venturi Scrubber, Floor Washing, Vehicle/ Container Washing etc. and the same is treated in ETP and after treatment the treated water is recycled and reused in the Quencher as well in Air Pollution Control Device (Venturi Scrubber). Solid waste generated is managed as:-

Table: 8 Solid waste disposal

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Process</th>
<th>Type of waste</th>
<th>Disposal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Incineration</td>
<td>Incinerated Ash</td>
<td>Municipal Landfill</td>
</tr>
<tr>
<td>2</td>
<td>Autoclaving</td>
<td>Autoclaved/ shredded plastic waste</td>
<td>Through authorized recyclers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sharp</td>
<td>Encapsulation</td>
</tr>
<tr>
<td>3</td>
<td>ETP</td>
<td>Sludge</td>
<td>After incineration in Municipal Landfill</td>
</tr>
</tbody>
</table>

4.0 SITE ANALYSIS

(i) Connectivity

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Particulars</th>
<th>Name</th>
<th>Distance &amp; Directions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Nearest habitation</td>
<td>Village Balwa</td>
<td>1.17 Km towards NW</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Nagaur</td>
<td>7.03 km towards NW</td>
</tr>
</tbody>
</table>
2. Nearest Highway
   - NH-89
   - NH-65
   - SH-19
   3.15 km towards W
   7.80 km towards SE
   3.22 km towards W

3. Nearest Railway
   - Nagaur Railway Station
   5.91 km towards SE direction.

4. Nearest Airport
   - Jodhpur Airport
   - Bikaner Airport
   - Jaipur Airport
   126.2 km towards SW
   103.09 km towards NNW
   215.8 km towards ESE

(ii) Land Form, Land use and Land ownership

The CBWTF project is coming up on 9000 sq. m. of plot area which is leased for 20 years in the name of M/s E Tech Projects, for establishment of common biomedical waste treatment facility in Tehsil & District Nagaur, Rajasthan.

Table: 9 Land Status of Leased out Area

<table>
<thead>
<tr>
<th>Near Village</th>
<th>Tehsil</th>
<th>District &amp; State</th>
<th>Khasra No</th>
<th>Status of land</th>
<th>Area in sq.m</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>Nagaur</td>
<td>Nagaur, Rajasthan</td>
<td>1515/75</td>
<td>Leased Land</td>
<td>9000 sq. m</td>
</tr>
</tbody>
</table>

(iii) Topography (Along with map)

Nagaur district is located almost in the middle of the state of Rajasthan and extends between North latitudes 26°25’ and 27°40” and East longitudes 73°10” and 75°15”.

It covers an area of 17778 sq. km. out of which 17448.5 sq. km is rural area and 269.5 sq. km is urban. The Nagaur district is bounded on the north by Bikaner and Churu districts, on the east by Sikar and Jaipur districts, on the south by Ajmer, and Pali districts and on the west by Jodhpur districts. Nagaur district covers only 5.18 percents of the total area of the state.

The district is Maximum part of the district is Thar Desert. North-western part has large sand mounds. Southern part of the district is some leveled. Nagaur district has only river name LUNI which flows 37 Km. only in rainy season.

(iv) Existing land use pattern (agriculture, non-agriculture, forest, water bodies (including area under CRZ), shortest distances from the periphery of the project to periphery of the forests, national park, wild life sanctuary, eco sensitive areas, water
bodies (distance from the HFL of the river), CRZ. In case of notified industrial area, a copy of the Gazette notification should be industrial area, a copy of the Gazette notification should be given.

The site is situated in industrial area. The land breakup of the project will be as follows:

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Particulars</th>
<th>Area (sq.m)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Work shed</td>
<td>2520</td>
<td>28%</td>
</tr>
<tr>
<td>2</td>
<td>Green Belt</td>
<td>2970</td>
<td>33%</td>
</tr>
<tr>
<td>3</td>
<td>Staff Rooms &amp; Open Surface</td>
<td>3510</td>
<td>39%</td>
</tr>
<tr>
<td>4</td>
<td>Total</td>
<td>9000</td>
<td>100</td>
</tr>
</tbody>
</table>

There is no wild life sanctuary, biosphere reserve, national park, tiger reserve within 10 km radius of the project site. 10 km radius GT toposheet map is attached as Annexure.

(v) **Existing Infrastructure**
This is a proposed CBWTF unit for the treatment of Bio Medical Waste. A well equipped first aid facility will be available at the site. Permanent rest shelter, urinals and latrines will be present. Water will be sourced by ground water. Amenities/ Facilities will be provided for workers by the industry owners.

(vi) **Soil Classification**
Four types of soils have been reported in the district viz, clay, clay loam, sandy loam and sandy soil. The general texture of the soil in the area is sandy loam to clayey loam which is further classified into “Barani” or un-irrigated and “Chahi” or irrigated soil. A part of Nagaur tehsil and south-eastern part of Merta tehsil have deep sandy loam, while red loamy soil exists elsewhere in Merta tehsil except on the banks of river Luni. Light loamy soil occurs in Parbatsar tehsil away from hill ranges. A longitudinal belt from Didwana to Nawa extending up to Sambhar Lake has the characteristics of alkaline soil. Distribution of different types of soils is shown in table:-

**Soil Types in Nagaur district**

<table>
<thead>
<tr>
<th>S. No</th>
<th>Soil type</th>
<th>Block</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Clay</td>
<td>Nagaur, Jayal, Merta, Riyan, Parbatsar</td>
</tr>
<tr>
<td>2.</td>
<td>Clay loam</td>
<td>Nagaur, Kuchaman, Jayal, Riyan, Merta, Degana, Makarana,</td>
</tr>
</tbody>
</table>
(vii) **Climatic data from secondary sources**

The district experiences arid to semi-arid type of climate. Mean annual rainfall (1971-2005) of the district is 410 mm whereas normal rainfall (1901-1970) is lower than average rainfall and placed at 363.1 mm. It is obvious that there is significant increase in rainfall during the last 30 years.

(viii) **Social Infrastructure Available**

1. **Railway Station:** Nearest railway station is Nagaur Railway Station which is about 5.91 km towards SE direction.
2. **Road:** District is well served by a network of metalled and unmetalled road. NH-89 is about 3.15 km in W direction. NH-65 is about 7.80 km SE direction. SH – 19 is 3.22 km in W direction.
3. **Medical Facilities:**
   JLN Hospital, Nagaur is at located in about 2.01 km SE.
4. **Electricity:** The estimated power requirement for the proposed project is 100 KW which will be sourced from AVVNL, Nagaur (Ajmer Vidhyut Vitran Nigam Limited). DG Set (1 Nos) of 125 KVA will be also used as power backup resource. Diesel (HSD) requirement for the project will be 4500 Ltrs/month.
5. **Educational Facilities:** Primary schools are available at most of the prominent villages in 10 kilometers of the project area.

5.0 **PLANNING BRIEF**

(i) **Planning Concept (type of industries, facilities, transportation etc.) Town and country Planning/Development authority Classification**
M/s. E Tech Projects is proposing to establish a Common Bio-Medical Waste Treatment Facility (CBWTF) where Bio-Medical Waste generated by surrounding member health care establishments will be collected, transported, treated & disposed of as per Bio-Medical Waste Management Rules, 2016. At present there are large numbers of health care units present in Nagaur and they generate huge quantity of BMW daily. In order to manage this quantum of Bio-Medical waste a CBWTF will be established in Nagaur.

Bio-Medical Waste will be collected from the entire Nagaur district in different colour coded bags/containers. After collecting the waste will be transported in closed vehicles to Common Bio-Medical Waste Treatment Facility. In Common Bio-Medical Waste Treatment Facility different types of waste will be treated in different units (incinerator, Autoclave, Shredder) as applicable to that category. Finally treated waste will be disposed off as per Bio-Medical Waste Management Rules, 2016.

Facilities will include temporary rest shelter, first aid center. The project site is well connected with road network. Other facilities such as power, transportation and communication, social infrastructure facilities are locally available near project site.

(ii) **Population Projection**  
The project will employ most of the workers from nearby areas. Local people from nearby villages will be given preference. Around 15 people will be employed due to the project.

(iii) **Assessment of Infrastructure Demand (Physical & Social)**  
The development of the CBWTF Plant eventually results in the development of the social infrastructure and also helps in providing employment to the local population. The road facility is available which is used and properly maintained. The project is well connected with state highway and national highway. Clean drinking water and medical facilities are made available at project area.

(iv) **Amenities/Facilities**  
The project is situated at about 6.5 km NW from Nagaur and is well connected through rail and road network. Communication facilities such as post office, telecommunications...
are available in Nagaur district and in nearby villages. Medical facilities and electricity are available in the all nearby areas.

6.0 INFRASTRUCTURE

(i) Industrial Area (Processing Area)

The project is a proposed Common Bio Medical Waste Treatment Facility Plant consisting of machine shed area of 2520 sq. m.

(ii) Green Belt

Green belt planning will be done with ecological perspectives for the project taking into consideration and availability of space and other aspects. This will help in increasing the aesthetic effect of the environment. Proposed plantation will maintain the regional ecological balance and will conform to soil and hydrological conditions. Total area for green belt shall be 2970 (sq. m. (~33% of total plot area).

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Botanical Name</th>
<th>Common Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Azadirachtaindica</td>
<td>Neem</td>
</tr>
<tr>
<td>2</td>
<td>Ficus religiosa</td>
<td>Peepal</td>
</tr>
<tr>
<td>3</td>
<td>Saracaasoka</td>
<td>Ashok tree</td>
</tr>
<tr>
<td>4</td>
<td>Plumeria alba</td>
<td>Champa</td>
</tr>
<tr>
<td>5</td>
<td>Psidiumguajava</td>
<td>Amrood</td>
</tr>
</tbody>
</table>

(iii) Connectivity (Traffic and transportation Road/Rail/Metro/Water ways etc.)

Nearest railway station is Nagaur Railway Station which is about 5.91 km towards SE direction. District is well served by a network of metalled and unmetalled road. NH-89 is about 3.15 km in W direction. NH-65 is about 7.80 km SE direction. SH – 19 is 3.22 km in W direction.

(iv) Drinking Water Management (Source & supply of water)

Water required for drinking purpose will be met through ground water supply. Approx 10 KLD water will be required for domestic as well as process purposes.
(v) **Industrial Waste Management**

The amount of waste water generated during the CBWTF’s operation, Floor washing, Vehicle/ container washing, boiler blow down and domestic use will be treated using in-house ETP and the Treated water will be reused in venture scrubber / vehicle washing/ for irrigation in green belt.

The effluent treatment plant consists of the following Units:

1. Collection Tank
2. Feeding Pump
3. Chemical Dosing tank
4. Equalization Tank
5. Primary Reaction cum Settling Tank
6. Secondary Reaction cum Settling Tank
7. Collection Tank
8. Activated Dual Media Filter

*Fig: ETP Flow Chart*
### Expected Characteristics of Raw Effluent Sample

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Parameters</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>pH</td>
<td>5-8</td>
</tr>
<tr>
<td>2.</td>
<td>Total Suspended Solids</td>
<td>350-500</td>
</tr>
<tr>
<td>4.</td>
<td>BOD</td>
<td>150-250</td>
</tr>
</tbody>
</table>

### Expected Characteristics of the Treated Waste Water

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Parameters</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>pH</td>
<td>6-7</td>
</tr>
<tr>
<td>2.</td>
<td>Total Suspended Solids</td>
<td>&lt;100</td>
</tr>
<tr>
<td>3.</td>
<td>BOD</td>
<td>&lt;30</td>
</tr>
<tr>
<td>4.</td>
<td>COD</td>
<td>&lt;250</td>
</tr>
</tbody>
</table>

* All concentration values are in mg/I excepting that of pH

(vi) **Solid Waste Management**
- Incinerator ash will be generated as waste after the treatment of Bio medical waste and is disposed as per the rules.
- Municipal solid waste generated will be sent to district municipal corporation site for safe disposal.
- Used plastic bottles will be shredded into pieces and resulting plastic will be later sold to recyclers.
- The domestic waste will be disposed through municipal dustbins.
- ETP will be used for the treatment of waste water.
- ETP Sludge shall be treated on site using incineration facility and Incineration Ash will be handed over to authorized treatment and disposal facility of Rajasthan State Pollution Control Board.

### 7.0 REHABILITATION & RESETTLEMENT(R&R PLAN)

(Policy to adopted (Central/State) in respect of the project affected person including home oustees, land oustee and landless labour (A brief outline to be given).

The project site has been leased to M/s. E Tech projects for establishing Common Bio Medical Waste Treatment Facility (CBWTF) in Nagaur for a period of 20 years. The project
will involve handling, storage, treatment and disposal of Bio-medical waste. The project site will be specifically designated for CBWTF as such there will be no home oustees, land oustees and landless labour due to the project. So there is no need of rehabilitation and resettlement plan so far.

8.0 PROJECTSCHEDULE AND COST ESTIMATES

i. (Likely date of start of construction and likely date of completion (time schedule for the project to be given)

Project will be operational after getting environmental clearance from SEAC, Rajasthan.

ii. Estimated project cost along with analysis in terms of economic viability of the project

Total Project Cost : Rs.3.30 crores

The profitability of the project depends upon the treatment of bio medical waste coming from various hospitals and healthcare centers in the city and nearby areas.

9.0 ANALYSIS OF PROPOSAL (FINAL RECOMMENDATIONS)

Financial and social benefits with special emphasis on the benefit to the local people including tribal population, if any, in the area.

CBWTF (Common Bio-Medical Waste Treatment Facility) is a proposed infrastructural set up where Bio-Medical Waste will be treated & disposed of in a most economical and viable method.

It is a system that will be designed to ensure Win-Win situation for all the Stake holders:

- General Public & the End User of Hospital Facilities: Happens to gain in cleaner & infectious free environment.
- Hospital Staff: Less of work load since bulk of the responsibilities are outsourced / transferred to well trained staff of Service Provider.
- Hospital Management: is able to focus better on their Core Competence.
- Service Providers: Eventually gains from Economies of Scale.
Therefore this project shall ensure following benefits to the society:

- Cleaner and healthier surroundings.
- Reduction in the incidence of hospital acquired and general infections.
- Reduction in the cost of infection control within the hospital.
- Reduction in the possibility of disease and death due to reuse and repacking of infectious disposal.
- Low incidence of community and occupational health hazards.
- Reduction in the cost of waste management through appropriate treatment and disposal of waste.
- Employment generation of 15 people.

**********