Executive Summary of Draft Environmental Impact Assessment Report & Environmental Management Plan of

Proposed Expansion of Caustic Soda (54750 MT/Annum to 109500 MT/Annum) & Ethylene Dichloride (84000 MT/Annum to 146000 MT/Annum) Manufacturing Unit

Located at
R.S NO. 33 (part), 34 (part), 35 (part), 36 (part), 37 (part), 38 (part), 39 (part), 40 (part), 42 (part), 43(part), 44(part), Vanjore Village, T.R Pattinam Commune, Karaikal – 609602

Project Proponent

M/s. Chemplast Sanmar Limited

EIA Consultant

NABET/QCI Accredited EIA Consultant: NABET/EIA/2023/SA 0196_Rev.01 Valid up to April 08, 2024 (Extension of Validity of Accreditation till October 7, 2024)
NABL Accredited Testing Laboratory: TC – 13747 Valid up to May 21, 2026
MoEF Accredited Testing Laboratory: LB/99/7/2021-INSTLAB-HO-CPCB-HO/Pvt Valid up to May21,2026

Executive Summary

1. Introduction

Chemplast Sanmar Limited (CSL) is operating Caustic soda and Ethylene Di-chloride (EDC) manufacturing unit at R.S No. 33 (part), 34 (part), 35 (part) 36 (part), 37 (part), 38 (part), 39(part), 40 (part), 42 (part), 43(part), 44(part), Vanjore Village, T.R Pattinam Commune, Karaikal – 609602. CSL proposes to expand the Caustic Soda capacity from 54750 TPA to 109500 TPA and EDC capacity from 84000 TPA to 146000 TPA within the existing manufacturing plant.

The project site is located in a non-notified industrial area and at a distance of approx. 1 Km from Puducherry – Tamil Nadu interstate boundary and hence general condition is applicable as per EIA notification, 2006 and considered as Category 'A' at MoEFCC, New Delhi.

The Proposed Expansion is a Brownfield Project which falls under Category "A" of item 4(d), Chlor-Alkali Industry (Industry – III) and 5(e), Petrochemical based processing (processes other than cracking & reformation and not covered under the complexes) (Industry – II).

2. Project Description

Present manufacturing capacity of CSL is 54750 MT/Annum Caustic Soda and 84000 MT/Annum Ethylene Dichloride as per Consent to Operate. To cater growing market demand for Caustic soda and EDC, it is proposed to expand the existing facility.

2.1 History of the Project

Kothari Petrochemicals obtained Environment Clearance (EC) for 60 TPD (21900 TPA) caustic soda plant at Melavanjore, Karaikal, vide file no. J-11011/24/96-IA. II. (I) on 03/07/1996.

Chemplast Sanmar Limited (CSL) acquired the Plant from Kothari Petrochemicals in April, 2003 and expanded the plant further to 54750 TPA caustic soda & associated by-products, 84000 TPA EDC and 11.3 MW natural gas based power plant as per EIA notification, 1994 (prior to EIA notification, 2006 coming into force).

Name transfer of EC in the name of CSL was obtained from MoEF&CC vide file no. J-11011/24/96—IA. II. (I) on 26/12/2022.

CSL has Consent to Operate (CTO) order for the project from Puducherry Pollution Control Committee (PPCC) valid till 31/03/2024. CTO Renewal Application Submitted to Puducherry Pollution Control Committee (PPCC) Dated 22/12/2023.

Details of Terms of Reference (ToR) received from MoEF&CC for this expansion project are provided in the below table.

Table – 1
Details of Letter Issued by MoEF&CC, New Delhi

Sr. No.	Project Categorization	Project Activity	Proposal No.	File No. & Identification No.	Date of Issued ToR / Amendment
1	Industrial Projects - 2	Petrochemical based processing (processes other than cracking & reformation and not covered under the complexes)	IA/PY/IND2/436960/2023	ToR vide File No: J-11011/24/96-IA. II (I) Identification No. TO23A2301PY5752772N	21/09/2023
			IA/PY/IND2/459318/2024	ToR Amendment vide File No.: J-11011/24/96-IA. II (I) Identification No. TO24A2301PY5724366A	18/06/2024
2	Industrial Projects - 3	Chlor-Alkali Industry	IA/PY/IND3/436691/2023	ToR vide File No: J-11011/24/96-IA. II (I) Identification No. TO23A1601PY5144830N	10/09/2023
			IA/PY/IND3/465603/2024	ToR Amendment vide File No: J-11011/24/96-IA. II (I) Identification No. TO24A1601PY5807709A	30/07/2024

2.2 Area of the Project Site

Total plant area is 15.7908 Hectares and Out of the total plant area 5.34 Hectares i.e. 33% of the total plant area has already been developed under greenbelt and the same will be maintained.

2.3 Cost of the Project

The total project cost would be around Rs. 614 Crores (Existing: 364 Crores + Proposed: 250 Crores). It includes plant and machinery, site development and cost required for Environment Protection Measures

2.4 Size and Magnitude of Operation

Table – 2

List of Product with Capacity

S. No	Name of Products	CAS No.	Production Capacity (MT/Annum)			Remarks
			Existing	Proposed	Total	
	Main product					
1	Caustic soda	1310-73-2	54750	54750	109500	Caustic soda as 100% basis.
1a	Caustic flakes (included in S.No.1)	1310-73-2	19162.5	19162.5	38325	Caustic flakes quantity is included in S. No.1
2	Ethylene Di Chloride	107-06-2	84000	62000	146000	
3	Natural gas based power generation (Only for internal consumption)	MW	11.3	0.0	11.3	For internal consumption
	Total (1 + 2)		**138750**	**116750**	**255500**	
	By products					
1	Chlorine Gas	7782-50-5	48181	48180	96361	
2	Hydrogen Gas	1333-74-0	1387	1368.8	2755.8	Hydrogen will be bottled in cylinders
3	Sodium Hypo Chlorite	7681-52-9	10950	10950	21900	
4	Hydrochloric Acid from Caustic plant	7647-01-0	16425	16425	32850	
5	Spent Acid - 78% H_2SO_4	7664-93-9	650	650	1300	
	Total (1 + 2 + 3 + 4 + 5)		**77593**	**77573.8**	**155166.8**	

2.5 Details of Raw Materials with Source, Distance and Mode of Transportation

Table – 3

List of Raw Materials

Sr. No.	Name of the Product	Name of the Raw Materials	CAS No.	Existing (MT/Annum)	Proposed (MT/Annum)	Total (MT/Annum)	Source	Distance	Mode of Trans-portation
1.	Caustic soda	Sodium Chloride Salt (Commercial Salt)	7647-14-5	94000	94000	188000	Domestic market/ Vedaranyam Factory	1500 km/50 km	Road, Rail and Ship
2.	Ethylene Di Chloride	Ethylene	74-85-1	25200	18600	43800	Global market	2500 nm	Ship
		Chlorine	7782-50-5	61320	45260	106580	Domestic market	500 km	Via Pipeline and Road

2.6 Water Requirement, Wastewater Generation and Management After Expansion

- Total industrial Water requirement for the project is 3014 KL/Day. Out of this water requirement, PASIC water supply would be 550 KL/Day and 2464 KL/Day from the Desalination Plant. For getting 2464 KL/Day of Desalinated (Industrial) water, about 6710 KL/Day of sea water is required for the Desalination Plant.
- Effluent of 811 KL/Day will be treated through ETP followed by MEE facility.

Stream-I

426 KL/Day of cooling blow down, 150 KL/Day of DM plant reject and Boiler blow down, 153 KL/Day of process effluent, 62 KL/Day of plant wash effluent will be treated in ETP followed by MEE facility. MEE Salt 4.1 MT/Day will be send to TSDF and MEE condensate 748 KL/Day will be reuse within plant premises.

Stream-II

20 KL/Day of Domestic waste water will be treated in STP and then reuse for gardening purpose.

2.7 Details of Power Requirement

Power Requirement will be met through existing 8.1 MW & 3.2 captive power plant and standby power supply is meeting through 82.5 KVA, 180 KVA, 400 KVA, 500 KVA and 600 KVA D.G Set. Additionally, 2 Nos. of 2000 KVA D.G Set will be installed for emergency power backup.

2.8 Details of Fuel Requirement

Table – 4

Sr. No.	Fuel	Consumption		
		Existing	Proposed	Total
1.	LSHS(Low Sulfur heavy stock)	720 liter/hr.	720 liter/hr.	1440 liter/hr.
2.	Natural Gas	465.7 SCM/hr.	0	465.7 SCM/hr.
3.	Natural Gas Or SKO Or Hydrogen	300 nm^3/hr. Or 300 kg/hr. Or 670 m^3/hr	0	300 nm^3/hr. Or 300 kg/hr. Or 670 m^3/hr
4.	HSD	186 Lit/hr.	200 Lit/hr.	386 Lit/hr.

2.9 Details of Flue Gas Emission from each Utility

Existing Point Source Emission of various pollutants in to air from the project is through flue gas stacks attached to 8 TPH Steam Boiler, Incinerator, 4.95 TPH of Ethylene Flare, 8.5 MW and 2.8 MW of Natural Gas Based Captive Power Plant and Different Capacities of D.G Sets.

Additionally, Point Source Emission of various pollutants in to air from the project will be through flue gas stacks attached to 8 TPH Steam Boiler and 2000 KVA of D.G Sets.

2.10 Details of Process Gas Emission

Existing Point Source Emission of various pollutants in to air from the project is through process gas vent attached to Caustic Soda Plant, HCl Tower and Hypo Tower.

Additionally, Point Source Emission of various pollutants in to air from the project will be through process gas vent attached to Caustic Soda Plant, HCl Tower and Hypo Tower.

2.11 Details of Hazardous Waste Generation and Management

The Hazardous Waste will be collected and stored at dedicated Hazardous Waste Storage Area as per Hazardous Waste Rule. Used Oil or Spent Oil, Empty Barrels/ Containers Contaminated with Hazardous Chemicals / Wastes, Sludge and Filters Contaminated with oil is being disposed to authorized recyclers. Waste or Residue Containing Oil, Contaminated Cotton Rags or Other Cleaning materials, ETP Sludge and MEE Salt being sent for Co or Pre-Processors / cement industries.

2.12 Details of Non-Hazardous Waste Generation and Management

Non-Hazardous Waste like E-Waste, Plastic Waste, M.S Scrap and Battery Waste will be sale to authorized recyclers or authorized vendors. Biomedical Waste will be send to authorized Bio-Medical Waste Treatment Facility, Brine Sludge will be send to Common TSDF, Domestic Waste will be used as Vernicompost within plant premises, Dry Waste will be send to municipal solid waste site and Wet Waste will be used as Organic Manure for green belt development.

3. Description of the Environment

To establish the baseline status around the project site of the study region monitoring was conducted at different locations in and around the study region during 1st July, 2022 to 30th September, 2022. Selection of location is considered base on CPCB guideline and We have selected 3 nos. of location in down wind direction and 4 nos. of location in up wind direction.

3.1 Details of Air Environment

The ambient air quality monitoring was carried out in accordance with National Ambient Air Quality Standards (NAAQS) of CPCB. Ambient Air Quality Monitoring (AAQM) was carried out at 10 locations including project site during the study period.

Ambient Air Quality Monitoring reveals that the concentrations of $PM_{2.5}$ and PM_{10} for all the AAQM stations were in range of 19.13 to 25.54 µg/m^3 and 40.5 to 54 µg/m^3 respectively and were found to be within the prescribed limits National Ambient Air Quality Standards.

The concentrations of SO_2 and NO_x were found to be in range of 6.65 to 10.25 µg/m^3 and 13.01 to 16.58 µg/m^3 respectively.

3.2 Details of Noise Environment

The noise monitoring was carried out at 10 locations including project site in day time during (6 am to 10 pm) and at night time (10 pm to 6 am) in the study area as mentioned in Noise Pollution (Regulation and Control) Rules, 2000. Hourly Equivalent noise levels Leq (day) & Leq (night) were measured at each monitoring locations.

Noise level varies from 47.9 to 54.1 Leq dB (A) during day time and from 41.7 to 44.8 Leq dB (A) during night time.

From the above study, it can be concluded that noise levels in the study area are well within the prescribed limits as prescribed by the Noise Pollution (Regulation and Control) Rules, 2000.

3.3 Details of Water Environment

The baseline water quality status in the region is established by analysing surface water and ground water.

3.3.1 Details of Ground Water Environment

10 Nos. of Ground Water Samples were collected from the study area. These samples were analysed for physico-chemical parameters to ascertain the baseline status in the existing ground water bodies. Samples were collected and analysed as per standard methods of water and wastewater analysis (APHA).

The ranges of various parameters such as pH (7.14 to 8.17), Electrical Conductivity (262 to 2850 µS/cm), Total Dissolved Solids (437 to 1614 mg/l), Chemical Oxygen Demand (<4 to 10 mg/l), Dissolved Oxygen (5.6 to 5.9 mg/l), Total Alkalinity (140 to 430 mg/l), Total Hardness (180 to 440 mg/l), Calcium (48 to 97 mg/l), Magnesium (14 to 48.6 mg/l), Chloride (137 to 563 mg/l), Sulphates (40 to 122 mg/l), Fluoride (0.23 to 0.52 mg/l), Zinc (0.05 to 0.14 mg/l), Iron (<0.05 to 0.16 mg/l)**.**

It can be concluded from the sampling results for groundwater that all the samples were observed to be within the permissible limits.

3.3.2 Details of Surface Water Environment

8 Nos. of Surface Water Samples were collected from the study area. These samples were analysed for physico-chemical parameters to ascertain the baseline status in the existing surface water. Samples were collected and analyzed as per standard methods of water and wastewater analysis (APHA).

The ranges of various parameters such as pH (7.58 to 8.17), Electrical Conductivity (530 to 37800 µS/cm), Total Dissolved Solids (278 to 23249 mg/l), Chemical Oxygen Demand (12 to 24 mg/l), Bio-Chemical Oxygen Demand (<2 to 3.8), Dissolved Oxygen (5.2 to 6.3 mg/l), Total Alkalinity (110 to 210 mg/l), Total Hardness (130 to 4450 mg/l), Calcium (31 to 327 mg/l), Magnesium (10 to 882 mg/l), Chloride (77 to 12948 mg/l), Sulphates (18 to 1124 mg/l), Fluoride (0.24 to 0.78 mg/l), Zinc (0.08 to 0.17 mg/l), Iron (0.1 to 0.42 mg/l). Total Coliforms (700 to >1600 MPN/100 ml), E. Coli (40 to >1600 MPN/100 ml).

3.4 Details of Land Environment

Soil samples were collected from 10 locations including project site within the study area to assess its physico-chemical characteristics.

All the major nutrients were present, namely organic matter (0.82 to 1.32 %), available nitrogen (43 to 118 mg/kg), available phosphorus (19.7 to 41.7 mg/kg), available potassium (258 to 471 kg/ha). This indicates that soil fertility is good in the study area.

Other nutrients were present in the soil samples, namely Exchangeable Calcium (16.7 to 25.1 m. eq/100 g), Magnesium (4.12 to 7.33 m. eq/100 g), Zinc (14.7 to 40.6 mg/kg).

4. Socio-Economic

All developmental projects have direct likewise as indirect relationship with socio-economic aspects and public acceptability. Therefore, the study of socio-economic component (incorporating various facets associated with prevailing social & cultural conditions and economic status) of the project region forms a vital part of EIA study.

Developmental activities in industrial sector are required for economic development along with creation of employment opportunities (direct & indirect) and to satisfy the basic/modern needs of the society, which ultimately ends up in overall upgrading of quality of life through upliftment of social, economic, health, education nutrition status. Though, at the identical time, the industrial activities are also anticipated to generate/discharge different types of pollutants within the neighbouring environment.

The aesthetic component of environmental study denotes to the scenic value of any in the study area comprising tourist attraction, details about forest, wildlife, historic and cultural monuments. The study of those parameters helps in identification, prediction and evaluation of likely impacts on socio-economic and parameters of human interest because of the project.

5 Analysis of Alternative

5.1 Analysis with respect to site selection

No alternative site selection study has been conducted by CSL because existing plant is acquired by CSL from Kothari Petrochemicals in April, 2003 and expanded the plant further to 54750 TPA caustic soda & associated by-products, 84000 TPA EDC and 11.3 MW natural gas based power plant as per EIA notification, 1994 and now applying for expansion in existing products.

5.2 Analysis with respect to Technology

- Caustic Soda (52.5 TPD) plant, 4^{th} Generation cell elements are replaced with 6^{th} Generation cell elements for less power consumption.
- Waste Chlorine absorption system with Caustic circulation converts waste Chlorine gas into Sodium Hypo Chlorite, a value added product.

6. Environmental Monitoring Programme

Table-5
Environment Monitoring Plan (During Construction Phase)

Sr. No.	Particulars	Frequency of Monitoring	Parameters	Methodology
Air Pollution Monitoring				
1.	Ambient Air Quality Monitoring (2 locations within the premises for 24 hrs.)	Monthly	Prescribed by PPCC	IS : 5182
Water Pollution Monitoring				
1.	Monitoring of wastewater (STP inlet and outlet)	Monthly	Prescribed by PPCC	IS : 3025
Soil Monitoring				
1	Monitoring of Soil (1 Location within the plant premises	Yearly	Prescribed by PPCC	USDA Method-2014, IS 2720, IS 14684, IS 1350, USEPA 3050,
Noise Monitoring				
1	Ambient Noise Monitoring	Monthly	Prescribed by PPCC	IS:9989:1981

Table-6
Environment Monitoring Plan (During Operation Phase)

Sr. No.	Particulars	Frequency of Monitoring	Parameters	Methodology
Air Pollution Monitoring				
1.	Stack Monitoring of Flue Gas (6 Nos. of Stack)	Monthly	PM, SO_2, NO_x	IS: 11255
2.	Stack Monitoring of Process Gas (6 Nos. of Stack)	Monthly	PM, SO_2, NO_x, Cl_2, HCl	IS: 11255
3.	Ambient Air Quality Monitoring (2 locations within the premises for 24 hrs.)	Monthly	PM_{10}, SO_2, NO_x, CO, Chlorine, HCl Mist	IS: 5182
4.	Work Zone Fugitive Monitoring (2 locations) (for 8 hrs.)	Twice in a year	VOC	Instrumental Method
Water Pollution Monitoring				
1.	Monitoring of Water Withdrawal (1 No. of Bore well)	Monthly	Specified by PPCC in Consent	APHA-AWWA 23rd Edition & IS : 3025
2.	Monitoring of wastewater (ETP inlet and outlet)	Monthly	Specified by PPCC in Consent	IS : 3025
3.	Monitoring of wastewater (STP	Monthly	pH, Total Suspended Solids (TSS),Total	IS : 3025

	inlet and outlet)		Coliform (MPN Technique) & Biochemical Oxygen Demand (BOD_5^{20})	
Hazardous Waste Monitoring				
1.	Monitoring of solid / hazardous waste (ETP Sludge, Brine Sludge, MEE Salt)	Yearly	Specified by PPCC in Consent	IS 9235 : 1979
2.	Hazardous Waste Generation Monitoring / Record Keeping	Daily	Records of generation, handling, storage, transportation and disposal of other hazardous/solid	--
Soil Monitoring				
1	Monitoring of soil (1 Location within the plant premises	Yearly	Specified by PPCC in Consent	USDA Method-2014, IS 2720, IS 14684, IS 1350, USEPA 3050,
Noise Monitoring				
1	Ambient Noise Monitoring	Monthly	Noise level by Sound Level Meter	IS:9989:1981
Occupation Health				
1.	Pre-employment and periodical health check up	Twice in a Year	--	--

7. Additional Studies

As per EIA Notification dated 14th September 2006, and its subsequent amendments this Draft EIA/EMP Report has been prepared as per the ToR letter issued for 5(e) Category vide File No: J-11011/24/96-IA. II (I) and Identification No: TO23A2301PY5752772N Dated 21/09/2023 and for 4(d) Category vide File No.: J-11011/24/96-IA. II (I) and Identification No: TO23A1601PY5144830N Dated 10/09/2023 by MoEF&CC New Delhi.

The Additional Studies have been carried out for the project include: Risk Assessment & Disaster Management Plan; Emergency response and preparedness plan.

The PPCB will conduct the Public Hearing/public consultation, as per the provisions of EIA notification, 2006. The Public Hearing will be chaired by an Officer not below the rank of Additional District Magistrate. The concerns / suggestions received in the Public Hearing as well as during the consultation process and the commitments made by the project proponent on the same will be included separately in final EIA-EMP Report. The minutes of the public hearing will also be included in the final EIA – EMP report after completion of the public hearing.

8. Project benefits

The project will provide additional employment opportunities (both direct and indirect employment) in the region leading to prosperity and improvement of living standards.

9. Details of Green Belt

Total plant area is 15.7908 Hectares and Out of the total plant area 5.34 Hectares i.e. 33% of the total plant area has already been developed as greenbelt and the same will be maintained.

10. Environment Management Plan

Environment Management Committee is in place to ensure the implementation of Environment Management Plan. Periodic review and audits will be conducted for checking the effectiveness of implementation of mitigation measures listed in the EIA report. Environment management plan is suggested to mitigate the impacts of the project during construction and operational phase of project.

Total Cost for Environment protection measures (including cost of ETP, RO, MEE, STP, Acoustic enclosures online monitoring systems, detector systems, CEMS, Odour Control, Environment Lab & Tree Plantation, etc.) is Rs. 16.72 Crores and recurring cost for the project is Rs. 41.29 Crores per annum.

11. Conclusion

The EIA study of M/s. Chemplast Sanmar Limited has been carried out with respect to the TORs awarded by MoEF&CC, New Delhi. All the impacts likely to have an effect on the environment have been identified and efficient / adequate mitigation measures have been proposed for the same.

The baseline study carried out for the study area indicates that all the physical, chemical and biological characteristics of the environmental attributes in the surrounding area are well within the permissible limits.

Based on this environmental assessment, the possible impacts during both pre-project and post-project phase are anticipated and the necessary adequate control measures are formulated to meet the statutory compliances.

- The project will provide quality product to the users.
- The project would not have any considerable impact on environment with efficient mitigation measures implemented.
- The waste generated in form of gas (Flue gas & Process gas), effluent and solid waste may have impacts on environmental parameters but CSL has install most efficient technologies for prevention of emission and treatment of effluent.

- The generated hazardous waste will be disposed of through approved co-processing or TSDF/ CHWIF site. Hence there would not be any considerable impacts on environment.
- There should be positive impact on the socio-economic condition of the area in terms of direct and indirect employment due to the expansion project.
- Country will save valuable foreign exchange as import of these products will be reduced by corresponding amount.
- Rapid risk assessment including On-site & Off-site Emergency Plan and DMP has been prepared to handle any sort of emergencies.

Hence considering, overall project justification, process, pollution potential and pollution prevention measures/ technologies installed by CSL, environmental management activities; it can be concluded that the proposed expansion project would not have any considerable impacts on environment as well as socio-economic and ecological conditions of the project area. Hence proposed expansion project is considered to be environmentally safe.