EXECUTIVE SUMMARY

1. About Project

The proposed project of setting up of Common Biomedical Waste Treatment Facility (CBWTF) falls under Category "B", schedule 7(da) as per the EIA notification, 2006 and after the subsequent amendments made in 2009 and 2015. Environmental clearance from MoEF&CC for the setting up of CBMWTF has become mandatory, in terms of the directions issued by the National Green Tribunal on 28th November, 2013. In order to tackle the various problems that arise as a result of improper disposal of biomedical wastes, a Common Biomedical Waste Treatment Facility (CBWTF) is set up.

M/s. Vidarbha Enviro Solutions LLP proposes to set-up common Integrated Biomedical Waste Management Facility with biomedical wastes per day, covering 10,000 beds of health care at District Bhandra and Gondia of Maharashtra.

2. About Project Proponent

M/s Vidarbha Enviro Solutions LLP is a partnership firm. The Partners are carrying on the business of treatment and all type of wastes under the name of M/s. Vidarbha Enviro Solutions LLP at Gondia in terms of deed of partnership dated 1st August 2017. Details of Partners are given below:

Mr. Vashim Siddiki

Mr. Rajesh Jha

Mr. Gulamdastgir Pathan

Mr. Altaf Mahabbe

3. Location of The Proposed Project

The project is located a Latitude 21°13'32.6" North & Longitude 80°09'16.2" East covering an area of 5463.25 m^2 (1.35 Acres). The proposed site is on the outskirt of the village Pandhari on the side of NH-6 in Sadak Arjuni, Gondia District of Maharashtra. **Figure 2.1** showing Google image of the project

Figure 2.1: Google image of the project site

4. Area Statement

The area of plot is 5463.25 m^2 (1.35 acres) and the proposed facility will cater the needs of all biomedical waste generated in surrounding hospital. A greenbelt development plan will be prepared and implemented along with the project. Total green belt area shall be of 1400 m^2.

Area break up of project is given in **Table 3.1** and Master layout is shown in **Figure 3.1.** Salient features of the project showing in **Table 3.2**. Environmental and other attributes of the area is given in the **Table 3.3.**

Table 3.1 Area break up of project

Sr. No.	Facility	Area in m^2
1	Incinerator Shed	144
2	Autoclave/Shredder	20
3	ETP	20
4	Administration Block	60
5	Electric Panel Room	24
6	Store Room	32
7	Unloading Bay	132
8	Underground Sump	9
9	Parking Slot	60
10	Labor changing Room	48
11	Guard Room	12
12	Chimney/ stack	9
13	Green Belt 1 & Green Belt 2	1400
14	Internal Road	2020
	Total Area	**3990**

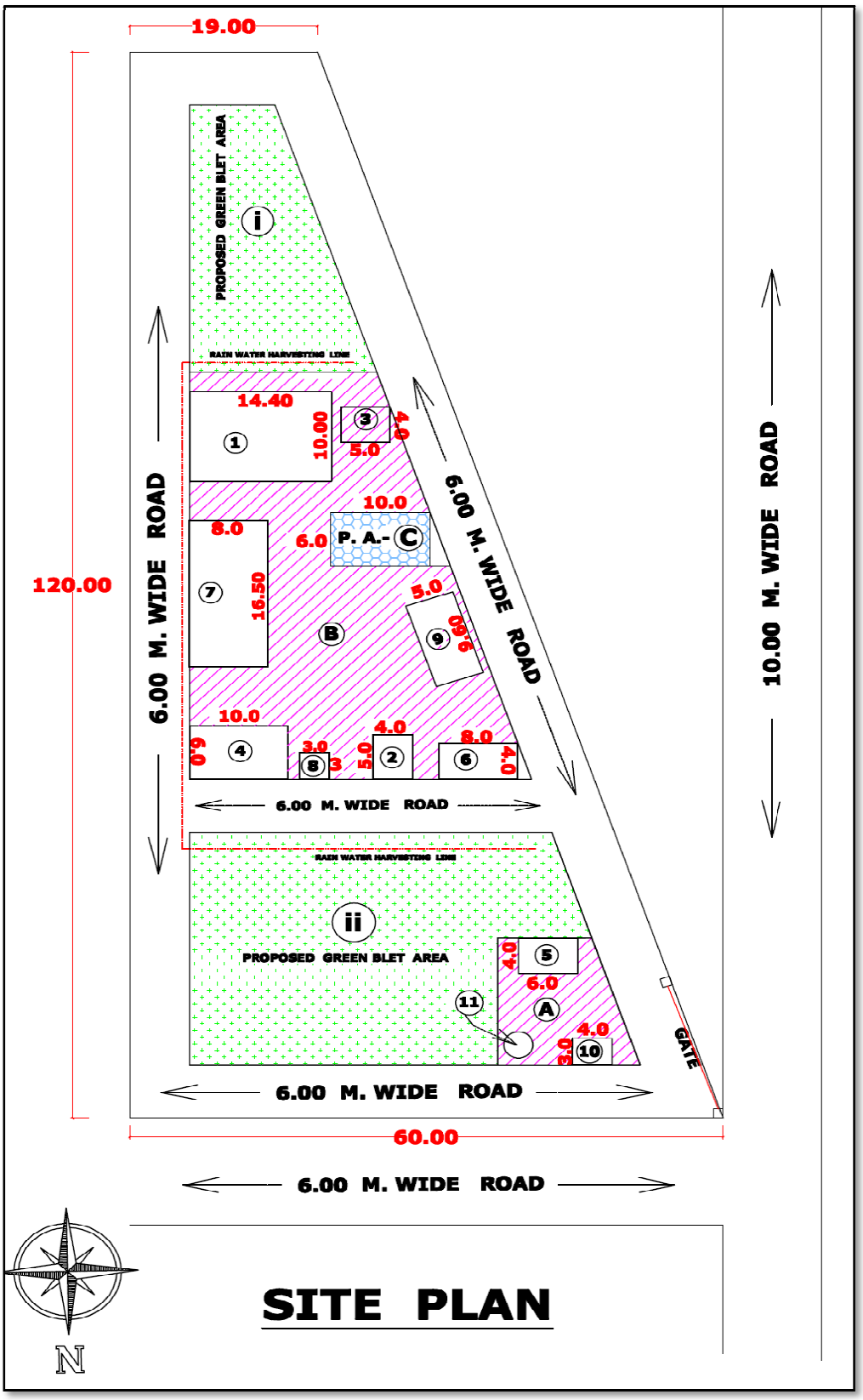

Figure 3.1 Master Layout

Table 3.2 Salient features of the project

Sr. No	Activities	Status
1.	Name	**M/s. Vidarbha Enviro Solutions LLP**
2.	Address	Gondia District, Maharashtra
3.	Type of the project	New
4.	Product details	Common Bio-Medical Treatment Waste Facility
5.	Company Incorporation	Date of Incorporation:12/08/2017 Udyog Aadhaar Registration Certificate Certificate No: MH11E0022008
6.	Mean Sea Level	299 m AMSL
7.	Site Coordinate	Latitude 21°13'32.6" North Longitude 80°09'16.2" East
8.	Treatment capacity	250 kg/hr Covering Up to 10,000 beds in and around Gondia and Bhandara
9.	Total Area	5463.25 m^2 (1.35 Acres)
10.	Green Belt Area	1400 m^2
11.	Built up area	570 m^2
12.	Internal road	2020 m^2
13.	Project cost	Rs. 2.55 Crore
14.	Proposed EMP Cost	EMP during construction phase: Rs. 5.00 Lakhs EMP during Operation phase: Capital Rs. 26.00 Lakhs & O & M: Rs.19.00 Lakh/year
15.	Fuel requirement	High Speed Diesel – 66 Litres/hr
16.	Water Requirement	Total Water requirement for this proposed project will be about 20 KLD during Non Monsoon Season and 11 KLD during Monsoon. – Process Requirement (Lab, Eye wash etc) – 7 CMD – Vehicle Washing – 2 CMD – Domestic Requirement – 2 CMD – Greenbelt Development – 9 CMD
17.	Source of Water	Pandhari Grampanchayat
18.	Waste Water Details	Sewage generation will be 1.8 KLD Effluent Generation will be 9 KLD Capacity of ETP will be 13 KLD Quantity of the Recycled Water will be 9.0 KLD
19.	Water Pollution Control System Details	ETP of capacity 13 KLD will be installed
20.	Stack Details	1 No. of incineration stack of 30 m height 1 No. DG Set stack of height 5 m above roof
21.	Air pollution control system details	Venturi Scrubber, Quencher, Multi Cyclonic Droplet Separators, Flooded scrubber with Quenching Arrangement. Media of the Scrubber will be Water.
22.	Power Requirement	During Construction Phase: (Demand Load) – 20 kVA During Operation phase (Demand load) – 30 kVA During Operation phase (Connected load) – 50 kVA
23.	Alternative power source	During Construction Phase – 1 Nos. D.G Set Capacity 50 kVA During Operation Phase – 1 No. of DG set of capacity 50

		kVA Transformer – 30 kVA
24.	Hazardous waste details	ETP Sludge – As per actual Incineration Ash – 113 kg/day
25.	Hazardous Waste Management	Membership with Butibori Nagpur (CHWTSDF)
26.	Non Hazardous solid waste	NA

Table 3.3 Environmental and other attributes of the Area

Sr. No.	Particular	Details (Approx. Aerial Distance from project site)
1	Nearest Town/City	District: Gondia (26 Km) N
2	Nearest Village	Village: Sadak Arjuni (15 Km) S
3	Nearest Railway Station	Gongle Pandhari (0.76 Km) SW
4	National Highway	NH-6, Distance- 17 Km (S)
5	Nearest Airport	Dr. Babasaheb Ambedkar International Airport, Nagpur (160 Km) W
6	Nearest River/Canal	Chulbandh Dam spillway a & reservoir 6.59km E Mangezari Lake 8.2 NW Rangepar Reservoir 5.35N
7	Archaeological Important Place within 10 km radius	No

5. Size And Magnitude of The Operation

The total cost of the project is Rs. 2.55 Crores. The following are the proposed equipment to be installed in the plant. Refer **Table 5.1.**

Table 5.1 Component of Units (Equipment to be installed)

Sr. No.	Equipment	Installed Capacity	Number
1	Incinerator	250 kg/hr	1
2	Autoclave	24 liters per batch	1
3	Shredder	100 kg/hr	1
4	Effluent Treatment Plant	6 KLD	1

5.1 Methodology

An integrated waste management system for treatment of biomedical wastes must look into various stages of the process to complete the operation. These key components in the process of treatment can be broadly classified as stated below:

- Segregation of Waste at source
- Waste Collection and Transport
- Waste Treatment, Storage and Disposal

- **Waste Segregation**

Waste segregation will reduce the load of bio-medical waste from about 0.5 to 1 kg/bed/day and this also minimize the environmental impacts associated with further processing. Waste will have to be segregated into domestic refuse, hazardous waste and infectious waste separately. Further the infectious waste will have to be segregated into plastics, metals, and other infectious waste generated. Segregation is done effectively if performed at source. CPCB has issued clear guidelines for colour coded segregation.

- **Waste Collection and Transport**

Facility / unit have to ensure that there are no environmental or human health impacts while collecting & transporting Bio-Medical waste.

- **Treatment/ Storage/ Disposal:**

Treatment/ Storage and disposal of the waste have various options available. Waste treatment can be effectively performed by two operations running parallel to each other:

1. A Disinfecting Unit

A Disinfecting unit is one that will effectively kill all the microorganisms. Autoclaving, Microwaving, Hydroclaving and Chemical disinfection processes are the most prevalent technologies used for disinfection of pathogens from the bio-medical waste.

Autoclave used for the purpose of bio-medical waste management is expected to be dedicated for the purpose and is expected to operate under standards specified by CPCB. Medical Waste shall not be considered treated unless the time, temperature and pressure indicated in the standards are reached (for e.g. 121°C, 15 psi for 60 minutes for normal autoclave or 45 minutes for a vacuum type autoclave).). Microwave and Hydroclave disinfection units are similar in application to that of an autoclave. Microwave technology cannot be applied for cytotoxins, hazardous or radioactive waste, contaminated animal carcasses, body parts and large metal items. Microwave should completely and consistently kill the bacteria and other microorganisms. Chemical disinfection is a process of disinfection wherein chemical disinfectants like chlorine and its derivatives or their disinfectants are used in a closed process to attain complete killing of the pathogens.

2. A Destruction Unit

A Destruction unit is one that will completely destroy the waste into safe end products. High temperature incinerators are used to achieve this. Incineration is a process by which combustible materials are burnt, producing combustion gases and non-combustible residue and ash. The combustible gases are vented into the air after treatment through air pollution control devices. Ash and other non-combustible residue remain after the destruction/ incineration process is disposed off securely into a landfill site.

- **Waste Storage**

Waste Storage is an applicable option for effective storage of certain hazardous waste like mercury and cytotoxins that do not have a cost-effective treatment technology as yet. Waste Disposal is primary performed by deep burial of waste into secure landfills.

- **Waste disposal**

Waste disposal is an option which remains to exist irrespective of the treatment options, in case of disinfection waste material post-disinfection needs to be land filled and in case of incineration the non-combustible residue and ash needs to be disposed off into a landfill and thus landfill remains to be an integral part of an integrated bio-medical waste management facility including recyclable Plastic & Glass Waste after disinfection shall be recycled inside the premises for final disposal such as Fuel recovery or Plastic & Glass Product for further re-use in various Industry.

5.2 Proposed Treatment Technology

1. Incineration

The primary purpose of incineration is to burn the waste to ashes through a combustion process. Vidarbha Enviro Solutions intends to setup a 250 Kg/hr incinerator. The unit shall be a dual chambered diesel-fired incinerator. The primary chamber's primary purpose would be combustion of the waste materials into safe end products (ash).The temperature of the primary chamber would be of 8000°C, wastes shall be completely destroyed. The primary chamber would have an attached burner with auxiliary fuel supply to augment the fuel requirements and ensure maintenance of temperatures. The purpose of the secondary chamber would be to burn off gases and ensure safe end products (gaseous). The secondary chamber would operate at a temperature minimum of 10500°C ± 500°C. The gases would be completely burnt and safe gases then shall be let out of the incinerator unit.

The incinerator shall be completely automated with control panel and continuous recording of temperatures. The entire system is very simple and is easy to operate. The system is environmentally safe without any hazard.

Summary of the Features of the Proposed Incinerator are:

- Dual combustion Chambered Incinerator, with MS outer shell and Internal lining using high alumina and low silica refractory fire bricks and backed up by insulation bricks to withstand 14000°C.
- They shall be connected with fully automatic spark ignited pressure jet burners assembly to be run using HSD/LDO with all necessary interlocks like the cut-off systems.
- Electrically operated slide gate with reverse forward moving arrangement fitted on top of the feed hopper.
- Method of feeding the waste to the primary chamber shall be mechanical and electrically operated.

- A multiple-cycle conveyor belt system to reduce the PM level of the gas coming out of the secondary chamber.
- Interconnected ducting from combustion chamber to ventury shall also be lined inside portion with high grade heat resistant refractory material.
- The system shall be supported with combustion air supply through an FD fan.
- Temperatures in both the chambers shall be continuously recorded, graphically.
- The incinerator has been designed according to the latest specifications envisaged in BMW Rules, 2016.

2. Autoclave

The proposed autoclave is a high pressure high vacuum steam sterilizer. This technique uses mechanical air removal with the help of vacuum pump and offers several advantages over standard sterilization cycle such as:

- Nearly 100% air removal from sterilization chamber.
- Better temperature uniformity in the chamber because of the absence of air pockets which result in cold spots.
- Good penetration of steam in porous products from which removal of air is difficult.
- Vacuum drying at the end of sterilization hold period ensures drying of the material which has been sterilized.

Summarily, the High Pressure High Vacuum Steam Sterilization Cycle consists of following phases, which are as follows:

a. Vacuum Steam Pulsing
b. Heat up
c. Sterilization holds

The primary purpose of autoclave is to sterilize/ disinfect the waste with steam.

Microorganisms which contribute to infection do not survive beyond 80°C. However, as a precaution MoEF&CC has stipulated a minimum sterilization temperature of 121° C with 15 pounds per square inch (psi) pressure to ensure distribution of temperature. At this temperature and pressure, microorganisms are completely destroyed and thus render the wastes infection free.

The Facility will be provided with an autoclave maintaining above principles, thus rendering the wastes free from infection. The disinfected waste shall then be segregated into HDPE, PP, rubber, latex, glass and metal. The segregated material shall be shredded completing the process of disinfection and ensuring non-recycling and reusing of the waste material for medical/ food grade purposes. As an added safety, it is proposed to setup programmable high pressure high vacuum type autoclave which can be operated at

set temperature and pressure. It is proposed to operate the autoclave with 135° C temperature and 31 psi pressure and residence time of 30 minutes. This is also another stipulation set by MoEF&CC. The system shall be controlled by a Program Logistic Control (PLC) and Man Machine Interface (MMI) which has tamper proof continuous recording devices to record the operational parameters, batch, load and operator number, date, time and other details as required.

3. Shredder

Shredder will be installed by the side of Autoclave for immediate shredding of sterilized materials to complete the cycle of operation of disinfection and segregation for reuse/recycle. The capacity of shredder will be 100 kg per hour with 7.5 HP motor.

6. Description of Environment

6.1 Study Area

Study area for the Integrated Common Bio-Medical Waste Treatment Facility is taken as an area within 10 km radius from the project site. Baseline monitoring for environmental parameters were carried out in the pre monsoon season (February, March and April) 2019

Study area of 10 km radius is shown in **Figure 6.1** and locations of baseline monitoring are given in **Table 6.1.**

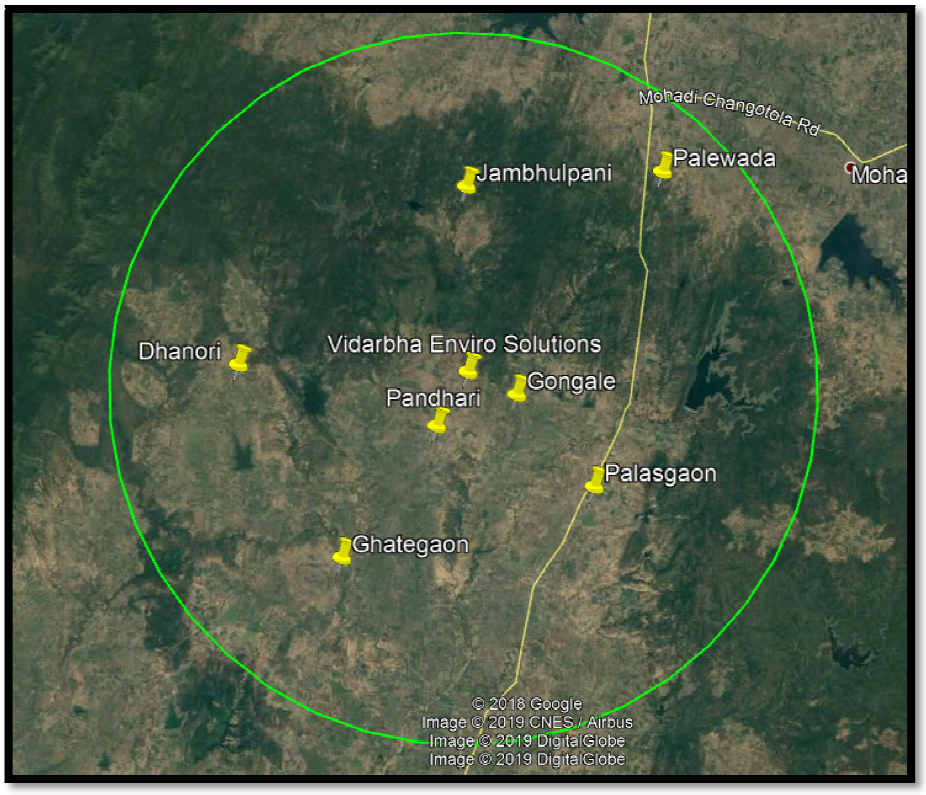

Figure 6.1 Google image of 10 km radius of the project site

Table 6.1 Locations for Baseline Monitoring

Sr. No.	Location	Geographical co-ordinates		Distance from Project Site (km)	Direction from Project Site
		Latitude	Longitude		
1	Project Site	$21^0$13'32.6" N	$80^0$09'16.2" E	0	---
2	Pandhari Village	$21^0$12'41.52"N	$80^0$08'48.61" E	1.79	South-West
3	Gongale Village	$21^0$13'14.08"N	$80^0$10'04.41"E	1.5	South-East
4	Palewada Village	$21^0$16'43.14"N	$80^0$12'15.26"E	7.76	North-East
5	Jambhulpani Village	$21^0$16'21.79"N	$80^0$09'04.46"E	5.2	North
6	Dhanori Village	$21^0$13'27.04"N	$80^0$05'30.86"E	6.52	West
7	Ghategoan Village	$21^0$10'36.05"N	$80^0$07'23.94'E	6.53	South-West
8	Palasgaon Village	$21^0$11'54.08"N	$80^0$11'25.16"E	4.88	South-East

6.2 Study Components and Methodology

Following components of the environment have been scopes as valued for establishment of baseline environmental status for EIA study for the Project, and have been studied in commensurate details in accordance with nature of the Project and its potential impact on the environment.

a) Site Topography - based on SOI Toposheet, elevations and drainages
b) Regional Geology - based on published information
c) Landuse - based on satellite imagery acquired on 4th December, 2016. Landuse determination using GIS applications
d) Weather and Climate - based on IMD data
e) Air environment – based on Ambient Air Quality monitoring for scoped parameters relevant to the Project at eight locations in the within 10 km of the project site.
f) Noise level - Monitoring at all eight stations within 10 km radius of the Project site.
g) Water environment (surface and ground water) – based on grab sampling of the Project site and other 3 water bodies in the vicinity of project site for surface water and eight locations for ground water (borewell)
h) Soils – based on analysis of eight samples taken from site and vicinity
i) Ecology and Biodiversity – based on qualitative survey of biological components at the site and its immediate vicinity
j) Socio Economic status - based on Census of India, 2011 and other secondary data

The environmental components considered valued and relevant in the scoping stage of the EIA have been described in detail in Chapter 3 of the EIA Report.

- **Air Environment**

The common air pollutants namely Particulate Matter (PM<2.5µm, PM<10µm), Sulphur dioxide (SO_2), Oxides of Nitrogen (NOx) and Carbon Monoxide (CO) were monitored during study period to meet the requirements of the MoEFCC and compared with the standards stipulated by CPCB. The results were found well within the NAAQ standards. The average values of AAQM results have been given in below Table 6.2.

Table 6.2 The average values of AAQM results

Sr. No.	Location	$PM_{2.5}$ (ug/m^3)	PM_{10} (ug/m^3)	SO_2 (µg/m^3)	NOx (µg/m^3)	CO (mg/Nm^3)
		Avg.	Avg.	Avg.	Avg.	Avg.
1	Project Site	46.9	83.29	7.58	18.33	1.32
2	Pandhari Village	43.5	79.2	5.03	15.10	0.63
3	Gongale Village	42.6	80.34	4.64	13.67	0.20
4	Palewada Village	38.8	71.76	4.43	15.58	0.14
5	Jambhulpani Village	37.1	70.13	4.88	14.83	0.34
6	Dhanori Village	36.6	65.43	4.767	13.61	0.06
7	Ghategoan Village	38.4	67.36	5.09	13.67	0.49
8	Palasgaon Village	35.4	64.86	5.13	14.73	0.13
	NAAQS	**≤ 60**	**≤ 100**	**≤ 80**	**≤ 80**	**≤ 04**

- **Noise Environment**

Baseline noise monitoring studies were carried out at eight stations around the proposed project site within 10 km using a noise meter Day and Night per hour 24 hourly in decibel as per CPCB Norms. Noise readings for day and night are summarily within prescribed Ambient Noise Level standards.

- **Water Quality**

Ground water samples collected from eight locations including sources viz. hand pump and well. Surface water was sampled from Chulbandh Dam Spillway & Reservoir, Mangezari Lake, Rangepar Reservoir falling within the 10 km impact area of the project. The water quality results found within prescribed norms as IS 105000:2012.

- **Soil Quality**

Soil samples were collected near the locations of the ground water sampling and analyzed for relevant Physico-Chemical parameters. The soil at the sampling stations varied from sandy silt and loamy almost black in colour. The soil pH was found to be slightly alkaline. The conductivity was low showing less salinity of the soil. Organic content was good in locations except industrial area. Micronutrients were found to be adequate. No heavy metal contamination (Lead, Mercury, Nickel, Boron) of soil was observed.

- **Ecology and Biodiversity**

The main objective of the survey is to collect the information about the ecology and biodiversity of the project site and its surrounding of the project site within 10km radius.

Generate baseline data from field observations from various terrestrial and aquatic ecosystems;

The species of Flora and Fauna found in study area are given below in **Table 6.3** & **Table 6.4** respectively.

Table 6.3 List of Flora observed in Study area

Sr. No.	Common Name	Botanical Name
1.	Mokha	*Schrebera swietenoides*
2.	Dhoban	*Dalbergia paniculata*
3.	Behada	*Terminalia belerica*
4.	Surya	*Xylia xylocarpa*
5.	Bhirra	*Chloroxylon swietenia*
6.	Mowai	*Laennia coromandalica*
7.	Karam	*Mitragyna parviflora*
8.	Sewan	*Gmelina arborea*
9.	Bhilawa	*Semicarpus anacardium*
10.	Salai	*Boswellia serrata*
11.	Semal	*Bombax ceiba*
12.	Moha	*Madhuca longifolia*
13.	Kusum	*Schleichera oleosa*
14.	Rohan	*Soymida febrifuga*
15.	Arjun or Kahu	*Terminalia arjuna*
16.	Shisham	*Dalbergia latifolia*
17.	Bor	*Zizyphus spp*
18.	Lokhand	*Ixora arborea*
19.	Palas	*Butea monosperma*
20.	Amaltas	*Cassia fistula*
21.	Apta	*Bauhinia racemosa*
22.	Khair	*Acacia catechu*
23.	Haldu	*Haldina cordifolia*
24.	Bans	*Dendrocalamus strictus*
25.	Nirgudi	*Vitex negundo*
Shrubs		
1.	Bharati	*Maytenus emarginatus*
2.	Kharata	*Dodonea viscosa*
3.	Dudhi	*Wrightia tinctioria*
4.	Eruni	*Zizyphus oenoplia*
5.	Neel	*Indigofera tinctoria*
6.	Katumber	*Ficus hispida*
7.	Tarota	*Cassia tora*
8.	Kukudranji	*Calycopteris floribunda*

Source: Forest Division, Gondia

Table 6.4 List of Fauna observed in Study area

Sr. No.	Common Name	Scientific Name
1.	Cow	*Bos taurus*
2.	Buffalo	*Bubalus bubalis*
3.	Sheep	*Ovis aries*

4.	Goat	*Capra aegagrus hircus*
5.	Cat	*Felis catus*
6.	Dog	*Canis lupus familiaris*
7.	Fox	*Vulpes bengalensis*
8.	Sambhar	*Cervus unicolor*
9.	Three striped Palm squirrel	*Funambulus palmarum*
10.	Langur	*Presbytis entellus*
11.	Jackal	*Canis aureus*
Birds		
1.	Painted sand grouse	*Pterocles indicus*
2.	Common sand grouse	*Pterocles exustus*
3.	Peacock	*Pavo cristatus*
4.	Black breasted quail	*Coturnix coromandelica*
5.	Indian bustard quail	*Turnix suscitator*
6.	Blue rock pigeon	*Columba livia*
7.	Purple wood pigeon	*Columba punices*
8.	Common Crane	*Grus grus*
9.	Dove (spotted)	*Streptopelia chinensis*
10.	Vulture	*Sarcogyps calvus*
11.	Brown wood Owl	*Strix leptogrammica*
12.	Brown fish owl	*Ketupa zeylonensis*
13.	Eurasia Eagle Owl	*Bubo bubo*
14.	Indian White Backed Vulture	*Gyps bengalensis*
15.	Black drongo	*Dicrurus macrocercus*

Source: Forest Division, Gondia

- **Socio-economic Environment**

The Primary data is collected through a well designed questionnaire by interviewing head i.e. either male or female of the household of the various communities residing within the 10 kilometer periphery of the project area. But the focus group is more on the people living within the 0-2 kilometers periphery of the proposed plant as they are the people most affected by the subject plant. The sample size is 20% of the total household residing in 0-2 kms and 15% in 2-5 kms and 10% in the 5-10 kms periphery of the existing as well as proposed plant area.

The Secondary data is collected from the Census Records, District Gazetter, District Statistical Abstract, Official Documents, Internet and District Website. The VDI data is based on the 2011 census. The summary of Socio Economic Data of Gondia District is given in below **Table 6.5**

Table 6.5 The summary of Socio Economic Data of Gondia District

Description	**Data as per Census 2011**
Actual Population	1,322,507
Male	661,554
Female	660,953
Area Sq. Km	5,234

Density/km2	253
Sex Ratio (Per 1000)	999
Average Literacy	84.95
Male Literacy	92.04
Female Literacy	77.89

7. Environmental Impacts due to proposed Project

This EIA report is covering brief description of project, brief description of existing environment, likely impact of the project, the mitigation and protection measures, consideration of alternatives, and summary with conclusion.

The environmental impacts of the proposed industry can be divided in to two a categories;

1. Construction Phase
2. Operational Phase

1. Construction Phase

Sr. No.	Environmental Aspect	Impact	Mitigation measures
1	Ambient Air Quality	Dust from various construction/Installation operations and emission from operation of construction equipment or movement of vehicles are likely to cause some impacts on the working population within immediate vicinity of the project site.	The important dust suppression measures proposed will be regular water sprinkling on main haul roads in the project area, this activity will be carried out at least twice a day, if need arises frequency will be increased on windy days, in this way around 50% reduction on the dust contribution from the exposed surface will be achieved.
2	Ambient Noise Level	The major activities, which produce periodic noise, during construction phase, are Foundation works, Fabrication of structures, Plant erection, Operation of construction equipment, Movement of vehicles etc	Regular checking of Vehicles, construction work will be restricted during day time. Provision of silencers to modulate the noise generated by machines. DG Sets shall be bought acoustically enclosed to reduce the noise level as CPCB guideline. Provision of protective devices like ear muff/plugs to the workers. Preventive maintenance of the machine/equipment will be carried out. Provision of rubber padding/noise isolators.
3	Water Quality	Waste water generated during Construction phase	The adequate number of toilets with septic tank and Soak pit shall be provided for workers
4	Land environment (Solid waste)	This category of waste generation in the proposed project is due to different types of raw materials such as cement	All construction waste shall be stored within the site itself. A proper screen will be provided so that the waste

		concrete Bricks, tiles, Cement plaster Steel (RCC, door/ window frames, roofing support, railings of staircase etc) Rubble, sand, Stone (Marble, granite, sand stone) Timber/wood, Paints/varnishes	does not get scattered
6	Biological Environment (Ecology)	Loss of vegetation due to construction activity Displacement of Fauna	In core zone there is no vegetation, only patches of grass is recorded. There will be no loss of vegetation. Hence there will be minimum impact during construction phase. Plantation in the project area will increase the avifauna in the area. Burrow animals will also be restored.

2. During Operation

Sr. No.	Environmental Aspect	Impact	Mitigation measures
1	Ambient Air Quality	Impact on nearest habitat due to the emissions from stacks of incineration & D.G. Set. The major air pollutants released from DG Set & incineration stack will be NOX, SO_2 and PM. The SPM, SO_2, NOx, Dioxines, Furans and HCl emission from the stacks attached to incinerator.	For mitigation of impacts of air pollution stack height of 5 m above roof level shall be provided for proposed D.G. set of capacity 1 x 50 kVA. Incinerator stack: Venturi Scrubber, Quencher, Multi Cyclonic Droplet Separators, Flooded scrubber with Quenching Arrangement.
2	Ambient Noise Level	Noise will be generated due to Operation of DG Sets during power failure, Running equipment & Machinery, movement of vehicles	D.G. set of capacity 1 x 50 kVA will be bought acoustically enclosed as per CPCB guidelines and shall be kept in a room Free flow of traffic movement is being maintained Noise generating equipment & units like Machinery area, will be well insulated with enclosed doors
3	Water Quality	Effluent Generation will be 9 due to washing & process	ETP of Capacity 13 KLD will be installed
4	Land environment (Solid waste)	Solid waste generated during the biomedical waste treatment process and wastewater treatment process is mainly ash and sludge	Ash and other hazardous wastes will be sent to CHWTSDF. Sludge will be disposed off in secured landfill.
5	Biological Environment (Ecology)	Impact of emission due to running of DG Set, Incinerator and vehicular movement on core and buffer zone.	Development of green belt area of 1400 m^2 and 289 Nos. of trees will be planted.
6	Odour	If wastes not treated timely, it will generate odour in the premises	As per BMW Rules the waste should be treated within 48 hrs of its generation. Daily washing of waste collecting containers, vehicle compartment

			and floor of store room. Closed cabin vehicles shall be used for the collection and transportation of bio-medical wastes.
7	Socio-economic environment	The benefit relate to the direct employment associated with the construction of the facility. Job would be given to the unskilled, semi skilled as well as skilled labour category, for which locals would be given preference	----

8. Analysis of Alternatives For Site

For establishing a common facility for treatment, storage, disposal and recycling facilities of Biomedical waste CPCB has issued guidelines for site selection criteria (HAZWAMS/25/2002-2003).

9. Environmental Monitoring Plan

Environmental Monitoring for the proposed CBMWTSDF will be carried out in accordance with the BMW Management Rules, 2016. Summary of monitoring proposed to be carried out is as follows. Refer **Table 9.1** and **Table 9.2.**

Table 9.1 Environmental Monitoring during Construction Phase

Parameters	**Location**	**Frequency**
Ambient air quality-PM_{10}, $PM_{2.5}$, NOx and SO_2	One ambient air quality monitoring stations near the present facility gate	Minimum of 2 measurements in a month taken twice a week, 24 hourly
Ambient Noise	Above locations	One, 24 hourly readings once on the day of AAQ monitoring

Table 9.2 Environmental Monitoring during Operation Phase

Area	**Location**	**Parameters**	**Frequency**
Stack Emission	Each stack	PM, SO2, NOx, HCl, Hg and its compounds	Once in three months
Stack Emission	Each stack	Total Dioxins and Furans	Once in a year
Liquid effluent	ETP outlet	pH, Suspended solids, Oil and grease, BOD, COD and/or as per consent of MPCB	Daily basis

Procurement of environmental monitoring services will be done on an annual basis from laboratory recognized under Environmental (Protection) Act, 1986, or NABL accredited laboratory.

10. Risk Assessment

Both incineration and autoclaving are potential hazardous operations owing to following reasons.

- Storage and handling of infections wastes
- High temperature operations of incineration, potential for pressure build up in the system due to fuel surge or occlusion of flue gas path
- High pressure operation of autoclave
- Storage of fuels and chemicals (HSD/LDO, caustic lye, sodium hypochlorite and alum)

11. Project Benefits

The following major benefits shall be achieved from the proposed project in additional to improving the degraded environment by establishing a Common Biomedical Waste Treatment Facility.

- The proposed project facilitates better management of the Hospital wastes.
- It will be the showcase for other states for management of bio medical waste, additional benefit of green and clean Environment.
- It minimizes the pollution load on environment from Hospital biomedical waste
- Compliance with prescribed regulatory norms which in turn avert the risk of closure on account of violation of rules
- It reduces the number of hazardous waste dump sites in the area and also eliminates the pollution potential
- Management of wastes is easier and economically viable at common facility.
- Cost of environmental monitoring is less at common facility
- Reduced environmental liability due to captive storage of biomedical waste in the premises of hospital.
- Better occupational health and safety at individual Hospital level
- Prevention of natural resource contamination thereby improving overall environmental status of the state and region.

10.1 Corporate Social Responsibility

Suggested CSR Activities and Community Development Plan

The social welfare activities can be planned in the following areas:

- Total Quality Education for girls
- Health and Hygiene Check-ups and awareness camps
- Ensuring Safe drinking water and Healthy Sanitation Practices
- Environment Education & Awareness including tree plantation

12. Environmental Management Plan

The management team is very much concern about environmental issues. All the environmental components will be looked out by Environmental Management Cell (EMC). Mitigation of environmental impacts has to be implemented according to the suggestions and will be monitored regularly to prevent any lapse.

Company has committed to implement all the pollution control measures to protect the surrounding environment. The project can definitely improve the regional, state and national environment and reduce health hazards. Projects like this will certainly improve the living standard of local people. The implementation of this project will definitely improve the physical and social infrastructure of the

surrounding area. Budgetary allocations for construction phase EMP & Operation phase EMP are given below in **Table 12.1** and **Table 12.2** respectively.

Summary Environment Management actions during construction phase will comprise the following:

- Ensuring zero environment and safety incidences on the site
- Compliance of Environmental Clearance and other statutory permissions, communication of the same to statutory agencies during construction phase
- Drafting the contract document with contractors, ensuring site environment and safety responsibility clearly spelt out with frequency and mode of reporting, and penalty and encouragement clauses
- Proper barricading extent for any activity in the construction zone
- Medical attention in case of any injury
- Zero environmental and safety incidences while unloading, storage, site fabrication, erection and commission of all hardware
- To ensure that all utilities (power, water, sewage evacuation, storm water, etc.) are made available in an environmentally acceptable and safe manner at the battery limit of the construction site
- To ensure good construction practices and environmental safeguards during construction activities
- Implementation of fire safety plan, working at heights plan, excavation plan, lock and tag out plan, confined space entry plan, machine guarding, power tools safety, electrical safety, ergonomics, availability of PPE, medical evacuation preparedness, availability of portable fire extinguishers stocking of first aid boxes, maintenance of labor amenities

Environment Management actions during operation phase will comprise the following.

Air Pollution Management

- Stack with adequate height will be provided with Incinerator (30 m) and D.G. Set will have stack height of 5 m above roof.
- The Venturi scrubber and droplet separator shall be provided
- Quencher followed by Venturi Scrubber with two cyclonic droplet separators as pollution controlling system
- All storage, handling & transfer shall be done with properly designed facilities
- Based on the waste type appropriate storage facility shall be provided
- Regular water sprinkling shall be carried out in and around the plant site
- Thick green belt shall developed to control the air pollution

Water & Wastewater Management

- ETP of 13 CMD for treatment of Effluent and waste water
- Regular chemical analysis of Effluent at inlet and outlet point shall be conducted
- Treated effluent will not be discharged to outside the plant.
- All treated effluent shall be utilized in the plant process and other non-portable domestic purpose
- If required, inlet and out let shall be provided with on line monitoring facility for important parameters or as suggested by the MPCB.

Solid & Hazardous Waste Management

- Removed top soil shall be stored separately and further will be used for plantation
- ETP sludge and Incineration ash shall be sent to CHWTSDF

Noise and Vibration Management

- The operator's cabins shall be properly insulated Provision of acoustic enclosure
- Use of Silencers Transportation of raw martial during day time
- High noise generating sources will be insulated
- All rotating items shall be lubricated
- Green belt shall be developed
- Ear-muffs/plugs shall be provided where ever required

Odor Management

- Odor generally generated from the Biomedical waste if stored for long time
- As per New Bio-medical Rule, waste shall be treated within 48 hrs. of generation
- Regular cleaning and washing of vehicles, containers, storage area floor, and plant area
- While collection of BMW, closed containers and covered vehicles shall be used
- Personal Protective Equipment shall be provided to the workers while handling of waste at any stage of treatment process
- Thick green belt shall be developed which heal to restore the aesthetic value
- Ensure the proper housekeeping Proper aerobic condition will be maintained in Effluent Treatment Plant
- Continuous disposal of sludge shall be ensured
- Spraying of anti-odor chemicals wherever required

Occupational Safety and Health

- Rotating equipment shall be covered to avoid the traps
- Proper training to operators and supervisors

- Regular safety training for handling of waste
- Pre - Employment & Periodical health checkup
- Provision of first aid boxes
- Emergency alarm system Fire hydrant, detector and Extinguishers
- Emergency preparedness plan & periodical mock drills
- Provision of PPEs as and when required

Table 12.1 Environment Management Plan Budgetary Allocation- During Construction Phase

Sr. No.	Description	Cost in Lakh (Rs.)
1	Air Pollution Management	1.0
2	Water Pollution Management	1.0
3	Solid & Hazardous Waste Management	1.0
4	Occupational Health & Safety	1.0
5	Green Belt Development	1.0
	Total	**5.0**

Table 12.2 Environment Management Plan Budgetary Allocation- During Operation Phase

Sr. No.	Description	Capital Cost in Lakh (Rs.)	O & M Cost in Lakh (Rs.)
1	Air Pollution Management	5.0	3.0
2	Water Pollution Management	10.0	2.0
3	Solid & Hazardous Waste Management	5.0	5.0
4	Environment Monitoring and Management	5.0	8.0
5	Green Belt Development	1.0	1.0
	Total	**26.0**	**19.0**