

EXECUTIVE SUMMARY

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Proposed Expansion From 6,715.00MT/M to 20,090.94MT/M



PROJECT PROPONENT

M/s. Godavari Biorefineries Ltd. (GBL)

Sakarwadi, Tal. Kopergaon, Dist. Ahmednagar

PREPARED BY



buildingenvironment

M/S. BUILDING ENVIRONMENT INDIA PVT LTD.

IN ASSOCIATION WITH



TECHNOGREEN ENVIRONMENTAL SOLUTIONS

January 2020

1.1 Introduction

M/s. Godavari Biorefineries Limited (GBL) located at Sakarwadi, Kopargaon, District Ahmednagar of Maharashtra. The industry was incorporated in 1939 under the name of Godavari Sugar Mills. In 1961, Chemical unit was established as "Somaiya Organo Chemical" which was later demerged to M/s. Godavari Biorefineries Ltd. in 2009. GBL is one of the entity formed under the Somaiya Group and one of the oldest and well-established industrial houses in India with diversified interests in Sugar, Alcohol and Bulk Organic Chemicals, Specialty Chemicals, Printing and Publishing & Education & Social welfare. GBL is the leading company in the field of manufacturing and exporting of the Specialty Chemical products.

Industry has obtained Environmental Clearance (No Objection Certificate) for manufacturing of 11 products from Environment Department, dated 25th January 1993. Industry is currently manufacturing 23 products (including 7 R&D products) and 6 by-products with production capacity of 6,715MT/month and has obtained Consent to Operate for the same from MPCB on 16.10.2019 vide UAN No. CAC-Cell/UAN No. 0000078500/AR/CAC-1910000780.

Looking towards the abrupt increase in market demand, industry is proposing for expansion. The proposed capacity enhancement along with new addition is from 6,715.00 MT/Month to 20,090.94 MT/Month and post expansion, Industry shall manufacture total 42 types of products.

As per the latest EIA Notification of Ministry of Environment, Forests and Climate Change, Govt of India (MoEF&CC) dated 14th September 2006 and 10th December 2014, the proposed expansion of the said project falls under item no. 5(f) of its schedule and is classified as Category 'A' as the project is not located within the notified industrial area hence attracts the Public Hearing and it is necessary to obtain prior Environmental Clearance from Expert Appraisal Committee [EAC], Ministry of Environment, Forest and Climate Change [MoEF&CC], Delhi. With regards to this, Industry has applied for Terms of Reference [ToR] on 11.04.2019 and EAC has awarded Standard Terms of Reference [ToR] on 13.05.2019 vide letter no. IA-J-11011/154/2019-IA-II(I). The present EIA report is prepared based on the conditions given in the awarded as well as Standard Terms of Reference [ToR] and submitting for Public Hearing.

1.2 Details of Project

Proposal is for Capacity Enhancement in existing facility along with addition of new products and proposed expansion will be done within existing plot area. Project is located at Sakarwadi, Tal: Kopargaon, Dist. Ahmednagar. Site comes under Gram Panchayat Wari Jurisdiction. The site is located at Gut No. 159-165, 180/1, 180/2, 181/1, 181/2, 187/1, 187/2,

188, 189, 199, 158, 167-178,511,139/2, PO – Sakarwadi, Taluka - Kopargaon, District – Ahmednagar - 413708, Maharashtra. Nearest railway station is at Kanhegaon about 0.3km away from project site. Geocoordinates of project is 19°49'11.78"N latitude and 74°34'8.55"E longitude.

1.3 Project Description

The existing and proposed details of the project are summarized in **Table 11.1**

Table 11.1 Project Details

Particulars		Details	
Name and Location of project	Proposed Expansion of Existing activity and addition of New products by: M/s. Godavari Biorefineries Ltd. Sakarwadi, Taluka - Kopargaon, District - Ahmednagar - 413708, Maharashtra.		
Geo Coordinates	Latitude	19°49'11.78"N	
	Longitude	74°34'8.55"E	
	MSL	504 m	
Land Type of Project Site	Private industrial plot & located outside MIDC area		
Name of applicant	Mr. S. Mohan		
Postal Address	PO - Sakarwadi, Taluka – Kopargaon, District – Ahmednagar - 413708, Maharashtra		
E-mail	director.sakarwadi@somaiya.com		
Phone	(02423) 279308, 279308, 279396, 279397		
Year of Commissioning	Industry was established under the name of “The Godavari Sugar Mills Ltd.” in 1939 and commencement of Chemical unit took place in 1961 as ‘Somaiya Organo Chemicals’ which is later demerged to “Godavari Biorefineries Ltd.” in 2009		
Is land procured or to be procured for new project or for expansion?	No, The proposed development will be within existing premises		
Screening category (as per SO 1533 as timely amended)	5(f) – “Synthetic Organic Chemicals” Category: “A”		
Total Plot Area	13,92,123.00m ²		
Land for Green Belt	4,59,839.00m ²		
Cost of project	Total	INR. 366.44 Cr.	
	Existing	INR. 166.44 Cr.	
	Proposed	INR. 200.00 Cr.	
Capital and recurring cost earmarked for EMP	Total Capital Cost for EMP: INR. 2,803.30 Lakhs <ul style="list-style-type: none">Existing: INR. 1,558.30LakhsProposed: INR. 1,245.0Lakhs Total Recurring Cost for EMP: INR.640.0 Lakhs/Annum <ul style="list-style-type: none">Existing: INR. 301LakhsProposed: INR. 339Lakhs		
Water Requirement			
Existing Water Requirement		2,919.0CMD[Fresh:1,495CMD + Recyle 1,424CMD]	
Proposed Water Requirement		2,864.0CMD[Fresh:1,196CMD + Recyle 1,668CMD]	
Total Water Requirement		5,783.0CMD[Fresh:2,691CMD + Recyle 3,092CMD]	
Source	Ground Water: Godavari River, Canal Water Surface Water: RWH Tank of 85,000m ³ and 45,000m ³ (Industry has obtained permission from irrigation department)		
Power Requirement and Source			
Power Requirement	Existing: 2.9MW/H		
	Proposed: 8.3MW/H		
	Total: 11.2MW/H		

Transformer	Existing: 1500KVA x 2 Proposed: 4000KVA Total: 1500KVA x 2 and 4000KVA
Source	MSEDCL

Utility Details

Particulars	Existing	Proposed	Final
D.G. Set	1000KVA x 1	1000KVA x 3	1000KVA x 4
	590KVA x 1	NA	590KVA x 1
Boilers	18TPH x 2	24TPH x 2	24TPH x 2
	12TPH x 1	45TPH x 1	45TPH x 1
Thermic Fluid Heater	NA	2Lakhs x 1	2Lakhs x 1
	NA	10Lakhs x 1	10Lakhs x 1
Hydrogen Generator	NA	5200cum/day x 3	5200cum/day x 3
Nitrogen Generator	NA	1000cum/day x 1	1000cum/day x 1

Note: The Existing 3 Boilers shall be replaced with Boiler of 45TPH

Fuel requirement

Particulars	Existing	Proposed	Final
Coal	218TPD	250TPD	468TPD
HSD	5.1KLD	14.60KLD	19.7KLD

Emissions Control

Stack Attached to	APC System	Height (m)
Existing Stack Details		
Boiler 18TPH x 2	ESP	30 Each
Boiler 12TPH	Bag Filter	30
D.G. Set 1000KVA	Adequate Stack Height	9
D.G. Set 590KVA	Adequate Stack Height	9
Proposed Stack Details		
Boiler 24TPH x 2	ESP	45 Each
Boiler 45TPH	ESP	50
D.G. Set 1000KVA x 3	Adequate Stack Height	6 Each
Thermic Fluid Heater 10Lac Kcal/Hr.	Adequate Stack Height	15
Thermic Fluid Heater 2Lac Kcal/Hr.	Adequate Stack Height	10
Hydrogen Generator	NA	NA
Nitrogen Generator	NA	NA

Solid/ Hazardous Wastes and Management

Category	Source and Name	Quantity			Unit	Disposal
		Existing	Proposed	Final		
Hazardous Waste						
5.1	Used/Spent Oil	1.2	1.8	3.0	KL/Y	Recycler
35.3	Chemical Sludge from WW Treatment Plant	0.1	0.2	0.3	TPD	CHWTSDF
1.4	Organic Residue	8.0	0.0	8.0	CMD	CHWTSDF
36.1	Distillation/ Process Residue	0.192	14	14.192	TPD	CHWTSDF
1.6	Spent Catalyst and Molecular Sieve	1.4	180	181.4	Kg/Day	CHWTSDF/Cement industry
28.3	Spent Carbon	00	0.3	0.3	TPD	Authorized Recycler
26.4	Mixed Spent Solvents	00	5.0	5.0	KLD	CHWTSDF
A1160	Lead Acid Batteries	00	80	80	No's/Y	CHWTSDF
	Used Filters (HEPA filters, oil filters, etc.)	00	100	100	Nos./Y	CHWTSDF
	Used/Discarded Filters Bags	00	100	100	Nos./Y	Detoxified and reused
	Discarded PPE's	00	0.5	0.5	TPA	CHWTSDF
	Salts generated in MEE	0.3	15.0	15.3	TPD	CHWTSDF
	Salt generated in MEE from RO reject	0.3	3.0	3.3	TPD	CHWTSDF for Land filling
	Bio Medical Waste	00	0.8	0.8	TPA	CHWTSDF

Non Hazardous Waste					
Source and Name	Existing	Proposed	Total	UOM	Disposal
Dust	3.0	4.0	7.0	MT/D	Sent to Brick manuf.
Bio-Degradable Waste	408	198	606	Kg/D	Composted and used as manure
Non-Biodegradable Waste	272.5	132	404.5	Kg/D	Given to authorized vendors
Boiler Ash	65	85	150	TPD	Sent to Brick manuf.
Glass Bottles	00	100	100	No./M	Sent to outside agencies/recyclers
HDPE Containers	00	100	100	TPM	Detoxified & Reused
Liner and Bags	00	0.5	0.5	TPM	Authorized Recycler
Paper, Cotton waste and packing materials i.e wood, carton, ropes	00	5.0	5.0	TPA	Sent to outside agencies/recyclers
STP Sludge	28.5	4.98	33.48	Kg/D	Used as manure
Metal Scrap	00	30	30	TPA	Authorized Recycler
Plastic Waste	00	0.5	0.5	TPA	Authorized Recycler
Waste Packing Wood/ Broken glass etc.	00	5.0	5.0	TPA	Sent to Bio medical Waste Treatment facility
Used/Discarded RO membrane	00	0.2	0.2	TPA	Authorized Recyclers
Insulation and glass wool waste	00	1.0	1.0	TPM	Dispose off to outside agencies after detoxification

1.4 Basic Requirement of The Proposed Project

- Land:** The company owns total 13,92,123.00m² of land and proposed expansion shall be accommodated in the existing land onnly
- Water:** Total Fresh Water demand is 2,691m³/day. Permission of Irrigation Department is obtained. Water source is Godavari River, Canal Water and Rain water harvesting Tank of 85,000m³ and 45,000m³
- Power:** Power requirement is met through MSEDCL. Industry is having existing turbine of 2.3MWH and has proposed additional Turbine of 4.8MWH
- Fuel:** Coal and Diesel will be used as fuel for the Boilers [12TPH, 18TPH, 24TPHx2 and 45TPH] and D.G. Set [1000KVx4, 590KVA]. The requirement for the same is as 468TPD and 19.7KLD respectively
- Man Power:** Existing manpower is 413 and additional 200 employees shall be required in proposed expansion. More than 85% of the manpower requirement will be fulfilled by employing the local people. Man power requirement for construction work will be fulfilled from nearby vicinity

1.5 Manufacturing Process

Currently GBL is actively involved in manufacturing of Ethyl Acetate, Acetaldehyde, Crotonaldehyde, Acetic Acid, Dilute Acetic Acid and wide range of chemicals and has proposed to manufacture Acetaldehyde Diethyl Acetal, 3-Methoxy Butanol, Acetaldehyde Oxime and many other chemicals.

Genral Process Description

All the chemical reactions or routes of synthesis are either patented rights or applied for patent and hence not disclosed in this public document. However the same shall be made available as a controlled document for regulatory clearance purpose.

The proposed project is for manufacturing varieties of products in Continuous & batch operation having different chemicals and formulations. The manufacturing process shall have a combination of Unit operations which shall be undertaken in series or simultaneously operation to produce the desired product. In the following sections, the different kinds of unit operations proposed to be adopted for the manufacturing processes are detailed. Therefore, the overall Process Flow Diagram for the proposed project would remain the same and would vary by eliminating one or more of the processes not required for a given product.

- Reactor
- Chemical Reaction
- Neutralization
- Separation
- Extraction
- Decanting
- Condensation
- Mixing
- Distillation
- Centrifugation
- Filtration
- Crystallization
- Vacuum System
- Drying

General manufacturing process flow diagram is presented in **Figure 11.1**

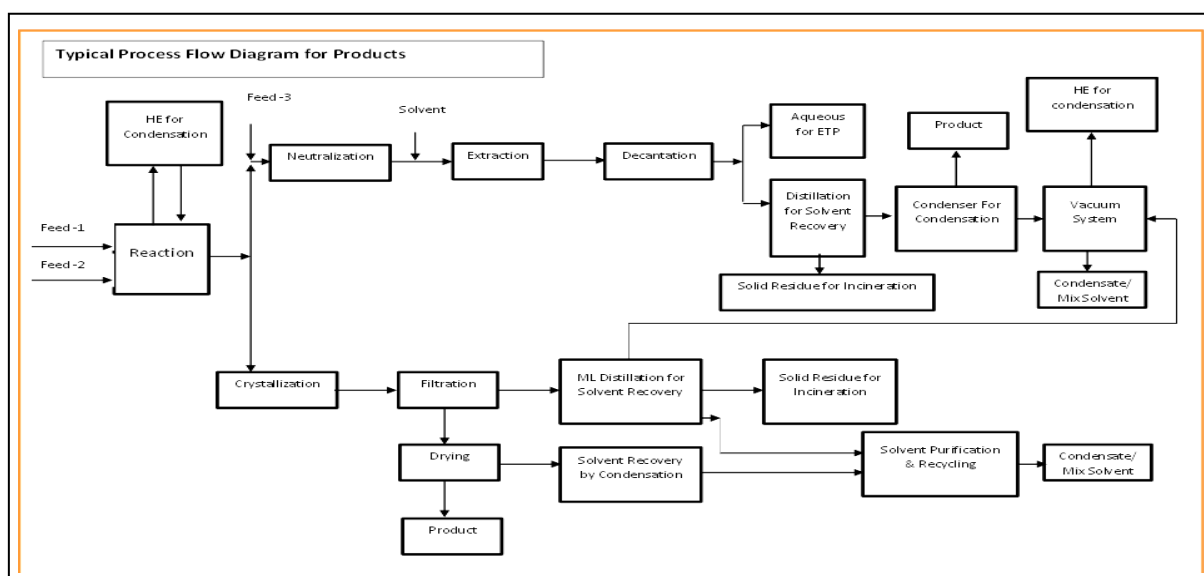


Figure 11.1 General Manufacturing Process Flow Diagram

1.6 Pollution Control Technology and Equipment

- i. **Air Pollution Control Equipment:** Details of air pollution sources of the industry along with pollution control equipment is presented in the **Table 11.2**
- ii. Industry has installed scrubbers for Acetaldehyde and Acetic Acid manufacturing processes
- iii. For other manufacturing plants, process emissions will be directed to the common vent condenser of each plant and condensate from same will be collected as mix solvent and same shall be sent to the CHWTSD

Table 11.2 Air Pollution Activity & APC

Sr. No.	Particulars	Stack Height [m]	APCD provided
1	Boiler – 12TPH	30	Bag Filter
2	Boiler – 18TPH	30	ESP
3	Boiler – 18TPH	30	ESP
4	Boiler – 24TPH	45	ESP
5	Boiler – 24TPH	45	ESP
6	Boiler – 45TPH	50	ESP
7	Thermic Fluid Heater 10Lac Kcal/Hr.	15	ESP
8	Thermic Fluid Heater – 2Lac Kcal/Hr.	10	Adequate Stack Height

- iv. **Water and wastewater:** Industry shall be utilizing 5,783CMD [Fresh Water 2,691CMD and Recycled 3,092CMD]. Treated water from STP shall be utilized for gardening and treated waste water from ETP shall be utilized in Cooling Tower hence achieving the Zero Liquid Discharge [ZLD]
- v. **Hazardous Waste:** Hazardous waste generated from industry shall be handled as per The Hazardous and other Waste [Management and Trans-boundary Movement] Rules 2016. Generated shall be disposed off to CHWTSD and authorized vendors. Industry is having valid membership of CHWTSD valid up to 28.05.2022
- vi. **Solid Waste:** Solid Waste generated shall be segregated as per the characteristics of solid waste and stored in designated isolated storage area. Wet waste shall be treated through the vermicomposting and other solid waste shall be disposed of through the vendors or authorized recyclers

1.7 Description of Environment

The area around the proposed project is being surveyed for physical features and existing environmental scenario. The field survey and baseline environmental monitoring has been carried out during the period of 1st March 2018 to 31st May 2018.

Environmental Setting (10 km radius)

Environmental setting of the proposed project along with important locations with respect to transportation, emergency and environmental sensitivity of the site are presented in **Table 11.3**.

Table 11.3 Environmental Settings of the Proposed Project

Amenities	Name	Directions	Aerial distance from Project site (km)
Connectivity			
Nearest Airport	Shirdi International Airport	SW	23.32
Nearest Railway Station	Kanhegaon R.S.	S	0.75
Nearest Road	Vari Village Road	E	0.22
	State Highway 47	SW	3.22
Nearest Post office	Sakarwadi P.O	SSE	0.28
Nearest School	Z P Primary School Sakarwadi	NE	0.18
Emergency			
Nearest Hospital	Atma Malik Hospital	W	10.10
Nearest Post office	Vari Post Office	S	0.60
Environment Sensitivity			
Nearest Religious / Historical Place	Prasadalya Shirdi Sai Baba Mandir	SW	11.88
Nearest Water Body / Canal / Dam	Godavari River	W	1.0
Nearest Archaeological Monuments	None within 10km radius study area		
Nearest Protected Forest / National Park/ Wildlife Sanctuary			
Inter-state boundaries			
Seismic Zone	Zone III (Moderate)		

11.7.1. Meteorological Condition Of Site

Site specific data has been generated during the period of March 2018 to May 2018. Data shows that Predominant wind direction during baseline monitoring period was North-West followed by West. The average wind speed during this period was found to be 1.66 m/s. Meteorological data is presented in the **Table 11.4** and windrose diagram is represented in **Figure 11.2**.

Table 11.4 Average of meteorological data

Month	Temperature (°C)		Relative Humidity (%)		Mean Wind Speed (K.m.p.h.)	Pre-dominant Wind Direction	Precipitation (mm)
	Max.	Min.	Mor.	Eve.			
March	35.2	15.8	43	17	7.6	NW	0.3
April	37.6	19.3	43	19	9.6	NW	6.2
May	37.6	21.9	57	30	12.9	W	24.5

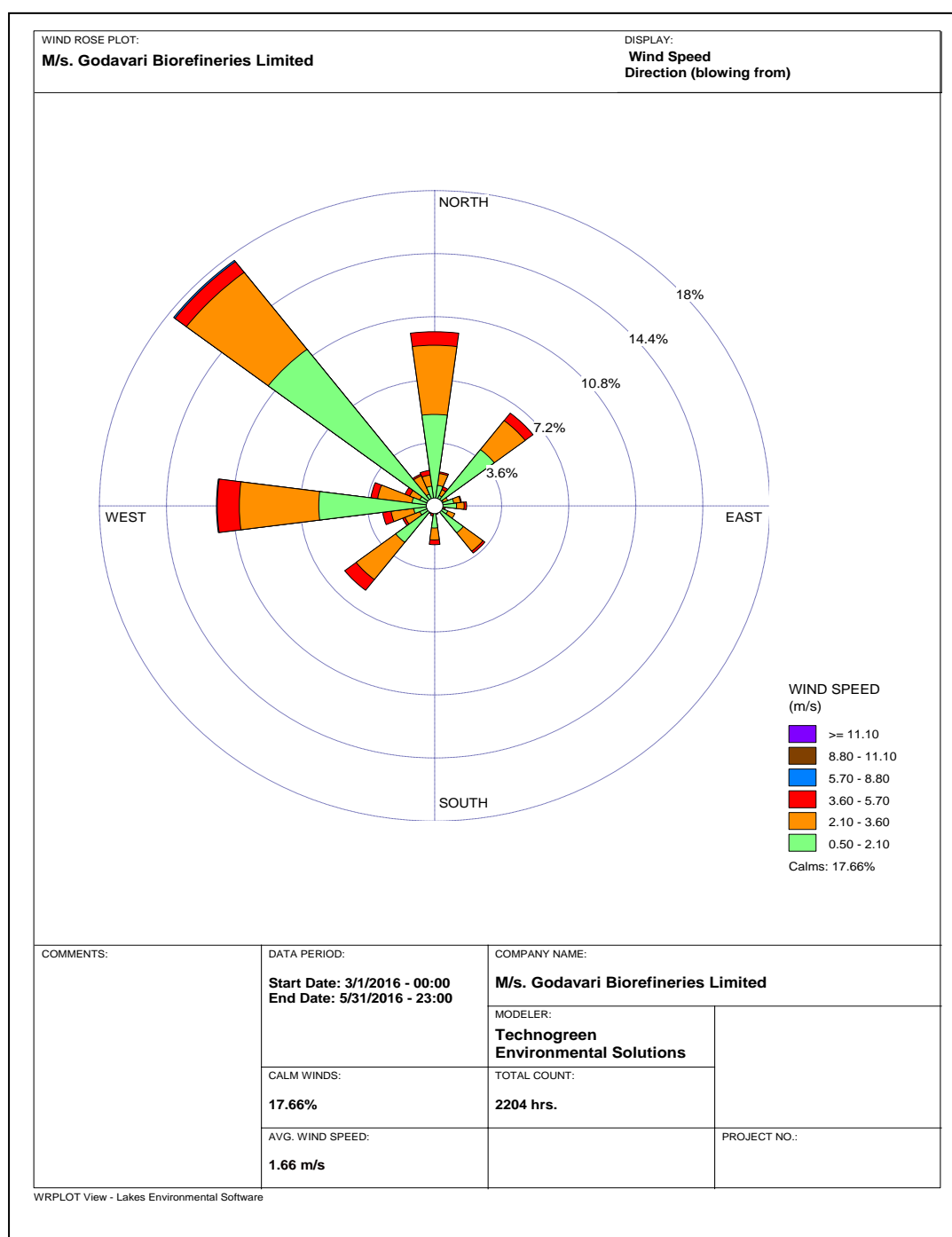


Figure 11.2 Windrose Diagram of Project Site

11.7.2. Ambient Air Quality

During baseline monitoring, Ambient Air Monitoring was carried out at 8 locations in and around the project site. All the locations monitored are mostly rural / residential. Monitoring was carried out as per guidelines of CPCB. PM₁₀ and PM_{2.5} ranges from 53.60 to 79.60 µg/m³ and 22.90 to 51.30 µg/m³ whereas SO₂, NO_x & CO ranges from 12.55 to 27.92/m³ 15.11 to 39.11/m³ and 0.12 to 0.58 µg/m³ respectively. Results show all the parameters are well within the prescribed limit of NAAQS Standards.

11.7.3. Ambient Noise Quality

Thirteen monitoring stations [6 within site and 7 in nearby area] were selected based on the criteria used for designing the network in and around the project site. The Leq values of noise levels during daytime Leq (d) varied between 42.0 to 68.5 dB (A). Highest Leq value recorded near industries' main gate was 68.5dB(A) and lowest Leq value recorded at Mukundvasti was 42.0dB(A). Similarly, Leq value near the Bio Gas Plant Area showed noise level as 64.2dB(A). On the other hand, the values of noise level during night time varies between 32.6 to 60.9dB(A). Highest Leq value was recorded near the industries main gate which was 60.9dB(A) whereas the lowest Leq value was recorded at Mukundvasti which was 32.6dB(A). Noise monitoring data reveals that all the results of day time and night time are within the CPCB standards.

11.7.4. Water Quality

Total 11 samples were collected to assess the water quality of project area, out of 11, 8 samples were of ground water and 3 samples were of surface water.

Ground Water Quality

pH ranges from 6.75 to 7.86. Total Hardness is in the range of 198.9-264 mg/lit. Chlorides ranges from 17.4-129.8 mg/lit. TDS is found higher than the prescribed standards at all 8 locations but water can be utilized for drinking after providing further treatments. Highest TDS concentration was found at Mukund Vasti village i.e. 741.4mg/l. Copper, Magnesium, Zinc, Mercury, Arsenic and Selenium was not found at any of the locations.

Surface Water Quality

pH ranges from 7.6 to 7.9. TDS in the range of 411.4 to 419.9mg/lit. Whereas DO in the range of 5.7 to 5.9 mg/lit. BOD was found in the range of 2.3 to 2.6 mg/lit. Total Coliforms were found to be very minimal i.e. in the range of 10 to 16 MPN/100ml. All parameters are well within the standards and it can be stated that all the three samples fall under Classification A of the inland surface water standards which mean it can be used as Drinking Water Source without conventional treatment but after disinfection.

11.7.5. Soil Quality

Soil quality was assessed at Eight locations. It is observed that pH is in the range of 7.3 to 8.7, moderately on alkaline side. Electrical Conductivity value ranges from 0.22mmhos/cm to 0.54mmhos/cm. which is not harmful for germination. The water holding capacity of soil observed in range of 37.1 to 48.9%. Calcium and Magnesium are in the range of 15.3 to 22.4mg/kg and 1.44 to 4.86mg/Kg respectively whereas; Sodium and Potassium are in the range of 29 to 48mg/Kg and 144-221 mg/kg respectively. Sand percentage varied between 15 to 25% and silt percentage varied from 53-58% whereas clay percentage is in range of 24 to 32%. Soil texture of study area is Loam. it can be concluded that soil fertility is high in nature.

11.7.6. Ecology

Approx. 66 species of trees, herbs & shrubs and 6 grasses were observed within the study area. From the faunal study it was observed that there were 22 different species of birds, 6 species of Mammals, 4 species of Reptiles, 5 species of Butterfly and 8 species of Fishes were found in Schedule 1 as per Wildlife Protection Act, 1972. There is no National Park, Wildlife Sanctuary, Protected Forest located within 10km radius from the project site.

11.7.7. Socio - Economic Environment

Out of total 24 villages and 2 urban areas coming in the study area, socio-economic survey conducted in 10 villages, covering all the directions. Total geographical area of project site is 31772.55sq. km and overall population density is 299 persons/sq. km. As per Census 2011 record of the 10km radius of project site, total population of project site is 1,96,564 out of which male population is 1,01,204 and female population is 95,360 with average literacy rate of 69.37%. Main workers are 70,003 (35.61%) and marginal workers are 7,538 (3.83%). Total non-working population is 1,19,023 (60.55%).

1.8 Anticipated Environmental Impact And Mitigation Measures

The environmental impacts of proposed project during construction and operation phases have been assessed and detailed management plan has been evolved to mitigate the anticipated impacts. There are no major constructional activities involved in the proposed project. The environmental impacts during the construction stage will be short term, temporary in nature and will be confined close to the project sites only. The manpower required for these activities will be sourced from nearby villages.

11.8.1. Air Environment

Environmental Impacts during construction phase, operation phase and its mitigation measures are enlisted in **Table 11.5**.

Table 11.5 Air Quality Impacts & Mitigation Measures

Anticipated Impact	Probable Source	Mitigation Measures
During Construction Phase		
Dust Generation	<ul style="list-style-type: none"> Due to construction and Demolition phase Construction vehicle and movements on unpaved roads 	<ul style="list-style-type: none"> Sprinkling of Water as and when required The stockpiles will be minimized & covered to prevent re-suspension due to wind & subsequent dust fall Vehicles used for transportation of material shall be covered to reduce spills & dust blowing off the load
Gaseous Pollutant & Emission Generation	<ul style="list-style-type: none"> Operation of Construction Plant Emissions from D. G. Set 	<ul style="list-style-type: none"> Govt. approved D.G. Set shall be utilized Adequate stack heights shall be provided as per CPCB norms for the proper dispersion of pollutants
During Operation Phase		
Gaseous pollutants & Emission generation	<ul style="list-style-type: none"> Vehicular Movement 	<ul style="list-style-type: none"> Emissions likely to occur from the vehicular movement is negligible All vehicles shall be having PUC to confirm the standards
	<ul style="list-style-type: none"> Emissions from D.G. Set 	<ul style="list-style-type: none"> Low Sulphur/ Govt. approved DG sets shall be used DG sets shall be used only in case of power failure Adequate stack heights shall be provided as per CPCB norms for the proper dispersion of pollutants Existing D.G. Sets are provided with Adequate stack height and same shall be provided for proposed expansion Ambient air quality shall be checked periodically according to monitoring plan as per NAAQS standards
	<ul style="list-style-type: none"> Emissions from Boiler Fly Ash Generation 	<ul style="list-style-type: none"> Good quality Indian Coal will be used with low Sulphur content Existing Boilers are provided with Bag filter and ESP proposed Boilers will be provided with ESP and adequate stack height Online emission monitoring instruments are installed for all the boilers to check the efficiency of Air Pollution Control Equipment Fly Ash generated will be stored in silo and disposed of properly
	<ul style="list-style-type: none"> Emissions from Thermic Fluid Heaters 	<ul style="list-style-type: none"> Thermic fluid Heaters will be provided with adequate stack height
	<ul style="list-style-type: none"> Emissions from Manufacturing Processes 	<ul style="list-style-type: none"> Industry has installed scrubbers for Acetaldehyde and Acetic Acid manufacturing processes For other manufacturing plants, process emissions will be directed to the common vent condenser of each plant and condensate from same will be collected as mix solvent and same shall be sent to the CHWTSD Proper engineering controls will be provided to reduce chances of such leaks

11.8.2. Noise Environment

Environmental Impacts during construction phase, operation phase and its mitigation measures are enlisted in **Table 11.6**.

Table 11.6 Impacts on Noise Quality & Mitigation Measures

Anticipated Impact	Probable Source	Mitigation Measures
During Construction Phase		
Irritation, Headache, reduced Work efficiency	<ul style="list-style-type: none"> • Concerting, hammering, Drilling, fitting, D.G. Set operation 	<ul style="list-style-type: none"> • Construction activity will be limited during day time • Construction activity for proposed activity shall be temporary • D.G. Set shall be in case of power failure only • The existing D.G. Set shall be used during construction activity and shall be provided with adequate stack height • Provision of PPE's like ear muff/ plugs shall be provided to the workers • Existing green belt shall help to reduce the noise level crossing the project boundary
During Operation Phase		
Irritation, Headache, reduced Work efficiency due to Various Industrial Activity	<ul style="list-style-type: none"> • Noise generation from D. G. Set 	<ul style="list-style-type: none"> • Acoustic Enclosure shall be provided for existing D. G. Set and same shall be done for proposed activity • Regular Monitoring of the D. G. set shall be carried out
	<ul style="list-style-type: none"> • Honking 	<ul style="list-style-type: none"> • Strict prohibition of blowing horn within premises.
	<ul style="list-style-type: none"> • Machinery and Equipment's 	<ul style="list-style-type: none"> • PPE's like Ear Muffs and Plugs shall be provided • Worker shall be educated about importance of using PPE's • Exposure control shall be done if any worker is engaged in activities in intense noise area • Regular maintenance & lubrication of all noise generating equipment will be done • Existing green belt development (Noise Breaker species such as Azadirachta indica, Mangifera indica etc.) will help to reduce noise to great extent and also proposed greenbelt development will further attenuate the chances of noise generation outside the premises • There is residential colony within the premises hence, noise barrier plantation like Terminalia Arjuna, Azadirachta Indica, Mangifer Indica, Butea Monosperma etc. around these colonies will also be done to reduce noise at receptor level
	<ul style="list-style-type: none"> • Noise generated from Boiler 	<ul style="list-style-type: none"> • PPE's like Ear Muffs and Plugs shall be provided for people working in that area

11.8.3. Water Environment

Major Water source of industry is Godavari river and Canal Water for which industry has obtained permission from Irrigation department. Anticipated impact, source along with its mitigation measure for during construction and operation phase is presented in **Table 11.7**

Table 11.7 Impacts on Water Quality & Mitigation Measures

Anticipated Impact	Probable Source	Mitigation Measures
During Construction Phase		
Competing Users	• Fresh water consumption for construction activity	<ul style="list-style-type: none"> • Utilization of Water from Rain Water Harvesting Tank • Recycle of treated water to reduce fresh water consumption
Water Quality	• Wastewater from construction Labour	<ul style="list-style-type: none"> • Generated wastewater shall be treated in the existing STP
During Operation Phase		
Competing Users	• Domestic and Industrial activity	<ul style="list-style-type: none"> • Permission from Irrigation Department for withdrawal • Utilization of Water from Rain Water Harvesting in Monsoon • Water Meter will be set up at Inlet Tank • Monthly water audit to prevent wastage of water • Recycle of treated water to reduce fresh water consumption
Water Quality	• Wastewater from Industrial Activities	<ul style="list-style-type: none"> • ETP of 1250CMD [Existing 600CMD and Proposed 650CMD] followed by RO and MEE • Treated Effluent will be recycled and utilized in Cooling Tower • No treated water shall be discharged outside the factory premises as industry is achieving ZLD • Maintaining quality of Treated effluent as per CPCB Norms • Online Monitoring system provided for continuous quality check • Regular analysis of effluent by MoEFCC/NABL accredited laboratory to ensure that quality is as per prescribed norms • Daily analysis of effluent for few parameters in In-house Laboratory
	• Wastewater from Domestic Activities	<ul style="list-style-type: none"> • STP of 250CMD [Existing 250CMD and proposed 50CMD] • Treated sewage used for gardening [219CMD] • Regular analysis of sewage by MoEFCC/NABL accredited laboratory to ensure that quality is as per prescribed norms • Maintaining quality of Treated sewage as per CPCB Norms • Daily analysis of sewage for few parameters in In-house Laboratory
	• Run off storm water	<ul style="list-style-type: none"> • Adequate network for Storm water through closed pipe line • Separate drainage system for storm water and ETP treated water

11.8.4. Solid Waste [HW and Non HW] Management Environment

Industry generates various types of Hazardous as well as Non Hazardous Waste from different industrial and domestic activities. Anticipated impacts along with its mitigation measures are listed in **Table 11.8**

Table 11.8 Impacts On Solid Waste Environment and Mitigation Measures

Anticipated Impact	Probable Source	Mitigation Measures
During Construction Phase		
Generation of excavated material and construction waste	<ul style="list-style-type: none"> Construction activity 	<ul style="list-style-type: none"> Excavated material shall be reused for site leveling, backfilling and road construction Construction waste shall be segregated properly and reused to the maximum possible extent at site only Non recyclable material shall be disposed of by authorized vendor
Generation of Domestic Solid Waste	<ul style="list-style-type: none"> Domestic activity of Construction Labours 	<ul style="list-style-type: none"> Generated solid waste shall be segregated and wet waste shall be treated through Vermi-composting and dry waste shall be handed over to the authorized vendors
During Operation Phase		
Generation of Hazardous Waste	<ul style="list-style-type: none"> Manufacturing process and other Industrial Activities 	<ul style="list-style-type: none"> Generated Hazardous Waste shall be segregated as per the category Isolated and designated storage area shall be provided with non percolated flooring All Stored Hazardous waste shall be labelled Hazardous Waste shall be handled as per The Hazardous and Other Waste (Management & Transboundary Movement) Rules, 2016 PPEs shall be provided for handling of Hazardous Waste Industry has membership of CHWTSDF for disposal of Hazardous Waste All generated Hazardous waste shall be sent to the CHWTSDF only As industry is in operation phase, Annual Hazardous Waste Return is being submitted regularly and Manifest forms is also maintained and same shall be continue after expansion
Generation of Domestic Solid Waste [Non Hazardous Waste]	<ul style="list-style-type: none"> Domestic Activity 	<ul style="list-style-type: none"> Generated Solid Waste shall be segregated and stored in isolated and designated storage area Wet waste [Bio-degradable] shall be treated through Vermi-composting and resultant manure shall be used for gardening and landscaping Non Biodegradable waste shall be handed over to the authorized vendors for recycling purpose
Generation of Bio Sludge	<ul style="list-style-type: none"> STP & ETP [Non Chemical] operation 	<ul style="list-style-type: none"> This Sludge is of Bio sludge is considered as non-hazardous waste and shall be used as Manure for the gardening and greenbelt development within the plant premises

11.8.4. Land Environment

Proposed expansion shall be carried out in the same plot area and no additional plot shall be added. Anticipated Impacts along with its mitigation measures are enlisted in **Table 11.9**

Table 11.9 Impacts On Land Environment and Mitigation Measures

Anticipated Impact	Probable Source	Mitigation Measures
During Construction Phase		
• Land Acquisition & Conversion of Land	• For Proposed Expansion	• Proposed Expansion shall be carried out in the same plot premises hence there shall not be any land acquisition
• Change in Topography and Geology	• Excavation work and leveling of proposed site for construction	• Very Minimal leveling of site as proposed site has flat terrain
• Soil Erosion	• Loosening of top soil due to excavation	• Care will be taken to compact the soil after refilling so that, soil erosion and consequent soil import is avoided
• Generation of Debris	• Construction activity	• Waste generated will be reused for construction activities
• Contamination of Soil	• Leakage of oil from vehicles & DG Sets	• DG Set shall be installed on concrete roof with proper oil collection system
During Operation Phase		
• Soil Contamination	• Manufacturing Process and ETP Operation	<ul style="list-style-type: none"> • Hazardous waste generated shall be stored, transport and disposed as per The Hazardous and Other Waste (Management & Transboundary Movement) Rules, 2016 • Hazardous Waste shall be stored in a Isolated and designated storage area with non percolated flooring and care will be taken that no Hazardous Waste shall be placed on barren land • Chemicals required for ETP shall be stored in a designated storage room • Leachate from storage site shall be treated in the ETP
	• DG sets, transformer, vehicle maintenance, fuel carrying vehicle accidents, etc.	• Containment of contaminated land/soil in earmarked areas will be sent to CHWTSDF
• Soil Erosion	• Runoff during monsoon	• Care will be taken to compact the soil after refilling so that, soil erosion and consequent soil import is avoided
• Contamination of land due to discharge of untreated effluent and sewage	• Discharge of untreated effluent and sewage	<ul style="list-style-type: none"> • Industry has provided ETP of 650CMD and STP of 200CMD for treating the generated effluent and sewage • For proposed activity industry shall be providing additional ETP of 600CMD and STP of 50CMD thus accounting to 1250CMD and 250CMD respectively • The treated effluent shall be reused in Cooling Tower and treated sewage shall be discharged for gardening

11.8.5. Ecological Environment

Environmental Impacts on ecological environment during construction phase and operation phase along with its mitigation measures are enlisted in **Table 11.10**

Table 11.10 Impacts On Ecological Environment and Mitigation Measures

Anticipated Impact	Probable Source	Mitigation Measures
During Construction Phase		
<ul style="list-style-type: none"> Loss of vegetation associated with site clearance, road construction etc. 	<ul style="list-style-type: none"> Construction activities for land preparation and site development 	<ul style="list-style-type: none"> There shall be minimal clearance of site that too restricted to the wild grass only Construction shall be carried out on barren land designated for industrial activity only
<ul style="list-style-type: none"> Deposition of fine dust on leaves and plants due to emission 	<ul style="list-style-type: none"> Transportation and Construction activity 	<ul style="list-style-type: none"> Construction activities will be temporary and restricted to plant premises All the construction raw materials will be covered with tarpaulin to emit the chances of fugitive dust emissions Regular sprinkling of water will be done to suppress dust generation Plantation as per landscaping plan using native flora, which will enhance the overall ecology of the area Topsoil removed from an area during construction, will be replaced & reused
During Operation Phase		
<ul style="list-style-type: none"> Impact on Fauna & Flora due emissions 	<ul style="list-style-type: none"> Industrial Activity 	<ul style="list-style-type: none"> Adequate stack height with adequate APCE for proper dilution and dispersion of pollutants Extensive Green Belt Development

Detailed environmental impact matrix considering proposed mitigation measures to mitigate the anticipated environmental impacts are prepared for construction phase and operation phase. Cumulative Impact Matrix of proposed expansion is presented in **Table 11.11**

Table 11.11 Cumulative Impact Matrix

Environmental Attributes	Cumulative score for each parameter	Cumulative score for each attribute, Si	Relative Importance of each attribute, Wi (%)	Cumulative Significance, (Si x Wi) / 100
Air Environment		0	25	0
Climate, Air Quality	-2			
Odour	0			
Water Environment		-4	25	-1
Water Quality	0			
Water Quantity	-4			
Land Environment		11	10	-0.2
Land Use Pattern	7			
Topography	1			
Soil Quality	3			
Ecological Environment		1	10	-0.1
Terrestrial Flora & Fauna	4			
Aquatic Flora & Fauna	-3			
Social Environment		6	10	0.6
Aesthetics	6			
Economic Environment		52	5	2.6
Employment	21			
Trade & Contract Services	31			

Environmental Attributes	Cumulative score for each parameter	Cumulative score for each attribute, Si	Relative Importance of each attribute, Wi (%)	Cumulative Significance, (Si x Wi) / 100
Noise Environment	1	0	5	0
Occupational Health & Safety	-5	-5	10	-0.5
Cumulative Score				1.65

The matrix analysis reveals that the cumulative value of significance of the project, in terms of the impacts on the environment, without mitigation measures and with mitigation measures works out to be, (-28.7) and (+1.65) respectively. Therefore, it can be indicated that the proposed project would be posing Marginal Positive impacts on the environment. Apart from them, there are significant positive impacts on the environment due to the proposed project. From the overall study and evaluation of impacts, it can be concluded that the overall negative impacts from various polluting sources on different environmental attributes are negligible with proper EMP in place. Even some of the negative impacts can be converted into positive beneficial impacts with proper and timely implementation of EMP. Hence, the project can be considered environmentally safe & fit.

1.9 Corporate Environment Responsibility [CER]

As per the new Office Memorandum dated 1.05.2018 issued by MoEF&CC, GBL has to contribute 0.75% of Additional Project Cost (Brownfield project) (i.e. 150 Lakh) towards Corporate Environmental Responsibility (CER) activity which will bring environmental development in the nearby areas of the Company . GBL shall carry out various activities which shall uplift the living standards of nearby villages and this shall result in the strengthening the Socio-economic status of surrounding areas. Details of CER activities and allocated budget is presented in the **Tabel 11.12**

Table 11.12 CER Activities Along with Allocated Budget

CER Activity	Amount [INR]
Providing RO for Drinking Water	15038000
Sanitation (Providing Toilets)	
Providing Dustbins	
Electrification Including Solar Power	
Health [Donating Ambulance to Hospital]	
Road [Making Road]	
Providing Books to the Schools	
Scientific Support and Awareness to Local Farmers to Increase Yield of Crop and Fodder	
Rain Water Harvesting, Soil Moisture Conservation Works	
Avenue Plantation	
Plantation in Community Areas	

1.10 Corporate Social Responsibility [CSR]

Godavari Biorefineries Ltd. [GBL] is doing activities of Corporate Social Responsibility on founder's philosophy "What We Receive Gives Back Multi Fold". The Company's CSR activities are focused on different sectors with main emphasis on promotion of education, health, gender equity and empowering women towards holistic betterment of society. Different CSR Activities carried by Godavari Biorefineries Ltd, Sakarwadi is enlisted in **Tabel 11.13**

Table 11.12 CSR Activites of GBL

Sr. No.	List of CSR Activities
1.	Water Supply to Villages (Wari,Kanhegaon,Sade)
2.	Road-Reparis & Maintance,JCB Work (as and when required)
3.	Grampanchyat Singhwe-Joint water Supply scheme
4.	Puntamba & Shingave KT Weir-Repairs
5.	Village Tree Plantation,Temples repairing/Construction
6.	Balwadi & Balak Mandir Social Activities at Sakarwadi
7.	Rameshwar Highschool -Painting, roof sheets & repairing
8.	Financial help Deaf&dump School Kopargaon –Shoes
9.	Financial help to Shikshan Mandal Mahabaleshwar
10.	financial help Badmintion Tournament-Somaiya College
11.	Financial help-Saptaha,Jayanti Ustava & dindi
12.	Fixing Inaugaration Stone at Warigaon
13.	HP Inkjet Printer-Talathi Office Wari
14.	Finanacial help for by way of diesel to Ustava/Gram.Wari
15.	Financial help-Poilce Station Wari & Kopargaon
16.	Help Child (help for education to Student)

1.11 Environment Monitoring And Management Plant

Environment monitoring is prescribed during pre-construction, construction and operation phase. Environmental monitoring will comply Air, Water, Soil, Ecology, and Noise parameters as per monitoring compliance norms and schedule. All parameters will be tested as per standard tools and methods and obtained results should be compared with CPCB norms. Details of environmental activities along with budgetory allocation is presented in **Table 11.13**

Table 11.13 EMP Cost

Sr. No.	Activity	Existing cost		Proposed Cost		Total	
		Capital	Recurring	Capital	Recurring	Capital	Recurring
		Lakhs	(Lakhs/Y)	Lakhs	(Lakhs/Y)	Lakhs	(Lakhs/Y)
1	Air Pollution Control System	304	15	250	15	554	30
2	Water pollution control systems	1081	100	800	100	1881.3	200
3	Noise pollution control	10	1	10	1	20	2
4	Green Belt Development/ Maintenances	10	4	25	5	35	9
5	Environmental monitoring / Environmental Management	81	5	40	3	121	8
6	Occupational health & safety	40	26	50	15	90	41
7	Solid Waste Management	10	150	20	200	30	350
8	Energy Conservation Measures	22	0	50	0	72	0
TOTAL		1,558.30	301.00	1,245.00	339.00	2,803.30	640.00