EXECUTIVE SUMMARY OF EIA REPORT

Proposed Expansion of the Active Pharmaceutical Ingredients (API) & Drug Intermediate Manufacturing unit

At

Gat No. 200/1, PO Lakhmapur Tal. Dindori Dist. Nashik, Maharashtra-422202

By

M/s. Besi Drugs Pvt. Ltd.

Environmental Consultant

ENVIROSHPERE CONSULTANT AND ENGINEERS

NABET/EIA/23-26/SA 0246 Certified Organization

CORPORATE OFFICE: Envirosphere Consultant and Engineers,
Office No. 506, 5th Floor, Shree Ganesh Ace Arcade, Kokane Chowk, Dwarkadheesh Gardens, Rahatani, Pune, Pimpri-Chinchwad, Maharashtra 411017, INDIA
E-mail: info@envirosphere.co.in,
Contact: 9860220550
Website: www.envirosphere.co.in

Environmental Monitoring Lab
Horizon Services, Pune.

Baseline period – 1st March 2025 to 31st May 2025

Contents

1. Introduction

M/s. Besi Drugs Pvt. Ltd is a manufacturer of Active Pharmaceutical Ingredients & Drug Intermediate Manufacturing unit at Gat No. 200/1, PO Lakhmapur Tal. Dindori Dist. Nashik, Maharashtra-422202. The industry is currently operating with its 1st Consent to Operate issued by the Maharashtra Pollution Control Board (MPCB) vide Format 1.0/AS(T)/UAN No. 0000231496/CO/2506000343 dated 04/06/2025, which is valid up to 31/08/2027. The company is planning to establish a cutting-edge technology for Active Pharmaceutical Ingredients manufacturing facility in Dindori Nashik. The company aims to produce APIs & Drug Intermediates that meet the evolving needs of various pharmaceutical industry, biotechnology firms, and contract manufacturing organizations (CMOs). To achieve the same, the company has proposed an expansion of Active Pharmaceutical Ingredients (APIs) & Drug Intermediate Manufacturing unit in the same premises.

The proposed project will increase the total production capacity from 546.12 TPA to 600 TPA. This includes the addition of 40 new products, discontinuation of 6 existing ones, and selective capacity modifications such as removing Diphenhydramine Base and Adding Mirabegron for 6 TPA. The expansion will require corresponding adjustments in raw material procurement, utility consumption (water and power), fuel use, wastewater treatment, and staffing levels, in response to market-driven demand.

The proposed expansion will be carried out within the existing project premises, and no additional land is required.

The total plot area of the industry is 8193 sqm., built-up area is 3080.73sqm. and green belt area is 2710.32sqm. which is 33.08% of the total area.

2. Purpose of the report

The main purpose of this Environmental Impact Assessment (EIA) Report is to investigate and assess the principal environmental concerns associated with establishment of proposed expansion. The industry has been granted environmental clearance for the existing plant vide EC Identification No. EC22A058MH149459 dated 17th February 2022. As per Environmental Impact Assessment (EIA) Notification, September 14th, 2006 and amendments thereof, the proposed project falls under Activity 5(f) i.e., Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates). The project lies outside the industrial area and the water requirement of the industry is more than 25 m3/day. Consequently, the project falls under Category A and will be appraised by the Expert Appraisal Committee (Industry – 3), MoEFCC, New Delhi.

3. Identification of Project and Project Proponent

The proposed expansion aims to manufacture a range of Active Pharmaceutical Ingredients (APIs) & Drug Intermediates. A substantial demand-supply gap persists, particularly in API production, largely due to reliance on imports—especially from China. This project seeks to

reduce such dependency by strengthening indigenous production capacity. The project involves the introduction of 40 new APIs, thereby enhancing flexibility and responsiveness to market dynamics. High-demand products such as Azithromycin, Erythromycin derivatives, and Mirabegron will support therapeutic needs in areas such as antibiotics, cardiovascular care, and analgesics. The project is expected to generate significant direct and indirect employment. The company will make good faith efforts to employ skilled and unskilled manpower from nearby villages, thus supporting rural livelihoods. The facility is being designed to serve the domestic, export, and government supply chains effectively. This expansion will not only strengthen the company's market competitiveness but also contribute to Nashik's emergence as a pharmaceutical hub. The company is committed to sustainable development through the implementation of Zero Liquid Discharge (ZLD) systems, solvent recovery units, and greenbelt development covering over 33.08% of the site area.

M/s. Besi Drugs Pvt. Ltd. is owned by Mr. Vinodbhai Bhagandas Patel and Mr. Nirmal Vinod Patel. The team at Besi Drugs is highly motivated and dedicated to achieving excellence in meeting client needs. They strive for perfection in every aspect of their work, from product development to customer service.

4. Location of the Project

The proposed expansion will be carried out within the existing project premises at Gat No. 200/1, PO Lakhmapur, Tal. Dindori, Dist. Nashik, Maharashtra – 422202, no additional land will be required. The Project site accessible via the Saputara–Nashik Road, which runs along the northern boundary of the site and connects to National Highway NH 953 at an aerial distance of approximately 0.41 km. **Figure 1** shows index map of the project site whereas Google Imagery with corner co-ordinates is depicted in **Figure 2.**

The environmental setting around the site is summarized in **Table 1** which includes key details such as the nearest IMD station is in Nashik, the nearest town is Dindori, and the nearest airport is Nashik International Airport. Additionally, the area is characterized by the presence of several water bodies, including Kadwa river, Unanda river, Karanjvan dam, Palkhed reservoir, Ozarkhed reservoir, reservoir near Kasbe Vani.

Table 1: Environmental Attributes from Project Site

Sr. No.	Environmental Sensitivity	Details	Distance & Direction
1.	Nearest Reserved / Protected forests	1. Dindori reserve forest	4.19 Km NE
2.	Nearest Water Bodies	1. Kadwa River 2. Unanda River 3. Karanjvan Dam 4. Palkhed reservoir 5. Ozarkhed Reservoir 6. Reservoir Near Kasbe Vani 7. Nigdol lake	1.12 Km SW 4.30 Km E 7.82 Km NW 7.53 Km SE 3.89 Km NE 9.10 Km NE 8.66 Km SW

		8. Talav in Nalwadi 9. Talav in Ambevani	9.51 Km W 6.52 Km E
3.	Notified Eco-Sensitive Zone or Protected Area	None	---
4.	Notified Archaeological Sites/ Monuments	None	---
5.	Nearest Habitat/ Village	Awankhed	1.26 km S
6.	Densely Populated Area	Lakhampur	2.73 km NW
7.	Interstate Boundary	None	--
8.	School, Temple, Hospital	1. Z. P. School Parmori 2. Z. P. School Lakhmapur 3. Buddha Vihar Awankhed 4. Shree vindhyavaasini devi Mandir 5. Primary Healthcare Center Varkheda Bopegaon 6. Mauli Hospital	1. 2.24 E 2. 2.69 NW 3. 1.54 S 4. 7.78 km S 5. 4.68 km NE 6. 0.4 km W
9.	Creek	None	--
10	Defence installations	None	--

Sr. No.	**Infrastructure Sensitivity**	**Details**	**Distance & Direction**
1.	Airport	Nashik International Airport	16.81 Km SE
2.	Railway Station	Kherwadi Railway Station	26.6 km SE
3.	Town	Dindori	6.3km S
4.	National Highway	Saputara-Nashik National Highway (NH 953)	0.4 km W
5.	Nearest State / National Boundary	Gujarat	60.81 Km NW
6.	Distance from sea coast	Arabian Sea	104 km in W
7.	Nearest IMD station	Nashik IMD Station	26.49 km in SW
8.	Nearest Fire Station	NMC Fire rescue station, Satav Mali Nagar, Nashik	27.02 km in S
9.	Police Station	Dindori Police Station	5.97 km in SW
10.	Average Site elevation above mean sea level	-	637 m

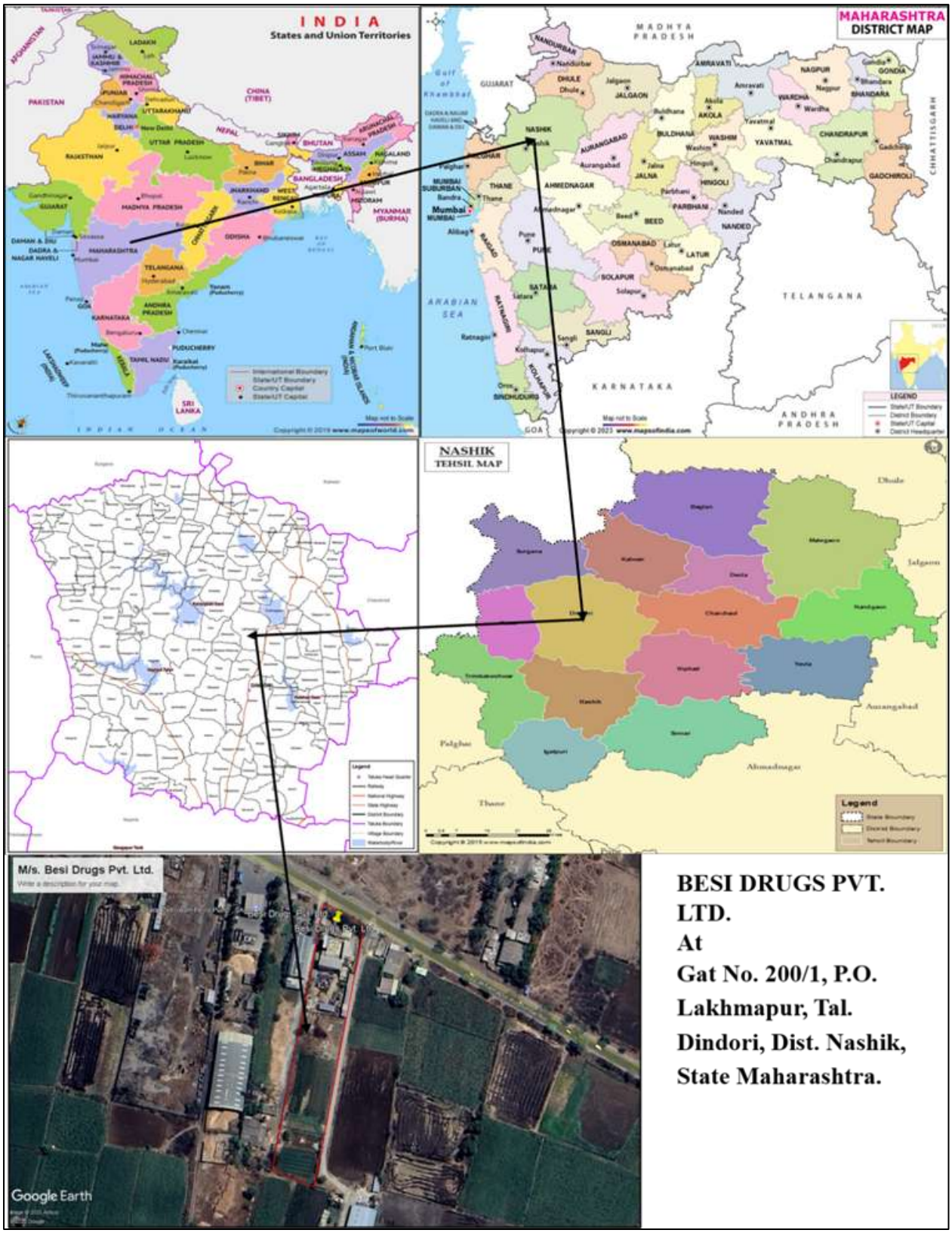


Figure 1: Index Map of Project Site

Figure 2: Google Image of the Project Site with Corner Co-ordinates

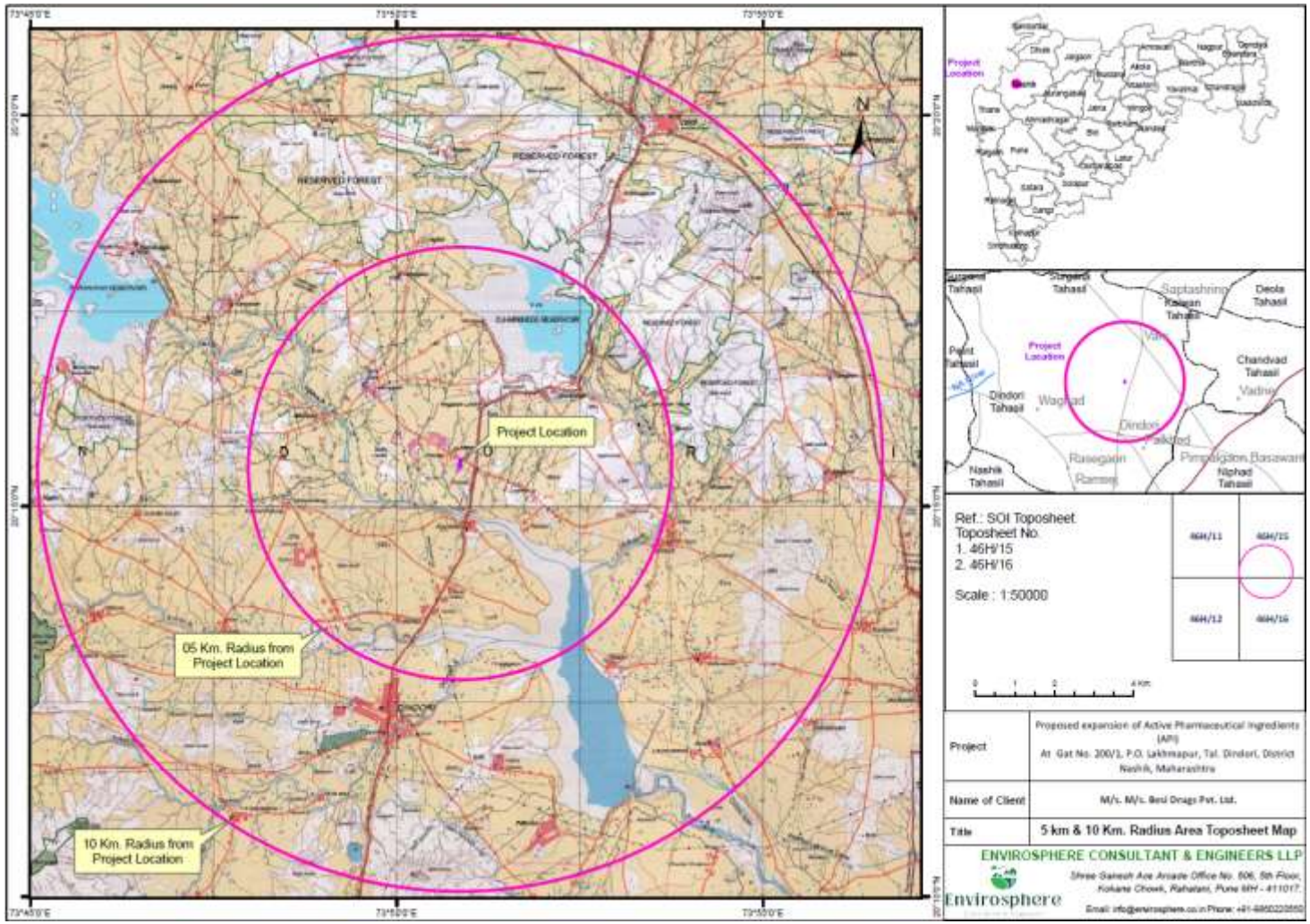


Figure 3: Project Location with 10 km radius study area shown on SOI Toposheet

5. Nature and Size of the Project

As per Environmental Impact Assessment (EIA) Notification, September 14th, 2006 and amendments thereof, the proposed project falls under Activity 5(f) i.e., Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates of the EIA Notification 2006 and its subsequent amendments. Since the project is situated outside the notified industrial area and the water requirement of the industry is more than 25 m3/day. Consequently, the project falls under Category A and will be reviewed by the Expert Appraisal Committee (Industry – 3), MoEFCC, New Delhi.

The industry has proposed to expand manufacturing of Active Pharmaceutical Ingredients (APIs) & Drug Intermediates thus increasing the production capacity from 546.12 TPA to 600 TPA, which includes the addition of 40 new products.

The total plot area of the industry is 8193 sqm., built-up area is 3080.73sqm. and green belt area is 2710.32 m^2 which is 33.08% of the total area.

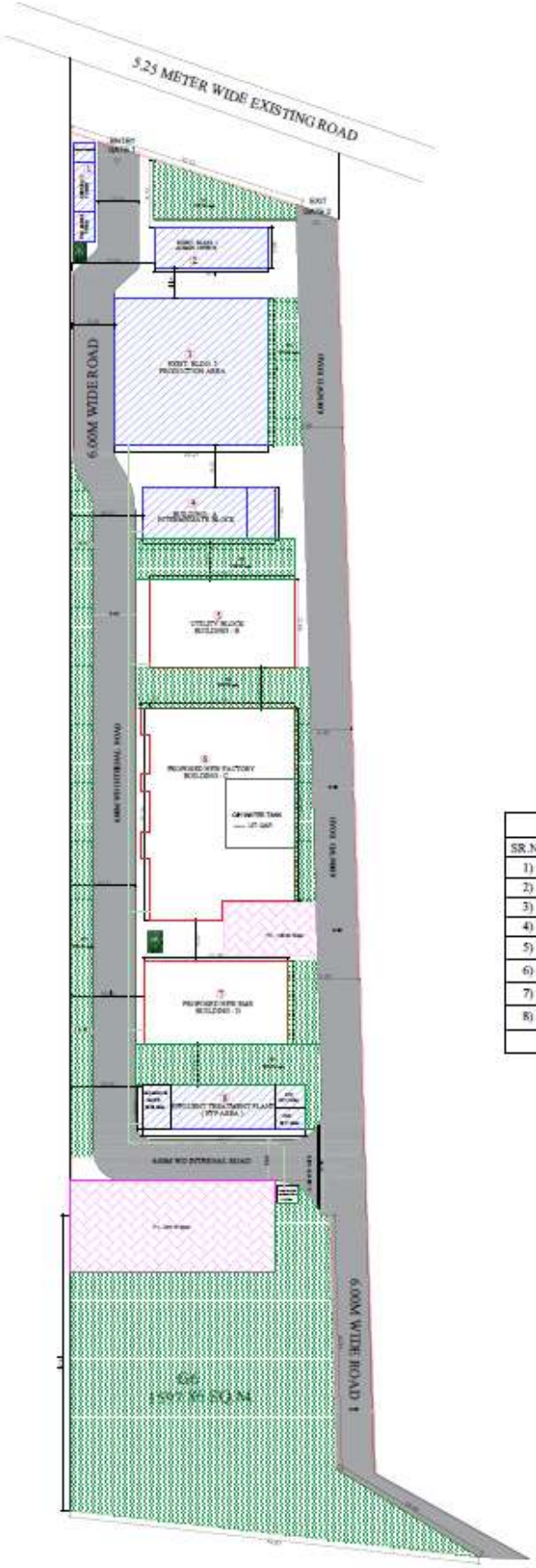
Table 2: Size and Magnitude of Operation

Sr. No.	Group Category	Name of Product	Existing Capacity (TPA)	Proposed Capacity (TPA)	Group Category Proposed Capacity (TPA)
1	Antihistamine	Diphenhydramine Hydrochloride	150	96	153
		Dimenhydrinate	60	30	
		Chlorpheniramine Maleate	0	9	
		8-Chloro Theophylline	0	18	
		Diphenhydramine Base	120	0	
2	Analgesic	Diethylamine Salicylate	60	6	6
		Mefenamic Acid	39.96	0	
3	Anesthetic	Lignocaine / Lidocaine Hydrochloride	12	12	12
4	Antiemetics	Apripitant	0	6	6
5	Antidepressant	Fluvoxamine Maleate	0	6	6
6	Antidiabetic	Sitagliptin Phosphate Monohydrate	0	3	6
		Linagliptin	0	3	
7	Anticoagulant	Rivaroxaban	0	6	6
8	Rubefacient	Methyl Nicotinate	0.96	3	6
		Myristyl Nicotinate	0	3	
9	Antibacterial Antibiotics	Bromhexine Hydrochloride	0	7.32	51.24
		Chloramphenicol Palmitate	0	7.32	

		Chloramphenicol Base	0	7.32	
		Azithromycin	0	7.32	
		Cetyl Pyridinium Chloride	0	7.32	
		Lauryl Pyridinium Chloride	0	7.32	
		Erythromycin Stearate / Ethyl Succinate / Estolate	0	7.32	
		Chlorhexidine Gluconate	25.2	0	
10	Antifungal Antibiotics	Clotrimazole	0	6	6
11	Antiscabbies	Permethrin	0	6	6
12	Anthelmintic	Antimony Potassium Tartrate	24	6	6
		Diethylcarbamazine Citrate	18	0	
13	Acetyl Chloride Compounds	Palmitoyl Chloride	0	60	150
		Lauroyl Chloride	0	12	
		Lauryl Chloride	0	12	
		Stearoyl Chloride	0	6	
		2-Chloro Ethane Sulfonyl Chloride	0	6	
		Cetyl Chloride	0	48	
		Myristoyl Chloride	0	6	
14	Ester Compounds	Menthyl Lactate	0	3	6
		Ethyl Lactate	0	3	
15	Bromo Compounds	1-Bromo-4-Tertiary Butyl Benzene	0	12	12
16	Antidiarrheal	Diphenyl Acetonitrile (Loperamide Intermediate)	0	60	60
17	R&D Product	R&D Product	0	41.88	41.88
18	Adrenergic Agonist	Mirabegron	0	6	6
		Phenyl Epinephrine Hydrochloride	36	0	
19	Nutraceuticals	Magnesium Bisglycinate	0	6	53.88
		Calcium Bisglycinate	0	6	
		Zinc Bisglycinate	0	6	
		Calcium Aspartate	0	6	
		Ferrous Bisglycinate	0	5.88	
		Manganese Glycinate	0	6	
		Magnesium L-Threonate	0	6	
		Magnesium Citrate	0	6	
		Magnesium L-Aspartate	0	6	
			546.12	600	600

6. Land Details

Project site is spread in to 8193 sq.m. area. Land is under industrial use. The non-agriculture land is owned by M/s. Besi Drugs Pvt. Ltd. Detailed area bifurcation is given in **Table 3** The plant layout with production area, utilities, green belt area has been shown in **Figure 4** below –



AREA STATEMENT		
SR.NO.	NAME OF AREA	AREA IN SQ.M.
1)	SECURITY CABIN	23.36
2)	EXIST. BLDG.-1 ADMIN OFFICE	71.43
3)	EXIST. BLDG.-2 PRODUCTION AREA	471.90
4)	BUILDING - A (INTERMEDIATE BLOCK)	143.63
5)	PROPOSED UTILITY BLOCK BUILDING-A	265.86
6)	PROPOSED NEW FACTORY BUILDING -C	1698.04
7)	PROPOSED NEW RMS BUILDING -D	252.00
8)	ETP, STP, OWC , HAZARDOUS WASTE	154.51
	TOTAL BUILT UP AREA	3080.73

Figure 4: Master Layout Plan

Table 3: Area Statement

Sr. No	Particulars	Area (sq.m)	Percentage
1.	Total Plot Area	8193	--
2.	Existing BUA	864.83	--
	Proposed BUA	2215.9	--
	Total BUA Area	3080.73	34.56
3.	Total Green Belt Area	2710.32	33.08
4.	Parking Area	495.76	6.05
5.	Ground Coverage	2066.46	25.23
6.	Internal Road Area	2207.72	26.95
7.	Open Area	712.74	8.7

7. Project Description with Project Details

Project information brief is given in **Table 4** below –

Table 4: Magnitude of Project Operation

Sr. No.	Particulars	Details	
1	Ownership of land	The non-agricultural land is owned by M/s. Besi Drugs Pvt. Ltd Land ownership document i.e. 7/12 has been attached as **Annexure II**	
2	Type/Category	5(f), Category "A"	
3	Production details	The project plans to increases the production capacity from 546.12 TPA to 600 TPA, which includes the addition of 40 new products, discontinuation of 6 existing products, and capacity reduction for 4 products	
4	Water Consumption	**Construction Phase-** Proposed Water Requirement- 1.8 KLD **Operation Phase-** Existing Water Demand– 51.61 KLD Proposed Water Demand–54.93 KLD **Total Water Demand–54.93 KLD** (Fresh-43.33 KLD + Recycle-11.6 KLD) (**Source –** Lakhmapur Gram Panchayat)	
5	Wastewater generation	Sewage	**Construction Phase-** 1.62 KLD **Operation Phase-** Existing – 0.9 KLD Proposed**-** 1.1 KLD **Total during Operation phase**– 2.0 KLD
		Effluent	**Operation Phase-** **Existing** – 0.85 KLD

			Proposed – 11.2 KLD **Total –** 12.05 KLD
6	Wastewater Treatment Facility	Sewage	**Existing Sewage treatment-** Unit have provided STP for the treatment of 0.9 KLD of sewage. **Proposed Sewage treatment-** Existing 0.9 KLD with proposed 1.1 KLD of domestic sewage will be treated in Package STP of 3 KLD.
		Effluent	The process effluent will be segregated into high COD and low COD streams. Approximately 3.05 KLD of high COD effluent will be treated in a Multiple Effect Evaporator (MEE), while 0.50 KLD of low COD effluent, along with cooling tower blowdown, boiler blowdown, scrubber effluent, and washing effluent, will be treated in a 20 KLD Effluent Treatment Plant (ETP) consisting of primary, secondary, and tertiary treatment units. The treated effluent from both the MEE and ETP will be reused in the cooling tower makeup, ensuring Zero Liquid Discharge (ZLD).
7	Thermic Fluid Heater	**Proposed** – 2 Lakh Kcal	
	Boiler	**Existing** – 0.8 TPH **Proposed** – 1.2 TPH **Total Proposed** – 2 TPH	
8	DG Set	**Existing –** 1 no. of 180 kVA **Proposed** – Additional 140 KVA **Total proposed** - 320 KVA	
9	Stack Details	**Stack Attached to**	**Stack Height**
		Existing	
		DG set	8 m
		Proposed	
		2 Lakh Kcal Thermic Fluid Heater	Common stack of 30 m stack height will be provided.
		2 TPH Boiler	
10	Fuel	For Boiler -LDO- 163.38 Lit/hr, For Thermic fluid heater- LDO- 25.76 Lit/hr For DG Set- HSD - 40 Lit/day	

11	Air Emissions	Process emissions in the form of Volatile Organic Compound (VOCs) are envisaged from the manufacturing process & storage. PM and SO_2 emissions are envisaged from DG set. DG sets shall act as stand by source of electricity for the site. PM, NOx and SO_2 emissions are anticipated from LDO based thermic fluid heater (2 Lakh Kcal) & Boiler (2 TPH). Common stack with height of 30m will be provided for thermic fluid heater & Boiler
12	Power Requirement	**Operation Phase-** **Existing & Proposed** Connected Load- 300 KVA Renewable Energy –30 KVA (10% of total power requirement)
13	Manpower	**Existing** – 20 nos. **Proposed** Construction Phase – 40 nos. Operation Phase –45 nos.
14	Project Cost	**Existing:** Rs. ₹2.8839 Cr **Proposed:** Rs. ₹2.3761 Cr **Total after Expansion:** Rs.5.26 Cr.
15	EMP Cost	**Construction Phase: Capital Cost- Rs.** 8.87 Lakhs **Recurring Cost- Rs.** 2.62 lakhs/Annum **Operation** Phase – Capital Cost – Rs. 61.61 Lakhs Recurring Cost – Rs 16.52 lakhs/Annum
16	CER Cost	Rs. 2.37 Lakhs

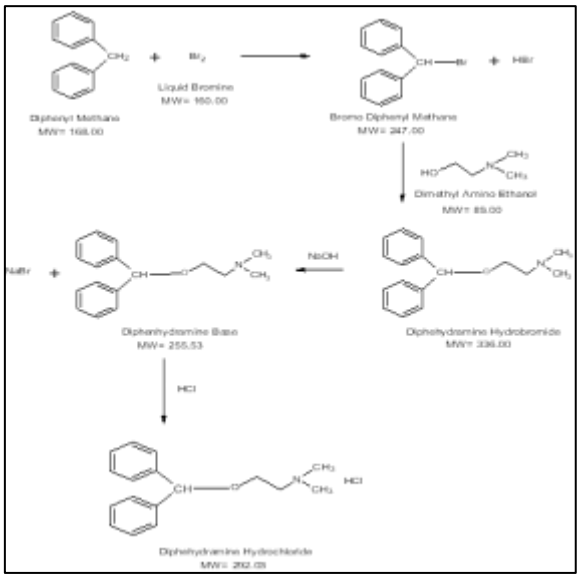
7.1 Process Details

Process Details few products have been given below-

Manufacturing Process of Diphenhydramine Hydrochloride

In a Reactor Diphenyl Methane is charged and liquid bromine is added under stirring. Reaction mass is cooled. Dimethyl amino ethanol is added to reaction mass and reflux for 2-3 hrs. Material is separated through centrifuge and washed with toluene. Material is spin off in centrifuge to make it semi dry. Then semi dried material is charged in reactor and sodium hydroxide solution is added. Organic layer is separated and distilled under vacuum to get diphenhydramine base. To the base add HCl and Cool the reaction mass. Then material is centrifuged and washed with IPA and semi dried. Then diphenhydramine hydrochloride is dried in dryer and packed in 25Kgs HDPE drums for market distribution.

Chemical Reaction



Material Balance

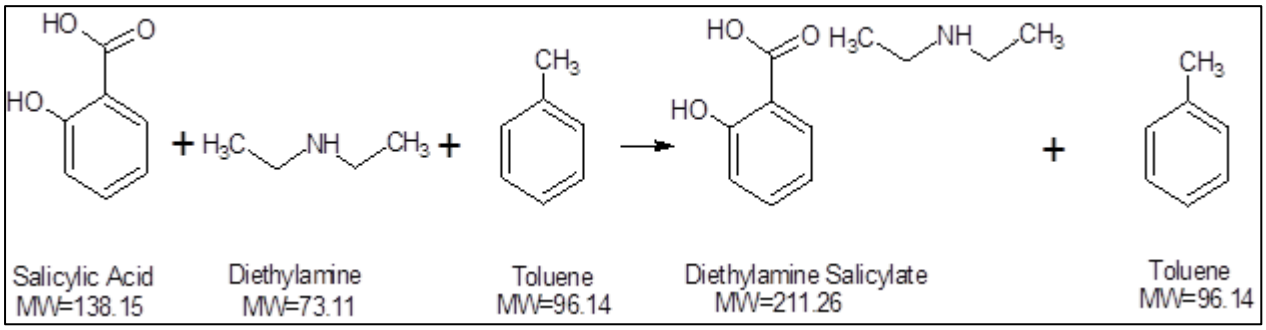
No of Batches/Month = 16

Sr. No	Input	UOM	Qty.	Output	Qty.	Remark
1	Diphenyl Methane	kg	287.64	Diphenhydramine Hydrochloride	500.00	Desired Product
2	liquid Bromine	kg	273.39	Hydrobromic Acid	138.68	Sold as by product
3	Dimethyl amino ethanol	kg	152.38			
4	Sodium Hydroxide Solution	kg	68.48	Sodium Bromide Soln.	205.70	Sold as by product
5	HCl	kg	62.49			
6	IPA	kg	25.00	IPA	25.00	Reused & recycled.
	Total Input	**kg**	**869.38**	**Total Output**	**869.38**	

2. Manufacturing Process of Diethyl amine Salicylate

Salicylic Acid and Toluene are charged into the rector and followed by the addition of Diethyl Amine. Maintained the temperature for some time and allow to cool naturally. Distill off the Toluene. Crude material is obtained and recrystallized in Acetone. Material is centrifuged and dried and then packed in 25 Kgs. HDPE drums

Chemical Reaction



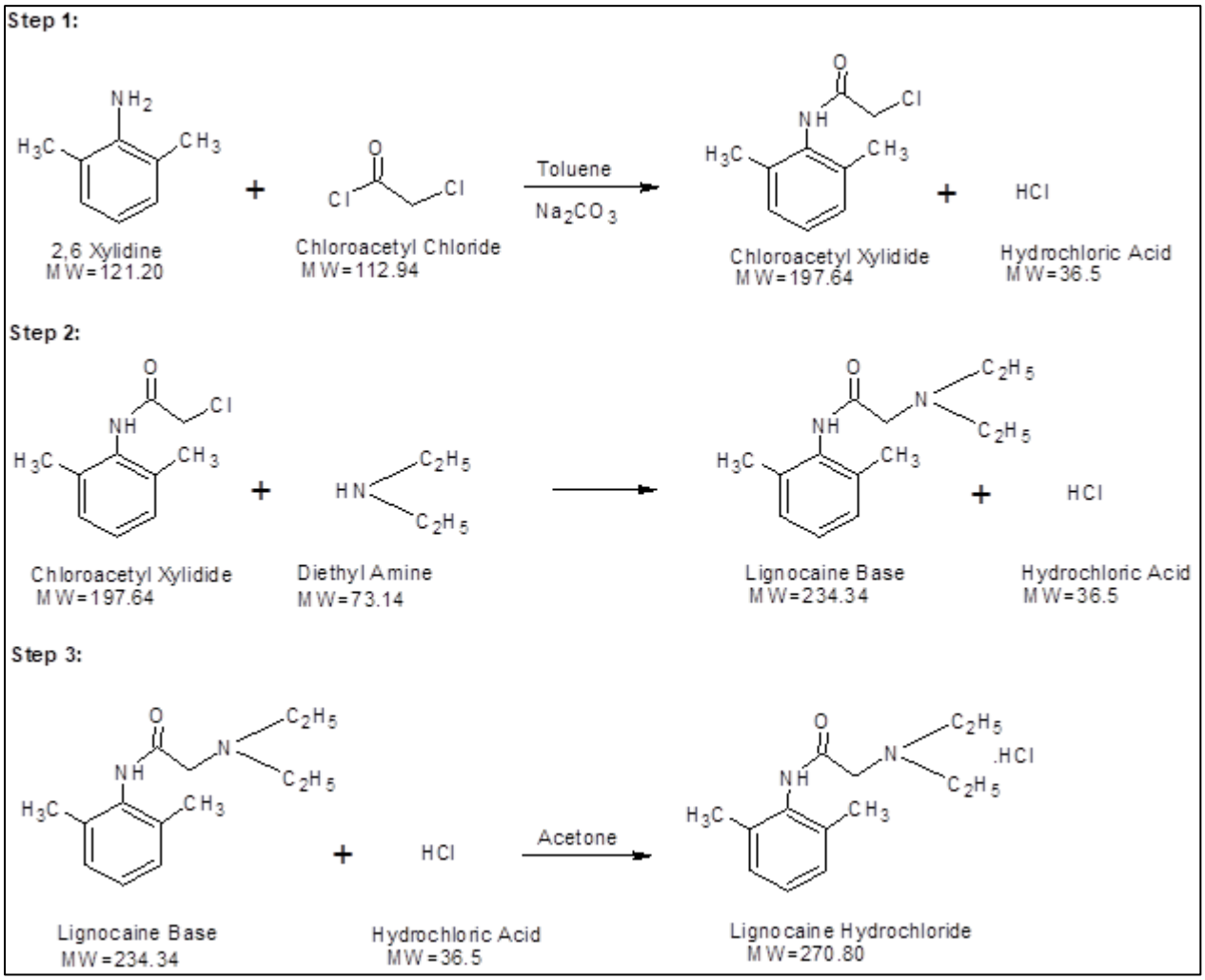
Material Balance

Sr. No	Input	UOM	Qty.	Output	Qty.	Remark
1	Salicylic Acid	kg	65.50	Diethyl amine Salicylate	100.00	Desired Product
2	Toluene	kg	45.00	Spent Toluene	44.00	Recycled
3	Diethyl amine	kg	34.60	Process Loss	1.10	
	Total Input	**kg**	**145.10**	**Total Output**	**145.10**	

3. Manufacturing Process of Lignocaine Hydrochloride

2,6 Xylidine and Sodium Carbonate mixed with Toluene in reactor and slowly add Chloroacetyl Chloride under cooling temperature at 15 degree C for three hrs. To get crystals of Chloroacetyl Xylidide (CAX), dilute and separate Toluene and centrifuged. Collect the toluene and reused back in process. CAX is taken in reactor for reflux and add Diethylamine slowly at temp. 50-℃. Heat to 80 ℃ and reflux for 2-3 hrs., hot mass is collected in SS tray after cooling to get crystal of crude Lignocaine Base. Crude Lignocaine Base is dissolved in Acetone, add Hydrochloric Acid under temp.10℃ to get crystals of Lignocaine HCL, centrifuge and collect recovered Acetone used in process.

Chemical Reaction



Material Balance

Sr. No	Input	UOM	Qty.	Output	Qty.	Remark
1	2,6 Xylidine	kg	44.76	Lignocaine HCL	100.0	Desired Product
2	Sodium Carbonate	kg	39.12	Acetone	21.44	Recovered & recycled
3	Chloroacetyl Chloride	kg	41.70	Toluene	34.00	Recovered & recycled
4	Toluene	kg	34.00	Sodium Carbonate	39.12	Salt to ETP
5	Diethylamine	kg	27.00	HCL	26.94	Recycled & reused.
6.	Acetone	kg	21.44			
7.	Hydrochloric Acid	kg	13.48			
	Total Input	**kg**	**221.5**	**Total Output**	**221.5**	

8. Description of the Environment

Field monitoring was done for primary data collection of various environment components such as air quality, water quality, soil quality, noise and others. Also, secondary data such as

micrometeorology, flora and fauna, socio-economic, hydro-geological study, traffic study etc. from authenticated sources was used as a guideline and reference material. The entire data has been collected through actual physical surveys and observations, literature surveys, interaction with locals, government agencies, and departments. The baseline study begins with site visits and reconnaissance survey in the study area.

The guiding factors for the present baseline study are the requirements prescribed by the guidelines given in the EIA Manual of the MoEFCC and methodologies mentioned in Technical EIA Guidelines Manual for Synthetic Organic Industries by IL&FS Ecosmart Ltd., approved by MoEFCC.

The studies were conducted during the Pre-Monsoon season for the period of 1st March 2025 to 31st May 2025.

Frequency and summary of results of environment monitoring is given in **Table 5**

Table 5: Frequency of primary data collection and its results

Environmental Attributes	Frequency of monitoring	Parameters	Observed Results
Meteorology	Microprocessor based Weather Monitoring Station Continuous hourly recording	Wind speed,	8.36 m/s
		Wind direction	North-West
		Max. Temp.	40 °C
		Mini. Temp.	21°C
		Relative Humidity	26.13 %- 43.40 %
		Precipitation	0.02498 mm
Ambient Air Quality	8 Locations 24 hourly samples Twice a week for 3 months (in $\mu g/m^3$)	$PM_{2.5}$	13.6 $\mu g/m^3$ – 26.9 $\mu g/m^3$
		PM_{10}	49.88 $\mu g/m^3$ – 67.18 $\mu g/m^3$
		SO_2	12.02 $\mu g/m^3$ – 21.01 $\mu g/m^3$
		NO_x	14.16 $\mu g/m^3$ –19.5 $\mu g/m^3$
Water Quality (Ground water)	Once in season at 8 locations (Physical, chemical and biological parameters)	Colour	Below acceptable standards
		pH	Within the CPCB-prescribed range of 6.82 to 8.23
		TDS	TDS ranged from 260 to 512 mg/L. The IS: 10500:2018 standard of 500 mg/L

		COD	COD ranged from 6.9 to 12.2 mg/L.
Water Quality (Surface Water)	Once in season at 8 locations (Physical, chemical and biological parameters)	Colour	Below acceptable standards
		pH	Within the CPCB-prescribed range of 7.07 to 7.63
		TDS	TDS ranged from 224 to 594 mg/L. The IS: 10500:2018 standard of 500 mg/L
		COD	COD ranged from 14.6 to 26.1 mg/L.
Soil Quality	Once in season at 8 locations	Soil type and texture, Physico-chemical properties, NPK	The soils are sandy loam, neutral to slightly alkaline, and non-saline. They have good structure, moderate water-holding capacity, and adequate organic matter. Nutrient levels are generally sufficient, with potassium being moderate. Overall, the soils are fertile and suitable for cultivation.
Noise Quality	Once in season at 8 Locations (Noise levels in dB(A))	Max & Min Day	68.8 & 46.1 dB(A)
		Max & Min Night	64.6 & 36.8 dB(A)
Land use Pattern	One time visit of the study area for ground truthing	Identification and classification of land use	Most of the land is Non-Agriculture Industrial land.
Geology and hydrogeology	Primary observation during visit and sec. data	Geology and hydrogeology of the study area	Nashik district has a plateau–hill physiography dominated by the Sahyadri ranges and basaltic plateaus, with distinct Godavari and Tapi river basins. The basalt-derived soils are generally fertile, supporting cereal and pulse cultivation.

			Hydrogeologically, the district is mainly under basalt aquifers, with limited alluvial aquifers along river valleys. Groundwater availability is highly variable and localized, controlled by weathering and fracturing of basalt. Shallow aquifers show good post-monsoon recharge, while deeper aquifers exhibit large pre-monsoon water-level declines in many areas, indicating stress and possible over-extraction, especially in eastern and southern parts of the district.
Ecology	General in 10 km radial study area and data collected around the project site through field visits.	Flora	Flora: The core zone supports poor and disturbed vegetation, dominated by grasses, ruderal herbs, and a few disturbance-tolerant shrubs, indicating long-term anthropogenic influence and absence of natural tree cover. In contrast, the 10 km buffer zone shows high floral diversity, comprising dry deciduous species, agricultural plantations, orchards, roadside trees, and riparian vegetation. Most plant species belong to the Least Concern category, reflecting stable and common vegetation types typical of semi-arid

			central Maharashtra. A few RET species (e.g., *Tectona grandis*, *Mangifera indica*, *Gloriosa superba*) occur sparsely in the wider landscape but are absent from the project site, indicating low ecological sensitivity of the core area.
		Fauna	Fauna: The study area supports a moderate and diverse faunal assemblage, dominated by common, widespread, and disturbance-tolerant species, especially birds. Most recorded fauna fall under Schedule II of the Wildlife (Protection) Act and are categorized as Least Concern (LC) by IUCN. No Schedule-I, endangered, critically endangered, or endemic species were recorded within the core or buffer zones. Faunal presence is largely associated with agricultural fields, water bodies, and human-modified habitats, indicating that the area does not represent a critical or sensitive wildlife habitat.
Socioeconomic Data	Primary and sec data in 10 km radial study area and data collected around the	Socio-economic characteristics of the affected area	Sanitation facilities are average. Power supply facility is available in almost villages and town. The water supply in the

	project site through field visits		region is mostly through wells and hand pumps. For drinking purpose people are using only ground water supply, but very few hand pumps are available for drinking water, medical facilities in terms of primary health center and primary health sub centers in the rural areas are good.

9. Potential Impacts and Remedial Plans

Environmental impact identification is based on stage of project and the type, scale and location of proposed project activity. Environmental components that may be affected negatively and positively due to proposed activity are identified for construction and operation phase are presented in **Table 6.**

Table 6: Environmental aspects and impacts of Project

Sr. No	Step/ Activity	Environmental Aspect	Impact	
			Description	Severity
1	Minor Construction of buildings and demolition of construction buildings	Emission to air (dust)	Air Pollution	Temporary
		Use of water, energy and materials.	Natural resources, conservation	Temporary
		Use of manpower	Employment	Temporary
		Hazardous and non-hazardous waste disposal on land.	Land pollution	Permanent
2	Commissioning	Use of DG Set, Raw material and Finished product Transportation, Handling of chemicals	Air Pollution	Permanent
		Use & storage of hazardous chemicals	Land Pollution, Safety,	Permanent

			Occupational Hazards	
		Waste Water discharge	Water Pollution Land Pollution	Permanent
		Hazardous and Non-hazardous Waste Disposal on land	Land Pollution	Permanent
		Use of Water	Natural resources/ conservation	Permanent
		Use of manpower	Employment	Permanent
		Production of goods	Revenue Generation	Permanent
		Operation of Plant and machinery	Noise Pollution	Permanent
3	Closure and Decommissioning	Stoppage of New product	Revenue & employment loss	Permanent
		Decommissioning	Land pollution	Permanent

9.1 Prediction of Impacts during Construction Phase

Construction activity shall be done on an area of 2215.9sq.m. for the proposed expansion. Proposed expansion involves equipment installation and allied civil works Hence, significant major impacts are envisaged. **Table 7** shows potential impacts and mitigation measures during construction phase.

Table 7: Summary of Impacts and Mitigation Measures during Construction phase

Sr. No.	Environmental Aspects	Potential Source of Impact	Proposed Mitigation Measures
1.	Land Environment	Site clearing, earthwork, topsoil removal, and disturbance to the soil surfaces	• Store topsoil for green belt development • Plan major excavation activities during dry seasons • No labour camp at the site during construction • Treat sewage in septic tank and soak

			pit • Use sand and gravel for road construction • Recycle waste materials like concrete, glass, and plastic • Implement dust control measures during demolition • Properly dispose of debris from construction activity to avoid soil contamination
2.	Air Quality	Levelling, grading, excavation, and transportation activities	• Prohibit excavation and Construction in windy conditions. • Use PUC holder trucks. • Regularly sprinkle water to suppress dust. • Separate excavation and construction areas with barriers. • Cover loose materials, construction debris, and Construction waste. • Use dust screens around construction sites to reduce particulate matter dispersion.
3.	Water Environment	Sewage generation, runoff from construction activities, and stagnant construction wastewater	• Install silt fences and sediment barriers. • Provide clean drinking water and proper sewage treatment for workers. • Avoid earthwork and construction during the rainy season. • Properly dispose of hazardous liquids and debris from construction to prevent water contamination.
4.	Ecological & Biological Environment	Site preparation, excavation, transportation, and construction activities	• Prioritize utilization of low noise-generating equipment • Provide barriers and water sprinkling to reduce dust and noise • Develop a green belt area • Ensure no significant impact on fauna and flora • Minimize clearing of vegetation during construction

			• Relocate any affected flora or fauna before construction
5.	Noise and Vibration Environment	Construction traffic, digging, piling, blowing horns, noise from equipment	• Use low noise-generating equipment • Provide PPE for workers • Use barriers to prevent noise propagation • Conduct weekly noise level monitoring • Schedule construction activities during daytime hours to minimize disturbance
6.	Occupational Health and Safety	Working at risk height, storage of hazardous material/chemicals, work without protective equipment, site sanitation	• Design proper safety plans for workers • Provide internal safety training • Provide adequate PPE for workers • Implement emergency preparedness plan • Segregate and recycle generated solid waste • Ensure strict adherence to safety protocols during construction • Conduct a risk assessment before any construction activity
7.	Socio-Economic Environment	Increased strain on civic amenities, temporary employment, business opportunities	• Prioritize hiring local residents for construction jobs • Adhere to environmental regulations • Provide employment opportunities and resources to local communities • Create business opportunities for local suppliers and contractors • Inform local communities about construction schedules to minimize disruption • Ensure construction does not negatively impact access to local businesses and services

9.2 Prediction of impacts during operational phase

Significant Impacts from the project activities and its mitigation measures are summarized in **Table 8** below –

Table 8: Summary of Impacts and Mitigation Measures during Operation Phase

Sr. No.	Environment Aspects	Potential source of Impact	Proposed mitigation measures
1	Air Environment	Manufacturing Process, vehicular movement, raw material handling, Operation of DG Set, operation of Thermic Fluid Heater & Boiler	• Packed column system is provided to efficiently capture and recover Volatile Organic Compounds (VOCs). VOC sensors will be installed to control VOC emissions. • Periodic maintenance of vehicles should be carried out. Green belt will be developed. • Periodic maintenance of vehicles and material storage area. • Workplace monitoring will be carried at regular intervals. • 1 no. of DG set with adequate stack height of 8 m is provided. • Only PUC holder trucks will be allowed at site • Vehicular speed limit is defined 20 KMPH within the plant area • All internal road within plant area is asphalted & whenever dusty situation will be found on road, water sprinkling will be done. • For workers half yearly health check -up will be done. • If required spraying of water on the road to suppress the dust emission.
2	Water Environment	Exploitation of surface water and disposal of waste water on land	• The process effluent will be segregated into high COD and low COD streams. Approximately 3.05 KLD of high COD effluent will be treated in a Multiple Effect Evaporator (MEE), while 0.50 KLD of low COD effluent, along with cooling tower blowdown, boiler blowdown, scrubber effluent, and

			washing effluent, will be treated in a 20 KLD Effluent Treatment Plant (ETP) consisting of primary, secondary, and tertiary treatment units. • The treated effluent from both the MEE and ETP will be reused in the cooling tower makeup, ensuring Zero Liquid Discharge (ZLD). In addition, about 1.8 KLD of domestic wastewater will be treated in a 3 KLD package STP, and the treated water will be reused for gardening within the premises. • Storm water network will be designed from construction phase only. 1 No. rain water harvesting recharge tank will be provided within the plant area.
3	Land	Land use	• Production, maintenance area and warehouses for storage of raw materials, finished products and hazardous wastes will be provided with impervious flooring. • All bulk storage tanks will be provided with adequate dyke walls to prevent spreading of spill or leaked chemicals causing contamination of soil. • Necessary cleanup procedures (SOPs) for the specific area will be designed and implemented. • Used oil from machineries/equipment etc. will be collected in drums & stored in designated storage area. • Hazardous waste management will be done as per statutory guidelines & requirements. • Empty Chemical drums will be decontaminated and reused/recycled or sent back to

			supplier or sold to MPCB authorized party. • All transportation of hazardous wastes will be done in closed truck/tanker by MPCB approved agencies • Guidelines will be followed for transport of all hazardous materials. All required safety & emergency equipment & materials will be provided on the transport vehicles. • Proponent will maintain a good spill or leak control action plan to cope up with such incidents. • Monitoring of soil samples in areas near hazardous waste storage will be done as per Environmental monitoring plan.
4	Soil	Disposal of waste on the land	Industry has proposed to disposed off Hazardous waste to authorized CHWTSDF facility. All the waste will be disposed of as per Solid and hazardous waste management and handling rule 2016.
5	Noise	During Operation	• Low noise generating equipment and working methods for the production unit are installed to reduce noise generation in plant areas. • Provision of ear protection equipment (earplug/ earmuff) for activities that are likely to create noise in excess of 75 dB (A) to protect workers' health and safety. • Undertake in-plant audit to identify high noise level generating equipment. • Preventive maintenance including regular lubrication of machineries and equipment to reduce noise level.

			• Static & dynamic balancing of all rotating equipment & machineries are carried out on regular time basis to reduce the vibration & noise. • Regular noise monitoring shall be done as per environment monitoring plan chapter 6. • The impacts of noise on occupational health would be mitigated by proper shift timing & annual audiological check-up of concern employees. • Workers showing hearing loss, if any, will be shifted to other less noisy areas.
6	Ecology	Release of pollutant in environment contaminating soil, and water, leading to habitat destruction, loss of biodiversity, and harm to local flora and fauna	• Based on the pollutant dispersion analysis conducted using the AERMOD model. As a result, it is may be concluded that the proposed pollutants are not expected to have a significant adverse impact on the local ecology and biodiversity. • Study area comprises of plant species which are not included in IUCN's category of threatened, critically endangered plant species. • The industry is committed to implementing effective measures to prevent both noise and light pollution. Additionally, it's noteworthy that there is no observed migration route of birds in proximity to the industrial area. • During operation phase of project, some negative impacts on the ecology and biodiversity of the project site and its surrounding area is expected which will be reduced/minimized through implementation of suitable mitigation measures and development of green belt area.

7	Socioeconomic	Influx of people, settlement and resource utilization	Over all positive impact is envisaged. CSR activities by proponent will be beneficial to local people
8	Occupational Health and safety	Exposure to the chemicals, Operation of machines, Fire hazardous	All safety measures and safety equipment's will be placed. PPE's will be provided to workers and associated staff

10. Site and Technology Alternative Analysis

As the project is an expansion of existing industry at Gat No. 200/1, P.O. Lakhmapur, Tal. Dindori, Dist. Nashik, alternative site analysis was deemed unnecessary. Required infrastructure such as Water, Electricity, Roads, Solid Waste Disposal Facility, etc. are already provided. Site is well connected to Saputara-Nashik National Highway (NH 953) at 0.4 km at West direction, Nashik International Airport at 16.81 km in SE, Kherwadi Railway Station at 26.6 km SE from project site. The site selected also has the following merits –

- Project site is already developed and the existing area is sufficient for the proposed expansion.
- Land use of the site is already earmarked as industrial use.
- Required infrastructure like road, transport, water, electricity, etc. are already available in the area.
- No resettlement & rehabilitation is involved.
- Site is easily accessible to local markets.

Matrix of Alternative site Analysis is given in **Table 9** below whereas Technology alternatives is given in **Table 10** below.

Table 9: Matrix of Alternative Site Analysis

Sr. No.	Site Selection Criteria	Existing Site
1.	Non-Agricultural Land	✓
2.	No R & R Issue	✓
3.	Topography (Slope)	✓
4.	Site Connectivity (Approach Road)	✓
5.	No Notified Wildlife Sanctuary, National Park, Biosphere Reserve, etc. within 5 km radius	✓
6.	No Notified Critically Polluted Area as per CPCB within 5 km radius	✓
7.	No Archaeological Monuments within 5 km radius	✓
8.	Availability of Electricity (MSEDCL)	✓
9.	Availability of Raw Material	✓
10.	Availability of labour force	✓

11.	Availability of Local Market for finished products	✓

Table 10: Analysis of alternative technology

Sr. No.	Parameters	Indicator	Executed	Remark
i	Process	Continuous / Batch	Batch	Batch processing allows better control over water, temperature, steam, and reaction time, reducing resource waste compared to continuous processes, which require constant parameter maintenance to avoid production disruptions.
ii	Thermopack Fuel Requirement	Thermopack	Thermopack	Light Diesel Oil (LDO) has lower NOx and sulfur content than conventional fuels like coal (13.99% ash, 0.5-8% sulfur). A 30-meter stack ensures pollutant dispersion.
iii	Boiler Fuel Requirement	Boiler	Boiler	Light Diesel Oil (LDO) has lower NOx and sulfur content than conventional fuels like coal (13.99% ash, 0.5-8% sulfur). A 30-meter stack ensures pollutant dispersion.
iv	Waste Water Disposal	ETP/ ZLD	ZLD	A 20 KLD ETP treats 10.05 KLD of trade effluent via primary, neutralization, equalization, and tertiary treatments. Treated water is recycled for cooling towers and process washing, achieving Zero Liquid Discharge (ZLD).
v	STP Treatment	Package STP	Package STP	A 3 KLD package STP treats 2 KLD of domestic sewage,

				with treated water reused for gardening.
vi	ETP Technology	Conventional / Biological	Biological	A 20 KLD biological ETP effectively treats 10.5 KLD of effluent, ensuring compliance with environmental standards.
vii	Charging of Chemicals	Manually/ Automatic	Automatic	Automatic charging reduces fugitive emissions compared to manual methods, improving safety and environmental performance.
viii	Electrical Power	Conventional/ Solar	Solar	10% of energy needs will be met by solar power, reducing reliance on MSEDCL and lowering the carbon footprint.

11. Environment Monitoring Plan

The regular monitoring of different environmental parameters is of immense importance to assess the present environment conditions as well as impacts of the proposed expansion on the environment. A proper monitoring program will be required to ensure effectiveness of implementation of suggested mitigation measures. The environmental monitoring will help in assessing the changes in environmental conditions by monitoring the effective implementation of mitigation measures, and measuring deteriorations in environmental quality for further preventive actions. Environmental Monitoring program during revamping and retrofitting phase is given in **Table 11** whereas Environmental Monitoring program for operation phase is given in **Table 12** below –

Table 11: Environmental Monitoring during Project – Construction Phase

Sr. No.	Potential Impact	Action to be Followed	Parameters for Monitoring	Frequency of Monitoring
1.	Air	All equipment's to be operated within specified design Parameters.	Random checks of equipment's logs/manuals	Weekly
		Vehicle trips to be minimized to the extent possible	Vehicle logs	Weekly during site clearance and construction activities

		Maintenance of DG set emissions to meet stipulated standards	Gaseous emissions (SO_2, CO, NO_X)	Three Monthly emission monitoring
		Ambient air quality within the premises of the proposed unit to be monitored.	The ambient air quality will conform to the standards for PM_{10}, $PM_{2.5}$, SO_2, NO_X	As per CPCB/SPCB requirement or on monthly basis whichever is earlier
2.	Noise	List of all noise generating machinery onsite along with age to be prepared. Equipment to be maintained in good working order.	Equipment logs, noise readings.	Monthly during construction activities
		Night working is to be minimized.	Working hour records.	Daily records
		Generation of vehicular noise	Maintenance of record of vehicles.	Daily records
		Noise to be monitored within the plant premises.	Spot noise recording.	As per CPCB/ SPCB requirement or on monthly basis whichever is earlier
3.	Wastewater Discharge	No untreated discharge is to be made to surface water, groundwater, or soil.	No discharge hoses shall be in the vicinity of the watercourse.	Monthly during construction activities.
4.	Soil Erosion	Protect top soil stockpile where possible at the edge of the site.	Ensure protective measures for topsoil stockpiles are in place, with regular inspection to verify stability and effectiveness in preventing erosion.	The period during construction activities
5.	Drainage Management	Ensure that the drainage system and specific design measures are functioning effectively. The design should	Visual inspection of drainage and record thereof.	Three monthly during construction activities

		incorporate the existing drainage patterns and prevent any disruption to them.		
6.	Waste Management	Implement a waste management plan that identifies and characterizes every waste arising associated with proposed activities and which identifies the procedure for collection, handling, and disposal of each waste arising.	A comprehensive Waste Management plan should be in place and available for inspection on site. Compliance with MSW Rules,1998 and Hazardous Wastes (Management and Handling Rule)2003.	Fortnightly check during construction activities
7.	Non-routine events and accidental releases	Plan to be drawn up, considering likely emergencies and steps required to prevent/limit consequences	Mock drills and records of the same.	Monthly during construction activities.
8.	Health	Employees and migrant labour health check-up.	All relevant parameters including HIV.	Three monthly check-ups.
9.	Environmental Management Cell/Unit	The Environmental Management Cell/Unit is to ensure implementation and monitoring of environmental safeguards.	Responsibilities and roles will be decided before the commencement of work.	During construction phase.
10.	Loss of flora and fauna	Re-vegetation as per Forest guidelines	No. of plants, species.	During site clearance Phase.

Table 12: Environmental Monitoring Schedule during Operation Phase

Sr. No	Particulate	Parameters	Number of locations	Frequency
Air Environment				

1.	Ambient air quality	PM_{10}, $PM_{2.5}$, SO_2, NOx, CO, and HC	Ambien air quality at minimum 3 location. 1 location within the plant premises, 1 location in upwind, 1 location in downwind direction.	Monthly
2.	Exhaust from DG set	SPM, SO_2, and NO_x	Stacks of 1 x 320 KVA	Quarterly
3.	Indoor Air Quality	$PM_{2.5}$, PM_{10}, SO_2, NO_x, CO	2 locations/plant, 1 outside vent	Quarterly
4.	Thermic Fluid Heater Emission & Boiler Emission	PM, SO_2, CO, NOx	Common Stack of 1 x 2 Lakh kcal Thermic Fluid Heater & 1 x 2 TPH Steam Boiler	Monthly
Water Environment				
5.	Wastewater	pH, EC, SS, TDS, O & G, Ammoniacal Nitrogen, COD, BOD, Chloride, Sulphides, etc.	Inlet and outlet of ETP	Quarterly
6.	Drinking Water	Parameters as per IS 10500:2012 Rev. 02	At each drinking water Locations	Once every 3 Month
Noise Environment				
7.	Noise	Leq (Day & Night)	3 locations at industry plot boundary and 1 at nearest habitats if any	Once every 3 Month
Biological Environment				
8.	Green belt	Number of plantation (units), number of survived plants/ trees, number of poor plants/ trees.	In and around the plant site and designated green belt area.	Half yearly
Land Contamination				
9.	Soil	Texture, pH, electrical conductivity, cation exchange	1 location near Solid/hazardous waste storage.	Half yearly

		capacity, alkali metals, Sodium Absorption Ratio (SAR), permeability, porosity.		

12. Rehabilitation And Resettlement Plan

The proposed expansion is planned in the existing area at Gat No. 200/1, PO Lakhmapur Tal. Dindori Dist. Nashik, Maharashtra-422202.

This project does not require the acquisition of other land relating to social settlement and will not affect any kind of social settlement, infrastructure, and establishment of society. Hence, there is no applicability of rehabilitation and resettlement.

13. Project Benefits

- Improvement in Physical infrastructure
- Improvement in Social infrastructure
- Employment generation
- Likely indirect employment opportunities
- The proposed project will generate an additional revenue to the local Gram panchayat.
- Additional taxes shall be paid to Government of Maharashtra.
- Availability of raw material to local manufacturing industry at reasonable costs which results in reduction of the cost of finished products.
- Economic benefits of the proposed project will result in further benefits in terms of the Literacy level, primary and middle level education and on health facilities.
- Many small businesses will induce such as Mess, Hotels, Tea Stall, Grocery Market, Vegetable Market, Automobile workshop etc.
- Improvement in local amenities
- Improvement in road link facilities as transportation through truck and other vehicles will be increased due to proposed project.

Under Corporate Environmental Responsibility (CER), as per the Ministry's O.M. No. 22-65/2017-IA. II (M) dated May 1, 2018, Rs. 2.37 lakhs (1% of the proposed expansion cost) are allocated for physical infrastructure improvements. These initiatives aim to enhance sustainability and community welfare, as detailed in **Table No. 13.**

Table 13: Details of CER Activity

Sr. No.	CER Activity	Details	Cost (₹. In Lakh)

1.	Providing RO Water Filters	Installation of 1 RO water purification unit at Zilla Parishad School, Lakhamapur, to ensure access to clean drinking water for students.	0.7500
2.	Sanitation Facility	Renovations and improvement of toilet blocks, hand wash stations, and waste disposal units in government schools across Dindori Taluka, based on needs identified during local consultations.	0.77610
3.	Rainwater Harvesting	Implementation of rainwater harvesting systems in public buildings and schools at Lakhamapur village, to promote groundwater recharge and address water scarcity.	0.8500
	TOTAL		**₹2.3761.**

14. Environment Management Plan

The EMP is,

- Prepared in accordance with rules and requirements of the MoEFCC and the State Pollution Control Board.
- Prepared to ensure that the component of facility is operated in accordance with the design.
- A process that confirms proper orientation through supervision and monitoring.
- A system that addresses public complaints during construction and operation phase.
- A plan that ensures remedial measures are implemented immediately.

The key benefits of the EMP are that, it provides the organization with means of managing its environmental performance thereby allowing it to contribute to improved environment quality. The other benefits include cost control and improved relation to stakeholders.

EMP includes four major element –

- **Commitment and Policy**: of proposed project will strive to provide and implement the Environmental Management Plan that incorporates all issues related to air, land and water.
- **Planning**: This includes identification of environmental impacts, legal requirements and setting environmental objectives.
- **Implementation**: This comprises of resources available to the developers, accountability of contractors, training of operational staff associated with environmental control facilities and documentation of measures to be taken
- **Measurement and Evaluation**: This includes monitoring, corrective actions, and record keeping.

During study of the environmental attributes, it was seen that all the aspects would be considered to promote the better development in case of future aspects of project as well as environmental aspects.

14.1 Environment Management Plan during Construction Phase

The expansion involves revamping and retrofitting of the existing industries. However, some of the mitigation measures which will be implemented during the construction, retrofitting and revamping of machinery are –

- Retrofitting and revamping will be carried out on concrete impervious surface to avoid seepage of oil or lubricant in the soil.
- Separate area will be earmarked for storage of solid wastes generated while hazardous wastes will be stored in existing covered area earmarked for the purpose.
- PPE's will be provided to workers.
- Temporary arrangement of clean drinking water will be provided for workers
- Toilet facility is already existing which will be used by the construction personnel.
- Generated sewage of 2 KLD will be treated in Package STP of 3 KLD.
- Provision of PPE (dust masks, goggles) for onsite workers.
- Periodic water sprinkling in dust prone areas.

Table 14: EMP for Construction Phase

S. N.	Activity	Aspect	Impact	Mitigation Measures	Approximate Budget (₹)	Timeframe	Responsibility
1	- Construction Activities (2215.9 sq. m.) includes- Site levelling, Use of machineries, Hammers, Crowbars, Welding & Metal Cutting, Dump Trucks & Tippers - Equipment Installation (Thermic Fluid Heater, Boiler Cooling Tower, DG Set,). - Solid waste handling (Debris, welding, roofing)	- Air emissions from machinery; Fugitive dust (PM10, PM2.5); CO_2, NO_x, CO from construction equipment. - Air emissions from machinery, welding, and handling of materials. - Dust and particulate emissions.	- Increased particulate matter affecting local air quality - Respiratory problems and eye irritation for workers - Dust deposition on plants, affecting photosynthesis and growth.	**Dust Control:** - Suppress dust using water sprinklers at construction site and material handling areas. - Cover debris, sand, cement, steel, and other fine materials with tarpaulin sheets during storage and transport. - Confine construction area and construction zones using metal sheet barricades. **Equipment & Vehicle Emissions:** - Use low-emission machinery. - Ensure vehicles transporting materials are BS-VI compliant. - Regular maintenance of machinery and vehicles. **Worker Protection:** - Provide PPE: N95/P100 masks, goggles, face shields.	**Capital Cost:** ₹. 3,78,442/- **Recurring Cost:** ₹. 50,000/-	**Equipment installation**- Construction Phase (3–6 months).	Contractor, Environmental Officer, EHS Team, Site Supervisor

				- Train workers on safe handling of dusty materials and equipment operation. **Solid Waste Management:** - Collect and dispose of debris, welding scraps, roofing materials at designated sites. - Avoid leaving loose waste uncovered. **Vegetation Protection:** - Prevent dust deposition on nearby plants using barriers and water sprinklers. - Avoid storing dusty materials near green areas.			
2	- Dust suppression during construction. - Tank farm and equipment installation. - Domestic activity	- Water usage - Runoff carrying sediment or oils	- Excessive water consumption. - Minor risk of runoff with pollution potential. - Contamination of soil/groundwater.	**Water Use Management:** - Use manual water sprinkling (1–2 times daily) during material handling and construction activities to suppress dust (PM10, PM2.5) over 2215.9 sq.m area. - Monitor daily water usage to avoid wastage. **Runoff & Sediment Control:** - Install temporary silt traps or sediment barriers around installation and construction	**Capital Cost:** ₹. 1,10,000/- **Recurring Cost:** ₹. 60,000/-	Construction Phase (3–6 months)	EHS Team / Site Supervisor

				areas. - Ensure proper grading to prevent ponding or uncontrolled runoff. **Spill Prevention & Storage:** - Store fuels, oils in bunded, leak-proof containers on impervious platforms during tank farm installation. - Regularly inspect storage areas for leaks or seepage. **Domestic Wastewater Management:** - Collect and treat domestic wastewater in temporary septic tanks or soak pits. - Prevent direct discharge of untreated wastewater into surrounding soil or drains.			
3	- Construction activities - Equipment installation	- Noise & vibration from machinery. - Use of cranes and power tools.	- Increase in ambient noise levels, causing hearing issues and physical discomfort for on-site workers - Vibration impacts on nearby structures - Temporary exceedance of CPCB noise limits (~70–85 dB(A)) at site	**Work Scheduling:** - Conduct construction activities and installation activities during daytime hours (6/8 AM – 6/8 PM) to reduce disturbance. **Noise Control Measures:** - Install noise barriers (metal sheet barricades) around work zones. - Use low-noise equipment	**Capital Cost:** ₹. 1,50,000/- **Recurring Cost:** ₹. 15,000/-	Construction phase	Contractor / EHS Team / Site Supervisor

			boundary (75 dB(A) daytime, 55 dB(A) nighttime).	(silenced cranes, electric tools) to keep noise within CPCB limits. **Worker Protection:** - Provide earplugs and earmuffs to all on-site workers. - Restrict worker exposure to noise >80 dB(A) for 8-hour shifts. **Monitoring:** - Conduct ambient noise monitoring once a month during construction and installation activities. - Conduct monthly noise checks at work zones to ensure compliance with workplace exposure limits.			
4	- Construction activities - Equipment installation (Thermic Fluid Heater, Boiler, Cooling Tower, DG Set) - Domestic activities on-site	- Waste generation (debris, concrete, bricks, metals, domestic wet & dry waste) - Potential spills of fuels, oils during installation	- Large volume of waste requiring proper disposal. - Potential landfill burden and increased landfill load. - Approx. 3.6 kg/day dry waste and 2.4 kg/day wet waste from 40 workers. - Unsightly and unhygienic	**Waste Segregation & Handling:** - Provide separate dustbins for dry and wet waste. - Train workers on waste segregation. - Segregate materials for reuse and recycling. - Hand over dry waste to authorized scrap vendors. - Send wet waste to local municipal facilities.	**Capital Cost:** ₹. 56,000/- **Recurring Cost:** ₹. 25,000/-	Construction phase	Contractor / EHS Team / Site Supervisor

			conditions if improperly managed. - Foul odors from decomposing organic waste causing discomfort or inhalation issues. - Leachate from wet waste contaminating soil and groundwater. - Decomposition of organic waste releasing greenhouse gases. - Inert waste affecting site aesthetics and space - Dust generation from uncovered debris. - Minor risk of soil contamination from spills.	**Construction & Demolition (C&D) Waste Management:** - Implement a C&D Waste Management Plan. - Crush and reuse concrete debris for non-structural purposes (site levelling, backfilling). - Segregate and recycle metal scraps. - Cover debris to prevent dust. - Dispose of non-reusable waste through authorized recyclers. **Hazardous Waste & Spill Prevention:** - Store fuels, oils in designated bunded areas. - Use spill containment kits (absorbent pads, booms) for accidental spills. - Limit material storage to designated areas (2215.9 sq.m footprint) to avoid soil disturbance. **Monitoring & Inspections:** - Conduct fortnightly site inspections by EHS officer			

<table>
<tr><td></td><td></td><td></td><td></td><td>to ensure proper waste handling and disposal.</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td colspan="6">The construction & demolition waste will be segregated as
<table>
<tr><th>Sr. No</th><th>Type of the waste</th><th>Quantity (tons)</th><th>Mode of Disposal</th></tr>
<tr><td>1</td><td>C & D Waste</td><td>92.42</td><td>Concrete / bricks / plaster /stone: Reuse for site levelling and road construction.
Wood: Send to authorized Vendor.
Metal: Send to scrap vendor.</td></tr>
<tr><td>2</td><td>Excavated Soil</td><td>1033.23</td><td>Top soil - Reuse for gardening within plot. Other soil- reuse for on-site levelling/road construction.</td></tr>
<tr><td>3</td><td>Packaging Material</td><td>23.10</td><td>Plastic / Cardboard: Recycle via authorized facilities.
Wood: Reuse or send to authorized vendor.</td></tr>
</table></td></tr>
<tr><td>5</td><td>Construction activity, Equipment installation, Domestic Activity</td><td>Ambient Air Quality
Ambient Noise Level
Drinking Water Quality
Soil Quality</td><td>- Dust and exhaust emissions (PM10, PM2.5, SO_2, NO_x, CO) from construction, material handling and vehicle movement degrading local air quality.
- Equipment installation, construction, and vehicle operation causing elevated noise beyond CPCB limits and potential worker discomfort.</td><td>- Ambient air quality shall be monitored for parameters PM10, PM2.5, SO_2, NO_x, and CO at the construction site once every quarter using MoEFCC & NABL approved laboratories.
- Ambient noise levels shall be monitored for Leq (day and night, or over one work shift) at the construction site once every quarter through MoEFCC & NABL approved laboratories.
- Drinking water quality shall be tested for parameters as per IS</td><td>Capital Cost: ₹. 0/-
Recurring Cost: ₹. 32,400/-</td><td></td><td></td></tr>
</table>

			- Usage of local water during construction with possible contamination from construction debris, oils, or domestic wastewater affecting potability. - Possible soil contamination during installation works.	10500:2012 (Revision 02) at the construction site on a quarterly basis using MoEFCC & NABL approved laboratories. - Soil quality shall be assessed for oil and grease, heavy metals, pH, moisture content, and other relevant parameters at the construction site on a half-yearly basis through MoEFCC & NABL approved laboratories			
6	- Construction Activities - Equipment installation (Thermic Fluid Heater, Boiler, Cooling Tower, DG Set) - Welding activities during installation	- Fire hazards from fuels, oil, welding sparks, and other flammable materials	- Accidental fires during Construction, installation, or welding - Property damage and environmental impact - Risk to workers	**Fire Prevention & Control:** - Store flammable materials (fuels, oils) in designated bunded areas with spill containment. - Use fire-resistant tarpaulins or shields near welding operations. - Maintain fire extinguishers and firefighting equipment close to welding and tank farm areas. - Prohibit open flames near flammable storage and welding zones. **Emergency Preparedness:**	**Capital Cost:** ₹. 1,81,655/- **Recurring Cost:** ₹. 55,300/-		

				- Implement an Emergency Response Plan (ERP) specifically for fire incidents. - Conduct mock fire drills periodically. - Install safety signage indicating fire hazards. **Personnel Safety:** - Engage trained personnel for welding and handling flammable materials. - Ensure workers are aware of fire hazards and trained in emergency procedures.			
7	- Construction Activities. - Equipment installation (Thermic Fluid Heater, Cooling Tower, Boiler, DG Set). - General construction and installation activities.	- Worker exposure to dust, noise, and manual handling. - Health & safety training requirements.	- Respiratory irritation from dust and exhaust emissions. - Hearing issues or temporary discomfort from noise (~70–85 dB(A)). - Safety risks from equipment handling, sharp objects, and manual lifting - Lack of awareness leading to unsafe practices.	**Personal Protective Equipment (PPE):** - Dust masks/N95 respirators, earplugs, helmets, safety boots, gloves, welding jackets, welding shields, welding gloves, welding goggles, full-body harnesses for work at height. **Health Monitoring & Training:** - Pre-employment health screenings (respiratory, auditory). - Monthly safety briefings.	**Capital Cost:** ₹. 10,000/- **Recurring Cost:** ₹. 24100/-		

				- Train workers in SOPs for crane operation, welding, and construction. **Safety Management & Procedures:** - Install safety signage ("Wear PPE", "Caution: Equipment Installation"). - Mini Disaster Management Plan (DMP) with quarterly mock drills for spills and accidents. - Restrict access to risk areas without proper safety measures and permits. - Use machinery for lifting and moving heavy or sharp materials; prohibit manual handling where possible. **First Aid & Emergency Preparedness:** - Maintain fully equipped First Aid Kit onsite. - Engage trained personnel for construction activity and hazardous tasks.			

14.2 Environment Management Plan for Operation Phase

Factory proposes comprehensive environment management plan to combat pollution arising from the project activities. Detailed EMP is described below for various environmental parameters. EMP for operation phase is given in **Table 15** below –

Table 15: EMP during Operation Phase

S. N.	Activity	Aspects	Impact	Mitigation Measures	Budget	Timeframe	Responsibility
1	- Operation of 2 Lakh Kcal LDO Fired Thermic Fluid Heater, 2 TPH LDO Fired Boiler and 320 kVA DG Set. **(**TFH includes- Operation of burner & Furnace, Thermic Fluid Pump, Heat transfer Coil, Flue gas System, Heat Exchanger & Safety & control System)	- Combustion emissions from 25.76 Lit/hr LDO in TFH, 163.38 Lit/Hr LDO in Boiler and 40 L/hr HSD in DG Set (CO_2, NO_x, SO_2, PM) - Fugitive and VOC emissions from Active Pharmaceutical Ingredients (APIs) & Drug Intermediate Manufacturing unit - Air emissions (CO_2, NO_x, PM) from vehicle	- Emissions of PM10 (0.04 g/s), SO_2 (0.0069 g/s), and NO_x (0.023 g/s) contribute to local air pollution and respiratory irritation. - GHG emissions: tCO_2e/year from TFH, Boiler & process combustion; tCO_2e/year from DG Set. - VOCs and Hazardous Acid Pollutants may cause odor nuisance, photochemical smog, or occupational exposure hazards. - Upstream transport	**Thermic Fluid Heater (TFH):** - Use BS-VI grade LDO (≤10 ppm sulphur) to limit PM10 (<50 mg/Nm³), SO_2 (<10 mg/Nm³), NO_x (<300 mg/Nm³), and CO (<150 mg/Nm³), complying with CPCB/SPCB norms. - Provide 30 m stack height for efficient flue gas dispersion. - Install low-NO_x burners and maintain proper air-fuel ratio for efficient combustion. - Conduct quarterly maintenance and stack emission monitoring. **DG Set:**	**Capital Cost:** ₹. 6,55,000/- **Recurring Cost:** ₹. 40,000/-	Continuous operation; quarterly maintenance of stacks, scrubbers, LEV; daily checks for combustion efficiency	Plant Environmental Officer (PEO) Maintenance In-charge Shift-in-charge

	Boiler operation includes – Operation of the Burner & Furnace, Feedwater Pump, Steam/Water Drum & Tubes, Air & Flue Gas System, Economizer, Superheater (if provided), Blowdown System, and all associated Safety & Control Systems. - Process Reaction and Associated Operations in Reactors. - Storage and Handling of solvent & Chemicals. - Truck (3-4 Nos.) & Tempo	movement and transport - Upstream (raw material supply) and downstream (product distribution) transportation emissions - Employee commuting emissions	(raw materials) contributes tCO_2/year, and downstream transport (finished goods) contributes tCO_2/year — both adding to the site's carbon footprint and local air pollution. - Employee commuting contributes tCO_2/year, increasing total GHG load. - Combined GHG emissions contribute to regional air quality degradation and climate change potential.	- Provide 8 m stack height per CPCB guidelines. - Use low-sulfur HSD; perform routine maintenance and operate DG only during power failure. **Process Reaction (VOC/HAP Control):** - Equip all reactors with chilled condensers (-20°C to 0°C) achieving ≥99.97% VOC recovery. - Use nitrogen purging to maintain inert atmosphere and minimize oxidation. - Adopt closed material transfer systems with sealed pipelines and pumps. - Install Local Exhaust Ventilation (LEV) with activated carbon adsorption (>95% VOC/HAP removal). - Maintain flameproof equipment and conduct quarterly valve/seal maintenance.			

	(2-3 No) Transportation for movement of Raw Material and Finished Good.			**Storage & Handling of Solvents/Chemicals:** - Store solvents in closed, ventilated areas with vapor recovery systems. - Use vapor-tight fittings and mechanical seals to prevent fugitive emissions. **Transportation & Logistics (Upstream, Downstream, Employee Commute):** - Allow only PUC-certified and BS-VI compliant vehicles for transport. - Encourage electric vehicles for logistics and staff commuting. - Promote carpooling and shared transport to reduce emissions. - Install EV charging points and offer incentives for electric bikes. - Schedule deliveries to minimize idling and congestion.			

Details of point sources of flue emission (stack) with APCM

Sr. No.	Source of emission with capacity	Type of fuel	Quantity of Fuel	Stack Height (meter)	Type of emissions i.e. Air Pollutants	Air Pollution Control Measures (APCM)
1	2 Lakh Kcal Thermic Fluid Heater	LDO	25.76 kg/hr & 163.38 kg/hr	30	PM, SO_2, NOx, CO	30 m stack, SPM Sensor
2	2 TPH Boiler	LDO				
3	D.G. Set (1*320KVA)	H.S.D	30 Lit/Day	8	PM, SO_2, NOx, CO	8 m Stack

2	- Water requirement for process, Boiler, Scrubber, cooling tower, washing, domestic and gardening. - Effluent Generation due to Process, operation of CT Blow Down & Boiler blowdown, Scrubber and Washing activities. - Sewage generation due	- 54.93 KLD of Water Consumption. - 6 KLD of effluent generation with pollutant load. - 4.50 KLD of sewage generation with pollutant load. - Potential to capture up to 100.35 m^3/day roof top rainwater.	- Increased 43.33 KLD freshwater demand will put pressure on local water resources and groundwater. - 5.04 KLD Effluent from Cooling Tower, if left untreated, it will raise salinity and chemical toxicity in nearby water bodies. - Contamination risk from organic wastewater (0.5 KLD) generated during reactor cleaning, potentially affecting groundwater if not managed.	**Water conservation & reuse:** Use 7.9 KLD of ETP-treated water, 2.1 KLD of MEE Treated water recycled for cooling tower make-up; use 1.6 KLD of STP-treated water for gardening — this reduces freshwater draw. **Effluent treatment & recycling:** Route 0.5 Low COD + Process effluent + 5.04 KLD cooling tower blowdown + 1.96 KLD Boiler blowdown + 0.5 KLD cleaning + 1 KLD Scrubber wastewater to a ETP (primary: coagulation/settling; secondary: biological; tertiary: filtration) for	**Capital Cost:** ₹. 24,50,000/- **Recurring Cost:** ₹. 5,00,000/-	Continuous during operation; weekly checks for water recycling systems; monthly checks for ETP/STP operations	Plant Environmental Officer (PEO) Shift-in-charge for water systems

	to domestic activity. - Generation of Roof-top Rainwater.		- 1.8 KLD Sewage from Domestic Activity, if untreated, it will lead to nutrient enrichment and eutrophication in water bodies. - If storm water discharge mixes with contaminants, it will degrade the water quality of the nearby waterbodies.	treatment and reuse. Aim: no liquid discharge; treated water reused for CT **Domestic sewage treatment & reuse:** Install 3 KLD MBBR/STP for domestic sewage; treated effluent reused for gardening (1.6 KLD) **Solvent/organic management:** Implement solvent recovery (distillation) for reactor washings and process streams; reduce organic load to wastewater. **Stormwater & runoff control:** Provide separate stormwater drainage (no mixing with effluent). Construct one underground RCC tanks (100.92 m^3) for rooftop capture) for collection and use. Use harvested rainwater for cooling tower make-up, washing & scrubber (reduces freshwater demand & reduces river discharge). **Oil/sediment control:**			

				Install silt traps/oil interceptors at yard drains and around tank farm; route interceptor effluent to ETP. **Storage & bunding:** Provide bunded, impervious platforms for storage of fuels, oils to prevent seepage; collect any spills and route to ETP / neutralization. **Operation & maintenance:** Regular desludging of ETP/settling, solvent still maintenance, periodic cleaning of rain tanks/reservoir, and preventive maintenance of pumps/piping. **Administrative controls:** SOPs for reactor cleaning (minimize solvent use), training on spill response, signage for no-mixing of stormwater/effluent, and recordkeeping of water use & reuse volumes.			

Water Consumption, Waste Water Generation and Management During non-monsoon

Sr.	Particulars	Water Requirement – Make up (KLD)	Loss	Effluent Generation	Treatment Method

No.		**Fresh**	**Recycle**	**Total**		**(KLD)**	
1	Domestic	2	0	2	0.2	1.8	STP of 3 KLD capacity
2	Process	3.38	0	3.38	-	3.55	Process effluent will be separated into high and low COD streams. About 3.05 KLD of high COD effluent will be treated in an MEE, while 0.50 KLD of low COD effluent—along with CT blowdown, boiler blowdown, scrubber, and washing effluent—will be treated in a 20 KLD ETP with primary, secondary, and tertiary units. Treated water from both the MEE and ETP will be reused in cooling tower makeup, achieving Zero Liquid Discharge (ZLD).
3	Boiler	18.20	0	18.20	16.24	1.96	
4	Washing	0.5	0	0.5	0	0.5	
5	Cooling Tower	15.8	10	25.80	20.76	5.04	
6	Scrubber	1	0	1	0	1	
7	Gardening	2.45	1.6	4.05	4.05	0.00	
	Total	**43.33**	**11.6**	**54.93**	**41.25**	**13.85**	

Water Consumption, Waste Water Generation and Management During Monsoon

Sr. No	**Particulars**	**Fresh**	**Recycle**	**RWH**	**Total Consumption**	**Loss**	**Effluent**	**Treatment Method**
		Values are in CMD						
1	Domestic	2	0	0	2	0.2	1.8	STP of 3 KLD capacity
2	Process	3.38	0	0	3.38	-	3.55	Process effluent will be separated into high and low COD streams. About 3.05 KLD of high COD effluent
3	Boiler	3.2	0	15	18.20	16.24	1.96	
4	Washing	0.5	0	0	0.5	0	0.5	
5	Scrubber	1	0	0	1	0	1	

		6	Cooling Tower	5.8	10	10	25.80	20.76	5.04	will be treated in an MEE, while 0.50 KLD of low COD effluent—along with CT blowdown, boiler blowdown, scrubber, and washing effluent—will be treated in a 20 KLD ETP with primary, secondary, and tertiary units. Harvested Rain water 25 KLD will be reused in Cooling tower makeup & Boiler makeup. Treated water from both the MEE and ETP will be reused in cooling tower makeup, achieving Zero Liquid Discharge (ZLD).
		7	Gardening	0	1.6	0	1.6	1.6	0.00	
			Total	**15.88**	**11.6**	**25**	**52.48**	**38.8**	**13.85**	

Characteristic of Domestic Waste Water – STP Technology (MBBR)

Sr. No.	**Parameter**	**Unit**	**Inlet**	**Outlet**
			(mg/l, except pH)	
Quantity (KLD)			**5**	**4.5**
1	pH	--	6.5-8.5	6.5-8.5
2	TSS	mg/L	100-500	<50
3	BOD	mg/L	150-400	<10
4	COD	mg/L	250-600	<30

5	Total Coliform	CFU/100ml	10^6-10^8	<1000CFU/100 ML

Characteristic of Effluent-ETP

Parameter	Units	Low-COD Stream — Inlet (typical design range)	Low-COD Stream — Outlet (post-ETP target)	High-COD Stream — Inlet (typical design range)	High-COD Stream — Outlet (post-MEE / post-treatment target)	Combined Treated Water (for reuse) — Target
Flow	KLD	9.00	9.00 (treated)	3.05	3.05 (MEE condensate + treated)	12.05 (recycled)
pH	—	3.0 – 9.0	6.5 – 8.5	2.5 – 10.0	6.5 – 8.5	6.5 – 8.5
TSS	mg/L	100 – 2000	< 10	200 – 5000	< 50 (prior to MEE)	< 10
TDS	mg/L	800 – 3000	800 – 3000	2000 – 20000	Concentrated in MEE; condensate low (<1000)	<3000 (meet cooling spec)
BOD	mg/L	200 – 800	< 30 – 50	1000 – 10000	Concentrate high; condensate variable	<30 – 50
COD	mg/L	500 – 1500	< 250 – 300	5000 – 50000	MEE concentrate very high; condensate target <500	<300 (preferably <200)
Oil & Grease	mg/L	10 – 200	< 5	20 – 500	< 10 (prior to MEE)	<5

Rain Water Harvesting

Since the site will handle chemicals, direct groundwater recharge is not recommended. Storage will be done primarily for roof-top runoff to prevent contamination.

Roof top Runoff

- **Annual Roof-top Harvesting Potential:** 1485.81 m³/year

		• **No. of Rainy Days Considered:** 52 • **Average Daily Roof-top Rainfall:** 1485.81/52 = 28.57 m^3/day • **Minimum 3-day storage requirement:** 28.57 x 3 = 85.72 m^3 • **Number of Tanks for 3-day Storage:** 85.72/100.92 = 0.8493 (Say 1 No.) **Roof-top runoff- No. of Tanks Required for Peak Flow:** 1 No (100.92 m^3).					
3	- Operation of 2 Lakh Kcal LDO Fired Thermic Fluid Heater. - Operation of 2 TPH LDO fired Boiler - Operation of HSD fired DG Sets (320 KVA) during power failure to supply electricity. - Truck (3-4 Nos.) & Tempo (2-3 No) Transportation for movement of Raw Material and Finished Good.	- Noise generated during Thermic Fluid Heater & Boiler operation. - ID/FD Fans, Blowers, Air Compressors. - Steam Venting & Safety Valve Testing. - Noise Pollution (DG Set & Exhaust System). - Noise Pollution: Due to engine operation and honking horns	- Continuous exposure to 80–100 dB(A) may cause hearing loss, fatigue, and discomfort among workers near equipment. - Vibrations may affect structural stability and worker comfort. - Ambient noise at site boundary may exceed CPCB industrial area limits (75 dB(A) day, 70 dB(A) night). - Transport noise can disturb nearby receptors and increase occupational stress.	**Engineering Controls:** - Install acoustic enclosures for Thermic Fluid Heaters, Boiler and DG sets to achieve <75 dB(A) at 1 m from source and <70 dB(A) at boundary. - Use sound-absorbing panels (mineral wool or perforated GI) inside TFH Boiler, and compressor rooms. - Mount ID/FD fans, blowers, compressors on anti-vibration pads/isolation mounts to reduce vibration transmission. - Install silencers/mufflers at air intake & exhaust points. **Administrative Controls:**	**Capital Cost:** ₹. 1,50,000/- **Recurring Cost:** ₹. 55,000/-	Continuous operation; quarterly noise monitoring; daily operational checks	Maintenance In-charge PEO / Safety Officer

				- Schedule steam venting and valve testing during daytime only. - Restrict DG operation to power failure hours only and ensure proper maintenance. - Restrict truck/tempo movement to daytime (8 AM–8 PM) and maintain PUC certification. - Maintain boundary noise within CPCB norms: 75 dB(A) day / 70 dB(A) night. **Occupational Safety Controls:** - Ensure workplace noise exposure <85 dB(A) for 8-hour shift (OSHA/CPCB). - Provide ear protection (earplugs/muffs) for workers near high-noise equipment. **Maintenance:** - Lubricate moving parts, maintain fan balance, check acoustic panels quarterly. - Conduct quarterly ambient noise monitoring			

				at strategic points (near DG, TFH, unloading area).			
4	Manufacturing process, Maintenance activity, Raw Material and Packaging, ETP Operation, STP Operation, Domestic Activity	- Generation of Hazardous waste such as- ETP sludge, used lubricants, used metal and plastic containers, HDPE/LDPE materials, gunny bags, MEE evaporator residue, distillation residue, organic distillate, spent carbon, spent solvents, off-specification product, and date-expired product. - Generation of non-hazardous waste such as- Wooden Material, Paper Waste, STP Sludge, Garden Waste. - Generation of Domestic Solid Waste	- Soil and groundwater contamination if improperly disposed. - Odor and vector nuisance if not disposed properly. - Solid waste can become attraction of rodents and pests.	- Hazardous Waste Management as per Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 and amendment thereof. - Ensure proper labeling, leak-proof containers, and disposal at authorized reprocessor as per the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 and amendment thereof.	**Capital Cost:** ₹. 2,80,000/- **Recurring Cost:** ₹. 2,60,000/-	During Operation Phase	Maintenance Department, Environmental Officer, Operation Manager, Waste Management Team, Horticulture Team

Operation Phase – Hazardous Waste

Sr. No.	Type of Waste	Category	Source	Existing Quantity	Proposed Quantity	Total	Method of Disposal
1	ETP Sludge	35.3 Sch – I	Primary & Secondary Treatment	0.25 TPM	0.0	0.25 TPM	Sent over to CHWTSDF
2	Used Lubricants	5.1 Sch – I	Plant & Machineries	0.3 KL/M	0.0	0.3 KL/M	Sent over to Authorized Vendor
3	Used Containers (Metal & Plastic)	33.1 Sch – I	Raw Material Storage	250 (Nos/M)	0.0	250 (Nos/M)	Sent over to Authorized Vendor
	HDPE/ LDTE/ Gunny Bags		Raw Material Storage	300 (Nos/M)	0.0	300 (Nos/M)	Sent over to Authorized Vendor
4	MEE Evaporator Residue	37.3 Sch – I	Evaporation Process	1.31 TPM	0.0	1.31 TPM	Sent over to CHWTSDF
5	Distillation Residue	36.1 Sch-I	Solvent Distillation	0.003TPM	0.0	0.003TPM	Sent over to CHWTSDF
6	Organic Distillate	28.6 Sch – I	Recovered Mix solvent from chillers	0.38 KL/M	0.0	0.38 KL/M	Sent over to Authorized Vendor
7	Spent Carbon	28.3 Sch-1	Process	0.13 TPM	0.0	0.13 TPM	Sent over to CHWTSDF
8	Spent solvents	28.6 Sch-1	Process	11.56 KL/M	0.0	11.56 KL/M	Sent over to Authorized Vendor

9	Off Specification Product	28.4 Sch-1	In Case of Batch failure	0.50 TPM	0.0	0.50 TPM	Sent over to CHWTSDF
10	Date expired Product	28.5 Sch-1	In case of product damage or expiry	0.50 TPM	0.0	0.50 TPM	Sent over to CHWTSDF

Operation Phase -Non-Hazardous Waste

Sr. No.	Type of Waste	Quantity (MT/A)	Mode of Disposal
1	Packaging waste	0.30	Sale to authorized party
2	Office waste	0.25	Sale to authorized party
3	Broken glass	0.01	Sale to authorized party
4	Food Waste	0.20	Used as manure
5	Corrugated Box	0.10	Sale to authorized party
6	MS Scrap	0.50	Sale to authorized party
7	SS Scrap	0.50	Sale to authorized party
8	STP Sludge	0.25	Used as manure

Solid Waste – Operation Phase

Manpower	45	**Type**	**Quantity (Kg/Day)**	**Treatment**
Total Solid Waste	6.75	**Wet waste**	2.7	Wet Waste will be treated in Organic Waste Processor
		Dry waste	4.05	Dry waste will be sent to authorized recyclers.

E-Waste Generation & Management

Sr. No.	Description	Total	UOM	Treatment
1.	E-waste	0.05	MT/yr	Segregate and disposal as per E-Waste Management Rules, 2022 and amendment thereof.

Bio-Medical Generation & Management

Sr. No.	Description	Total	UOM	Treatment
1.	Contaminated materials like bandages, Cotton swabs, Expired medications and gloves	5	kg/yr	Segregation of contaminated materials should be done in color-coded bags, followed by disposal to an authorized biomedical waste management facility as prescribed under Schedule-I of BMWM Rules, 2016

Battery Waste Management

Sr. No.	Description	Total	UOM	Treatment
1.	Batteries from UPS backups, forklifts, and emergency backup systems	2	MT/year.	Disposed through authorized battery recycler

5	Combustion process of, thermic fluid heaters, and DG set operations. Chemical reactions and processing operations.	Environment monitoring and management	- Air pollution: releases particulates, gases (SO2, NOx, CO), VOCs, harmful fumes impacting air quality and public health. - Noise pollution: affects human health - Water pollution: contamination from	- Ensure regular Ambient air quarterly sampling at minimum 4 locations (plant premises, upwind, and 2 downwind) using NABL-accredited labs. - Conduct quarterly monitoring of stacks (1 no. of DG set and 1 no. of thermic fluid heaters). - Monthly monitoring of Indoor Air Quality.	**Capital Cost:** ₹. 0/- **Recurring Cost:** ₹. 2,04,000/-	As per monitoring schedule (monthly, quarterly, half-yearly)	PEO / External NABL-accredited Labs EHS Officer

	Noise from machinery and operations. Effluent generation and wastewater discharge. Chemical storage and handling		effluents, chemicals, and wastewater affecting aquatic ecosystems, soil, and groundwater. - Soil contamination: leaks, spills of chemicals, hazardous wastes affecting land health.	- Quarterly noise monitoring at plant boundary, DG set, and nearby habitats. - Monthly monitoring of ETP inlet/outlet and STP outlet. - Perform half-yearly Ground Water and quarterly Surface Water monitoring respectively to detect any contamination. - Quarterly monitoring of drinking water sources. - Half-yearly soil sampling near hazardous waste storage. - Install real-time leak detection sensors (ultrasonic/VOC). - Maintain logbooks and incident records for spills and corrective actions.			
6	Development & Maintenance of Greenbelt in an area of 2710.32 sq.m.	- Air Pollution Control - Noise Reduction - Soil Conservation - Water Management - Biodiversity Enhancement	- Green belt acts as a sink for air pollutants by trapping particulate matter and absorbing gaseous pollutants like CO2, SO2, and NOx. This	- Plant native, pollution-tolerant tree species in a tier arrangement; maintain healthy vegetation cover; regular watering and care to ensure plant survival. - Green Belt to be developed within 1 Year.	**Capital Cost:** ₹. 4,78,200/- **Recurring Cost:** ₹. 2,52,392/-	Planting: first 12 months; maintenance: continuous, monthly inspections	PEO / Greenbelt In-charge Gardening Staff / Shift-in-charge

			improves overall local air quality. - Trees and shrubs reduce noise levels by deflecting, refracting, and absorbing sound waves, lowering ambient noise pollution around the plant.	- Develop a green belt with a density of 2500 trees per hectare. - Planting saplings with a height above 6 ft. - Maintain dense greenbelt around plant boundary to act as a natural barrier for fugitive emissions.			

- ❖ Plant Species Selection for Green Belt Development
- ❖ Total Green Belt Area – 2710.32 Sq.m. (33.08 % of total plot area)
- ❖ No. of Plant species to be planted - 797 nos. (Existing plant 50 Nos)
- ❖ Tree density per/ha – 2500 nos.
- ❖ Survival Rate – 80%
- ❖ Sapling Height- 5-6 ft.

Green Belt Development Approach

❖ Planting Process

Spacing:
Trees: 2x2 meters apart
Shrubs: 1.5-2 meters apart
Ground Covers: 0.5-1 meter apart

Pitting: Prepare pits of appropriate size based on plant root structure. For trees, dig 60x60x60 cm pits, and for shrubs, 30x30x30 cm pits.

Mulching: Apply organic mulch around the plants to retain soil moisture, reduce weed growth, and improve soil fertility.

Irrigation and Soil Management
Establish a drip irrigation system for efficient water use, especially during the initial growth phase.

Enhance soil quality by adding organic manure, compost, and bio-fertilizers, which are well-suited to medium black and shallow black soils

Planned schedule for 1 Year

Sr. No	Activity	Timeline	Details
1	Site Preparation	1st Month	Clear the area, prepare the soil, and create planting pits.
2	Planting	2nd Month	Plant 797 + (50 Existing) saplings with proper spacing (2X2 meters apart).
3	Irrigation	Weekly (1st to 12th Month)	Ensure regular watering, especially during dry months.
4	Weeding and Mulching	Every 2 months	Remove weeds, apply mulch to retain moisture.
5	Fertilization	4th and 8th Month	Apply organic manure for healthy growth.
6	Pruning and Trimming	6th and 12th Month	Remove dead or damaged branches to promote healthy growth.
7	Survival Monitoring	End of each quarter	Record survival rate, growth, and health of the saplings.

Capital Budget allocation for Greenbelt development

Estimated Time for Plantation: 1 year			
Total greenbelt area: 2710.32 sq.m. Trees for Plantation:797, (50 Nos of Existing Samplings), 847 = (678 + 80% survival rate + 50 Existing) Height of Saplings: 5-6 ft.			
Sr. No.	**Items**	**Cost per plan (Rs.)**	**Total Cost (Rs.)**
Capital Budget			
1	Pit digging & alignment	40	31,880
2	Sapling purchase (avg. 5–6 ft)	520	4,14,440
3	Tree planting cost	40	31,880
Total		**600**	**4,78,200**
Recurring Budget			

		<table><tr><td>1</td><td>Watering cost (drip O & M)</td><td>36</td><td>28,692</td></tr><tr><td>2</td><td>Manure/pesticide (per year)/tree</td><td>44</td><td>35,068</td></tr><tr><td>3</td><td>Weeding/Mulching/tree</td><td>16</td><td>12,752</td></tr><tr><td>4</td><td>Misc. cost /tree</td><td>40</td><td>31,880</td></tr><tr><td>5</td><td>Labour (1 persons)</td><td>12,000/Person</td><td>1,44,000</td></tr><tr><td colspan="2">Total</td><td>15170</td><td>2,52,392</td></tr></table> **Maintenance and Monitoring** **Watering** Water the plants regularly during the first two years to ensure proper establishment, especially in dry months. **Fertilization** Apply organic compost or vermicompost every 6 months to maintain soil fertility. **Pruning and Weeding** Prune dead or damaged branches regularly and remove weeds to avoid competition for nutrients					
7	Storage and Handling of Chemicals (IPA (isopropyl alcohol), toluene, acetic acid hydrochloride, ethyl acetate, and benzene etc.)	- Fire/explosion risk (pool fire, thermal radiation up to 46.9 m)	- Fire / explosion risk (pool fire, thermal radiation up to 46.9 m) causing damage to property, workers, and environment - Corrosion/leakage causing environmental contamination. - Odor.	**Storage & Handling:** - Follow PESO guidelines for storage of xylene and others - Store chemicals in MS drums, SS 316L tanks, HDPE bags per MSDS - Tanks fabricated as per IS 10987 - Vent pipe: 40 m × 4 cm, 4 m clearance around, vent opening covered with two layers of non-corrodible metal wire gauze (11 mesh/cm) - Dip sticks of brass with dip pipe	**Capital Cost:** ₹. 2,60,000/- **Recurring Cost:** ₹. 53,250/-	Continuous maintenance; monthly inspections; 6-monthly major drills	Safety Officer / EHS Officer Shift-in-charge

				- Hydrostatic testing: water at 0.25 kg/cm² pressure - Tanks painted with anticorrosive paint and properly earthed as per relevant Indian standards - All fittings flameproof, suitable for Group II gases as per IS 2148 - Maintain safe distance from ignition sources (MSIHC Rules 1989) - Grounding/bonding of drums/tanks during transfer to prevent static sparks - Use flameproof equipment storage **Fire Protection Systems:** - Maintain 200 m³ firewater tank with fire hydrant system; test monthly - Class B & C fire extinguishers: 1) Dry Chemical Powder / ABC – 26 Nos. 2) CO_2 – 15 Nos. 3) Mechanical foam – 14 Nos. - Extinguishers inspected quarterly **VOC & Leak Controls:**			

				- Install LEV with activated carbon adsorption (>95% VOC removal) - Install real-time VOC/leak sensors with alarms **Training & Emergency Preparedness:** - Monthly fire drills and safety training - Maintain SOPs, logbooks, and incident records - Provide No Smoking and Danger sign boards - PPE for chemical handling and fire hazards			
8	- Chemical manufacturing and handling - Solvent mixing and storage - Loading / unloading of raw materials - Operation of heavy machinery (pumps, compressors, generators).	Worker exposure to airborne hazards such as dust, fumes, VOCs, toxic gases Noise exposure affecting hearing and overall health Chemical exposure risks through inhalation, dermal contact, or ingestion Physical hazards including heat, radiation, and	- Respiratory / dermal exposure to Hazardous chemicals or solvents during reactions, cleaning, or maintenance, causing acute irritation or chronic health effects; indoor air pollution from fugitive VOCs affecting worker health. - Spill/fire hazards. - Worker exposure to toxic fumes or skin burns.	**Engineering & Administrative Controls:** - Automated handling systems (pumps, conveyors, mechanical drum handlers) to minimize manual exposure. - Safety signages and SOPs for high-risk activities - Emergency spill response plan as per HWM Rules 2016. - Monthly inspections for leaks, corrosion, and hazards.	**Capital Cost:** ₹. 1,50,000/- **Recurring Cost:** ₹. 2,37,297/-	Continuous PPE use; weekly safety checks; quarterly medical tests and drills; biannual health check-ups	OHS Officer / EHS Officer Shift-in-charge

	- Material handling and transportation in plant areas. - Cleaning and maintenance of chemical tanks and pipelines. - Working near hot reactors, furnaces, boilers. - Handling wastewater from ETP / STP. - Manual lifting and carrying of chemical drums.	vibration impacting worker well-being Biological hazards from infectious agents or bioaerosols Ergonomic stressors from repetitive or strenuous tasks Psychological stress due to workplace conditions and workload		- Disaster Management Plan (DMP) with 6-monthly mock drills for spills/fires. **Personal Protective Equipment (PPE):** - Chemical-resistant gloves, suits, aprons, boots, face shields, goggles, helmets. - Respirators for VOCs, (half-mask or full-face, P100 cartridges). - Hearing protection (earplugs/earmuffs). - Heat-resistant gloves and flame-retardant clothing near hot surfaces. - Cut-resistant gloves for manual handling. - High-visibility vests for plant movement areas. - Fall protection harnesses and lanyards for work at height. **Safety Infrastructure:** - Safety showers and eyewash stations at chemical handling, mixing, and reactor zones; ANSI/IS compliant; tested weekly.			

				- First aid boxes at production floor, storage, loading/unloading, lab, admin, control rooms, and emergency assembly points. - Spill kits (absorbent pads, neutralizers, booms). - Fire extinguishers, fire blankets, hydrants, firewater tank as per fire EMP. **Medical Monitoring & Health Check-ups:** - Pre-employment and biannual health check-ups: lung function, pulmonary function, radiology, audiometric, general clinical examination. - Quarterly health tests at Dindori Hospital for all 45 employees **Training & Awareness:** - Training on chemical handling, PPE usage, emergency spill/fire response, ergonomics, and stress management.			

<table>
<tr><td></td><td></td><td></td><td></td><td>- Regular drills for fire, spill, and chemical emergencies.</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td colspan="6">
Medical Facilities
The following quarterly tests will be conducted for each worker:
<table>
<tr><th>Sr. No.</th><th>Test</th><th>Venue</th></tr>
<tr><td>1</td><td>Lung Function Test</td><td rowspan="6">Rural Hospital, Dindori</td></tr>
<tr><td>2</td><td>Radiology – X-ray</td></tr>
<tr><td>3</td><td>Pulmonary Function Test</td></tr>
<tr><td>4</td><td>Audiometric Test</td></tr>
<tr><td>5</td><td>General clinical examination with emphasis on respiratory system</td></tr>
<tr><td>6</td><td>Pre-employment examinations</td></tr>
</table>
Details of First Aid Box to be provided:
<table>
<tr><th>Sr. No.</th><th>Equipment’s</th><th>Placement</th></tr>
<tr><td>1</td><td>Sterile adhesive bandages (various sizes)</td><td rowspan="10">Production Floor, Storage Area, Loading/Unloading Zone, Laboratory, Admin office and control rooms, Emergency assembly point</td></tr>
<tr><td>2</td><td>Sterile gauze pads and rolls</td></tr>
<tr><td>3</td><td>Adhesive tape</td></tr>
<tr><td>4</td><td>Antiseptic wipes and solution</td></tr>
<tr><td>5</td><td>Antibiotic ointment/burnt ointments</td></tr>
<tr><td>6</td><td>Scissors (blunt-tipped)</td></tr>
<tr><td>7</td><td>Tweezers</td></tr>
<tr><td>8</td><td>Disposable gloves</td></tr>
<tr><td>9</td><td>Cotton balls and swabs</td></tr>
<tr><td>10</td><td>Pain relievers</td></tr>
</table>
</td></tr>
<tr><td>9</td><td>CER activity</td><td>Improvement of local environmental infrastructure and</td><td>- Potential impacts on local environment and community due to inadequate</td><td>- Implementation of CER initiatives as per Ministry of Environment, Forest and Climate Change O.M. No.</td><td>Capital Cost: ₹237,610. /- Recurring Cost: ₹. 0/-</td><td>Within the first 2 years of project commissioning</td><td>Project Proponent / CSR/CER Team in coordination</td></tr>
</table>

		resource management	environmental infrastructure or lack of sustainable practices.	22-65/2017-IA. II(M) dated 01.05.2018.			with local Gram Panchayat / school authorities
10	Energy Utilization (300 KVA) for manufacturing processes, utilities (Thermic Fluid Heater, Boiler, cooling towers), lighting, and other electrical systems.	High electrical load.	- Increased electricity demand. - Higher operational costs. - Consumption of 300 KVA of electricity is estimated to generate tCO_2/year, contributing significantly to the facility's carbon footprint and climate change.	- Industry has proposed the installation of 30 KVA of solar PV, which will lead to an emissions saving of tCO_2e/year, reducing reliance on fossil fuels. - Implementation of energy-efficient lighting (LEDs) and appliances to reduce power consumption. - Maintain PF above 0.95 using capacitor banks. - Install SCADA-based real-time energy tracking system.	**Capital Cost:** ₹. 15,00,000/- **Recurring Cost:** ₹. 50,000/-	During Operation Phase	Plant Manager, Maintenance Team

14.3 Implementation of EMP

The implementation mainly comprises of resources available to the project proponent, accountability of contractors, training of operational staff associated with environmental control facilities and documentation of measures to be taken. It is proposed to create Environment Management Cell under EHS Manager for effective implementation of EMP. The Cell will have following functions:

- To implement the environmental management plan,
- To assure regulatory compliance with all relevant rules and regulations,
- To ensure regular operation and maintenance of pollution control devices,
- To minimize environmental impacts of operations as by strict adherence to the EMP,
- To initiate environmental monitoring as per approved schedule.
- Review and interpretation of monitored results and corrective measures in case monitored results are above the specified limit.
- Maintain environmental related records; and
- Coordination with regulatory agencies, external consultants, monitoring laboratories.

The schematic organizational set up of Environment Management Cell for operation phase is given in **Figure 9.**

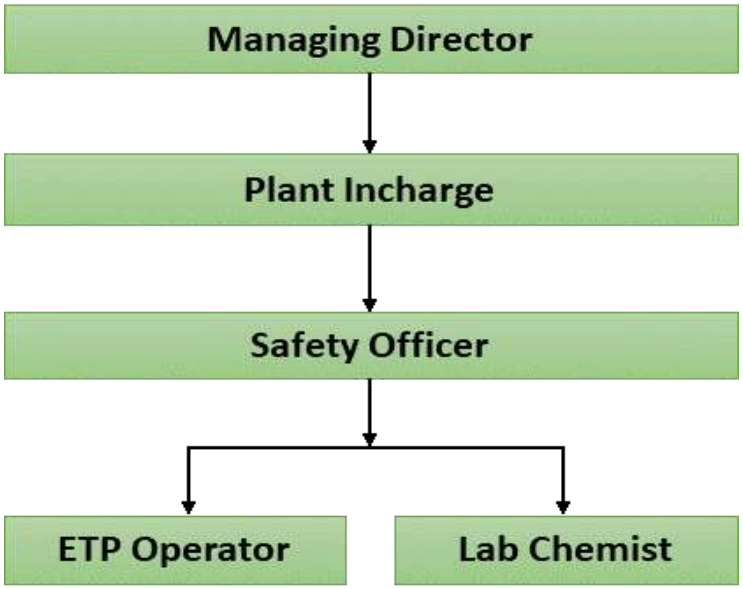


Figure 9: Environment Monitoring Cell

14.4 EMP Review and Amendments

The EMP serves as a vital tool for environmental management and must be reviewed periodically to accommodate changes in the organization, processes, or regulatory requirements. After each review, the EHS Manager will be responsible for updating the EMP and obtaining approval from senior management. The revised EMP will then be communicated to all relevant staff.

The EHS Manager will identify and conduct training needs based on the specific requirements of the EMP and the capability of site and project personnel to implement the necessary

management actions and monitoring activities. Additionally, general environmental awareness will be promoted among the project team to foster the adoption of environmentally sound practices and ensure compliance with project activities. This approach will help minimize adverse environmental impacts, ensure adherence to applicable regulations and standards, and achieve performance that exceeds compliance requirements.

An environmental management training program will be conducted for project related activities. This will ensure capacity building for effective implementation of the management and control measures on various project activities. The training program will ensure that all concerned members of the team understand the following aspects:

- Purpose of management plan for the project activities;
- Requirements of the management plan and specific Action Plans;
- Understanding of the sensitive environmental and social features in the immediate vicinity of the Project site.; and Awareness of the potential risks from the Project activities.

15. Environment Management Cost

Initially, the capital expenditure was approximately 2.8839 crore. With the expansion cost of 2.3761 crore, the total proposed project cost will be 5.26 crores. The project cost estimates include land and land development, civil, building structure, plant and machinery, other expenses, contingencies @2% on building, plant and machinery, margin money of working capital. Environment management cost for construction phase will be Rs. 8.86 Lakh. whereas for operation phase capital cost will be around Rs. ₹61.61 Lakh and recurring cost will be Rs. 2.62 Lakh per year for construction phase & ₹ 16.52 Lakh per year for Operation phase. The details of EMP cost are given in **Table 16 and Table 17**

Table 16: Environment Management Cost during Construction Phase

Sr. No.	Component	Description	Capital cost Rs.	Recurring Cost (In Rs. /year)
1	Air Pollution Control	Metal sheet barricading (2215.9 sq.m. Built up area), advanced water sprinklers (1–2 times daily), tarpaulin covers for debris/materials, BS-VI compliant vehicles	3,78,472	50,000
2	Water Pollution Control	Temporary silt traps around construction/installation areas, bunded leak-proof containers for fuels/oils, spill containment kits (absorbent pads, booms) to prevent runoff and soil/groundwater contamination.	1,10,000	60,000
3	Noise pollution Control	Metal sheet noise barriers (2215.9 sq.m. construction area), low-noise equipment (silenced cranes, electric tools), monthly noise monitoring (Leq day/night) to ensure <75 dB(A) daytime, <70 dB(A) nighttime.	1,50,000	15,000
4	Solid & Hazardous	Segregation bins for construction debris (steel, RCC, bricks), domestic waste, advanced crusher for concrete	56000	25000

	Waste Management	reuse, tarpaulin covers, 2 dustbins for dry/wet waste, transport to C&D recycling plants, scrap vendors, MSW facility, fortnightly EHS inspections.		
5	Environmental Monitoring and Management	monthly ambient air quality (PM10, PM2.5, SO_2, NO_x, CO at 1 location), monthly noise (Leq day/night at 1 location), quarterly drinking water (IS 10500:2012 at 1 location) by MoEFCC/NABL-approved labs, data reporting.	0	32,400
6	Fire & Safety	Fire extinguishers (ABC type) near welding & tank areas, Safety signage installation, Mock drill / ERP implementation, Storage bunding for flammables	1,81,655	55,300
6	Occupational Health and Others	First aid kits (bandages, antiseptic, gloves) at demolition/installation sites, safety signages ("Wear PPE", "Caution"), full-body harnesses, pre-employment health screenings (respiratory, auditory), monthly safety briefings, mini DMP with quarterly mock drills for 40 workers. PPE's Kits	10,000	24,100
Total			**8,86,127**	**2,61,800**

Table 17: Environment Management Cost during Operation Phase

Sr. No.	Component	Description	Capital cost In Rs.	Recurring Cost (In Rs. /year)
1	Air Pollution Control	30 m stack & wet scrubber for thermic fluid heaters & Boiler, 8 m stack for 320 kVA DG set, LEV with activated carbon adsorption, closed loop system, nitrogen purging.	6,55,000	40,000
2	Water Pollution Control	20 KLD ETP (primary: coagulation/sedimentation; secondary: biological; tertiary: filtration), MEE, 3 KLD MBBR STP, neutralization tanks, solvent recovery (distillation). Rain water harvesting- two underground RCC tanks of 100.92 m^3 each for rooftop rainwater harvesting.	24,50,000	5,00,000
3	Noise pollution Control	Acoustic enclosures, sound-absorbing panels, vibration isolators, silencers for thermic fluid heaters, Boiler acoustic enclosures, mufflers, anti-vibration pads for DG set.	1,50,000	55,000
4	Solid and Hazardous Waste Management	Segregation bins, leak-proof containers, 5 kg/day OWC for wet waste & garden waste, storage for process waste, used oil, spent solvent, ETP sludge, contaminated containers, STP sludge (manure), e-waste, biomedical, battery waste disposal per HWM, E-Waste, BMWM Rules.	2,80,000	2,60,000

5	Environmental Monitoring and Management	Real-time VOC/leak sensors, quarterly ambient air quality (PM10, PM2.5, SO_2, NO_x, CO, HC at 4 locations), stack monitoring (thermic fluid heaters, DG set), indoor air (1 locations), monthly wastewater (ETP inlet/outlet, STP outlet), drinking water (IS 10500:2012), noise (3 boundary locations), semi-annual soil (1 location).	0	2,04,000
6	Green Belt	Green belt development & maintenance	478,200	252,392
7	Fire and safety measures	200 m^3 firewater tank, CO_2/DCP extinguishers, flameproof equipment, MS/SS316L/HDPE storage for chemicals, grounding/bonding systems, spill containment kits, real-time VOC/leak sensors, monthly fire drills, DMP with 6-monthly drills for spill/fire response.	260000	53250
8	Occupational Health and Others	First aid kits (sterile bandages, gauze, antiseptic, gloves, etc.) across production, storage, lab, admin areas, safety signages, SOPs, quarterly safety training, pre-employment/biannual health check-ups (lung function, radiology, audiometry, respiratory exams) for 45 workers. PPE'S- N95/P100 respirators, chemical-resistant gloves, goggles, suits, earplugs/earmuffs for 45 employees	1,50,000	237297
9	CER	Improvement of existing drainage system and provision of Ice box for proper storage of critical medicines to the PHC Dindori as per CER OM 2018/2020.	237610	0
10	Renewable Energy	30 KVA solar PV panels, LED lighting, capacitor banks for PF >0.95, SCADA-based real-time energy tracking system to reduce tCO_2e/yr from 300 KVA consumption.	15,00,000	50,000
Total			**61,60,810**	**16,51,939**

16. Conclusion

Considering the potential impacts of the proposed project, M/s. Besi Drugs Pvt. Ltd. has prepared adequate remedial measures and an Environmental Management Plan for their implementation. Overall, the proposed project will generate direct and indirect employment opportunities as well as increase in physical resources. Similarly, M/s. Besi Drugs Pvt. Ltd. has planned to implement various activities under the Companies Act such as rain water harvesting, solar lights, green belt development etc. which will result in positive effects from the project site to the surrounding area and create a thriving environment. It can be concluded that strict adherence to mitigation measures during the construction and operational phases will result in negligible impact on the environment.